Beyond Profit-Centric – Transcendent Business Modelling

by

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Abstract

It is widely recognised that there is an increased need for business modellers to understand businesses do not exist in isolation, but are part of a complex interconnected and interactive system (e.g. local communities, national and global societies, natural environment settings, local and global economies). There is an increased pressure on businesses to think beyond self-interests and focussing on maximising their profits. Many now argue that every business needs to take a transcendent responsibility for its actions and decisions. Moreover, there are increasing numbers of stakeholders (e.g. employees, customers, suppliers), besides shareholders, who want to have their say and influence on how businesses do the business. There are also calls for transcendent business education, with the claim that it has not been shown clearly enough how businesses could achieve their objectives with transcendent responsibilities. A transcendent business is one that goes beyond self-interest and generating profit; it is a business that simultaneously accounts for multiple typological groupings when developing business objectives, and leaves behind a better world for the next generation.

This thesis presents a Transcendent Reference Model and Methodology (TRM+) of a business modelling approach that goes beyond self-interest and generating profit. The TRM+ is a set of repeatable steps/phases that have been developed to assist future business entrepreneurs/modellers to design business models for their transcendent businesses around their selected innovations/patents. The TRM+ consists of a number of problem solving and decision-making methods (heuristics), and interpretations. These can assist business entrepreneurs/modellers to make decisions during the process of designing business models of their transcendent businesses – businesses that simultaneously account for multiple typological groupings (e.g. social, environmental, economic) when developing business opportunities from post-incubation innovations/patents.

The TRM+ is exercised by developing a detailed business model for a hypothetical transcendent business around a selected patent, and by extracting knowledge from multiple expert groups (Corporate Social Responsibility (CSR) experts, Solar Thermal Power (STP) experts with expertise relative to a selected patent, and business entrepreneurs). Whilst the TRM+ has been shown to be conceptually viable, it is no more than a theoretical reference model and methodology at this stage. There is a need for its practical testing as well as a need for feedback from business modellers who will use it as a guide for developing business models of their transcendent businesses. The TRM+ is a first step toward development of a reusable methodology for transcendent business modelling and measurement. It provides a foundation for future research and refinement of the TRM+.
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Declaration of Originality

This thesis contains no material which has been accepted for the award of any other degree or diploma in any university, and to the best of my knowledge contains no material previously published or written by another person, except where due reference is made in the text of the thesis. Work based on joint research or publications in this thesis fully acknowledges the relative contributions of the respective authors or workers.

Signed..........................................................................................................

Miroslav Cincura

Date...........................................................................................................
# Table of Contents

1. **Introduction** .................................................................................................................. 25
   1.1 Introduction .................................................................................................................. 25
   1.2 Research problem and rationale .................................................................................. 27
   1.3 Research questions and investigation ......................................................................... 30
   1.4 Modelling and metrics ............................................................................................... 31
   1.5 Proposed model of a transcendent business modelling .............................................. 32
   1.6 Objectives, scope, and limitations of the research .................................................... 33
   1.7 Research approach ...................................................................................................... 34
   1.8 Layout of the thesis ..................................................................................................... 38
   1.9 Summary .................................................................................................................... 39

2. **Research Background** .................................................................................................... 41
   2.1 Introduction .................................................................................................................. 41
   2.2 Transcendent, egalitarian, and visionary business literature ...................................... 42
   2.3 Business models, business modelling, and reference models .................................... 47
   2.4 Business modelling approaches and attempts ............................................................ 53
   2.5 Monitoring, measuring, and reporting of business performance .................................. 58
   2.6 Business modelling versus business measurement ..................................................... 65
   2.7 Society focused world organisations and business modelling .................................... 69
   2.8 Prioritising decision options; decision-support methods and tools ............................. 72
   2.9 Conceptual framework model ..................................................................................... 76
   2.10 Summary .................................................................................................................... 86

3. **Research methodology** ................................................................................................ 87
   3.1 Introduction .................................................................................................................. 87
   3.2 Methodology framework used during development of the TRM+ ............................... 88
   3.3 Steps/phases of the TRM+ when used as a model ....................................................... 89
   3.4 Data collection methods ............................................................................................ 97
   3.5 Data analysis methods ............................................................................................... 104
   3.6 Scope and limitation of the research .......................................................................... 110
   3.7 Selection of participants ............................................................................................ 111
   3.8 Ethics and research procedures .................................................................................. 112
   3.9 Validity and reliability of the research ...................................................................... 113
   3.10 Summary ................................................................................................................... 115

4. **Phase I of the TRM+ investigation** ............................................................................. 117
   4.1 Introduction .................................................................................................................. 117
   4.2 Identification of major typological groupings ............................................................. 118
      4.2.1 Findings of the analysis ......................................................................................... 120
   4.3 Identification of core values/ideals of major typological groupings ............................. 121
      4.3.1 Findings of the analysis ......................................................................................... 121
   4.4 Verification of major typological grouping and their core values/ideals ...................... 123
      4.4.1 Social typological grouping .................................................................................. 124
      4.4.2 Environmental typological grouping .................................................................... 127
      4.4.3 Economic typological grouping ........................................................................... 129
      4.4.4 Additional typological groupings .......................................................................... 131
   4.5 Prioritisation of core values/ideals of each typological grouping ............................... 134
      4.5.1 Prioritisation of core values/ideals for a Social grouping ..................................... 135
      4.5.2 Prioritisation of core values/ideals for an Environmental grouping ..................... 136
      4.5.3 Prioritisation of core values/ideals for an Economic grouping ............................. 137
      4.5.4 Additional 'Polity’ grouping .................................................................................. 137
      4.5.5 Prioritisation of core values/ideals for a Polity/Governance grouping: ................ 139
      4.5.6 Additional 'Sustainable human development' grouping .................................... 139
      4.5.7 Prioritisation of core values/ideals for a Sustainable human development grouping 140
5. **Phase II of the TRM+ investigation** ................................................................. 173
   5.1 Introduction ........................................................................................................ 173
   5.2 Selection and evaluation of patents for addressing core values/ideals .............. 174
      5.2.1 Research findings – evaluation of patent1 .................................................. 176
      5.2.2 Research findings – evaluation of patent2 and patent3 ............................. 176
   5.3 Identification of potential usages of a selected patent3 ..................................... 178
      5.3.1 Research findings – potential usages of patent3 ........................................ 186
   5.4 Prototyping characteristics of potential businesses ......................................... 187
      5.4.1 Research findings – prototyped and evaluated characteristics of potential businesses ................................................................. 199
   5.5 Evaluation of methods and procedures for prototyping characteristics .......... 206
      5.5.1 Research findings – evaluated methods and procedures for prototyping characteristics ................................................................. 207
   5.6 Prototyping of appropriate business model(s) .................................................. 208
   5.7 Evaluating the prototyped business models ..................................................... 210
      5.7.1 Research findings – evaluated prototyped business models ..................... 211
   5.8 Prioritising and rating of prototyped business models ..................................... 212
      5.8.1 Research findings – prioritised and rated prototyped business models ....... 212
   5.9 Outcome of Phase II: ......................................................................................... 213
   5.10 Summary ........................................................................................................... 215
6. **Phase III to Phase V of the TRM+ investigation** .............................................. 217
   6.1 Introduction ........................................................................................................ 217
   6.2 Phase III: Selecting potentially the most beneficial business model .............. 218
      6.2.1 Research findings – the most beneficial business model selected by AHP technique ................................................................. 223
      6.2.2 Research findings – the most beneficial business model selected by CSR experts ................................................................. 226
   6.3 Development of a mission statement for the selected business ....................... 227
   6.4 Outcome of Phase III: ......................................................................................... 228
   6.5 Phase IV: Developing detailed business model of a future business ............... 229
      6.5.1 Research findings – developed detailed business model of a future business ................................................................. 229
   6.6 Outcome of Phase IV: ......................................................................................... 233
   6.7 Phase V: Setting up KPIs of a modelled transcendent business ....................... 234
      6.7.1 Research findings – the set KPIs of a modelled transcendent business ....... 235
   6.8 Outcome of Phase V: ......................................................................................... 240
   6.9 Summary: ........................................................................................................... 241
7. **Design Space Analysis of the TRM+ methodology** ........................................ 243
   7.1 Introduction ........................................................................................................ 243
   7.2 Analysis of the Transcendent Reference Model ............................................... 244
| 7.2.1 | Phase I: Identification of major typological groupings and their core values/ideals .......... 245 |
| 7.2.2 | Phase II: Addressing core values/ideals of major typological groupings ............................. 245 |
| 7.2.3 | Phase III: Selecting potentially the most beneficial business ............................................ 247 |
| 7.2.4 | Phase IV: Developing a detailed business model of a future business ................................ 247 |
| 7.2.5 | Phase V: Setting up KPIs of a modelled transcendent business ......................................... 248 |
| 7.3  | Analysis of the Transcendent Reference Methodology using QOC .............................................. 249 |
| 7.4  | Summary .................................................................................................................................. 258 |

8. **Summary of the findings, conclusion, and further research** .......................................................... 259

| 8.1  | Introduction............................................................................................................................... 259 |
| 8.2  | Summary of the findings ........................................................................................................... 260 |
| 8.3  | Assessing the created business model ..................................................................................... 266 |
| 8.3.1 | Assessment against five goals of a transcendent business ...................................................... 266 |
| 8.3.2 | Assessment against five principles of CSR 2.0 ........................................................................ 267 |
| 8.3.3 | Outcome of the assessments and discussion ......................................................................... 269 |
| 8.4  | Benefits of transcendent business modelling and the TRM+ ................................................... 273 |
| 8.5  | Conclusion ............................................................................................................................... 274 |
| 8.6  | Further research..................................................................................................................... 276 |

References ........................................................................................................................................... 279
Appendixes ....................................................................................................................................... 291
List of Figures

Figure 1.1: QOC – How to identify multiple typological groupings a modelled transcendent business will account for ......................................................................................................................................... 35

Figure 2.1: Hierarchical structure of the AHP assessment ........................................................................................................ 74

Figure 2.2: QOC – How to identify major typological groupings and their core values any transcendent business could/should account for .......................................................................................................... 77

Figure 2.3: QOC – How to address diversified core values of multiple typological groupings ............................................................. 79

Figure 2.4: QOC – How to identify patent experts ............................................................................................................................. 80

Figure 2.5: QOC – How to prioritise decision options ....................................................................................................................... 82

Figure 7.1: Diagram of the TRM+ model .................................................................................................................................... 244

Figure 7.2: QOC – How to identify multiple typological groupings a modelled transcendent business will account for – analysis of the Transcendent Reference Methodology .................................................................................................................. 249

Figure 7.3: QOC – How to identify core values/ideals for each major typological grouping – analysis of the Transcendent Reference Methodology .............................................................................................................. 250

Figure 7.4: QOC – How to prioritise core values/ideals of each major typological grouping – analysis of the Transcendent Reference Methodology ......................................................................................................... 251

Figure 7.5: QOC – How to address diversified core values of multiple typological groupings – analysis of the Transcendent Reference Methodology ...................................................................................................... 253

Figure 7.6: QOC – How to identify patent experts – analysis of the Transcendent Reference Methodology ........................................... 254

Figure 7.7: QOC – How to prioritise decision options – analysis of the Transcendent Reference Methodology .............................................................................................................................................. 255
List of Tables

Table 2.1: Example of AHP assessment of business models ................................................................. 75
Table 4.1: Selection of the most important core values/ideals of a social typological grouping ............... 124
Table 4.2: Selection of the most important core values/ideals of an environmental typological grouping .... 127
Table 4.3: Selection of the most important core values/ideals of an economic typological grouping .......... 129
Table 4.4: Prioritisation of core values/ideals of a social grouping .......................................................... 135
Table 4.5: Prioritisation of core values/ideals of an environmental grouping .......................................... 136
Table 4.6: Prioritisation of core values/ideals of an economic grouping .................................................. 137
Table 4.7: Prioritisation of core values/ideals of a polity/governance grouping ........................................ 139
Table 4.8: Prioritisation of core values/ideals of a sustainable human development grouping ................. 140
Table 4.9: Prioritisation of the most important core values/ideals of major typological groupings .......... 143
Table 4.10: Assigning weighting points for each prioritised core value/ideal ............................................ 146
Table 4.11: Research findings – assigned weighting points to each prioritised core value/ideal ................. 148
Table 4.12: Prioritisation of core values/ideals of a social grouping – CSR experts Group2 ..................... 152
Table 4.13: Prioritisation of core values/ideals of an environmental grouping – CSR experts Group2 ........ 153
Table 4.14: Prioritisation of core values/ideals of an economic grouping – CSR experts Group2 ............... 153
Table 4.15: Prioritisation of core values/ideals of a governance grouping – CSR experts Group2 ............... 154
Table 4.16: Prioritisation of core values/ideals of a sustainable human development grouping – CSR experts Group2 ................................................................. 154
Table 4.17: Prioritisation of the most important core values/ideals of major typological groupings – CSR experts Group2 ................................................................. 158
Table 4.18: Research findings – CSR experts Group1 versus CSR experts Group2 ................................. 159
Table 4.19: Calculating weighting points for each prioritised core value/ideal .......................................... 161
Table 4.20: Prioritised list of groupings ............................................................................................ 162
Table 4.21: Research findings – assigned weighting points to each prioritised core values/ideal ............... 164
Table 5.1: Prioritised and rated prototyped business models ................................................................. 212
Table 6.1: Prioritised and weighted core values/ideals of major typological groupings ............................ 219
Table 6.2: AHP assessment of prototyped business models ................................................................. 220
Table 6.3: List of prioritised and weighted core values/ideals of major typological groupings as prioritised and weighted by CSR experts ................................................................. 235
List of Appendices

Appendix I: Phase I – Online survey questionnaire – Delphi cycle A1; CSR experts Group1 ......................... 291
Appendix II: Phase I – Online survey questionnaire – Delphi cycle A2; CSR experts Group1 ......................... 294
Appendix III: Phase I – Online survey questionnaire – Delphi cycle A3; CSR experts Group1 ......................... 298
Appendix IV: Phase I – Online survey questionnaire – Delphi cycle A2; CSR experts Group2 ......................... 299
Appendix V: Phase I – Online survey questionnaire – Delphi cycle A3; CSR experts Group2 ......................... 303
Appendix VI: Phase II – Description of a selected patent1 ....................................................................... 304
Appendix VII: Phase II – List of core values/ideals ................................................................................. 309
Appendix VIII: Phase II – Online patent1 survey; STP experts................................................................. 310
Appendix IX: Phase II – Description of a selected patent2 ....................................................................... 311
Appendix X: Phase II – Description of a selected patent3 ....................................................................... 317
Appendix XI: Phase II – Online patent3 survey; STP experts ................................................................... 323
Appendix XII: Phase II – Online discussion forum .................................................................................. 325
Appendix XIII: Phase II – Online survey questionnaire – feedback ........................................................... 336
Appendix XIV: Phase II – Online survey questionnaire ............................................................................ 337
Appendix XV: Phase III – Online survey questionnaire ............................................................................ 339
Appendix XVI: Ethics clearance ............................................................................................................ 340
List of Acronyms

AA ......................................................................................................................AccountAbility standards
AHP ................................................................................................................ Analytic Hierarchy Process
APEC ............................................................................................................ Asia-Pacific Economic Cooperation
CAMAC ........................................................................................................ Corporations and Markets Advisory Committee
CPRS ................................................................................................................ Carbon Pollution Reduction Scheme
CSP .................................................................................................................. Concentrated Solar Power
CSR ................................................................................................................ Corporate Social Responsibility
DJSI .................................................................................................................. Dow Jones Sustainability Indexes
DSA ................................................................................................................ Design Space Analysis
EB .................................................................................................................... Ethical Business
EIA .................................................................................................................. Environmental Impact Assessment
EMS ................................................................................................................ Environmental Management Systems
ESI .................................................................................................................... Enlightened Self Interest
EU ................................................................................................................... European Union
GFC ................................................................................................................ Global Financial Crises
GSS ................................................................................................................ Global Sustainability Services
GRI ................................................................................................................ Global Reporting Initiatives
HREC ............................................................................................................ Human Research Ethics Committee
ILO ................................................................................................................ International Labour Organization
ISEA ............................................................................................................... Institute for Social and Ethical Accountability
ISO ................................................................................................................ International Organization for Standardization
KPIs ................................................................................................................ Key Performance Indicators
KRIIs ............................................................................................................... Key Result Indicators
MDG ............................................................................................................... Millennium Development Goals
NASA ............................................................................................................. National Aeronautics and Space Administration
NATO ............................................................................................................. North Atlantic Treaty Organization
NGERS ....................................................................................................... National Greenhouse and Energy Reporting System
OECD ........................................................................................................... Organization for Economic Co-operation and Development
OHSAS ........................................................................................................ Occupational Health and Safety Assessment Series
PIs .................................................................................................................... Performance Indicators
QOC ............................................................................................................... Questions, Options, Criteria
ROI ............................................................................................................... Return on Investment
SA ................................................................................................................ Social Accountability
SAM ............................................................................................................... Sustainable Asset Management
SEA ............................................................................................................... Strategic Environmental Assessment
SIA ................................................................................................................ Social Impact Assessment
SME ............................................................................................................... Small and Medium Enterprise
STP ............................................................................................................... Solar Thermal Power
TBL ................................................................................................................ Triple Bottom Line
TI .................................................................................................................. Transparency International
TRM+ ....................................................................................................... Transcendent Reference Model and Methodology
UBM ............................................................................................................ Universal Business Model
UN ................................................................................................................ United Nations
UNESCO ........................................................ United Nations Educational, Scientific and Cultural Organisation
USPTO ....................................................................................... United States Patent and Trademark Office
VC .............................................................................................................................. Venture Capitalists
WBCSD ........................................................................ World Business Council for Sustainable Development
WEF ...................................................................................................................... World Economic Forum
Glossary

Business
In a broad sense, a ‘business’ is an entity that brings together resources to create values for its target customer / client / stakeholder. This thesis uses the term ‘business’ for describing an entity (business, company, firm, enterprise, organisation) of any type, size, and development cycle, physically located anywhere in the world or operating in an online environment.

Business metrics
By definition, a business metric refers to any type of measurement used to evaluate some quantifiable component of a business's performance, such as return on investment (ROI). Business metrics used in transcendent business modelling refers to measurement of beyond-profit performance e.g. social, environmental. Business metrics help in guiding the strategic direction of a business (Rubin, 1991).

Business model
“In general, a ‘business model’ can be understood to be a simplification of a planned or existing business.” (Mair, 2005: 3). A business model is a single representation of a planned or existing business, based on which the business could be analysed, understood, evaluated, and compared to any other business (Dowding, 2001).

Egalitarian
By definition, ‘egalitarian’ can be characterised by the belief that all people are equal and should have equal (e.g. political, social, human, economic) rights. In this thesis the term ‘egalitarian’ is used in conjunction with number of typological groupings, where a business is favouring all members equally and accounting for core values/ideals of all typological groupings. Favouring, equally, means that opinions and concerns of all members of typological groups are listened to and accounted for; they are all involved in decision making processes during the process of developing business models for the future businesses.

Egalitarian business modelling
For the purpose of this thesis an ‘egalitarian business modelling’ approach is an approach where a business modeller is not only accounting for core values/ideals of multiple typological groupings, but a business modeller also lets members of those groupings to be actively involved during the process of modelling a business model for the future business. In this thesis, the phrase ‘egalitarian business modelling’ is used within the context of ‘transcendent business modelling’, arguing transcendent business modelling shall be egalitarian in its nature.
**Patent**

According to the US patent and trademark office, a patent is a document granting to the inventor(s) sole rights to their invention, be that a utility patent (useful device and process); a design patent (appearance of a useful device); or a plant patent (man-made plant variety). A utility patent protects the way something works and is used; a design patent protects the way something looks, including the shape, configuration or decorations; and a plant patent is given to an inventor who has discovered a new and distinct variety of a plant that is asexually reproduced.

**Social business**

Yunus (2008) argues a ‘social business’ needs to put humans’ needs before making profit; it is a business that is designed to do good for people (society) before doing anything else (e.g. creating profit). Generally speaking a social business considers its short-term and long-term impact on society, and it has a positive relationship with the community where it operates. For the purpose of this thesis I define a social business as a business that addresses social needs, creates and delivers values for people (society) and is ethical and accountable for its actions.

**Social expert**

In this thesis the term ‘social expert’ refers to professionals who have extensive expertise studying and understanding people, their needs, behaviours, patterns of living, and generally the values/ideals that matter the most to them and their society.

**Social value(s)**

Wei (2009) defines ‘social values’ as the judgments of right and wrong about social relationships; relationships among people living in the society. “Social values are evinced in the form of behaviour guides popular in the society, and which lie deep within the people’s consciousness” (Wei, 2009: 54). The literature regularly uses the term ‘social values’ to refer to abstract standards or practical experiences in social life which are believed to be important and/or desirable. This thesis uses the term ‘social values’ to refer to something that is important, needed, desired, and valued by a group of people (society).

**Society**

In this thesis, the term ‘society’ refers to a group of people who are sharing some commonalities (e.g. cultural aspects such as language, dress, norms of behaviour), common interests, and a set of common values. The term ‘society’
in this thesis is used to refer to people of one’s country or a community taken as a whole.

**Socio / social**
Max Weber in Carr (2003) defines ‘social’ as a human action that exists only in the relations between two or more individuals. Generally speaking, ‘social’ relates to communities or organised groups, human society and its members (colonies of the same kind / people). ‘Social’ in this thesis refers to people / group of individuals who live together in a community.

**Stakeholder**
Donaldson and Preston (1995) define a ‘stakeholder’ as an individual, or a group of individuals, who claims a share of the value created by the business’s production, or holds an interest in the business’s existence. A ‘stakeholder’ is a person, a group, another business, or system that can affect, or be affected by, the actions, activities, products or services and associated performance of a business (Freeman, 1984).

**Transcendent**
By definition, the term ‘transcendent’ refers to something that goes beyond and outside the ordinary range of human experience or understanding. Giacalone (2004) uses the term ‘transcendent’ in relation to business as those businesses that go beyond self-interest and a single business objective, which is often profitability of the business. In this thesis, the term ‘transcendent’ refers to a business that has multiple objectives and goes beyond self-interest and generating revenue.

**Transcendent business**
Giacalone (2004: 416) argues a ‘transcendent business’ is a business whose goals are not solely financial; transcendent business aims to increase material wealth with a sense of long term social benefit. Transcendent business leaves behind something worthy of its time on the planet. Transcendent business has non-financial objectives, besides financial ones; it strives for collective improvement of our world, and has generative aspirations to leave behind a better world for those who follow (Giacalone, 2004).

**Transcendent business modelling**
According to Giacalone (2004), ‘transcendent business modelling’ refers to developing business models for future businesses whose objectives will not be purely focused on self-interest, but would be concerned about multiple groupings that businesses directly, and indirectly, influence and interact with (e.g. local/global communities, natural environment, national and international economy).
**Visionary business**

Collins and Porras (2000) identify a ‘visionary business’ as a business that is a market leader in the industry where it operates. It is a well-known business that is respected by its business partners; a business that has the top management unchanged for several years; a business that has gone through a number of product life cycles; a business that has been operating for several decades.
CHAPTER I

1. Introduction

1.1 Introduction

The key challenge of our time is to provide the economic growth needed by the world’s poor while leaving the local, regional, and global environment in a state that will provide sustenance and benefits in the future. (Laszlo, 2003: xiii)

It is increasingly being argued that the world has reached the point where business modellers need to understand businesses do not exist in isolation but, rather, are part of an intertwined global business scenario (Hitchins, 2005; Ferrary, 2009; Rae, 2007) and, therefore, they need to take transcendent responsibility for their actions and their decisions (Harman, 1990; Reich, 1998; Giacalone, 2004). This involves thinking and acting morally (Reich, 1998), beyond profitability and self-interest, “having objectives for the non-financial, collective improvement of our world, and generative aspiration to leave behind a better world for those who follow” (Giacalone, 2004: 416). If the assumption is that there is a need for a transcendent business approach, then a core question must be how the models and metrics heuristics are defined for testing so these imperatives are attained.

The argument is that businesses do not only have business objectives and responsibilities to their shareholders (Ferrary, 2009), but that social capital, environmental performance and stakeholder relations have become equally critical to their success (Laszlo, 2003). They are being called upon to respond to the needs of multiple stakeholders (e.g. employees, customers, shareholders) in the short, medium, and long term (Reich, 1998). Ferrary (2009) argues there are a number of stakeholders business needs to be accountable to. Elkington (1998) argues that stakeholders want to be treated as partners; “the greater the mutual earned respect and loyalty, the greater the chance that the business will be sustainable” (Elkington, 1998: 219).

However, the interests of stakeholders are often in conflict. For example, “directors and employees demand a salary, shareholders demand dividends, the state demands taxes, customers want to buy goods at low prices while suppliers want to sell at high ones” (Ferrary, 2009: 33). Laszlo (2003: xvii) argues, “there is a growing gap between short term profit thinking of businesses and social and environmental pressures from stakeholders.” On the other hand, R. E. Wood, (CEO from Sears) believes, “if customers, employees, and community are properly taken care of, the stockholder will benefit in the long run” (Laszlo, 2003: 36).
Laszlo (2003) argues that business modellers need to understand that value is created from social and environmental responsibility, which translates into social and environmental sustainability. He argues that socially and environmentally responsible businesses contribute to long term global sustainability. The Brundtland report (1987: 8) defines sustainability and sustainable development as development “...that meets the needs of the present generation without compromising the ability of future generations to meet their own needs.” The Global Reporting Initiatives (GRI) guidelines (2003) argue, that sustainability reporting is the practice of measuring, disclosing, and being accountable to internal and external stakeholders for business performance in sustainable development.
1.2 Research problem and rationale

This thesis investigates a transcendent business modelling and measurement approach, and argues for a methodology including how to design business models of future businesses that go beyond profit making. More specifically, this thesis investigates how to identify the major typological groupings (e.g. social, environmental, economic) of the same type of problems, interests, beliefs, values, ideals, that can be categorised by specific characteristics. Once the typological groupings are identified, this thesis investigates how to identify core values/ideals of the groupings a modelled transcendent business will simultaneously account for when developing a business opportunity.

There are different views on how businesses should operate. Economists, academics, environmental experts, to name a few, all have their opinions and views. Doing business is conventionally linked with winning and keeping customers and making profit both in the short and long term (Berry, 1995; McKaskill, 2006a). On the other hand, society-focused world organisations like the United Nations (UN), and an emerging number of authors, argue that businesses should go beyond a single goal of making profit and generating wealth for their owners (Harman, 1990; Reich, 1998; Giacalone, 2004; Annan, 2002).

1. Business and society:
Harman (1990) argues that every business operating in any society needs to take responsibility for the whole of its impact/influence/outcomes. By ‘the whole’ Harman refers to everything that is inside and outside the business – people (society), natural environment (planet), and global economy (financial world). Hitchins (2005) argues there is an increased need for business modellers to understand businesses do not exist in isolation, but are part of an intertwined global business scenario – they are positioned in a natural environment setting and a community of people. Businesses have themselves come to realise they need to respond to the major social and environmental trends and challenges that are reshaping our world (Annan, 2002).

2. Stakeholder focus:
Reich (1998) argues businesses are being called upon to respond to the needs of multiple stakeholders\(^1\) in the short, medium, and long term. Reich (1998) explains that businesses are pressured by shareholders to maximise shareholder value, and they often make decisions to favour shareholders rather than all stakeholders equally because, under the law, they have a responsibility to their investors/shareholders. On the other hand, businesses are also concerned about public opinion and their public image because they sell their products directly, or indirectly, to the public. Whilst there are advocates of

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\(^1\) A stakeholder is a person, a group, another business, or system that can affect, or be affected by the actions, activities, products or services and associated performance of a business (Freeman, 1984). A stakeholder includes employees, board of directors, shareholders, trade unions, clients, suppliers, customers, etc. to name a few (Ferrary, 2009)
corporate 'social responsibility' who argue that "what's good for the company's shareholders over the long term is also good for its other stakeholders over the long term" (Reich, 1998: 11), society need not accept that businesses have responsibilities to their shareholders only (Reich, 1998) but rather, have deeper and more robust responsibilities, "meta"-responsibilities – transcendent responsibilities that go beyond responsibilities to their investors (Reich, 1998).

3. Beyond profit metrics:
Laszlo (2003) argues that businesses need to simultaneously integrate multiple stakeholder objectives as part of the way they do business, because, if a business addresses, for example, social objectives without environmental ones, it would end up being unsustainable. Whilst Spiller (2000) claims a business can achieve together a triple bottom line of environmental, social and financial performance, Laszlo (2003) believes a business can be sustainable while being profitable. Examples of such businesses given by Laszlo (2003) include, for example, 'Patagonia Inc.', 'The Co-operative Bank', and 'Bulmers'. He further argues that becoming a sustainable business is not about choosing ethics over profits, but about combining values of all stakeholders together; "if customers, employees, and community are properly taken care of, the stockholder will benefit in the long run" (Robert, E. Wood, CEO of Sears cited by Laszlo, 2003: 36.). Spiller (2000) believes a business can go beyond a single bottom line of generating profit and maximising shareholders’ value, calling such a business an "ethical business".

Mair and Schoen (2005) provide examples of businesses that go beyond a single bottom line of generating profit. They analysed three socially and economically ‘successful’ businesses (‘Grameen Bank’, ‘Sekem’, ‘Mondragon Corporacion Cooperativa’) that aimed to address specific fundamental social problems. They discovered all three proactively created their own value networks of businesses that shared their social vision; they all developed resource strategies as an integral part of their business modes, and they all integrated their target group (society in a broad sense) into their social value networks (e.g. by creating more jobs, creating healthy environments, offering cultural, social and professional services).

4. Business education:
Giacalone (2004: 415) looks at current business education and criticises how business faculties teach business. He claims they create brilliant tacticians who know how to define financial success and create wealth. However, financial success in textbooks is defined without transcendent responsibilities. He argues that the goals of some professionals (e.g. aspiring doctors and psychologists) are not solely financial, but transcendent, unlike the goals of many businesses.

Giacalone (2004: 416) argues, that in current business education "there is no objective
for the non-financial, collective improvement of our world, and no generative aspiration to leave behind a better world for those who follow". He calls for a change in business education and argues, "business education must help students think beyond profitability and self-interest" (2004: 418). However, he does not suggest how the change could be achieved or how business faculties should teach students/future business modellers to develop business models of transcendent businesses.

Principally, the tradition of businesses and business modellers has been a profit-centric approach (Berry, 1995). However, it could be argued, and has been argued, that such an approach is self-interested, individualistic and shareholder-driven, where the interests of shareholders are more considered than those of other stakeholders (e.g. customers, employees, suppliers), who have minimal input and influence on business decisions (Reich, 1998). It is increasingly being recognised that there are increasing numbers of multiple stakeholders who want to have their say and influence about how businesses act (Reich, 1998; Ferrary, 2009; Howard, 1994). Unfortunately, traditional business models do not allow multiple stakeholders to be actively and efficiently involved in decision-making processes (Reich, 1998). Traditional business models do not allow business modellers to design and view proposed business models to see how well they satisfy the needs of multiple stakeholders (Reich, 1998).

Although it can be evidenced that some existing businesses generate value for their shareholders whilst also considering values/ideals of other stakeholders (Spiller, 2000; Mair and Schoen, 2005), there is not enough supporting information in existing literature to demonstrate how those businesses identify values/ideals that are important for multiple stakeholders beside shareholders. At present, businesses that are concerned about public opinion, their public image, and their beyond-profit performance (e.g. social, environmental, economic), often follow the Global Reporting Initiative (GRI) guidelines and are reporting their social, environmental and economic performance using the Triple Bottom Line (TBL) reporting framework (Barut, 2007). However, businesses often simply guess what performance indicators are important to their stakeholders. Moreover, businesses are free to make decisions about what beyond-profit performance indicators they will include in their reports (Norman & MacDonald, 2003). Such freedom makes it possible even for a cynical business to appear to be socially, environmentally, and economically responsible (Norman & MacDonald, 2003). The existing literature also lacks information that would clearly help future business modellers to design business models of their transcendent businesses. In other words, there is currently no documented and explained reusable reference model of such a business modelling approach.
1.3 Research questions and investigation

Many scholars (e.g. Spiller, 2000; Mair and Schoen, 2005) have argued that businesses can go beyond a single bottom line of self-interest and generating profit, but how that could be achieved is not forthcoming. This thesis aims to advance the concept of transcendent business and aims to develop, test, and present a reusable reference model and methodology (TRM+) for a business modelling approach that would assist business modellers to develop business models of their transcendent businesses. This thesis therefore investigates the following broad questions:

1. What would a business modelling and measurement approach look like that simultaneously accounts for a number of typological groupings (e.g. social, environmental, economic) when developing business opportunities?

2. What are the steps/phases for such an approach that allows business modellers to develop business models of their future transcendent businesses with responsibilities to multiple typological groupings, and to subsequently measure the extent to which these have been achieved?

3. Can we represent the Transcendent Reference Model (TRM+) of such an approach as a reusable methodology?
1.4 Modelling and metrics

There are a number of scholars who aimed to develop reusable reference models for starting up businesses of various types. For example, Rae (2007) documented a set of steps/reference model for starting up entrepreneurial businesses. Similarly, Mariotti (2006) developed a set of steps for developing business models and business plans for entrepreneurial businesses. Mair and Schoen (2005) identified common features of socio-entrepreneurial businesses, which can help future business modellers to start up businesses of a socio-entrepreneurial nature. Collins and Porras (2000) identified common features of visionary businesses. Dowding (2001) claims he developed a Universal Business Model (UBM), which is argued to be a reusable reference model for analysing, identifying, understanding, describing, evaluating, comparing, and modelling any type of business. The International Co-operative Alliance (1995) developed a definition for cooperative business, and documented the main principles that underline its cooperative business model.

Spiller (2000) documented criteria of an Ethical Business (EB) from an ethical investor perspective. He claims that ethical investors “are constantly judging the environmental, social, and financial performance of business and considering triple bottom line in their investment decision making” (Spiller, 2000: 150). He argues that the purpose of EB is to create environmental, social, and financial wealth, by making a positive contribution to the environment and society in a financially responsible manner. Giacalone (2004) called for business education that could teach students how to start up and run businesses that would have transcendent responsibilities for the future; businesses whose objectives would not be solely focused around self-interest, but would aspire to transcendent objectives and responsibilities.

Conceptually this thesis is looking at business modelling and measurement approaches, and reference business modelling and metrics. Various business modelling and measurement approaches are investigated with a view to developing a reusable transcendent business modelling and measurement approach, and presented in a form of a reusable methodology, and expressed as a Transcendent Reference Model, (TRM+). In other words, transcendent business modelling provides a much broader context of business modelling, and multiple typological groupings with their core values/ideals are the operatives of such an approach. This includes multiple typological groupings identification, identification of tangible and intangible values or ideals, and investigation of decision-support tools and methods for making strategic objective decisions during a business modelling process that considers multiple criteria.
1.5 Proposed model of a transcendent business modelling

Designing a business model and metrics prior to starting any business is important, because it will show the key structure of the business and explain how the business will work. The expected outcome of this thesis is to provide a methodology, which is envisaged as a series of steps/phases that can be repeated for the development of any transcendent business and capable of being implemented anywhere in the world. The benefits of such a methodology, expressed as a reusable Transcendent Reference Model (TRM+), are as follows:

Firstly, the TRM+ as a reusable reference model and methodology will fill a gap in extant literature by providing a set of steps/phases (and methods embedded within each phase) for how to develop business models and metrics of future transcendent businesses.

Secondly, the TRM+ will provide a method and procedures for identifying major typological groupings and their core values/ideals that every business could/should account for. Being able to identify major typological groupings is important because extant literature does not provide a clear, straightforward answer as to which typological grouping businesses should account for, and report their performance to. The TRM+ will provide a method for how to identify world major issues, categorise them into groups of similar type creating typological groupings, and how to identify core values/ideals of each group identified.

Thirdly, the TRM+ will provide a method and procedures for identifying, prioritising, and weighting the most important core values/ideals a business may be accountable for. While the extant literature identifies a long list of values/ideals that are argued to be important to multiple stakeholders, there is an argument raised by Norman & MacDonald (2003) that the list of values/ideals is far too long for a business to be able to address. The TRM+ will provide a method and procedures for the prioritisation and weighting of core values/ideals of individual typological groupings as well as across multiple groupings.

The proposed TRM+ can provide a method and procedures for designing plausible business outcomes that could be expected, if any post-incubation innovations/patents are trialled for development of potential business models for future transcendent businesses. Moreover, the TRM+ can also provide a method and procedures for identifying the best usage of a selected post-incubation innovation/patent in developing the most beneficial transcendent business. In other words, the TRM+ can provide a method of how to connect human needs with inspirations from science, technology, and business in order to provide products/services that are, for example, socially and culturally relevant, economically productive, and ecologically sustainable.
1.6 Objectives, scope, and limitations of the research

Research objectives

This thesis is set in a business modelling and measurement context within a market-driven economy. It aims to develop, test, and evaluate a reusable methodology, which includes a number of general business modelling methods for how to design and measure business models of future transcendent businesses. This includes development, testing, and evaluation of:

- Steps/phases for such an approach that allows business modellers to develop business models of their future transcendent businesses with responsibilities to multiple typological groupings (e.g. social, environmental, economic) and to subsequently measure business performance
- A method and procedures that could be reused for identification of major typological groupings and their core values/ideals any modelled transcendent business could/should simultaneously account for when developing a business opportunity
- A method and procedures that could be reused for prioritising decision options, and selecting a business model of potentially the most beneficial transcendent business

Research scope and limitations

The developed methodology is evaluated using two selected patents – ‘Solar power generator and water purifier’ patent, and the ‘High temperature molten salt receiver’ patent – for development of business models for each of the patents. Methods and procedures embedded within the TRM+ are tested and evaluated by three assisting expert groups – Corporate Social Responsibility (CSR) experts, post-incubation innovation domain experts (Solar Thermal Power, STP experts), and business entrepreneurs. Testing and evaluation of the developed methodology and the proposed TRM+ is limited to patents only. Moreover, testing and evaluation of the proposed TRM+, and Proof-of-concept, is conducted theoretically only, and only with a limited number of experts. None of the developed business models of future transcendent businesses for the selected patents (which come out of the testing) is implemented in practice because of the time and financial restraint.

Therefore, it can only be speculated as to how well the created business models, and the selected business model of potentially the most beneficial business, would practically fit its purpose, and satisfy the creation of core values/ideals of multiple typological groupings in a real life environment. The reason for the above limitations is the time constraints and the associated cost. It would be very time consuming and human resource intensive (using multiple experts) to test the proposed TRM+ with various patents and innovations. Furthermore, to start up a transcendent business in practice would require financial capital, and a time span of a few years for the business to prove its practical fit for purpose, potential success and growth, and its sustainability profile.
1.7 Research approach

The research aimed to develop a reusable methodology for a business modelling and measurement approach, which would assist and guide business modellers to develop business models of their future transcendent businesses. The researcher used an action-based methodology to identify a set of steps/phases in a transcendent business modelling approach, and to develop, test (proof-of-concept), and evaluate an overarching reusable reference model (the TRM+) for such an approach. Cherry (1999) describes Action Research as a continuous cycle of planning, action, and review of the action. The Action Research approach was chosen as the researcher was actively and subjectively involved during the research development process; there was a need to continuously reflect on the actions taken, the creation of understanding of the subject studied and the knowledge gained from doing the research (Cherry, 1999).

A semiformal notation called ‘QOC’ (Questions, Options, Criteria) was used to represent the Design Space Analysis (DSA) around the research questions. It was used to brainstorm and identify the most obvious options (methods) that would assist to find answers to questions asked during the development of the TRM+. "The main constituents of QOC are Questions identifying key design issues, Options providing possible answers to the Questions, and Criteria for assessing and comparing the Options“ (MacLean, 1991:201). The main benefit of the QOC is, that “QOC is intended to help in avoiding acceptance of a single option by encouraging the exploration of alternatives which might turn out to be more appropriate“ (MacLean et al. 1991: 11).

The overall idea and the starting point for developing the TRM+ was that the transcendent business modelling approach would take a ‘reverse-value chain’ or socio-constructive co-creation of value approach. This is described by Kalakota as a customer-centric approach where client priorities and requirements need to be placed first (Kalakota and Robinson, 2001). However, customers / clients in this case were the transcendent responsibilities of business itself as expressed through the values and ideals of society. In other words, taking a value-centric approach as a starting point requires identification of the values, ideals, beliefs, needs of society and major stakeholders. Therefore, the analysis of the research began at the highest level of the scenario – looking at people, activities or tasks, and information sources such as literature, world reports, and experts’ knowledge. The starting point was to define the design space of the research, and to do this we returned to the question – how would transcendent business model/s be framed in a repeatable reference modelling and measurement strategy? According to Giacalone (2004: 418 - 420), transcendent business modelling requires:

“balancing self-interest with responsibilities to others; focusing on intangibles as closely as the bottom line; decision making based on empathy, generativity, mutuality, civil aspiration, and intolerance of ineffective humanity”.
Bearing in mind the above requirements for transcendent business modelling, the next step is to represent the above in an initial QOC representation as Questions, Options, and Criteria (MacLean, 1991), and asking the most obvious question – how do we identify multiple stakeholders, or partners, and their core values/ideals/beliefs that modelled transcendent business could/should simultaneously account for? Considering it is practically impossible to include all stakeholders and the whole world, the focus is placed on identification major typological groupings. The following diagram shows the QOC of the first question asked:

![Figure 1.1: QOC - How to identify multiple typological groupings a modelled transcendent business will account for](image)

Note: the first set of lines on the left illustrates there are three potential options linked to the question Q1. The second set of lines on the right illustrates there are six criteria (C1 to C6) applicable to the options O1 to O3, where each option is assessed against each criterion. In the QOC assessment there are only two states – a full line indicates an option meets the criterion; a dashed line indicates an option does not meet the criterion. In the diagram above all options are linked with all criteria with a full line, since at this stage it could be proposed each option can hypothetically meet every criterion.

Considering the aim of the research is to develop a proof-of-concept reusable business modelling and measurement approach, the search is for methods and procedures that could be repeated in the future. Moreover, there are a number of other criteria that need to be met. For example, methods and procedures for identification of major typological groupings need to be accessible, verifiable, knowledge and expertise based, and ideally diversified in ideas. There are information sources available, such as extant literature and world reports, case studies of a number of businesses, as well as worldwide available domain experts, that could assist in finding an answer as to which typological grouping could/should be considered by transcendent businesses.

Surveys of published materials, surveys of experts, and case studies of businesses are potential methods (options) for identification of major typological groupings, each method having its own advantages, disadvantages, and limitations. Criteria C1 to C6 are ideal criteria that need to be met. All three options (O1 to O3) are tested, analysed, and evaluated in this...
thesis. Whilst asking the first question and proposing potential methods for answering it, more questions are raised almost simultaneously:

- How do we identify intangibles, core values/ideals of society and major typological groupings?
- How do we identify measures for intangibles in order to measure whether these are attained?
- How do we account for, and address the intangibles, core values/ideals?
- How do we prioritise decision options during business modelling process?
- How do we make democratic, objective decisions that consider others?

All the above questions are about discovering methods and procedures that could be repeated, verified, and not be biased or based on guessing. A survey of information sources, such as literature, world reports, and examples of existing businesses, would provide a good starting point for the research. However, there will be assistance needed from multiple expert groups, such as social, environmental, and economic experts, or Corporate Social Responsibility (CSR) experts, domain experts and business entrepreneurs. The research will start by surveying information sources, such as: transcendent, egalitarian, and visionary business literature; business models, business modelling, and reference models literature; business measurement literature; business modelling approaches and attempts; influence of society, world organisations, and politics on business modelling. Domain experts will provide valuable information and assistance to develop a business modelling approach for modelling transcendent businesses, and will further assist in testing (proof-of-concept) and verifying such an approach.

Delphi technique will be used to achieve a consensus among participating experts. Considering that the assistance is sought of multiple domain experts located in various geographic locations, utilisation of electronic data collection through electronic surveys over the internet is a preferred method, rather than traditional mail questionnaires; this will increase the response rate of the participants and improve efficiency of collecting and processing data (Neuman, 1997). Furthermore, “electronic method of data collection provides a clear time-saving advantage when used for Delphi studies” (Young, 2001: 44).

There is a need to conduct focus groups for exchange of information and sharing knowledge among multiple experts. Considering it is expected multiple experts could be physically located anywhere in the world, it is proposed to conduct an online discussion forum rather than face-to-face discussions. An electronic, web-based, asynchronous discussion forum was chosen as an appropriate, effective, and preferred method for exchange of expertise and knowledge between participants. It is further proposed an electronic, asynchronous, text-based discussion forum would allow multiple experts a collaborative exchange of information
and expertise in a non-restricted environment, plus it would provide a reasonable amount of
time to explore multiple views on the subject studied (Bruffee, 1999).
1.8 Layout of the thesis
Based on the research questions, the objectives of this thesis, the process and contextual propositions, the following content map of the thesis provides a snapshot of the research.

**Chapter I:**
**Introduction**
Introduction of the research, background of the study, introduction of the research problem and research questions, scope and limitations, setting the scene for research development

**Chapter II:**
**Research background**
Review of the literature relative to transcendent, egalitarian, and visionary business modelling; business models, business modelling, and reference business modelling literature; business measurement literature; decision making techniques; identification of limitations of existing business models

**Chapter III:**
**Research methodology**
Methodology framework used during development of Transcendent Reference Model and Methodology (TRM+); steps/phases of the TRM+ when used as a model; data collections and analysis methods; scope and limitation of the research; ethics & research procedures

**Chapter IV - Chapter VI:**
**Proof-of-concept and verification of the TRM+**
Testing and evaluating the Transcendent Reference Model and Methodology (TRM+) of a business modelling approach that would assist business modellers to develop business models of their future transcendent businesses – businesses that go beyond profit making

**Chapter VII:**
**Analysis of the TRM+ as a methodology**
Analysis of the Transcendent Reference Methodology using QOC; analysis of the Transcendent Reference Model; benefits of a transcendent business modelling and the TRM+

**Chapter VIII:**
**Summary of the findings, conclusion, recommendations**
Summary of the findings; assessment of the created business model against five goals of a transcendent business, and against five principles of CSR 2.0; outcome of the assessments and discussion; conclusion; recommendations for further research
1.9 Summary

This chapter has presented the argument that there is an increased need for business modellers to understand businesses do not exist in isolation, but are part of a complex intertwined and interactive system. The argument that every business operating in any society needs to take transcendent responsibility (c.f. Harman, 1990; Reich, 1998; Giacalone, 2004) was also presented. Finally, while some scholars argue that it is possible for a business to go beyond a single bottom line of self-interest and generating profit, we have not been shown how to develop business models of transcendent business. Equally, there appears to be a need for transcendent business education (Giacalone, 2004). The main research question of this thesis thus follows:

*Can we, and if so, how do we create a business modelling approach that simultaneously accounts for multiple typological groupings and their core values/ideals when developing a business; and how do we measure the imperatives of such a business when attained?*
CHAPTER II

2. Research Background

2.1 Introduction

Chapter 1 presented the argument that there is an increased need for business modellers to understand businesses do not exist in isolation. It was argued, that every business, operating in any society, needs to take transcendent responsibility for its actions and the decisions it makes (c.f. Harman, 1990; Reich, 1998; Giacalone, 2004). On the one hand, the argument was presented that it is possible for a business to go beyond a single bottom line of self-interest and generating profit (Spiller, 2000; Mair and Schoen, 2005). On the other hand, an argument was presented that we have not been shown clearly enough how to develop business models of transcendent businesses that would simultaneously account for a number of typological groupings when developing business opportunities.

The argument introduced was that traditional business models are principally profit-focused (Berry, 1995) and, by definition, very limited in measuring beyond-profit business outcomes. Furthermore, an argument was also introduced that traditional business models do not allow multiple stakeholders to be actively involved during the business modelling process (Reich, 1998). Traditional business modelling approaches are very limited in allowing business modellers to consider multiple stakeholders, and account for their core values/ideals and beliefs. Moreover, business modellers themselves make decisions often based on the potential profitability of the modelled businesses (Reich, 1998). Giacalone (2004) calls for a business modelling approach that shows and teaches students at business faculties how to start up and run businesses with transcendent responsibilities that leave behind a better world for following generations.

Conceptually, this thesis is positioned in the framework of a transcendent view of business modelling and measurement, looking at various business modelling and measurement approaches, and reference business modelling. By investigating and learning from various business modelling and measurement approaches, this thesis aims to develop a reusable transcendent business modelling and measurement approach, presented in the form of a reusable methodology and expressed as a Transcendent Reference Model (TRM+). This chapter reviews the literature relative to transcendent, egalitarian, and visionary business literature; business models, business modelling, and reference models; business measurement; business modelling approaches and attempts; and the influence of society focused world organisations on business modelling. Based on the literature review and identified limitations and restrictions of existing business modelling and measurement approaches, this chapter will propose a new business modelling approach for developing business models of future transcendent businesses.
2.2 Transcendent, egalitarian, and visionary business literature

A transcendent business modelling and measurement approach is one where business modellers think beyond the profitability and self-interest of the modelled business. Its basis is aspirational, “acknowledging higher order goals as real possibilities, and balancing self-interest with responsibility to others” (Giacalone 2004: 418). Giacalone argues that a transcendent business is one whose goals are not solely financial. A transcendent business leaves behind something worthy of its time on the planet. Transcendent business has non-financial objectives besides financial ones; it strives for collective improvement of our world, and it has a generative aspiration to leave behind a better world for those who follow. It increases material wealth, but with a sense of long-term social benefit. Giacalone suggests five main goals of transcendent business modelling:

- ‘Empathy’ (“understanding the feelings of those who are powerless, poor, humiliated, afraid, and discouraged”)
- ‘Generativity’ (“having positive aspirations that engender a focus on non-financial contributions to our world”)
- ‘Mutuality’ (“understanding that success is best achieved not in personal gain, but in embracing a common victory”)
- ‘Civil Aspiration’ (“recognising that in a world of finite resources, while we cannot have an ever-expanding economy we can expand the moral consciousness of a society”)
- ‘Intolerance of Ineffective Humanity’ (“insensitive decision making, selfishness, a disinterest in those who follow, and the singular pursuit of wealth define an ineffective human being”)

(Giacalone, 2004: 418)

Similarly, Reich (1998) argues that businesses need to take a transcendent responsibility for their multiple stakeholders, not just shareholders. He suggests that the society needs “to impose, by law, procedures by which stakeholders other than investors can participate directly in corporate decisions” (Reich, 1998: 13). Collective bargaining agreements (e.g. in United States and Australia), “co-determination” laws (e.g. in Denmark, Sweden, and Austria) requiring employee representation on company boards, and works councils (in Western Europe) are examples of such procedures imposed by the law. However, whilst in theory all stakeholders could be given a voice in corporate decision-making, in practice this would prolong and complicate decision-making, leading towards extraordinarily inefficient ways to achieve "socially responsible" corporate behaviour of businesses (Reich, 1998: 14).

The second suggestion Reich makes is to rely on government to define a business's responsibilities to society. However, government regulations, requiring specific actions, tend to be less efficient than market-driven regulations. The last of Reich’s suggestions is that businesses should not have the moral or legal authority to use their resources to influence the creation of laws defining their responsibilities to stakeholders other than investors. The
meta-social responsibility of businesses is to respect the political process by staying out of it. Reich (1998) suggests that government should enforce this meta-responsibility by passing laws and rules that constrain corporate political activity – “Corporations must forbear from politics, or they are sure to invite, eventually, the politicisation of the corporation” (Reich, 1998: 17).

Mair and Schoen (2005) studied three socio-economic-entrepreneurial businesses (‘Grameen Bank’, ‘Mondragon Corporacion Cooperative’, ‘Sekem’) that simultaneously created social and economic value. They identified that all three businesses pro-actively created specific value networks; developed a novel way of setting up the customer interface; and transferred values to their target groups. They integrated their target groups into their social value networks and developed innovative resource strategies, securing their critical and scarce resources in a sustainable manner (Mair and Schoen, 2005). According to Giacalone (2004), this could be achieved, for example, by business modellers / entrepreneurs understanding the feelings of those who are powerless, poor, humiliated, afraid, and discouraged; responding to those feelings by providing products / services that addressed their needs; having positive aspirations; and focusing on non-financial contributions to our world. Howard (1994) suggests businesses should operate more like governments; for example, they should let customers vote for the board of directors, and they should expand the board of directors meetings to allow considerations of customer complaints and suggestions.

Spiller (2000) refers to businesses that go beyond a single bottom line of creating profit to a multiple bottom line of social, environmental, and financial performance as ‘Ethical Businesses’. He claims that:

- “The purpose of ethical business is to create environmental, social, and financial wealth, thereby making a positive contribution to the environment and society in a financially responsible manner”

- “Ethical business practices address stakeholder concerns – such stakeholders include the community, the environment, employees, customers, suppliers, and shareholders”

- “Ethical business performance measurement involves accounting for environmental and social as well as financial performance”

(Spiller, 2000: 151)

Freeman’s (1984) stakeholder model provides a powerful visualisation of multilateral relationships between multiple stakeholders and a business. Freeman identifies governments, civil society and competitors as stakeholders and draws attention to social, economical and political environment in which businesses are operating. He argues that the
growing diversity of stakeholder expectations represent risks to every business. Benn and Bolton (2011) argue that business managers have already recognised the need to identify, evaluate, prioritise and align the interests not only of stakeholders that have direct stake in the business, but also stakeholders that have stake in the business through the impact of the business on their community. Jensen (2008: 168) argues stakeholder theory should recognise that society needs to set rules to achieve desirable community outcomes, rather than assume that businesses will do the right thing to benefit society without appropriate rules to regulate behaviours. Moreover, Wood (2008) claims stakeholder theory is very limited in its potential to redress the problems of business in society.

Carroll and Buchholtz believe that understanding and responding to stakeholder concerns is critical for a business because “in the long run, those who do not use power in a manner which society considers responsible will tend to lose it” (Davis and Blomstrom, 1975, cited in Carroll and Buchholtz, 2006: 19). Donaldson and Preston (1995) use stakeholder theory to explore role of business in society and accountability for social, environmental, and economic impact of business operations. They argue that employees and other social stakeholders could influence performance of a business and therefore should be accounted for when business decisions are made. Kaler (2002, 2003, 2006, 2009) in his four papers investigates the stakeholder approach to running businesses. He investigates available stakeholder theories and claims that depending on how stakeholders are identified, all sorts of implications are going to apply, e.g. whether “stakeholding does or should feature in business thinking, does or should be incorporated into business practice, is or is not intrinsic to business, is or is not conducive to commercial success” (Kaler, 2003: 75). Kaler (2006) evaluates stakeholder theory and argues that “the optimally viable version is one in which employees have a co-equal status as stakeholders with shareholders while other groupings only have a minimal status as stakeholders and are generally restricted to just customers, suppliers, and lenders” (Kaler, 2009: 297). However, he concludes that although this version is the best of all possible ways of running a business in a stakeholder way, “it may not be the best of all possible ways of running a business” (Kaler, 2009: 311).

Collins and Porras (2000) studied behaviours and characteristics of visionary businesses, trying to identify common features of their underlying business models. They use the term ‘visionary business’ to refer to a well-known and respected business that is a market leader in the industry it operates in; a business that has been operating for several decades and has the top management unchanged for several years. They discovered that the common features of visionary businesses are:

- Flexibility, continuous openness to new business opportunities and willingness to adjust to an ever-changing market environment
- Implementing values, traditions, and vision of the company that is understood and shared within the business
• Having management that shares those values for decades – product/service can change, employees and business partners can change, but the core values traditions and vision should never change

• Having clear set goals, visions, and core ideology in place – mission statement to be written in a way that represents why the business exists and it should be valid for hundreds of years

(Collins and Porras, 2000)

Examples of visionary businesses and their mission statements:

**3M**

“To solve unsolved problems with an innovative approach.”

**Hewlett-Packard**

“To deliver technological benefits for development and benefits of all people”

**Merck**

“To protect and increase quality of human life”

**Sony**

“To experience happiness from development and use of technologies for benefits of the public”

**Walt Disney**

“To make people happy”

(Collins and Porras, 2000)

Businesses taking an egalitarian and transcendent business modelling approach pro-actively create specific value networks, develop a novel way of setting up the customer interface and transfer values to their target groups (Collins and Porras, 2000). They integrate their target groups into their social value networks and develop innovative resource strategies (Mair and Schoen, 2005). They run their businesses in conjunction with their customers, solving their problems, increasing their quality of life, and generally making customers happier (c.f. Collins and Porras, 2000; Mair and Schoen, 2005). They build their businesses around the values of their customers, not only around the values and objectives of the business itself, going beyond single business objectives to multiple ones (Spiller, 2000; Giacalone, 2004).

There are a number of suggestions given by researchers who studied the behaviours of various businesses. According to several authors, there are increasing numbers of multiple stakeholders (e.g. employees, world organisations, society at large) who want to have their say and influence in how businesses behave (Reich, 1998; Ferrary, 2009; Howard, 1994). There is more and more pressure on businesses to move from a single business objective to multiple objectives of creating tangible and intangible values for multiple stakeholders (c.f. Harman, 1990; Reich, 1998; Giacalone, 2004; Annan, 2002). But despite a number of attempts to identify common features of beyond-profit businesses, such as socio-entrepreneurial and socio-economic businesses (i.e. Mair and Schoen, 2005; Yunus, 2010; Collins and Porras, 2000), none of those approaches have developed and documented a teachable business modelling approach (a methodology) for developing business models of transcendent businesses.
Whilst literature discussing egalitarian, visionary, and ethical businesses relates to the questions investigated, this thesis goes beyond such conceptions towards a transcendent ideal proposing a transcendent business could and should simultaneously be an ethical, egalitarian business that accounts for multiple stakeholders. Stakeholder theory is inadequate for this research as the process of identification, categorisation, and prioritisation of stakeholders is in conflict with egalitarian and transcendent approach where multiple stakeholders are perceived and accounted for equally.
2.3 Business models, business modelling, and reference models

In this thesis the word 'business' is used to describe a business of any type, size, and development cycle, physically located anywhere in the world, or operating in an online environment. This includes commercial businesses, not-for-profit businesses, transport services, and generally any business one can think of. In this thesis the word 'business' refers to similar words such as 'enterprise', 'organisation', 'company', 'firm', and it does not distinguish between them. For the purpose of this thesis, businesses are viewed as generators of various types of tangible and intangible values. Therefore, a business is perceived as an entity that brings together required resources in order to create tangible and intangible values. Whether the business is for-profit, or not-for-profit, is irrelevant in this research; the thesis follows the line of argument that every business should aim to generate a surplus (c.f. Mosek, 2007; Lyons, 2007; Morris, 2009) in order for it to be self-sustainable, and to have enough resources for further research and development and growth.

No matter in which geographical or online environment a business is operating, in which century it is running, what type, size, and in which developmental cycle it currently finds itself, every business can be identified and explained on the basis of its underlying business model (Dowding, 2001) – "every business has a business model, whether or not they chose it deliberately, or whether or not the business founder has heard of or understands what a business model is" (Debelak, 2006: 20). On the other hand, Debelak (2006) argues that up to date, there is no single accepted definition of business models. Despite that, it could be argued a business model is a brief explanation (summary) of how a business works (Weill and Ross, 2006; Debelak, 2006) – "in general, a 'business model' can be understood to be a simplification of a planned or existing business" (Mair, 2005: 3). Dowding (2001) defines a business model as a single representation of a planned or existing business, based on which the business could be analysed, understood, evaluated, and compared to any other business.

According to Magretta (2002), a good business model is essential to every successful business, whether it is a new or already established business. Rae (2007) argues a business model of any business needs to show what resources are required, and how they will be used for the creation of values – tangible and intangible values – for the main target customer group and the business itself. A business model needs to explain why the business exists, what its vision is, and who its stakeholders are; for example, target customers/clients, shareholders, employees (McKaskill, 2006b; Collins and Porras, 2000). Dowding (2001) claims there are elements that can be found in every business and, by describing those elements, any business could be designed, understood, described, explained, compared to any other business, and evaluated.

Rae (2007) in his studies focuses primarily on for-profit businesses (businesses whose primary objective is generating profit and wealth), and he argues that a business model needs to demonstrate, as clearly and simply as possible, how a business opportunity will
create revenue and financial value from its operations. Similarly, McKaskill (2006b: 70) studied for-profit businesses, focusing on the businesses with high-growth profiles. He argues that “the business model needs to be very simple, robust, obvious and easily proven”, and needs to have the following characteristics:

- Well-defined, identifiable, easily reachable customers with compelling need to buy, and willingness and ability to pay the price
- A segmented market where it is possible to significantly differentiate the product or service from competitors
- A fragmented market that enables growth by acquisition

He further argues that a business model needs to be able to tell:

- The profile of the ideal customer
- How contact will be established
- What their buying pattern is
- How they have the purchasing power to readily meet the sales price

(McKaskill, 2006b: 70-71)

Weill and Ross (2006) studied e-commerce businesses that use information and communication technology as the enablers for running the business, looking at their business models from an operating point of view. They argue that a business model needs to define how the business will operate, and how processes and infrastructure critical to the business’s current and future operations will be designed. Collins and Porras (2000) focused on studying visionary for-profit businesses, looking at their underlying business models. According to them a business model needs to show a clear set of goals, vision, and ideology of the business that remain unchanged for several decades.

However, what happens if we want to develop a business modelling approach that goes beyond specific target customer groups; a business modelling approach that does not have, as yet, well-defined target customers; an approach that aims to simultaneously satisfy multiple typological groupings (e.g. social, environmental, economic)? How do we design a business model of the future transcendent business that will simultaneously account for numbers of typological groupings when developing a business opportunity? Is there a universal, repeatable reference model that assists business modellers to develop business models of their businesses?

Reference models
Weill (2005) suggests the following business model archetypes could be considered when prototyping and developing business models of any future business, depending on the type of asset a modelled business is going to deal with (financial, physical, intangible, human),
and ownership / use of the asset (creator, distributor, landlord, broker):

1. Financial creator financial values, financial assets involved
2. Manufacturer physical/tangible products are produced
3. Inventor new ideas/innovations, intangibles are created
4. Human creator humans are cloned (note: an illegal business archetype)
5. Financial trader distributing finance/trading financial values
6. Wholesaler/retailer buying/selling physical goods
7. Intellectual property trader distributing new ideas/innovations; trading IP
8. Human distributor distributing humans (note: an illegal business archetype)
9. Financial landlord lending finance
10. Physical landlord lending physical goods/property
11. Intellectual landlord lending intangible asset, e.g. new ideas, innovations, patents
12. Contractor contracting humans
13. Financial broker buying and selling financial assets
14. Physical broker buying and selling physical assets
15. Intellectual property broker buying and selling intellectual assets
16. Human resource broker buying and selling human resources

(Weill et al., 2005)

Mariotti (2006) studied business models of entrepreneurial businesses and focused on development of a reference model for entrepreneurs who are developing business models for their future entrepreneurial business. He developed and documented a set of steps for developing business models and business plans for entrepreneurial businesses identifying 42 categories of elements that need to be considered and addressed when developing business plans of any entrepreneurial business.

Dowding (2001) identifies 55 elements of a business model, which he categorised within ten aspects (Identity, Purpose, Structure, Participants, Enablers, Activities, Deliverables, Influences, Culture, Performance) based on which characteristics of any business could be visualised. Moreover, he identifies three issues (Analysis, Evaluation, Strategy) that can be used for assessing each of the 55 elements. Dowding (2001) claims that, based on his identified ten aspects and 55 elements of his Universal Business Model (UBM), a business model of any business can be designed, developed, identified, analysed, understood, described, and compared to any other business. He claims his Universal Business Model (UBM) is applicable to "virtually every form of organisation and their internal units or departments", which includes commercial businesses, local government, hospitals, galleries and museums, colleges, charitable trusts, sport clubs, etc. Moreover, he argues the UBM can
be applied to all sizes of businesses (e.g. small to medium businesses, large national and international businesses, global corporations), and all points of their development cycle (e.g. seed and start up businesses, pre and post-incubation businesses, venture capital businesses, mature businesses).

The UBM has a three-layer structure that shows connections among individual elements of a business. The top layer of the UBM shows 'Issues' (Analysis, Evaluation, Strategy) of the business concerning each element of the UBM. The middle layer deals with ten aspects of business, of which each aspect is composed of a number of elements that form the third layer of the UBM. According to Dowding (2001), by studying individual elements any business can be analysed, understood, and described. Whilst the aspects give a high-level view of the business and can be used for analysing and describing basic characteristic of a business, the elements provide detailed information about the business. Dowding (2001) argues the elements of the UBM are present in every business; they are like the genes of a living material; the “genes of every business” that determine what a business is and how it behaves. The following is a list of 55 elements categorised within ten aspects, developed by Dowding (2001) as the UBM:

- **Identity** (How the business is known)
  - Name (What the business is known by)
  - Constitution (What is the legal position of the business)
  - Reputation (How people perceive the business)
  - Impact (What impression the business gives)

- **Purpose** (Why the business exists)
  - Reason (The basic reason for the business’ existence)
  - Core values (The essential beliefs that will not be compromised)
  - Vision (What the business wants to become)
  - Mission (The action now to move towards the vision)
  - Key policies (The key guidelines of corporate behaviour)
  - Target market (For whom the business produces or serves)

- **Structure** (How the business is organised)
  - Physical deployment (The location of real estate, main office, people)
  - Functional composition (The functional parts of the business)
  - Roles and jobs (Who does what)
  - Workplaces (Where staff perform their jobs)
  - Reporting structure (Who individuals report to)
  - External infrastructure (External organisations involved + relationship)

- **Participants** (Those involved in the business)
  - Owners (Who owns the business and who is the boss)
  - Managers (Who manages the business (resources) + planning)
  - Workers (Workers + office staff (permanent + casual))
  - Channel (Bringing deliverables to the customer or user)
  - Customers (The people who buy or use the products / services)
  - Suppliers (Providers of goods and services to the business)
  - Partners (Other organisations, cooperating businesses)
- Neighbours (Those affected by the behaviour of the business)
- Indirect participants (Those who depend on the direct participants)

- **Enablers** (What the business makes use of)
  - Land and buildings (Land, buildings, waterways, airspace, net-space)
  - Technology (Machines and equipment)
  - Intellectual property (Patents, designs, formulas, know-how, texts)
  - Information (Data and its inter-relationships)
  - Skills (The capabilities of people)
  - Core competencies (The capabilities of the business)
  - Relationships (Fruitful contact with others)
  - Financial services (Money and investments)

- **Activities** (What the business does)
  - Line-of-business (Producing the deliverables)
  - Support (Making line-of-business activities effective)
  - Management (Planning, organising, controlling, managing)
  - Compliance (Required for legal reasons)
  - Incidental (Activities not in the above categories)

- **Deliverables** (What the business provides)
  - Products (Something that is produced and offered to target customers)
  - Services (Activities performed for customers / clients)

- **Influences** (What affects the business)
  - Constraints and pressures (Restricting freedom of action / barriers)
  - Risks and threats (De-stabilising the business)
  - Opportunities (Taking advantage of situations)
  - Competitors (Competing for customers / resources)

- **Culture** (How people in the business behave)
  - Management style (The way management are perceived)
  - Rules and customs (What is expected or acceptable)
  - Social behaviour (The way people treat each other)
  - Attitude to work (How people approach their work)
  - Benefits and perks (The rewards for working)
  - Personal development (The scope for people to ‘grow’)

- **Performance** (How good the business is)
  - Scale (Size, throughput and frequency, growth potential)
  - Efficiency (The ease and speed of doing things)
  - Empathy (The way participants are treated and motivated)
  - Innovation (The ability and ease of making change)
  - Financial (The financial soundness of the organisation)

Taking into consideration Dowding’s (2001) claim that the UBM is a simple, easy to use, reference model suitable for identifying, analysing, understanding, describing, comparing, and developing business models of any business, theoretically, it is suitable also for developing business models of any transcendent businesses. Bearing in mind a business model is a brief explanation of how the business works, business modellers need to explain why the business exists, what its mission and vision is, and who its stakeholders (e.g. target customers/clients, shareholders, employees) are (McKaskill, 2006b; Collins and Porras,
only then can they explain how their businesses will work, use resources (Mariotti, 2006), and create revenue and financial value from their operations (Rae, 2007). Therefore, prior to developing business models, business modellers firstly need to realise and explore a business opportunity, and start prototyping business models of future potential business (McKaskill, 2006a; Rae, 2007; Mariotti, 2006). In terms of business modelling, prototyping business models requires prototyping characteristics of the future business. Dowding (2001) claims that a description of the ten aspects of a business can provide enough information about the characteristics of a business. Therefore the ten aspects of the UBM could be used as a tool/guideline for development of characteristics (prototyping) of any business, and the 55 elements of the UBM could be used as a tool/guideline for the development of a detailed business model of any business. However, in order to do that, business modellers need to recognise specific problems that have a compelling need to be solved. Moreover, they will need to know why their businesses will exist, and what their mission, vision, and stakeholders (e.g. target customers/clients, shareholders, employees) will be.
2.4 Business modelling approaches and attempts

*Traditional, product-centric business modelling*

People have been manufacturing, selling, exchanging various products, and providing services to other people for thousands of years. Such activity can be defined as doing business. In other words, doing business is a complex goal-oriented activity, distributed in time and space, and performed by humans living in their societies. McKaskill (2006a) argues that doing business is a social activity, where individuals lead the team that interacts with other people in society. In the past, people often modelled and established business around their skills, abilities, and passions.

As scientists and engineers discovered new technologies, new business opportunities arose, especially in the industrial (e.g. material processing, product manufacturing etc.), transport (e.g. car, ship manufacturing), and banking sectors. Businesses started to cooperate with each other, creating networks of businesses linked by equity, debt, people, trade and services (Boyns, 1998). International and multinational businesses drew attention to the importance of individual business modellers being able to utilise a network of contacts, adjust existing contracts, and transfer and acquire (Boyce, 1996). However, with increased numbers of businesses, competition as well as cooperation arose among businesses. Business owners started to realise the necessary relationship between efficiency and success. They realised also, that efficiency of doing business does depend to a significant extent on being able to develop and utilise networks of contacts (Rae, 2007), and that successful business is not built on single, but on repeat sales (Mariotti, 2006).

Business owners and business modellers realised that their ability to find creative ways to increase efficiency and to cut costs, often meant the difference between a struggling business and a thriving one (Mariotti, 2006). Moreover, they discovered that the true mission of a successful business is to meet a consumer need better than anyone yet has, because even millions of dollars spent on advertising and marketing will not make people buy unwanted products (Mariotti, 2006). As business modellers realised that in order for a business to succeed in a competitive, market-driven business environment, where businesses need to offer products or services at prices customers are willing to pay, a new approach to business modelling was born. With global supply chains, pressure for even faster time to the market, and shifts in customer demographics and desires, businesses modellers have been forced to be more agile and entrepreneurial, to respond to the market more rapidly, and to run their businesses efficiently.

*Entrepreneurial, reverse-value chain, customer-centric business modelling*

Entrepreneurial business modellers are often opportunity-centred businesses modellers that realise and respond to the opportunity to solve a problem, to satisfy an unmet and emerging need (McKaskill, 2006a; Mariotti, 2006). They respond to the market and aim to design businesses in the right place and at the right time (McKaskill, 2006a; Rae, 2007). In other
words, where other business modellers see problems and needs that are difficult to satisfy, entrepreneurial businesses modellers recognise new business opportunities (Mariotti, 2006). Rae (2007: 84) explains, "an opportunity can exist where there is a need, a problem, and either actual or potential demand for a product, service or experience". Moreover, he argues that reacting to the opportunity at the right time is a critical factor in opportunity recognition.

A business modelling approach that firstly identifies what is needed by potential customers, and then aims to satisfy those needs, is described by Kalakota (2001) as a 'reverse-value chain' approach. This is a customer-centric approach, where customers’ priorities and requirements are placed first. McKaskill (2006a) argues that a business that recognises and responds to a very specific problem and solves it has a great chance of succeeding commercially and growing rapidly. There are a number of examples of successful business modellers who recognised unsatisfied needs and unsolved problems, and responded to them by providing creative and responsive solutions. For example, Muhammad Yunus recognised a business opportunity in providing small loans to poor people in Bangladesh and founded his ‘Grameen Bank’, an institution that provides micro-credits to poor people to help build their financial self-sufficiency.

Similar to the ‘Grameen Bank’, ‘Sekem’ and ‘Mondragon Corporacion Cooperativa’ are also economically successful businesses that aim to address specific fundamental social problems (Mair and Schoen, 2005). There are a number of common features that can be observed by studying successful, reverse-value chain entrepreneurial businesses. For example, business modellers of such businesses manage to provide solutions to previously unsolved problems and unsatisfied needs; they understand the feelings of those who are powerless, and they increase their quality of life, and generally, make people happier (Collins and Porras, 2000; Mair and Schoen, 2005). Customer-centric business modellers build businesses around the values of their customers, pro-actively create specific value networks, and develop a novel way of setting up the customer interface to transfer values to their customers/target groups (Collins and Porras, 2000). Moreover, they integrate their target groups into their social value networks and develop innovative resource strategies (Mair and Schoen, 2005). Laszlo (2003) argues that customer-centric business modellers need to be aware of global problems, address them, and manage them as their new responsibilities like any other key performance issue. They need to be focused, and clearly know what problems they are solving (McKaskill, 2006a). This assists business modellers to develop vision, mission, and a long-term strategy of their modelled business (McKaskill, 2006a).

Rae (2007) argues opportunity-centred business modellers need to match the need, problem or demand with the resources required to make it happen, to ensure that the modelled business will be capable of delivering on the specific goals and objectives it has committed itself to. According to McKaskill (2006a), opportunity-centred entrepreneurial business
modellers often use innovations to solve problems, to satisfy unmet needs, and to deliver products/services that are needed. Moreover, Elkington (1998) suggests businesses use innovations and new technologies to achieve increased efficiencies, higher productivity, reduced resource consumption, and improved sustainability. Strong barriers to entry, such as new inventions and patents, also create a good basis for competitive advantage of a business, which is a pre-condition to high growth – “a patent that solves a unique problem can be a powerful blocking strategy” (McKaskill, 2006a: 65).

New technologies/innovations/patents are often used as enablers for businesses to find creative solutions to persistent problems and unsatisfied needs and demands, and to find a solution to a persistent problem that wastes resources, whether public or private (McKaskill, 2006a; Rae, 2007). New inventions/patents provide a good basis for new business growth and success. However, success and sustainable growth is rarely based on a single innovation. Generally, it requires a process of continual innovations to generate sustainable growth over a longer period of time (McKaskill, 2006a). Therefore, businesses established around innovations/patents need to first:

- Watch developments at the edge of their market and invest in emerging technologies, know what new technologies are coming onto the market that they could incorporate into their own products
- Develop strategic partnerships that will enable them to access new developments that they could use in their marketplace
- Have research and development capability
- Have a proactive Research and Development team and constantly provide them with the required training and information on the industry, the marketplace and how customers/clients are using the products (McKaskill, 2006a).

An example of a successful business that solves problems and satisfies unmet needs with an innovative approach is ‘3M’. Originally a mining business, it evolved into a diversified technology business, offering products and services across various sectors, such as displays and graphics, electronics, electrical and telecommunications, health care, safety, security, and protection, to name a few. 3M’s mission statement reads: “To solve unsolved problems with an innovative approach”. Another example of a successful science-based business is ‘DuPont’ which claims it “puts science to work by creating sustainable solutions essential to a better, safer, healthier life for people everywhere” (cited from the official website). DuPont was originally an explosives business that has evolved into a science-based business offering solutions across a diverse range of industries such as food and nutrition, health care, safety and security, construction, electronics and transportation. Both ‘3M’ and ‘DuPont’ are examples of businesses that continuously recognise and respond to existing problems, unsatisfied needs and demands; because, where an unsolved problem and unmet need exists, there is a business opportunity (c.f. McKaskill, 2006a; Mariotti, 2006). A business modeller who responds to such opportunity, and finds a responsive, creative, innovative,
scalable, glocal (responding to local problem while considering global impact) and sustainable solution, has a greater chance of developing a business model of a sustainable and profitable business (McKaskill, 2006a; Mariotti, 2006). Considering we have a number of world issues and unsolved problems which are worth addressing and solving (e.g. climate change, energy demand, etc.), and we have also a number of registered innovations and patents, it is worth asking how to connect these two components together, and design businesses that could offer economically productive, politically beneficial, and ecologically sustainable products, services, solutions, and experiences.

Beyond innovation-driven business modelling

Esslinger (2011: 401) argues that “designers have a responsibility to connect and coordinate human needs and dreams with new opportunities and inspirations from science, technology, and business in order for products and their usage to be culturally relevant, economically productive, politically beneficial, and ecologically sustainable.” The idea of going beyond the innovation-driven (sustainability-driven) business modelling also goes beyond entrepreneurial business modelling, opportunity-centred business modelling, and the ‘reverse-value chain’ approach. His beyond-the-innovation business modelling is argued to be a creative problem solving, innovation-driven business modelling that considers the needs of its various stakeholders (as well as a broader definition of who the stakeholders are, or should be). Esslinger (2011: 401) specifically argues that “a new business model is needed: one that considers (a) consumers as individuals with a complex set of needs that consumption of products only partially satisfies and as members of a larger community with complex interdependencies; (b) today’s underrepresented communities; and (c) tomorrow’s communities, i.e., the generations of individuals and communities that will follow our own and which depend critically on our current decisions and behaviors”.

Similarly, Visser (2010) requires business modellers to be creative (using innovations and creativity as the driver and enabler to provide solutions to existing problems, to satisfy unmet needs and demands), scalable (providing immediate impact on a small scale that could be scaled up to a large scale), responsive (e.g. responding to community needs), glocal (think global, act local) and circular (designing for ‘good’ and closing the loop on production). In order to develop business models of such transcendent businesses, Esslinger (2011: 403) suggests building business models based on long-term vision and ongoing innovation, where “customers join executives, employees, and owners/shareholders on equal footing as competent “caretakers” of businesses and the world they serve”. However, such an approach requires having access to ongoing innovations; knowing who the stakeholders are, or should be; knowing the stakeholders’ needs, values or ideals and beliefs; being able to evaluate whether a selected innovation / patent could successfully and effectively address unmet needs and core values/ideals of stakeholders; and being able to use innovations and patents creatively to provide scalable, responsive, glocal, and circular solutions. By seeking professional advice and extracting expertise from multiple experts, there is not only a good chance of finding creative solutions to existing problems and unmet needs, but also to
potentially to increase success of a modelled business, or conversely, dramatically decrease the probability of its failure (Watson, 2003).
2.5 Monitoring, measuring, and reporting of business performance

According to Parmenter (2010), there are three types of performance measures businesses need to use – ‘KRIs’, ‘PIs’, and ‘KPIs’. Key Result Indicators (KRIs) inform performance within a perspective (e.g. customer satisfaction, net profit before tax, etc.); Performance Indicators (PIs) inform what to do (e.g. net profit on key product lines, percentage increase in sales with top 10% of customers, etc.); and Key Performance Indicators (KPIs) informs what to do to increase performance dramatically (e.g. increase customers’ and employees’ satisfaction, contribution to ozone depletion, etc.).

The idea of businesses monitoring, measuring, and reporting on their performances to multiple stakeholders, is not new. As early as the 1950s, Bowen talked about the social responsibility of a business in his book, “Social Responsibilities of the Businessman”. In the 1970’s Social Impact Assessment (SIA) and Environmental Impact Assessment (EIA) were born, as groups of accountants were concerned about the social and environmental impact of businesses. They developed a form of assessment and accounting framework for monitoring, measuring, and reporting on the social and environmental performance of business (Vanclay, 2004). In the late 1970s, the first widely accepted definition of Corporate Social Responsibility (CSR) emerged – Archie Carroll’s 4-part concept of economic, legal, ethical and philanthropic responsibilities (Visser, 2010).

In 1983, the Brundtland Commission (formally World Commission on Environment and Development) was concerned about the deterioration of the human environment and natural resources. They recognised that environmental problems were global, and that it was in the common interest of all nations to establish policies for sustainable development. John Elkington, in 1994, created a concept of the Triple Bottom Line (TBL) and stated that businesses should measure and report their social, environmental, and economic performance to all of their stakeholders, and should not only measure and report their financial performance to their shareholders. In addition, in the 1990’s, the Global Reporting Initiative (GRI) created guidelines and a reporting framework designed for businesses that wished to voluntarily report their social, environmental, and economic performance to their stakeholders.

In 2006, the Corporations and Markets Advisory Committee (CAMAC) supported the idea of voluntary reporting on social, environmental, and economic performances of businesses, and in 2007, National Greenhouse and Energy Reporting System (NGERS) laid the foundations for a Carbon Pollution Reduction Scheme (CPRS) requiring businesses to meet greenhouse gas emissions of 25kt of CO₂ and report it by 31st October 2009. In 2010, Wayne Visser introduced a new utilisation of Corporate Social Responsibility (CSR), which he named ‘CSR 2.0’. He argues that we need to let the ‘old CSR’ die and look for the next generation of CSR – we need to move beyond the outmoded approach of CSR as philanthropy or public relations, to a more interactive, stakeholder-driven model. He argues CSR 2.0 should stand
for ‘Corporate Sustainability and Responsibility’, rather than ‘Corporate Social Responsibility’.

Visser (2010) identifies five principles of CSR 2.0 – Creativity, Scalability, Responsiveness, Glocality and Circularity. The International Organization for Standardization (ISO) is making ISO 26000 standards available, which claims to be a comprehensive guideline and a reporting framework designed for businesses to voluntarily report their social, environmental, and economic performance to their stakeholders, including the general public.

There have been a number of institutions that have developed guidelines and standards for businesses to help them to be socially, environmentally and economically sustainable and accountable. Such institutions include: the World Business Council for Sustainable Development (WBCSD); World Economic Forum (WEF); Organization for Economic Cooperation and Development (OECD); Occupational Health and Safety Assessment Series (OHSAS); United Nations Global Compact; Global Reporting Initiative (GRI); Dow Jones Sustainability Indexes (DJSI); Sustainable Asset Management (SAM); Transparency International (TI); Amnesty Business Group; International Labor Organization (ILO); Fair Trade; Social Accountability (SA 8000); AccountAbility standards (AA 1000); Triple Bottom Line (TBL); Global Sustainability Services (GSS); Kyoto Protocol; International Organization for Standardization (ISO).

According to ‘KPMG Global Sustainability Services’ (2007), in Australia, 37% of the 100 largest companies publish their non-financial reports. Over 60 businesses (primarily represented by the banking, mining, and electricity sectors) use Global Reporting Initiative (GRI) guidelines for reporting of their social and environmental performance (KPMG Global Sustainability Services, 2007). However, despite increasing popularity of the GRI guidelines, they are not global standards for multiple-performance (social, environmental, economic) reporting of business, since there are 2/3 of businesses that use other reporting guidelines (Norman & MacDonald, 2003). Vanclay (2004) argues that social indicators for measuring and reporting of social performances of businesses are not as easy to identify as the economic and environmental ones. Social performance indicators need to monitor and measure impacts of business on society, quality of life, and participation in building ‘social capital’.

Entrepreneurial performance indicators are designed to collect and report data that indicates how entrepreneurial a business is. Kuratko et al. (2006) argue that the degree of entrepreneurship of any business can be assessed by measuring its innovativeness (ability to see creative, unusual or novel solutions to problems); risk-taking (willingness to commit resources to opportunities having a reasonable chance of failure / success); and pro-

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2 “Social capital is defined as the norms and social relations embedded in the social structures of societies that enable people to coordinate action to achieve desired goals.” (Hopkins, 2002: 5)
activeness (looking forward and acting on a recognised entrepreneurial opportunity).

Hossain et al. (2006) created a list of 60 social and environmental indicators that allow businesses to monitor and measure their performance. Putnam (2002) created a list of 39 environmental variables categorised within three groups. Posner (2009) identified a list of around 200 social values/ideals that a business needs to consider whenever making decisions, in order to be socially responsible. The GRI guidelines suggest monitoring, managing, and reporting of 49 core and 30 additional social, environmental, and economic performance indicators. Moreover, Vanclay (2004) lists 142 impact assessment tools that assist businesses to measure and report their social, environmental, and economic performances. He investigated how Triple Bottom Line (TBL), Environmental Impact Assessment (EIA), Social Impact Assessment (SIA), Strategic Environmental Assessment (SEA), and Environmental Management Systems (EMS) related to each other. He claims the TBL differs from EIA, SIA and SEA, but not from EMS. Vanclay (2004: 282) further states that the "social TBL indicators, and quite possibly the economic and environmental ones as well, are inadequate" because they fail to consider the field of impact assessment, the learning in the field of impact assessment about what impacts are, and how to identify, define and measure them. There are a number of tools and guidelines, and dozens or even hundreds of social, environmental, and economic performance indicators, documented in extant literature and suggested by social, environmental, and economic experts. Triple Bottom Line (TBL), Global Reporting Initiative (GRI) guidelines, and Dow Jones Sustainability Indexes (DJSI) are three examples of such tools and guidelines.

**Triple Bottom Line (TBL)**

Elkington (1998), the originator of the term Triple Bottom Line (TBL) and TBL technique, states TBL reporting is a form of voluntary corporate reporting that blends aspects of economic, social and environmental performance into a single report.

Barut (2007) explains that the concepts of corporate social responsibility reporting and TBL reporting are ways of looking into the relationship between a business and society that is positioned in a natural environment. The TBL concept was originally developed as a philosophy, a way of thinking, rather than a method of accounting and a reporting tool. In this sense, it is not new. Vanclay (2004: 269) argues, "social TBL is just another name for SIA within EIA".

The concept of TBL demands that a business has responsibility to its 'stakeholders' rather than shareholders. In TBL thinking, a 'stakeholder' is anyone who is influenced, either directly or indirectly, by the actions of the business (e.g. people/society, natural environment/planet, national/global economy). Elkington (1998) argues that a business should rather coordinate stakeholder interests than maximise shareholder (owner) profit. Deegan (2000) claims that according to recent research, businesses that are adopting TBL
reporting are making changes to the way they do, or at least think about, business.

On the other hand, Norman & MacDonald (2003: 13) criticises the TBL reporting; “the concept of a TBL in fact turns out to be a ‘Good old-fashioned Single Bottom Line plus Vague Commitments to Social and Environmental Concerns.’” He claims that the principles of the TBL are exceedingly easy for almost any business to include in their reporting and allows them to make almost no commitment and no responsibility whatsoever. He further argues, “without any real social or environmental bottom lines to have to calculate, businesses do not have to worry about those bottom lines” (Norman & MacDonald, 2003: 13).

The main point Norman & MacDonald are making is the fact that businesses can decide what performance indicators they are going to report to a specific stakeholder group, and then even change their selection of performance indicators over time. In other words, the businesses are in control of the reports; they can report what they consider is relevant to the stakeholder groups. Moreover, they do not actively discuss with their stakeholders what set of performance indicators the stakeholders would like to see reported and what should be included in the reports.

Norman & MacDonald (2003: 13) argues that because of the freedom the TBL reporting gives to businesses, and the hundreds of data points businesses can decide to report, comparisons of social, environmental, and economic performances of businesses even within the same sector are difficult. He emphasises that the TBL reporting lacks key social and environmental performance indicators that are globally acceptable, when compared to global economic indicators like profit/loss, cash flow, return-on-investment, and earnings-per-share. Because of its emptiness and vagueness, the TBL reporting allows even a cynical business “to appear to be committed to social responsibility and ecological sustainability” (Norman & MacDonald, 2003:13).

Gligo (1995: 17) also argues, “sustainable development is brandished as a new standard by those who do not really wish to change the current pattern of development”. There are more and more businesses that provide charitable contributions, environmental contributions, and political contributions because they are concerned about their public image, and because their competitors are doing so (Reich, 1998).

Global Reporting Initiative (GRI) guidelines
The GRI guideline is a voluntary reporting framework designed for businesses to assist them report economic, environmental and social performance. GRI guidelines argue that any business should report its non-financial performance beside financial ones and contribute to global sustainability – “GRI’s mission is to create conditions for the transparent and reliable exchange of sustainability information through the development and continuous improvement of the GRI Sustainability Reporting Framework.” (GRI, 2010: ii)
GRI guidelines can be used as a tool for continuous performance improvement of a business by: encouraging innovation; creating a competitive advantage and enhancing its reputation through socially responsible, sustainable and transparent business practices; and creating and communicating social, environmental, and economic values to its stakeholders. GRI guidelines identify the following categories of performance indicators:

Performance indicators (social, environmental, economic performance data)

- Economic (7 core + 2 additional)
- Environmental (17 core + 13 additional)
- Society (6 core + 2 additional)
- Product responsibility (4 core + 5 additional)
- Labour practices (9 core + 5 additional)
- Human rights (6 core + 3 additional)

Total: 49 core + 30 additional

GRI guidelines recognise three levels of reporting ('A', 'B', 'C'), based on the number of indicators a business is reporting. In the 'A' level of reporting a business is required to report all core indicators; in the 'B' level a business is required to report 20 or more indicators; and in the 'C' level to report 10 or more indicators.

A business can assess its social, environmental, and economic performance by itself, or, it can be assessed by a third party assessor (e.g. Accountability assessor) to guarantee objectivity of the report. If so, then it is awarded by a ‘+’ sign behind a letter ‘A’, ‘B’, or ‘C’. For example a business awarded an ‘A+’ must be checked by a third party assurance provider, it has to report on all core performance indicators stated in the GRI guidelines, and it has to disclose its management approach.

The Institute for Social and Ethical Accountability (ISEA), also known as ‘AccountAbility’, developed the ‘AA1000 Assurance Standard’ (AA1000AS). The AA1000AS requires the assessor to look at underlying management approaches, systems and processes, and investigate how stakeholders have interacted with the business and participated in decision-making processes.

At the present, ‘AA1000 Stakeholder Engagement’ (AA1000SE) is a leading internationally accepted standard used to provide assurance on publicly available social, environmental, and economic performance information. AA1000SE aims to assist businesses to define social, environmental, and economic goals and targets, helps to measure progress made against those targets, and assists with auditing and reporting of performance.
**Dow Jones Sustainability Indexes (DJSI)**

DJSI was primarily developed to find the best socially, environmentally and economically performing businesses to help responsible investors to invest in 'good businesses' and benefit society, the environment, and the economy. Businesses that are listed on DJSI benefit from their sustainability reputation, and have greater access to investment capital compared to businesses that do not disclose their social, environmental, and economic performance. Businesses that are socially, environmentally, and economically responsible, use their sustainability profile as a competitive advantage.

DJSI identifies 'best-in-class' businesses by assessing social, environmental, and economic performance of businesses as well as investigating whether those businesses are creating long term shareholder values. In DJSI, assessment of businesses varies from sector to sector. There are individual assessment criteria for each industry. Overall weighting of assessment criteria focuses more on industry specific criteria rather than on general criteria. For example, it is more important how a business performs in the sector it is positioned within, than in general; for instance, bank 'A' may perform well socially, environmentally and economically when compared to a mining business, though it may under-perform when compared to a bank 'B'.

DJSI is based on a thorough assessment of corporate social, environmental and economic performance. The assessment includes questionnaires, assessment of reports, press releases, articles, stakeholder comments, and direct clarification of information with the assessed business via phone or personal contacts. Assessment of reports provided by a business is conducted by an external assessor, which increases the overall credibility of the assessment.

While there are a number of tools and guidelines and hundreds of social, environmental, and economic performance indicators that are suggested to be monitored and reported by businesses, Kaplan and Norton (2004) recommend no more than 20 Key Performance Indicators (KPIs). Similarly, Hope and Fraser (2003) suggest fewer than 10 KPIs to be monitored, measured, and reported by businesses. Parmenter (2010) also agrees with monitoring, measuring and reporting of a small number (around 10) of KPIs, and he explains there are about 10 KRIs, up to 80 PIs, and 10 KPIs that businesses need to monitor, measure, and report on. Furthermore, Norman & MacDonald (2003) argue that monitoring, measuring and reporting of a large number of diversified KPIs is, practically, difficult to achieve by any business. He claims there is a need to identify globally acceptable KPIs that can be monitored, measured, and reported on by any business; KPIs that reflect the most important core values/ideals of major stakeholders of a business (Norman & MacDonald, 2003).

The question now is, how do we identify the most important KPIs that could/should be
monitored and reported by any business anywhere in the world? According to a number of authors (c.f. Mair and Schoen, 2005; Collins and Porras, 2000; Giacalone, 2004; McKaskill, 2006a; Parmenter, 2010) KPIs need to reflect and address core values/ideals of major stakeholders. They need to be well understood and implemented in a business’s vision and mission (Mair and Schoen, 2005; Collins and Porras, 2000). Moreover, according to Parmenter (2010), KPIs need to be monitored frequently, for example, 24/7, daily, or weekly. Following the line of such arguments, we need to ask the question already asked: who are the major stakeholders any business could/should be accountable to, and what are their core values/ideals? There are information sources available, such as literature, case studies of businesses, and world reports. What can we learn from this literature? This chapter has already discussed business modelling and measurement literature. The question being asked now is whether we could use the information from business measurement literature to assist us, for example, in identifying major typological groupings that any business should be accountable to.
2.6 Business modelling versus business measurement

Bearing in mind the argument that business modellers need to be able to explain why their modelled business will exist, what their mission and vision will be, and who their stakeholders will be, prior to developing a business model, the question is: how can business modellers successfully identify multiple stakeholders of their modelled businesses?

According to Freeman’s (1984) definition of stakeholders, a stakeholder is anyone who can have an effect on the business or who can be affected by it. This includes not only the most obvious stakeholders, such as community, environment, shareholders, suppliers, customers, employees (Spiller, 2000), but also the media, consumers or ecological movements (Ferrary, 2009). Donaldson and Preston (1995) define a stakeholder as an individual, or a group of individuals, that claims a share of the value created by the business’s production, or holds an interest in the business’s existence. Frooman (1999) defines stakeholders as groups or parties holding resources that are essential to the business’s existence. Because a stakeholder can be theoretically everyone and anyone, and considering it would be practically impossible for any business to account for all stakeholders and the whole world, there is a need to rather identify typological groupings (e.g. social, environmental, economic) of world major issues, ideals and beliefs major stakeholders could be characterised by.

Ferrary (2009: 33) suggests stakeholder theorists propose different categories of stakeholders grouped as: voluntary and involuntary stakeholders, primary or secondary stakeholders, strategic or moral stakeholders. Moreover, Ferrary (2009: 36) argues the same stakeholder, or stakeholder group, can play different roles in economic, political or social spheres. For example, an individual stakeholder in the economic sphere may be an employee, an investor, a client, etc. However, in the political sphere the same individual stakeholder may be a trade unionist, an elected official, etc., and in the social sphere he or she may be a parent, consumer, member of an association or church, etc. In other words, individual stakeholders (e.g. employees, customers) can belong to different groups of stakeholders and even more, they can simultaneously represent multiple stakeholders. For example, an employee can be simultaneously a shareholder, trade unionist and environmentalist. Taking into account that at a low level view a stakeholder could be everyone and anyone, and it would be impractical for a business to include everyone, there is a need to look at all stakeholders from the broadest meta-perspective, and rather identify typological groupings applicable to every business. One of the possible options for how to identify major typological groupings is to study business reporting tools and guidelines, and investigate what they recommend to report performance to.

There are a number of business measurement and reporting tools and guidelines applicable to any business, such as Environmental Impact Assessment (EIA), Social Impact Assessment (SIA), Strategic Environmental Assessment (SEA), Environmental Management Systems (EMS), Triple Bottom Line (TBL), Global Reporting Initiatives (GRI), Dow Jones Sustainability Index (DJSI), and others.
Indexes (DJSI), to name a few, that suggest monitoring and reporting of performance to various stakeholders. For example, GRI guidelines suggest businesses report their performance to stakeholders such as: shareholders and investors, employees, customers, suppliers, community, state and local governments, business partners / trade unions, and non-governmental organisations. Vanclay (2004) conducted a study comparing a number of business performance reporting tools, such as TBL, SIA, EIA, SEA, and EMS. He suggests businesses need to consider multiple stakeholder groups, such as stakeholders representing society, the natural environment, economy, and culture. Spiller (2000) in his study of ‘Ethical Businesses’ considers six major stakeholder groups (community, environment, shareholders, suppliers, customers, employees), which he categorises within three major types of stakeholders (Social, Environmental, Financial). Similarly, Elkington’s (1998) concept of TBL considers three typological groups of stakeholders – social, environmental, and economic.

Categorisation of stakeholders into three major typological groupings – Social, Environmental, and Economic – is widely supported by a number of authors, such as Spiller (2000), Elkington (1998), Vanclay (2004), Hopkins (2002), Purba (2006), Hossain et al. (2006), Putnam (2002), and Posner (2009). Institutions like WBCSD, WEF, OECD, OHSAS, UN Global Compact, SAM Group, TI, Amnesty Business Group, ILO, Fair Trade, GSS, and ISO also support categorisation of major stakeholders into the three major typological groupings – Social, Environmental, and Economic. If we accept the recommendation from the literature that there are appropriately three major types of stakeholders (social, environmental, economic), then what are the characteristics of each of them?

**Social business modelling**

Being ‘social’ means considering, and accounting for, values/ideals/behaviours of other humans. A social business is one that accounts to people inside and outside the business; a social business is one that combines business objectives with its social mission. According to Yunus (2009), a social business is one that seeks to profit from acts that generate social improvements and serve a broader human development purpose. A social business has positive social objectives; it reinvests surpluses back to the business and the community it serves, and customers benefit from business success (Yunus, 2009). Elkington (1998) argues that a social business respects human rights (e.g. women rights, indigenous peoples rights, minority group rights); it recognises land rights; gives charitable and political contributions; and has some form of relationship with a community. It pays fair salaries to its workers, provides a safe work environment and tolerable working hours, contributes to the growth of its community, and does not use child labour (Yunus, 2010). Dees (1998) argues that for social entrepreneurs, social missions are fundamental; they strive for social improvements that cannot be reduced to creating private benefits (financial returns) for individuals. Social entrepreneurs founding social businesses strive to make a difference to the world, lasting improvements, and long-term social returns on investment (Dees, 1998).
**Environmental business modelling**

Being an environmental (environmentally responsible) business means respecting, protecting, and not causing any negative impact and change to the natural environment, to the flora, fauna, and living systems that make up the planet (Laszlo, 2003: 12). According to Dean (2007), an environmental business is one whose products and services are used directly for environmental protection, or are closely related to it. It carefully manages its consumption of energy and non-renewables; reduces production of waste and pollutants; enhances material recyclability; does not produce any harmful or destructive products such as weapons, toxic chemicals or batteries containing dangerous heavy metals; and extends product durability (Elkington, 1998). Elkington (1998) further argues that:

- The physical basis for nature’s productivity and diversity must not be allowed to deteriorate
- Substances from the Earth’s crust must not be extracted at a rate faster than their slow redeposit into the Earth’s crust
- Substances must not be produced by society faster than they can be broken down in nature or deposited into the Earth’s crust

**Economic business modelling**

Meadows (1997) emphasises conflict between the objectives of the global economy and environmental health, for example, by arguing that constant growth of this economy is against the law of the natural environment. Similarly, Kennedy (1995) highlights a connection between environment and economy – locally, regionally, nationally, and globally – into a seamless net of causes and effects. Therefore, Meadows (1997) argues, businesses need to aim for objectives that are consistent with planetary ones. A similar argument is made by Visser (2010), that our modern capitalist and economic system is conceived as an abstract system without limits, what Kenneth Boulding refers to as a ‘cowboy economy’, where endless frontiers imply no limits on resource consumption or waste disposal (Visser, 2010).

To sum up, a number of authors (c.f. Spiller, 2000; Mair and Schoen, 2005; Elkington, 1994; Yunus, 2009) and institutions (e.g. WBCSD, WEF, OECD, OHSAS, UN Global Compact, SAM Group, TI, Amnesty Business Group, ILO, Fair Trade, GSS, ISO), argue that at the broadest meta level, there are appropriately three major types of stakeholders – social, environmental, economic – to be considered and accounted for when developing any business models. If a business addresses social objectives without environmental ones, the business would end up being unsustainable (Laszlo, 2003). Moreover, he argues businesses need to be aware of global problems, address them, and manage them as their new responsibilities like any other key performance issue. McKaskill (2006a) claims that businesses that solve a very specific problem that has a compelling need to be solved will succeed in a highly competitive market, and will have a very high growth potential, since the
compelling need reduces the cost of selling.

A number of authors indicate there is a link between responsibility, sustainability, and success of businesses (c.f. Spiller, 2000; Mair and Schoen, 2005; Elkington, 1994; Collins and Porras, 2000; Yunus, 2009). A business that is responsible for its actions and makes unselfish, sensitive decisions has a greater chance of being sustainable and successful (Giacalone, 2004; Spiller, 2000; Mair and Schoen, 2005; Collins and Porras, 2000; Yunus, 2009).

On the one hand, we have reference models like Dowding’s UBM, suitable for developing business models of any business, which includes transcendent business, but which are limited in providing suggestions as to who major stakeholders of any business might be. On the other hand, we have measuring and reporting tools giving suggestions as to what performance indicators any business could/should monitor, measure and report to what stakeholders, but which are limited in providing suggestions about what are the most important performance indicators that would be globally acceptable. Even though categorisation of stakeholders into three major typological groupings – social, environmental, and economic – is widely supported by number of authors and institutions, the question still remains: what are the major stakeholders/typological groupings and what are their underlying core values/ideals every business could/should be accountable for? Are the social, environmental, and economic/financial groupings the only groupings businesses should be accountable for, and if so, what are their core values/ideals?
2.7 Society focused world organisations and business modelling

According to the UN (2011), social, political and economic challenges affect businesses more than ever before, and many businesses have already recognised the need to collaborate and partner with governments, civil society, labour and the United Nations. The UN has developed the ‘Global Compact’, which is a “strategic policy initiative for businesses that are committed to aligning their operations and strategies with ten universally accepted principles in the areas of human rights, labour, environment and anti-corruption” (cited from UN official website). In other words, the Global Compact is a practical framework for the development, implementation, and disclosure of sustainability policies and practices, offering businesses assistance in developing sustainable business models and markets – “It exists to assist the private sector in the management of increasingly complex risks and opportunities in the environmental, social and governance realms” (cited for the UN official website, page updated on 30 April 2011). The Global Compact has the following two major objectives:

- To mainstream the ten principles of the Global Compact in business activities around the world
- To catalyse actions in support of broader UN goals, including the Millennium Development Goals (MDGs)

The argument is that businesses that aim to meet the above two objectives of the Global Compact will provide collaborative solutions to the most fundamental challenges that are facing both business and society. Moreover, they will be able to access the UN's extensive knowledge and experience with sustainability and development issues, and advance sustainability solutions in partnership with a range of stakeholders, including UN agencies, governments, civil society, labour, and other non-business interests. The Global Compact is a set of ten universal consensus principles, in the areas of human rights, labour, the environment and anti-corruption, applicable to any business:

**Human Rights**

- Principle 1: Businesses should support and respect the protection of internationally proclaimed human rights; and
- Principle 2: make sure that they are not complicit in human rights abuses

**Labour**

- Principle 3: Businesses should uphold the freedom of association and the effective recognition of the right to collective bargaining;
- Principle 4: the elimination of all forms of forced and compulsory labour;
- Principle 5: the effective abolition of child labour; and
- Principle 6: the elimination of discrimination in respect of employment and occupation
Environment

- Principle 7: Businesses should support a precautionary approach to environmental challenges;
- Principle 8: undertake initiatives to promote greater environmental responsibility; and
- Principle 9: encourage the development and diffusion of environmentally friendly technologies

Anti-Corruption

- Principle 10: Businesses should work against corruption in all its forms, including extortion and bribery

(Cited from UN official website)

The following is a list of UN MDG targeted for completion by 2015:

- Eradicate extreme poverty and hunger
- Achieve universal primary education
- Promote gender equality and empower women
- Reduce child mortality
- Improve maternal health
- Combat HIV/AIDS, malaria and other diseases
- Ensure environmental sustainability
- Develop a global partnership for development

(Cited from UN MDG Report 2010)

The UN produces a number of reports every year where issues of civil society, partnership, sustainability and other major issues that are reshaping our world are discussed. Whilst world organisations like UN, UNESCO, EU, Amnesty International, and APEC discuss overall social, environmental, and economic world major issues, Greenpeace focuses primarily on monitoring and reporting of world major issues related to the natural environment. Examples of such issues include: air, water, and soil pollution; use of hazardous chemicals; impact of pollution on human health; industrial water pollution policies; deforestation and climate change; global warming, climate change, ecological degradation, and biodiversity loss; environmental protection; energy use, and renewable energy; green electronic production; food safety and sustainable agriculture, etc.

There are dozens of reports produced by world organisations every year highlighting the world’s major issues that require immediate attention. World organisations like the UN, the World Bank, and Greenpeace argue that world major issues can no longer be ignored by businesses, but should be perceived as new business opportunities (c.f. Annan, 2002; Esty, 2006; Ferrary, 2009), because where there is a need, problem, and either actual or potential
demand for a product, service or experience, there is a business opportunity (c.f. Rae, 2007; McKaskill, 2006a). Whilst there are hundreds of world major issues discussed in world reports, the common themes of the reports and the most frequently discussed issues can be discerned. However, the question remains, how do we connect human needs and world major issues with new opportunities and inspirations from science, technology, and business, and produce solutions that are beneficial for society, environment, and economy? How do we represent such business modelling approaches as a reusable reference model, and a methodology that could be used by future business modellers to design business models of their businesses that are not self-centred, but go far beyond single business objectives?
2.8 Prioritising decision options; decision-support methods and tools

When exploring business opportunities and prototyping business models of future potential businesses, there is always more than one option to consider. Hence, the question must be: how do we prioritise decision options and select potentially the most beneficial one; what are the available decision-support methods and tools that allow assessing multiple options against multiple criteria, and objectively selecting the most potentially beneficial option?

There are a number of methodologies for making selections and decisions that could be used. Methodologies for making decisions about which option (e.g. what business model) should be selected can be classified by the type of decision task being faced, or, according to the adaptive problem that needs to be solved. Gigerenzer (2000) identified seven classes of methodologies (heuristics/rules of thumb) for making fast and frugal decisions. After conducting a number of tests and comparisons of seven classes of methodologies for making such decisions, he argues that ‘Take The Best’ heuristic made the highest (74%) correct inferences in the test of choosing an object (e.g. a business model) with the highest value (e.g. potentially the most beneficial), and 80% of correct responses in the test of choosing an object (e.g. business model) by guessing. He tested the ‘Take The Best’ heuristic across 20 different environments, and discovered that it achieved the highest accuracy (71%) among all other heuristics developed for making fast and frugal decisions. The ‘Take The Best’ heuristic is searching for reasons or cues beyond mere recognition; however, it is using only a single piece of information for making a decision (Gigerenzer, 2000). On the other hand, the Analytic Hierarchy Process (AHP) is a decision-aiding methodology, developed by Saaty, which searches for a single alternative, which meets a number of selection criteria (Saaty, 1980). Since criteria in AHP methodology are prioritised and weighted, the AHP makes it possible to select a single option, which not only meets the largest number of selection criteria, but also considers the relative importance of each (Saaty, 1990).

The AHP is a “decision support methodology for strategic selection decisions, in which a single choice has to be made between a number of alternatives in the presence of multiple stakeholders” (Firouzabadi 2008: 851). The AHP methodology structures a complex set of alternatives/options and criteria (for a given decision that has to be made) into a hierarchical structure creating matrices of decision, alternatives/options and criteria for assessing the alternatives/options. The process of structuring complexity used in the AHP methodology is similar to the QOC notation (MacLean et al., 1991). However, while the QOC is primarily used for structuring complex situations into hierarchical structures in order to provide a structured representation of argumentation for why a designed artefact is the way it is (MacLean et al, 1991), the AHP aims not only to structure complex situations, but also to assess multiple alternatives/options against multiple criteria (so the alternative/option which meets the largest number of criteria to the largest extent can be identified). The AHP methodology includes both the rating and comparison methods (Saaty, 1994). In other words, the main difference between the QOC and the AHP is that the QOC aims to develop a
structured Design Space Analysis (DSA) – a visual representation of multiple options and criteria for a given question – and by doing so encourages the exploration of alternatives (MacLean et al., 1991). The AHP methodology structures a set of alternatives/options and criteria in a similar way as the QOC does, and by doing so it provides a clear, organised, and logical view of a decision that has to be made. Moreover, the AHP compares and assesses any set of options for a given decision that has to be made against any tangible and intangible criteria whose relative importance is prioritised and weighted (Firouzabadi, 2008) – “the essence of the AHP is the use of ratio scales in elaborate structures to assess complex problems” (Saaty, 1994: 38). Structuring complexity and ratio scale measurement is one of the primary functions of the AHP.

Example:

Decision to be made: What business model is potentially the most beneficial to multiple stakeholders?

Available alternatives: A set of prototyped business models of potential businesses.

Selection criteria: Prioritised and weighted core values/ideals of major stakeholders that also allow the business to prosper.

To use the AHP methodology correctly:

1) A clear question (decision problem) needs to be asked (e.g. what is the most beneficial business model)

2) A set of alternatives/options that respond to the decision problem needs to be developed (e.g. a list of potential business models)

3) A list of assessment criteria needs to be known (e.g. a list of core value/ideals of major stakeholders)

The assessment criteria need to be applicable to every alternative/option considered and they need to be prioritised and weighted. In the AHP assessment, the total sum of all weighting points of all criteria equals 1, which represents 100%. The AHP assessment allows structuring of multiple levels of criteria, which is conducted from top to bottom. For example, let’s assume the following scenario. There is a decision problem that needs to be addressed. There are three alternatives identified, one of which will have to be chosen based on assessment against five criteria (and seven sub-criteria). Within each criterion and sub-criterion, a decision maker needs to divide up the number of weighting points available among the different alternatives/options. The highest total of weighting points will indicate the most beneficial alternative/option for the decision problem. To visualise this complex situation, the following diagram could be drawn:
<table>
<thead>
<tr>
<th>Decision points</th>
<th>Alternatives</th>
<th>List of criteria</th>
<th>Weighting</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Alternative #1</td>
<td>Criterion #1</td>
<td>0.30</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sub-criterion #1.1</td>
<td>0.15</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sub-criterion #1.2</td>
<td>0.15</td>
</tr>
<tr>
<td></td>
<td>Alternative #2</td>
<td>Criterion #2</td>
<td>0.25</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sub-criterion #2.1</td>
<td>0.15</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sub-criterion #2.2</td>
<td>0.05</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sub-criterion #2.3</td>
<td>0.05</td>
</tr>
<tr>
<td></td>
<td>Alternative #3</td>
<td>Criterion #3</td>
<td>0.20</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Criterion #4</td>
<td>0.15</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sub-criterion #4.1</td>
<td>0.10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sub-criterion #4.2</td>
<td>0.05</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Criterion #5</td>
<td>0.10</td>
</tr>
</tbody>
</table>

**Total:** 1.00

Figure 2.1: Hierarchical structure of AHP assessment

The diagram above shows Design Space Analysis (DSA) for a given decision problem with illustrated alternatives that were considered, and criteria that were used for assessing the alternatives. The diagram in fact is a QOC notation, which shows a hierarchy for selecting the most beneficial alternative among three alternatives, considering multiple criteria (criteria #1 to #5). However, the diagram above uses the AHP methodology which not only structures the decision problem into a hierarchical structure, but also contains weighting points for each criterion and sub-criterion that is used for assessing each available alternative (alternative 1 to 3). As mentioned earlier, criteria in AHP methodology need to be prioritised and weighted, reaching the total weight of 1 (equivalent to 100%). Therefore, assigning weighting points to each criterion must be relative to the total weighting points of all criteria. For example, criterion #1 has a weighting 0.30, criterion #2 = 0.25, criterion #3 = 0.20, criterion #4 = 0.15, and criterion #5 = 0.10, which totals 1.00.

The above diagram shows two levels of assessment criteria; however, the AHP methodology allows using multiple levels of criteria. In such a case, weighting points of sub-criteria must be equal to the weighting points of a criterion one level above. For example, criterion #1 (with its weighing of 0.30) has two sub-criteria (criterion #1.1 with weighing of 0.15, and criterion #1.2 with weighting of 0.15). When assessing available alternatives (alternative #1 to #3), weighting points for each criterion have to be divided among all alternatives, based on how well each alternative meets that criterion. For example, weighing points of criterion...
Alternative #1 (0.30) will need to be divided among alternatives #1 to #3. The following table shows an example of AHP assessment where alternatives #1 to #3 were assessed against criteria #1 to #5:

Table 2.1: Example of AHP assessment of business models

<table>
<thead>
<tr>
<th>Potential Business Models</th>
<th>AHP Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>C#1</td>
</tr>
<tr>
<td>Alternative #1: Business Model A</td>
<td>0.15</td>
</tr>
<tr>
<td>Alternative #2: Business Model B</td>
<td>0.10</td>
</tr>
<tr>
<td>Alternative #3: Business Model C</td>
<td>0.05</td>
</tr>
<tr>
<td>TOTAL</td>
<td><strong>0.30</strong></td>
</tr>
</tbody>
</table>

C#1 to C#5 are assessment criteria (please note for simplicity purposes, sub-criteria are not shown in the table above). Weightings for the criteria are represented in the final row of the table. The total weighting for all criteria is equal to 1 (100%), and within each criterion the numbers of weighting points available were divided up among the different alternatives available (alternative #1 to #3). The column on the right of the table represents the total number of weighting points for each alternative available (option #1 to #3). The alternative with the highest total weighing points after the assessment is selected as the most beneficial, since it addresses the most important criteria. In the example above, alternative #1 (the Business Model A) will be selected as it reached the highest score (0.37 out of 1.00).

Saaty (1990) claims that by assessing multiple alternatives against a prioritised and weighted set of criteria, using the AHP technique, it is possible to objectively identify the most beneficial alternative. Moreover, Forman (2001) argues the AHP is perhaps the most widely used decision-making approach in the world today. It has been used, for example, by ‘Xerox’, (for R&D decisions on portfolio management), ‘NASA’ (for evaluating alternatives ranging from photo-voltaic cell farms to nuclear reactors), ‘General Motors’ (for evaluating design alternatives), and thousands of applications round the world – “the AHP is a simple, easy to understand, flexible and accurate technique for choosing one alternative (option) among many, prioritisation/evaluation of a set of alternatives (options), resource allocation, benchmarking, quality management, public policy, and strategic planning” (Forman, 2001: 83). The AHP methodology is a useful technique that could be effectively used not only for assessing and comparing a number of options during the business modelling process, but also for objectively selecting a business model of the most potentially beneficial business on multiple levels.
2.9 Conceptual framework model

This chapter has reviewed literature relative to: transcendent, egalitarian, and visionary business literature; business models, business modelling, and reference models literature; business measurement literature; business modelling approaches and attempts; and the influence of society focused world organisations on business modelling. Literature relative to prioritising decision options was reviewed, as well as a methodology for making strategic decisions (the AHP).

Review of literature relative to business modelling approaches and attempts indicated there was a significant shift from a product-centric business modelling approach to a more entrepreneurial, customer-centric business modelling approach. A number of business modellers have realised that business opportunity often lies in solving a problem (e.g. social, environmental, economic) and satisfying unmet demands, needs, and wants. There are also a number of businesses that are successfully using new innovations and patents to solve problems, and satisfy the needs of their customers (e.g. 3M, DuPont). Moreover, a number of authors suggest an even more entrepreneurial approach where, for example, customers join executives, employees, and owners/shareholders on an equal footing. However, it has not been sufficiently explained how such an approach could be achieved.

Taking into account arguments from extant literature that businesses should: respond to world major issues, unsolved problems, and unsatisfied demands; account for the core values/ideals of multiple stakeholders; and that they should design and run their businesses together with multiple stakeholders, a transcendent business modelling to take an egalitarian, customer-centric approach is proposed. However, to develop a reusable methodology for such an approach, applicable to any modelled business anywhere in the world, requires perceiving customers from the broadest perspective; as individuals with a complex set of needs within a larger community with complex interdependencies. Or rather, perceiving customers as stakeholders who could simultaneously represent, for example, customers, employees, shareholders, union members, etc. The following question was asked:

- What are the major typological groupings and what are their core values/ideals every business could/should simultaneously account for?

Considering the research aimed to develop a reusable business modelling methodology and model that could assist future business modellers to develop business models of any transcendent business anywhere in the world, the focus was placed on discovering, testing (providing proof-of-concept), and evaluating methods and procedures that could be repeated in the future. The following QOC was already introduced in chapter 1, figure 1.1, however here the question is extended to follow up question of identifying also core values/ideals of major typological groupings and the methods considered by the researcher for doing so:
The researcher considered identifying multiple typological groupings and their core values/ideals by conducting case studies of businesses that had a record of accomplishment for going beyond self-interest and generating profit. However, it was proposed that studying existing businesses would return very specific outcomes relative to each business studied. Moreover, using the case study as a reusable method for identifying typological groupings of transcendent businesses could generate biased, unverifiable results, limited in the number of ideas and not fully representing the real picture. The researcher considered also conducting surveys with experts, such as Corporate Social Responsibility (CSR) experts, but after talking to some of these experts it became very obvious that asking them who the major typological groupings of any transcendent business were, and what their core values/ideals were, was too broad a question to generate any useful answers. On the other hand, surveying published materials, such as world reports produced by world organisations, was potentially a very viable option, as the world reports are generally easily accessible, are knowledge and expertise based, (produced by experts, field workers, journalists), and such a method could be easily repeated and verified. World reports produced by world organisations (e.g. UN, the World Bank, NATO, etc.) highlight and discuss the world major issues; they aim to create the conditions for dialogue among civilizations, cultures and people, based upon respect for commonly shared values/ideals, sharing knowledge and promoting social progress and sustainable growth. Therefore, it was proposed major typological groupings, and their core values/ideals, could be identified by surveying world reports. In other words, surveying world reports was proposed as an efficient and reusable method for identification of major typological groupings and their core values/ideals. Moreover, it was proposed that surveying world reports could repeatedly point any business modeller to the problems and issues that require immediate attention, and could be explored as new business opportunities.
The researcher also proposed that the world major issues discussed in world reports are a reflection of major typological groupings core values/ideals. Therefore, the core values/ideals for major typological groupings could be identified. However, once major typological groupings and their core values/ideals are identified, there is a need to prioritise these so a small number of the most important core values/ideals of each typological grouping could be identified. Therefore, a question was raised:

- How do we prioritise diversified core values/ideals of multiple groupings?

The researcher proposed that initial core values/ideals could be prioritised through ranking, based on their relative importance. It was proposed that a priority number of each core value/ideal could be assigned based on the frequency of how often each core value/ideal appears across world reports, or alternatively, experts representing major typological groupings (e.g. CSR experts), could prioritise the core values/ideals. Moreover, it was proposed CSR experts could, not only prioritise the core values/ideals, but could also verify them and suggest changes if required. CSR experts could prioritise the core values/ideals for each typological grouping, and by doing so the most important core values/ideals for each could be identified. Finally, it was proposed CSR experts could prioritise the most important core values/ideals for each typological grouping across all typological groupings, so a relative importance for each core value/ideal could be identified. The expected outcome of the above was to create a single list of the most important core values/ideals for major typological groupings.

Once such a list is created it could point business modellers to world major issues that could/should be perceived as business opportunities. However, such a list indicates only what businesses should be focused on and what values/ideals they should be addressing, but does not recommend how those core values/ideals could be addressed. In other words, there was a need to develop a reusable methodology to respond to those opportunities and address them simultaneously in a way that increases efficiencies, higher productivity, reduces resource consumption, and enhances sustainability. Therefore, the following questions were asked:

- How can we simultaneously address diversified core values/ideals of multiple typological groupings, acknowledging they may even be in conflict?
- How do we develop business models around diversified core values/ideals of multiple typological groupings?

The literature review revealed that there are authors like McKaskill (2006) and Rae (2007) who argue opportunity-centred entrepreneurial business modellers often use new technologies / innovations / patents to find creative solutions to persistent problems, to satisfy unmet needs, and to deliver products/services that are needed for prices customers are willing to pay. Taking into consideration the above arguments, the researcher proposed the identified world major issues / core values/ideals of multiple typological groupings to be
addressed with an innovative approach. However, a question was raised as to what enablers business modellers could use to simultaneously address a diverse range of core values/ideals. The following QOC shows methods (options) considered by the researcher for addressing any core value/ideal of major typological groupings:

![QOC Diagram](image)

**Q2: How to address diversified core values of multiple groupings?**

- **O1:** Using innovation / patents
  - **C1:** Repeatable
  - **C2:** Scalable
  - **C3:** Knowledge based
  - **C4:** Expertise; skill based
  - **C5:** Diversity of ideas
  - **C6:** Accessible
  - **C7:** Glocal

- **O2:** Using people's skills and expertise
- **O3:** Using available capacity and capability

It was proposed that core values/ideals could be simultaneously addressed by using the available capacity and capability of an existing business. However, such capacity and capability is not always accessible, is often very limited in the number of ideas, and difficult to be implemented at the local level while considering the global impact (refer to criterion C7 – glocal). Moreover, to test such a proposition would require an existing business, which was not possible for this research. Also, considering that this research aimed primarily to develop a reusable methodology for developing business models for new transcendent businesses, and was not concerned with how to modify existing businesses into transcendent businesses, using the available capacity and capability option was not further considered. The researcher considered also using someone’s skills and expertise as an enabler for addressing core values/ideals of multiple typological groupings, however, such an approach would be very individual, difficult to be repeated by someone else, not always easy to scale up from local to global implementation, and very limited in the variety of ideas, influenced by the person's own skills, experiences, and expertise. Therefore, the researcher proposed, that the most potentially effective and efficient way to address diversified core values/ideals of multiple typological groupings would be to use available post-incubation innovations / patents, and the expertise of post-incubation innovation domain experts, whose knowledge relative to a selected post-incubation innovation/patent could be easily extracted. To test such a proposition required selecting a post-incubation innovation/patent, and identifying its potential usages for simultaneously addressing diversified core values/ideals.

The researcher proposed to use a post-incubation innovation, rather than a completely new innovation, to minimise the potential risk of failure, and to increase the chances of finding enough experts with expertise and knowledge relative to a selected post-incubation innovation / patent. The aim was to develop a reusable business modelling methodology for addressing any world major issues / core values/ideals of typological groupings with any
post-incubation innovations / patents in the future. Thus there was a need to discover a set of steps, methods, and procedures that could be reused in future applications. The following question was asked:

- How do we select and evaluate a post-incubation innovation / patent that can be creatively and effectively used for addressing diversified core values/ideals of multiple typological groupings?

There were thousands of post-incubation innovations and patents available on the internet and other information sources. There were also post-incubation innovation domain experts available in the areas of new technologies, innovations, and patents. The researcher used the internet as a source of information and identified a number of websites with databases of available patents. The researcher then selected three technical utility patents (useful devices). Since the researcher did not have any background knowledge relative to the selected patents, and did not conduct any background research relative to the technology used in the patents, evaluation of the selected patents without the assistance of experts was not possible. Making a decision to ask post-incubation innovation domain experts for assistance, however, triggered a new question:

- How do we identify post-incubation innovation domain experts?

The following QOC shows methods (options) of finding post-incubation innovation domain experts, considered by the researcher:

Figure 2.4: QOC - How to identify patent experts

Considering the aim of the research was to develop a model and methodology that could be reused in the future by any business modeller to develop business models of their future transcendent businesses, the focus was on identifying methods and procedures that could be successfully repeated in the future, that could be verifiable, accessible, and ideally did not cost a fortune. The researcher proposed post-incubation innovation domain experts with

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3The researcher did not specify any selection criteria for selecting post-incubation innovations / patents, since this research aimed to develop a reusable model and methodology that could be applicable to any post-incubation innovation/patent.
extensive expertise relative to a selected post-incubation innovation / patent could be identified using a private network of contacts, however, such method is not always available, as was also the case with this research. Moreover, using a private network of contacts limits the number of experts available and consequently limits the diversity of ideas. Ideally, a group of post-incubation innovation domain experts could be identified using lists of speakers at world conferences dedicated to technology used in a selected patent, since conference speakers are already recognised experts in specialist areas. Moreover, using conference speakers from around the world magnifies the diversity of ideas, as the experts are likely to have a wide range of academic backgrounds, theoretical and field experiences, and individual personal skills.

It was proposed to introduce selected patents to post-incubation innovation domain experts, together with a list of prioritised core values/ideals of major typological groupings, created earlier. It was further proposed post-incubation innovation experts identify and discuss multiple usages of the patents. Moreover, the researcher prototyped characteristics of potential businesses for each recommended usage of the patent, using expertise extracted from post-incubation innovation domain experts. The expected outcome of the above was to create a list of prototyped characteristics of future potential businesses for each recommended usage of the patent. However, such a proposition triggered a new question:

- How do we use information and knowledge, extracted from post-incubation innovation domain experts, to prototype characteristics of potential businesses?
- How do we prototype characteristics of future potential businesses?

The literature review relative to reference business models revealed a Universal Business Model (UBM) is suitable for developing, identifying, analysing, understanding, describing, and comparing any business, as discussed earlier on pp. 48-51. Based on Dowding’s claim, the researcher proposed to prototype characteristics of future potential businesses by describing ten aspects, adapted from the UBM. Characteristics of a potential business for each of the recommended usages of the selected patent provided enough information about identity, purpose, structure, etc. However, such information was insufficient for creating prototypes of potential businesses. Review of the literature revealed that according to Weill (2005), there are 16 business model archetypes (depending on the type of asset a modelled business is dealing with (financial, physical, intangible, human), and ownership / use of an asset (creator, distributor, landlord, broker)), that could be considered when prototyping and developing business models of any future business. Therefore, the researcher proposed to prototype business models of potential businesses by using already described characteristics of potential businesses, and matching it with potentially the most appropriate business model archetype(s).

The researcher proposed business entrepreneurs could evaluate the prototyped business models, as well as evaluate the process of prototyping business models for the selected
patents. Moreover, they could prioritise and rate the prototyped business models based on the potential probability of success from a business perspective. However, considering this research aimed to develop a reusable model and a methodology for developing business models of transcendent businesses, there was a need to objectively assess the prototyped business models from a perspective of multiple typological groupings, so a business model of the most potentially beneficial business could be identified. Conducting such an assessment required assessing prototyped business models (multiple options) against diversified values/ideals of multiple typological groupings (multiple criteria). In order to do that, the following question needed to be answered:

- How do we prioritise decision options and objectively select potentially the most beneficial one?

The following QOC shows methods (options) considered by the researcher:

<table>
<thead>
<tr>
<th>Q4: How to prioritise decision options?</th>
<th>O1: Using decision-support tools (e.g. AHP)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>C1: Repeatable</td>
</tr>
<tr>
<td></td>
<td>C2: Verifiable</td>
</tr>
<tr>
<td></td>
<td>C3: Knowledge based</td>
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<tr>
<td></td>
<td>C4: Expertise based</td>
</tr>
<tr>
<td></td>
<td>C5: Diversity of ideas</td>
</tr>
<tr>
<td></td>
<td>C6: Accessible</td>
</tr>
<tr>
<td></td>
<td>C7: Low cost</td>
</tr>
</tbody>
</table>

O2: Using assistance of sample interested parties (e.g. stakeholders)

There were decision-support tools available, such as the Analytic Hierarchy Process (AHP), and there were also sample interested-parties representing multiple typological groupings that could assist in conducting such an assessment. Review of the literature relative to prioritising decision options and decision-support methods and tools revealed that the AHP is perhaps the most widely used decision-making technique in the world today (Forman, 2001). Using sample interested parties, such as the direct stakeholders of the modelled transcendent business, for selecting a prototyped business model of the most potentially beneficial business would represent a very time consuming and expensive option. On the other hand, experts such as CSR experts could use their knowledge and expertise to represent multiple typological groupings, however, they are not easily accessible. Therefore, the researcher proposed to use the AHP as a method for assessing the prototyped business models against the core values/ideals of multiple typological groupings. However, in order to use the core values/ideals of multiple typological groupings as the assessment criteria, weighting points needed to be assigned to each of the core values/ideals. The researcher proposed to calculate weighting points for each of these based on relative priority of each.
In order to start up a business, a detailed business model is needed. Therefore, a new question was raised:

- How do we develop a detailed business model for any business?

The researcher proposed to use 55 elements, adapted from Dowding’s (2001) UBM, as a guideline for developing a detailed business model for the selected patent. However, there was a need to assess how transcendent the modelled business would be, and that required setting up beyond-profit performance indicators for transcendent / beyond-profit performance measurement. The following questions were asked:

- How do we measure beyond-profit performance of a transcendent business?
- What are the KPIs of a transcendent business that could/should be monitored, measured, and reported to public?

The literature review revealed businesses need to monitor, measure and report only a small number (around 10) of KPIs (Hope and Fraser, 2003; Parmenter 2010; Norman & MacDonald, 2003). This research proposed to take a reverse-value chain approach at the broadest level. Moreover, the modelled transcendent business was to be modelled around core values/ideals of multiple typological groupings that were the proposed drivers of the modelled business. Therefore, the researcher proposed the core values/ideals, identified at the very early stage of the transcendent business modelling, be the KPIs the modelled transcendent business should monitor, measure, and report to the public. Moreover, the importance and weighting of each of the identified core value/ideals represented the proportional target value the modelled business will need to strive to achieve.

Based on the literature review, QOC that provided the basis for framing the research, and propositions made by the researcher, it was proposed the TRM+ as a model be envisaged as a series of steps/phases that can be repeated and can assist any business modeller to develop a business model of any transcendent business. However, it was proposed the TRM+ as a methodology would not require sequential use of the phases, but each phase would rather provide assistance for finding answers to questions asked during the business modelling process. The following shows proposed phases of the TRM+, questions embedded within each proposed phase, and methods that were proposed to provide reliable, repeatable, and beneficial answers to the question asked:

**Phase I:  Identification of typological groupings and their core values/ideals**

Identification of major typological groupings (e.g. social, environmental, economic) and their core values/ideals that any modelled transcendent business will strive to address.

- How do we identify major typological groupings every business could/should simultaneously account for?

  By conducting surveys of published materials, e.g. world reports.
• How do we derive the ideal set of values/ideals of the identified multiple typological groupings?
   By conducting surveys of published materials, e.g. world reports.

• How do we derive the priority set of measures of the identified set of values/ideals?
   By ranking the identified set of values/ideals based on their relative importance.

**Phase II: Addressing core values/ideals of major typological groupings; prototyping of appropriate business model(s)**

Selection and evaluation of a post-incubation innovation/patent that could be used as an enabler for addressing core values/ideals of major typological groupings; identification of its potential usages for development of business models; and prototyping of appropriate business model(s) for each of the identified potential usages.

• How can we simultaneously address diversified core values/ideals of multiple typological groupings, acknowledging they may even be in conflict?
   By taking an innovative approach using available post-incubation innovations / patents.

• How do we select and evaluate a post-incubation innovation / patent that could be creatively and effectively used for addressing diversified core values/ideals of multiple typological groupings?
   Post-incubation innovation and patents could be accessed from online databases publicly available; evaluation of a selected post-incubation innovation / patent requires assistance of post-incubation innovation domain experts.

• How do we identify post-incubation innovation domain experts?
   From lists of world conferences dedicated to a specific technology.

• How do we use information and knowledge, extracted from post-incubation innovation domain experts, to prototype characteristics of potential businesses?
   Post-incubation innovation domain experts to recommend and discuss multiple usages of a selected patent.

• How do we prototype characteristics of future potential businesses?
   By describing ten aspects (Identity, Purpose, Structure, etc.) of potential businesses.

• How do we prototype appropriate business models?
   By assigning 1 of the 16 basic business model archetypes and describing 10 business model aspects as identified by Weill (2005) and Dowding (2001) respectively.

**Phase III: Selecting potentially the most beneficial business**

Selection of a prototyped business model of potentially the most beneficial business that will be proposed for implementation in practice.
• How do we objectively select potentially the most beneficial business?
  By using the AHP technique.

Phase IV: Developing a detailed business model of a future business
Development of a detailed business model for a selected post-incubation innovation / patent.
• How do we develop a detailed business model for any business?
  By describing 55 elements of the modelled business, adapted from Dowding’s (2001) UBM.

Phase V: Setting up KPIs of a modelled transcendent business
Setting up Key Performance Indicators (KPIs) of the modelled transcendent business for monitoring and reporting of performance that goes beyond profit.
• How do we set up KPIs of a modeled transcendent business?
  According to the list of prioritised and weighted, the most important, core values/ideals of major typological groupings; every core value/ideal of every major typological grouping equals one KPI.
2.10 Summary

This chapter reviewed literature relative to transcendent, egalitarian, and visionary business; business models, business modelling, and reference models; business measurement; business modelling approaches and attempts; how the influence of society focused world organisations on business modelling; and literature relative to prioritising decision options. Based on the literature review, a QOC was drawn that provided a basis for framing the research and making propositions. This chapter proposed the TRM+ to be envisaged as a series of steps / phases when used as a model. However, it was proposed the phases of the TRM+ could be used non-sequentially when used as a methodology.
CHAPTER III

3. Research methodology

3.1 Introduction
Chapter 2 presented a review of the literature relative to transcendent, egalitarian, and visionary business; business models, business modelling, and reference models; business measurement; business modelling approaches and attempts; how the influence of society focused world organisations on business modelling; and literature relative to prioritising decision options. Based on the literature review, a number of questions were posed and a QOC (MacLean et al. 1991) was drawn that provided the basis for framing the research and for developing the proposed phases of the TRM+ that could be used sequentially as a model consisting of series of steps, or as a methodology making use of its individual phases.

This chapter presents the methodology and framework used during development of the TRM+, during testing (proof-of-concept) and evaluating phases of the TRM+, and all methods and procedures embedded within its individual phases. It presents methods of data collection and data analysis; criteria for selecting participants (experts) who assisted during the research; ethics and research procedures; and validity and reliability of the research procedures.
3.2 Methodology framework used during development of the TRM+

This qualitative research used an action-based research approach as an overall methodology to develop and refine a set of steps/ phases of the TRM+. The data collection within each proposed phase of the TRM+ was through content analysis of world reports, surveys, and discussion forum focus groups, since the objective of each phase of the TRM+ required taking a slightly different approach. Delphi methodology was used in Phase I to collect data in rounds and to achieve consensus among participants. A parallel study of extant literature provided refinement of the theoretical understandings and assisted with analysis of the collected data.

The action-based research approach was chosen as the researcher was actively and subjectively involved during the research development process, and there was a need to continuously reflect on the actions taken, the growing understanding of the subject studied, and the knowledge gained and learned from doing the research (Cherry, 1999). The research, development and refinement of methods and procedures within each proposed phase of the TRM+ progressed forward in continuous cycles of planning, actions, and review of the actions taken, which is how Cherry (1999) describes action-based research. Data collected within each proposed phase of the TRM+ was collected and analysed in a few rounds, where the first round data collection provided the basis for future data collection.

A semiformal notation, called ‘QOC’ (Questions, Options, Criteria) was used to represent the Design Space Analysis (DSA) around the research questions, and the questions asked within each proposed phase of the TRM+ – “the main constituents of QOC are Questions identifying key design issues, Options providing possible answers to the Questions, and Criteria for assessing and comparing the Options” (MacLean, 1991:201). The Questions asked within each proposed phase of the TRM+ were about what methods and procedures could be used to fulfil the phase objectives. The Options represented potentially useful and available methods and procedures that could meet each of the phase’s objectives, and the Criteria were those that needed to be met so that a specific method could be integrated into the TRM+, so it would contribute to the overall objective. The QOC in this research was used to structure a complex set of options and criteria within each proposed phase of the TRM+, and by doing so encourage the researcher to explore alternative options and select, potentially, the most appropriate one (Bellotti, 1991). It assisted not only in structuring a set of options relative to each question asked, but also to select options (methods and procedures) that met the objectives of the question (objectives of each phase) most closely (MacLean et al., 1991).
3.3 Steps/phases of the TRM+ when used as a model

The TRM+ can be used as a model as well as a methodology. As a model, it is used as a sequence of steps/phases whilst each phase has its own objectives and expected outcome. Given this, the TRM+ can be used also as a methodology, and in such a case phases of the TRM+ can be used non-sequentially and independently. The following section of this chapter presents all phases of the TRM+, objectives and expected outcome of each phase, and procedures embedded within each phase.

**Phase I: Identification of typological groupings and their core values/ideals**

This involved identification of major typological groupings (e.g. social, environmental, economic) and their core values/ideals that any modelled transcendent business will strive to address.

**Objectives of Phase I:**

1. To identify major typological groupings (e.g. social, environmental, economic, etc)
2. To identify core values/ideals of each typological grouping
3. To prioritise the identified core values/ideals of each typological grouping (so a small number of the most important core values/ideals could be identified)
4. To prioritise the most important core values/ideals of each grouping across all typological groupings (so relative importance of each, the most important, core value/ideal could be identified)
5. To calculate weighting points of each prioritised core value/ideal (so each core value/ideal could be used as a criterion when the AHP technique is used)

**Propositions and procedures:**

1. Major typological groupings could be identified by content analysis of world reports (e.g. UN, the World Bank, NATO) aiming to identify the world major issues by studying major themes of the reports, headings, and the most frequently discussed topics and used keywords. It was further proposed world major issues could be categorised into groupings (groupings of similar kind of issues), creating typological groupings
2. World major issues frequently discussed in world reports were reflections of core values/ideals of major typological groupings. Hence it was proposed the most frequently discussed world major issues were the core values/ideals of major typological groupings previously identified
3. Experts representing major typological groupings, such as CSR experts, could prioritise (by ranking) the identified core values/ideals of each typological grouping and by doing so, the most important core values/ideals of each typological grouping could be identified
4. CSR experts could prioritise the most important core values/ideals of each typological
grouping across all typological groupings

5. Weighting points of each core value/ideal could be calculated based on the assigned relative priority

The participating CSR experts would be required to:

1. Evaluate whether major typological groupings and their initial core values/ideals, could be effectively and repeatedly identified by performing content analysis of world reports
2. Prioritise the identified initial core values/ideals of the major typological groupings by ranking and achieve a consensus (an agreement of majority of the participants) on the most important core values/ideals of each of the identified typological groupings
3. Prioritise the most important core values/ideals of each grouping across all typological groupings

Methods:

Each of the tasks in (1) to (3) above represented one Delphi cycle. The Delphi method was selected as a preferred method for achieving consensus among participating CSR experts because of its efficient consensus-building characteristic that makes use of a series of questionnaires.

Delphi cycle A1: (see Appendix I)

Evaluation of whether major typological groupings and their initial values/ideals can be effectively identified via content analysis of world reports (e.g. UN reports, the World Bank reports, etc.).

Procedures:

1. Major typological groupings and their initial values/ideals (identified by the researcher through content analysis of world reports dedicated to major world issues) to be presented to CSR participants via an online survey
2. A survey to ask participants to verify the presented typological groupings based on their expertise, and to suggest other typological groupings with initial values/ideals that were important, and hence, should be considered when developing a business opportunity and constructing business models of future transcendent businesses
3. A survey also to ask participants to select three values/ideals from the list they consider to be the most important, or to nominate their own for each of the typological groupings

Expected outcome of Delphi cycle A1:

• Verification of the typological groupings and their associated core values/ideals presented in the form of a list; evaluation of content analysis of world reports as a method for identifying major typological groupings and their initial values/ideals
Delphi cycle A2: (see Appendix II)

Achieving consensus on three, the most important, core values/ideals for each of the typological groupings and when the core values/ideals should be reviewed/updated

Procedures:

1. The outcome of Delphi cycle A1 to be presented to CSR experts
2. A survey to ask participants to prioritise the presented values/ideals by ranking them, based on their relative importance
3. A survey to also ask participants to suggest in how many years the values/ideals of each typological grouping should be reviewed/updated in the future
4. The three values/ideals for each typological grouping with the highest mean ranking to be considered the consensus, the most important core values/ideals of that typological grouping
5. Mean review time suggested by participants to represent a consensus review time for when the core values/ideals of each typological grouping should be revisited and reviewed

Expected outcome of Delphi cycle A2:

- Identification of the three core values/ideals for each typological grouping
- Identification of the time period for reviewing core values/ideals for each typological grouping

Delphi cycle A3: (see Appendix III)

Prioritisation of core values/ideals across all identified typological groupings

Procedures:

1. The outcome of Delphi cycle A2 to be presented to participants
2. The survey to ask participants to prioritise all core values/ideals listed
3. The priority of each core value/ideal across all typological groupings to be based on mean rankings given by the participants

Expected outcome of Delphi cycle A3:

- A list of prioritised core values/ideals of major typological groupings

Phase II: Addressing core values/ideals of major typological groupings; prototyping of appropriate business model(s)

This involved the selection and evaluation of a post-incubation innovation/patent that could be used as an enabler for addressing core values/ideals of major typological groupings, identification of its potential usages for development of business models, and prototyping of appropriate business model(s) for each of the identified potential usages.
**Objectives of Phase II:**

1. To evaluate selected patents as to how practical and beneficial they are for addressing core values/ideals of major typological groupings (developed at Phase I)
2. To identify potential usage of the selected patents considering the list of prioritised core values/ideals of major typological groupings (developed at Phase I)
3. To prototype characteristics of potential business for each of the recommended usages of the selected patent
4. To conduct a discussion forum focus group with STP experts and business entrepreneurs to gather further information and feedback relative to the prototyped characteristics of future potential businesses
5. To develop a list of prototyped business models for each potential usage of the selected patent
6. To prioritise and rate prototyped business models from a business perspective

**Propositions and procedures:**

1. The researcher to send a description of one of the three selected patents to STP experts via email, together with a list of the most important core values/ideals of major typological groupings (created at Phase I)
2. The STP experts to be asked to study the description of the patent and then, based on their expertise and knowledge, to identify potential usages of the patent via an online survey, considering the list of prioritised core values/ideals of major typological groupings obtained from Phase I. Moreover, the STP experts to be asked to explain how the core values/ideals would be achieved by each recommended usage of the patent, and what measures could be used to test whether the core values/ideals were achieved
3. Based on the information collected from the survey and the knowledge and expertise from STP experts, the researcher to prototype characteristics of a potential business for each recommended usage of the patent, using ten aspects (Identity, Purpose, Structure, Participants, Enablers, Activities, Deliverables, Influences, Culture, Performance) of a business model as a guideline
4. The researcher to present the prototyped characteristics of potential businesses for the selected patent to STP experts and business entrepreneurs in an online, text-based, asynchronous discussion forum
5. The participants to be asked to discuss the prototyped characteristics of potential businesses and to provide feedback and refinement of the prototyped characteristics of potential businesses
6. The business entrepreneurs to provide feedback whether they agree/disagree that information collected from online discussions of post-incubation innovation domain experts can provide enough knowledge for development of business models
7. The researcher to assign one of the 16 basic business model archetypes to each of
the recommended potential usages of the patent, based on the nature (type of the patent) and ownership of the patent

8. The researcher to prototype business models by describing 10 aspects (Identity, Purpose, Structure, etc.) for each proposed business

9. Business entrepreneurs to be presented via an online survey with the list of prototyped business models developed by the researcher

10. Business entrepreneurs to be asked to suggest changes to the presented business models and provide further comments

11. Business entrepreneurs to be asked to prioritise (by ranking) prototyped business models, developed by the researcher, based on the potential probability of success (from a business perspective)

12. Business entrepreneurs to be asked to rate the prototyped business models (on a scale 1 to 10), based on the potential probability of success

Expected outcomes of Phase II:

- A list of potential usages of the selected patent, accompanied by sufficient information for development of business models; prototyped characteristics of a potential business for each of the recommended usages of the patent
- Prioritised and weighted list of prototyped business models for each of the identified potential usages of the patent

The participating STP experts would be required to:

1. Identify potential usages of the presented patent, considering the list of prioritised core values/ideals of major typological groupings

2. Explain how the core values/ideals would be achieved by each recommended usage of the patent, and what measures could be used to test whether the core values/ideals were achieved

3. Discuss prototyped characteristics of potential businesses and to provide feedback and refinement of the prototyped characteristics of potential businesses

The participating business entrepreneurs would be required to:

1. Discuss prototyped characteristics of potential businesses and to provide feedback and refinement of the prototyped characteristics of potential businesses

2. Provide feedback as to whether they agree/disagree that information collected from online discussions of post-incubation innovation domain experts can provide enough knowledge for development of business models
Methods:

An electronic online survey questionnaire was chosen as a preferred method of collection of responses from participants, rather than traditional mail questionnaires, in order to increase the response rate and to improve efficiency of collecting and processing data. Neuman (1997) argues that one of the biggest general problems with mail questionnaires is a relatively low response rate, which the researcher tried to avoid. Moreover, Couper (2000) argues that electronic surveys provide a way to conduct studies when it is impractical or financially unfeasible to access certain populations, which was also the case for this research as the participants were physically located in various geographic locations. The primary reason for conducting an electronic questionnaire technique rather than the traditional pencil and paper one, was the easy access to the participants from around the world, convenience offered to all participants, high efficiency, and the possibility of conducting a survey in a convenient and very efficient manner. Lazar and Preece (1999) also highlight fast distribution and short response cycles as the significant advantages of electronic surveys. Besides all these advantages, electronic surveys have a number of disadvantages. Cho and LaRose (1999) are particularly concerned about trust and confidentiality issues. They identified the following four possible types of electronic survey privacy and confidentiality infringements:

Physical (unsolicited requests), informational (personal information control), psychological (personal choice control), and interactional (relationship control) privacy infringements (Cho and LaRose, 1999: 421)

In this research only the participants who signed a Consent Form were involved in the research. Moreover, they were all anonymous and no personal information was collected about any participant. All were allowed to reveal only the information they wished to reveal, and terminate their participation in the research at any time. They received a Consent Information Statement prior to participating and all questions were answered to their satisfaction.

An electronic, text-based, asynchronous discussion forum was chosen as an appropriate, effective, and preferred method for exchange of expertise and knowledge between participants, rather than face-to-face discussion, since the participants were physically located in various geographic locations. Moreover, an electronic, asynchronous, text-based discussion forum allowed multiple experts collaborative exchange of information and expertise in a non-restricted environment (time and place), reasonable amount of time to explore multiple views on the subject studied (Bruffee, 1999), efficiency of collecting and processing data (Neuman, 1997), and a clear time-saving advantage (Young, 2001).
Phase III: – Selecting potentially the most beneficial business

This involved selection of a prototyped business model of potentially the most beneficial business to be proposed for implementation in practice and development of its mission statement.

Objectives of Phase III:

1. To objectively select potentially the most beneficial business model from the list of prioritised and ranked prototyped business models (outcome of Phase II), to be proposed for practical implementation
2. To develop a mission statement of the selected, potentially most beneficial business model, to be proposed for practical implementation

Propositions and procedures:

1. The researcher to assess each prototyped business model (outcome of Phase II) against each prioritised and weighted core value/ideal of major typological groupings obtained at Phase I
2. Within each criterion, the researcher to divide up numbers of weighting points available among the prototyped business models available
3. The prototyped business model with the highest total weighing points after the assessment, to be selected as potentially the most beneficial, since it is expected to address the most important criteria to the largest extent
4. The researcher to develop a mission statement for the selected business based on described details about 10 aspects, developed at Phase II

Expected outcomes of Phase III:

- Selection of the most beneficial business model, from a typological groupings perspective, to be proposed for practical implementation
- A mission statement for the selected business model for potentially the most beneficial business

Phase IV: – Developing a detailed business model of a future business

This involved development of a detailed business model for a selected post-incubation innovation/patent based on the mission statement created at Phase III.

Objectives of Phase IV:

1. To develop a detailed business model for a selected patent, based on the characteristics of the modelled business prototyped at Phase II and mission statement created at Phase III
Propositions and procedures:
The researcher to develop a detailed business model of a future business by describing 55 elements, adapted from the UBM, as introduced earlier on pp. 55 and 56.

Expected outcomes of Phase IV:
- Detailed business model of future transcendent business for the selected patent

Phase V: Setting up KPIs of a modelled transcendent business
This involved setting up Key Performance Indicators (KPIs) of the modelled transcendent business for monitoring and reporting of performance that goes beyond profit.

Objectives of Phase V:
1. To set up Key Performance Indicators (KPIs) of the modelled transcendent business for monitoring and reporting of performance that goes beyond profit

Propositions and procedures:
The researcher to set each core value/ideal of major typological groupings to be a KPI of the modelled transcendent business

Expected outcomes of Phase V:
- A list of KPIs of the modelled transcendent business for the selected patent
3.4 Data collection methods

The previous section of this chapter outlined proposed phases of a transcendent business modelling methodology expressed as a reusable Transcendent Reference Model (TRM+). This section outlines data collection methods that were used during the development of phases of the TRM+, and evaluation of methods and procedures embedded within each phase.

Phase I: Identification of typological groupings and their core values/ideals

Identification of major typological groupings (e.g. social, environmental, economic) and their most important core values/ideals that any modelled transcendent business will strive to address.

Objectives of Phase I:

1. To identify major typological groupings (e.g. social, environmental, economic)

   Method used: – content analysis of world reports (e.g. UN reports, Greenpeace reports)
   Participants: – the researcher

   Data collection method: The researcher downloaded 57 UN reports, 24 UNESCO reports, 45 World Bank reports, 14 EU reports, 3 NATO reports, 13 APEC reports, 11 Red Cross reports, 8 Amnesty International reports and 36 Greenpeace reports from the internet, free of charge. The decision to identify major typological groupings by conducting content analysis of world reports was made based on the following propositions:

   • World reports are easily accessible from the internet free of charge, hence this method of identifying major typological groupings could be repeated anytime in the future by any business modeller
   • World reports are produced in cooperation with experts, field workers, and journalists, hence they combine knowledge and expertise of multiple people, and they are also easily verifiable
   • World reports are produced by world organisations that are committed to discussing major world issues that are reshaping our world
   • These reflect core values/ideals and beliefs of major typological groupings, hence by identifying categories of world major issues, major typological groupings could be identified

2. To identify core values/ideals of major typological groupings (e.g. climate change)

   Method used: – content analysis of world reports (e.g. UN reports, Greenpeace reports)
   Participants: – the researcher

   Data collection method: The same world reports that were used for identifying major typological groupings were used for identifying values/ideals associated with each of the
identified typological groupings. Content analysis of world reports as a method for identifying core values/ideals of major typological groupings was made based on the same propositions as listed above in step 1.

3. To verify whether major typological areas and their core values/ideals can be effectively identified by performing content analysis of world reports

Method used: – surveying experts
Participants: – CSR experts

Data collection method: The researcher asked for assistance of CSR experts to verify the major typological groupings and core values/ideals associated within each typological grouping identified by the researcher. Details how the CSR experts were chosen, how many, and how they were contacted are discussed in section 4.4. The decision to use assistance of CSR experts was made based on the following propositions:

- CSR experts have knowledge and expertise in providing advice to businesses in the area of Corporate Social Responsibility and sustainability
- Theoretically, CSR experts represent multiple typological groupings, hence by asking CSR experts for assistance, the number of participants could be minimised
- CSR experts have local, national and global expertise, hence they can look at local issues whilst still seeing the big picture

Participating CSR experts were presented via an online survey with categories / typological groupings of world major issues and values/ideals, identified by content analysis of world reports. They were asked to select three values/ideals from each presented typological grouping they considered were the most important, or nominate their own values/ideals. They were also asked to explain why each of the values/ideals they selected was important. Moreover, they were asked to identify what other typological categories and their initial values/ideals should be considered when developing a business opportunity and constructing business models (see Appendix I for copy of the survey).

4. To prioritise the core values/ideals of each typological grouping, verified in step 3, so a consensus (an agreement of majority of the participants) on the most important core values/ideals of each typological grouping could be achieved.

Method used: – surveying experts
Participants: – CSR experts

Data collection method: The participating CSR experts were presented with the outcome of step 3 (first survey round) via an online survey, and they were asked to prioritise the core values/ideals of each typological grouping by ranking, based on relative importance of each core value/ideal. Moreover, they were asked to identify in how many years the identified consensus core values/ideals should be revisited and revaluated (see Appendix II for copy of the survey).
5. To prioritise the most important core values/ideals of each typological grouping across multiple typological groupings (so the relative importance of each core value/ideal could be identified compared to the rest of the core values/ideals)

**Method used:** – surveying experts

**Participants:** – CSR experts

**Data collection method:** The participating CSR experts were presented with the outcome of step 4 (second survey round) via an online survey, and they were asked to prioritise (rank) all listed values/ideals based on their relative importance (see Appendix III for copy of the survey).

6. To assign weighting points to each of the prioritised core value/ideal

**Method used:** – calculating weighing points based on relative priority assigned by the CSR experts

**Participants:** – the researcher

**Data collection method:** N/A – the researcher used data collected at step 5 from the participating CSR experts to calculate weighting points for each prioritised and consensus core value/ideal.

Note: step 3, 4, and 5 represented one survey round conducted with the same group of CSR experts. The researcher used Delphi methodology to conduct survey in step 3, 4, and 5, where the outcome of the first survey round was presented to the participants in the second survey round; and the outcome of second survey round presented in the third survey round. Delphi methodology was used to achieve a consensus (an agreement of majority of the participants) among participating experts.

Phase II: – Addressing core values/ideals of major typological groupings; prototyping of appropriate business model(s)

**Objectives of Phase II:**

1. To evaluate the selected patents as to how practical and beneficial they are for addressing core values/ideals of major typological groupings (developed at Phase I), and to identify potential usages of selected patents considering the list of prioritised core values/ideals of major typological groupings (developed at Phase I)

**Method used:** – surveying post-incubation innovation domain experts

**Participants:** – post-incubation innovation domain experts (Solar Thermal Power (STP) experts)

**Data collection method:** The researcher randomly selected three technical, utility patents (useful devices) that had been designed for water purification and electricity generation
purposes from an online database of patents, publicly available and free of charge. Since the researcher did not have any knowledge or expertise relative to the technology used in the selected patents, assistance was sought from post-incubation innovation domain experts. Considering all three selected patents used a thermal effect of Concentrated Solar Power (CSP), STP experts were right for evaluating the selected patents. The STP experts were presented with the description of one of the patents as a PDF document (see Appendix VI), and the list of prioritised and weighted core values/ideals from Phase I. (Note: the list of prioritised and weighted core values/ideals of major typological groupings were also illustrated with some examples – see Appendix VII for a copy of the list of core values/ideals sent to STP experts).

The STP experts were asked to study the description of the patent and then, based on their expertise and knowledge, recommend potential usages of the patent considering the list of prioritised core values/ideals of major typological groupings obtained from Phase I. Moreover, they were asked to explain how the core values/ideals would be achieved by each of the recommended usages of the patent, and what measures could be used to test whether the core values/ideals were achieved (see Appendix VIII for copy of the survey). An online, web-based survey was used to collect and analyse responses.

2. To prototype characteristics of a potential business for each of the recommended usages of the selected patent

Method used: – describing details about ten aspects (Identity, Purpose, Structure, etc.), adapted from Dowding’s (2001) UBM, using information collected from surveying STP experts

Participants: – the researcher

Data collection method: N/A – the researcher used information collected from the survey conducted with STP experts for prototyping characteristics of potential businesses by describing ten aspects for each of the recommended usages of the patent

3. To gather further information and feedback relative to the characteristics of future potential businesses developed by the researcher at step 2

Method used: – discussion forum focus group

Participants: – STP experts and business entrepreneurs

Data collection method: – the reason for inviting business entrepreneurs into discussion with STP experts was so that they could assist in verifying the prototyped business models and provide some feedback relative to prototyping characteristics of future businesses. An asynchronous, online, text-based discussion forum was used for exchange of information and sharing knowledge among multiple experts
4. To evaluate whether online discussions of post-incubation innovation domain experts with business entrepreneurs can provide enough information / knowledge to prototype characteristics of future businesses

*Method used:* – surveying experts

*Participants:* – business entrepreneurs

*Data collection method:* – the business entrepreneurs who participated in the conducted online discussion forum with STP experts were asked to provide feedback, via an anonymous online survey, as to whether discussions of post-incubation innovation domain experts with business entrepreneurs can generate enough knowledge for prototyping characteristics of future businesses (see Appendix XIII for a copy of the survey)

5. To develop a list of prototyped business models for each of the potential usages of the selected patent

*Method used:* – assigning one of the 16 basic business model archetypes to each of the identified potential usages of the patent based on the nature (type of the patent) and ownership of the patent

– describing details about 10 business model aspects based on information collected from online discussion forum

*Participants:* – the researcher

*Data collection method:* N/A – the researcher used information collected from the online discussion forum to develop a list of prototyped business models for each of the potential usages of the selected patent

6. To evaluate whether the business models for potential usages of a patent, developed by the researcher, were prototyped correctly and to suggest changes to the prototyped business models, if required

*Method used:* – surveying experts

*Participants:* – business entrepreneurs

*Data collection method:* – the researcher contacted business entrepreneurs, who had previously participated in the conducted discussion forum, and sent them the list of prototyped potential business models via email. They were provided with the 16 basic business model archetypes and 10 aspects, and invited to participate in an anonymous online survey evaluating the developed business models for potential usages of the selected patent (see Appendix XIV for copy of the survey)

7. To evaluate whether 10 aspects (Identity, Purpose, Structure, etc.) described for each potential business model, based on information collected from discussions of post-incubation innovation domain experts and business entrepreneurs, can supply sufficient details for prototyping business models
Method used: – surveying experts
Participants: – business entrepreneurs

Data collection method: – the same survey (see Appendix XIV) asked the participants to evaluate whether, in general, a description of a potential business provides a sufficient amount of detail for prototyping business models for potential businesses

8. To prioritise and rate the list of prototyped business models based on potential probability of success, using details about the 10 aspects as the assessment criteria

Method used: – surveying experts
Participants: – business entrepreneurs

Data collection method: – the same survey (see Appendix XIV) asked the participants to prioritise and rate the prototyped business models from a business perspective, based on probability of success

Phase III: – Selecting potentially the most beneficial business

Objectives of Phase III:

1. To objectively select potentially the most beneficial business model, from the list of prioritised and ranked prototyped business model (outcome of Phase II), that will be proposed for practical implementation

Method used: – AHP technique
Participants: – the researcher

Data collection method: N/A – the researcher assessed the business models (prototyped at Phase II) against prioritised and weighted core values/ideals of multiple typological groupings (identified at Phase I)

2. To evaluate whether the AHP technique could be effectively and objectively used for selection of potentially the most beneficial business model.

Method used: – surveying experts
Participants: – CSR experts

Data collection method: – CSR experts who participated in Phase I conducted an evaluation of the AHP method used for selecting potentially the most beneficial business model from multiple typological groupings’ perspective. Evaluation of AHP technique, as a method for objectively selecting the most beneficial business model was conducted by triangulating the AHP technique with the CSR and TBL expertise of CSR experts. The CSR experts were presented via email with a list of business models of potential businesses (outcome of Phase II) and the list of prioritised and weighted core values/ideals of typological groupings (outcome of Phase I). They were invited to participate in an anonymous online survey selecting the most potentially beneficial business model from a CSR and TBL perspective and
briefly explaining why they believed the business model they had selected was potentially the most beneficial one (see Appendix XV for a copy of the survey)

3. To develop a mission statement of the selected, potentially the most beneficial business model, to be proposed for practical implementation

Method used: – using information about the prototyped business model, gained at Phase II
Participants: – the researcher

Data collection method: N/A – the researcher developed a mission statement of the selected most potentially beneficial business model based on the characteristics of the future potential business discussed at Phase II and the business model prototyped at Phase II

Phase IV: – Developing a detailed business model of a future business

Objectives of Phase IV:

1. To develop a detailed business model of a future business for a selected patent

Method used: – describing 55 elements of the modelled business, adapted from UBM
Participants: – the researcher

Data collection method: N/A – the researcher used information collected from discussion forum at Phase II and the mission statement created at Phase III. A detailed business model was developed for the most potentially beneficial business selected at Phase III by describing 55 elements for the modelled business

Phase V: – Setting up KPIs of a modelled transcendent business

Objectives of Phase V:

1. To set up Key Performance Indicators (KPIs) for the modelled transcendent business, for monitoring and reporting of performance that goes beyond profit

Method used: – setting up KPIs for the modelled transcendent business according to the core values/ideals of major typological groupings
Participants: – the researcher

Data collection method: N/A – the researcher used the list of core values/ideals of major typological groupings created at Phase I to set up KPIs of the modelled transcendent business; every core value/ideal from the list developed at Phase I became a KPI
3.5 Data analysis methods

The previous section of this chapter outlined data collection methods that were used for collecting data during development of phases of the TRM+ and evaluation of methods and procedures embedded within each phase of the TRM+. This section outlines methods that were used for analysing the collected data.

Phase I: Identification of typological groupings and their core values/ideals

Objectives of Phase I:

1. To identify major typological groupings (e.g. social, environmental, economic, etc)

Data collection required: world reports produced by world organisations (e.g. UN)

Method used for analysing the collected data: content analysis

The content analysis of the reports aimed to identify the major issues and then categorise them into typological groupings (i.e. issues of a similar type). It focused primarily on identifying the main themes in the reports, searching for those most frequently discussed, and for keywords used in headings and throughout the reports.

2. To identify core values/ideals of major typological groupings (e.g. climate change)

Data collection required: world reports produced by world organisations (e.g. UN)

Method used for analysing the collected data: content analysis

The same world reports that were used for identifying categories of world major issues / major typological groupings were used for identifying core values/ideals associated with each of the identified typological groupings. The researcher focused content analysis of world reports on identifying the most frequently discussed topics and keywords throughout the reports.

3. To verify whether major typological areas and their core values/ideals can be effectively identified by performing content analysis of world reports

Data collection required: responses from globally recognised CSR experts

Method used for analysing the collected data: qualitative analysis of responses of CSR experts collected via an online anonymous survey

The researcher divided a list of major issues identified by content analysis of world reports into proposed typological groupings, and presented the lists of core values/ideals to the participating CSR experts in an online survey questionnaire - Delphi cycle A1 (see Appendix I for copy of the survey.) The experts were asked to select three values/ideals from each typological grouping, which they considered were the most important, or to nominate their own values/ideals. They were also asked to explain why each of the values/ideals they selected was important. Moreover, they were asked to identify what other typological
categories and their initial values/ideals should be considered when developing a business opportunity and constructing business models. The researcher was checking whether the CSR experts would select core values/ideals from the presented lists or whether they would nominate their own values/ideas. CSR experts, by selecting core values/ideals from the presented lists, would confirm whether the researcher identified the core values/ideals correctly. CSR experts nominating their own core values/ideals would indicate the researcher identified incorrect core value/ideals. The same method was used for verifying major typological groupings – CSR experts nominating other typological groupings would indicate the researcher identified incorrect typological groupings.

4. To prioritise the core values/ideals of each typological grouping, verified in step 3, so a consensus (an agreement of majority of the participants) on the most important core values/ideals of each typological grouping could be achieved.

Data collection required: – responses from globally recognised CSR experts

Method used for analysing the collected data: – qualitative analysis of responses of CSR experts collected via an online anonymous survey

The participating CSR experts were presented with the outcome of step 3 (first survey round) via an online survey and they were asked to prioritise the core values/ideals of each typological grouping by ranking, based on the relative importance of each core value/ideal. (The higher priority the number was assigned, the higher relative importance the value/ideal had.) Moreover, they were asked to identify in how many years the identified consensus core values/ideals should be revisited and revaluated (see Appendix II for copy of the survey). The researcher calculated a mean priority number for each of the prioritised core values/ideals. The values/ideals with the highest mean score were then considered as being the most important.

5. To prioritise the most important core values/ideals of each typological grouping across multiple typological groupings (so the relative importance of each core value/ideal could be identified compared to the rest of the core values/ideals).

Data collection required: – responses from globally recognised CSR experts

Method used for analysing the collected data: – qualitative analysis of responses of CSR experts collected via an online anonymous survey.

The participating CSR experts were presented with the outcome of step 4 (second survey round) via an online survey and they were asked to prioritise (rank) all values/ideals listed based on their relative importance (see Appendix III for copy of the survey). The researcher calculated a mean priority number for each of the prioritised core values/ideals. This number corresponded to the relative importance of each core value/ideal.

6. To assign weighting points to each of the prioritised core values/ideals

Data collection required: – there was no need to collect any additional data to assign
weighting points to each of the prioritised core value/ideal. The researcher calculated weighting points for each prioritised and consensus core value/ideal based on the priority given by participants at step 5 (mean calculated score)

**Phase II:**  Addressing core values/ideals of major typological groupings; prototyping of appropriate business model(s)

*Objectives of Phase II:*

1. To evaluate the selected patents as to how practical and beneficial they are for addressing core values/ideals of major typological groupings (developed at Phase I), and to identify potential usages of selected patents considering the list of prioritised core values/ideals of major typological groupings (developed at Phase I)

*Data collection required:* – responses from globally recognised post-incubation innovation domain experts (Solar Thermal Power (STP) experts)

*Method used for analysing the collected data:* – qualitative analysis of responses of STP experts collected via an online anonymous survey.

Evaluation of the practical usage of the selected patent was conducted by analysing participants’ responses. If the participants stated the patent was impractical or if they refused to discuss it, it corresponded to an impractical patent. Identification of potential usages of a patent was conducted by qualitative analysis of the participants’ responses.

2. To prototype characteristics of a potential business for each of the recommended usages of the selected patent

*Data collection required:* – there was no need to collect any additional data to prototype characteristics of a potential business for each of the recommended usage of the patent. The researcher used information collected from survey conducted, at step 1, and prototyped characteristics of potential businesses by describing ten aspects (Identity, Purpose, Structure, etc.) for each of the recommended usage of the patent

3. To gather further information and feedback relative to the characteristics of future potential businesses developed by the researcher at step 2

*Data collection required:* – discussion between STP experts, who recommended potential usages of the patent, and serial business entrepreneurs (entrepreneurs who started at least two, or a number of businesses)

*Method used for analysing the collected data:* – qualitative analysis of data collected via online, text-based discussions between STP experts and business entrepreneurs

The researcher analysed feedback relative to the prototyped characteristics of potential businesses, given by STP experts and business entrepreneurs.
4. To evaluate whether online discussions of post-incubation innovation domain experts with business entrepreneurs can provide enough information / knowledge to prototype characteristics of future businesses

Data collection required: – responses from business entrepreneurs who participated in the conducted discussions between STP experts and business entrepreneurs (step 3)

Method used for analysing the collected data: – qualitative analysis of responses of serial business entrepreneurs collected via an online anonymous survey

Business entrepreneurs, who participated in the conducted online discussion forum with STP experts, were asked to provide feedback, via an anonymous online survey, as to whether discussions of post-incubation innovation domain experts with business entrepreneurs can generate enough knowledge for prototyping characteristics of future businesses (see Appendix XIII for a copy of the survey).

5. To develop a list of prototyped business models for each of the potential usages of the selected patent

Data collection required: – there was no need to collect any additional data to develop a list of prototyped business models for each of the potential usages of the patent. The researcher prototyped business models by assigning one of the 16 basic business model archetypes to each of the identified potential usages of the patent, and describing details about 10 business model aspects based on information collected from online discussion forum

6. To evaluate whether the business models for potential usages of a patent, developed by the researcher, were prototyped correctly and to suggest changes to the prototyped business models, if required

Data collection required: – responses from business entrepreneurs who participated in the conducted discussions between STP experts and business entrepreneurs

Method used for analysing the collected data: – qualitative analysis of responses of serial business entrepreneurs collected via an online anonymous survey

Participants agreeing with the details provided for each presented business model indicated the researcher had prototyped the business models correctly. On the other hand, participants suggesting changes to the presented business models and providing further comments indicated the researcher did not prototype the business models correctly.

7. To evaluate whether 10 aspects (Identity, Purpose, Structure, etc.) described for each potential business model, based on information collected from discussions of post-incubation innovation domain experts and business entrepreneurs, can supply sufficient details for prototyping business models.

Data collection required: – responses from business entrepreneurs who participated in the conducted discussions between STP experts and business entrepreneurs

Method used for analysing the collected data: – qualitative analysis of responses of business
entrepreneurs collected via an online anonymous survey

The same survey (see Appendix XIV) asked the participants to evaluate whether, in general, a description of a potential business (developed based on a written description of each of the 10 business model aspects) provides a sufficient amount of detail for prototyping business models for potential Businesses. An open-ended question gave the participants an opportunity to express their views.

8. To prioritise and rate the list of prototyped business models based on the potential probability of success using details about the 10 aspects as the assessment criteria

Data collection required: – responses from business entrepreneurs who participated in the conducted discussions between STP experts and business entrepreneurs

Method used for analysing the collected data: – qualitative analysis of responses of serial business entrepreneurs collected via an online anonymous survey

The same survey (see Appendix XIV) asked the participants to prioritise (by ranking) and rate the list of prototyped business models based on probability of success, from a business perspective. The participants were asked to assign a priority number for each of the listed business models. The researcher calculated a mean priority number for each of the listed business models. This number then corresponded to the probability of success for each of the presented business models. Participants rated the presented business models (from 1 to 10) in terms of probable success. The researcher calculated mean ratings for each of the presented business models which then indicated how potentially successful each business model was (on a scale of 1 to 10, where 1 represented a potentially very unsuccessful business and 10 represented a potentially very successful business).

Phase III: – Selecting potentially the most beneficial business

Objectives of Phase III:

1. To objectively select potentially the most beneficial business model from the list of prioritised and ranked prototyped business models (outcome of Phase II) to be proposed for practical implementation

Data collection required: – there was no need to collect any additional data to select potentially the most beneficial business model. The researcher assessed the business models (prototyped at Phase II) against prioritised and weighted core values/ideals of multiple typological groupings (identified at Phase I) using the AHP technique

2. To evaluate whether the AHP technique could be effectively and objectively be used for selection of potentially the most beneficial business model

Data collection required: – responses from globally recognised CSR experts

Method used for analysing the collected data: – qualitative analysis of responses of CSR experts collected via an online anonymous survey.
The CSR experts who participated in Phase I were presented with a list of business models of potential businesses (outcome of Phase II) and the list of prioritised and weighted core values/ideals of typological groupings (outcome of Phase I), via email. They were invited to participate in an anonymous online survey selecting potentially the most beneficial business model using their Corporate Social Responsibility (CSR) and Triple Bottom Line (TBL) expertise. Moreover, they were asked to explain why they believed the business model they had selected was potentially the most beneficial one (see Appendix XV for a copy of the survey). Assistance of CSR experts, using their CSR / TBL expertise, was used as a method for triangulating whether the participating CSR experts would select the same business model as was selected by the AHP technique. If the majority of the participants select the same business model, then the AHP technique will be evaluated as an appropriate technique for selecting business models of potentially the most beneficial businesses.

3. To develop a mission statement of the selected, potentially the most beneficial business model, to be proposed for practical implementation

*Data collection required:* – there was no need to collect any additional data to develop a mission statement of the selected, potentially the most beneficial business, selected at step 2. The researcher developed a mission statement based on the characteristics of the future potential business discussed at Phase II and the business model prototyped.

**Phase IV:** – Developing a detailed business model of a future business

*Objectives of Phase IV:*

1. To develop a detailed business model of a future business for a selected patent

*Data collection required:* – there was no need to collect any additional data to develop a detailed business model for the modelled transcendent business. The researcher used information collected from discussion forum at Phase II and the mission statement created at Phase III. The researcher developed a detailed business model for potentially the most beneficial business, selected at Phase III, by describing 55 elements for the modelled business.

**Phase V:** – Setting up KPIs of a modelled transcendent business

*Objectives of Phase V:*

1. To set up Key Performance Indicators (KPIs) for the modelled transcendent business, for monitoring and reporting of performance that goes beyond profit

*Data collection required:* – there was no need to collect any additional data to set KPIs for the modelled transcendent business. The researcher used the list of core values/ideals of major typological groupings, created at Phase I, to set up KPIs of the modelled transcendent business. Every single core value/ideal from the list developed at Phase I became one KPI.
3.6 Scope and limitation of the research

The proposed methodology (and the underlying TRM+) was proofed (tested) and evaluated with two of selected patents – a ‘solar power generator and water purifier’ patent, and a ‘high temperature molten salt receiver’ patent – for development of a business model for each of the patents. Both selected patents used the same technology – the thermal effect of a Concentrated Solar Power (CSP). The researcher selected utility patents intentionally, as it was hypothesised utility patents and their applications would be easier to visualise than design patents or plant patents. Testing all methods and procedures embedded within the TRM+ with various patents would require: 1) a large number of expert groups, specifically post-incubation innovation domain experts and business entrepreneurs, and; 2) considerable time for conducting all processes embedded within Phase II to Phase IV. All of this was beyond the scope of this research.

Three expert groups (Corporate Social Responsibility (CSR) experts, Solar Thermal Power (STP) experts, and business entrepreneurs) assisted in proof the concept (test) and evaluated methods and procedures embedded within individual phases of the TRM+. The number of experts within each group was very limited as the response rate of potential participants was very low; 6 CSR experts (response rate 11.76%) worked in the CSR experts Group 1; 5 CSR experts (response rate 6.25%) worked in the CSR experts Group 2; 4 STP experts (response rate 16%); 2 business entrepreneurs (response rate 1.80%). The small sample size of participating experts was compensated for by the diversity of the participants and their diverse range of extensive expertise. All participating experts were internationally recognised experts with extensive experience in the areas of their expertise.

Proof-of-concept (testing) and evaluation of the developed methodology (and the proposed TRM+) was limited to patents only. Moreover, proof-of-concept was only conducted theoretically. Practical implementation of the developed detailed business model of the future transcendent business for the selected patent was beyond the scope of this research. Moreover, Phase V and Phase VI of the TRM+ was tested only, as it could take several years to start up a business in practice and assess how well it fits its purpose, how well it satisfies core values/ideals of multiple typological groupings, and how beneficial, successful and sustainable it is. Therefore, it could only be speculated as to how well the created and selected business model of potentially the most beneficial business would practically fit its purpose, and satisfy the creation of core values/ideals of multiple typological groupings in a real life environment. It would be very time consuming and human resource intensive (using multiple experts) to test the proposed TRM+ with various patents and innovations. Furthermore, to start up a transcendent business in practice would require financial capital, and the time span of a few years for the business to prove its practical fit for purpose, potential success and growth, and its sustainability profile.
3.7 Selection of participants

Three groups of experts (Corporate Social Responsibility (CSR) experts, Solar Thermal Power (STP) experts, and business entrepreneurs) assisted in developing, testing, and evaluating methods and procedures embedded within individual phases of the TRM+. The following criteria were used for selecting prospective participants:

1. Diversity – diversification of the participating experts within each expert group was achieved by selecting experts with:
   - Theoretical expertise (academic background and research experience)
   - Practical experience (field expertise)
   - Global experience (experiences from number of countries from around the world, e.g. Australia, US, Asia, Europe)

2. World recognition – participants were nationally or globally recognised experts; authors or co-authors of research and conference papers presented at national/world conferences; authors of articles published nationally or worldwide

3. Computer literacy – participants were computer literate, had access to the internet active email accounts

4. Communication – participants were able to communicate fluently in English, with good communication skills and were willing to share their expertise with other participants
3.8 Ethics and research procedures

Ticehurst and Veal (2000) argue that the most important principles in research ethics involving humans are that participants take part in the research freely, based on their informed consent, and that no harm is caused to them. Since the research involved humans as the subjects of data collection, a written approval from the Human Research Ethics Committee (HREC) was required prior to commencing data collection, ensuring that the research met ethical standards. As part of the ethics approval process, a copy of a consent form, a consent information statement, and the letter to potential participants that outlined the purpose and nature of the research were requested by HREC. The letter to the participants explained that their participation was voluntary and that at any stage they could withdraw from participation. All participants were given an option to withhold information they did not wish to reveal or were not allowed to reveal (e.g. because they were bound by agreements of their employers, business partners, etc.).
3.9 Validity and reliability of the research

Validity:

Wainer and Braun (1988) describe the term ‘validity’ in qualitative research as the initial concept – the question or hypothesis that determines which data is to be gathered and how it is to be gathered. Validity of the research refers to the “appropriateness, meaningfulness, and usefulness of the specific measurements used” (Young, 2001: 133) during the data collection and data analysis related to the initial concept.

In this research, the Transcendent Reference Model and Methodology (TRM+) was developed, tested, and evaluated with selected patents. A conducted test (Proof-of-concept) focused on testing methods and procedures embedded within individual phases of the TRM+ for the selected patent. Verification procedures focused on evaluation of methods and procedures embedded within individual phases of the TRM+, and whether they could produce reliable and repeatable outcomes. Phase I to Phase III of the TRM+ was tested and verified by multiple experts groups – Corporate Social Responsibility (CSR) experts, Solar Thermal Power (STP) experts with expertise relative to the selected patents, and business entrepreneurs. The small sample size was compensated for by all participants being exceptionally experienced experts: 75% of CSR experts were the top, well-respected leaders in CSR; all business entrepreneurs were serial entrepreneurs who had launched a number of entrepreneurial businesses, one being awarded the ‘Ernst & Young Entrepreneur of the Year Award’. Evaluation of Phase IV and Phase V was outside the scope of this research as these phases are implementation phases. Therefore, methods and procedures embedded within Phase V and Phase VI were tested by the researcher only, to illustrate and provide a future reference for how these should be conducted by business modellers in future applications of the TRM+.

Delphi technique was used for achieving a consensus (an agreement of majority of the participating experts) among CSR experts in Phase I. Strauss and Zeigler (1975: abstract) define the Delphi technique as a "method for the systematic solicitation and aggregation of informed judgments from a group of experts on specific questions or issues". They identify three types: numeric, policy, and historic. In this research, the numeric Delphi technique was used.

Reliability:

Glaser and Strauss (1967) argue that reliability in qualitative studies needs to demonstrate that the operations of a study, such as the data collection and coding procedures, can be repeated with the same results. The main objective of this research project was to develop a reusable methodology, expressed in the form of a reusable reference model (TRM+), that could be reused for developing business models of any future transcendent businesses for any post-incubation innovation/patent anywhere in the world; businesses that would go beyond generating profit, considering multiple typological groupings. It was hypothesised
that reliability and reusability of the TRM+ would be achieved by the choice of methods and procedures embedded within the TRM+ that were globally known and tried techniques, such as the Delphi and AHP techniques. Moreover, the procedures that were used during data collection, such as electronic surveys and electronic text-based discussion forum, were selected to minimise inaccuracies, minimise misinterpretation of information caused by the human factor, and to improve efficiency.
3.10 Summary

This chapter explained the research approach taken and presented the proposed steps/phases of a transcendent business modelling methodology, expressed as a reusable Transcendent Reference Model (TRM+). This chapter presented descriptions of each proposed phase of the TRM+, together with methods and procedures embedded within each individual phase, data collection and analysis methods, criteria for selecting experts who assisted during development and evaluation of the TRM+ and methods and procedures embedded within the TRM+. Ethics and research procedures, and validity and reliability of the research procedures were also covered.

Chapter 4 will present the process of testing (proof-of-concept) the first phase of the TRM+ and identification of typological groupings and their core values/ideals. It will present data that was collected and analysed during testing and evaluation of methods and procedures embedded within the Phase I of the TRM+. 
4. Phase I of the TRM+ investigation

4.1 Introduction

Chapter 3 presented the proposed steps/phases of a business modelling methodology, expressed as a reusable Transcendent Reference Model (TRM+). The first step/phase of the TRM+ identifies major typological groupings (e.g. social, environmental, economic) and their core values/ideals that the modelled transcendent business will strive to address. The objectives for testing (proof-of-concept) and evaluation of methods and procedures embedded within Phase I were outlined. This chapter presents data collected and analysed during testing and evaluation of methods and procedures embedded within Phase I.
4.2 Identification of major typological groupings

Chapter 3 proposed a reverse-value chain approach, described as a customer-centric approach, where customers are perceived as major stakeholders with a complex set of needs. It further proposed that a transcendent business modelling take an egalitarian approach, where multiple typological groupings join together, and multiple needs, wants and demands be simultaneously perceived as new business opportunities. The reason for taking a ‘reverse-value’ chain egalitarian approach was influenced by arguments that businesses needed to integrate target groups into their social value networks (Mair and Schoen, 2005), and have a meta-responsibility transcending a responsibility to investors (Reich, 1998). Therefore, it was proposed that the first step was to identify major typological groupings.

Content analysis of reports

The content analysis of the reports was conducted using NVIVO 9 software. It aimed to identify the world major issues and then categorise them into typological groupings (i.e. issues of a similar type). It focused primarily on identifying the main themes of the reports, searching for the most frequently discussed themes and keywords used in the headings and throughout the reports. The most frequently discussed social issue in most of the analysed reports was ‘eradicating global poverty and hunger’, which is also one of the current eight UN ‘Millennium Development Goals’ (MDG) as discussed earlier on p. 69.

In the UN MDG report 2010, the term ‘poverty’ was mentioned 53 times, and the term ‘education’ 58 times. Issues such as ‘eradicating poverty’, ‘human rights’, ‘achieving universal primary education’, ‘improving human health’, and ‘ensuring environmental sustainability’ were also discussed. ‘Ensuring access to clean water’, ‘climate change’, ‘water and energy’, and ‘impacts of water use on water systems, biodiversity, and the environment’ were discussed in all analysed UN Water Development reports and a vast number of analysed UN reports.


Analysis of 45 reports produced by the World Bank revealed agreement with the UN MDG. The most frequently discussed issues in the analysed World Bank reports were ‘poverty’, ‘pollution’, ‘human health issues’, ‘globalisation’, ‘employment’, ‘population growth’, ‘debt


Analysis of 13 Asia Pacific Economic Cooperation (APEC) reports showed that the analysed reports dealt with similar issues as the UN, UNESCO, EU, and Amnesty International reports. The most frequently discussed issues were ‘combating hunger and malnutrition’, ‘poverty’, ‘inequality among people and countries’, ‘human security’, ‘climate change’, ‘global climate change and its impact on food security and water security’, ‘dynamic of world food prices’, ‘social impact of climate change’, ‘bio-energy’, ‘domestic inflation’, ‘vulnerable employment’, ‘sustainable development’, ‘sustained rapid growth and change in consumption patterns in emerging countries’, and ‘partnership’. The most frequently mentioned terms were:


4.2.1 Findings of the analysis

The analysis of world reports revealed that many of the identified themes were interconnected and overlapped with one another. Some of the themes could be grouped into categories of similar types of issues, creating typological groupings of world major issues. The analysis of world reports identified world major issues, which were then grouped into three, already known, categories of similar type – social, environmental, and economic – creating three typological groupings.

These typological groupings are discussed by a number of authors such as Elkington (1998), Laszlo (2003), Norman & MacDonald (2003), Spiller (2000), Hossain (2006), Putnam (2002), Posner (2009), and Barut (2007). There are also a number of available tools and instruments designed and developed for monitoring, measuring, and reporting of social, environmental, and economic values/ideals; examples include, Social Impact Assessment (SIA), Environmental Impact Assessment (EIA), Strategic Environmental Assessment (SEA), Environmental Management Systems (EMS), Triple Bottom Line (TBL), Global Reporting Initiatives (GRI) guidelines, and National Greenhouse and Energy Reporting System (NGERS).
4.3 Identification of core values/ideals of major typological groupings

Once the categories of world major issues were identified, there was a need to identify their core values/ideals. Chapter 3 proposed that the major world issues discussed in world reports are the reflection of major typological groupings’ core values/ideals. Therefore, by identifying world major issues, the core values/ideals of major typological groupings could also be identified.

4.3.1 Findings of the analysis

The researcher proposed the following core values/ideals of the identified groupings:

**Social grouping:**
1. Eradicate / end poverty and hunger
2. Protect human security (e.g. income security, personal security, cultural security)
3. Increase voluntary contribution and international humanitarian help
4. Protect and promote human health
5. Achieve universal primary education and distribution of knowledge
6. Combat HIV/AIDS, malaria, and other diseases
7. Reduce crime, combat violence and terrorism
8. Protect human rights (e.g. women rights, children rights, minority groups rights)
9. Fair and equal wages and decent work conditions for everyone
10. Combat production and consumption of drugs
11. Reduce child mortality

**Environmental grouping:**
1. Manage global climate change
2. Protect and ensure access to clean water
3. Produce and consume clean renewable energy
4. Minimise waste and pollutants production, land degradation
5. Develop and apply environmentally friendly and sustainable technologies
6. Ensure global sustainability (land, air, water, flora and fauna)
7. Ensure sustainable consumption of resources
8. Shift incentives from consumption that damages the environment to consumption that promotes human development
9. Ensure minimal consumption of resources
10. Maximise recyclability and reusability of resources

**Economic grouping:**
1. Create a global partnership and cooperation for sustainable development
2. Create fair international labour and migration rules and freedom for everyone
3. Minimise financial volatility and economic insecurity, achieve sustainable economic growth
4. Create fair and simplified international investment and trade rules, equal access to resources
5. Maximise sustainable and efficient employment, minimise unemployment
6. Combat bribery and corruption, promote transparency
7. Promote private investment in infrastructure projects
8. Reduce military spending
9. Manage world population and ageing generation trends
10. Narrow the gap between rich and poor and the extremes between countries

Once the major typological groupings and their core values/ideals were identified, there was a need to evaluate whether the groupings and core values/ideals had been identified correctly. There was also a need to evaluate whether the content analysis of world reports could be successfully and repeatedly used in the future as a method for identification of major typological groupings and their core values/ideals. Moreover, there was a need to prioritise the identified core values/ideals so that a small number (e.g. 3) of each typological grouping could be identified, otherwise, it would be too difficult for a business to simultaneously address a large number of diversified values/ideals of multiple typological groupings. Chapter 3 proposed that Corporate Social Responsibility (CSR) experts would not only evaluate whether the major typological groupings and their core values/ideals were identified correctly, and whether they could be successfully identified by performing content analysis of world reports, but would also prioritise the core values/ideals based on their relative importance. Performing such tasks required conducting three rounds of surveys informed by Delphi methodology (Delphi cycle A1, A2, and A3).
4.4 Verification of major typological grouping and their core values/ideals

The researcher contacted 60 CSR experts selected from lists of speakers of world conferences dedicated to Corporate Social Responsibility: ACCSR’s 4th Annual Conference, ‘Meeting the Standard: The Post-GFC World of Responsible Business Practice’; 9th ‘International Conference on Corporate Social Responsibility’; ‘Academic Conference on Social Responsibility’; and the ‘World Corporate Social Responsibility Conference’. They were selected based on the following selection criteria:

- As speakers presenting at national and world conferences, they were nationally or internationally recognised experts; and
- They had knowledge and skills as authors and co-authors of research and conference papers, and other publications globally recognised

The CSR experts were contacted by email and asked to participate in the research. They were provided with information explaining the project and were asked to sign a consent form agreeing to their involvement in the project. Nine (15%) of the invitation emails sent to potential participants bounced back as undelivered, since their email addresses appeared to be invalid. Out of the remaining 51 CSR experts, 19 (37.25%) showed interest in the project, however, only 6 (11.76%) signed the consent form and became involved. These were from Malaysia, Australia, Canada, and the Netherlands. They had extensive experience in CSR. It was proposed that three rounds of Delphi survey cycles be conducted.

**Delphi cycle A1:**

The aim of Delphi cycle A1 was to verify the typological groupings/categories (social, environmental, economic) and their core values/ideals, as identified by the researcher (i.e. see Section 4.3.1), and by doing so to verify whether these could be identified by content analysis of world reports. The researcher presented the three lists of core values/ideals to the participating CSR experts, in an online survey questionnaire – Delphi cycle A1 (see Appendix I for a copy of the survey). The participating CSR experts were asked to select three values/ideals from each typological grouping, which they considered the most important, or to nominate their own values/ideals. They were also asked to explain why what they had selected was important. Moreover, they were asked to identify what other typological categories, and their initial values/ideals, should be considered when developing a business opportunity and constructing business models.

Delphi cycle A1 was conducted between 1st September 2010 and 12th September 2010; participants completed the first survey round within 11 days. The following table shows data collected from CSR experts. The column on the left represents core values/ideals of a social grouping as they were presented to the participants (see appendix I for a copy of the
survey). A tick (✓) in the table indicates when a participant selected the core value/ideal. The column on the far right shows the total number of participants who selected each core value/ideal.

4.4.1 Social typological grouping

Table 4.1: Selection of the most important core values/ideals of a social typological grouping

<table>
<thead>
<tr>
<th>LISTED VALUES/IDEALS</th>
<th>PARTICIPANTS</th>
<th>TOTAL COUNT</th>
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<tbody>
<tr>
<td>1</td>
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<td>11</td>
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</table>

New nominated values/ideals

1. effective global governance
   x access to clean water

1. improve governance and open society conditions

2. facilitate economic opportunity and development at the local level

1. advocacy for better governance and democratic space

3. environmental security

Data analysis – social typological grouping

According to the responses received from the participants, the initial core values/ideals 1, 4, 5, 6 and 8 were considered as the core values/ideals of the social typological grouping. By selecting these initial core values/ideals (re-stating the same values/ideals), the participants indicated that the researcher had correctly identified them. On the other hand, the initial core values/ideals 2, 3, 7, 9, 10, and 11 were not selected by any of the participants. The total number of how many participants selected each core value/ideal is shown in the far right column of the table. The participants also nominated a number of new values/ideals, shown in the bottom row of the table. The nominated value/ideal marked as ‘1’ refers to a new value/ideal, “Create effective global governance and ‘open society’ conditions”, which
was added into the list to present in Delphi cycle A2. The nominated value/ideal ‘2’ and ‘3’ were also added into the list. Whilst the new nominated core value 1 appeared to be appropriate, the nominated core value/ideal 2 seemed more appropriate for an economic typological grouping and the nominated core value/ideal 3 appeared to be more appropriate for an environmental typological grouping. The new nominated value/ideal, marked as ‘X’, was not added into the list, since environmental typological grouping already contained such a value/ideal.

*Explanation given by CSR experts for selecting the core values/ideals:*

1. **Eradicate / end poverty and hunger**
   - “From a hierarchy of needs basis – basic needs are food, water and health, after that come issues like workplace reform”
   - “Poverty, hunger, lack of health and of education are for me the fundamental causes of most of the social, economic, and environmental problems that a large part of the world is plagued with”
   - “Eradication of hunger and poverty are long term strategic goals. A starving society and marginalized poor breeds violence and degradation”
   - “The minimisation of suffering should be our top priority”

2. **Protect human security (e.g. income security, personal security, cultural security)**
   None of the participants selected this core value/ideal.

3. **Increase voluntary contribution and international humanitarian help**
   None of the participants selected this core value/ideal.

4. **Protect and promote human health**
   - “Ecosystem health is precondition to functioning cultural, social and political systems. Without it, food and water (hunger, health, nutrition, child mortality), social stability (human rights, security) and development (employment, education)”
   - “Assistance in health education will also minimise suffering”

5. **Achieve universal primary education and distribution of knowledge**
   - “Knowledge is the font of all enlightenment”
   - “Education is key resource for medium term to long term impact. Institutional reform cannot be sustained without this”
   - “Education is probably the best way to minimise suffering”

6. **Combat HIV/AIDS, malaria, and other diseases**
   The participants did not provide any explanation for selecting this core value/ideal.

7. **Reduce crime, combat violence and terrorism**
   None of the participants selected this core value/ideal.
8. Protect human rights (e.g. women rights, children rights, minority group’s rights)
   • “The vulnerable groups women, child and refugees / migrant workers are subject to exploitation and improvement of their lot is the foundation of a just and fair society”

9. Fair and equal wages and decent work conditions for everyone
   None of the participants selected this core value/ideal.

10. Combat production and consumption of drugs
    None of the participants selected this core value/ideal.

11. Reduce child mortality
    None of the participants selected this core value/ideal.

New value/ideal 1 nominated by participant 1, 2, and 4:
Create effective global governance and ‘open society’ conditions
   • “I believe that substantial progress on any of the above can only be achieved with effective governance, so that would be the most important thing on my list”
   • “The ‘disinfectant of sunlight’ is the basis for eradication of poor governance and inequity”
   • “Poor governance and gross inequity underlies all other pathologies”

New value/ideal 2 nominated by participant 2:
Facilitate economic opportunity and development at the local level
   • The participant did not provide any explanation for nominating this core value/ideal.

New value/ideal 3 nominated by participant 5:
Environmental security
   • “Without environmental security, the rest are theoretical at best”
   • “Ecosystem health is precondition to functioning cultural, social and political systems”

Research findings – social typological grouping
Delhi cycle A1 generated the following list of core values/ideals of social typological grouping:
   • Eradicate / end poverty and hunger
   • Protect and promote human health
   • Achieve universal primary education and distribution of knowledge
   • Combat HIV/AIDS, malaria, and other diseases
   • Protect human rights (e.g. women rights, children rights, minority groups rights)
   • Create effective global governance and ‘open society’ conditions
Facilitate economic opportunity and development at the local level

Environmental security

4.4.2 Environmental typological grouping

Table 4.2: Selection of the most important core values/ideals of an environmental typological grouping

<table>
<thead>
<tr>
<th>LISTED VALUES/IDEOALS</th>
<th>PARTICIPANTS</th>
<th>TOTAL COUNT</th>
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<tbody>
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<td>1 2 3 4 5 6</td>
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<tr>
<td>New nominated values/ideas</td>
<td>effective global governance</td>
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</tr>
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</table>

Data analysis – environmental typological grouping

According to the responses received from the participants, the initial core values/ideals 1, 2, 3, 4, 5, 6, 7, 8, and 10 were considered as the core values/ideals of the environmental typological grouping. The researcher correctly identified 9 core values/ideals of environmental typological grouping. One of the participants nominated the new core value/ideal ‘effective global governance’. However, this was not added to the list, as it was already included in the social typological grouping. Moreover, as will be seen in section 4.4.4, governance was nominated as a new typological grouping.

Explanation given by CSR experts for selecting the values/ideals:

1. Manage global climate change
   - “Climate change is perhaps the biggest issue humanity has faced”
   - “If that goes non linear, self-defense will take priority”

2. Protect and ensure access to clean water
   - “Water is an immediate challenge”
   - “Access to clean water is fundamental for health”
   - “Water is a major commodity that is source of life and health”
3. Produce and consume clean renewable energy
   • “Unclean energy is the main cause of climate change”

4. Minimise waste and pollutants production, land degradation
   • “Waste and pollutants production and land degradation are key aspects of non-sustainability, with impact on health and poverty”
   • “Waste and pollutants leads to long term depletion of community’s well being and wealth”

5. Develop and apply environmentally friendly and sustainable technologies
   • “Technology (knowledge), in its broadest sense, is the basis of all socioeconomic development”

6. Ensure global sustainability (land, air, water, flora and fauna)
   • “Sustainability encompasses all this as well as governance”
   • “If our environment degrades suffering will increase”
   • “This is really about maintaining biodiversity”

7. Ensure sustainable consumption of resources
   • “The alignment of incentives and calibration of trade-offs are critical dimension without which environmental discourse are polemics without sound economic basis”

8. Shift incentives from consumption that damages the environment to consumption that promotes human development
   • “The best way to deal with environmental problems is through the market system, with appropriate government controls”

9. Ensure minimal consumption of resources
   None of the participants selected this core value/ideal.

10. Maximise recyclability and reusability of resources
    • “We must move from a growth model of economics to recycle model”

New value/ideal nominated by participant 1:

Effective global governance
   • “As stated above, I believe that substantial progress on any of the above can only be achieved with effective governance, so that would be the most important thing on my list”

Research findings – environmental typological grouping
The Delhi cycle A1 generated the following list of core values/ideals of environmental typological grouping:

- Manage global climate change
- Protect and ensure access to clean water
- Produce and consume clean renewable energy
• Minimise waste and pollutants production, land degradation
• Develop and apply environmentally friendly and sustainable technologies
• Maintain global biodiversity (land, water, flora and fauna)\(^4\)
• Ensure sustainable consumption of resources
• Shift incentives from consumption that damages the environment to consumption that promotes human development
• Maximise recyclability and reusability of resources

4.4.3 Economic typological grouping

Table 4.3: Selection of the most important core values/ideals of an economic typological grouping

<table>
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New nominated values/ideals
redirect growth to non-material growth through education and incentives

Data analysis – economic typological grouping
According to the responses received from the participants, the initial core values/ideals 1, 2, 3, 4, 6, 7, 8, 9 and 10 were considered as the core values/ideals of the economic typological grouping. The researcher correctly identified 9 core values/ideals. The new core value/ideal was nominated by one of the participant and added to the list.

\(^4\) ‘Ensure global sustainability (land, water, flora and fauna)’ core value/ideal was renamed to ‘Maintain global biodiversity (land, water, flora and fauna)’ as it was suggested by one of the participating CSR expert
Explanation given by CSR experts for selecting the values/ideals:

1. Create a global partnership and cooperation for sustainable development
   - The participant did not provide any explanation for selecting this core value/ideal.

2. Create fair international labour and migration rules and freedom for everyone
   - “Laborers that build a modern state infrastructure are the front line victims e.g. Dubai and even Malaysia”
   - “Much of the unfair rich/poor gap is caused by unfair rules and immoral trading practices”

3. Minimise financial volatility and economic insecurity, achieve sustainable economic growth
   - The participants did not provide any explanation for selecting this core value/ideal.

4. Create fair and simplified international investment and trade rules, equal access to resources
   - “While trade has a role to play I suspect it is more governmental/NGO actors who will make the biggest difference”
   - “Trade Investments rule create openness for investment and wealth creation”
   - “Much of the unfair rich/poor gap is caused by unfair rules and immoral trading practices”

5. Maximise sustainable and efficient employment, minimise unemployment
   None of the participants selected this core value/ideal.

6. Combat bribery and corruption, promote transparency
   - “Transparency vs. Bribery and Plunder”

7. Promote private investment in infrastructure projects
   - The participants did not provide any explanation for selecting this core value/ideal.

8. Reduce military spending
   - “Military spending is the largest harmful and wasteful spending that ought to be redirected to social and environmental aims”

9. Manage world population and ageing generation trends
   - “All earths systems will collapse if human population is too large”

10. Narrow the gaps between rich and poor and the extremes between countries
    - “The gaps between rich and poor feed many of the social, economic and environmental problems”
    - “Rich/poor gaps cause most conflicts and much suffering”
New value/ideal nominated by participant 3:

**Redirect growth to non-material growth through education and incentives**
- “Stabilization and redistribution of material growth is key to solving social and environmental issues”

**Research findings – economic typological grouping**
The Delhi cycle A1 generated the following list of core values/ideals of economic typological grouping:
- Create a global partnership and cooperation for sustainable development
- Create fair international labour and migration rules and freedom for everyone
- Minimise financial volatility and economic insecurity, achieve sustainable economic growth
- Create fair and simplified international investment and trade rules, equal access to resources
- Combat bribery and corruption, promote transparency
- Promote private investment in infrastructure projects
- Reduce military spending
- Manage world population and ageing generation trends
- Narrow the gaps between rich and poor and the extremes between countries
- Redirect growth to non-material growth through education and incentives

4.4.4 Additional typological groupings
The participants suggested the following additional typological groupings:
1. “The relationship between business and governance – i.e. to what extent is a business going to be a law taker or a law maker, for example through lobbying, donating money to political parties etc”
2. “Enlightened Self Interest (ESI)”
3. “Human development (not explicitly included in the social grouping)
   **Core values/ideals:**
   - Enable all people to reach their developmental potential
   - Develop both individual and collective leadership capacity”
4. “Business's CSR must have strategic integration with its positioning in that market segment. Creative integration of CSR and Business model is critical without which it cannot be sustained and would be viewed merely as palliative or act of bad conscience. Corp philanthropy is not merely a donation or cheque book CSR”
5. “Create a global partnership and cooperation for sustainable development”
6. “Creation of business/civil society partnerships around key sustainability themes (e.g. renewable energy). An interesting issue will be the balance between mitigation...”
business opportunities and adaptation opportunities”

7. “The category of human happiness is also an important focus. It is predicted by Prof Martin Seligman, Penn University, that the most successful companies of the future will emphasise ‘fulfilment and enjoyment’ as incentives rather than economic incentives”

**Data analysis – additional typological groupings**

The researcher conducted a literature survey relative to the ‘Open Society’ concept, which argues that in open societies, government is responsive and tolerant and that political mechanisms are transparent and flexible (Popper, 1966). The decision to conduct such a literature survey was influenced by one of the participating CSR experts who suggested ‘improvement of governance and open society conditions’ as an additional core value/ideal of the social typological grouping.

In addition, literature related to Enlightened Self Interest (ESI) was surveyed. Thomas (1989: 67) states that ESI is about “passing up a present benefit for a greater gain further down the road”. Andersen (1978) explains that ESI is about accounting for interests of all people, not just our own. In business terms this means that a (transcendent) business needs to account for the interests of multiple stakeholders (Giacalone, 2004). The concept of ESI is strongly supported by Giacalone (2004) who argues that transcendent businesses need to focus on non-financial contributions to our world and leave behind a better world for those who follow. However, motivation for businesses being ESI conscious varies. For example, Tilson (1985) argues that businesses that are ‘doing good’ for society contribute to their own competitive advantage. On the other hand, Martison (1994) argues that ‘doing good’ for others might be very costly for a business and it may not always be in the best interests of the business. The researcher revisited previously analysed world reports (UN, UNESCO, World Bank, EU, Amnesty International, Greenpeace, APEC, NATO, Red Cross reports) and searched for additional groupings, such as the ones suggested by the participating CSR experts.

**Research findings – additional typological groupings**

After conducting the second content analysis of world reports, additional typological groupings were formulated – a ‘Polity grouping’ dealing with governance issues and a ‘Sustainable human development grouping’ dealing with social issues not included in the ‘Social’ typological grouping. The researcher identified the following initial values/ideals of the additional groupings based on the content analysis:

**Polity grouping:**
1. Create strong and effective national and global governance
2. Build a more coherent and more democratic architecture for global governance
3. Think globally, act locally when lobbying
4. Be responsible to people – to equity, to justice, to enlarging the choices of all when influencing others (e.g. by sponsoring, donating money)
5. Build partnerships in pursuit of common goals
6. Create a good policy environment (e.g. financial policies that are market-aware)
7. Improve the international architecture for integration
8. Strengthen the rule of law upheld by an independent judiciary
9. Create public outreach and collaboration with the media, informing the public
10. Broaden partnership with civil society groups, donors, and others in the international community

*Sustainable human development grouping:*
1. Enlightened Self Interest (ESI)
2. Enable all people to reach their developmental potential
3. Develop both individual and collective leadership capacity
4. Develop society partnership
5. Ensure collective responsibility
6. Manage human capital (at local and global level)
7. Protect future through acknowledging the past and educating future generations
8. Provide the optimum infrastructure for further development
9. Harness the potential of technology
10. Change today’s consumption patterns for tomorrow’s human development

Based on the conducted content analysis of world reports, the researcher identified core value/ideal ‘Responsibility of a business to people – to equity, to justice, to enlarging the choices of all when influencing others (e.g. by sponsoring, donating money)’ of a ‘polity grouping’. This core value/ideal was suggested also by one of the participating CSR experts, claiming: “businesses need to take their responsibilities, for example, through lobbying and donating money to political parties etc”; “businesses should be law takers, not law makers”.

Concern with businesses influencing political parties is raised also by Reich (1998) who argues there are more and more businesses that provide charitable contributions, environmental contributions, and political contributions because they are either concerned about their public images or they want to influence the law and be part of the political systems – "corporations are becoming more openly and aggressively involved in the making of social policy; they are underwriting advertising campaigns aimed at influencing legislation" (Reich, 1998: 16). Reich further states there are many CEOs who tell him they need to contribute money to (e.g. political campaigns), because their competitors are doing so. The power of big corporations to influence law is criticised also by Visser (2010, 2011) who provides examples of corporations influencing political decisions and law making. Bakan (2004:107) also informs, “corporations essentially feel that they are partners with government”. Since the researcher, after reviewing previously analysed world reports, was able to identify additional typological groupings and associated initial values/ideals of each of the identified groupings, the hypothesis as to whether major typological groupings and their initial values/ideals could be effectively identified via content analysis of world reports was confirmed.
4.5 Prioritisation of core values/ideals of each typological grouping

Once the major typological groupings and initial core values/ideals of each grouping were identified, there was a need to prioritise the identified core values/ideals. Chapter 3 proposed the most important core values/ideals of each typological grouping be identified by prioritising (ranking) them, based on their relative importance, and then considering the top core values/ideals (values/ideals with the highest ranking) as the most important. CSR experts who participated in Delphi cycle A1 were asked to participate in the second survey round – Delphi cycle A2.

**Delphi cycle A2:**

The first objective of Delphi cycle A2 was to confirm whether the identified ‘Polity’ grouping and ‘Sustainable human development’ grouping, and their underlying core values/ideals, should also be considered by transcendent businesses beside the values/ideals of social, environmental, and economic groupings. The second objective of Delphi cycle A2 was to ask the CSR experts to prioritise the initial core values/ideals (outcome of Delphi cycle A1) by ranking, based on the relative importance of each core value/ideal, so that a consensus (agreement of majority of the participants) on the most important core values/ideals of each typological grouping could be achieved. The final objective of Delphi cycle A2 was to identify in how many years the most important consensus core values/ideals should be revisited and revaluated (see Appendix II for copy of the survey).

Delphi cycle A2 was conducted between 13th September 2010 and 19th September 2010; all participants completed the survey, however, one participant did not prioritise values/ideals of the typological groupings and prioritised only three values/ideals of ‘Polity’ and ‘Sustainable human development’ groupings (those values/ideals appear in the table below as strike through and were not considered in the data analysis).

The tables that follow show data collected from CSR experts. The column on the left represents core values/ideals of a typological grouping (outcome of Delphi cycle A1) as they were presented to the participants (see Appendix II for a copy of the survey). The participants were asked to prioritise the listed core values/ideals based on their relative priority by assigning a priority number. The higher the priority number assigned, the higher relative importance the value/ideal had. Number ‘8’ corresponds to the highest priority / the most important core value/ideal; number ‘1’ corresponds to the lowest priority / the least important core value/ideal. The column on the right shows the calculated mean score for each core value/ideal, and a calculated standard deviation for each core value/ideal. A tick (✔) in the table indicates the most important consensus core values/ideals.
4.5.1 Prioritisation of core values/ideals for a Social grouping

Table 4.4: Prioritisation of core values/ideals for a social grouping

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</table>

Data analysis

The values/ideals with the highest calculated mean score (core value/ideal 3, 6, and 7) were considered as being the most important core values/ideals of a social typological grouping. The small standard deviation indicates the strength of the choice across all CSR experts. The participants suggested re-evaluating their importance in approximately 2 to 5 years.
4.5.2 Prioritisation of core values/ideals for an Environmental grouping

Table 4.5: Prioritisation of core values/ideals for an environmental grouping

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Data analysis

There is a noticeably wide variation in participants’ responses. Three values/ideals with the highest calculated mean score were considered as being the most important, which also includes the core value/ideal ‘1’, despite the calculated standard deviation of 3.35, because the mean score was among the highest. The high standard of deviation was acknowledged, though it was not taken into consideration when identifying the most important core values/ideals of the grouping. The participants suggested re-evaluating the importance of core values/ideals of an environmental grouping in approximately 2 to 5 years.
4.5.3 Prioritisation of core values/ideals for an Economic grouping

Table 4.6: Prioritisation of core values/ideals for an economic grouping

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Data analysis

There is a noticeably high variation in participants’ responses for most of the prioritised core values/ideals of a grouping. This could plausibly be explained by participants being from countries with significantly different economies (Malaysia, Australia, Canada, Netherlands), and sectors (education, mining, finance, UN advisory, and energy), and hence, having very different views on what core values/ideals were the most important. Whilst the calculated standard deviation was acknowledged, it was not taken into consideration when identifying the most important core values/ideals of an economic grouping. The core values/ideals with the highest mean score (core values/ideals 7, 8, 9, and 10) were considered as the most important. Since core value/ideal 8 and 10 received equal mean scores, four values/ideals of a grouping were considered as being the most important. The participants suggested re-evaluating importance of the core values/ideals in approximately 2 to 5 years.

4.5.4 Additional ‘Polity’ grouping

83% of the participating CSR experts agreed that the ‘Polity’ grouping should be considered by transcendent businesses. However, there was a suggestion made by one of the participating CSR experts that the ‘Polity’ grouping should be renamed ‘Governance’. The CSR experts suggested the following changes to the presented core values/ideals of the ‘Polity’ / ‘Governance’ grouping:
• ‘Create strong and effective national and global governance’ core value/ideal to be renamed to ‘Emphasise local governance, integrated with regional and national governance’

• ‘Create a good policy environment (e.g. financial policies that are market-aware)’ should be modified to ‘Create a good policy environment (e.g. create market mechanisms that are sustainability aware and reward progressively reduced material and energy inputs)’

• ‘Build partnerships in pursuit of common goals’ core value/ideal “is too broad, there is a need to define ‘whose common goals’, otherwise it could be easily misconstrued (similarly how businesses sometimes abuse the concept of sustainability to be about profit)”

• ‘Develop collaborative leadership across sectors’ core value/ideal of the Governance grouping to be added to the list

Further comment was provided by one of the participant who stated that:

"A key issue is the extent to which business should be 'heard' in determining policy issues – business has a right to contribute to, but not dominate, discussions. Therefore responsible lobbying is a key value, which might include not making monetary political donations, disclosing all lobbying activities and government submissions etc."

(CSR expert, cited from the survey)
4.5.5 Prioritisation of core values/ideals for a Polity/Governance grouping:

Table 4.7: Prioritisation of core values/ideals for a polity/governance grouping

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Data analysis
Response from participant 1 was not considered in the data analysis as the participant prioritised only three values/ideals from the list. The core values/ideals 2, 4, 5, and 10 were considered the most important core values/ideals of a polity/governance grouping, since they achieved the highest mean score, even though standard deviation ranged from 3.05 to 3.78 for those values/ideals. Standard deviation was not considered when identifying the most important core values/ideals of the grouping; the most important core values/ideals were selected based on the highest achieved mean score only. It was speculated the high standard deviation was caused by participants being from different countries with various cultures, traditions, and governance requirements, and hence, having very different views on values/ideals of a polity/governance grouping.

4.5.6 Additional ‘Sustainable human development’ grouping
It was agreed by all (100%) of the participants that the ‘Sustainable human development’ grouping should be considered by businesses that go beyond profit making. The following changes to the core values/ideals of the grouping were suggested by the participants:

- ‘Protect future through acknowledging the past and educating future generations’ core value/ideal “is slightly problematic as it dismisses the responsibility of the present generation”
- ‘Change today’s consumption patterns for tomorrow’s human development’ core
value/ideal “is also broad and easily misconstrued. Some would argue that without consumption there is no development”

Further comments provided by the participating CSR experts:

“The development of happiness or optimism through education and self realisation, i.e. assisting staff to recognize and work to their strengths”, to also be considered by transcendent businesses.

“This is a comprehensive list” agreed one of the participating CSR experts.

4.5.7 Prioritisation of core values/ideals for a Sustainable human development grouping

Table 4.8: Prioritisation of core values/ideals for a sustainable human development grouping

<table>
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Data analysis

The participating CSR experts provided feedback to the presented core values/ideals of the Sustainable human development grouping. However, they did not suggest any major change, or additional core values/ideals of the grouping. The small standard deviation for the core value/ideal 3 and 4 indicates the strength of the choice across all CSR experts, however, the core value/ideal ‘5’ was considered as one of the most important because of its high mean score. The researcher did not take into consideration the calculated standard deviation, and selected three values/ideals with the highest mean score.
4.5.8 Research findings – prioritised core values/ideals for verified typological groupings

The proposition that major typological groupings and their initial values/ideals could be effectively identified by conducting content analysis of world reports was confirmed – the participating CSR experts agreed with typological groupings and their core values/ideals proposed by the researcher. The most important core values/ideals of each typological grouping were identified and a consensus among participating CSR experts was achieved. However, there was recorded a noticeable variation in responses of the participants, sometimes even contradiction (standard deviation ranging from 0.84 to 4.22). For example, (refer to the Table 4.8 above) participant 5 claimed that the core value/ideal 1 of a Sustainable human development grouping was the least important while participant 6 claimed that the same value/ideal was in fact the most important. Given the small number in the sample and a high standard deviation, validity of the outcome of Delphi cycle A2 was questioned. This absolute contradiction of perceiving the same values/ideals differently was recorded across all typological groupings (refer to Table 4.4 to Table 4.8). Moreover, there was an unexplained variation in responses between the first and the second survey round. In the second survey round (Delphi cycle A2) the values/ideals were presented to the participants in already pre-prioritised order, based on the outcome of the first survey round (Delphi cycle A1) – the values/ideals that received the highest score (nominated as the most important) in Delphi cycle A1 were presented on the top of the list in Delphi cycle A2. Therefore, it was expected the first top five values/ideals of each typological grouping would receive higher priority than the last five values/ideals of the list.

The following are the most important core values/ideals for major typological groupings, consensus by the participating CSR experts:

**Social grouping:**
1. Protect human rights (e.g. women rights, children rights, minority groups rights)
2. Achieve universal primary education and distribution of knowledge
3. Protect and promote human health

**Environmental grouping:**
1. Maximise recyclability and reusability of resources
2. Protect and ensure access to clean water
3. Minimise waste and pollutants production, land degradation

**Economic grouping:**
1. Redirect growth to non-material growth through education and incentives
2. Minimise financial volatility and economic insecurity, achieve sustainable economic growth
3. Create fair international labour and migration rules and freedom for everyone
4. Manage world population and ageing generation trends

**Polity/Governance grouping:**
1. Be responsible to people – to equity, to justice, to enlarging the choices of all when influencing others (e.g. by sponsoring, donating money)
2. Build more coherent and more democratic architecture for global governance
3. Build partnerships in pursuit of common (human development) goals
4. Broaden partnership with civil society groups, donors, and others in the international community

*Sustainable human development grouping:*
1. Develop both individual and collective leadership capacity
2. Develop society partnership
3. Ensure collective responsibility

The outcome of Delphi cycle A2 produced a list of 17 of the most important core values/ideals of five major typological groupings. However, because of the variety of the core values/ideals, there was a need to prioritise these across all typological groupings. Whilst the Sustainable Asset management (SAM) group with their Dow Jones Sustainability Indexes (DJSI) argue that the actual priority and weightings for the economic, environmental and social dimension differ between industry groups (to reflect the sector’s specific exposure to certain sustainability trends), in the general assessment they assign the highest priority and weighting to economic values/ideals and lowest priority/weighting to environmental values/ideals. Since there is limited information in relation to prioritising core values/ideals across multiple typological groupings, the participating CSR experts were asked to express their views on how they perceived each individual core value/ideal compared to the rest, as reported in the following section.
4.6 Prioritisation of core values/ideals across major typological groupings

**Delphi cycle A3:**

The aim of Delphi cycle A3 was to prioritise the most important core values/ideals of each typological grouping (outcome of Delphi cycle A2) across all typological groupings (see Appendix III for copy of the survey).

The CSR experts were presented with a single list of 17 of the most important core values/ideals of Social, Environmental, Economic, Governance, and Sustainable human development groupings – the outcome of Delphi cycle A2 (see Section 4.5.8). They were asked to prioritise (rank) all listed values/ideals based on their relative importance. Delphi cycle A3 was conducted between 20th September 2010 and 26th September 2010.

**Data analysis**

*Prioritisation of the most important core values/ideals for major typological groupings:*

Table 4.9: Prioritisation of the most important core values/ideals for major typological groupings

<table>
<thead>
<tr>
<th>LISTED VALUES/IDEALS</th>
<th>PARTICIPANTS</th>
<th>Mean Score</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1  2  3  4  5  6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>16 17 6 1 7 1</td>
<td>8.0</td>
<td>7.04</td>
</tr>
<tr>
<td>2</td>
<td>10 10 5 3 6 4</td>
<td>6.3</td>
<td>3.01</td>
</tr>
<tr>
<td>3</td>
<td>17 9 10 2 16 5</td>
<td>9.8</td>
<td>5.91</td>
</tr>
<tr>
<td>4</td>
<td>15 8 4 4 5 8</td>
<td>7.3</td>
<td>4.18</td>
</tr>
<tr>
<td>5</td>
<td>12 6 8 16 4 2</td>
<td>8.0</td>
<td>5.22</td>
</tr>
<tr>
<td>6</td>
<td>14 7 7 12 3 3</td>
<td>7.7</td>
<td>4.55</td>
</tr>
<tr>
<td>7</td>
<td>13 13 2 13 8 9</td>
<td>9.7</td>
<td>4.37</td>
</tr>
<tr>
<td>8</td>
<td>6 15 3 5 11 10</td>
<td>8.3</td>
<td>4.46</td>
</tr>
<tr>
<td>9</td>
<td>4 11 13 9 2 11</td>
<td>8.3</td>
<td>4.37</td>
</tr>
<tr>
<td>10</td>
<td>1 3 9 17 15 6</td>
<td>8.5</td>
<td>6.44</td>
</tr>
<tr>
<td>11</td>
<td>3 14 1 10 1 12</td>
<td>6.8</td>
<td>5.85</td>
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<tr>
<td>12</td>
<td>9 16 11 11 17 7</td>
<td>11.8</td>
<td>3.92</td>
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<td>8.2</td>
<td>4.07</td>
</tr>
<tr>
<td>14</td>
<td>8 1 14 7 10 14</td>
<td>9.0</td>
<td>4.90</td>
</tr>
<tr>
<td>15</td>
<td>5 12 15 8 12 15</td>
<td>11.2</td>
<td>3.97</td>
</tr>
<tr>
<td>16</td>
<td>2 4 16 15 13 16</td>
<td>11.0</td>
<td>6.32</td>
</tr>
<tr>
<td>17</td>
<td>11 5 17 14 14 17</td>
<td>13.0</td>
<td>4.52</td>
</tr>
</tbody>
</table>

The table above shows responses of the participants with the calculated mean score of the
priority assigned, and the calculated standard deviation. What is noticeable is a very high variation in responses of the participants, sometimes, even contradictions. For example, participant 2 claimed that the core value/ideal 1 was the most important, while participant 4 claimed that the same value/ideal was the least important. Participant 4 claimed that value/ideal 10 was the most important while participant 1 claimed the same value/ideal was the least important. Previously (refer to Table 4.8) the claims of participant 5 and participant 6 were in contradiction. However, now the claims of participant 2 and participant 4 (and participants 1 and 4) are in contradiction. A question was raised as to why contradictions between participants’ responses were inconsistent throughout the typological groupings and why such a high variation of responses occurred. These outcomes raised a question of validity. Therefore, the Delphi cycle A2 and A3 were repeated with a new group of CSR experts – CSR experts Group2. Details how CSR experts Group2 were selected are provided on p. 151.

4.6.1 Research findings – core values/ideals prioritised across major typological groupings

Delphi cycle A3 returned the following list of prioritised core values/ideals of the identified major typological groupings5:

1. (12) Achieve universal primary education and distribution of knowledge
2. (17) Protect and promote human health
3. (5) Protect human rights (e.g. women rights, children rights, minority group’s rights)
4. (15) Protect and ensure access to clean water
5. (13) Maximise recyclability and reusability of resources
6. (14) Minimise waste and pollutants production, land degradation
7. (6) Redirect growth to non-material growth through education and incentives
8. (9) Create fair international labour and migration rules and freedom for everyone
9. (10) Minimise financial volatility and economic insecurity, achieve sustainable economic growth
10. (8) Manage world population and ageing generation trends
11. (16) Build more coherent and more democratic architecture for global governance
12. (2) Be responsible to people – to equity, to justice, to enlarging the choices of all when influencing others (e.g. by sponsoring, donating money, etc.)
13. (11) Build partnerships in pursuit of common (human development) goals
14. (7) Broaden partnership with civil society groups, donors, and others in the international community

5 The above-listed values/ideals are listed in order as they were presented to participants for prioritisation (see Appendix 3). The numbers in brackets show consensus priority number after prioritisation – the lowest score in the bracket indicates the most important core value/ideal; the highest score in the bracket indicates the least important core value/ideal.
15. (3) Develop both individual and collective leadership capacity
16. (4) Develop society partnership
17. (1) Ensure collective responsibility

After analysing the outcome of the Delphi cycle A3, a number of questions were raised. For example, how can we explain that the experts agreed that 'Protect human health' core value/ideal was the least important core value/ideal among 17 core values/ideals? The plausible answer was that they ranked ‘Ensure collective responsibility’ core value/ideal as the most important; therefore, it could be hypothesised that if we are collectively responsible for our actions, the rest of the core values/ideals (e.g. protecting human health) will be taken care of. Such a hypothesis suggested that the core values/ideals were strongly inter-linked, which was also argued by one of the participating CSR expert, stating: “It's difficult to identify individual issues here because they all are inter-linked.”

(Cited from survey, CSR expert.)
4.7 Assigning weighting points to each prioritised core value/ideal

After the relative priority of each core value/ideal was identified, the researcher calculated weighting points for each to identify its relative importance expressed by a numerical value, in the same way the DJSI uses weighting points of criteria for assessing performance of businesses. Being able to assess performance of any business using weighting points, assigned to tangible and intangible criteria (core values/ideals), was perceived by the researcher as very important, especially in order for a business to monitor, measure, and report its beyond profit transcendent performance.

4.7.1 Assigning weighting points for each prioritised core value/ideal

Table 4.10: Assigning weighting points for each prioritised core value/ideal

<table>
<thead>
<tr>
<th>LISTED VALUES/IDEALS</th>
<th>PARTICIPANTS</th>
<th>AVERAGE SCORE</th>
<th>CORE VALUE WEIGHTING</th>
<th>AVERAGE GROUPING WEIGHTING</th>
</tr>
</thead>
<tbody>
<tr>
<td>Original Order</td>
<td>Prioritised Order</td>
<td>Assigned Priority</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>12</td>
<td>16 17 6 1 7 1</td>
<td>8.0</td>
<td>0.052</td>
</tr>
<tr>
<td>2</td>
<td>17</td>
<td>10 10 5 3 6 4</td>
<td>6.3</td>
<td>0.041</td>
</tr>
<tr>
<td>3</td>
<td>5</td>
<td>17 9 10 2 16 5</td>
<td>9.8</td>
<td>0.064</td>
</tr>
<tr>
<td>4</td>
<td>15</td>
<td>15 8 4 5 8</td>
<td>7.3</td>
<td>0.048</td>
</tr>
<tr>
<td>5</td>
<td>13</td>
<td>12 6 8 16 4 2</td>
<td>8.0</td>
<td>0.052</td>
</tr>
<tr>
<td>6</td>
<td>14</td>
<td>14 3 7 12 3 3</td>
<td>7.7</td>
<td>0.050</td>
</tr>
<tr>
<td>7</td>
<td>6</td>
<td>13 13 2 13 8 9</td>
<td>9.7</td>
<td>0.063</td>
</tr>
<tr>
<td>8</td>
<td>9</td>
<td>6 15 3 5 11 10</td>
<td>8.3</td>
<td>0.055</td>
</tr>
<tr>
<td>9</td>
<td>10</td>
<td>4 11 13 9 2 11</td>
<td>8.3</td>
<td>0.055</td>
</tr>
<tr>
<td>10</td>
<td>8</td>
<td>1 3 9 17 15 6</td>
<td>8.5</td>
<td>0.056</td>
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<td>11</td>
<td>16</td>
<td>3 14 1 10 1 12</td>
<td>6.8</td>
<td>0.044</td>
</tr>
<tr>
<td>12</td>
<td>2</td>
<td>9 16 11 11 17 7</td>
<td>11.8</td>
<td>0.077</td>
</tr>
<tr>
<td>13</td>
<td>11</td>
<td>7 2 12 6 9 13</td>
<td>8.2</td>
<td>0.054</td>
</tr>
<tr>
<td>14</td>
<td>7</td>
<td>8 1 14 7 10 14</td>
<td>9.0</td>
<td>0.059</td>
</tr>
<tr>
<td>15</td>
<td>3</td>
<td>5 12 15 8 12 15</td>
<td>11.2</td>
<td>0.073</td>
</tr>
<tr>
<td>16</td>
<td>4</td>
<td>2 4 16 15 13 16</td>
<td>11.0</td>
<td>0.072</td>
</tr>
<tr>
<td>17</td>
<td>1</td>
<td>11 5 17 14 14 17</td>
<td>13.0</td>
<td>0.085</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td><strong>152.90</strong></td>
<td><strong>1.00</strong></td>
<td><strong>45.1</strong></td>
</tr>
</tbody>
</table>

The table above shows weighting points for each core value/ideal, calculated by the researcher based on the relative priority number given, and consensus by the participating CSR experts in Delphi cycle A3. The total average score of all the prioritised core values/ideals was 152.90. Weighting points of each individual core value/ideal were calculated by dividing the average score of each value/ideal by 152.90. Therefore, for
example, weighting points of core value/ideal 1 is 0.052. (8.0 / 152.90 = 0.052). The total weighting points of all core values/ideals is 1, which represents 100%. Average weighting points of each typological grouping is shown in the final right hand column. The total of all typological groupings weighting was 45.1. Dividing average weighting of each grouping by 45.1 and multiplying it by 100, the proportional importance of each typological grouping was calculated. For example, the proportional importance of values/ideals of a social grouping was calculated to be 17.7% (8.0 / 45.1 * 100 = 17.7). According to the participating CSR experts, values/ideals of a sustainable human development grouping were the most important and represented 25.9%, followed by the governance grouping (20.0%), economic (19.3%), social (17.7%), and environmental (17.1%) groupings. The following pie chart shows the proportional importance of the values/ideals all groupings.

*Proportion of importance of social (17.7%), environmental (17.1%), economic (19.3%), governance (20.0%), and sustainable human development groupings (25.9%):*
4.7.2 Research findings – assigned weighting points to each prioritised core value/ideal

The following is a list of prioritised and weighted core values/ideals for major typological groupings as reached by the consensus of the CSR experts. They are listed from the most important (1) to the least important (17). The total weighting of all values/ideals equals 1.000 or 100%.

Table 4.11: Research findings – assigned weighting points to each prioritised core value/ideal

<table>
<thead>
<tr>
<th>Priority</th>
<th>Core Value/Ideal</th>
<th>Weighting</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ensure collective responsibility</td>
<td>0.085</td>
</tr>
<tr>
<td>2</td>
<td>Be responsible to people – to equity, to justice, to enlarging the choices of all when influencing others (e.g. by sponsoring, donating money, etc.)</td>
<td>0.077</td>
</tr>
<tr>
<td>3</td>
<td>Develop both individual and collective leadership capacity</td>
<td>0.073</td>
</tr>
<tr>
<td>4</td>
<td>Develop society partnership</td>
<td>0.072</td>
</tr>
<tr>
<td>5</td>
<td>Protect human rights (e.g. women rights, children rights, minority group’s rights)</td>
<td>0.064</td>
</tr>
<tr>
<td>6</td>
<td>Redirect growth to non-material growth through education and incentives</td>
<td>0.063</td>
</tr>
<tr>
<td>7</td>
<td>Broaden partnership with civil society groups, donors, and others in the international community</td>
<td>0.059</td>
</tr>
<tr>
<td>8</td>
<td>Manage world population and ageing generation trends</td>
<td>0.056</td>
</tr>
<tr>
<td>9</td>
<td>Create fair international labour and migration rules and freedom for everyone</td>
<td>0.055</td>
</tr>
<tr>
<td>10</td>
<td>Minimise financial volatility and economic insecurity, achieve sustainable economic growth</td>
<td>0.055</td>
</tr>
<tr>
<td>11</td>
<td>Build partnerships in pursuit of common (human development) goals</td>
<td>0.054</td>
</tr>
<tr>
<td>12</td>
<td>Achieve universal primary education and distribution of knowledge</td>
<td>0.052</td>
</tr>
<tr>
<td>13</td>
<td>Maximise recyclability and reusability of resources</td>
<td>0.052</td>
</tr>
<tr>
<td>14</td>
<td>Minimise waste and pollutants production, land degradation</td>
<td>0.050</td>
</tr>
<tr>
<td>15</td>
<td>Protect and ensure access to clean water</td>
<td>0.048</td>
</tr>
<tr>
<td>16</td>
<td>Build more coherent and more democratic architecture for global governance</td>
<td>0.044</td>
</tr>
<tr>
<td>17</td>
<td>Protect and promote human health</td>
<td>0.041</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>1.000</strong></td>
</tr>
</tbody>
</table>
The CSR expert group was presented with the research findings and asked to provide some explanation as to why such a high variation in participants’ responses occurred. They were also asked to validate the generated list of prioritised and weighted core values/ideals in terms of whether they agreed with it. Only a single participant out of the six CSR experts, provided feedback:

“I have to say looking at the results that you would get a very wide range of answers depending upon a number of factors – location of the person, type of industry, economic background, political beliefs, etc. A simple example is that being in Canada (and not working for say an international mining company), I would not rank human rights or partnerships with civil society groups very high because they are not within my day-to-day reality of concern. Waste, conservation, etc. are however.”

(Cited from email, CSR expert)

Considering the participating CSR experts were from Malaysia, Australia, Canada, and Netherlands, and had experience from Europe, Australia, Asia, US, and Scandinavia, they had a wide range of backgrounds, political beliefs, and industry experience. Therefore, the feedback above, provided by the CSR expert, plausibly explains the high variation in participants’ responses. This CSR expert also stated:

“I have to say that you have such a large number of values that again the answers are going to be spread out significantly because people likely check answers relative to the other choices – the more choices the more spread out answers will be. Again using my initial answer, although I wouldn’t rank human rights high, I may still give it a fairly good score because it is important to be in general, but as I said before not as important as say the environment.”

(Cited from email, CSR expert)

Since the participating CSR experts were asked to prioritise a list of 17 diversified values/ideals, the feedback provided by this expert also plausibly explains the high variation in the participants’ responses. Based on this feedback, it was proposed that conducting Phase I in future would require a focus on identifying a small number of core values/ideals for each typological grouping. In practical terms, a small number in this case means a total of about ten, which is also recommended by Parmenter (2010). Furthermore, it was proposed that if Delphi cycles A2 and A3 are repeated and a high variation in participants’ responses occur, there will be a need to minimise the variation, for example, by applying a three-sigma rule to the participants’ responses. Based on these outcomes, it was proposed:

- Delphi cycle A2 and Delphi cycle A3 be repeated with a new group of CSR experts (CSR experts Group2)
- CSR experts Group2 be asked to prioritise core values/ideals by assigning a priority number 1 to the most important core value/ideal and priority number 10 to the least
important value/ideal (reverse ranking system compared to the ranking conducted with the CSR experts Group1)

- If variation in participants’ responses conducted with CSR experts Group2 is high, a three-sigma rule be applied to participants’ responses and only the core values/ideals where standard deviation is lower than 2, with mean score lower than 5, (focusing on the first top five values/ideals) be considered as a consensus

- Outcomes of Delphi cycle A3 conducted with CSR experts Group1 to be compared against outcomes of Delphi cycle A3 conducted with CSR experts Group2. If the list of prioritised and weighted core values generated by two CSR expert groups varies, both CSR expert groups to be presented with both lists and asked to validate the outcome and provide some explanation

- If outcomes of Delphi cycle A3 conducted with CSR experts Group1 is identical with outcome of Delphi cycle A3 conducted with CSR experts Group2, methods embedded within Phase I of the TRM+ to be evaluated as reliable and repeatable, and the research outcome to be considered as a credible validated outcome.
4.8 Validating prioritised core values/ideals of each typological grouping

The researcher created a new list of 44 CSR experts selected as before. They were provided with information explaining the project and asked to sign a consent form agreeing to their involvement in the project. 14% of the invitation emails sent to potential participants bounced back as undeliverable. Out of the remainder, 7 (18.42%) showed an interest, but only 3 (7.89%) signed the consent form, thus the 42 CSR experts previously contacted were re-contacted. Four out of 42 (9.52%) returned signed consent forms agreeing to participate in the research. All together, seven CSR experts formed the second group of CSR experts, but only five (6.25%) actually participated. They were all internationally recognised CSR experts with experience from Europe, Australia, Asia, US, and Scandinavia.

4.8.1 Delphi cycle A2 repeated with CSR experts Group2:

The aim of repeating Delphi cycle A2 was to achieve consensus among participating CSR experts Group2 on three (or less than three), of the most important core values/ideals for each of the presented typological groupings (Social, Environmental, Economic, Governance, Sustainable human development); and to identify in how many years the identified consensus of most important core values/ideals should be revisited and re-evaluated. The second aim of repeating Delphi cycle A2 with CSR experts Group2 was to investigate whether a variation in the participants’ responses would occur again, and to compare outcomes of Delphi cycle A2 conducted with CSR experts Group1 against outcomes of Delphi cycle A2 conducted with CSR experts Group2. Delphi cycle A2 presented the CSR experts Group2 with five typological groupings, since CSR experts Group1 confirmed and agreed that these were those that transcendent businesses should simultaneously account for. The ‘Polity’ grouping was renamed ‘Governance’ as suggested by participants from CSR experts Group1, with the following modifications:

- ‘Create strong and effective national and global governance’ core value/ideal was renamed ‘Emphasise local governance, integrated with regional and national governance’
- ‘Build partnerships in pursuit of common goals’ core value/ideal was modified to ‘Build partnerships in pursuit of common (human development) goals’
- ‘Create a good policy environment (e.g. financial policies that are market-aware)’ core value/ideal was modified to ‘Create a good policy environment (e.g. create market mechanisms that are sustainability aware and reward progressively reduced material and energy inputs)’
- Additional core value/ideal ‘Develop collaborative leadership across sectors’ was added to the list of Governance typological grouping

The above modifications were based on suggestions given by participants from CSR experts
Group1 (see Appendix IV for a copy of the survey presented to CSR experts Group2). The CSR experts Group2 were asked to prioritise by ranking core values/ideals of each typological grouping verified by CSR experts Group1. Delphi cycle A2, conducted with CSR experts Group2, ran between 4th October 2010 and 10th October 2010. Despite seven CSR experts returning their signed consent form to participate in the research, only five actually did.

Prioritisation of core values/ideals of a Social grouping – CSR experts Group2

Table 4.12: Prioritisation of core values/ideals of a social grouping – CSR experts Group2

<table>
<thead>
<tr>
<th>LISTED VALUES/IDEALS</th>
<th>PARTICIPANTS</th>
<th>Mean Score</th>
<th>Medium</th>
<th>Mode</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
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<td>1</td>
<td>7</td>
<td>4.67</td>
<td>5</td>
<td>-</td>
<td>2.08</td>
</tr>
<tr>
<td>2</td>
<td>8</td>
<td>8.00</td>
<td>8</td>
<td>8</td>
<td>0.00</td>
</tr>
<tr>
<td>3</td>
<td>5</td>
<td>3.67</td>
<td>3.5</td>
<td>-</td>
<td>1.53</td>
</tr>
<tr>
<td>4</td>
<td>3</td>
<td>3.67</td>
<td>3.5</td>
<td>-</td>
<td>1.73</td>
</tr>
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<td>4</td>
<td>3.67</td>
<td>3.67</td>
<td>4</td>
<td>0.58</td>
</tr>
<tr>
<td>7</td>
<td>5</td>
<td>3.67</td>
<td>3.67</td>
<td>5</td>
<td>2.31</td>
</tr>
</tbody>
</table>

A reverse prioritisation system was used with CSR experts Group2 – the participants were asked to rank values/ideals by assigning a priority number 1 (to a core value/ideal with the highest priority) to 8 (to a core value/ideal with the lowest priority). Since a high variation in the participants’ responses occurred again (standard deviation ranging from 0.71 to 4.10), a three-sigma rule was applied to the participants’ responses. (Note: table 4.12 to table 4.16 shows the calculated standard deviation after applying the three-sigma rule to the collected data. The data taken out after applying the three-sigma rule is shown with a double strike through lines.) Only the core values/ideals where the mean ranking given by participating CSR experts Group2 was lower than five (focusing on the most important core values/ideals), with a standard deviation lower than two, were considered as a consensus. Therefore, only the core values 3 and 7 were so considered. It was suggested Social grouping’s core values should be reviewed in approximately 6.6 years time (3 – 15 years).
### Prioritisation of core values/ideals of an Environmental grouping – CSR experts Group2

Table 4.13: Prioritisation of core values/ideals of an environmental grouping – CSR experts Group2

<table>
<thead>
<tr>
<th>LISTED VALUES/IDEALS</th>
<th>PARTICIPANTS</th>
<th>Mean Score</th>
<th>Medium</th>
<th>Mode</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
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<td>2.5</td>
<td>2</td>
<td>0.58</td>
</tr>
<tr>
<td>2</td>
<td>3</td>
<td>4.00</td>
<td>4.5</td>
<td>1 &amp; 8</td>
<td>3.61</td>
</tr>
<tr>
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<td>3</td>
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<td>-</td>
<td>2.65</td>
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<td>5</td>
<td>4</td>
<td>7.67</td>
<td>7.5</td>
<td>9</td>
<td>1.53</td>
</tr>
<tr>
<td>6</td>
<td>4</td>
<td>4.67</td>
<td>4.5</td>
<td>4 &amp; 5</td>
<td>0.58</td>
</tr>
<tr>
<td>7</td>
<td>6</td>
<td>6.00</td>
<td>6</td>
<td>6</td>
<td>0.00</td>
</tr>
<tr>
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<td>4.00</td>
<td>4</td>
<td>-</td>
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</tr>
<tr>
<td>9</td>
<td>4</td>
<td>5.67</td>
<td>6.5</td>
<td>4 &amp; 9</td>
<td>2.89</td>
</tr>
</tbody>
</table>

Note: Only the core value/ideal 1 and the core value/ideal 8 were considered a consensus. These are to be reviewed in approximately 7.2 years time (3 – 15 years).

### Prioritisation of core values/ideals of an Economic grouping – CSR experts Group2

Table 4.14: Prioritisation of core values/ideals of an economic grouping – CSR experts Group2

<table>
<thead>
<tr>
<th>LISTED VALUES/IDEALS</th>
<th>PARTICIPANTS</th>
<th>Mean Score</th>
<th>Medium</th>
<th>Mode</th>
<th>Standard Deviation</th>
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</thead>
<tbody>
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<td>3</td>
<td>3</td>
<td>0.00</td>
</tr>
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<td>5</td>
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<td>5</td>
<td>-</td>
<td>2.00</td>
</tr>
<tr>
<td>4</td>
<td>5</td>
<td>4.67</td>
<td>5</td>
<td>4</td>
<td>1.15</td>
</tr>
<tr>
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<td>1.73</td>
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<td>6</td>
<td>7.67</td>
<td>7.5</td>
<td>-</td>
<td>2.52</td>
</tr>
<tr>
<td>7</td>
<td>7</td>
<td>5.67</td>
<td>6</td>
<td>-</td>
<td>2.08</td>
</tr>
<tr>
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<td>6</td>
<td>6.00</td>
<td>6</td>
<td>-</td>
<td>3.00</td>
</tr>
<tr>
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<td>7</td>
<td>5.67</td>
<td>5</td>
<td>-</td>
<td>4.16</td>
</tr>
</tbody>
</table>

Note: Core values/ideals 1, 2 and 4 were considered a consensus, the most important core values/ideals of an Economic typological grouping. These are to be reviewed in approximately 7.2 years time (3 – 15 years).
Prioritisation of core values/ideals of a Governance grouping – CSR experts Group2

Table 4.15: Prioritisation of core values/ideals of a governance grouping – CSR experts Group2

<table>
<thead>
<tr>
<th>LISTED VALUES/IDEALS</th>
<th>PARTICIPANTS</th>
<th>Mean Score</th>
<th>Medium</th>
<th>Mode</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
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<td>2.67</td>
<td>2.5</td>
<td>3</td>
<td>0.58</td>
</tr>
<tr>
<td>2</td>
<td>4 1 7 4</td>
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<td>4</td>
<td>-</td>
<td>3.00</td>
</tr>
<tr>
<td>3</td>
<td>7 8 11 1</td>
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<td>9</td>
<td>-</td>
<td>2.08</td>
</tr>
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<td>5.5</td>
<td>-</td>
<td>1.53</td>
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<td>7</td>
<td>-</td>
<td>2.08</td>
</tr>
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<td>2</td>
<td>1</td>
<td>1.15</td>
</tr>
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<td>7</td>
<td>-</td>
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<td>6.5</td>
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<td>1.73</td>
</tr>
<tr>
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<td>9</td>
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<td>2.31</td>
</tr>
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<td>8</td>
<td>0.58</td>
</tr>
<tr>
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<td>6 6 6 6 6</td>
<td>6.00</td>
<td>6</td>
<td>6</td>
<td>0.00</td>
</tr>
</tbody>
</table>

Only the core values/ideals 1 and 6 were considered a consensus. These are to be reviewed in approximately 7.6 years time (3 – 15 years).

Prioritisation of core values/ideals of a Sustainable human development grouping – CSR Group2

Table 4.16: Prioritisation of core values/ideals of a sustainable human development grouping – CSR experts Group2

<table>
<thead>
<tr>
<th>LISTED VALUES/IDEALS</th>
<th>PARTICIPANTS</th>
<th>Mean Score</th>
<th>Medium</th>
<th>Mode</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6 6 6 9 8</td>
<td>6.67</td>
<td>7</td>
<td>6</td>
<td>1.15</td>
</tr>
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<td>2</td>
<td>4 1 7 2</td>
<td>4.00</td>
<td>4</td>
<td>-</td>
<td>3.00</td>
</tr>
<tr>
<td>3</td>
<td>4 1 2 2</td>
<td>2.67</td>
<td>3</td>
<td>2</td>
<td>1.15</td>
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<td>8 8 6 4</td>
<td>7.33</td>
<td>7</td>
<td>8</td>
<td>1.15</td>
</tr>
<tr>
<td>5</td>
<td>3 3 3 4</td>
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<td>3.5</td>
<td>3</td>
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</tr>
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<td>2.31</td>
</tr>
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<td>6.5</td>
<td>4</td>
<td>2.65</td>
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<tr>
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<td>8 5 6 2</td>
<td>6.33</td>
<td>6.5</td>
<td>-</td>
<td>1.53</td>
</tr>
<tr>
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<td>9 9 5 7</td>
<td>8.33</td>
<td>8</td>
<td>9</td>
<td>1.15</td>
</tr>
<tr>
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<td>5 5 1 1</td>
<td>3.67</td>
<td>3</td>
<td>5</td>
<td>2.31</td>
</tr>
</tbody>
</table>

Only the core values/ideals 3 and 5 were considered a consensus of the most important core
values/ideals. These are to be reviewed in approximately 7.0 years time (3 – 15 years).

4.8.2 Research finding the core values/ideals of each grouping prioritised by CSR experts Group2:

The following are the most important core values/ideals for major typological groupings identified by the participating CSR experts Group2:

Social grouping:
1. Achieve universal primary education and distribution of knowledge
2. Protect human rights (e.g. women rights, children rights, minority groups rights)

Environmental grouping:
1. Protect and ensure access to clean water
2. Minimise waste and pollutants production, land degradation

Economic grouping:
1. Create a global partnership and cooperation for sustainable development
2. Create fair and simplified international investment and trade rules, equal access to resources
3. Combat bribery and corruption, promote transparency

Governance grouping:
1. Emphasise local governance, integrated with regional and national governance
2. Create a good policy environment (e.g. create market mechanisms that are sustainability aware and reward progressively reduced material and energy inputs)

Sustainable human development grouping:
1. Develop both individual and collective leadership capacity
2. Ensure collective responsibility

Even after applying the three-sigma rule to the collected data, the standard deviation ranged from 0.00 to 4.16. However, the most important core values/ideals became more obvious to identify. Since there was a high variation also in CSR experts Group2 responses, it was proposed the participants would need to explain the research outcomes. A question was raised as to whether the high variation in participants’ responses was caused by variation in their geographical location, type of industry they came from, their economic background, and political beliefs, for example. The speculation that some of the participants may have misinterpreted the ranking system was ruled out. Even when the participants were asked to prioritise the listed core values/ideals from the most important core values/ideals (priority number 1) to the least important core values/ideals (priority number 10), and the explanation of the priority system was very straightforward, there was still significant variation in the participants’ responses.
4.8.3 Research findings – CSR experts Group1 versus CSR experts Group2

The maximum standard deviation within the CSR experts Group1 was 4.22 and the maximum standard deviation within the CSR experts Group2 was 4.10. Applying the three-sigma rule to the responses of CSR experts Group2 even increased the standard deviation to 4.16, which was presumably caused by the low number of participants (only five CSR experts participated in the CSR experts Group2). However, the most important core values/ideals stood out after applying a three-sigma rule to the collected data. There was also a noticeable difference as to when the most important core values/ideals should be revisited and reviewed in the future. While the CSR experts Group1 suggested reviewing the core values/ideals in approximately 4 years time (2 to 5 years), the CSR experts Group2 suggested reviewing the core values/ideals in approximately 7 years time (3 to 15 years).

The following is a comparison of the most important core values/ideals of each typological grouping identified by CSR experts Group1 and Group2. Bolding represents values/ideals that both CSR expert groups identified as the most important. The list of the most important core values/ideals generated by CSR expert Group2 is shorter as the three-sigma rule was applied to the collected data and as a consensus, the most important core values/ideals were considered only the ones where standard deviation was lower than 2.

**Social grouping – the most important core values/ideals consensus by CSR experts Group1:**
1. Protect human rights (e.g. women rights, children rights, minority groups rights)
2. Achieve universal primary education and distribution of knowledge
3. Protect and promote human health

**Social grouping – the most important core values/ideals consensus by CSR experts Group2:**
1. Achieve universal primary education and distribution of knowledge
2. Protect human rights (e.g. women rights, children rights, minority groups rights)

The CSR experts Group2 and Group1 identified the same most important core values/ideals for the Social typological grouping.

**Environmental grouping – the most important core values/ideals consensus by CSR experts Group1:**
1. Maximise recyclability and reusability of resources
2. Protect and ensure access to clean water
3. Minimise waste and pollutants production, land degradation

**Environmental grouping – the most important core values/ideals consensus by CSR experts Group2:**
1. Protect and ensure access to clean water
2. Minimise waste and pollutants production, land degradation

The CSR experts Group2 and Group1 identified the same most important core values/ideals for the Environmental typological grouping.

**Economic grouping – the most important core values/ideals consensus by CSR experts**
Group1:
1. Redirect growth to non-material growth through education and incentives
2. Minimise financial volatility and economic insecurity, achieve sustainable economic growth
3. Create fair international labour and migration rules and freedom for everyone
4. Manage world population and ageing generation trends

Economic grouping – the most important core values/ideals consensus by CSR experts Group2:
1. Create a global partnership and cooperation for sustainable development
2. Create fair and simplified international investment and trade rules, equal access to resources
3. Combat bribery and corruption, promote transparency

The CSR experts Group2 and Group1 identified different core values/ideals for Economic typological grouping.

Governance grouping – the most important core values/ideals consensus by CSR experts Group1:
1. Be responsible to people – to equity, to justice, to enlarging the choices of all when influencing others (e.g. by sponsoring, donating money)
2. Build more coherent and more democratic architecture for global governance
3. Build partnerships in pursuit of common (human development) goals
4. Broaden partnership with civil society groups, donors, and others in the international community

Governance grouping – the most important core values/ideals consensus by CSR experts Group2:
1. Emphasise local governance, integrated with regional and national governance
2. Create a good policy environment (e.g. create market mechanisms that are sustainability aware and reward progressively reduced material and energy inputs)

Note: The CSR experts Group2 and Group1 identified different core values/ideals of Governance typological grouping.

Sustainable human development grouping – the most important core values/ideals consensus by CSR experts Group1:
1. Develop both individual and collective leadership capacity
2. Develop society partnership
3. Ensure collective responsibility

Sustainable human development grouping – the most important core values/ideals consensus by CSR experts Group2:
1. Develop both individual and collective leadership capacity
2. Ensure collective responsibility

The CSR experts Group2 and Group1 identified the same most important core values/ideals of Sustainable human development typological grouping. Overall, the CSR experts Group1 and the CSR experts Group2 agreed on the identical most important values/ideals for the Social, Environmental, and Sustainable human development grouping. However, they identified different core values/ideals of the economic and governance groupings.
4.9 Validating prioritised core values/ideals across typological groupings

4.9.1 Delphi cycle A3 repeated with CSR experts Group2

Data collection

The CSR experts Group2 were presented with a single list of the most important core values/ideals of Social, Environmental, Economic, Governance, and Sustainable human development groupings – the outcome of Delphi cycle A2 (see Section 4.8.2). The participating CSR experts Group2 were asked to prioritise (by ranking) all the listed core values/ideals based on the relative importance of each core value/ideal. Delphi cycle A3 with five participants was conducted between 11th October 2010 and 17th October 2010.

Prioritisation of the most important core values/ideals of major typological groupings – CSR experts Group2

Table 4.17: Prioritisation of the most important core values/ideals of major typological groupings – CSR experts Group2

<table>
<thead>
<tr>
<th>LISTED VALUES/IDEALS</th>
<th>PARTICIPANTS</th>
<th>Mean Score before</th>
<th>Mean Score after</th>
<th>Standard Deviation before</th>
<th>Standard Deviation after</th>
</tr>
</thead>
<tbody>
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<td>1</td>
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<td></td>
<td></td>
</tr>
<tr>
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<td></td>
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</tr>
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<td></td>
</tr>
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<td></td>
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<tr>
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<td>7 6 9 5 2</td>
<td>7.80 8.67 3.56 1.53</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
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<td>5 6 8 6 3</td>
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<td></td>
<td></td>
</tr>
<tr>
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<td>8 3 10 6 5</td>
<td>8.80 9.00 1.30 1.00</td>
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<tr>
<td>9</td>
<td>4 3 7 10 1</td>
<td>5.20 4.67 3.90 2.08</td>
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<tr>
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<td>1 9 7 11 4</td>
<td>8.60 9.00 2.61 2.00</td>
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<td>1 8 1 1 10</td>
<td>3.80 3.33 3.83 4.04</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The table above shows the rankings assigned to the most important core values/ideals, 1 to 11 (outcome of Delphi cycle A2 ran with CSR experts Group2). Since there was a high variation in the participants’ responses, even contradictions (e.g. participant 5 claimed that a core value/ideal 9 was the most important, while participant 4 claimed that the same core value/ideal was the least important), a three-sigma rule was applied to the collected data. The table shows the calculated mean priority before and after applying the three-sigma rule to the collected data, as well as the calculated standard deviation before and after applying the three-sigma rule.
4.9.2 Research findings – core values/ideals prioritised across typological groupings

Delphi cycle A3, run with CSR experts Group2, returned the following list of the most important core values/ideals of Social, Environmental, Economic, Governance, and Sustainable human development groupings. The listed core values/ideals are listed in order, as they were presented to the participants (see Appendix V). The numbers in brackets show the consensus priority number after prioritisation and after applying a three-sigma rule to the collected data. The lowest score in each bracket indicates the most important core value/ideal; the highest score in each bracket indicates the least important core value/ideal.

1. (7) Achieve universal primary education and distribution of knowledge
2. (5) Protect human rights (e.g. women rights, children rights, minority groups rights)
3. (1) Protect and ensure access to clean water
4. (2) Minimise waste and pollutants production, land degradation
5. (8) Create a global partnership and cooperation for sustainable development
6. (9) Create fair and simplified international investment and trade rules, equal access to resources
7. (6) Combat bribery and corruption, promote transparency
8. (11) Emphasise local governance, integrated with regional and national governance
9. (4) Create a good policy environment (e.g. create market mechanisms that are sustainability aware and reward progressively reduced material and energy inputs)
10. (10) Develop both individual and collective leadership capacity
11. (3) Ensure collective responsibility

4.9.3 Research findings – CSR experts Group1 versus CSR experts Group2

The core values/ideals below are listed in order as they were presented to the participating CSR experts Group1 (see Appendix III) and CSR experts Group2 (see Appendix V) for prioritisation. The numbers in brackets show the consensus priority number given and the bold indicates core values/ideals consensus by both expert groups. The highlighted text shows the common core values/ideals that were selected by both CSR experts groups.

Table 4.18: Research findings – CSR experts Group1 versus CSR experts Group2

<table>
<thead>
<tr>
<th>Outcome of Delphi cycle A3, CSR Group1:</th>
<th>Outcome of Delphi cycle A3, CSR Group2:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. (12) Achieve universal primary education and distribution of knowledge</td>
<td>1. (7) Achieve universal primary education and distribution of knowledge</td>
</tr>
<tr>
<td>2. (17) Protect and promote human health</td>
<td>2. (5) Protect human rights (e.g. women rights, children rights, minority groups rights)</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>3. (5) Protect human rights (e.g. women rights, children rights, minority group’s rights)</td>
<td>3. (1) Protect and ensure access to clean water</td>
</tr>
<tr>
<td>4. (15) Protect and ensure access to clean water</td>
<td>4. (2) Minimise waste and pollutants production, land degradation</td>
</tr>
<tr>
<td>5. (13) Maximise recyclability and reusability of resources</td>
<td>5. (8) Create a global partnership and cooperation for sustainable development</td>
</tr>
<tr>
<td>6. (14) Minimise waste and pollutants production, land degradation</td>
<td>6. (9) Create fair and simplified international investment and trade rules, equal access to resources</td>
</tr>
<tr>
<td>7. (6) Redirect growth to non-material growth through education and incentives</td>
<td>7. (6) Combat bribery and corruption, promote transparency</td>
</tr>
<tr>
<td>8. (9) Create fair international labour and migration rules and freedom for everyone</td>
<td>8. (11) Emphasise local governance, integrated with regional and national governance</td>
</tr>
<tr>
<td>9. (10) Minimise financial volatility and economic insecurity, achieve sustainable economic growth</td>
<td>9. (4) Create a good policy environment (e.g. create market mechanisms that are sustainability aware and reward progressively reduced material and energy inputs)</td>
</tr>
<tr>
<td>10. (8) Manage world population and ageing generation trends</td>
<td>10. (10) Develop both individual and collective leadership capacity</td>
</tr>
<tr>
<td>11. (16) Build more coherent and more democratic architecture for global governance</td>
<td>11. (3) Ensure collective responsibility</td>
</tr>
<tr>
<td>12. (2) Be responsible to people – to equity, to justice, to enlarging the choices of all when influencing others (e.g. by sponsoring, donating money, etc.)</td>
<td></td>
</tr>
<tr>
<td>13. (11) Build partnerships in pursuit of common (human development) goals</td>
<td></td>
</tr>
<tr>
<td>14. (7) Broaden partnership with civil society groups, donors, and others in the international community</td>
<td></td>
</tr>
<tr>
<td>15. (3) Develop both individual and collective leadership capacity</td>
<td></td>
</tr>
<tr>
<td>16. (4) Develop society partnership</td>
<td></td>
</tr>
<tr>
<td>17. (1) Ensure collective responsibility</td>
<td></td>
</tr>
</tbody>
</table>
4.10 Assigning weighting points to each prioritised core value/ideal

The weighting points for each core value/ideal were calculated based on the relative priority number given and the consensus reached by the participating CSR experts Group2 after applying the three-sigma rule to the data collected in Delphi cycle A3.

Calculating weighing points for each prioritised core value/ideal

<table>
<thead>
<tr>
<th>LISTED VALUES/IDEALS</th>
<th>PARTICIPANTS</th>
<th>Mean score after 3sigma rule</th>
<th>Core value weighting after 3sigma</th>
<th>Mean grouping weighting after 3sigma</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Original Order</td>
<td>Prioritised Order</td>
<td>Assigned Priority</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>7</td>
<td>6 4 9</td>
<td>6.33</td>
<td>0.096</td>
</tr>
<tr>
<td>2</td>
<td>5</td>
<td>5 5 5</td>
<td>5.00</td>
<td>0.076</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>4 2 3</td>
<td>3.00</td>
<td>0.046</td>
</tr>
<tr>
<td>4</td>
<td>2</td>
<td>4 3 4</td>
<td>3.00</td>
<td>0.046</td>
</tr>
<tr>
<td>5</td>
<td>8</td>
<td>8 8 7</td>
<td>7.67</td>
<td>0.117</td>
</tr>
<tr>
<td>6</td>
<td>9</td>
<td>10 9 2</td>
<td>8.67</td>
<td>0.132</td>
</tr>
<tr>
<td>7</td>
<td>6</td>
<td>6 6 6</td>
<td>6.00</td>
<td>0.091</td>
</tr>
<tr>
<td>8</td>
<td>11</td>
<td>8 9 10 1</td>
<td>9.00</td>
<td>0.137</td>
</tr>
<tr>
<td>9</td>
<td>4</td>
<td>3 7</td>
<td>4.67</td>
<td>0.071</td>
</tr>
<tr>
<td>10</td>
<td>10</td>
<td>9 7 11</td>
<td>9.00</td>
<td>0.137</td>
</tr>
<tr>
<td>11</td>
<td>3</td>
<td>8 1 1 8</td>
<td>3.33</td>
<td>0.051</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>65.67</strong></td>
<td><strong>1.000</strong></td>
<td><strong>29.1</strong></td>
<td></td>
</tr>
</tbody>
</table>

The total mean score of the all prioritised core values/ideals after applying the three-sigma rule to the collected data from CSR experts Group2 was 65.67. Weighting points for each core value/ideal was calculated by dividing the mean score of each core value/ideal by 65.67. Therefore, for example, weighting points for core value/ideal 1 was equal to 0.096 (6.33 / 65.67 = 0.096). The total weighting for all core values/ideals is 1, which represents 100%. Mean weighting points for each typological grouping is shown in the far right column. The total of all typological groupings weighting was 29.1. By dividing the mean weighting points for each grouping by 29.1 and multiplying the result by 100, the proportional importance of each typological grouping was calculated. However, since the CSR experts
Group2 prioritised the core values/ideals by assigning the lowest priority number to the most important core values/ideals, the numerical values needed to be reversed.

Table 4.20: Prioritised list of groupings
(Note: The most important grouping is listed on the top and the least important one at the bottom of the list.)

<table>
<thead>
<tr>
<th>Prioritised groupings</th>
<th>Mean grouping weighting</th>
<th>Proportional importance [%]</th>
<th>Reverse (the true) importance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental</td>
<td>3.0</td>
<td>10.3</td>
<td>25.4</td>
</tr>
<tr>
<td>Social</td>
<td>5.7</td>
<td>19.6</td>
<td>23.4</td>
</tr>
<tr>
<td>Sustainable human development</td>
<td>6.2</td>
<td>21.3</td>
<td>21.3</td>
</tr>
<tr>
<td>Governance</td>
<td>6.8</td>
<td>23.4</td>
<td>19.6</td>
</tr>
<tr>
<td>Economic</td>
<td>7.4</td>
<td>25.4</td>
<td>10.3</td>
</tr>
<tr>
<td>TOTAL</td>
<td>29.1</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

The proportional importance of each grouping was calculated by dividing the mean grouping weighting by the total of all mean groupings (29.1) and multiplying the result by 100. For example, the proportional importance of an Environmental grouping is equal to 10.3% (3.0 / 29.1 * 100 = 10.30%). After reversing the numerical values it was discovered that according to the participating CSR experts Group2, the values/ideals of an Environmental grouping are the most important and represent 25.4%, followed by the values/ideals of a Social (23.4%), Sustainable human development (21.3%), Governance (19.6), and Economic (10.3%) groupings. Compared to the Dow Jones Sustainability Indexes (DJSI), the values/ideals of an Economic typological grouping are the most important (they have the highest priority and weighting in general assessments) and the values/ideals of an environmental grouping are the least important (they have the lowest priority and weighting). This is the direct opposite of what the CSR experts Group2 participants indicated. The following pie chart shows the proportional importance of the values/ideals of Social, Environmental, Economic, Governance, and Sustainable human development groupings argued by CSR experts Group2 participants.
Proportion of importance of Social (23.4%), Environmental (25.4%), Economic (10.3%), Governance (19.6%), and Sustainable human development groupings (21.3):
### 4.10.1 Research findings – assigned weighting points to each prioritised core value/ideal

The following is a list of prioritised and weighted core values/ideals of major typological groupings (Social, Environmental, Economic, Governance, Sustainable human development) by CSR experts Group2.

Table 4.21: Research findings – assigned weighting points for each prioritised core values/ideal

<table>
<thead>
<tr>
<th>Priority</th>
<th>Core Value/Ideal</th>
<th>Weighting</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Protect and ensure access to clean water</td>
<td>0.137</td>
</tr>
<tr>
<td>2</td>
<td>Minimise waste and pollutants production, land degradation</td>
<td>0.137</td>
</tr>
<tr>
<td>3</td>
<td>Ensure collective responsibility</td>
<td>0.132</td>
</tr>
<tr>
<td>4</td>
<td>Create a good policy environment (e.g. create market mechanisms that are sustainability aware and reward progressively reduced material and energy inputs)</td>
<td>0.117</td>
</tr>
<tr>
<td>5</td>
<td>Protect human rights (e.g. women rights, children rights, minority group’s rights)</td>
<td>0.096</td>
</tr>
<tr>
<td>6</td>
<td>Combat bribery and corruption, promote transparency</td>
<td>0.091</td>
</tr>
<tr>
<td>7</td>
<td>Achieve universal primary education and distribution of knowledge</td>
<td>0.076</td>
</tr>
<tr>
<td>8</td>
<td>Create a global partnership and cooperation for sustainable development</td>
<td>0.071</td>
</tr>
<tr>
<td>9</td>
<td>Create fair and simplified international investment and trade rules, equal access to resources</td>
<td>0.051</td>
</tr>
<tr>
<td>10</td>
<td>Develop both individual and collective leadership capacity</td>
<td>0.046</td>
</tr>
<tr>
<td>11</td>
<td>Emphasise local governance, integrated with regional and national governance</td>
<td>0.046</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>1.000</strong></td>
</tr>
</tbody>
</table>
4.11 Outcome of Phase I

Methods and procedures embedded within Phase I of the TRM+ aimed to:

1. Identify major typological groupings
2. Identify core values/ideals of major typological groupings
3. Verify whether major typological areas and their core values/ideals can be effectively identified by performing a content analysis of world reports
4. Prioritise the core values/ideals of each typological grouping, verified in step 3, so a consensus (an agreement of the majority of the participants) on the most important core values/ideals of each typological grouping could be achieved
5. Prioritise the most important core values/ideals of each typological grouping across multiple typological groupings
6. Assign weighting points to each of the prioritised core value/ideal

The researcher identified world major issues, categorised them into typological groupings, and identified core values/ideals for each of the identified typological groupings. CSR experts then evaluated the results of step 1 and step 2, and the hypothesis as to whether major typological groupings and their core values/ideals could be effectively identified by performing content analysis of world reports. The researcher correctly identified three typological groupings with associated core values/ideals, however, the participating CSR experts argued there were more than three typological groupings transcendent businesses needed to account for. Therefore, the researcher revisited previously analysed world reports and as a result, proposed five typological groupings with associated core values/ideals. Since the participating CSR experts agreed there were more than three typological groupings and core values/ideals proposed by the researcher, the hypothesis as to whether major typological groupings and their core values/ideals could be effectively identified by performing content analysis of world reports was confirmed. The researcher correctly identified the most important core values/ideals of major typological groupings. Moreover, the hypothesis that major world issues represent core values/ideals of major typological groupings was also confirmed.

The participating CSR experts Group1 then conducted step 4 and step 5 listed above. Since there was recorded a high variation in participants’ responses, the researcher formed a new group of CSR experts (CSR experts Group2), and steps 4 and 5 were repeated. However, responses of the CSR experts Group2 participants varied greatly (standard deviation ranged from 0.89 to 4.10). Therefore, a three-sigma rule was applied to the participants’ responses and only the core values/ideals where the mean priority assigned by the participants was below five, and the standard deviation was below two, were considered a consensus. Applying such a method to the collected data from CSR experts Group2 resulted in identification of 11 core values/ideals of five major typological groupings, compared to 17 core values by the CSR experts Group1. The outcome of step 4 run with CSR experts Group1
was compared to the outcome of step 4 run with CSR experts Group2. It was discovered that the following six core values/ideals were identified by both CSR experts groups as the most important core values/ideals:

- Achieve universal primary education and distribution of knowledge
- Protect human rights (e.g. women rights, children rights, minority groups rights)
- Protect and ensure access to clean water
- Minimise waste and pollutants production, land degradation
- Develop both individual and collective leadership capacity
- Ensure collective responsibility

Prioritisation of the most important core values/ideals of each typological grouping across all typological groupings (outcome of step 5) varied greatly as well. Step 5, with CSR experts Group1, resulted in a standard deviation ranging from 3.01 to 7.04. Since there were only 11 core values/ideas to prioritise in step 5 with CSR experts Group2, compared to 17 core values/ideals in step 5 with CSR experts Group1, the standard deviation ranged from 1.00 to 3.90. The three-sigma rule was applied to the data collected from CSR experts Group2, which resulted in an increase of the maximum standard deviation to 4.04, however, standard deviation for most of the core values/ideals lowered to a range from 0.00 to 2.52. CSR experts Group1 suggested revisiting and reviewing core values/ideals of major typological groupings after approximately 4 years (2 to 5 years), whilst the CSR experts Group2 suggested reviewing the core values/ideals in approximately 7 years time (3 to 15 years).

Calculating weighting points for each prioritised core value/ideal was conducted for collected data from both expert groups. The proportional importance of each typological grouping was then calculated and compared. CSR experts Group1 assigned the highest priority to the core values/ideals of a Sustainable human development grouping (25.9%), followed by values/ideals of Governance (20%), Economic (19.3), Social (17.7), and Environmental (17.1%) groupings; the CSR experts Group2 assigned the highest importance to the core values/ideals of an Environmental grouping (25.4%), followed by values/ideals of Social (23.4%), Sustainable human development (21.3%), Governance (19.6%), and Economic (10.3%) groupings. The following pie chart shows the difference in perceiving the most important core values/ideals of major typological groupings between CSR experts Group1 and CSR experts Group2.
Outcomes of the testing of Phase I conducted with both CSR experts groups were sent to all participants who participated in the conducted surveys. They were asked to provide feedback and explain the high variation within each expert group, as well as variation of answers between both expert groups. The feedback of the participant from CSR experts Group1, which was presented on p. 150, was shared among all participants for further comments. Only a single participant (out of 11 CSR experts who participated in the surveys) provided further explanation:

"I think the comment from the CSR expert you quote is valid. That combined with each person's understanding of what CSR/sustainability is could definitely lead to a variety of answers. In general, the final weighted values match well with understandings, I think. It's interesting the choice of priorities given between the two groups, each with its own validity."

(Cited from email, CSR expert 'B')

The above claims are supported by Holme and Watts (2000), who argue Corporate Social Responsibility needs further development and definition; that a universally accepted definition of CSR has yet to emerge. They found there is significantly different emphasis of CSR in different parts of the world. Moreover, they argue "different businesses in different sectors inevitably put emphasis on different aspects of CSR depending on business sector
and geographic location” (Holme and Watts, 2000: 7). The following are examples of various definitions of CSR from USA, the Netherlands, Taiwan, the Philippines, and Thailand.

**USA**

"CSR is about taking personal responsibility for your actions and the impacts that you have on society. Companies and employees must undergo a personal transformation, re-examine their roles, their responsibilities and increase their level of accountability.”

**The Netherlands**

"CSR is about making a leadership commitment to core values and recognising local and cultural differences when implementing global policies. It’s about companies endorsing the UN Convention on Human Rights and the ILO Rights at Work.”

**Taiwan**

"CSR is the contribution to the development of natural and human capital, in addition to just making a profit.”

**The Philippines**

"CSR is about business giving back to society.”

**Thailand**

"CSR must be locally relevant and meaningful only if backed up action”

(Holme and Watts, 2000: 9)

CSR expert ‘B’ agreed with the comments of CSR expert ‘A’ and believed that both generated lists of the prioritised core values/ideals of major typological groupings were valid. Comments of the CSR expert ‘A’ plausibly explain why standard deviation in the conducted Delphi cycle A3 run with CSR experts Group2 was lower compared to standard deviation of Delphi cycle A3 run with CSR experts Group1 – a list of core values/ideals presented to CSR experts Group2 was shorter; the participants had less choices. Therefore, as noted by the CSR expert ‘A’, an increased number of values/ideals to prioritise will spread out answers significantly, because “people likely check answers relative to the other choices – the more choices the more spread out answers will be” (cited from email, CSR expert ‘A’). More choices and more participants potentially increase the variation of answers. For future reference, this thesis proposes to focus on identifying a low number of core values/ideals of major typological groupings (around 10 core values/ideals of all typological groupings, as is suggested also by Parmenter (2010)), and apply the three-sigma rule to the collected data if variation in participants responses occurs. Plausibly, identifying a single, the most important,
core value/ideal of each typological grouping could be satisfactory. However, for the continuation of this research and for further testing (Proof-of-concept) of the TRM+, the list of prioritised and weighted core values/ideals generated by CSR experts Group2 was used.

According to a number of authors (e.g. Spiller, 2000; Elkington, 1998; Vanclay, 2004), there are three major typological groupings businesses should account for – social, environmental, and economic. However, content analysis of world reports and recommendations of the participating CSR experts suggested there were more than three typological groupings – Social, Environmental, Economic, Governance, and Sustainable human development. CSR experts who participated in the conducted surveys argued that substantial progress on managing social, environmental, and economic issues can only be achieved with effective global governance, which has to be improved because "poor governance and gross inequity underlies all other pathologies" (cited from survey, CSR expert). Moreover, one of the participating CSR experts argued that the best way to deal with social, environmental, and economic problems is through the market system, with appropriate government controls.

Whilst Elkington’s (1998) concept of Triple Bottom Line (TBL) argues there are appropriately three typological groupings (social, environmental, economic) businesses need to account for, there are more and more opponents arguing that governance grouping should be added into the Triple Bottom Line as the fourth important grouping. For example, Kent (2008: 8) argues, “A company with a weak corporate governance structure is unlikely to adopt triple bottom line reporting, because management of these companies withhold information from stakeholders.” Moreover, Kolk (2010) argues that businesses that implement CSR with a focus on internal issues are more inclined to integrate corporate governance into their CSR reporting. Midttun (2008) highlights current governance gap in the global economy and CSR reporting, believing the governance potential may be enhanced by reorientation of public policy. The need for regulatory tools to transform global governance, and the development of public accountability mechanisms for private authorities is raised also by Albareda (2008); he criticises the current behaviour of corporations for reshaping their Corporate Social Responsibility, and for being extremely powerful and thus able to create their own self-regulation management standards and co-regulating norms. This is also a criticism of Bakan (2004), Visser (2010, 2011) and Reich (1998). The conducted surveys with CSR experts resulted in the argument that the Governance typological grouping is another grouping which transcendent businesses need to account for, with its own core values/ideals. The participating CSR experts argued that the creation of a good policy environment (e.g. creation of market mechanisms that are sustainability aware and reward progressively reduced material and energy inputs) is one of the most important core values/ideals of the Governance grouping. They further emphasised the need for local governance to be integrated with regional and national governance. Business's CSR must have strategic integration with its positioning in that market segment – "creative integration of CSR and Business model is critical without which it cannot be sustained and would be viewed merely as palliative or act of bad conscience” (cited from survey, CSR expert).
All CSR experts who participated in the surveys agreed that ‘Sustainable human development’ should be considered as another typological grouping. Development of both individual and collective leadership capacity, and ensuring collective responsibility were identified as the most important core values/ideals of this grouping. According to the participating CSR experts Group2, protecting access to clean water is the most important core value/ideal, since it is a basic human need that is fundamental for human health. Reduction of waste and pollutants production / land gradation was argued to be the second most important core value/ideal, as waste and pollutants are the key aspects of non-sustainability, with impact on health and poverty, leading to long term depletion of a community’s well being and wealth – “if our environment degrades suffering will increase” (cited from survey, CSR expert).
4.12 Summary

This chapter presented the process of testing (proof-of-concept) the first phase of the TRM+ and identification of typological groupings and their core values/ideals. It presented and analysed data that was collected during testing and evaluation of methods and procedures embedded within the Phase I of the TRM+.

In chapter 5, Phase II of a TRM+, the most important core values/ideals of major typological groupings will be addressed with one selected patent. It will present data that was collected from post-incubation innovation domain experts who assisted during the research, and aimed to use a selected patent as an instrument for addressing diversified core values/ideals of multiple typological groupings. It will present data analysis and research findings of the testing (Proof-of-concept) and evaluation of methods and procedures, embedded within Phase II of the TRM+, where the main objective was to identify multiple usages of a selected patent, and prototype characteristics and business models of future potential businesses for the selected patent.
5. Phase II of the TRM+ investigation

5.1 Introduction
This chapter involves the selection of a post-incubation innovation/patent that could be used as an enabler for addressing core values/ideals of major typological groupings, identification of its potential usages for development of business models, and prototyping appropriate business model(s) for each of the identified potential usages.

Chapter 4 generated a list of prioritised and weighted core values/ideals of major typological groupings. It was proposed Phase II of the TRM+ would address the core values/ideals (identified at Phase I) using a selected post-incubation innovation / patent as an enabler for doing so. Moreover, it was proposed business models of potential businesses would be prototyped for each of the recommended usages of the selected post-incubation innovation / patent. The following objectives for testing (proof-of-concept) and evaluation of methods and procedures embedded within Phase II were outlined:

Objectives of Phase II:

1. To evaluate selected patents as to how practical and beneficial they are for addressing core values/ideals of major typological groupings (developed at Phase I)
2. To identify potential usages of the selected patents considering the list of prioritised core values/ideals of major typological groupings (developed at Phase I)
3. To prototype characteristics of a potential business for each recommended usage of the selected patent
4. To conduct a discussion forum focus group with STP experts and business entrepreneurs to gather further information and feedback relative to the prototyped characteristics of future potential businesses
5. To develop a list of prototyped business models for each potential usage of the selected patent
6. To prioritise and rate prototyped business models from a business perspective

This chapter presents data that was collected and analysed during testing and evaluation of methods and procedures embedded within Phase II to meet the above objectives.
5.2 Selection and evaluation of patents for addressing core values/ideals

Chapter 4 generated a list of prioritised and weighted core values/ideals of major typological groupings. Chapter 3 proposed diversified core values/ideals of multiple typological groupings to be addressed with a creative and innovative approach using post-incubation innovations and patents as enablers. The researcher used the internet as a source of information and identified a number of websites with databases of available patents. However, a question was raised: what type of patent to select? The US patent and trademark office categorises patents within the following three typological groups – Utility Patents (useful devices and processes), Design Patents (appearance of a useful device), and Plant Patents (man-made plant varieties). Since all three types of patents could theoretically provide creative, scalable, responsive, glocal, and circular solutions, the researcher randomly selected three utility patents (from 50 patents that were studied) that were using solar energy to purify water and generate electricity, as it was hypothesised these would be easier to visualise and discuss.  

Since the researcher did not have any background knowledge relative to the selected patents, and had not conducted any background research relative to the technology used in the patents, evaluation of the selected patents was not possible. In other words, assistance was required of post-incubation innovation domain experts with expertise relative to the technology used in the selected patents. Since all three selected patents used the thermal effect of Concentrated Solar Power (CSP) to heat up fluid, which would then turn into steam and power a wind turbine, it became obvious that the experts who could assist needed to have expertise relative to harnessing CSP. There were world conferences conducted for Solar Thermal Power (STP) experts and there were available lists of speakers and these were accessed. The researcher identified and selected STP experts from a list of speakers from ‘Solar 2010 Conference’, ‘4th International Solar Energy Society Conference’, ‘National Solar Conference’, ‘Commercialising Solar Power Conference’, ‘Australian Solar Energy Society Annual Conference’, ‘Concentrating Solar Thermal Power 2010 Conference’ and similar sources. They were selected on the following criteria:

- They were nationally or internationally recognised in the area of their expertise by being speakers presenting at national and world conferences
- They had demonstrated their knowledge and skills by being authors and co-authors of globally recognised research and conference papers

The researcher contacted 30 potential participants by email and asked them to participate in the research. They were provided with information explaining the project and asked to sign a consent form agreeing to their involvement in the project. Five (17%) of the invitation emails

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6 Note: it is outside the scope of this research to explain and discuss how to select a patent that could be used for addressing multiple core values/ideals of major typological groupings.
sent to potential participants bounced back as undeliverable. Out of the remaining 25 STP experts, 9 (36%) showed an interest in participating, however, only 4 (16%) signed a consent form and were involved in the project. Two of the experts were from Australia, and the other two were from Germany. They all had extensive expertise in the area of solar thermal power.

Data collection – evaluation of patent1

The STP experts were presented with descriptions of one of the patents (the ‘Solar power generator and water purifier’) as a PDF document (see Appendix VI), and the list of prioritised and weighted core values/ideals from Phase I (outcome of Delphi cycle A3 conducted with CSR experts Group2). The STP experts were asked to study a description of the patent and then, based on their expertise and knowledge, recommend potential usages in relation to the list of prioritised core values/ideals obtained from Phase I. Moreover, they were asked to explain how the core values/ideals would be achieved by each recommended usage of the patent, and what measures could be used to test whether the core values/ideals were achieved (see Appendix VIII for copy of the survey). An online, web-based survey was used to collect responses as it provided a clear timesaving advantage in collecting and processing data. The survey was opened on 21 October 2010, and closed ten days later (on 31 October 2010), since two of the participants stated the patent would not work. The remaining two participants did not respond to the survey as they were not interested in discussing the selected patent.

Data analysis – evaluation of patent1

The following response was received from STP expert ‘A’:

"Having studied the solar patent carefully I have to say that the steam side of the device will produce some electrical power and distilled water the water side turbine will not do very well at all. The steam cycle would have to create steam of sufficient pressure to operate the turbine and allow water to be added to the boiler against the steam pressure. From the diagram, no means of injection water against the steam pressure has been allowed. Thus, the steam pressure would have to be very low to allow recharge from the ambient water height around the boiler. Also the boiler would have to be well insulated to avoid loosing the heat into the lake. Assuming that sufficient steam could be produced to provide work for the turbine the water reservoir would have to have sufficient head above the water turbine to create useful energy. Whilst the steam turbine follows the Carnot Cycle and requires sufficient temperature difference between the supply steam and the condensing side of the turbine, the water side is governed by gravity. The power that can be extracted from water relies on gravity, the density of the working fluid in kg/m3, its mass flow rate

Note: The list of prioritised and weighted core values/ideals of major typological groupings were also illustrated with examples – see Appendix 7 for a copy of the list of core values/ideals sent to STP experts.

175
and the height the working fluid has to fall in metres. The power is determined by $G \times \text{kg/sec} \times \text{H}$. Thus, the water turbine will never produce substantial power unless the height is equally substantial. Having a steam column of say 11 metres will require considerable insulation and a high pressure water recharge pump for the boiler. If the reservoir is at 10 m above the water turbine yes some power will be produced. The power thus produced might conceivably power the high pressure pump but little else.

**There are better ways to purify lake water and with less complication and completely solar powered. For example, a floating solar still where the only moving parts are a small solar powered pump to keep the water flowing and a pipe leading from the outlet to the shore. Since my opinion of the solar patent is one where I do not believe it would really work the other questions are quite irrelevant.**”

(STP expert ‘A’)

The response from STP expert ‘B’:

_"The patent is not practical – as it happens I have published on the topic of using concentrated solar thermal energy for desalination, and that definitely isn’t the way to do it!”_ (STP expert ‘B’)

5.2.1 Research findings – evaluation of patent1

Addressing core values/ideals of major typological groupings obtained from Phase I, with the selected patent1 and the development of a business model of transcendent business for the patent failed. Since they did not want to discuss the patent any further, improvement and future modifications of the patent were not even considered. In a real-life situation, development of a business model for future transcendent business would be terminated here. However, the researcher made a decision to continue with the research and test the proposed business modelling approach (the TRM+) with patent2 and patent3 (see Appendix IX for description of the selected patent2, and Appendix X for description of the selected patent3).

Data collection – evaluation of patent2 and patent3

The researcher sent descriptions of both of the patents, as PDF documents, to the STP experts via email and asked them to choose which one they were interested in discussing, or alternatively to nominate their own patents. All four STP experts studied patent2 ('Water purification apparatus') and patent3 ('High temperature molten salt receiver').

5.2.2 Research findings – evaluation of patent2 and patent3

All STP experts selected the patent3 ('High temperature molten salt receiver') as a preferred patent for discussion, since "it has been well proven and can be adapted to many salts and from small scale to very large scale” (cited from email, STP expert). Therefore, patent3 was
evaluated as a beneficial patent for addressing core values/ideals of major typological groupings (obtained from Phase I) and identification of its potential usages.
5.3 Identification of potential usages of a selected patent

An online survey for an identification of potential usages of the 'High temperature molten salt receiver' patent was opened on 1 November 2010. The STP experts were asked to recommend potential usages of the patent, using their expertise whilst considering a list of core values/ideals of the major typological groupings they received via email (see Appendix VII for a copy of the list of core values/ideals, and Appendix XI for a copy of the survey).

Data collection

Response A1

"This patent has not only been well proven but offers many variants. Specifically the size may vary from something that could be erected on a say small plot in a remote village, where photovoltaic PV panels have been installed to operate the control mechanisms and the pumps etc. The resulting heat from the molten salt store in fact even phase change material at around 150 C could be used to purify water, sterilise surgical equipment for a small medical clinic and even be used to operate a Rankine-cycle turbine or Absorption chiller to air condition the small clinic."

(Cited from the survey, 'A')

Response A2

"The Brayton Cycle system shown on the patent can be manufactured in a fair range of sizes to suit the capacity of the Heliostat/Solar receiver. As before a Rankine cycle turbine also available in a fair range of sizes can be used. The molten salt heat store or phase change heat store may also be used to dry agricultural produce, process for transport other agricultural products to prevent spoilage or indeed season timber to be turned into furniture or other products."

(Cited from the survey, 'A')

Response A3

"The only limitation that would limit the widespread use of this patent would be the availability of sufficient sunshine. Given that a considerable proportion of the World’s poor live in relatively sunny/desert/mountainous areas there would be great scope for this patent. Even in desert areas prone to dust storms simple maintenance will keep the heliostat field operational. Given decent funding perhaps by the WHO, the World Bank or other charitable organisations sufficiently large units could be supplied to various of those countries needing sustainable energy to desalinate/sterilise water, produce electrical power and process agricultural products."

(Cited from the survey, 'A')
Response A4

"Perhaps someone like Bill Gates who is a very active philanthropist and others like him might be prevailed upon to fund some demonstration units suitable for villages in 3rd World nations. This patent has as far as I am aware exists in only about 3 countries; Spain, France and the USA. Israel may have them but I think most of their big solar units are the Solar Heat Gradient Salt Ponds such as at Ein Bokkec in the Negev Desert. This patent is eminently scalable in size, can have a variety of power outputs, e.g. Rankine and Brayton Cycle generators. The heat from the store may be used for processing products, which can improve the economy of the village/city/country. Employment would be created as workers would be required to service/clean mirrors etc. Given that solar heat is available new crops could be grown that can be processed for export. And desalinated water could be used to hydroponically grow crops without reliance on the fickleness of rainfall. That is about all I can think of in relation to this patent."

(Cited from the survey, ‘A’)

Data analysis

From the above responses, the following usages of the patent were identified:

Usage 1

- ‘Purifying water, sterilising surgical equipment, absorbing heat for chiller, heating and air-conditioning a small medical clinic in a remote village’ – small scale implementation of the patent

Usage 2

- Initially formulated as: ‘Drying agricultural produce or timber’

Given response A4, Usage 2 was recast as:

‘Desalinating seawater for human consumption and growing new crops, drying agricultural produce or timber, generating renewable energy’ – small to medium scale implementation of the patent

Usage 3

- ‘Desalinating seawater, sterilizing wastewater, generating electrical power, processing agricultural products in developing third World Nations’ – large scale, multinational development and implementation of the patent

Data collection

Responses from STP expert ‘B’ and STP expert ‘C’:

STP expert ‘B’ and STP expert ‘C’ worked together as a team, as they were from the same company. Therefore, their participation in the survey shows up as a single response. They recommended a single usage of the patent ‘Multinational development of new solar tower
system for electricity production in developing countries’ and discussed how the core values/ideals of major typological groupings could be addressed by patent3. Their recommended usage of the patent was identical with usage 3 above, as recommended by ‘A’.

Response B/C 1

“By using a Brayton process in order to produce the electricity. Furthermore a dry cooling system should be used which runs without any water consumption (but has a lower efficiency than water cooling). Additionally no water treatment is needed with this technology approach.”

(Cited from the survey, ‘B’ and ‘C’)

Based on the above comment, the patent could run without any water consumption to put the patent into operation. Therefore, according to ‘B’ and ‘C’, the patent addresses the core value/ideal 1.

1) Protect and ensure access to clean water

Response B/C 2

“The system should have a thermal energy storage system (salt) with a minimum storage capacity of 15 hours full load capacity. With this no back up energising (fossil co-firing) is needed and reduces for example the CO2 emission.”

(Cited from the survey, ‘B’ and ‘C’)

The patent could be put into operation without burning fossil fuel. Therefore, no waste and pollutants would be produced to run the technology, which satisfies core value/ideal 2.

2) Minimise waste and pollutants production, land degradation

Response B/C 3

“Built up an international committee for this multinational project development to monitor and steer the evolution process. The committee has to assist political and technical decisions made by the political organisms of the involved countries.”

(Cited from the survey, ‘B’ and ‘C’)

‘B’ and ‘C’ suggested creation of an international committee to monitor development and operation of the patent; this addresses core value/ideal 3.
3) **Ensure collective responsibility**

Response B/C 4

"**Special training groups should be created which should get the support of foreign companies, research institutes and universities.** The companies using the patent should develop training programs in the target markets in order to employed experienced local workers and develop the surroundings of the project. For example, in US, Solar Trust of America made donations to universities to train students for future solar jobs. Those trained student will be hired in future locally to help the development of the solar projects in US. This program will benefit the company and the local authority that will see his unemployment reduced."

(Cited from the survey, ‘B’ and ‘C’)

The suggestion here was for the creation of training groups and relationships with foreign businesses, research institutions, and universities. This addresses core value/ideal 4.

4) **Develop both individual and collective leadership capacity**

Response B/C 5

"**Create a worldwide feed-in tariff for molten salt tower power plants which would promote the environmental protection.** For example, under the Desertec project, the German electricity consumers will import and consume the electricity from North Africa and therefore, this would transfer revenues to the developing countries and this would promote the usage of the molten salt tower technology."

(Cited from the survey, ‘B’ and ‘C’)

‘B’ and ‘C’ suggested the creation of policies that would promote usage of the patent and green technologies in general. Developing such policies would then assist in addressing core value/ideal 5.

5) **Create a good policy environment**

Response B/C 6

"**Through international agreement and cooperation, the national governance would accept and promote the usage of this technology because the country would benefit from the revenues generated, protection of environment, technology transfer and local employment. This local governance would then distribute the revenues by making the national law enforced by regional and local authorities.**"

(Cited from the survey, ‘B’ and ‘C’)

181
‘B’ and ‘C’ suggested the creation of national law and local governance that would promote usage of the patent. Development of such law and governance would address the core value/ideal 6.

6) Emphasise local governance, integrated with regional and national governance

Response B/C 7

“The implementation of the worldwide feed-in tariff for molten salt tower power plants in developing countries should be coupled with the acceptance of a code of conduct negotiated between EU and the developing country. Moreover, this code of conduct should be followed by the national governance of the developing country benefiting from this technology.”

(Cited from the survey, ‘B’ and ‘C’)

The suggestion was for the creation of a Code of Conduct that would be negotiated and signed between developed and developing countries to protect human rights, and to be followed up by governments of developing countries by creating their own national governance under the global governance. Development of such governance and Code of Conduct would address the core value/ideal 7.

7) Protect human rights

Response B/C 8

“The power tower construction done by companies of the industrialised countries should also be assisted by universities and institutes (industrialized countries). Some of the plants should have a special concentrating solar thermal power training centre which enables the local staff to gather know how upon this upcoming technology. In addition each project should be executed with a local content of at least 20 %. This local content would benefit the local companies who will gain technology know-how and be able to be competitive in the global market.”

(Cited from the survey, ‘B’ and ‘C’)

‘B’ and ‘C’ focused primarily on distribution of knowledge (know how) relative to the patent. They suggested creation of relationships between a business operating the patent and universities that could assist to further improve the technology. Any suggestion as to how the patent could assist in achieving universal primary education in developing countries was not provided.
8) Achieve universal primary education and distribution of knowledge

Response B/C 9

“As said in Core Value/Ideal 7 a special code of conduct should be negotiated. This code of conduct contain should contain a chapter called “compliance” with general rules to combat bribery and corruption. The input could be given by companies of the industrialised countries which have a trained compliance department.”

(Cited from the survey, ‘B’ and ‘C’)  

As ‘B’ and ‘C’ suggested earlier, a Code of Conduct needs to be developed between developed and developing countries. This would contain not only a protection of human rights section but also how bribery and corruption could be minimised. This would then assist in addressing the core value/ideal 9.

9) Combat bribery and corruption, promote transparency

Response B/C 10

“In general the power tower technology has to be proven and bankable. This boundary condition could be achieved by constructing and running demo plants (5 MWe to 15 MWe) in the target market. In order to create fairness in the project financing throughout the technologies, an international financing institution should support such demo plants (ex: European Investment Bank, International Finance Corporation). Moreover, World Trade Organisation should study, implement the international trading and investment rules for renewable energies projects around the world which would not only benefit the molten salt tower technology but others alternative energies. For example, national governments should treat at the same level international companies and local companies to implement such projects.”

(Cited from the survey, ‘B’ and ‘C’)  

‘B’ and ‘C’ suggested development of “international trading and investment rules for renewable energy projects around the world” to be formulated by the World Trade Organisation and governments. Successfully implemented, such rules would then assist to address the core value/ideal 10.

10) Create fair and simplified international investment and trade rules; equal access to resources

(Cited from the survey, ‘B’ and ‘C’)  

By referring to the core value/ideal 4 and 8, ‘B’ and ‘C’ suggested that global partnerships and cooperation for sustainable development could be achieved by the creation of networks.
and relationships among foreign businesses, research institutions, and universities.

11) **Create a global partnership and cooperation for sustainable development**

**Data analysis**

From the above responses, the following usages of the patent were identified:

**Usage 1** (Identical usage as usage 1 recommended by ‘A’)
- ‘Absorbing heat for chiller, heating and air-conditioning small buildings’ – small scale implementation of the patent

**Usage 2** (Identical usage as usage 3 recommended by ‘A’)
- ‘Multinational development of new solar tower system for electricity production in developing countries’ – large scale implementation of the patent

**STP expert ‘D’**:

‘D’ recommended three usages of the patent:

**Response D1** – recommended first usage of the patent

1. “Provide large scale renewable generation with storage, thereby reducing the amount of coal mined and burned for electricity”

(Cited from the survey, ‘D’)

This was the same usage (usage 3) recommended by ‘A’, ‘B’, and ‘C’: ‘D’ explained how the core value/ideal 2 (Minimise waste and pollutants production, land degradation) could be addressed and the performance of a business addressing the value/ideal, monitored and reported.

**Addressing core value/ideal 2:**
- **Reduction amount of below ground coal mining (and thus risk to mine workers)**
- **Reduce pollution from coal dust in open cut coal mining localities**
- **Reduce greenhouse gas emissions and other air pollution**
- **Solar plant uses widely available non-toxic materials** [caveat: I am not sure about the status of all the salts mentioned in the patent]
- **Provide employment opportunities in regional & remote areas (solar plant construction, operation & maintenance)**

**Test measures:**

*Log the MWh of renewable energy produced. Investigate the amount of coal fired electricity in the same grid during the period, with historical values, taking into account demand profiles. Ultimate goal is to confirm that coal consumption is being displaced (rather than e.g. gas for peaking power*
plants). Monitor air quality in coal mining area. (Cited from the survey, 'D')

Response D2 – recommended second usage of the patent

2. 'Enable more efficient small to medium scale renewable energy generation (with the Brayton cycle option, as compared to photovoltaics or solar thermal powered steam turbines). (Cited from the survey, 'D')

This proposed usage was the same as usage recommended by ‘A’ and ‘B’ in relation to usage 1. ‘D’ here refers to the core value/ideal 2, and explained how this could be addressed, and the progress of a business addressing the value/ideal monitored and reported.

Addressing core value/ideal 2

- **Displacement of diesel fuelled electricity generation in remote areas and developing countries**
- **Reduce greenhouse gas emissions and other air pollution**
- **Conservation of oil reserves**

**Test measures:**

*Takeup rate of the technology in target regions.*

**Reduction of CO2 emissions and oil consumption is straightforward to calculate in this usage.**”

(Cited from the survey, 'D')

Response D3 – recommended third usage of the patent

3. 'Generate desalinated water’ either using the generated electricity to power a conventional reverse osmosis plant, or using exhaust heat from electricity generation with high temperature Brayton cycle to drive a thermal desalination system (e.g. Multiple Effect Distillation)

(Cited from the survey, 'D')

This usage was the same as usage 2, recommended by ‘A’. ‘D’ refers to the core value/ideal 1 (Protect and ensure access to clean water), explaining how it could be addressed and the progress of a business addressing the value/ideal monitored and reported, even though acknowledging assessment of social impacts could be difficult to quantify.

Addressing core value/ideal 1:

- **Provide water for human consumption & agriculture**
- **Reduce tensions over limited water resources in arid regions (e.g. Middle East)**

**Test measures:**

*Production of significant volume of water relative to the consumption in the local region. Assessment of social impacts is more difficult to quantify, but some*
form of sociological study should be possible.”

(Cited from the survey, ‘D’)

5.3.1 Research findings – potential usages of patent3

The following three usages of the ‘High temperature molten salt receiver’ patent were recommended by the participating STP experts:

- **Usage #1**: ‘Desalinating seawater, sterilising wastewater, generating electrical power, processing agricultural products in developing third World Nations’ – large scale, multinational development and implementation of the patent

- **Usage #2**: ‘Desalinating seawater for human consumption and for growing new crops, drying agricultural produce or timber, generating renewable energy’ – small to medium scale implementation of the patent

- **Usage #3**: ‘Purifying water, sterilising surgical equipment, absorbing heat for chiller, heating and air-conditioning a small medical clinic in a remote village’ – small scale implementation of the patent
5.4 Prototyping characteristics of potential businesses

Once the potential usages of the selected patent were identified and the researcher had gained enough knowledge relative to the patent and its potential usages, the knowledge was used for prototyping the characteristics of potential businesses. The researcher described ten aspects (Identity, Purpose, Structure, etc.) adapted from Dowding’s (2001) UBM for each of the recommended usages of the patent, and by doing so, characteristics of potential businesses were described (see Appendix XII for recommended usages of the patent and described characteristics of potential businesses for each recommended usage). However, there was a need to evaluate whether the knowledge extracted from the STP experts was used appropriately, and whether the ten aspects of potential business models were described correctly. Feedback was needed from the STP experts, as well as the feedback needed from business entrepreneurs, who could evaluate the prototyped characteristics of potential businesses. In other words, an evaluation was needed as to whether information and expertise, extracted from post-incubation innovation domain experts, could provide enough knowledge for prototyping characteristics of future businesses. The researcher identified and selected serial business entrepreneurs (entrepreneurs who had launched more than one entrepreneurial business) from a list of winners of the Ernst & Young’s Entrepreneur of the Year award, and similar sources. The reason for using well-known serial business entrepreneurs was that they were already recognised as experienced and successful. They were selected on the following criteria:

- They were well-known serial business entrepreneurs with extensive experience and expertise, who had launched more than one entrepreneurial business
- They had shown knowledge and skills in the area of starting and running entrepreneurial businesses by being authors or co-authors of globally recognised articles and conference papers dedicated to business entrepreneurship

The researcher contacted 111 potential participants by email and invited them to participate in the research. Contacted business entrepreneurs were provided with information explaining the research and they were asked to sign a Consent Form agreeing with their involvement in the research. 16 (14%) of the invitation emails sent to potential participants bounced back as undeliverable. Out of the remaining 95, 21 (22%) showed an interest in participating in the research, however, only 5 (5%) signed a Consent Form, and only 3 (3%) participated in the research. All business entrepreneurs who participated were from Australia.

Data collection

A text-based asynchronous discussion forum was prepared for an online discussion of STP experts (who had recommended usages of the patent) and business entrepreneurs. The forum was open on 6 December 2010 and remained opened till the end of December 2010 (see Appendix XII for a copy of the discussion forum with information presented to STP experts and business entrepreneurs for discussion). It was structured using discussion
threads. Each recommended usage of the patent represented an individual discussion thread displayed on a separate webpage. The STP experts and the business entrepreneurs were asked to respond to any, and as many, discussion threads as possible, and comments made by the researcher and any participant.

The hypothesis that business entrepreneurs would encourage STP experts to share their expertise, and that they would ask questions, failed. During the first week after opening the discussion forum only STP experts responded. Business entrepreneurs responded to the forum in the third week after the forum was open, after they were reminded and encouraged by the researcher to post some comments to the information presented. Overall, two STP experts posted two comments. The other STP experts did not post any comment, but they sent an email stating:

"We studied your text-based discussion forum. However we don’t have to add or propose more because the described characteristics of future business are adequate in our opinion."

(Cited from email, 'B' and 'C')

Only two of business entrepreneurs posted some comments, the other two did not respond at all, and one claimed he agreed with the comments made by the others stating:

"I logged in once this past week and to be completely honest, did not see what more I could contribute. I just did not want to waste your (the researcher’s) time by providing comments already made by others."

(Cited from email, business entrepreneur)

Considering the business entrepreneurs responded to the forum only after they were sent reminder emails, and given such a low response rate, raised the question as to why they did not participate. After sending reminder emails, the researcher received a couple of emails where they apologised for not participating, claiming they were overwhelmed with their own workload. This plausibly explains the low response rate. A similar explanation was also seen while recruiting business entrepreneurs, when 22% of the potential participants showed an interest in participating. However, they did not sign a consent form stating a) they could not afford to spend the time required; b) the allocated time did not suit them; or c) they were overseas on business trips. Moreover, the discussion forum was scheduled for the last month of the year and that could have also contributed to the low response rate.

A second plausible explanation for the low response rate is that they were serial business entrepreneurs, many of them being awarded by the ‘Ernst & Young Entrepreneur of the Year Award’. Considering their high profile, it is plausible they did not participate because they
were not offered any financial incentives to do so.

Finally, it is important to highlight here that according to a number of authors (e.g. McKaskill, 2006a; Rae, 2007; Mariotti, 2006) business entrepreneurs often launch businesses in the areas of their expertise and skills. None of the contacted business entrepreneurs had knowledge or expertise with the technology used in the selected patent. By presenting this argument, a question is raised as to how beneficial assistance from business entrepreneurs really is in the proposed business modelling approach (TRM+). However, despite the low response rate of business entrepreneurs, the researcher proceeded further with testing and evaluating methods and procedures embedded within the TRM+.

The following are comments posted by the participants as they appeared on the discussion forum (see Appendix XII for a copy of the forum without participants’ comments):

**Usage #1:**

‘Desalinating seawater, sterilising wastewater, generating electrical power, processing agricultural products in developing third World Nations’ – large scale, multinational development and implementation of the patent

**Identity:**

The business will be known as a multinational business partly funded by charitable organisations (e.g. WHO, World Bank, etc.). Sufficiently large units of the apparatus will be manufactured in developed countries and supplied to Third World Nations who are in the need of sustainable energy to desalinate/sterilise water, produce electrical power, and process agricultural produce. The business will have a reputation for helping undeveloped countries to generate their own electrical power, desalinate/sterilise water, and process their own agricultural produce.

“Great idea but scale seems to grandiose for a start-up. Suggest focusing on a pilot in one third world nation and securing funding for this via a charitable organisation. Once proof-of-concept established should make larger investment more appealing.”

(Cited from the forum, business entrepreneur ‘E’)

“This is certainly an excellent goal to have for the Identity of the company. I believe that whilst the overall intent is excellent, it will be more difficult to gain ‘buy in’ from the charitable organisations you are targeting with a large undertaking to begin with.

It would be good to see the Identity defined by ‘phases’ of operation, Start-up, Development and Testing, Roll Out and Ongoing Support and Maintenance.”

(Cited from the forum, business entrepreneur ‘A’)

189
Purpose:

Variable sizes of the apparatus will be manufactured and exported to Third World Nations to meet their power and clean water supply requirements. Great importance will be placed on creating long-term relationships among developed countries and developing countries, and between cooperating multinational countries who are directly involved in the business (e.g. suppliers of raw materials, researchers and developers of new technologies relative to the patent, etc.). As the business grows, it will expand globally – on the one hand, cooperating with multinational businesses to manufacture the apparatus, and on the other hand, to supply the apparatus to more and more undeveloped countries worldwide.

"Develop one size of apparatus that has best chance of succeeding commercially. Once this success is demonstrated additional sizes can be produced and marketed."

(Cited from the forum, business entrepreneur 'E')

"A pilot project should be identified as part of the purpose. I'm concerned that there is no mention of commercial viability and how that will translate to the stakeholders in the business. This will possibly be the most challenging part of this project – reaching the balance between commercial viability and community / world good focus."

(Cited from the forum, business entrepreneur 'A')

Structure:

The business will create an international committee to monitor and control development of the business. This will assist in making political and technical decisions made by government organisations of the countries directly and indirectly involved in the business.

The business will construct and put into operation small demo plants (e.g. 5 MWe to 15 MWe) in the target market to promote the technology and to find sponsors, so the business can promote itself and grow globally. These will be funded by international financial institutions (e.g. European Investment Bank, International Finance Corporation, etc.). The World Trade Organisation to develop and implement international trading and investment rules for renewable energy projects around the world.

"In my experience, too many committees or a committee with too many members slows progress. Carefully select true champions of the idea to serve on the committee.

Get one demo plant up and operational. Walk before you run."

(Cited from the forum, business entrepreneur 'E')

"I would avoid the creation of committees for control of development and monitoring of the projects. Committees are more likely to slow development and often decisions won't be made because consensus can't be reached.

Certainly working parties to report findings and thoughts to a managerial team empowered to make decisions would work – but the team who will oversee the
development of the project needs to have one person empowered to make decisions. Decide on which size plant is most beneficial to a wide selection of your target audience and develop that as a proof of concept. This will not only prove the concept, but also gain support of a wider target audience.”

(Cited from the forum, business entrepreneur 'A')

Participants:
The business will be owned by multinational organisations at the start up stage, and then potentially owned by the public in the form of shares. The business will build up a network of multinational suppliers of raw materials, focusing on reusing non-toxic, waste recyclable materials. The business will have a strong sense of responsibility towards the local community where the apparatus will be manufactured, as well as where the apparatus will be supplied and put into operation. The business will be involved in a number of international research and development projects relative to the patent.

The business will create special training groups to give support to all employees, research institutions and universities who will have some form of relationship with the business. (For example, in the US, Solar Trust of America makes donations to universities to train students for future solar jobs; those trained students are then hired in the future to help development of the solar projects in the US.)

"Scope seems too grandiose for a start-up. Get one organisation to fund and build upon success. The description of participants above reads like a company that is already a multinational. That should be the vision, but start with a realistic achievable goal.”

(Cited from the forum, business entrepreneur 'E')

"It is possible that there are Venture Capitalists who could assist in the creation of a pilot project at this point – it would be wise to identify those that could be approached.”

(Cited from the forum, business entrepreneur 'A')

Enablers:
The business will have very experienced staff who will be encouraged to make suggestions as to how the apparatus could be further improved, simplified, and innovated. All staff will receive regular training and will be encouraged to attend international exhibitions and conferences relative to the patent and technologies used. Staff attending such events will be sponsored by the business.

"This statement needs to be much stronger – experienced staff shouldn’t just be encouraged to make suggestions....

Experienced staff will be actively involved in the improvement and simplification of the apparatus. This staff will be key to the innovation of the products and technologies and regularly represent the organisation and industry events,
specifically those sponsored by the business. This will set the tone of the business in the recruitment of staff, and can be used to attract the right staff for your business.”

(Cited from the forum, business entrepreneur 'A')

**Deliverables:**

The main products are apparatuses of various sizes designed and manufactured for Third World Nations to give them the option of generating their own electric power, desalinate/sterilise water, and process their agricultural produce.

“Define one product for market entry. Don't try to do too much at the outset. Define a specific need in a specific country. Identify a champion there and then partner with the funding organisation that makes the most sense.”

(Cited from the forum, business entrepreneur 'E')

**Influences:**

Being a multinational business supplying apparatus to Third World Countries, government regulations and corruption of some undeveloped countries will be barriers to overcome.

The business is to sign international agreements among countries that are directly, and indirectly, involved in the business, not to discriminate against anyone, to promote partnership and cooperation, and to simplify international investment and trading. It will lobby governments of countries (where the apparatus will be supplied) to promote usage of the patent and by doing so, to promote use of green technology and protect the environment; decrease unemployment by creating new jobs (the apparatus will need to be installed and serviced); and to contribute to the economy of the country.

The business will negotiate and develop a code of conduct between developed countries and Third World Countries, which will be signed among all cooperating businesses and the countries that are involved in the project, to protect human rights in every country the business is directly, and indirectly, working with. The code of conduct is to cover general rules to combat bribery and corruption. A more detailed content of code of conduct to be suggested by all cooperating businesses. The code of conduct to be introduced and followed up by governments of Third World Nations, as well as governments of developed countries.

“Here is where an internationally known politician, financier or other qualified figure could add credibility to the new business.”

(Cited from the forum, business entrepreneur 'E')

“There are Venture Capitalists that will assist small businesses setup in other parts of the world and aid in addressing many of the issues you outline.”

(Cited from the forum, business entrepreneur 'A')
**Culture:**
Senior management is to take a keen interest in staff, and to encourage staff to make suggestions that will lead to continuous improvement of the business. A strong emphasis will be placed on training all staff to give them a professional attitude and image.

(The participants showed a lack of interest to discuss culture of the proposed business and posted no comment.)

**Performance:**
The business will strive to be particularly good at introducing green technologies to Third World Nations and creating loyal multinational relationships.

“This should be a stronger statement.

The business will be a leader in introducing green technologies to Third World Nations and, as a result, the business will create multinational relationships.”

(Cited from the forum, business entrepreneur ‘A’)

**Usage #2:**
‘Desalinating seawater for human consumption and for growing new crops, drying agricultural produce or timber, generating renewable energy’ – small to medium scale implementation of the patent

**Identity:**
The business will be known as a small to medium size private business. It will have a reputation for manufacturing apparatuses of small to medium sizes, primarily for farmers, designed for generating renewable energy, desalinating seawater that could be used for agricultural purposes, and at the same time used for drying agricultural produce to prevent spoilage; or for drying timber.

“Plausible model. Suggest tighter focus – pick one application initially such as desalinating seawater. Once this application is demonstrated to work another application can be added.”

(Cited from the forum, business entrepreneur ‘E’)

“The three purposes you’ve identified are a wide focus. Select one focus, and if you need to identify how it can support the other two purposes, but one focus will be better understood.”

(Cited from the forum, business entrepreneur ‘A’)

**Purpose:**
The business will manufacture the apparatus for local and international markets. Great importance will be placed on creating relationships with clients/farmers to understand their needs and get direct feedback about the manufactured apparatuses, so they can be further
enhanced.
(Please suggest where the first manufacturing business should be establish and explain why.)

The business could grow in size by replication/duplication, opening more manufacturing businesses worldwide; and by franchising.

"Find a country with stable political and business environments and with a need for such technology."

(Cited from the forum, business entrepreneur 'E')

"By selecting one purpose, the selection of the location of the business will become clearer. Several things to be considered in the selection of a location:
1. Accessibility of target audience
2. Ability to locate a manufacturing plant in the area
3. Access to power and other necessary facilities
4. Ability to transport materials into the facility and the completed products from the facility. Costs of locating the facility will be a consideration."

(Cited from the forum, business entrepreneur 'A')

Structure:
The business will grow gradually at first in the country of its origin and then expand into the international market. Although the business will plan to increase in size, the aim will be to have minimal hierarchical structure without introducing more levels of management.

"Agree!"

(Cited from the forum, business entrepreneur 'E')

Participants:
At the start up, the business will be owned by small numbers of individuals creating a network of small business partners (e.g. suppliers of materials). The business will have a strong sense of responsibility towards its employees, customers, and local community where the business will operate.

"Excellent."

(Cited from the forum, business entrepreneur 'A')

Enablers:
The business will have very experienced staff who will be encouraged to make suggestions as to how the apparatus can be improved, simplified, and innovated. All staff will receive regular training and will be encouraged to attend international exhibitions and conferences relative to the patent and technologies used. Staff attending such events will be sponsored by the business.
"Get the business generating revenues before flying around to conferences."

(Cited from the forum, business entrepreneur 'E')

"What is the purpose of attending the exhibitions and conferences in the early days? It will be important to 'mix' with the right parts of the industry for marketing purposes, but care should be exercised to ensure that there is a good balance between the attendance at conferences and 'getting the work' done."

(Cited from the forum, business entrepreneur 'A')

Activities:
Emphasis will be placed on manufacturing and selling apparatuses of various sizes to satisfy the needs of the customers. Whist a few apparatuses will be manufactured for display, most of production will be manufactured according to incoming orders.

"SELL is the critical activity. One apparatus to start with. Demonstrate the commercialisation potential and grow from there."

(Cited from the forum, business entrepreneur 'E')

"Exercise care with the use of the words "to satisfy the needs of the customers". Whilst it is very important to meet your client’s expectations, the business must set the expectation and have a clear understanding of the objectives for the business. Sometimes, the clients expectations / needs will not be inline with the businesses objectives.

In the early days of operation, knowing the manufacturing requirements will not be easy. It will be important to quickly understand the length of the sales period in each environment, and create a sales funnel that can be used to predict the manufacturing timetable. This will reduce wait times for the clients and improve cash flow / profitability for the business."

(Cited from the forum, business entrepreneur 'A')

Deliverables:
The main products are apparatuses of various sizes designed and manufactured for generating renewable energy, for desalinating seawater, and drying agricultural produce or timber. The business will also provide installation of the apparatuses and post-purchase servicing.

"My thoughts are for countries like Vietnam with mixed agricultural forestry and reasonable sunshine. Many crops can be spoiled by lack of adequate drying or processing. Considerable energy is put into timber drying. The solar tower system can be used to dry timber to international moisture level specs with less use of coal or by burning agricultural trash, which is often used for cooking food. High temperature pyrolysis could also be applied to these agricultural trash to convert to oils, syngas etc. Areas like Mexico for example have great sunshine but little fresh water and these units could be applied to create fresh water from saline allowing the growth of crops in an otherwise arid environment."

(Cited from forum, STP expert 'D')
Influences:
Being a relatively small business at the start up stage, government regulations may be barriers to overcome. It is not expected competition will be an issue at the start up stage, nevertheless, the business will need to protect its competitive advantage. The business will negotiate rights for using the patent with authors of the patent and other businesses operating within the same sector.

"Thus the need to pick the pilot country carefully and find a local champion (politician, financier, other) who will assist and protect the project."

(Cited from the forum, business entrepreneur 'E')

Culture:
The atmosphere will be much of a small family run business with senior management taking a keen interest in staff and having a close, friendly, and supportive relationship. Emphasis will be placed on training to give the staff knowledge and a professional attitude. Continuous improvement strategies will be implemented across the entire business where staff will be encouraged to further innovate and improve performance of the business.

"Instead of a family find an entire village. Critical will be the professional, expert support at all levels; technology, regulatory, financial, export of finished product, etc."

(Cited from the forum, business entrepreneur 'E')

Performance:
The business is expected to grow by 30 to 40% each year for the first 3 years. An experienced management will be required to manage high growth of the business with the focus on creating a reliable network of cooperating business (e.g. material supplier network, distribution network, etc.).

"Too grandiose. The first two years or so will be dedicated to getting the business up and running. Perhaps 10% growth in year 3, 20% year 4 etc. Who knows?"

(Cited from the forum, business entrepreneur 'E')

"Whilst business growth numbers have to be attractive to potential investors, it is important to not 'oversell' this – as you will have to deliver on it.
The business has a high R&D and manufacturing component which may impact the early growth figures. Be realistic in the numbers, create a solid base with sustainable growth."

(Cited from the forum, business entrepreneur 'A')

Usage #3:
'Purifying water, sterilising surgical equipment, absorbing heat for chiller, heating and air-conditioning a small medical clinic in a remote village' – small scale implementation of the patent.
Identity:
The business is to be known as a small to medium size, privately owned business that manufactures apparatuses of small sizes for small medical clinics in rural areas. The business will have a reputation for providing environmentally friendly solutions to small medical clinics to purify water, sterilise equipment, absorbing heat for chillers, and air-conditioning buildings – one apparatus, designed and manufactured to meet the requirements of each individual clinic that will do it all at once. Furthermore, the apparatus could be used for central heating during winter months. The business will have a reputation for its professional image, providing professional advices and solutions, and excellent post-purchase service.

"Careful market research needed. Does the intended market, "small medical clinics in rural areas", have the financial resources to make this model work?"

(Cited from the forum, business entrepreneur 'E')

Purpose:
Very high quality, custom made apparatuses will be designed and manufactured to suit the individual needs of its customers. Great importance will be placed on creating a network of cooperating business partners and creating a network of loyal clients. The business will not only manufacture the apparatuses, but it also will provide installations and servicing of the sold products. The business will be established in one country (please suggest where the first manufacturing business should be established) and then it will gradually expand into other nations worldwide.

"I have my doubts about the ability of this proposed business to compete with the giant medical devise companies which can probably produce similar devices at a lower cost. Only if the new technology is so strong and so protectable (patent) would this make sense."

(Cited from the forum, business entrepreneur 'E')

Structure:
The business will be established as a single manufacturing unit, and then it could expand by duplicating or franchising. Since the business is expected to have a high-growth profile, there will be a requirement to have an experienced management. As the business grows (e.g. by duplication), independent manufacturing units could operate under a decentralised structure, however, sharing the same vision, mission, and core values/ideals.

"If the business is successful in demonstrating its viability with a single manufacturing unit, it must have protected technology, unique non-circumventable technology and big marketing to expand before a big medical device company recognises the potential in this new market and overwhelms the start-up."

(Cited from the forum, business entrepreneur)
Participants:
At the start up stage, the business will be owned by a few individuals and angel investors, however, as the business grows in size, it could be sold to the public in the form of shares. The business will have a strong sense of responsibility towards its employees, clients, business partners, and the local community where it will operate.

“The business may also seek or require permanent government support as noted below in ‘Influences’”

(Cited from the forum, STP expert 'A')

“A single owner, if possible at the outset, makes life simpler.”

(Cited from the forum, business entrepreneur 'E')

Activities:
Emphasis will be placed on the high image of the business, designing and manufacturing environmentally friendly apparatuses of a very high quality and durability, and providing professional advice to its clients and excellent service. The business will be promoting the use of environmentally friendly technologies by sponsoring a number of local and national events. As the business grows bigger, the business will become a promoter of green technologies worldwide.

“Demonstrate the apparatus works and can generate revenue. Save all the rest until later.”

(Cited from the forum, business entrepreneur 'E')

Influences:
Being a relatively small business at the start up stage, government regulations will influence the business. It is not expected there will be competition at the start up stage, however, there is a high probability that more and more competitors will emerge gradually. The business will need to protect its competitive advantage and their own innovation of the patent.

“The business is unlikely to be economic at the start-up stage, due to the complexity of the equipment and the inability / inappropriateness of charging premium prices for the products (water, cooling etc). Significant subsidies would be required – possibly permanent government support as socially useful infrastructure.”

(Cited from the forum, STP expert 'A')

What about if the business is run as a private business, where a significant percentage of its asset is own by the government? (e.g. factory to be owned by the government; raw materials and wages to be paid by the business). In such a case, business would need to apply for government grants prior start up. If manufactured apparatus is to be sold to publicly owned remote medical clinics, then government could purchase / pay for the apparatus.

(The above comment was made by the researcher)

"Yes, I think that is a much more viable model, at least in the start up phase of the
"Grants are one way to go. Another is partnering with a large company. Give them an option to increase equity position in exchange for providing the funding during the development stage."

(Cited from the forum, business entrepreneur 'E')

"Same comment as above: "If the business is successful in demonstrating its viability with a single manufacturing unit, it must have protected technology, unique non-circumventable technology and big marketing to expand before a big medical device company recognises the potential in this new market and overwhelms the start-up."

Find a beta-site where government is friendly and supportive."

(Cited from the forum, business entrepreneur 'E')

**Performance:**

There is a high probability the business could grow to 30 to 50% each year for the first 5 years. The business will need to have experienced management, and continuously research and introduce new innovations and new technologies relative to the patent.

"Need to monitor the reliability of the units and their success in being integrated into remote communities. Many renewable energy projects have failed in this respect in the past. A large amount of after-sales service would be required initially, in parallel with training of local operators & service people A technological goal would be to develop units that minimise ongoing maintenance."

(Cited from the forum, STP expert 'A')

"Unless the company is really well funded this is too optimistic. The first several years will be R&D and proof of concept. Significant revenue growth probably will only begin in year 4."

(Cited from the forum, business entrepreneur 'E')

5.4.1 Research findings – prototyped and evaluated characteristics of potential businesses

Based on the comments provided by STP experts and business entrepreneurs participating in the discussion forum, the prototyped characteristics of three potential businesses for the 'High temperature molten salt receiver' patent were modified. The following shows modifications made:

**Usage #1 (Characteristics of a potential business):**

'Desalinating seawater, sterilising wastewater, generating electrical power, processing agricultural products in developing Third World Nations’ – large scale, multinational development and implementation of the patent.
Identity:
The identity aspect was scaled down with the requirement of conducting a background research to identify the optimal size of the apparatus needed by most of the target countries. Specific countries where the apparatus will be manufactured (Germany, Australia) and supplied to (Vietnam, Africa) were nominated.

Purpose:
The purpose aspect was refocused on manufacturing one size of apparatus that has the best chance of succeeding commercially, instead of producing variable sizes, especially at the start up stage of the business. Once the business demonstrates success with one size of the apparatus exported to Third World Nations to meet their power and clean water supply requirements, additional sizes will be produced and marketed. The business will need to strive to reach a balance between commercial viability (attracting investors) and community/world good focus in order to achieve commercial success.

Structure:
The business will create working parties (consisting of carefully selected members), rather than creating an international committee, to report findings and thoughts to a managerial team empowered to make decisions.

The business will construct and put into operations demo plants (plants of the size that is the most beneficial to a wide selection of target audience) in the target market (e.g. Vietnam, Africa) to prove the concept and to gain support of a the wider target audience.

Participants:
At the start-up stage, the business will be owned by one or two organisations, for example, the World Bank, Solar Trust of America, or a Venture Capitalist, rather then being owned by a number of international organisations. Once the business proofs the concept and succeeds, it will be internationally owned by a number of other investors.

Enablers:
The enablers aspect was rephrased to be a much stronger statement: Experienced staff will be actively involved in the improvement and simplification of the apparatus. The staff will be the key to the innovation of the products and technologies and regularly represent the organisation at industry events, specifically those sponsored by the business.

Activities:
There was no modification made to Activities aspect.
Deliverables:
One product was defined – the main product is an apparatus that has the best chance of succeeding commercially (conducting background research will be required to identify the size of an apparatus with the highest chance of success). The target country was pre-defined (Vietnam, Africa) with pre-defined needs (electric power, clear water, process agricultural produce). However, further background research will be required to define a very specific need in a specific country, for example, Vietnam – electric power, Africa – clean water.

Influences:
The business is to seek assistance of Venture Capitalists and an internationally known politician or other qualified figure to add credibility to the new business.

Culture:
There was no modification made to Culture aspect.

Performance:
The performance aspect was rephrased to be a much stronger statement: The business will be a leader in introducing green technologies to third world nations and, as a result, the business will create multinational relationships.

Usage #2 (Characteristics of a potential business):
‘Desalinating seawater for human consumption and for growing new crops, drying agricultural produce or timber, generating renewable energy’ – small to medium scale implementation of the patent.

Identity:
The identity aspect was refocused to manufacture apparatus for farmers, designed for desalinating seawater that could be used for agricultural purposes. However, the same apparatus could be simultaneously used for drying agricultural produce to prevent spoilage (or for drying timber), and generating renewable energy.

Purpose:
The purpose aspect was refocused to, for example, the Vietnamese market with mixed agricultural forestry and reasonable sunshine, where many crops can be spoiled by lack of adequate drying or processing.

Selection of a manufacturing plant (where the business will be initially established) will depend on the main usage of the apparatus (e.g. the apparatus primarily used for desalinating seawater – the apparatus to be used in Mexico, manufacturing plant to be
established in Mexico; the apparatus primarily used for drying agricultural produce – the apparatus to be manufactured and used in Vietnam.)

Great importance will be placed on creating relationships with buyers / users of the apparatuses to understand their needs and get direct feedback about the manufactured products, so they can be further enhanced.

The business could grow in size by replication/duplication, opening more manufacturing businesses worldwide; and by franchising. Mexico, for example, has great sunshine but little fresh water – these units could be applied to create fresh water from saline allowing the growth of crops in an otherwise arid environment. When selecting a location of a manufacturing business, the following to be considered:

- Compelling need of target audience (buyers of the apparatus)
- Accessibility of target audience
- Stable political and business environments where the target audience is located
- Ability to locate an existing manufacturing plant in the area
- Access to power and other necessary facilities
- Ability to transport materials into the facility and the completed products from the facility
- Costs of locating the facility

**Structure:**
There was no modification made to Structure aspect.

**Participants:**
There was no modification made to Participants aspect.

**Enablers:**
Experienced staff will be actively involved in the improvement and simplification of the apparatus, especially in the area of durability of the apparatus, reduction of maintenance costs, and the reduction of manufacturing costs. Whilst staff will be encouraged to attend conferences relative to the patent and technologies used, the focus will be on getting the project off the ground and the business generating revenues before flying around to conferences.

**Activities:**
Emphasis will be placed on manufacturing and selling the most commonly needed size of an
apparatus to demonstrate commercialisation potential, and to improve cash flow / profitability for the business. Once the manufacturing requirements, manufacturing timetable and sales period is known, the business can plan manufacturing of apparatuses to incoming orders.

**Deliverables:**
The deliverables aspect was refocused to the most commonly required size of an apparatus.

**Influences:**
The country where the manufacturing business will be established needs to be selected carefully with a need to find a local champion (e.g. politician, investor) who will assist and protect the project.

**Culture:**
The atmosphere will be much of a small community run business, rather than family run business. The business will seek professional, expert support at all levels; technology, regulatory, financial, export of finished product, etc.

**Performance:**
The business has a high R&D and manufacturing component, which may impact the early growth figures and attract potential investors. However, it may take a couple of years or so to get the business up and running. Being realistic, creating a solid base with sustainable growth, and not overselling the business whilst looking for investors will be important, as the business will have to deliver its promises.

**Usage #3 (Characteristics of a potential business):**
'Purifying water, sterilising surgical equipment, absorbing heat for chiller, heating and air-conditioning a small medical clinic in a remote village' – small scale implementation of the patent.

**Identity:**
No modification to the identity aspect was made, however, a recommendation to conduct background market research as to whether the intended market, “small medical clinics in rural areas”, have the financial resources.

**Purpose:**
No modification to the purpose aspect was made, however, one of the participating business entrepreneurs had doubts about the ability of the proposed business to compete with the giant medical devise companies, which could probably produce similar devices at a lower
cost. There will be a need to obtain exclusive rights to use the patent.

**Structure:**

The business will be established as a single manufacturing facility. Once it is successful in demonstrating its viability with a single manufacturing unit, then it could expand by duplicating or franchising. As the business grows (e.g. by duplication), independent manufacturing facilities could operate under a de-centralised structure, sharing the same vision and mission, and its unique non-circumventable technology and big marketing used to expand before a big medical device company recognises the potential in this new market, and overwhelms the start-up.

**Participants:**

The business will be owned by a single owner and angel investors, rather than by a few owners.

**Enablers:**

There was no modification made to the Enablers aspect.

**Activities:**

At the start up stage, demonstrating the apparatus works and can generate revenue will be more important than promoting the use of environmentally friendly technologies.

**Deliverables:**

There was no modification made to the Deliverables aspect.

**Influences:**

Being a relatively small business at the start up stage, it is unlikely the business will be economic, due to the complexity of the equipment and the inability / inappropriateness of charging premium prices for the products (water, cooling etc). Significant subsidies would be required – possibly permanent government support as socially useful infrastructure. For example, the business could be run as a private business; however, a significant percentage of its assets could be owned by the government (e.g. factory to be owned by government; raw materials and wages to be paid by the business).

Since the business will most likely need to apply for government grants prior to start up, it will be dependent and influenced by the government to some extent. Moreover, if the manufactured apparatus were to be sold to publicly owned remote medical clinics, then the government would be responsible for purchasing the apparatus.
Another option is partnering with a large company, ideally with a giant medical devise company that can probably produce similar devices at a lower cost. An equity position could be offered in exchange for providing the funding during the development stage. Once the business is successful in demonstrating its viability with a single manufacturing unit, it will have to have protected technology, unique non-circumventable technology and big marketing to expand before a big medical device company recognises the potential in this new market, and overwhelms the start-up.

Culture:
There was no modification made to the deliverables aspect.

Performance:
The business will need to monitor the reliability of the units and their success in being integrated into remote communities.

A large number of after-sales services would be required initially, in parallel with training of local operators and service people.

A technological goal would be to develop units that minimise ongoing maintenance.

The first several years will be R&D and proof-of-concept. Significant revenue growth probably will only begin in year 4.
5.5 Evaluation of methods and procedures for prototyping characteristics

An online survey was set up for business entrepreneurs to evaluate whether online discussions of post-incubation innovation domain experts with business entrepreneurs can provide enough information/knowledge to prototype characteristics of future businesses.

Data collection

The business entrepreneurs who participated in the conducted online discussion forum with STP experts were asked to provide feedback, via an anonymous online survey, and by doing so verify the hypothesis as to whether discussions of post-incubation innovation domain experts with business entrepreneurs can generate enough knowledge to prototype characteristics of future businesses (see Appendix XIII for a copy of the survey). Despite the survey being open for a couple of weeks, and the inclusion of business entrepreneurs who did not participate in the discussion forum (but signed a consent form agreeing to participate in the research), only two business entrepreneurs completed the survey. Business entrepreneur ‘A’ believed that:

“In some simple cases yes. But for new technologies or new complex business models, I doubt it. The in-depth discussions, the give and take of probing, modifying, questioning, reasoning, etc., is not easily done online.”

(Cited from survey, business entrepreneur ‘A’)

Business entrepreneur ‘A’ further argued that:

“Theoretical discussions online don’t translate into real world business situations. Online discussions, in my experience tend to be abbreviated when compared to “live” face-to-face or telephonic discussions.”

(Cited from survey, business entrepreneur ‘A’)

Business entrepreneur ‘B’ believed that:

“Online discussions can be very useful for drafting business models, but I doubt detailed business models could be developed online without face-to-face discussions. My favourite from a business perspective of the 3 applications is the second one; Desalinating seawater for human consumption and growing new crops, drying agricultural produce or timber, generating renewable energy – small to medium scale implementation of the patent. All three are worthwhile causes, but at the end of the day the business must become profitable and #2 seems best suited.”

(Cited from survey, business entrepreneur ‘B’)
5.5.1 Research findings – evaluated methods and procedures for prototyping characteristics

According to business entrepreneurs, online discussions of post-incubation innovation domain experts with business entrepreneurs could be used for drafting business models, but theoretical discussions online don’t translate into real world business situations as they are too abbreviated when compared to ‘live’ discussions. However, conducting face-to-face discussions is costly and not always possible.

Considering it took the researcher three weeks to create a list of 111 business entrepreneurs with contact details, yet only two of them participated in the online discussion forum, there is a question as to how difficult it would be to organise face-to-face discussions with participants. The researcher spent nearly two weeks negotiating with four STP experts and five business entrepreneurs for the most suitable week for conducting the online discussions. When all four STP experts and all five business entrepreneurs agreed on a specific week, after the discussion forum was finally open none of the business entrepreneurs logged-in until two weeks after the forum opened. Based on the researcher’s experience it could be argued that to synchronise nine experts and make them physically come to a single geographic location for face-to-face discussions would be impossible. Moreover, there is a need to consider the associated time and cost for organising face-to-face discussion of nine experts, a cost that could exceed potential benefits. On the other hand, it is plausible response rate and motivation of experts, and primarily business entrepreneurs, could be stimulated by financial incentives or other benefits offered to them (e.g. exclusive right to use the patent).

Methods and procedures embedded within Phase II aim primarily to gain knowledge for prototyping of business models, not for development of detailed business models. Considering there were only two responses received from the participants, it is questionable whether the discussion forum as a method for sharing and exchanging knowledge among post-incubation innovation domain experts is appropriate. On the other hand, the researcher was able to extract knowledge from STP experts, and prototype characteristics of potential businesses. There is however, a question as to how beneficial it is to get business entrepreneurs involved in the process of sharing knowledge with post-incubation innovation experts. After trialling, using the assistance of business entrepreneurs and experiencing a low response rate, the researcher proposed that business entrepreneurs may not be required during the process of prototyping characteristics of potential businesses, and they might rather be replaced by Business Angels and Venture Capitalists (Mariotti, 2006; McKaskill, 2006b) at a later stage of business modelling (once a business modeller develops a detailed business model of a future business). While this proposition can be tested in real life situations, it is unlikely the researcher would get a high response rate from Business Angels or Venture Capitalists (VC) as they are often known for having limited spare time (McKaskill, 2006b). Moreover, Venture Capitalists are known for weighing their activities in a monetary sense, hence their participation in an academic research without offered financial incentives is unlikely.
5.6 Prototyping of appropriate business model(s)

Chapter 3 proposed that business models of any business could be prototyped by assigning one of the sixteen basic business model archetypes identified by Weill (2005), and describing characteristics of potential businesses Dowding (2001). In other words, by matching described characteristics of a future potential business with an appropriate business model archetype, a prototype of a business model could be created.

Assigning the most appropriate business model archetype for each potential usage of the patent

The following three usages of the ‘High temperature molten salt receiver’ patent were recommended by the participating STP experts and discussed with business entrepreneurs:

- **Usage #1:** ‘Desalinating seawater, sterilising wastewater, generating electrical power, processing agricultural products in developing third World Nations’ – large scale, multinational development and implementation of the patent
- **Usage #2:** ‘Desalinating seawater for human consumption and for growing new crops, drying agricultural produce or timber, generating renewable energy’ – small to medium scale implementation of the patent
- **Usage #3:** ‘Purifying water, sterilising surgical equipment, absorbing heat for chiller, heating and air-conditioning a small medical clinic in a remote village’ – small scale implementation of the patent

Since the ‘High temperature molten salt receiver’ patent was a technical patent that deals with a physical asset, only the following business model archetypes were considered as appropriate for prototyping potential business models for the selected patent:

- Manufacturer
- Wholesaler/retailer\(^8\)
- Physical landlord\(^9\)
- Physical broker\(^{10}\)

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\(^8\) Selecting a wholesaler/retailer business model archetype would mean the business would require working in cooperation with a manufacturing business, which would require starting up two businesses: manufacturer + wholesaler/retailer

\(^9\) Selecting physical landlord business model archetype would require starting up manufacturer and physical landlord businesses

\(^{10}\) Selecting physical broker business model archetype could require starting up manufacturer and physical broker businesses
It became obvious there was a need for a manufacturing business before considering any other business model archetype. This was reinforced by the fact that the practical application of the patent "exists in only about 3 countries" (STP expert ‘A’). Other business model archetypes can then be considered and worked in cooperation with the manufacturing business. Therefore, the manufacturing business model archetype was considered to be the most appropriate for all recommended usages of the patent. The following three business models were proposed:

- **Business Model 1**: Manufacturer of an apparatus for desalinating seawater, sterilising wastewater, generating electrical power, processing agricultural products in developing Third World Countries – large scale multinational business

- **Business Model 2**: Manufacturer of an apparatus for desalinating seawater for human consumption and for growing new crops, drying agricultural produce or timber, generating renewable energy – small to medium scale national or international business

- **Business Model 3**: Manufacturer of an apparatus for purifying water, sterilising surgical equipment, absorbing heat for chilling, heating and air-conditioning a small medical clinic in a remote village – small scale national or international business

Prototyping business models by describing ten aspects for each assigned business model archetype

Once the business model archetype was assigned to each recommended usage of the patent, and matched with described characteristics of potential businesses that were created and refined in the conducted online discussion forum, prototyped business models of future transcendent businesses were created. In other words, prototyped business models were represented by the characteristics of future businesses matched with appropriate business model archetypes.
5.7 Evaluating the prototyped business models

Once the researcher prototyped business models of potential businesses for the selected patent, there was a need to evaluate how well the prototyped business models were developed; whether they would need to be modified. There was also a need to evaluate whether business models for potential usages of a patent can be developed correctly, based on information obtained from discussions with post-incubation innovation domain experts.

Data collection

The researcher contacted business entrepreneurs, who had previously participated in the discussion forum, and sent them the list of prototyped potential business models via email. They were provided with the sixteen basic business model archetypes and the ten aspects. They were invited to participate in an anonymous online survey evaluating the developed business models for potential usages of the ‘High temperature molten salt receiver’ patent (see Appendix XIV for copy of the survey).

Although the survey was open for a couple of weeks (from 10 January 2011 to 25 January 2011), and all five business entrepreneurs who signed the Consent Form were invited and encouraged to participate in the survey, only one business entrepreneur completed the survey. Therefore, new contacts to serial business entrepreneurs were gained, and the potential participants were contacted via emails. Moreover, 17 business entrepreneurs, who previously showed an interest in participating but who did not, were re-contacted. A Consent Form from one business entrepreneur was collected and she was invited to participate in the survey, despite not being involved in the online discussion forum. The following are comments from the two business entrepreneurs who completed the evaluation survey:

Both agreed the business models were developed correctly, recommending “no changes” and stating, “the models are fine with different saleability”. One of them suggested that:

"Regular review of the business models should be programmed into the business development schedule to address changes in the company's thinking, market and understanding of the target market.”

(Cited from survey, business entrepreneur ‘A’)

The other believed that:

"Most entrepreneurs would start at model 3 or 2 and then try to scale up to something like model 1 after the technology has been proven, loyalty has grown and support and demand exists in the market. Jumping straight into model 1 is ambitious, unrealistic and futile at best without significant runs on the board or very deep pockets – although there are a number of big supporters the red tape to get this off the ground will be a mile long."

(Cited from survey, business entrepreneur ‘B’)
5.7.1 Research findings – evaluated prototyped business models

Since there were only minor recommended changes to the business models it could be argued they had been developed correctly. However, there is a need to highlight that only two participants completed the survey, which undermines the validity of such a claim. Furthermore, there is a need to consider the following limitations of this research: 1) only a single patent was discussed in the conducted online discussion forum; 2) the number of participating experts was very limited (4 STP experts; 3 business entrepreneurs). On the positive side there is a need to highlight that, descriptions of the potential business models were developed primarily by the researcher, based on the suggestions of post-incubation innovation domain experts (STP experts), without any input from business entrepreneurs. The business entrepreneurs who participated in the online discussion forum only refined the characteristics of potential businesses as developed by the researcher.

There is a need to conduct a number of similar tests before it could be successfully argued that the business models could be prototyped correctly, based on information collected from post-incubation innovation domain experts. However, there is also a need to take a slightly different approach since repeating the same approach tested by the researcher would most likely generate a low response of business entrepreneurs. There is a possibility of increasing the response rate if, for example, students of business faculties are invited to participate in the research. However, considering that business students are not experienced, such an approach is unlikely to generate a useful outcome. Therefore, for future reference, Phase II of the TRM+ could be tested without any involvement from business entrepreneurs with the assistance of post-incubation innovations only. In a real life situation, once business models are prototyped and the most beneficial business model is selected, feedback from Business Angels and Venture Capitalists could be obtained. However, this is unlikely to generate useful outcomes for academic purposes as response rates of Business Angels and Venture Capitalists is expected to be low when such research is conducted with no offered financial or other benefits for the participants.

The participating business entrepreneurs were asked to also evaluate whether, in general, a description of the ten business model aspects of a potential business provides a sufficient amount of detail for creating business models. According to them the description of ten aspects of a potential business is "a good start" because "it is impossible to identify all the issues or fully understand the implications of all aspects, as the projects are large" (business entrepreneur ‘A’). While ‘A’ recommended a regular review of developed business models, 'B' argued that, “there are many other considerations though”. Again, because of the very small sample size, it is impossible to validate whether the hypothesis, that the ‘description of ten business model aspects of a potential business provides a sufficient amount of details for creation of business models for potential businesses’ was confirmed. While Dowding (2001) claims that the description of ten business model aspects could be successfully used for prototyping business models, the conducted evaluation survey only suggests that it is plausible.
5.8 Prioritising and rating of prototyped business models

The participating business entrepreneurs were also asked to prioritise and rate the prototyped business models from a business perspective, based on probability of success. The following is a list of prioritised and weighted business models:

Table 5.1: Prioritised and rated prototyped business models

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<tr>
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<th>Business Model 1:</th>
<th>Business Model 2:</th>
<th>Business Model 3:</th>
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<tr>
<td><strong>A</strong></td>
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<td>7/10</td>
<td>4/10</td>
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<tr>
<td><strong>B</strong></td>
<td>2/10</td>
<td>8/10</td>
<td>6/10</td>
</tr>
<tr>
<td><strong>AVERAGE</strong></td>
<td>4.5</td>
<td><strong>7.5</strong></td>
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According to a business entrepreneur who participated in the online discussion forum, but did not participate in the survey, his favourite business model was 2 as he believed it is best suited and likely to become profitable. Unfortunately, it is not known how the participant would rate the business model compared to the others.

5.8.1 Research findings – prioritised and rated prototyped business models

On aggregate average weighting, Business Model 2 reached the highest score (7.5), followed by Business Model 3 (5.0) and Business Model 1 (4.5). Whilst ‘B’ ranked Business Model 1 with the lowest priority arguing it was "unrealistic and futile at best without significant runs on the board or very deep pockets", and that “most entrepreneurs would start at model 3 or 2 and then try to scale up to something like model 1”, there were a number of arguments against the Business Model 3 posted that, the business would “not be able to compete with the giant medical devices companies which can probably produce similar devices at a lower cost”. A business, using the Business Model 3 would need “big marketing to expand before a big medical device company recognises the potential in this new market and overwhelms the start-up” of the business. Thus, considering all the arguments of all the business entrepreneurs involved in the process of refining, evaluating, prioritising, and weighing of the prototyped business models for the ‘High temperature molten salt receiver’ patent, Business Model 2 is potentially seen as the most successful from a business perspective.
5.9 Outcome of Phase II:

The researcher selected three technical utility patents from an online database of patents publicly available on the internet. STP experts evaluated the selected patents and selected one they agreed was the most beneficial. They considered the list of core values/ideals of major typological groupings (obtained from Phase I) and identified three usages of patent 3. Based on the recommendations given by them, the researcher developed characteristics of a potential business for each of recommended usages of the patent. The developed characteristics of potential businesses were then presented to the STP experts and business entrepreneurs for discussion via an online, text-based discussion forum. Based on feedback obtained, the characteristics of potential transcendent businesses were refined. Business entrepreneurs who joined the online discussion with STP experts evaluated whether online discussions of post-incubation innovation domain experts with business entrepreneurs can provide enough information and knowledge to prototype characteristics of future businesses. It was discovered that online discussions of post-incubation innovation domain experts with business entrepreneurs can be used for prototyping characteristics of potential businesses, however, it was argued that online discussions “tend to be abbreviated when compared to ‘live’ face-to face’ or telephonic discussions”. Considering the small sample size of business entrepreneurs, there is a need to conduct further tests with a number of post-incubation innovation domain experts identifying potential usages of various patents (e.g. design patents, plant patents). However, participation of business entrepreneurs during discussions with post-incubation innovation experts was questioned, as the cost of hiring them may over-exceed potential benefits. Therefore, it was proposed for further trialling Phase II of the TRM+ that participation of business entrepreneurs might not be needed, and they be replaced by Business Angels or Venture Capitalists at later stage of the business modelling process.

The researcher prototyped business models for each of the potential usages of the ‘High temperature molten salt receiver’ patent, which were then evaluated by the participating business entrepreneurs. Since they did not suggest any modification to the prototyped business models, it can be proposed that business models for potential usages of a patent can be developed correctly based on information obtained from discussions of post-incubation innovation domain experts. It can be also proposed that using 16 basic business model archetypes, and 10 business model aspects, will lead to prototyping business models of future potential businesses. However, considering the small number of the participating business entrepreneurs, there is a need to conduct further tests.

The hypothesis that the description of a potential business (developed based on a written description of each of the 10 business model aspects) provides a sufficient amount of detail for prototyping business models of potential businesses, and prioritising them based on the probability of success, was plausibly confirmed. The participating business entrepreneurs prioritised and rated the presented business models from a business perspective, based on a
probability of success. However, based on the received responses, it seemed the participants expressed their personal opinions, rather than providing solid arguments about the potential success of each prototyped business. The researcher demonstrated that business models of any future businesses could be prototyped by describing 10 aspects of a business model and assigning one of the 16 basic business models archetypes, and the participating business entrepreneurs concurred that such business models could be prioritised in this way. However, the low number of participants undermines the validity of this claim.
5.10 Summary

This chapter presented the process of testing (proof-of-concept) of the third phase of the TRM+; addressing a diverse range of core values/ideals of major typological groupings with a post-incubation innovation / patent; and prototyping of appropriate business models for a selected post-incubation innovation / patent. Testing and evaluating methods and procedures for selecting post-incubation innovations / patents was outside the scope of this research. However, this chapter presented and evaluated methods and procedures for evaluating patents, identifying their potential usages, and prototyping business models of future potential businesses for each of the recommended usages of the patent. It was demonstrated that knowledge and expertise extracted from post-incubation innovation domain experts could provide enough knowledge for prototyping of business models. It was also demonstrated that by describing the ten aspects, (Identity, Purpose, Structure, etc.) adapted from Dowding’s (2001) UBM, the characteristics, and a prototype of a future potential business could be effectively developed. However, validity of the prototyped business models is questioned, since not enough business entrepreneurs participated in the research to satisfactorily evaluate all methods and procedures embedded within Phase II. Methods and procedures embedded within Phase II of the TRM+ generated a list of prototyped business models, prioritised and ranked by business entrepreneurs.

In chapter 6, the prototyped business models are going to be assessed against multiple criteria, so the potentially most beneficial business model can be identified, proposed as Phase III of a TRM+. Chapter 7 will present an assessment of the prototyped business models against core values/ideals of major typological groupings (developed at Phase I), using the AHP technique. Moreover, it will present data collected from CSR experts conducting the same assessment using their CSR and TBL expertise. Overall, chapter 7 will present data analysis and research findings of testing (Proof-of-concept), and evaluation of methods and procedures, embedded within Phase III of the TRM+. 
CHAPTE R VI

6. Phase III to Phase V of the TRM+ investigation

6.1 Introduction

In chapter 5, business models for the selected patent of potential businesses were prototyped, prioritised and rated based on their probability of success. In this chapter:

1. Methods and procedures embedded within Phase III will be tested and evaluated; the prototyped business models will be assessed on how beneficial they are, so that the most beneficial business model could be identified and proposed for practical implementation together with its created mission statement. The assessment of the prototyped business models will be conducted by the researcher using the AHP technique; it will also be conducted by CSR experts using their CSR and TBL expertise. A Mission statement of the selected most beneficial business will be created by the researcher using information obtained from Phase II.

2. Methods and procedures embedded within Phase IV will be tested; a detailed business model of the selected most beneficial business will be created by the researcher describing 55 elements of a business, adapted from Dowding’s (2001) UBM.

3. Methods and procedures embedded within Phase V will be tested; KPIs of the selected most beneficial business will be set by the researcher based on the prioritised and weighted core values/ideals of major typological groupings, obtained at Phase I.
6.2 Phase III: Selecting potentially the most beneficial business model

The following objectives for testing (proof of concept) and evaluation of methods and procedures embedded within Phase III were outlined:

Objectives of Phase III:

1. To objectively select potentially the most beneficial business model from the list of prioritised and ranked prototyped business model (outcome of Phase II), that will be proposed for practical implementation
2. To evaluate whether the AHP technique could be effectively and objectively used for selection of potentially the most beneficial business model
3. To develop a mission statement of the selected, potentially most beneficial business model, that will be proposed for practical implementation

Phase II generated a list of prototyped business models of potential businesses for the selected patent. Business entrepreneurs who participated in the research studied the prototyped business models from a business perspective, and prioritised and rated the business models based on the probability of the businesses succeeding commercially. However, considering the aim of this research was to develop a reusable methodology for developing business models of future transcendent businesses, there was a need to assess the prototyped business models from a beyond profit point of view. This required assessing the business models against prioritised and weighted core values/ideals of multiple typological groupings (created at Phase I). Chapter 3 proposed to use the AHP technique as a method for assessing business models (prototyped at Phase II) against the prioritised and weighted core values/ideals of multiple typological groupings.

Selecting potentially the most beneficial business model using the AHP technique

Each business model, prioritised and weighted by the participating business entrepreneurs at Phase II, was assessed against each of the core values/ideals created at Phase I (see Appendix VII for copy of the list of core values/ideals of major typological groupings). The researcher calculated weighting points for each of the core values/ideals based on the relative priority assigned by the CSR experts at Phase I. The researcher then used the AHP technique as a tool for assessing the business models against prioritised and weighted core values/ideals of multiple typological groupings. The following is a list of prioritised and rated business models that were proposed for assessment against core values/ideals of major typological groupings using the AHP technique:

1. Business Model 1: Average score: 4.5/10
2. Business Model 2: Average score: 7.5/10
3. Business Model 3: Average score: 5.0/10
The following is a list of prioritised and weighted core values/ideals of major typological groupings (outcome of Phase I) that were used as the assessment criteria for assessing the above three business models:

Table 6.1: Prioritised and weighted core values/ideals of major typological groupings

<table>
<thead>
<tr>
<th>Priority</th>
<th>Criterion</th>
<th>Core Value/Ideal</th>
<th>Weighting</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>C1</td>
<td>Protect and ensure access to clean water</td>
<td>0.137</td>
</tr>
<tr>
<td>2</td>
<td>C2</td>
<td>Minimise waste and pollutants production, land degradation</td>
<td>0.137</td>
</tr>
<tr>
<td>3</td>
<td>C3</td>
<td>Ensure collective responsibility</td>
<td>0.132</td>
</tr>
<tr>
<td>4</td>
<td>C4</td>
<td>Create a good policy environment (e.g. create market mechanisms that are sustainability aware and reward progressively reduced material and energy inputs)</td>
<td>0.117</td>
</tr>
<tr>
<td>5</td>
<td>C5</td>
<td>Protect human rights (e.g. women rights, children rights, minority group’s rights)</td>
<td>0.096</td>
</tr>
<tr>
<td>6</td>
<td>C6</td>
<td>Combat bribery and corruption, promote transparency</td>
<td>0.091</td>
</tr>
<tr>
<td>7</td>
<td>C7</td>
<td>Achieve universal primary education and distribution of knowledge</td>
<td>0.076</td>
</tr>
<tr>
<td>8</td>
<td>C8</td>
<td>Create a global partnership and cooperation for sustainable development</td>
<td>0.071</td>
</tr>
<tr>
<td>9</td>
<td>C9</td>
<td>Create fair and simplified international investment and trade rules, equal access to resources</td>
<td>0.051</td>
</tr>
<tr>
<td>10</td>
<td>C10</td>
<td>Develop both individual and collective leadership capacity</td>
<td>0.046</td>
</tr>
<tr>
<td>11</td>
<td>C11</td>
<td>Emphasise local governance, integrated with regional and national governance</td>
<td>0.046</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>Weighting</strong></td>
<td><strong>1.000</strong></td>
</tr>
</tbody>
</table>
The following table shows assessment of the three business models (outcome of Phase II) against the prioritised and weighted core values/ideals of major typological groupings (outcome of Phase I)

**AHP assessment:**

Table 6.2: AHP assessment of prototyped business models

<table>
<thead>
<tr>
<th>Criteria (Core Values/Ideals)</th>
<th>Business Model 1</th>
<th>Business Model 2</th>
<th>Business Model 3</th>
<th>Weighting of Criterion</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1</td>
<td>0.070</td>
<td>0.050</td>
<td>0.017</td>
<td>0.137</td>
</tr>
<tr>
<td>C2</td>
<td>0.060</td>
<td>0.050</td>
<td>0.027</td>
<td>0.137</td>
</tr>
<tr>
<td>C3</td>
<td>0.060</td>
<td>0.050</td>
<td>0.022</td>
<td>0.132</td>
</tr>
<tr>
<td>C4</td>
<td>0.060</td>
<td>0.050</td>
<td>0.007</td>
<td>0.117</td>
</tr>
<tr>
<td>C5</td>
<td>0.050</td>
<td>0.040</td>
<td>0.006</td>
<td>0.096</td>
</tr>
<tr>
<td>C6</td>
<td>0.050</td>
<td>0.040</td>
<td>0.001</td>
<td>0.091</td>
</tr>
<tr>
<td>C7</td>
<td>0.040</td>
<td>0.026</td>
<td>0.010</td>
<td>0.076</td>
</tr>
<tr>
<td>C8</td>
<td>0.050</td>
<td>0.020</td>
<td>0.001</td>
<td>0.071</td>
</tr>
<tr>
<td>C9</td>
<td>0.025</td>
<td>0.020</td>
<td>0.006</td>
<td>0.051</td>
</tr>
<tr>
<td>C10</td>
<td>0.025</td>
<td>0.020</td>
<td>0.001</td>
<td>0.046</td>
</tr>
<tr>
<td>C11</td>
<td>0.022</td>
<td>0.020</td>
<td>0.004</td>
<td>0.046</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>0.512</strong></td>
<td><strong>0.386</strong></td>
<td><strong>0.102</strong></td>
<td><strong>1.000</strong></td>
</tr>
</tbody>
</table>

Note: the column on the left shows criteria C1 to C11. The column on the right shows the weighting points of each criterion with the total sum being equal 1. Weighting points of each criterion were divided among three business models based on how well each met that criterion. According to the AHP assessment, Business Model 1 should be proposed for practical implementation, as it is potentially the most beneficial; it best satisfies the core values/ideals of the major typological groupings (criteria C1 to C11), even though business entrepreneurs rated it as potentially least successful from a business perspective.

**Explanation of the assessment:**

**Criterion C1** – Protect and ensure access to clean water

According to the participating post-incubation innovation domain experts (STP experts), an apparatus using the patent, “runs without any water consumption” and does not require any “water treatment”. All three cases of recommended usages of the patent (business models)
protect, and ensure, access to clean water, by not consuming any additional water and not requiring any water treatment. However, since implementation of the patent in Business Model 1 is in the much larger scale, Business Model 1 satisfies the core value/ideal C1 to a greater degree than Business Model 2 and Business Model 3.

**Criterion C2** – Minimise waste and pollutants production, land degradation
According to the participating STP experts, if a system using the patent “have a thermal energy storage system with a minimum storage capacity (e.g. 15 hours full load capacity), no back up energising (fossil co-firing) would be needed to run the apparatus, which would reduce for example the CO₂ emissions. Since Business Model 1 is designed to operate at much larger scale than Business Model 2 and Business Model 3, Business Model 1 would potentially generate more electricity and desalinate/sterilise/distill water more efficiently, with no waste and no pollutants produced. On the other hand, implementation of the patent on a larger scale would have a more negative impact on the environment, since a considerably larger land area would be required to install the apparatus.

**Criterion C3** – Ensure collective responsibility
According to the STP experts, implementation of the patent in Business Model 1 would require creation of an international committee to monitor development and operation of the patent, and by doing so ensuring collective responsibility. Implementation of the patent in Business Model 2 and Business Model 3 is on a much smaller scale. Business Model 3 implements the patent without any committee, and it is suggested it be run more like a family business. Hence, Business Model 1 satisfies the criterion C3 to the largest extent.

**Criterion C4** – Develop both individual and collective leadership capacity
According to suggestions given by the participating STP experts, Business Model 1 aims to create special training groups, and create of relationships with foreign businesses, research institutions, and universities. By doing so, the business will develop collective leadership within its industry. Business Model 3 does not consider creation of such a strong leadership capacity, and, according to one of the business entrepreneurs who participated in the online discussion forum, the start up of the business could be overwhelmed by a big medical device company, once it recognises the potential in this new market. Therefore, Business Model 1 satisfies the criterion C4 to a larger extend than business model 3\(^{11}\).

**Criterion C5** – Create a good policy environment
According to the participating STP experts, implementation of the patent in Business Model 1 suggests creation of policies that would promote usage of the patent and green technologies

\(^{11}\) Note: Business Model 2 lies somewhere between. While it can create some collective leadership capacity, it potentially will not be as strong as the business using Business Model 1 that is a cooperation of multinational businesses.
in general. Whilst Business Model 2 could create similar policies, the extent to which such policies could be implemented would be considerably lower. Hence, Business Model 1 satisfies the criterion C5 to a larger extend than Business Model 2 and Business Model 3.

**Criterion C6 – Emphasise local governance, integrated with regional and national governance**

Business Model 1 is a business model of an international business that proposes creation of international agreements and cooperation; creation of national governance that would accept and promote the usage of the technology used in the patent; and creation of national law and local governance that would promote usage of the patent. Business Model 2 and Business Model 3 do not emphasise local governance, integrated with regional and national governance, to such an extent as Business Model 1.

**Criterion C7 – Protect human rights**

Business Model 1 is a business model of an international business that aims to manufacture an apparatus for Third World Nations. It aims to create a of Code of Conduct, which would be negotiated and signed between developed and developing countries, to protect human rights and to be followed up by governments of developing countries. Business Model 1 satisfies criterion C7 to a considerably greater extent than Business Model 2 and Business Model 3. On the other hand, it is important to highlight the high corruption of government in Third World Nations (Collier, 2010), violation of human rights, and the low egalitarian culture in developing countries (Siegel et al., 2008).

**Criterion C8 – Achieve universal primary education and distribution of knowledge**

Business Model 1 is an international business that works in cooperation with other businesses, research organisations and universities. It was designed for a business that is willing to share knowledge, whereas, Business Model 3 was designed for a business to protect the knowledge that would be its competitive advantage. If Business Model 1 succeeded commercially and generated revenue, it could support local/national schools to a significantly greater extent than Business Model 2.

**Criterion C9 – Combat bribery and corruption, promote transparency**

As discussed earlier, the participating STP experts suggested that a business using Business Model 1 would need to create a Code of Conduct. A further suggestion given by the participating STP experts was that the Code of Conduct should cover not only protection of human rights section, but also how bribery and corruption could be combated. Since Business Models 2 and 3 do not consider creation of such a detailed Code of Conduct, monitoring corruption and bribery would be much harder. On the other hand, culturally it is very common in some developing countries (e.g. Vietnam, South Korea, Africa) that government officials often receive generous gifts, therefore they are more prone to engage
in bribery and corruption (Siegel et al., 2007, 2008). Moreover, Business Model 1 will need to have a much stronger hierarchical structure compared to Business Models 2 and 3, which could have a non-hierarchical structure since the number of employees is likely to be low. The stronger the hierarchical structure of management a business has, the easier it is to be corrupted and engaged in bribery (Siegel et al., 2008).

**Criterion C10 –** Create fair and simplified international investment and trade rules; equal access to resources

The participating STP experts suggested that the World Trade Organisation and governments should develop international trading and investment rules for renewable energy projects around the world. If such rules are developed and successfully implemented, Business Model 1 would satisfy criterion C10 to the largest extent as it would generate/support trading of the greatest amount of energy generated.

**Criterion C11 –** Create a global partnership and cooperation for sustainable development

Business Model 1 fully supports global partnerships and co-operation of businesses, as it is designed for an international transcendent business that goes beyond profit making. Whilst Business Model 2 and Business Model 3 may cooperate with other international businesses, the extent of partnership and co-operation would be considerably lower. Business Model 3 is designed to be a family type of business. Hence, Business Model 1 satisfies the criterion to the largest extent.

All three developed business models meet criteria C1 to C11 (core values/ideals of major typological groupings). The extent to how well each business model meets each criterion is determined, primarily, by the scale of implementation of the patent. Since Business Model 1 is of a large-scale multinational business, it meets all criteria to the largest extent\(^{12}\). On aggregate average, business entrepreneurs proposed Business Model 2 as potentially the most successful business, from a business perspective. However, the AHP assessment result suggests that from a beyond profit performance point of view, Business Model 1 is potentially the most beneficial, even though the participating CSR experts expressed varied views as further discussed below.

6.2.1 **Research findings – the most beneficial business model selected by AHP technique**

Business Model 1 was selected as potentially the most beneficial business model for the ‘High temperature molten salt receiver’ patent, satisfying the creation of core values/ideals of major typological groupings to the largest extent. The AHP technique returned a selected business model potentially of the most beneficial business from multiple core values/ideals

\(^{12}\) Note: dividing weighting points of each criterion is more about proportionally dividing the weighting points among available options. Whilst weighting of each weighting point counts, it is not so important to be absolutely accurate on every single weighting point, especially when dealing with intangible criteria.
perspective. However, there was a need to evaluate whether the business model selected by the AHP technique was a business model of potentially the most beneficial business. Considering there were CSR experts available who represented core values/ideals of multiple typological groupings, the researcher re-contacted them and asked them for further assistance.

**Selecting potentially the most beneficial business model using CSR experts’ expertise**

CSR experts, who participated in Phase I, were presented with a list of prototyped business models of potential businesses (outcome of Phase II), and the list of prioritised and weighted core values/ideals of major typological groupings (outcome of Phase I, Delphi cycle A3 ran by CSR experts Group2), via email. They were invited to participate in an anonymous online survey selecting potentially the most beneficial business model using their CSR and TBL expertise, and briefly explaining why they believed the business model they had selected was potentially the most beneficial one (see Appendix XV for a copy of the survey). The survey was open from 14 February 2011 until 28 February 2011. Four CSR experts responded to the survey and provided a wide range of responses. However, a consensus on what business model was potentially the most beneficial was not achieved, as the participating CSR experts had very different views on the presented list of business models.

**Data collection**

The CSR expert ‘A’ claimed she had selected Business Model 1 only because the questionnaire did not allow her not to select any. She provided the following explanation:

"Had I had the option, I would have selected none of the business models as each has its merits if done correctly."

(CSR expert ‘A’, cited from survey)

After the researcher prompted the CSR expert ‘A’ to provide further explanation, she stated:

"I would say that there are elements from all of them that could be good examples of CSR (from the perspectives of the different situations of the different companies). Models are often "models", not practical examples, and therefore they have theoretical rather than direct practical value. The important thing is to draw out the main points from the different models to assess what is practically possible."

(Cited from email, CSR expert ‘A’)

**Data analysis**

The statement from ‘A’ could be interpreted as that, while all of the developed business models are "good examples of CSR", they are just "models, not practical examples, and therefore they have theoretical rather than direct practical value." However, if the main points are drawn out in practical terms, the models could be presumably assessed. It could be hypothesised that if KPIs were applied specifically to each prototyped business model and explained in detail, ‘A’ could have recognised which of the presented business models was..."
potentially the most beneficial one.

According to CSR expert 'B', Business Model 1 was potentially the most beneficial, however, no any explanation was provided for this.

According to CSR expert 'C', Business Model 3 was potentially the most beneficial because “small scale efforts are more focused and outcomes more meaningful. A large scale effort may be impressive but trade offs and wastefulness will occur.”

(Cited from the survey, CSR expert 'C')

According to CSR expert 'D', business Model 2 was potentially the most beneficial because:

- “The business is both local and global
- It involves also enterprises in developing countries
- It is connecting different networks and beneficiaries
- It uses multifunctional innovation
- The model can be duplicated”

(Cited from the survey, CSR expert 'D')

CSR expert 'E' stated:
“I have read through this. Although the structure seems like a useful way of thinking through issues, I do not feel sufficiently qualified or informed to make a selection. Each is a very complex proposal, the success of which depends more on implementation than conception. I am sorry I cannot be more helpful.”

(Cited from email, CSR expert 'E')

Five participating CSR experts assessed three potential business models and provided four different views. Similar to ‘A’, ‘E’ did not make any selection, arguing the success of each business “depends more on implementation than conception”. Given the CSR experts had such different views and could not reach a consensus on the presented business models, this raises the question of how a business modeller can decide what business model to implement in practice.

On the other hand, the AHP technique provided useful assistance, and the researcher efficiently selected one of the three proposed business models. However, feedback from CSR experts as a method of triangulation and evaluation of the use of the AHP technique failed. It could be proposed the AHP technique can be used for selection of potentially the most beneficial businesses, while simultaneously accounting for multiple criteria (tangible as well as intangible), and taking into consideration weighting of each criterion. However, such selection cannot be evaluated at this stage. Models are just models, whereas practical implementation of business models will make the difference. On the other hand, if a business
modeller cannot make a selection of potentially the most beneficial business, the AHP technique will; it is argued to be the most widely used decision-making approach in the world today used by a number of organisations such as Xerox, NASA, General Motors, etc. (Forman, 2001).

6.2.2 Research findings – the most beneficial business model selected by CSR experts
The participating CSR experts did not achieve a consensus as to which business model was potentially the most beneficial one. There was an argument for selecting Model 1 as potentially the most beneficial for unknown reasons; Model 2 because the business is both local and global, it also involves enterprises in developing countries, it is connecting different networks and beneficiaries, it uses multifunctional innovation, and the model can be duplicated; Model 3 because small scale efforts are more focused and outcomes more meaningful. There was also an argument that the presented business models are just models and practical value needs to be drawn out of them before the most beneficial business model could be selected.
6.3 Development of a mission statement for the selected business

Since there was a high variation in participants’ responses as to which business model was potentially the most beneficial one, and a consensus was not achieved, the researcher proceeded with the business model selected by the AHP technique. The following mission statement was created for the selected business model 1, based on the information obtained at Phase II:

Mission statement of the modelled transcendent business:

“The business to provide a solution to shortages of freshwater and electrical power in Third World Nations, by manufacturing and supplying apparatuses for desalinating seawater, sterilising wastewater, generating electrical power, and processing agricultural products.”
6.4 Outcome of Phase III:

The researcher selected a business model of potentially the most beneficial business using the AHP technique. CSR experts were asked to conduct the same task as conducted by the researcher, though instead of using the AHP technique they used their expertise. Repeating the same task, and conducting the same assessment using different techniques, was used as a method of triangulation and evaluation as to whether the AHP technique could be used for objectively selecting the most potentially beneficial business model. The participating CSR experts, however, did not achieve a consensus as to what was the most beneficial business model from CSR / TBL perspective. However, running the AHP technique ended up selecting a business model based on multiple assessment criteria (core values/ideals of major typological groupings). Therefore, it is proposed the AHP technique could be considered as an appropriate method for objective selection of business models of the most potentially beneficial businesses. However, there is a need to conduct more tests and practical implementation of designed and selected business models, before it can be successfully argued the AHP technique embedded within the TRM+ could provide repeatable, reliable selection of business models.
6.5 Phase IV: Developing detailed business model of a future business

Whilst it was outside the scope of this research to develop and implement the selected business model in practice, in order to start up a business a detailed business model needs to be developed since it is argued a good business model is essential to every successful business, whether it is a newly launched business or an already established one (Magretta, 2002). At Phase IV a detailed business model is developed using 55 elements of a business, adapted from Dowding’s UBM (2001). The following are objectives for testing (proof-of-concept) and evaluation of methods and procedures embedded within Phase V:

Objectives of Phase IV:

1. To develop a detailed business model of a future business

Since the participating CSR experts did not achieve a consensus as to which of the presented business models was the most beneficial one, the researcher progressed with the following business model, selected by the AHP technique:

'Manufacturer of an apparatus for desalinating seawater, sterilising wastewater, generating electrical power, processing agricultural products in developing Third World Nations – large scale multinational business'.

There was no need to collect any additional data to develop a detailed business model for the selected, potentially most beneficial business. The developed detailed business model was developed based on the business model prototyped at Phase II and the mission statement created at Phase III.

6.5.1 Research findings – developed detailed business model of a future business

- **Identity**
  - Name
  - Constitution: Multinational business funded and owned by WHO
  - Reputation: Number of supplied apparatuses to Third World Nations a year
  - Impact: Professional attitude, transparent, non-corrupted business that helps countries in need

- **Purpose**
  - Reason: To manufacture an apparatus that will be supplied to Third World Nations to meet their energy and clean water supply needs
  - Core values:
    - To protect and ensure access to clean water
    - To minimise waste and pollutants production, land degradation
    - To ensure collective responsibility
    - To develop both individual and collective leadership capacity
    - To create a good policy environment
    - To emphasise local governance integrated with national governance
To protect human rights
To achieve universal primary education and distribution of knowledge
To combat bribery and corruption, promote transparency
To create fair and simplified international and investment and trade rules, equal access to resources
To create a global partnership and cooperation for sustainable development

- **Vision**
  To manufacture and supply the apparatus to the most needed largest towns in developing countries within 10 years

- **Mission**
  To double the size of the business in three years after the business demonstrates its commercial success

- **Key policies**
  Pay suppliers within 30 days, pay equally men and women doing the same job no matter what their geographical location and ethnic background, political and personal believes

- **Target market**
  Poor largest towns in developing countries

**Structure**

- **Physical deployment**
  Three factories and a warehouse in north-west Germany

- **Functional composition**
  Manufacturing factories, warehouse, main office, delivery department, IT and research and development department, human resources department

- **Roles and jobs**
  CEO, board of directors, managers, sales assistants, accountant, warehouseman, secretary, labour

- **Workplaces**
  Research and development department, factories, office, warehouse, procurement and delivery tracks

- **Reporting structure**
  Board of directors, factory managers, department managers, supervisors

- **External infrastructure**
  Suppliers, chamber of commerce, local government, European government, press

**Participants**

- **Owners**
  The WHO organisation, the board of directors, venture capitalists

- **Managers**
  CEO, board of directors, factory managers, warehouse manager, research and development manager, personnel manager

- **Workers**
  Labour, research and development staff, sales representative staff, warehouseman, secretaries, delivery and shipment staff

- **Channel**
  Mail/fax order

- **Customers**
  Larger communities living in poor large towns in developing countries

- **Suppliers**
  20 raw material suppliers, 2 office suppliers, 2 IT suppliers

- **Partners**
  3 research universities, 10 cooperating businesses

- **Neighbours**
  Residents living near factory outlets

- **Indirect participants**
  Families of employees, suppliers to the suppliers of the business

**Enablers**

- **Land and buildings**
  Freehold of three manufacturing factory outlets, freehold of a warehouse with five acres of land

- **Technology**
  Machines for manufacturing the apparatuses; telephone system; IT
system; ordering, design and development system; warehouse handling system; tracks and ships

- **Intellectual property**  Patent of the apparatus, designs produced for customers, the company name and logo
- **Information**  Product specifications, list of clients and contact details, list of suppliers and their contact details, list of employees and their details, orders and sales figures, financial data
- **Skills**  Design and development of the apparatuses, negotiating and buying of raw materials, computing, managing, making strategic decisions and plans
- **Core competencies**  To present an affordable and durable solution to the problem of shortages of freshwater and clean energy, by using environmentally friendly technologies, to present quality and professional post-purchase service
- **Relationships**  Clients, suppliers, local government departments, European government department, local press
- **Financial services**  Working capital, investments, loans, donations

### Activities
- **Line-of-business**  Buying raw materials, manufacturing the apparatuses, selling, delivering, invoicing
- **Support**  Training, personnel, IT
- **Management**  Board meetings, strategy planning, formulating business objectives and staff personal objectives, reviewing implemented strategies, reviewing salaries
- **Compliance**  Environmental standards, health and safety checks, minimum wages and health cover paid
- **Incidental**  Organised events for promoting the technology used in the patent and use of environmentally friendly technologies in general, sponsoring local communities in Third World Nations where the apparatuses are put into operation

### Deliverables
- **Products**  Apparatuses designed and developed for generating electric power, desalinate/sterilise/distillate seawater/wastewater, process agricultural produce in Third World Nations (e.g. Vietnam, Africa)
- **Services**  Design and development of the apparatuses, alterations and modifications, post-purchase training for servicing and maintenance of the apparatuses sold

### Influences
- **Constraints and pressures**  Availability of qualified skilled staff, new technologies and development that will come to the market, planning regulations, corruptions of governments where the apparatuses will be supplied
- **Risks and threats**  Loss of key staff, especially from research and development department, unpredicted natural disasters – e.g. fire, loss of support and willingness of governments in developing countries to negotiate with potential buyers/sponsors of the apparatuses
- Opportunities: Expansions to new markets, such as in Africa and Mexico
- Competitors: CSP apparatus manufacturers, Solar Trust of America

**Culture**
- Management style: Egalitarian and democratic style where management takes a keen interest in staff and encourages staff to make suggestions that will lead to continuous improvement of the business
- Rules and customs: High standards and professional attitude, friendly and supportive atmosphere where honest mistakes are accepted for future improvement of the business
- Social behaviour: Kind, helpful, supportive and encouraging atmosphere
- Attitude to work: Enthusiastic staff, low absenteeism, staff willing to accept change for the benefit of their own personal development and further development of the business
- Benefits and perks: Private health cover for all staff; pension scheme; paid maternity leave for 12 months; 10% discount of share price once the business proves itself, succeed commercially, and go on IPO
- Personal development: Half yearly training, annual training review of staff

**Performance**
- Scale: Three manufacturing factory outlets, one warehouse, employing approximately 250 employees
- Efficiency: Number of manufactured and sold apparatuses a month
- Empathy: Time to pay suppliers, care of employees, support from governments, acceptance of the apparatus in the target client countries
- Innovation: The speed at which new working practices are introduced and implemented
- Financial: Sound balance sheet, cash flow, profit/loss account, dividends paid per share, sales/month, sales/overhead

(Template of the UBM adapted from Dowding, 2001)

By addressing each element above, a detailed business model for the future business was developed for example and future reference, not implementation. Implementation and launching of the actual business in practice was outside the scope of this research.
6.6 Outcome of Phase IV:
The researcher developed a detailed business model of the selected, potentially the most beneficial business, by describing 55 elements of the modelled business. Evaluation of the developed detailed business model was not possible, as it could take several years for a business to prove its fitness for purpose, growth, and sustainability profile.
6.7 Phase V: Setting up KPIs of a modelled transcendent business

Phase IV returned a detailed business model of potentially the most beneficial transcendent business. However, in order for any business to demonstrate how transcendent it is, it needs to monitor, measure, and report performance that goes beyond profit, which means it needs to have a set of KPIs that enable this. Even though practical implementation of the developed business model and launching the transcendent business in practice was outside the scope of this research, there was a need to develop some reusable methodology of how KPIs could/should be set up to monitor, measure, and report beyond-profit performance of a modelled business. At Phase V, KPIs of the modelled transcendent business are going to be set, based on the prioritised core values/ideals of major typological groupings obtained at Phase I.

Objectives of Phase V:

1. To set up Key Performance Indicators (KPIs) of the modelled transcendent business, for monitoring and reporting of performance that goes beyond profit

Note: there was no need to collect any additional data to set up KPIs of the modelled business. The KPIs were set based on the prioritised core values/ideals of major typological groupings, obtained at Phase I.

Considering this research took a reverse-value chain approach, where the transcendent business was modelled around core values/ideals of multiple typological groupings, Chapter 3 proposed that these were the KPIs the modelled business should monitor, measure, and report to the public. Therefore, the researcher set up KPIs based on the prioritised and weighted core values of major typological groupings obtained at Phase I. Every single core value/ideal from the list developed at Phase I became a KPI. However, KPIs did not have equal weighting and priority. In fact, priority and weighting of each KPI was set according to the priority and weighting corresponding to each core value/ideal. Moreover, the researcher proposed that the modelled transcendent business needed to satisfy each KPI according to the priority and weighting, reflecting the priority and weighting of multiple typological groupings. Weighting of each core value/ideal, therefore, represents the target level that could/should be achieved by the modelled transcendent business. The following is a list of prioritised and weighted core values/ideals of major typological groupings as prioritised and weighted by CSR experts. Based on the list below, the following target levels were set for the modelled transcendent business:
Table 6.3: List of prioritised and weighted core values/ideals of major typological groupings as prioritised and weighted by CSR experts

<table>
<thead>
<tr>
<th>Priority</th>
<th>Core Value/Ideal</th>
<th>Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Protect and ensure access to clean water</td>
<td>0.137</td>
</tr>
<tr>
<td>2</td>
<td>Minimise waste and pollutants production, land degradation</td>
<td>0.137</td>
</tr>
<tr>
<td>3</td>
<td>Ensure collective responsibility</td>
<td>0.132</td>
</tr>
<tr>
<td>4</td>
<td>Create a good policy environment (e.g. create market mechanisms that are sustainability aware and reward progressively reduced material and energy inputs)</td>
<td>0.117</td>
</tr>
<tr>
<td>5</td>
<td>Protect human rights (e.g. women rights, children rights, minority group’s rights)</td>
<td>0.096</td>
</tr>
<tr>
<td>6</td>
<td>Combat bribery and corruption, promote transparency</td>
<td>0.091</td>
</tr>
<tr>
<td>7</td>
<td>Achieve universal primary education and distribution of knowledge</td>
<td>0.076</td>
</tr>
<tr>
<td>8</td>
<td>Create a global partnership and cooperation for sustainable development</td>
<td>0.071</td>
</tr>
<tr>
<td>9</td>
<td>Create fair and simplified international investment and trade rules, equal access to resources</td>
<td>0.051</td>
</tr>
<tr>
<td>10</td>
<td>Develop both individual and collective leadership capacity</td>
<td>0.046</td>
</tr>
<tr>
<td>11</td>
<td>Emphasise local governance, integrated with regional and national governance</td>
<td>0.046</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>1.000</strong></td>
</tr>
</tbody>
</table>

6.7.1 Research findings – the set KPIs of a modelled transcendent business

**Core value/ideal 1** – Protect and ensure access to clean water; target 0.137

According to CSR experts Group2, the most important core value/ideal of major typological groupings is to ‘Protect and ensure access to clean water’ with weighting of 0.137 out of 1. According to the TRM+ presented and tested in this thesis, every transcendent business needs to satisfy this core value/ideal as best as possible. It was discovered that the manufactured product once it is put into operation will not require any water treatment and will not need any additional water to operate. However, the core value/ideal 1 needs to be satisfied also by the business that will design and manufacture the apparatus. It could in fact develop one apparatus for itself as a demo apparatus for promotion, and use it for generating its own electricity and recycling its own wastewater. The set target 0.137 would be achieved if the business does not consume any external electricity and water. If the business can satisfy half of its demand for electricity and water, then it could be argued the
business meets its target 50%, which translates to 0.0685. The business therefore is to monitor MWh of renewable energy produced by it, compared to MWh of coal fired electricity consumed and supplied from a grid.

**Core value/ideal 2 – Minimise waste and pollutants production, land degradation**

According to STP experts, the apparatus uses widely available non-toxic materials, therefore there should not be any toxic waste generated by the manufacturing business. However, the business will need to monitor, measure, and report its overall impact on the environment. This includes monitoring, measuring, and reporting:

- Percentage of materials used that are recycled input materials
- Energy saved due to conservation and efficiency improvements
- Total direct and indirect greenhouse gas emissions by weight
- Emissions of ozone-depleting substances by weight
- NO, SO, and other significant air emissions by type and weight
- Total weight of waste by type and disposal method
- Environmental impacts of transporting products and other goods and materials used
- Total environmental protection expenditures

According to CSR experts Group2, core value/ideal 2 has a weighting 0.137 out of 1 (in fact the same weighting as the core value/ideal 1). Even if the manufacturing business uses only recycled materials, does not require external sources of energy and water, nor generate any waste, it would still generate some pollution by importing raw materials, packing and transporting the manufactured apparatuses, and it would thus have some impact on the environment where the manufacturing business is established. Therefore, achieving the core value/ideal 2 to 100% would probably never happen. However, the business needs to do its best to get as close to the target as possible, for example, by using only recycled materials, etc.

**Core value/ideal 3 – Ensure collective responsibility**

The business will create an international committee to monitor development and operation of the patent, as well as design and manufacture of the apparatuses and by doing so the core value/ideal 3 will be potentially satisfied 100%, achieving the weighting target 0.132. The negative impact of the manufacturing business on the environment, and the negative impact of the apparatus on local communities, where the apparatus will be put into operation, will indicate whether the core value/ideal is met. The number of negative impacts mentioned in media will be a good variable to measure. No negative publicity would represent achievement of the target.
Core value/ideal 4 – Create a good policy environment (e.g. create market mechanisms that are sustainability aware and reward progressively reduced material and energy inputs)

The business will create policies that would promote usage of the patent and green technologies in general. Venture capitalists need to assist the business during the process of creation of such policies. If they are developed and implemented satisfactorily, the core value/ideal 4 is satisfied 100%, achieving the target of 0.117.

Core value/ideal 5 – Protect human rights (e.g. women rights, children rights)

The business will negotiate a Code of Conduct that will be signed between developed countries with incentives in the manufacturing business, and developing countries interested in buying and using the manufactured apparatus. The Code of Conduct will include general rules of protecting human rights, and will have to be followed by governments of developing countries to make sure every human and every co-operating business has equal right and no-one is disadvantaged, including all its business partners. The business will have to monitor the number of female employees compared to male employees; the number of employees having various ethnical backgrounds, political beliefs, personal values; and the level of wages paid to male workers compared to female workers. If all employees, all suppliers, all distributors, etc. have equal rights, than the core value/ideal 5 is met 100%, the target of 0.096 is achieved.

Core value/ideal 6 – Combat bribery and corruption, promote transparency

The business is to develop a Code of Conduct that will cover general rules and anti-corruption policies. It will have to monitor and report cases of bribery. If no corruption occurs, and the business is operating transparently and fairly with all business partners, then the core value/ideal 6 is satisfied and the target weighting of 0.091 is achieved.

Core value/ideal 7 – Achieve universal primary education and distribution of knowledge

The business will work closely with research organisations and universities exchanging experiences and sharing knowledge. Once the business is well established and succeeding commercially, it will become a sponsor of local schools in developing countries assisting them to achieve universal primary education. However, it is expected that at the start up stage the business will not have sufficient funds to be self-sustainable and will rely on sponsorship of a large international organisation such as WHO. The business will monitor the number of trained employees and students trained for future solar jobs. At a later stage, the business will monitor donations to local primary schools in the area of the target market and other activities, such as sponsoring and encouraging teachers from developed countries to teach at primary schools in developing countries. The weighting of the core value/ideal 7 is 0.076. This target can be achieved after the business is well established and self-sustainable. The monitoring and reporting system will be set up according to the number of employees trained/schools helped. For example, 10 trained employees could equal 0.001, 20 trained employees equals 0.002, etc. It is important to highlight that monitoring and reporting of
core values/ideals is better expressed proportionally by percentages, rather than counting individual numbers.

**Core value/ideal 8 – Create a global partnership and cooperation for sustainable development**

The business will create relationships among co-operating businesses, suppliers of raw materials, research institutions and universities, etc. It will also become a bridge between developed countries and developing countries, providing clean technology, training employees in developing countries, and assisting their governments fight issues to do with human rights, corruption, and bribery. The business will monitor new contacts to co-operating businesses, the number of new clients, the number of new co-operating research organisations and universities. Weighting of core value/ideal 8 is 0.071. It is expected that at the start up stage the business will meet the core value/ideal 8 to something above zero, for example, 0.001. However, as more contracts and partnership projects are signed with business partners, the higher the extent to which the core value/ideal 8 is achieved.

**Core value/ideal 9 – Create fair and simplified international investment and trade rules, equal access to resources**

The business will assist the World Trade Organisation to develop international trading and investment rules for renewable energy projects around the world. It will promote usages of green technologies and trading of green energy generated with zero emissions, such as electricity generated by using concentrated solar power. The business will focus on using recycled materials to manufacture the apparatuses and by doing so preserve natural resources. Once the international investment and trade rules are developed and successfully implemented, and fair access to natural resources is guaranteed, the core value/ideal 9 is satisfied 100%, achieving the target weighting point of 0.051. However, this target will in practice never be fully achieved, as the business will require input materials to manufacture the apparatuses (even recycled materials). The more apparatuses that are manufactured, the more resources that are consumed, the less resources are left for other businesses to create something else.

**Core value/ideal 10 – Develop both individual and collective leadership capacity**

The business will be a collective leader in introducing green technologies to Third World Nations. The business will monitor its share of the target market group worldwide. Achieving more than 50% of the world market would correspond to its leadership capacity. Once this share is achieved, the business satisfies the core value/ideal 10 100%, achieving the target weighting of 0.046.
**Core value/ideal 11** – Emphasise local governance, integrated with regional and national governance

The business will assist to create national law and local governance for promoting usage of green technologies, such as the technology used in the apparatus it will manufacture. It will work closely with local communities and the government where the apparatuses are manufactured and put into operation. The business will strive to be a bridge between local communities and governments. Moreover, it will consider not only the local impact of its operations and the apparatuses manufactured, but also the global impact. Once the business successfully assists in creating new governance rules for development and usages of green technologies, the core value/ideal 11 will be satisfied 100%, and the target weighting of 0.046 will be achieved.

The total weighting of all core values/ideals is equal to 1. It is unlikely this target will ever be achieved as the business will always need some resources to operate (to manufacture the apparatuses), there will always be some negative impact to the natural environment, and there will always be some waste generated, etc. The aim of developing transcendent businesses is not to construct businesses that do not require any resources and generate only the benefits for everyone (all stakeholders one can think of); but rather, to go beyond profit-making, consider other stakeholders and their core values/ideals, and minimise the negative impact on major typological groupings and the world around the business.

It was proposed that monitoring and measuring to what degree each individual core value/ideal of each typological grouping is satisfied will never be accurate to 100%, since it is difficult to numerically measure intangible values/ideals of major typological groupings. Therefore, it was proposed that measuring of the KPI set for transcendent business modelling will rather be proportional – indicating in percentages how well each KPI (core value/ideal) is satisfied. KPIs set in the TRM+ according to the prioritised and weighted core values/ideals of major typological groupings aim to improve non-financial performance of a modelled transcendent business, and leave behind a better world for the next generation.
6.8 Outcome of Phase V:
The researcher set up KPIs of the modelled transcendent business based on the core value/ideals of major typological groupings, obtained at Phase I. It was discovered that KPIs of a transcendent business could potentially be set according to core values/ideals of major typological groupings to reflect their values/ideals/beliefs. However, the KPIs in this thesis were set only as an example and a future reference. Evaluation of the set KPIs of the modelled business was beyond the scope of this research as it could take several years to launch a business in practice and assess how well it fits its purpose, address core values/ideals of multiple typological groupings, and how beneficial and sustainable it would be in medium to long term.
6.9 Summary:

Chapter 4 to 6 presented testing and evaluation of methods and procedures embedded within Phase I to Phase V of the TRM+, and by doing so, the whole TRM+ as a reference model and a methodology for designing business models of future transcendent businesses was tested and evaluated. Methods and processes embedded within each phase of the TRM+ led the researcher to develop a list of three potential business models for the ‘High temperature molten salt receiver’ patent, and select a business model of potentially the most beneficial business. The next chapter presents the TRM+ as a reference model, it analyses the TRM+ as a methodology, and it assesses the developed business model against the five goals of a transcendent business outlined by Giacalone (2004), and the five principles of Corporate Sustainability and Responsibility (CSR 2.0) identified by Visser (2010).
CHAPTER VII

7. Design Space Analysis of the TRM+ methodology

7.1 Introduction
This thesis presented, tested, and evaluated a Transcendent Reference Model and Methodology (TRM+) for development of business models of future transcendent businesses. It was proposed, tested, and evaluated, that the TRM+ could be used as a series of steps/phases as a reference model. However, the TRM+ could also be used as a reusable methodology where the steps/phases do not have to be used in order, and where not all phases of the TRM+ have to be used. Whilst the aim of this research was to create, test, and evaluate a business modelling approach for developing business models of future transcendent businesses, this chapter will propose multiple potential usages of the TRM+, including transition of existing businesses into transcendent ones. This chapter analyses all phases of the TRM+ and all methods and procedures embedded within individual phases. Overall, it presents the TRM+ as a reference model as well as analysing the TRM+ as a methodology, using the QOC.
7.2 Analysis of the Transcendent Reference Model

Figure 7.1: Diagram of the TRM+ model

The diagram above shows options that were exercised, and are recommended to be used, in future applications of the TRM+. The following sections summarise and discuss each phase of the model.
7.2.1 Phase I: Identification of major typological groupings and their core values/ideals

This phase aims to create a list of prioritised and weighted, the most important, core values/ideals of major typological groupings a modelled transcendent business will strive to address. The created list of prioritised and weighted core values/ideals is then used in Phase II, Phase III, and Phase V of the TRM+.

It is proposed Phase I of the TRM+ will not have to be repeated every time a new post-incubation innovation/patent is trialled through the TRM+. Once a list of prioritised and weighted core values/ideals of major typological groupings is created, it can be reused until the point when the core values/ideals would need to be re-evaluated, which would depend on changes in society, and perceptions of values/ideals/beliefs of major typological groupings. Therefore, a business modeller would start developing a model for a new post-incubation innovation/patent directly at Phase II of the TRM+.

7.2.2 Phase II: Addressing core values/ideals of major typological groupings

This phase aims to identify a wide range of potential usages of a selected post-incubation innovation / patent and prototype business models of potential businesses for each of the identified usages.

The TRM+ recommends using post-incubation innovations / patents as instruments for addressing core values/ideals of major typological groupings. Since it is important to maximise chances for success of the modelled business, a business modeller needs to select a post-incubation innovation or a patent that is well known, so experts with knowledge relative to the post-incubation innovation / patent can be easily identified. Otherwise potential failure of the modelled business, caused by a business modeller not able to identify post-incubation innovation domain experts and extract their knowledge, would be too high.

Lists of post-incubation innovations and descriptions of thousands of patents can be accessed from patent and trademark offices and other publicly available information sources, such as the World Wide Web. The United States Patent and Trademark Office (PTO or USPTO) issues over 150,000 patents to companies and individuals worldwide each year (United States Patent & Trademark Office Statistics, 2010). The following websites are examples where thousands of patents and their descriptions could be accessed:

- http://www.google.com/patents/
- http://www.delphion.com/
- http://patft.uspto.gov/
- http://www.uspto.gov/
Access to databases of patents is normally free of charge. Business modellers are able to browse databases and select patents of their interest. The TRM+ recommends selecting a patent that is already expected to contribute to addressing major world issues / core value/ideals of major typological groupings. For example, if one of the identified most important core values/ideals is ‘access to drinking water’, a business modeller can intentionally search for patents relative to water purification. However, the TRM+ is not strictly limited to technological patents. A patent could be also, for example, a mathematical formula.

When searching for patents, the first step is to brainstorm and write down all keywords that broadly and creatively describe the invention / patent that is searched for. The following are useful questions to ask; questions that should trigger the brainstorming process:

- What does the invention/patent do?
- What is the end result?
- How does it work?
- What is it made of?
- What is it used for?
- What problem(s) does it solve?

(Adopted from: McKinney Engineering Library, 2010)

If a business modeller is not the author of a selected patent and has a limited (or nil) knowledge in the area relative to the patent, seeking advice of experts who have knowledge and expertise relative to a selected patent is crucial. By extracting knowledge and expertise of experts and identifying the most beneficial usages of a selected patent, the success of the modelled business can be significantly increased. “It could be argued that part of the potential ‘pay-off’ to Small and Medium Enterprise (SME) owners, who seek professional advice, may relate to improving the odds of success or, conversely, reducing the probability of failure” (Watson, 2003: 2) even though cost of accessing experts might be too high for SME owners. Furthermore, Rae (2007) argues the effectiveness of starting up an (entrepreneurial) business depends, to a significant extent, on being able to develop network(s) of contacts, and utilise knowledge and experience of members of the developed network(s). Generally speaking, experts who are speakers at international conferences and who publish work in the area of their expertise are globally recognised experts. Therefore, a list of speakers of international conferences dedicated to specific technologies / inventions /
patents are a good source of contacts for post-incubation innovation domain experts.

Identification and prototyping of appropriate business model(s) for each of the identified potential usages of a post-incubation innovation / patent is a two-stage process:

1. A business modeller firstly assigns an appropriate business model archetype for each of the recommended potential usages of a selected post-incubation innovation / patent
2. A business modeller describes ten aspects (Identity, Purpose, Structure, Participants, Enablers, Activities, Deliverables, Influences, Culture, Performance) for each of the potential business models

When assigning the most appropriate business model archetype, it is important to bear in mind that a selected patent is an asset; it is an instrument that will be used, for example, to address major world issues, to satisfy unmet needs, to solve a problem that has a compelling need to be solved, or to satisfy wants and desires of target customers / stakeholders. Assigning the most appropriate business model archetype to each of the recommended usages of a selected patent will depend on the type of the patent (financial, physical intangible, human) and ownership of a patent (whether a business modeller holds exclusive rights to use the patent, or whether he/she is licensing the patent, re-selling it, etc.). It is hypothesised there will only be a few appropriate business model archetypes applicable for a selected patent. Information gained from discussions between post-incubation innovation domain experts will guide a business modeller throughout the process of assigning appropriate business model archetypes. Once the most appropriate business model archetypes are assigned for all recommended usages of the selected patent, a business modeller describes ten aspects for each of the assigned business model archetypes, and by doing so business models are prototyped.

7.2.3 Phase III: Selecting potentially the most beneficial business

The aim of this phase is to assess the list of potential business models for a selected post-incubation innovation / patent (created at Phase II) against a list of identified, prioritised, and weighted core values/ideals of major typological groupings (created at Phase I), and to select the most beneficial business model that will be proposed for practical implementation. The most beneficial business model will then be used at Phase IV for development of a detailed business model for the future business.

7.2.4 Phase IV: Developing a detailed business model of a future business

This phase aims to develop a detailed business model for the future transcendent business that was selected, at Phase III, as potentially the most beneficial. A detailed business model is developed by describing 55 elements of a business model, adapted from Dowding’s (2001) Universal Business Model (UBM). It is important business modellers explain every detail of their modelled businesses, because otherwise they will not be able to manage any significant
growth of their businesses and attract potential investors (McKaskill, 2006a).

7.2.5 Phase V: Setting up KPIs of a modelled transcendent business
This phase aims to set up KPIs of the modelled transcendent business, described in detail in Phase IV, so its beyond-profit performance can be monitored, managed, and reported to multiple typological groupings (e.g. social, environmental, economic). Since the TRM+ is designed for developing business models for transcendent businesses that go beyond the financial bottom line, a business modeller needs to set up KPIs that reflect more than the financial aspect of the business. The TRM+ proposes that a modelled transcendent business needs to monitor, manage, and report the core values/ideals of major typological groupings that were identified, prioritised, and weighted at Phase I. The KPIs of a modelled transcendent business are in fact the most important core values/ideals of major typological groupings. Moreover, the TRM+ proposes the most important core values/ideals of major typological groupings need to be monitored, measured, managed, and reported to the public. Priority level and weighting points of each of the most important core values/ideals of major typological groupings provide a target level the modelled transcendent business needs to strive to achieve, once it is launched.
7.3 Analysis of the Transcendent Reference Methodology using QOC

Five steps/phases of the TRM+ were proposed, tested, and evaluated. Each of the phases asked a main question and a number of sub-questions that lead to finding the answer to the main question of each phase. Sub-questions were answered by using a number of methods and procedures embedded within each phase. The following QOC shows the TRM+ as a reusable methodology with all options considered during development of the TRM+. In the diagrams that follow a solid line linking an option with a criterion illustrates the option meets the criterion to a large extent, whereas a dashed line indicates the criterion is not met or is met to a low extent.

Phase I:

Q1: Identification of major typological groupings (e.g. social, environmental, economic) and their initial values/ideals that the modelled transcendent business will strive to address

The TRM+ is a typological groupings-centric business modelling approach. This means the major typological groupings need to be identified at the very early stage of developing a business model of the future transcendent business – at the ‘meta-level’, far before a business modeller knows who the target customers will be and what the offered product/service might be. The first question (Q1.1) that was asked during development of the TRM+ was: how do we identify multiple typological groupings a modelled transcendent business will account for?

Figure 7.2: QOC – How to identify multiple typological groupings a modelled transcendent business will account for – analysis of the Transcendent Reference Methodology

The researcher identified three options (O1.1.1 to O1.1.3) for how to identify major typological groupings any modelled transcendent business will simultaneously account for. Whilst there are potentially more options, the researcher focused on the most obvious ones. Option O1.1.3 was not tested as the researcher considered using case studies of existing businesses as a biased option – selection of businesses would depend on the individual business modeller (user of the TRM+) trying to identify major typological groupings. Whilst using case studies of existing businesses as a method for identification of major typological
groupings could hypothetically meet criteria C1 to C6, it was hypothesised the criteria would not be met to a large extent. Dashed lines linking the option O1.1.3 with criteria C1 to C6 indicate such a claim. Option O1.1.2 was tested as a pilot study, however, it did not return any beneficial outcome as the question asked was too broad – surveyed participants were not able to identify major typological groupings, or they identified a wide range of diversified groupings. While surveying experts as a method for identification of major typological groupings hypothetically represents knowledge and expertise based, verifiable and repeatable option, the experts are not always accessible, and they may lack diversified ideas depending on their background and expertise. Dashed lines linking option O1.1.2 with criterion C5 and C6 illustrate this. Option O1.1.1 was tested by the researcher – the researcher conducted content analysis of world reports. Content analysis of world reports, as a method for identification of major typological groupings, is potentially a repeatable, verifiable, knowledge and expertise-based option, full of diversified ideas. Moreover, world reports are easily accessible. Therefore, option O1.1.1 meets all criteria C1 to C6 to a large extent, which is illustrated by solid lines linking option O1.1.1 with criteria C1 to C6.

Once typological groupings were identified, it was important to identify core values/ideals for each grouping, otherwise it would be impractical for a transcendent business to address large numbers of diversified values/ideals. Question Q1.2 was asked:

![Figure 7.3: QOC – How to identify core values/ideals for each major typological grouping – analysis of the Transcendent Reference Methodology](image)

The researcher proposed option O1.2.1 and O1.2.2 to be the most obvious and appropriate options to identify core values/ideals for each major typological grouping. The researcher tested option O1.2.1 by conducting content analysis of world reports, which was presumably confirmed as a repeatable, verifiable, knowledge and expertise based, accessible option, full of diversified ideas. Solid lines linking option O1.2.1 with criteria C1 to C6 illustrate this. However, there was a need to evaluate the validity of such method. Therefore, option O1.2.2 was tested – the researcher conducted surveys with CSR experts. Whist option O1.2.2 represented a knowledge and expertise-based option, full of diversified ideas, this turned out to be a disadvantage – there was a recorded wide variation of participant responses, even contradictions. Moreover, there was inconsistency between conducted cycles of the surveys.
(Delphi cycle A1 and A2), and also between two groups of CSR experts that participated in the conducted surveys (CSR experts Group1 and Group2). Therefore, the research finding suggests option O1.2.2 is not a repeatable, verifiable, and easily accessible option, which is illustrated by dashed lines connecting option O1.2.2 with criteria C1, C2, and C6.

Despite the high variation of participant responses, and not successfully validating the identified major typological groupings and their core values/ideals, the researcher proceeded to question Q1.3 of Phase I: how do we prioritise core values/ideals of major typological groupings so a business modeller knows the relative importance of each core value/ideal? Knowing the relative priority, in terms of importance, is necessary during decision-making whilst developing a business model of the future transcendent business. Priority of the identified core values/ideals will assist a business modeller to make decisions for the best benefits of major typological groupings. It will eliminate the self-interest of the business modeller and it will shift the focus towards addressing core values/ideals of multiple typological groupings.

The researcher proposed core values/ideals of major typological groupings could be prioritised by conducting content analysis of world reports (option O1.3.1), based on the frequency of how often they appear across world reports. In other worlds, the more frequently a core value/ideal is mentioned in world reports, the more important it is. However, such a proposition was not tested since objectivity of such an approach would depend on a number of analysed reports and the actual reports being analysed. For example, an analysis of UN drug reports could generate significantly different outcomes compared to analysis of Greenpeace reports. In order to generate an objective outcome, a business modeller would have to analyse a large number of diversified world reports, which would be time consuming and would require a business modeller having some research skills. Therefore, the researcher asked for the assistance of CSR experts and tested option O1.3.2, which generated a very high variation of answers in participant responses. This was presumably caused by participants having different backgrounds, experiences, beliefs, and being from various geographic locations. Therefore, the research finding suggests that

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**Figure 7.4: QOC – How to prioritise core values/ideals of each major typological grouping – analysis of the Transcendent Reference Methodology**
surveying experts, as a method for prioritisation of core values/ideals of major typological groupings, is not an ideal method. As one of the participant stated, “...you would get a very wide range of answers depending upon a number of factors – location of the person, type of industry, economic background, political beliefs, etc.” Similarly, Holme and Watts (2000: 7) argue, “different businesses in different sectors inevitably put emphasis on different aspects of CSR depending on business sector and geographic location”. It is plausible that core values/ideals of major typological groupings could be prioritised by conducting quantitative research with the general public, and have their opinion being heard as to how they perceive Corporate Social Responsibility. Alternatively, face-to-face focus groups could be conducted with the most experienced and internationally recognised CSR experts.

Despite the high variation in participant responses, the researcher proceeded with follow up question Q1.4: how do we prioritise core values/ideals of each major typological grouping across all typological groupings? Prioritisation of core values/ideals across all major typological groupings is important in order for a business modeller to know the relative importance of each core value/ideal against all other core values/ideals. Similarly as for the question Q1.3, the researcher proposed, and tested, conducting surveys with CSR experts. Prioritisation of core values/ideals of each typological grouping across all typological groupings generated a very wide variation of participant responses, presumably caused by the participants being from different geographic locations (Malaysia, Australia, Canada, Netherlands), types of industries (education, mining, finance, UN advisory, energy sector), economic backgrounds, and political beliefs.

The final question Q1.5 of Phase I asked: how do we assign weighting points to each prioritised core value/ideal? The researcher proposed and tested calculating weighting points based on the priority given by the participating CSR experts. Such a method appeared to be appropriate, allowing accurate calculation of weighting points to each core value/ideal.

Overall, Phase I of the methodology aims to identify: 1) major typological groupings; 2) core values/ideals of each of the identified groupings; 3) prioritise the identified core values/ideals within each typological grouping so the most important core values/ideals of each grouping could be identified; 4) prioritise the most important core values/ideals of each grouping across all typological groupings; and 5) assign weighting points to each prioritised core value/ideal. The outcome of Phase I is a single list of prioritised and weighted core values/ideals of major typological groupings. According to the participating CSR experts, once a list of the most important core values/ideals is created, the list is expected to be valid for several years depending on changes in society, environment, economy, human development, and other external factors, such as the GFC for example. In other words, Phase I would not have to be conducted every time business modellers are developing business models of their transcendent businesses; the TRM+ could be used directly from Phase II.
Phase II:

Q2: Addressing core values/ideals of major typological groupings

Phase II aims to prototype business models of potential businesses that would address diversified core values/ideals of major typological groupings. The first question of Phase II asks: how do we address diversified core values/ideals of major typological groupings?

The researcher proposed three, the most obvious, options (O2.1.1 to O2.1.3) as to how to address diversified core values/ideals of multiple typological groupings. Option O2.1.3 proposed that core values/ideals could be simultaneously addressed by using the available capacity and capability of an existing business. This option was not tested, as the researcher did not have access to any existing business that would allow testing such proposition. Moreover, it was hypothesised that businesses may not have accessible spare capacity and capability; such capacity and capability are likely to be limited in the number of ideas of what an existing business can do. For example, addressing global issues at the local level might not be applicable when such issues do not exist at the location where the existing business operates. There could be also some issues with scalability and repeatability as an existing business may have very limited resources. Dotted lines linking option O2.1.3 with criteria C1 to C7 illustrate the criteria are unlikely to be met to a large extent. The researcher considered also using someone’s skills and expertise (option O2.1.2) as an enabler for addressing core values/ideals of multiple typological groupings. However, it was hypothesised such an approach would be very individualistic, difficult to repeat by someone else, not always easy to scale up from local to global implementation, and very limited in a variety of ideas influenced by the person’s own skills, experiences, and expertise. Dotted lines linking option O2.1.2 with criteria C1 to C7 illustrate this. On the other hand, it was proposed option O2.1.2 and O2.1.3 could be used by existing businesses to transition themselves into transcendent businesses. Such a proposition was not tested. Instead, the researcher tested option O2.1.1 and aimed to address diversified core values/ideals of major typological groupings by using available post-incubation innovations/patents. The researcher tested option O2.1.1 with two patents publicly available on the internet. Whilst the participating post-incubation innovation domain experts described one of the selected

Figure 7.5: QOC – How to address diversified core values of multiple typological groupings – analysis of the Transcendent Reference Methodology
patents as unpractical, the other patent confirmed that patents could potentially be used for simultaneously addressing diversified core values/ideals of multiple typological groupings. Research findings suggest that patents could be used as enablers for simultaneously addressing diversified core values/ideals of multiple typological groupings. Option O2.1.1 meets criteria C1 to C7, which is illustrated by solid lines. However, in order to use patents as enablers for addressing multiple core values/ideals, their potential usages have to be identified. Therefore, question Q2.2 of Phase II was asked: how do we identify potential usages of a selected post-incubation innovation / patent for development of business models? The researcher proposed that post-incubation innovation domain experts, with knowledge and expertise relative to technology used in a selected post-incubation innovation / patent, would be able to identify its multiple usages. Making such a proposition triggered a new question: how do we identify post-incubation innovation domain experts?

![Figure 7.6: QOC – How to identify patent experts – analysis of the Transcendent Reference Methodology](image)

The researcher proposed post-incubation innovation domain experts could be identified by using a private network of contacts (option O2.2.1), which is likely to be a low cost, though not always available option, since not everyone has access to such contacts. Moreover, such an option is unlikely to be repeatable (since the same experts would not be able to provide assistance to various patents with different technologies); it would have to be verified by some other experts to minimise biases; and it is likely to lack of diversified ideas. Dotted lines linking option O2.2.1 with criteria C1 to C4 and a solid line linking option O2.2.1 with criterion C5 illustrate this. On the other hand, option O2.2.2 is likely to meet all criteria C1 to C5, which was also tested and proved with this research. Once a group of post-incubation innovation domain experts was selected, and they identified multiple usages of a selected patent, a new question was asked: how do we identify and prototype appropriate business model(s) for each of the identified potential usages of a post-incubation innovation / patent? The researcher proposed, tested and evaluated using knowledge extracted from post-incubation innovation domain experts and prototyping business models, by assigning the most appropriate business model archetype to each of the recommended usages of the selected post-incubation innovation, and describing ten aspects (Identity, Purpose, Structure, Participants, Enablers, Activities, Deliverables, Influences, Culture, Performance) for each of the proposed potential business.
Overall, Phase II of the methodology aims to prototype business models of future transcendent businesses by addressing diversified core values/ideals of multiple typological groupings. By taking such an approach, business models and business metrics are developed simultaneously, unlike the current business modelling approaches that suggest developing business models, and then use available business measuring tools to measure and report performance.

Whilst the aim of Phase II is to prototype business models of future potential businesses, it could be used as a methodology for exploring post-incubation innovations, as they come along, and evaluating their potentials for development of future businesses. Moreover, as it was already mentioned, Phase II as a methodology could be used for transitions of existing businesses into transcendent ones. In such a case, an existing business would explore its capacity and capabilities for addressing, for example, world major issues, unmet needs and demands. In practice this would mean that an existing business would use its infrastructure and resources to address core values/ideals of major typological groupings, such as those identified in this research. By doing so, existing businesses would make the most out of their businesses and create more employment / minimise redundancy.

Phase III:

**Q3: Selection of the most beneficial business model that will be proposed for implementation in practice and development of its mission statement**

Phase III aims to assess a list of prototyped business models against a list of core values/ideals of major typological groupings and select potentially the most beneficial one. The main question asked during development of the TRM+ was: how do we prioritise decision options and select the one that meets the largest number of criteria to the largest extent? There was a required methodology that would allow assessing multiple options (multiple business models) against multiple criteria (diversified core values/ideals of multiple typological groupings). Whilst there might be more available options, the researcher proposed and tested the following option O3.1.1 and O3.1.2).

![Figure 7.7: QOC - How to prioritise decision options - analysis of the Transcendent Reference Methodology](image-url)

Figure 7.7: QOC - How to prioritise decision options - analysis of the Transcendent Reference Methodology
The researcher tested option O3.1.1 using the AHP technique to assess prototyped business models against core values/ideals of major typological groupings. The research outcome indicates that the AHP technique is a repeatable, verifiable, easily accessible low cost methodology that could be used for assessing prototyped business models against multiple criteria, and selecting potentially the most beneficial business model. The AHP technique is easy to use and does not require any knowledge or expertise (Forman, 2001). The AHP technique met all criteria C1 to C7, which is illustrated by solid lines linking the option O3.1.1 with criteria C1 to C7. The researcher also tested option O3.1.2 by using assistance of CSR experts. CSR experts were presented with the same list of prototyped business models and prioritised and weighted core values/ideals of major typological groupings that were used during the AHP assessment. Using assistance of CSR experts as a methodology for selecting a business model of potentially the most beneficial business failed; the participants did not achieve a consensus as to which of the presented business models was potentially the most beneficial. Whilst the participants had extensive expertise and knowledge in CSR and TBL, and many diversified ideas of transcendent businesses, they represented a high cost, not easily accessible, repeatable, and verifiable option. Solid lines linking option O3.1.2 with criteria C3, C4, and C5, and dashed lines linking option O3.1.2 with criteria C1, C2, C6, and C7 illustrate this. Since using the AHP technique allowed the researcher to select a single business model of potentially the most beneficial business, whereas opinions of CSR experts varied greatly and a single business model was not selected, the researcher proceeded with the one selected by the AHP technique. The researcher created a mission statement of the selected business using knowledge gained during the prototyping process at Phase II.

Overall, Phase III of the methodology aims to assess prototyped business models against a list of prioritised and weighted core values/ideals of multiple typological groupings, and select a business model of potentially the most beneficial business. Phase III could potentially be used also by Business Angels to assess business proposals and prototyped business models to minimise guessing, and objectively select options that are potentially the most beneficial for multiple typological groupings. Moreover, Phase III could potentially be used by existing businesses to make strategic decisions in the areas of social, environmental, economic, governance and sustainable human development planning.

**Phase IV:**

**Q4: Development of a detailed business model for the future transcendent business**

Phase IV aims to develop a detailed business model of the future transcendent business. The researcher proposed and tested using the Universal Business Model as a tool for developing a detailed business model of future transcendent business. The researcher described 55 elements, adapted from the UBM and, by doing so a detailed business model of the modelled transcendent business was created. The research findings suggest the UBM could be effectively used as a tool for developing detailed business models of future transcendent
businesses. However, the created detailed business model was not evaluated, since it would require launching the business in practice, which was beyond the scope of this research.

Phase IV of the methodology could not only be used for development of detailed business models for new businesses, but it could potentially be used, for example, by investors to understand, evaluate, and compare various businesses. Moreover, it could be used by existing businesses as a tool for evaluation of their (e.g. social, environmental, economic) performance, leading towards better management, strategic planning, refocussing directions of businesses, and transitions of businesses towards multiple stakeholder-driven business models.

Phase V:

Q5: Setting up Key Performance Indicators (KPIs) of the modelled transcendent business, for monitoring and reporting of performance that goes beyond profit

Phase V aims to set KPIs for the modelled transcendent business based on the list of core values/ideals of major typological groupings. The researcher proposed and tested whether core values/ideals of major typological groupings could be the KPIs a modelled transcendent business needs to monitor and report to the public. The research finding suggests KPIs of a modelled business could be effectively and efficiently set up according to core values/ideals of major typological groupings, where each core value/ideal of major typological groupings needs to be monitored, measured, managed, and reported. However, the set KPIs were not evaluated, since it would require launching the business in practice, and then it could take several years for a business to prove its fitness for purpose, and to show how beneficial, sustainable it is.

Whilst some opponents may argue that business models are ‘just’ models and the practical implementation is what makes the difference, this thesis argues that the extra time spent of planning, refining, and making business models ‘right’ could minimise potential failure of new businesses, and maximise their chances for being successful and sustainable. “‘Successful’ businesses spend more time planning at start-up” (Duchesneau, 1990: 309). Moreover, this thesis argues that development of business models of transcendent businesses needs to be driven by core values/ideals of major typological groupings; the business modelling process needs to be conducted simultaneously with business measuring metrics. Beyond-profit KPIs need to be incorporated into business models during their development process, not after a business is launched. In other words, beyond-profit KPIs and business models need to be joined together, not perceived independently.
7.4 Summary

This chapter presented the TRM+ as a reference model and also analysed the TRM+ as a methodology, using the QOC. All phases of the TRM+, as well as methods and procedures embedded within the phases, were analysed. The final chapter of this thesis presents a summary of the research findings, discusses benefits of the TRM+, and its contribution to knowledge. Conclusions and recommendations for further research are also presented.
Chapter VIII

8. Summary of the findings, conclusion, and further research

8.1 Introduction

Chapter 2 reviewed extant literature relative to transcendent, egalitarian, and visionary business. It was revealed that whilst there have been some case studies of businesses that go beyond profit making (e.g. Mair and Schoen, 2005; Collins and Porras, 2000; Spiller, 2000), up to date, there is not a documented and explained reference model, and a repeatable methodology of a business modelling and measurement approach, that would assist business modellers to design business models of future transcendent businesses (Giacalone, 2004). Therefore, the main research question was asked:

Can we, and if so, how do we create a business modelling approach that simultaneously accounts for a number of typological groupings (e.g. social, environmental, economic) when developing a business opportunity from a post-incubation innovation / patent?

The Transcendent Reference Model and Methodology (TRM+) was developed based on a literature review, and identified gaps and limitations of current business models. It was proposed the TRM+ have five steps/phases, each with its objectives, embedded methods and procedures. Three expert groups (CSR experts, STP experts, and business entrepreneurs) assisted during testing (proof-of-concept) and evaluation of methods and procedures embedded within the first three phases of the TRM+. Methods and procedures embedded within Phase IV and Phase V were exercised only, since evaluation would require launching the business in practice, which was outside the scope of this research.

The TRM+ was exercised with two technical utility patents (‘Solar power generator and water purifier’; ‘High temperature molten salt receiver’). Development of a business model for one of the patents failed, however, a business model for the ‘High temperature molten salt receiver’ patent was developed. This chapter summarises the research findings and assesses the developed business model against five goals of a transcendent business, and five principles of Corporate Sustainability and Responsibility (CSR 2.0). Moreover, it presents recommendations for further research.
8.2 Summary of the findings

The following research questions were asked throughout this research:

1. What would a business modelling and measurement approach look like that simultaneously accounts for a number of typological groupings (e.g. social, environmental, economic) when developing business opportunities? (See Section 1.3)

2. What are the steps/phases for such an approach that allows business modellers to develop business models of their future transcendent businesses with responsibilities to multiple typological groupings, and to subsequently measure the extent to which these have been achieved? (See Section 1.3)

3. Can we represent the Transcendent Reference Model (TRM+) of such an approach as a reusable methodology? (See Section 1.3)

4. How do we identify major typological groupings and their core values any transcendent business could/should account for? (See Section 2.9)

5. How do we address diversified core values of multiple typological groupings? (See Section 2.9)

6. How do we develop business models around diversified core values/ideals of multiple typological groupings? (See Section 2.9)

7. How do we prioritise decision options and objectively select potentially the most beneficial one? (See Section 2.9)

8. How do we develop a detailed business model for any business? (See Section 2.9)

9. What are the KPIs of a transcendent business that could/should be monitored, measured, and reported to public? (See Section 2.9)

Answers to all of the above research questions lay in the proposed Transcendent Reference Model and Methodology (TRM+) that was exercised by using the expertise of multiple expert groups (Corporate Social Responsibility (CSR) experts, post-incubation innovation domain experts (Solar thermal Power (STP) experts), and business entrepreneurs). Testing of the TRM+ for development of a business model for the ‘Solar power generator and water purifier’ patent failed, as the participating STP experts described the selected patent as unpractical. However, testing of the TRM+ for development of a business model for the ‘High temperature molten salt receiver’ patent succeeded and three business models of potential businesses were prototyped, one of which was selected by the AHP technique as potentially the most beneficial one. A detailed business model for potentially the most beneficial business, selected by the AHP technique was developed, and the Key Performance Indicators (KPIs) were set. The following summarises research findings of each phase of the TRM+.
Phase I:
Identification of major typological groupings and their core values/ideals

Whilst the first attempt of the researcher to identify major typological groupings failed (the researcher correctly identified three typological groupings, though participating CSR experts argued there were more than three groupings), the second attempt succeeded. The researcher correctly identified five typological groupings (Social, Environmental, Economic, Governance, Sustainable human development) the CSR experts agreed on. The researcher also correctly identified core values/ideals of the groupings that were in fact the world major issues most frequently discussed in world reports. Research findings indicate that major world issues can be effectively identified and categorised into typological groupings by performing content analysis of world reports (e.g. UN reports). These can represent core values/ideals of major typological groupings and can be also identified by content analysis of world reports.

Prioritisation of the identified core values/ideals within each typological grouping and across all typological groupings returned a high variation in the participating CSR experts’ responses because there were a large number of diversified values/ideals they were asked to prioritise. The higher number of values/ideals participants are asked to prioritise, the more spread out answers will be because people likely check answers relative to the other choices. Variation of answers will depend upon a number of factors – location of the person, type of industry, economic background and political beliefs, for example. After applying the three-sigma rule to the data collected from CSR experts Group2, a list of the most important core values/ideals of major typological groupings was created, and weighting points of each core value/ideal was calculated. However, because of the very small sample of participants and the high variation of participants’ responses, the created list of prioritised and weighted core values/ideals of major typological groupings should be perceived as an example only. While these experts suggested reviewing the created list of the most important core values/ideals of major typological groupings in approximately 7 years, frequency of the review can be considerably affected by a number of factors such as draught, civil wars, and the Global Financial Crises (GFC), for example.

The aim of Phase I was not to create a valid list of the most important core values/ideals, but rather, to exercise whether or not they could be efficiently, and effectively, identified by conducting content analysis of world reports. CSR literature fails to identify a small number (e.g. 10) of the most important core values/ideals of major typological groupings. While there are a number of tools and guidelines (e.g. GRI, SIA, EIA, etc) and hundreds of indicators suggesting what the core values/ideals might be, up to date, we do not have a small number (e.g. 10) of the most important core values/ideals of major typological groupings that would be acceptable around the world. We do have a small number of indicators (profit/loss, balance sheet, cash-flow) that help us to assess any business from a financial performance point of view, but we do not have those for assessing any business from a social, environmental, economic, governance, and sustainable human development
point of view. Until we have those, Corporate Social Responsibility is likely to be a vague idea of businesses going beyond profit, which could mean various things to different people. As long as businesses are free to select which beyond profit performance they will monitor, measure, and report to the public, they will have an opportunity to present themselves as sustainable and responsible businesses even when they do not believe in CSR, and have no idea what it means (Norman & MacDonald, 2003; Visser 2010, 2011).

Phase II:
Addressing core values/ideals of major typological groupings with post-incubation innovations / patents and prototyping of appropriate business model(s)

The researcher selected three technical utility patents from an online database of patents publicly available on the internet free of charge. Since all three selected patents used Concentrated Solar Power (CSP), the researcher invited Solar Thermal Power (STP) experts to evaluate the selected patents and recommend their potential usages, whilst they would simultaneously account for the most important core values/ideals of major typological groupings, obtained at Phase I.

STP experts evaluated one of the patents as unpractical and from the remaining other two they selected the ‘High temperature molten salt receiver’ patent as the preferred patent of discussion. Three potential usages of the patent were recommended, together with provided suggestions for how the core values/ideals of major typological groupings would be achieved by each recommended usage of the patent, and what measures could be used to test whether the core values/ideals are achieved. The researcher used the collected information and prototyped characteristics of potential business for each of the recommended usages, by describing each of the ten aspects of a business model adapted from the UBM. The prototyped characteristics were presented to STP experts and business entrepreneurs in an online, text based discussion forum to obtain feedback and refinement. There were only a couple of comments made by two STP experts, and only two business entrepreneurs participated in the discussions. Moreover, the business entrepreneurs participated a couple of weeks later than the STP experts, hence, the real discussions between the two expert groups did not happen. Business entrepreneurs provided feedback to prototyped characteristics. This raised a question as to how difficult it would be to organise face-to-face focus groups with experts from around the world, considering an online discussion failed. This raised also a question as to why the response rate of business entrepreneurs was that low. The researcher proposed the following three plausible explanations:

1. All invited business entrepreneurs were successful serial business entrepreneurs who launched a number of their own entrepreneurial businesses, hence, presumably, they were overwhelmed with their own workload. Such a proposition is supported also by two business entrepreneurs who apologised for not participating as: a) they could not afford to spend time in the discussion forum; b) the scheduled time did not
suit them; or c) they unexpectedly went on business trips.

2. Taking into consideration the high profile of invited business entrepreneurs (some of them were rewarded by ‘Ernst & Young Entrepreneur of the Year Award’; they were conference speakers in the area of business entrepreneurship; they were authors of articles dedicated to business entrepreneurship), it is plausible they were not interested in participating in the research as the researcher did not offer any incentive for their participation.

3. Despite the fact all the invited business entrepreneurs were experienced serial business entrepreneurs, the business models developed in this thesis were outside their normal areas of expertise. However, the approach presented and exercised in this research requires business entrepreneurs who are willing and able to go beyond their knowledge and expertise into the unknown. It requires business entrepreneurs who are, rather, indirectly involved in business modelling process; business models here are prototyped based on inputs from a number of stakeholders, and until the very last moment it is not clear what the product will be, who the target customer will be, and what the business will look like. This type of business modelling is untraditional and has been suggested only recently by authors like Giacalone, 2004; Visser, 2010, 2011; and Esslinger, 2011.

Whilst the researcher prototyped characteristics of potential businesses for each of the recommended usages of the selected patent, and the business entrepreneurs indicated that such an approach could be very useful for drafting business models, there was an argument that theoretical discussions online do not translate into real world business situations. Therefore, at this stage, it cannot be successfully argued whether discussions of post-incubation innovation domain experts can generate enough knowledge for development of business models for potential usages of a post-incubation innovation / patent. More tests and practical implementation of developed business models would need to be conducted before such an approach could be validated.

At Phase II the researcher assigned the most appropriate basic business model archetype to each of the discussed potential businesses, and presented the outcome to business entrepreneurs who had an opportunity to make comments on the prototyped business models of future potential businesses. Since the participating business entrepreneurs did not suggest any further changes to the presented business models, the proposition that it is possible to correctly prototype business models of future businesses from information gained from discussions of post-incubation innovation domain experts and business entrepreneurs (using 16 basic business models archetypes and 10 business model aspects as the instruments for developing business models) was plausibly confirmed. However, there is a need to take into consideration the small sample size of the participants.
The involvement of business entrepreneurs in discussion with post-incubation innovation domain experts, discussing multiple usages of a patent, was questioned. The cost and benefit analysis of involving business entrepreneurs during discussions of multiple usages of a patent needs to be taken into consideration. Moreover, business entrepreneurs could be replaced by Business Angels and Venture Capitalists, who could not only provide funds for starting potential businesses, but also coach and assist business modellers during the start up stage. However, expertise and knowledge of post-incubation innovation domain experts is crucial when identifying multiple usages of a patent and developing potential business models.

Phase III:
Selection of the most beneficial business model that will be implemented in practice

The researcher assessed business models, prototyped at Phase II, against a list of prioritised and weighted core values/ideals of major typological groupings, obtained at Phase I, using the AHP technique. The AHP technique can be effectively used as a method for assessing multiple business models against multiple criteria, and democratically selecting the most beneficial one that could be implemented in practice. However, evaluation of such an approach failed. The researcher invited CSR experts, who represented the major typological groupings, and presented them the list of prototyped business models together with a list of prioritised and weighted core values/ideals of major typological groupings. They were asked to assess the prototyped business models and select potentially the most beneficial one, using their CSR and TRL expertise. Since the participants did not achieve a consensus as to which of the business models was potentially the most beneficial one, evaluation of the AHP technique for objectively selecting potentially the most beneficial business models failed. Two participants argued that the success of business models depends more on implementation than conception. Therefore, it can only be speculated whether the business model selected by the AHP technique is potentially the most beneficial one. On the other hand, it is important to state that while the participants did not achieve a consensus and two of them preferred not to make any selection, the AHP technique returned a single selected business model. Considering the AHP technique has been used by a number of organisations as an effective decisions-making methodology where multiple alternatives are assessed against multiple criteria, it could be argued that using it for objectively selecting potentially the most beneficial business models is appropriate. However, practical implementation of the selected business models is needed to validate such claim.

Phase IV:
Development of a detailed business model of a future transcendent business

The researcher developed a detailed business model for potentially the most beneficial business, selected by the AHP technique at Phase III, by describing each of the 55 elements of a business model, adapted from the UBM. The UBM as a tool and a guideline for development of a detailed business model was confirmed to be a useful instrument for
development of business models. However, to evaluate the created business model would require launching the real business in practice, which was outside the scope of this research. Therefore, at this stage, it cannot be evaluated how beneficial, sustainable, and potentially successful the business would be. It would take several years for a business to prove its fitness for purpose, growth, and sustainability profile.

**Phase V:**

*Setting up KPIs of a modelled transcendent business*

The researcher set beyond-profit KPIs of the modelled transcendent business based on the list of prioritised and weighted core values/ideals of major typological groupings obtained at Phase I. Research findings suggest that core values/ideals of major typological groupings can be successfully used as KPIs of the modelled business. These are set according to the list of core values/ideals of major typological groupings and are at the meta level; they need to be further broken into more detailed KPIs depending on the nature of the modelled business. For example, a mining business would have different detailed KPIs than a bank, though both the mining business and the bank would share the same core KPIs at the broadest (meta) level. For example, referring to one of the core value/ideal of major typological groupings, both a mining business and a bank would generate some form of pollutants, though they would be different. Whilst a mining business may need to monitor and manage, for example, dust production, a bank might need to monitor and manage pollutants generated by its electricity supplier. Even though the researcher managed to set KPIs of the modelled transcendent business, at this stage, the accuracy and practicality of measuring and reporting of such indicators cannot be validated. The modelled business would need to be launched in practice, which was outside the scope of this research.

It is becoming quite obvious that the presented and exercised TRM+ is more a theoretical model and a methodology, and cannot be fully evaluated by the evaluation procedures the researcher proposed and conducted. Some of the methods and procedures embedded within individual phases of the TRM+ were not fully evaluated because of the small sample size of the participants. Moreover, it seems conducting Delphi cycles with CSR experts ranking core values/ideals of major typological groupings is unlikely to produce a uniform outcome. A different approach is needed, such as conducting in-depth interviews and face-to-face focus groups. Moreover, there is an opportunity to conduct quantitative research with the general public to obtain its view of what are the most important core values/ideals of major typological groupings businesses should simultaneously account for when developing business opportunities. Whether the presented TRM+ is the best and the only model and methodology for developing business models of future transcendent businesses needs to be challenged further. The following section assesses the created business model for the ‘High temperature molten salt receiver’ patent against five goals of a transcendent business outlined by Giacalone (2004), and five principles of Corporate Sustainability and Responsibility (CSR 2.0) identified by Visser (2010).
8.3 Assessing the created business model

8.3.1 Assessment against five goals of a transcendent business

The selected ‘Manufacturer of an apparatus for desalinating seawater, sterilising wastewater, generating electrical power, processing agricultural products in developing third World Nations – large scale multinational business’ was assessed against five goals of a transcendent business. Whilst the business model theoretically meets all five goals of a transcendent business, as outlined by Giacalone, practical implementation is what will make the difference. Even the most transcendent business model can be corrupted and become a business model of a self-interested, business-objective driven business. The extent to how transcendent any modelled business is will depend on everyone who is involved in the business understanding what transcendence of a business really means. If, for example, a CEO, board of directors, or senior management do not understand the meaning and core principles of a transcendent business, the business could easily end up being a profit-centric, shareholder-driven business claiming it is a responsible, sustainable transcendent business.

Giacalone (2004) identifies the following five goals of a transcendent business:

- ‘Empathy’ – understanding the feelings of those who are powerless, poor, humiliated, afraid, and discouraged
- ‘Generativity’ – having positive aspirations that engender a focus on non-financial contributions to our world
- ‘Mutuality’ – understanding that success is best achieved not in personal gain, but in embracing a common victory (read victory of a group success where is no winner and looser)
- ‘Civil Aspiration’ – recognising that in a world of finite resources, while we cannot have an ever-expanding economy, we can expand the moral consciousness of a society
- ‘Avoiding Intolerance of Ineffective Humanity’ – avoiding insensitive decision making, selfishness, a disinterest in those who follow, and the singular pursuit of wealth

(Source: Giacalone, 2004: 418)

The following is an assessment of the developed business model against the above goals:

Goal 1: ‘Empathy’

The business model was designed for a business that aims to provide solutions in developing countries: countries that are disadvantaged, lack access to clean water and electricity supply, and are in need of further development. Therefore, it can be argued the business model meets the ‘Empathy’ goal.

Goal 2: ‘Generativity’

The business model was designed to focus on helping developing countries; it was not designed for the benefit of the developed countries that will be manufacturing and supplying
the apparatus. Moreover, these were designed to minimise pollutants and waste production; to protect clean water sources; to improve both individual and collective leadership capacity whilst being collectively responsible; to create a sustainability-aware policy environment; to emphasise local governance, integrated with regional and national governance. Hence, it could be argued the business model meets the ‘Generativity’ goal to a significant extent.

**Goal 3: ‘Mutuality’**
The developed business model was designed for an international business where cooperating businesses and governments are working together towards common goals for the benefit of developing, as well as, developed countries. The business model meets the ‘Mutuality’ goal.

**Goal 4: ‘Civil Aspiration’**
The developed business model was designed to manufacture apparatus that will minimise water consumption and generate electricity without using natural resources, such as coal and natural gas, hence preserving natural resources. Moreover, the apparatus that will be manufactured will require minimal maintenance, focusing on satisfying the needs of the people living in developing countries. The business model was designed to create strong working relationships between developing and developed countries, and focus on satisfying social, environmental, economic, governance, and sustainable human development values/ideals. Therefore, the business model meets the ‘Civil Aspiration’ goal.

**Goal 5: ‘Avoiding Intolerance of Ineffective Humanity’**
The developed business model was designed for a business that will develop an international committee to protect the interests and rights of developed countries, as well as the rights of developing countries, where local governance will be integrated with regional and national governance; where public office will not be abused for private gain; and where no one will be discriminated against. Hence, the business model also meets the final goal outlined by Giacalone.

8.3.2 **Assessment against five principles of CSR 2.0**
Visser (2010) identifies the following five principles of Corporate Sustainability and Responsibility, which he refers to as ‘CSR 2.0’:

- ‘Creativity’ (C) – need for innovation and creativity; we cannot solve today’s problems with yesterday’s thinking. Business creativity needs to be directed to solving the world’s social and environmental problems
- ‘Scalability’ (S) – need for incremental solutions for today’s problems with long term potential; and need for scalable solutions with immediate impact
- ‘Responsiveness’ (R) – responsiveness to community needs; need for uncomfortable, transformative responsiveness, which questions whether the industry or the business model itself is part of the solution or part of the problem. Need for greater
transparency, not only through reporting mechanisms like the Global Reporting Initiative and Carbon Disclosure Project, but also by sharing critical intellectual resources

- ‘Glocality’ (2) – thinking globally, acting locally; need for a harmonious society where businesses’ responsibility includes responsibility to the family (of employees), the community and policy engagement
- ‘Circularity’ (0) – need for closing the loop on production, designing for ‘good’, rather than ‘less bad’. Business should be constantly feeding and replenishing its social and human capital, not only through education and training, but also by nourishing community and employee wellbeing

(Source: Visser, 2010)

The following is an assessment of the potentially most beneficial business model for the ‘High Temperature Molten Salt Receiver’ patent against the above five principles:

**Principle 1: ‘Creativity’**

The developed business model was designed to manufacture and supply apparatus based on a patented post-incubation innovation to solve today’s problem of shortages of freshwater and electricity supply in developing countries. The recommended usage of the patent was suggested and discussed by multiple post-incubation innovation domain experts (Solar Thermal Power (STP) experts) from Germany and Australia. The recommended, most beneficial usage of the patent claimed it would minimise pollutants and waste production, and protect clean water sources. Hence, the future transcendent business will tackle current environmental problems by providing a creative solution and a creative usage of the patent. The developed business model meets the ‘Creativity’ principle.

**Principle 2: ‘Scalability’**

The selected patent has not only been well proven, but it also offers many variants of the apparatus that can be manufactured in a fair range of sizes. The apparatus can be manufactured on a small scale providing solutions for a small medical clinic in remote villages, as well as on a large scale for a small city in developing Third World Nations. Since the apparatus can provide scalable solutions with immediate impact, the developed business model meets the ‘Scalability’ principle.

**Principle 3: ‘Responsiveness’**

The manufactured apparatus could be used by the business itself to generate its own electricity and recycle its wastewater. By using its own products, the business would not only minimise its reliance on an external water and energy supply, but it would also promote usage of the technology and green technology in general. The business is part of the solution to an existing problem; it promotes collective responsibility, creation of a sustainability-aware policy environment, simplification of international investment and trading, integration
of local governance with regional and national governance, combats bribery and corruption, and promotes transparency. The developed business model is of an international business that will cooperate with other businesses and governments, sharing and exchanging knowledge and working closely with research organisations and universities. It meets the ‘Responsiveness’ principle of the Corporate Sustainability and Responsibility.

**Principle 4: ‘Glocality’**

The developed business model was designed to emphasise local governance, integrated with regional and national governance, thinking globally whilst acting locally, and helping developing countries to solve their problems of shortages of clean water and green energy. The international committee will: assist the business to make decisions and plan strategies that line up local objectives with global ones, especially in the area of clean energy production; minimise the negative impact on the environment by minimising waste and pollutants production; protect human rights; combat corruption; and simplify international investment and trading. The business will not only be responsible to its employees, who manufacture and service the apparatus in countries where the apparatus is to be used, it will also help local schools and communities that will be affected by it. The business meets the ‘Glocality’ principle.

**Principle 5: ‘Circularity’**

The business model was designed for a business that will do ‘good’ rather than ‘less bad’. It meets the ‘Circularity’ principle. However, the business does not close the loop of production completely. Whilst the apparatus will be manufactured primarily from recycled non-toxic materials, it is at the present not completely recyclable. Since the technology used is fairly new, and currently it exists in only about 3 countries (Spain, France and the USA), further testing and enhancement of the apparatus will be needed to minimise maintenance costs, to identify life-length of the apparatus, and to improve recyclability of the apparatus after its lifetime.

**8.3.3 Outcome of the assessments and discussion**

Based on the theoretical assessment, the business model for ‘High Temperature Molten Salt Receiver’ patent meets not only all five goals of a transcendent business, but also all five principles of Corporate Sustainability and Responsibility. However, the assessment should be perceived as a theoretical assessment only, as there is no guarantee the business will succeed after being implemented in practice. Practical implementation will be crucial. There would be a number of obstacles and challenges to overcome, such as financial (the proposal is of a multinational business that would require a number of big financial supporters); intellectual (even though the business will use an already proven patent, there will be considerable research and further development needed to minimise maintenance of the apparatus, increase its efficiency and recyclability after being used); and political (governments in a number of developing countries have a track record of high corruption...
and bribery). In other words, “to get this off the ground will be a mile long” (cited from survey, business entrepreneur).

The TRM+ presented and exercised in this thesis led the researcher to develop a business model of future transcendent business. The key aspect that made it possible is that the TRM+ uses a `reverse-value chain` approach, which is a customer-centric approach, conducted at a very broad (Meta) level. In other words, the TRM+ firstly identifies who the major typological groupings are, and what their core values/ideals are.

The second key aspect of the TRM+ is its egalitarian approach, meaning that once the major typological groupings and their underlying, most important core values/ideals are identified, these are all accounted for equally, if possible. Accounting for all means that they have to be the primary drivers and assessment criteria for decision-making processes during the development of business models; business modellers cannot make decisions themselves and should not influence decisions of other stakeholders being involved during business modelling process.

It is crucial to identify the most important, prioritised and weighted core values/ideals of major typological groupings (e.g. Social, Environmental, Economic, Sustainable human development) for development of any transcendent business. The most important core values/ideals have to be implemented in every transcendent business that is going to be designed. Every business that addresses those values/ideals, and makes decisions for the benefit of those values/ideals, will have a greater chance of becoming a transcendent business. The research ended up developing two lists of prioritised and weighted core values/ideals of major typological groupings (each list developed by each CSR expert group). Both of the lists should, however, be perceived as a point of reference only. Further research needs to be conducted to identify those. Conducted Delphi cycles with CSR experts provided a good starting point. However, there is a need to conduct more thorough research focused on identifying the most important core values/ideals of major typological groupings that would be globally acceptable around the world. Conducting interviews with the most respected CSR experts, face-to-face focus groups, and quantitative research (surveying the public) could do this. Whilst testing of the TRM+ for the ‘High temperature molten salt receiver’ patent succeeded, and a business model of the most potentially beneficial business was identified, it is important to highlight a number of limitations of this research.

*Limitations caused by a low number of experts testing and evaluating TRM+:

The number of experts who signed the Consent Form agreeing to participate in the project was much higher than the number of experts who actually participated, with an exception of STP experts – all STP experts who signed a Consent Form participated in the project. Since it was proposed four to five post-incubation innovation domain experts was sufficient, the researcher did not aim to get more STP participants. Finding the contact details of experts and recruitment of participants took approximately three months. 14 to 16% of email
addresses for experts, publicly available on the internet, were invalid. Lack of access to larger numbers of experts who could participate in the conducted research is the greatest limitation of this research. The following indicates the number of experts participating during testing and evaluating Phase I to Phase III:

- Six CSR experts participated in CSR experts Group1 testing and evaluating Phase I
- Five CSR experts participated in CSR experts Group2 testing and evaluating Phase I
- Four STP experts tested Phase II
- Three business entrepreneurs tested Phase II
- Two business entrepreneurs evaluated Phase II
- Five CSR experts evaluated Phase III

Further limitations of the research:

- There were only two selected technical utility patents that were trialled through the TRM+, one of which failed to end up with development of any business model. Because of the time constraints and limited access to post-incubation innovation domain experts, more post-incubation innovations / patents were not trialled through the TRM+. Testing the TRM+ with a larger number of diversified patents would require recruiting more post-incubation innovation domain experts, conducting more surveys and online discussions, which was beyond the time frame of this research.
- Phase I of the TRM+ uses a Delphi methodology as a method for achieving consensus among participating experts – the consensus is achieved by prioritising listed items based on their relative priority and taking the top items from the list. While this technique generates a list of consensus items, this is achieved by agreement of the majority of the participants – opinions of the minority of the participants are ignored. When a small number of participants with a wide range of background, experiences, and beliefs participate, the range of answers is very wide and achieving consensus is difficult.
- It was proposed and tested that Phase II of the TRM+ would involve assistance of business entrepreneurs. However, the researcher found that hiring business entrepreneurs could be very costly and time consuming, with minimal benefits brought to the business modelling process. Therefore, it was proposed that it would be more beneficial to seek the assistance of Business Angels and Venture Capitalists, once the most potentially beneficial business model is selected and its detailed business model is developed.
- Phase II of the TRM+ considers only 16 basic business model archetypes, outlined by Weill (2005), and their combinations. There is a chance that a new business model archetype might be developed in the near future.
- Phase III of the TRM+ recommends using the AHP technique as a decision support methodology for assessing multiple business models against multiple criteria. Whilst
the selection of the most potentially beneficial business model using the AHP technique succeeded, the participating CSR experts did not achieve a consensus as to what business model was the most potentially beneficial. Two of the participating CSR experts did not select any business, claiming the business models were just theoretical models and that the success of business models depends more on implementation than conception. Each of the other three participating CSR experts selected a different business model as potentially the most beneficial.

- Phase IV and Phase V of the TRM+ were not evaluated

Phase IV is an implementation of a developed business model in practice. Whilst Phase IV was tested by the researcher and a detailed business model of the future transcendent business was developed, it is unknown at this stage whether the business model was developed correctly and how easy/practical it would be to start up a real business based on it. It was outside the scope of this research to implement the developed and selected business model in practice, and launch a transcendent business.

- Phase V of the TRM+ proposes that the most important core values/ideals of major typological groupings, identified at Phase I, are the KPIs every transcendent business model needs to monitor, manage, and report to its stakeholders. Again, it is not known how practical this would be, and it cannot be evaluated at this stage as it would take several years for a business to prove how well it fits its purpose, and how successful and beneficial it is, which was far beyond the scope of this research.

Based on the conducted testing and evaluation of the TRM+, this thesis proposes the TRM+ could be used for development of transcendent businesses using the assistance of post-incubation innovations domain experts only. Business modellers using the TRM+, however, would be required to have some research and communication skills, be able to select post-incubation innovations / patents, and find post-incubation innovation domain experts who will share their knowledge and assist business modellers with development of potential business models.
8.4 Benefits of transcendent business modelling and the TRM+

There are multiple benefits of a transcendent business modelling approach and its overarching TRM+. Firstly, from an educational point of view, a transcendent business modelling approach could be taught as an additional business modelling approach (multiple typological groupings-centric) to the traditional (product-centric) business modelling approach and the reverse-value chain (customer-centric) business modelling approach (Giacalone, 2004). Mair and Schoen (2005) argue that while social entrepreneurial businesses are receiving more scholarly attention, relatively little is known about how businesses are able to create both social and economic value. The presented TRM+ could be used for teaching future business modellers how to design businesses whose goals are not solely financial; businesses that aim for something more than a financial bottom line (e.g. creation of social, environmental, economic values), and to "leave behind a better world for those who follow" (Giacalone, 2004: 416).

Secondly, from a literature review point of view, the presented TRM+ fills the gap in extant literature by providing a set of steps/phases with explanations as to how to start up and run a business that simultaneously accounts for multiple typological groupings (e.g. social, environmental, economic), and also how to create multiple values for those typological groupings.

Thirdly, a transcendent business modelling approach and the presented TRM+ increases the chances of success of the modelled transcendent business as it uses the expertise of multiple experts groups (such as Corporate Social Responsibility (CSR) experts and post-incubation innovation domain experts), and allows them to be actively involved during the business modelling process. "It could be argued that part of the potential 'pay-off' to Small and Medium Enterprise (SME) owners, who seek professional advice, may relate to improving the odds of success or, conversely, reducing the probability of failure" (Watson, 2003: 2).

Finally, the presented TRM+ can be used for exercising post-incubation innovations / patents as they come along, and determine whether, and how, a selected post-incubation innovation / patent could be used for simultaneous creation of multiple benefits to, for example, a community, environment, economy, human development. The TRM+ can assist business modellers to identify the most beneficial usage of a selected post-incubation innovation/patent for the benefits of multiple typological groupings. It can assist business modellers to address major world issues / problems, to satisfy the needs of, for instance, society, the environment, and the economy, by using a post-incubation innovation / patent, and avoid wasting resources by offering products/services that are not needed / that do not satisfy any demand nor solve any social, environmental, economic or other problem.

Potentially, there might be other benefits of the TRM+ that could be discovered by its practical implementations in various scenarios, including non-business environments.
8.5 Conclusion

This thesis presented and exercised a repeatable business modelling and measurement approach for developing business models of transcendent businesses. Whilst the CSR literature provides a number of case studies of truly responsible and sustainable projects and a few examples of transcendent businesses (e.g. Grameen Bank, Sekem, Mondragon Corporacion Cooperativa), those projects and businesses were launched to tackle specific unsatisfied social needs and demands. Hence, such case studies are not easy to replicate, and only a few of them can ever go to scale (Visser, 2010). However, the TRM+ was developed as a business modelling approach that could be repeated for addressing any unsatisfied needs, wants, demands, and world major issues by practically anyone who is willing to take some effort to explore business opportunities and start up his/her own business. The TRM+ does not require a business modeller to have any competence, nor even a clear idea of what business he/she wants to run. Rather, it promotes entrepreneurial thinking, and a willingness to go down an unknown path during the process of developing a set of potential business models and then selecting potentially the most beneficial one, no matter what product/service the business will deliver, and no matter whom the target customer will be. The most important drivers in the TRM+ are the core values/ideals of major typological groupings, which cannot be compromised for the creation of any other values (e.g. financial), but have to be satisfied as best as possible.

Whilst the TRM+ is no more than a theoretical reference model and methodology at this stage, it could be used as a reference, an example of how a business model of a future transcendent business could be developed. The TRM+ as it is at present could be taught and incorporated into courses at business faculties as a new subject called, for example, “Transcendent Business Modelling and Measurement” – a subject that would be different to “Business Ethics”. This could be an additional subject to traditional business modelling approaches, teaching students that running a business is not only about making money and creating wealth, where financial success is defined without responsibilities and a sense of long term social benefits. The “Transcendent Business Modelling and Measurement” subject could assist students to think morally and act ethically when developing business models of their future businesses, and build student capabilities to design and implement business models that address major world issues / core values/ideals of multiple typological groupings by, for example, using existing innovations / patents. The unit would also explain how to explore world major issues and unsatisfied human needs as new business opportunities, and how to connect them with science and technology; to produce and provide products / services that are culturally relevant, economically productive, politically beneficial, and ecologically sustainable. The TRM+ presented in this thesis provides an example of how to do that.

The TRM+ has been shown to be conceptually viable as a reference model and development methodology. It would be beneficial to businesses to use the approach as a guide for
modelling a real world business or for redeveloping an existing business in line with transcendent business approaches. Future implementations of the approach will deepen the Proof-of-concept and further test practical applications.

Exercising the presented TRM+ has shown there will be no need to involve as many experts in its future application. For example, once a list of the most important prioritised and weighted core values/ideals is created and validated, it would not need to be created again for several years, or until some significant changes occur in society, the environment, or economy – for example, a civil war, natural disaster, the Global Financial Crises (GFC). Once we know what the most important core values/ideals of major typological groupings are, and they are validated and globally accepted, Phase I will not need to be repeated again for some time. Moreover, assistance of business entrepreneurs during the business modelling process could be optional and used only when the cost of hiring them is low and expected benefits are high. Therefore, it is suggested the TRM+ can effectively be used with assistance of three to four post-incubation innovation domain experts only. However, further exercising, practical implementations of business models, and future research and refinement of the TRM+ are recommended.

Whilst the TRM+ presented and exercised in this thesis took a very holistic approach aiming to identify major typological groupings and their core values/ideals that are applicable to any business anywhere in the world, the TRM+ could also be used at a local scale identifying individual local stakeholders and their specific core values/ideals. In such a case (at Phase I) a business modeller would use local sources of information (e.g. local environmental, economic reports) rather than world reports (e.g. UN, Greenpeace reports), conducting face-to-face interview with the local council and community to identify individual stakeholders directly in the geographic location where a modelled business is proposed to be established (e.g. Melbourne, Australia; Nigeria, Africa). However, it is important to highlight that even a small business with local ambitions should investigate its beyond-profit global impact (e.g. how the business is going to contribute to global consumption of resources, production of waste and pollution, global economy) on the world and future generations.
8.6 Further research

A great limitation exists in extant literature relative to major typological groupings and their core values/ideals – to date we do not have a prioritised list of the most important core values/ideals of major typological groupings (e.g. social, environmental, economic). While we have a number of tools and guidelines (e.g. GRI, SIA, EIA), and hundreds of indicators for measuring and reporting of beyond-profit performance, we do not know the most important ones. Giving businesses the freedom to choose what beyond-profit performance indicators they will monitor, measure, and report to the public has been criticised by a number of authors. There is a need for identification of a small number (e.g. 10) of beyond-profit performance indicators that would be globally acceptable and applicable to any business, anywhere in the world (Parmenter, 2010; Norman & MacDonald, 2003). Whilst we have a small number of indicators (e.g. profit/loss, balance sheet, cashflow) on which we can assess any business from an investor point of view, we also need those for assessing any business from, for example, a social, environmental, economic, governance, and sustainable human development point of view. Until we have those, Corporate Social Responsibility as we know it today will always be a vague idea that means many things to different people. Similarly, as Visser (2010, 2011) suggests, we need to let the old CSR die and welcome a new Corporate Sustainability and Responsibility (CSR 2.0) that can assist businesses to do ‘good’ rather than ‘less bad’.

This thesis presented methods and procedures (at Phase I) for identification and prioritisation of the most important core values/ideals of major typological groupings. Whilst it was demonstrated that the most important core values/ideals of major typological groupings could be effectively identified by conducting content analysis of world reports (e.g. UN, Greenpeace, Amnesty International reports), the created lists were not fully validated. Moreover, experience showed that conducting Delphi surveys with CSR experts is unlikely to generate a valid consensus list of the most important core values/ideals of major typological groupings. There is a need for conducting more thorough research, for example, by conducting face-to-face discussion focus groups with the most respected international CSR experts. There is also a need for conducting quantitative research with the general public, surveying general citizens, to see their views and opinions on the social, environmental, and economic responsibilities of businesses. Alternatively, university research students could analyse world reports every year and identify major typological groupings and their core values/ideals. By doing so they could see the world from a different perspective, beyond themselves; seeing the world through the eyes of people who are powerless, poor, humiliated, afraid, and discouraged, and having empathy for those people. By analysing world reports and seeing what is happening around the world, students should realise that while not everyone can live in a developed country with a high standard of living, every human being has the same rights; for example, a right to clean water, a job, and a home in which to live. Business and economy students need to realise that with limited resources we cannot have an ever-expanding economy, but we can expand the moral consciousness of our society and share existing resources fairly and equally. We need to design products that
could be recycled and reused as a resource for making new products; we need an economy
that is based on a lease model, rather than a buy and throw away model. Once business
students understand what moral consciousness means, they will be ready to make sensitive
decisions that incorporate the needs and values/ideals of others.

The TRM+ presented and exercised in this thesis is no more than a theoretical reference
model and methodology at this stage; there is a need for its practical testing as well as a
need for feedback from business modellers who will use it as a guide for developing business
models of their transcendent businesses. Practical implementations of business models
developed by TRM+ could identify gaps and further limitations that consequently could be
fixed, and the TRM+ enhanced. Therefore, the TRM+ should be perceived as a first step
toward development of a reusable methodology for transcendent business modelling, which
provides a foundation for future research and refinement of the TRM+. 
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282


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286


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Appendix I
Phase I – Online survey questionnaire – Delphi cycle A1; CSR experts Group1

Content analysis of world reports that deal with major world issues were analysed to identify major categories of world issues. It has been discovered and proposed there are three major categories (typological groupings) – social, environmental, and economic. The content analysis also identified major issues (values/ideals) for each of the typological groupings. It is proposed that the identified values/ideals should be addressed by any transcendent business that goes beyond profit. However, since it would be impractical for a business to satisfy a large number of diversified values/ideals, there is a need to identify core values/ideals for each of the typological grouping.

QUESTION 1:
The following initial values/ideals of Social grouping (lobbyist) were identified by content analysis of world reports.

Social grouping:
1. Eradicate / end poverty and hunger
2. Protect human security (e.g. income security, personal security, cultural security)
3. Increase voluntary contribution and international humanitarian help
4. Protect and promote human health
5. Achieve universal primary education and distribution of knowledge
6. Combat HIV/AIDS, malaria, and other diseases
7. Reduce crime, combat violence and terrorism
8. Protect human rights (e.g. women rights, children rights, minority groups rights)
9. Fair and equal wages and decent work conditions for everyone
10. Combat production and consumption of drugs
11. Reduce child mortality

A: From the list above, select three values/ideals (by typing corresponding numbers into the textbox below) you consider are the most important, or nominate your own values/ideals.

B: Explain why each of the values/ideals you have selected is important.
QUESTION 2:

The following initial values/ideals of Environmental grouping (lobbyist) were identified by content analysis of world reports.

*Environmental grouping:*
1. Manage global climate change
2. Protect and ensure access to clean water
3. Produce and consume clean renewable energy
4. Minimise waste and pollutants production, land degradation
5. Develop and apply environmentally friendly and sustainable technologies
6. Ensure global sustainability (land, air, water, flora and fauna)
7. Ensure sustainable consumption of resources
8. Shift incentives from consumption that damages the environment to consumption that promotes human development
9. Ensure minimal consumption of resources
10. Maximise recyclability and reusability of resources

A: From the list above, select three values/ideals (by typing corresponding numbers into the textbox below) you consider are the most important, or nominate your own values/ideals.

B: Explain why each of the values/ideals you have selected is important.

QUESTION 3:

The following initial values/ideals of Economic grouping (lobbyist) were identified by content analysis of world reports.

*Economic grouping:*
1. Create a global partnership and cooperation for sustainable development
2. Create fair international labour and migration rules and freedom for everyone
3. Minimise financial volatility and economic insecurity, achieve sustainable economic growth
4. Create fair and simplified international investment and trade rules, equal access to resources
5. Maximise sustainable and efficient employment, minimise unemployment
6. Combat bribery and corruption, promote transparency
7. Promote private investment in infrastructure projects
8. Reduce military spending
9. Manage world population and ageing generation trends
10. Narrow the gaps between rich and poor and the extremes between countries

A: From the list above, select three values/ideals (by typing corresponding numbers into the textbox below) you consider are the most important, or nominate your own values/ideals.

B: Explain why each of the values/ideals you have selected is important.
QUESTION 4:
What other typological categories and their initial values/ideals should be considered when developing a business opportunity and constructing business models? (If you cannot think of any other major typological grouping, then skip this question and submit the survey.)
Appendix II
Phase I – Online survey questionnaire – Delphi cycle A2; CSR experts
Group 1

The following list of values/ideals of Social typological grouping is the outcome of the first survey round. The second survey round aims to achieve agreement of the majority of the participating CSR experts on three of the most important values/ideals. The agreement will be achieved by prioritising the values/ideals listed based on their relative importance and taking the ones with the highest ranking.

Social grouping:
1. Eradicate / end poverty and hunger
2. Combat HIV/AIDS, malaria, and other diseases
3. Achieve universal primary education and distribution of knowledge
4. Create effective global governance and 'open society' conditions
5. Facilitate economic opportunity and development at the local level
6. Protect and promote human health
7. Protect human rights (e.g. women rights, children rights, minority groups rights)
8. Environmental security

**QUESTION 1:**
Prioritise the above-listed values/ideals by ranking them (the higher the number, the higher priority the value/ideal has i.e., the more important it is). (Note: this is a ranking question where values/ideals 1 to 8 have to be prioritised by assigning a priority number. Each priority number can be used once only.)

**QUESTION 2:**
Suggest in how many years the above values/ideals should be re-evaluated and their importance reconsidered again in the future (e.g., in X years time).

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The following list of values/ideals of Environmental typological grouping is the outcome of the first survey round.

Environmental grouping:
1. Protect and ensure access to clean water
2. Manage global climate change
3. Maintain global biodiversity (land, water, flora and fauna)
4. Ensure sustainable consumption of resources
5. Maximise recyclability and reusability of resources
6. Develop and apply environmentally friendly and sustainable technologies
7. Produce and consume clean renewable energy
8. Minimise waste and pollutants production, land degradation
9. Shift incentives from consumption that damages the environment to consumption that promotes human development
QUESTION 3:
Prioritise the above-listed values/ideals by ranking them (the higher the number, the higher priority the value/ideal has i.e., the more important it is). (Note: this is a ranking question where values/ideals 1 to 9 have to be prioritised by assigning a priority number. Each priority number can be used once only.)

QUESTION 4:
Suggest in how many years the above values/ideals should be re-evaluated and their importance reconsidered again in the future (e.g., in X years time).

The following list of values/ideals of Economic typological grouping is the outcome of the first survey round.

Economic grouping:
1. Create a global partnership and cooperation for sustainable development
2. Create fair and simplified international investment and trade rules, equal access to resources
3. Narrow the gaps between rich and poor and the extremes between countries
4. Combat bribery and corruption, promote transparency
5. Promote private investment in infrastructure projects
6. Reduce military spending
7. Redirect growth to non-material growth through education and incentives
8. Create fair international labour and migration rules and freedom for everyone
9. Minimise financial volatility and economic insecurity, achieve sustainable economic growth
10. Manage world population and ageing generation trends

QUESTION 5:
Prioritise the above-listed values/ideals by ranking them (the higher the number, the higher priority the value/ideal has i.e., the more important it is). (Note: this is a ranking question where values/ideals 1 to 10 have to be prioritised by assigning a priority number. Each priority number can be used once only.)

QUESTION 6:
Suggest in how many years the above values/ideals should be re-evaluated and their importance reconsidered again in the future (e.g., in X years time).
A new typological grouping, ‘Polity’ grouping, was identified at the first survey round with the following values/ideals:

**Polity grouping:**
1. Create strong and effective national and global governance
2. Build more coherent and more democratic architecture for global governance
3. Think globally, act locally when lobbying
4. Be responsible to people – to equity, to justice, to enlarging the choices of all when influencing others (e.g. by sponsoring, donating money)
5. Build partnerships in pursuit of common goals
6. Create a good policy environment (e.g. financial policies that are market-aware)
7. Improve the international architecture for integration
8. Strengthen the rule of law upheld by an independent judiciary
9. Create public outreach and collaboration with the media, informing the public
10. Broaden partnership with civil society groups, donors, and others in the international community

**QUESTION 7:**
Do you agree ‘Polity’ typological grouping should be considered when constructing business models of transcendent businesses that go beyond profit? (YES : NO)

**QUESTION 8:**
If you agree ‘Polity’ grouping should be considered as another typological grouping, please comment on the listed values/ideals, or suggest what other values/ideals of the grouping should be considered when developing business models of transcendent businesses. (Skip this question if you do not agree with the nominated grouping.)

**QUESTION 9:**
Prioritise the listed values/ideals of ‘Polity’ grouping by ranking them (the higher the number, the higher priority the value/ideal has i.e., the more important it is). (Note: this is a ranking question where values/ideals 1 to 10 have to be prioritised by assigning a priority number. Each priority number can be used once only.) Skip this question if you do not agree ‘Polity grouping’ should be considered when constructing business models of transcendent businesses.

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A new typological grouping ‘Sustainable human development’ was identified at the first survey round with the following values/ideals:

**Sustainable human development grouping:**
1. Enlightened Self Interest (ESI)
2. Enable all people to reach their developmental potential
3. Develop both individual and collective leadership capacity
4. Develop society partnership
5. Ensure collective responsibility
6. Manage human capital (at local and global level)
7. Protect future through acknowledging the past and educating future generations
8. Provide the optimum infrastructure for further development
9. Harness the potential of technology
10. Change today’s consumption patterns for tomorrow’s human development

**QUESTION 10:**
Do you agree ‘Sustainable human development’ typological grouping should be considered when constructing business models of transcendent businesses that go beyond profit? (YES : NO)

**QUESTION 11:**
If you agree ‘Sustainable human development’ grouping should be considered as another typological grouping, please comment the listed values/ideals, or suggest what other values/ideals of the grouping should be considered when developing business models of transcendent businesses. (Skip this question if you do not agree with the nominated grouping.)

**QUESTION 12:**
Prioritise the listed values/ideals of ‘Sustainable human development’ grouping by ranking them (the higher the number, the higher priority the value/ideal has i.e., the more important it is). (Note: this is a ranking question where values/ideals 1 to 10 have to be prioritised by assigning a priority number. Each priority number can be used once only.) Skip this question if you do not agree ‘Sustainable human development’ grouping should be considered when constructing business models of transcendent businesses.
Appendix III
Phase I – Online survey questionnaire – Delphi cycle A3; CSR experts
Group 1

The following core values/ideals of Social, Environmental, Economic, Governance (Polity), and Sustainable human development typological groupings were reached by consensus by participating CSR experts.

Social, Environmental, Economic, Governance, Sustainable human development groupings
1. Achieve universal primary education and distribution of knowledge
2. Protect and promote human health
3. Protect human rights (e.g. women rights, children rights, minority group’s rights)
4. Protect and ensure access to clean water
5. Maximise recyclability and reusability of resources
6. Minimise waste and pollutants production, land degradation
7. Redirect growth to non-material growth through education and incentives
8. Create fair international labour and migration rules and freedom for everyone
9. Minimise financial volatility and economic insecurity, achieve sustainable economic growth
10. Manage world population and ageing generation trends
11. Build more coherent and more democratic architecture for global governance
12. Be responsible to people – to equity, to justice, to enlarging the choices of all when influencing others (e.g. by sponsoring, donating money)
13. Build partnerships in pursuit of common (human development) goals
14. Broaden partnership with civil society groups, donors, and others in the international community
15. Develop both individual and collective leadership capacity
16. Develop society partnership
17. Ensure collective responsibility

QUESTION 1:
Prioritise the above-listed values/ideals by ranking them (the higher the number, the higher priority the value/ideal has, i.e., the more important it is). (Note: this is a ranking question where values/ideals 1 to 17 have to be prioritised by assigning a priority number. Each priority number can be used once only.)
Appendix IV
Phase I – Online survey questionnaire – Delphi cycle A2; CSR experts
Group2

The following list of values/ideals of Social typological grouping has been verified by a group of CSR experts. This survey aims to achieve agreement of the majority of the participating CSR experts on three of the most important values/ideals. The agreement will be achieved by prioritising the values/ideals listed based on their relative importance and taking the ones with the highest priority.

Social grouping:
1. Eradicate / end poverty and hunger
2. Combat HIV/AIDS, malaria, and other diseases
3. Achieve universal primary education and distribution of knowledge
4. Create effective global governance and ‘open society’ conditions
5. Facilitate economic opportunity and development at the local level
6. Protect and promote human health
7. Protect human rights (e.g. women rights, children rights, minority groups rights)
8. Environmental security

QUESTION 1:
Prioritise the above-listed values/ideals by assigning a priority number 1 (to a value/ideal with the highest priority) to 8 (to a value/ideal with the lowest priority). (Note: this is a ranking question where values/ideals listed above have to be prioritised by assigning a priority number. Each priority number can be used once only.)

QUESTION 2:
Suggest in how many years the above values/ideals should be re-evaluated and their importance reconsidered again in the future (e.g., in X years time).

The following list of values/ideals of Environmental typological grouping has been verified by a group of CSR experts.

Environmental grouping:
1. Protect and ensure access to clean water
2. Manage global climate change
3. Maintain global biodiversity (land, water, flora and fauna)
4. Ensure sustainable consumption of resources
5. Maximise recyclability and reusability of resources
6. Develop and apply environmentally friendly and sustainable technologies
7. Produce and consume clean renewable energy
8. Minimise waste and pollutants production, land degradation
9. Shift incentives from consumption that damages the environment to consumption that promotes human development
QUESTION 3:
Prioritise the above-listed values/ideals by assigning a priority number 1 (to a value/ideal with the highest priority) to 9 (to a value/ideal with the lowest priority).

QUESTION 4:
Suggest in how many years the above values/ideals should be re-evaluated and their importance reconsidered again in the future (e.g., in X years time).

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The following list of values/ideals of Economic typological grouping has been verified by a group of CSR experts.

Economic grouping:
1. Create a global partnership and cooperation for sustainable development
2. Create fair and simplified international investment and trade rules, equal access to resources
3. Narrow the gaps between rich and poor and the extremes between countries
4. Combat bribery and corruption, promote transparency
5. Promote private investment in infrastructure projects
6. Reduce military spending
7. Redirect growth to non-material growth through education and incentives
8. Create fair international labour and migration rules and freedom for everyone
9. Minimise financial volatility and economic insecurity, achieve sustainable economic growth
10. Manage world population and ageing generation trends

QUESTION 5:
Prioritise the above-listed values/ideals by assigning a priority number 1 (to a value/ideal with the highest priority) to 10 (to a value/ideal with the lowest priority).

QUESTION 6:
Suggest in how many years the above values/ideals should be re-evaluated and their importance reconsidered again in the future (e.g., in X years time).

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The following list of values/ideals of Governance typological grouping has been verified by a group of CSR experts.

**Governance grouping:**
1. Emphasise local governance, integrated with regional and national governance
2. Build a more coherent and more democratic architecture for global governance
3. Think globally, act locally when lobbying
4. Be responsible to people – to equity, to justice, to enlarging the choices of all when influencing others (e.g. by sponsoring, donating money)
5. Build partnerships in pursuit of common (human development) goals
6. Create a good policy environment (e.g. create market mechanisms that are sustainability aware and reward progressively reduced material and energy inputs)
7. Improve the international architecture for integration
8. Strengthen the rule of law upheld by an independent judiciary
9. Create public outreach and collaboration with the media, informing the public
10. Broaden partnership with civil society groups, donors, and others in the international community
11. Develop collaborative leadership across sectors

**QUESTION 7:**
Prioritise the above-listed values/ideals by assigning a priority number 1 (to a value/ideal with the highest priority) to 11 (to a value/ideal with the lowest priority).

**QUESTION 8:**
Suggest in how many years the above values/ideals should be re-evaluated and their importance reconsidered again in the future (e.g., in X years time).

The following list of values/ideals of sustainable human development typological grouping has been verified by a group of CSR experts.

**Sustainable human development grouping:**
1. Enlightened Self Interest (ESI)
2. Enable all people to reach their developmental potential
3. Develop both individual and collective leadership capacity
4. Develop society partnership
5. Ensure collective responsibility
6. Manage human capital (at local and global level)
7. Protect future through acknowledging the past and educating future generations
8. Provide the optimum infrastructure for further development
9. Harness the potential of technology
10. Change today’s consumption patterns for tomorrow’s human development
QUESTION 9:
Prioritise the above-listed values/ideals by assigning a priority number 1 (to a value/ideal with the highest priority) to 10 (to a value/ideal with the lowest priority).

QUESTION 10:
Suggest in how many years the above values/ideals should be re-evaluated and their importance reconsidered again in the future (e.g., in X years time).
Appendix V
Phase I – Online survey questionnaire – Delphi cycle A3; CSR experts
Group2

The following core values/ideals of Social, Environmental, Economic, Governance, and Sustainable human development typological groupings were consensus by participating CSR experts.

*Social, Environmental, Economic, Governance, Sustainable human development groupings*
1. Achieve universal primary education and distribution of knowledge
2. Protect human rights (e.g. women rights, children rights, minority groups rights)
3. Protect and ensure access to clean water
4. Minimise waste and pollutants production, land degradation
5. Create a global partnership and cooperation for sustainable development
6. Create fair and simplified international investment and trade rules, equal access to resources
7. Combat bribery and corruption, promote transparency
8. Emphasise local governance, integrated with regional and national governance
9. Create a good policy environment (e.g. create market mechanisms that are sustainability aware and reward progressively reduced material and energy inputs)
10. Develop both individual and collective leadership capacity
11. Ensure collective responsibility

**QUESTION 1:**
Prioritise the above-listed values/ideals by assigning a priority number 1 (to a value/ideal with the highest priority) to 11 (to a value/ideal with the lowest priority).
Appendix VI
Phase II – Description of a selected patent

**United States Patent**

**Smith**

[54] SOLAR POWER GENERATOR AND WATER PURIFIER

**Inventor:** Derrick A. Smith, 1180 S. Seabreeze Blvd., Ft. Lauderdale, Fla. 33316

**Appl. No.:** 70,329

**Filed:** Aug. 27, 1979

**Int. Cl.** F03G 7/02; F03G 7/04

**U.S. Cl.** 60/641; 60/615

**Field of Search** 60/641, 675, 715

**References Cited**

U.S. PATENT DOCUMENTS

3,490,996 1/1970 Kelly, Jr. 60/641

3,905,352 9/1975 Jahn 60/641

3,953,971 5/1976 Parker 60/641

FOREIGN PATENT DOCUMENTS

50536 9/1954 Canada

Primary Examiner—S. Clement Swisher

**ABSTRACT**

A combined solar power generator and water purifier is provided herein. It includes a hollow globular boiler floating on and anchored atop a body of water to be purified. The globular boiler includes water inlet means disposed adjacent an upper portion of the globular boiler, an upwardly directed steam outlet conduit originating from an upper portion of the globular boiler, and a refractor lens window disposed within an upper half of the globular boiler. Controllable means are provided for directing the sun's rays towards the refractor lens window to generate heat to boil water in the boiler. A primary turbine is disposed at a level above that of the boiler, the primary turbine being connected to the steam outlet conduit and being driven by steam under pressure from the boiler. Steam condenser means are connected to the outlet from the primary turbine for dissipating residual heat in the steam effluent from the turbine and for condensing such steam as substantially pure water. A reservoir is connected to the outlet from the condenser means and such reservoir is disposed at a level which is lower than that of the primary turbine, but at a level which is higher than that of the globular boiler, for receiving such substantially pure water. A secondary turbine for the generation of electricity is disposed at a level which is lower than that of the reservoir but which is higher than that of the globular boiler. The secondary turbine is connected to the outlet from the reservoir and is driven by water from the reservoir. A pure water effluent is provided from the secondary turbine for use wherever pure water is required. Such solar power generator is thus very energy efficient.

6 Claims, 1 Drawing Figure
SOLAR POWER GENERATOR AND WATER PURIFIER

BACKGROUND OF THE INVENTION

(i) Field of the Invention

This invention relates to a solar power generator apparatus for harnessing energy from the sun and for purifying (i.e., distilling, etc.) water in the use of such apparatus.

(ii) Related Application

This invention is related to applicant's copending application Ser. No. 291,792.

(iii) Description of the Prior Art

Electricity is one of the most widely used forms of energy. It is known that electricity may be produced by hydroelectric generators, combustion engines powered by expensive fuel, e.g., oil or natural gas, or by electro-notive steam engines powered by coal, or by the use of nuclear energy. These procedures suffer the deficiency that they may use diminishing non-renewable resources, and of pollution of the environment. It is also known that purification of water is very important for agricultural, domestic and industrial uses, but that the expense of purification is quite often prohibitive.

It would therefore be advantageous if pure water and electricity could be simultaneously produced with the advantages pointed out above but with fewer of the aforementioned disadvantages.

Many proposals have been made to achieve these ends. In one proposal, that provided by Canadian Patent No. 145,381 issued Jan. 28, 1913 to R. A. Fussen- den, apparatus was provided for obtaining power from the sun's radiant energy, which included the combination of a reservoir and a working fluid therein exposed to be heated by the sun's radiant energy, means for protecting such fluid against loss of heat by convection, a low pressure turbine and means to operate it by that fluid, and an upper fluid reservoir and a lower fluid reservoir combined to store energy generated by the turbine. The problem which that inventor apparently desired to solve was that of protection of the working fluid against heat loss by convection.

In another system, that provided by Canadian Patent No. 505,536 issued Sept. 7, 1954 to A. S. E. Aiwert, the patentee attempted to provide improved apparatus that utilized the energy of solar rays for effecting a temperature differential between a quantity of water or other liquid and the atmosphere thereabove, to conduct the resultant vapors to a higher level, and then to condense the vapors and store the liquid thus provided. The vapors created power to generate electrical current. A heat exchange was effected between a source of water supply and a quantity of the water obtained from the supply to increase vaporization of the quantity of water. This was apparently solved by a solar engine including the combination of a reservoir, a basin for receiving liquid from the reservoir, a differential-pressure conduit extending from the reservoir to the basin for passing liquid into the latter, a transparent dome for the basin (comprising a plurality of flat sheets for transmitting solar rays to evaporate the liquid in the basin), a closed-circuit ther- mosiphon heat exchanger extending from the reservoir and into the liquid in the basin for increasing the evaporative rate of the liquid, an upwardly directed duct extending from the dome to conduct the evaporated liquid to a level above, and at a substantially lower atmospheric pressure, than that of both the reservoir and the basin, a condenser at the upper end of the duct to condense the vapors, means for removing free air from the condenser, a storage reservoir elevated above the first-mentioned reservoir, and a differential-pressure conduit leading from the condenser to the storage reservoir. The problem apparently to be solved by this patentee was to avoid the detrimental effect on the heat exchange characteristics of the presence of free air in the condenser circuit.

In a third system, that provided by Canadian Patent No. 669,504 issued Aug. 27, 1962 to Podolyn, the patentee desired to provide an arrangement for storing some of the heat energy from the sun so that it might be utilized during the intervals when the device was not exposed to the radiant heat of the sun; and also to provide a power-plant in which a chemical compound was used which could be separated into its constituents electrically, together with an arrangement for storing the constituents, to be later combined chemically for producing electrical energy for the powerplant. These ends were apparently met by a solar energy powerplant including the combination of a boiler, a mirror for concentrating radiant heat on the boiler, a turbine powered by vapor under pressure from the boiler, and a generator driven by the turbine in combination with an electrolysis device for separating a compound into its constituents, storage means for the constituents, a fuel cell in which the constituents are combined to produce electrical energy, and control means for selectively connecting the generator to the electrolysis device and to a load or connecting the fuel cell to the load. The problem thus apparently solved by this patentee was to store the sun's energy in the form of constituents of a chemical which could later be recombined to provide electrical energy.

SUMMARY OF THE INVENTION

(i) Aims of the Invention

It is seen therefore that the primary object of providing purification of water coupled with generation of electrical energy both in the daytime and at night has not yet been solved. However, by the present invention, this can be achieved by using a primary energy supply which is inexpensive, limitless and pure, namely the sun, in conjunction with the particular construction to be described hereinafter.

(ii) Statement of the Invention

Thus, by this invention, a combined solar power generator and water purifier is provided comprising: (a) a hollow globular boiler floating on, and anchored atop a body of water, the boiler including water inlet means disposed adjacent an upper portion of the globular boiler, an upwardly directed steam outlet conduit originating from an upper portion of the globular boiler, and a refractor lens window also disposed within an upper portion of the globular boiler; (b) controllable means for directing the sun's rays toward the refractor lens window to generate heat to boil water in the globular boiler; (c) a primary turbine for the generation of electricity disposed at a level above that of the globular boiler, such primary turbine being connected to the steam outlet conduit and being driven by steam under pressure from the boiler; (d) steam condenser means connected to the outlet from the turbine for dissipating residual heat in the steam which has been discharged from the primary turbine and for condensing the steam
as substantially pure water: (e) a reservoir connected to the outlet from the condenser means and disposed at a level which is lower than the primary turbine but which probably is disposed at a level lower than the globular boiler, for receiving substantially pure water; (f) a secondary turbine for the generation of electricity disposed at a level lower than the reservoir but preferably higher than that of the globular boiler, such secondary turbine being connected to the reservoir and being driven by water from the reservoir; and (g) pure water effluent means from the secondary turbine.

(iii) Other Features of the Invention

By one feature thereof, the steam condenser means includes a radiator connected to the primary turbine for simultaneously recovering useful heat from the steam and for partially condensing the steam to water, and a condenser connected to the radiator for substantially completely condensing the steam to water.

By another feature, the solar power generator includes a valve for controlling the flow of water from the reservoir to the secondary turbine.

By yet another feature, the solar power generator includes a valve automatically sequenced for periodic opening, to permit flow of water from the reservoir to the secondary turbine, and for periodic closing, to cut off such water flow.

By still further feature, means (g) comprises a paraboloid reflector mounted on a post.

By another feature, the reservoir (e) is disposed at a level higher than the level of said globular boiler; and the secondary turbine (f) is disposed at a level which is higher than that of the globular boiler.

BRIEF DESCRIPTION OF THE DRAWING

In the accompanying drawings, the single FIGURE is a schematic drawing of a solar water generator of one aspect of this invention as a combined desalination water purification plant and as an electrical power generating plant.

DESCRIPTION OF PREFERRED EMBODIMENTS

(i) General Description

The embodiment of the invention illustrated is applicable wherever sunlight reaches and wherever a body of water, whether saime, brackish, impure or clean, is available.

Generally, this solar power generator includes a ray collector which collects the rays of the sun, partially converges them and refracts them through a refractor lens which completes the convergence and yields high temperatures, which vaporizes the water in the boiler and produces steam that drives the day generator. The steam is then conducted through the radiator where most of its sensible heat will be released, then to the condenser where the remainder of the sensible heat and its latent heat will dissipate and the vapor will condense. The condensate will accumulate in the reservoir. This water will be pure distilled water. It will be released at night to drive the night generator.

The pure water leaving the night generator may now be used in homes, factories, and agricultural projects.

(ii) Description of the Figure

As seen in the drawing, the heart of the present invention is the globular boiler 10. The globular boiler 10 comprises a hollow globular vessel 11 floating on and anchored atop a body of water 12, the boiler including a trap door 13 for access to the interior of globular boiler 10 for the servicing thereof. The level 14 of the water in vessel 11 is the same as the level 15 of the main body of water.

A water inlet means, preferably a make-up water assembly 20 is provided including an inverted "L" shaped leg provided by a vertical segment 21a and horizontal segment 21b connected between the body of water 12 and the upwardly directed steam outlet conduit 22, and a horizontal connecting leg 23 between vertical segment 21a and globular vessel 11. The operation of the make-up water assembly 20 will be described hereinafter.

The upwardly directed steam outlet conduit 22, the suction legs 21a and 21b and the connecting leg 23 are each enveloped with insulation 24 to minimize heat loss by radiation.

Steam outlet conduit 22 leads to primary generator 25, provided with a steam-run turbine blade 26 which turns shaft 27 for the generation of electricity in the usual manner. The outflow steam lines 28 from generator 25 comprise a radiator 29, provided with radiator fins 29a for the simultaneous partial condensation of steam of dissipation of heat from the steam lines 29. Radiator 29 can alternatively, although not shown, be a water cooled heat exchanger system, with the flow of water being caused by a steam pump, using effluent steam from the generator 25. Radiator 29 leads to condenser 30, also provided with radiator fins 31, or (which is also provided with condenser 30, or which is also a water cooled heat exchanger), where the condensation of the steam to water can be substantially completed. Effluent from the condenser 30 is to a reservoir 32.

The reservoir 32 is adapted to release its contents through sluice 33, controlled by valve 34 (which may be an automatic timed solenoid valve or a hand valve) to a secondary generator 35 to run a water-powered turbine blade 36 which turns shaft 37 for the generation of electricity in the usual manner. The outflow of pure water from effluent line 38 can be used for a variety of purposes.

The input of energy for the operation of the solar generator is by the mechanism of a paraboloid reflector 40 mounted on a post 41. By suitable control of reflector 40, rays 42 of the sun 43 are caused to impinge as a parallel stream into refractor lens 44. The rays concentrated by refractor 44 generate heat to cause the water in globular boiler 11 to boil.

OPERATION OF PREFERRED EMBODIMENT

Steam as it passes upwardly through steam outlet conduit 22 causes an aspirated suction to be set up in suction outlets 21a and 21b. The steam conduit 22 is shown in schematic form and does not show the standard air aspirator which is well known in the art. In one conventional description, it may be described in the following terms: "A jet of water is forced through a small orifice into a narrow chamber with sloping sides as to draw in air from a side tube. In the same way, the steam is forced through a small orifice into the steam outlet conduit (which actually is a narrow chamber with sloping sides) to provide a suction in side tube 21b boiled out of globular boiler 11, float 45 lowers to open check valve 46. This permits water to flow through suction leg 21a and connecting leg 23 to boiler 11."
When the correct equilibrium water level is reached, float 45 automatically shuts off the resupply of water. Steam rising through steam outlet conduit 22 drives turbine 36 to generate electricity, is condensed to water in tubes 28 and condenser 39 and is stored in reservoir 32. Then it can perform additional useful work while flowing down through turbine 36 to generate more electricity. The effluent water is more useful as well because it is pure.

SUMMARY

From the foregoing description, one skilled in the art can easily ascertain the essential characteristics of this invention, and without departing from the spirit and scope thereof, can make various changes and modifications of the invention to adapt it to various usages and conditions. Consequently, such changes and modifications are properly, equally, and "intended" to be, within the full range of equivalence of the following claims.

1. A combined solar power generator and water purifier comprising:
(a) a hollow globular boiler floating on and anchored atop a body of water, said boiler including water inlet means disposed adjacent the upper portion of said globular boiler, an upwardly directed steam outlet conduit originating from an upper portion of said globular boiler, and a refractorless window also disposed within an upper portion of said globular boiler;
(b) controllable means for directing the sun's rays towards said refractorless window to generate heat, to boil water in said boiler;
(c) a primary turbine for the generation of electricity disposed at a level above that of said globular boiler, said primary turbine being connected to said steam outlet conduit and driven by steam under pressure from said globular boiler;
(d) steam condenser means connected to an outlet from said primary turbine for substantially simultaneously dissipating and collecting residual heat in said steam effluent from said primary turbine and for condensing said steam to substantially pure water;
(e) a reservoir connected to an outlet from said condenser means, said reservoir being disposed at a level lower than that of said primary turbine, for receiving said substantially pure water;
(f) a secondary turbine for the generation of electricity disposed at a level lower than that of said reservoir, said secondary turbine being connected to an outlet from said reservoir and being selectively driven by water from said reservoir; and
(g) pure water effluent means from said secondary turbine.

2. The solar power generator of claim 1 wherein said steam condenser means includes a radiator connected to said primary turbine for simultaneously recovering useful heat from said steam and for partially condensing said steam to water, and a condenser connected to said radiator for substantially completely condensing said steam to water.

3. The solar power generator of claim 1 including a valve for controlling the flow of water from said reservoir to said secondary turbine.

4. The solar power generator of claim 1 including a valve automatically sequenced for periodic opening, to permit flow of water from said reservoir to said secondary turbine, and for closing to cut off said flow.

5. The solar power generator of claim 1 wherein said means (b) comprises a paraboloid reflector mounted on a post.

6. The solar power generator of claim 1 wherein said reservoir (c) is disposed at a level higher than the level of said globular boiler, and wherein said secondary turbine (f) is disposed at a level which is higher than that of said globular boiler.
Appendix VII
Phase II – List of core values/ideals

List of core values/ideals of major typological groupings; identified, verified, and validated by Corporate Social Responsibility (CSR) experts:

<table>
<thead>
<tr>
<th>Core Value/Ideal</th>
<th>Example: (How to achieve)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Environmental grouping</td>
<td>• Protect and ensure access to clean water</td>
</tr>
<tr>
<td></td>
<td>• Minimise waste and pollutants production, land degradation</td>
</tr>
<tr>
<td></td>
<td>– by minimising water consumption for example</td>
</tr>
<tr>
<td></td>
<td>– making designs that improves recyclability and reusability of resources</td>
</tr>
<tr>
<td>Sustainable human development grouping</td>
<td>• Ensure collective responsibility</td>
</tr>
<tr>
<td></td>
<td>• Develop both individual and collective leadership capacity</td>
</tr>
<tr>
<td></td>
<td>– collectively causing no harm</td>
</tr>
<tr>
<td></td>
<td>– enabling people to work together to improve their communities and well being</td>
</tr>
<tr>
<td>Governance grouping</td>
<td>• Create a good policy environment</td>
</tr>
<tr>
<td></td>
<td>• Emphasise local governance, integrated with regional and national governance</td>
</tr>
<tr>
<td></td>
<td>– being sustainability aware - reducing material and energy inputs</td>
</tr>
<tr>
<td></td>
<td>– thinking globally and acting locally when influencing others</td>
</tr>
<tr>
<td>Social grouping</td>
<td>• Protect human rights</td>
</tr>
<tr>
<td></td>
<td>• Achieve universal primary education and distribution of knowledge</td>
</tr>
<tr>
<td></td>
<td>– not discriminating against others because of their age, race, beliefs, religion, etc.</td>
</tr>
<tr>
<td></td>
<td>– helping schools, by sponsoring, promoting, volunteering and so on</td>
</tr>
<tr>
<td>Economic grouping</td>
<td>• Combat bribery and corruption, promote transparency</td>
</tr>
<tr>
<td></td>
<td>• Create fair and simplified international investment and trade rules; equal access to resources</td>
</tr>
<tr>
<td></td>
<td>• Create a global partnership and cooperation for sustainable development</td>
</tr>
<tr>
<td></td>
<td>– not abusing public office for private gain, improving engagement of civil society, households, and the media</td>
</tr>
<tr>
<td></td>
<td>– simplifying trading by having simple, universally applicable rules that do not discriminate against any party</td>
</tr>
<tr>
<td></td>
<td>– cooperating rather than competing, creating and sharing common economic goals, such as sustainable growth</td>
</tr>
</tbody>
</table>

In an online, anonymous survey you will be asked the following questions, referring to the ‘Solar Power Generator and Water Purifier’ patent (see attached description of the patent).

1. **Based on your expertise and knowledge, recommend usages of the patent that must satisfy all of the above values/ideals as best as possible.**
2. **Explain how the above-listed values/ideals are going to be achieved by each of your recommended usages of the patent.**
3. **Describe what measures you would use to test whether the above core values/ideals are achieved by your recommended usage of the patent.**
Appendix VIII
Phase II – Online patent survey; STP experts

‘Solar power generator and water purifier’ (US Patent #4253307) has been selected to develop a list of potential business models of businesses that would create multiple benefits (benefits for society, environment, economy, governance, and sustainable human development). Prior developing of a list of such business models and potential usages of the patent have to be identified.

Based on your expertise and knowledge, recommend usages of the patent that will minimise pollutants and waste, and will protect clean water. Your recommended usages will need to improve both individual and collective leadership capacity, whilst being collectively responsible, creating a sustainability-aware policy environment, and emphasising local governance, integrated with regional and national governance. Your recommended usages shall not abuse public office for private gain, and shall not discriminate against anyone. Your recommended usages should help schools, promote partnership and cooperation, and simplify international investment and trading.

(Note: please refer to the documents you have received via email for description of the patent, and a list of core values/ideals with examples.)

QUESTION 1:

USAGE #1:
Based on your expertise and knowledge, recommend usage of the patent.
Explain how the core values/ideals are going to be achieved by your recommended usage of the patent.
Describe what measures you would use to test whether the above core values/ideals are achieved by your recommended usage of the patent.

QUESTION 2:

USAGE #2:
(Note: skip this question and submit the survey if you cannot think of any other usage of the patent.)

Based on your expertise and knowledge, recommend usage of the patent.
Explain how the core values/ideals are going to be achieved by your recommended usage of the patent.
Describe what measures would you use to test whether the above core values/ideals are achieved by your recommended usage of the patent.
QUESTION 3:

USAGE #3:

(Note: skip this question and submit the survey if you cannot think of any other usage of the patent. If you can think of more than three usages of the patent, visit the survey again and submit more responses.)

Based on your expertise and knowledge, recommend usage of the patent.

Explain how the core values/ideals are going to be achieved by your recommended usage of the patent.

Describe what measures would you use to test whether the above core values/ideals are achieved by your recommended usage of the patent.
Appendix IX
Phase II – Description of a selected patent

(12) United States Patent
Lee

(10) Patent No.: US 7,794,572 B2
(45) Date of Patent: Sep. 14, 2010

(54) WATER PURIFICATION APPARATUS

(72) Invention: Hsin-Hao Lee, Tzu-Cheng (TW)

(73) Assignee: Hon Hai Precision Industry Co., Ltd., Tzu-Cheng, Taipei Hsien (TW)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 1096 days.

(21) Appl. No.: 11/438,624
(22) Filed: May 19, 2006

(65) Prior Publication Data

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3,875,026 A * 4/1975 Frank .................... 246/035

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CN 2032066 8/2004

* cited by examiner

Primary Examiner—Virginia Manoharan
Attorney, Agent, or Firm—Jeffrey T. Knapp

(57) ABSTRACT

A water purification apparatus (10) includes an evaporating chamber (13), a light concentrator (11), and a heat pipe (12). The evaporating chamber is for containing impure water. The evaporating chamber has a connecting opening (134) and a vapor outlet (133). The light concentrator is for concentrating sunshine. The heat pipe has an evaporating section (121) and a condensing section (122). The evaporating section is iris-shaped by the concentrated sunshine, and the condensing section is disposed in the evaporating chamber through the connecting opening.

2 Claims, 2 Drawing Sheets
FIG. 2
1 WATER PURIFICATION APPARATUS

TECHNICAL FIELD

The present invention generally relates to desalinating or purifying water and, more particularly, to a freshwater generating apparatus.

BACKGROUND

More than 70 percent of the earth’s surface is covered by water. However, most of the water is seawater, which cannot be drunk as it salt content is too high. Therefore, freshwater or drinking water is very scarce. Desalinating or purifying the seawater is a solution for getting freshwater or drinking water.

Generally, the seawater is desalinated by chemical distillation, electrically-powered distillation, or solar-powered distillation. Chemical distillation and electrically-powered distillation are prohibitively expensive due to the volume of material and power required. Therefore solar-powered distillation is the method most commonly used in desalinating seawater.

Solar-powered distillation operates by solar-powered distillation evaporating seawater using solar energy. As the water evaporates it leaves behind its salt content, the vapor can then be cooled, for example by using a condenser, producing purified water that can be drunk or used in agriculture. A typical solar-powered distillation method for desalinating seawater uses a large greenhouse-like structure having transparent walls and roof. The solar energy transmits the transparent walls, and heats seawater contained in the green house. The seawater evaporates, and the vapor is cooled to form a supply of purified water. However, the large greenhouse uses too much space and has a low heating efficiency.

China patent No. 01137342.3 discloses an apparatus for desalinating seawater using evacuated solar collector tubes. The seawater is fed into the collector tubes, solar energy is then concentrated on the collector tubes and the seawater in the collector tubes is heated to vapor. This vapor is then cooled to form pure water. This apparatus has good heating efficiency, but the salt in the seawater is deposited on the inner surface of the collector tubes, decreasing the heating efficiency of the collector tubes, and shortening the useful lifetime of the collector tubes.

Therefore, a water purification apparatus which can overcome the above-described problems is desired.

SUMMARY

In one embodiment thereof, a water purification apparatus includes an evaporating chamber, a light concentration, and a heat pipe. The evaporating chamber is for containing impure water. The evaporating chamber has a connecting opening and a vapor outlet. The light concentrator is for concentrating sunlight. The heat pipe has an evaporating section and a condensing section. The evaporating section is irradiated by the concentrated sunlight, and the condensing section is positioned in the evaporating chamber through the connecting opening.

Other advantages and novel features will become more apparent from the following detailed description when taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

Many aspects of the water purification apparatus can be better understood with reference to the following drawings.

The components in the drawings are not necessarily drawn to scale, the emphasis instead being placed upon clearly illustrating the principles of the present apparatus. Moreover, in the drawings, like reference numerals designate corresponding parts throughout the several views.

FIG. 1 is a schematic view of a water purification apparatus in accordance with a preferred embodiment; and FIG. 2 is a schematic cut away view of the evaporating chamber in FIG. 1.

DETAILED DESCRIPTION OF THE EMBODIMENT

Referring to FIGS. 1-2, in a preferred embodiment, a water purification apparatus 10 includes a light concentrator 11, a heat pipe 12, an evaporating chamber 13, a vapor passage 14, and a cooling mechanism 15.

The light concentrator 11 includes at least one parabolic reflector 111 for concentrating sunshine. The light concentrator 11 has a focus line 113. The reflector 111 can concentrate sunshine onto the focus line 113.

The heat pipe 12 includes an evaporating section 121 and a condensing section 122. The evaporating section 121 is disposed at the focus line 113 of the light concentrator 11, to allow its irradiation with concentrated sunshine. The condensing section 122 is positioned in the evaporating chamber 13. A carbon nanotube layer 123 is formed on a surface of the condensing section 122 of the heat pipe 12. The heat pipe 12 is supported with a supporting bracket 124.

The evaporating chamber 13 is used for containing impure water 16. The impure water 16 can be seawater, or other foal water. A vapor outlet 131 and a water entrance 132 are formed on the top of the evaporating chamber 13. A connecting opening 133 is formed on a side wall of the evaporating chamber 13. The heat pipe 12 is settled into the evaporating chamber 13 through the connecting opening 133. A seal element 134 is disposed in the connecting opening 133 for preventing vapor in the evaporating chamber 13 venting through the connecting opening 133. One end of the vapor passage 14 is connected to the vapor venting opening 131. The other end of the vapor passage 14 is connected to the cooling mechanism 15.

During operation of the water purification apparatus 10, the impure water 16 is introduced into the evaporating chamber 13 through the water entrance 132, and the condensing section 122 of the heat pipe 12 is dipped in the impure water 16. The water entrance 132 is then sealed. The light concentrator 11 concentrates sunshine on the evaporating section 121 of the heat pipe 12, and the heat pipe 12 absorbs the solar energy of the sunshine. The solar energy absorbed by the heat pipe 12 is transferred to the condensing section 122 of the heat pipe 12. Because the carbon nanotube layer 123 formed on the surface of the condensing section 122 has a relatively large specific surface area, the carbon nanotube layer 123 can rapidly heat a relatively large volume of the impure water 16 to vapor. The vapor is vented into the vapor passage 14 through the vapor outlet 131. The vapor is then cooled to form purified water in the cooling mechanism 15.

When the carbon nanotube layer 123 is partially dipped into the impure water 16 the carbon nanotube layer 123 can soak up or absorb the impure water 16 allowing it to cover areas of the carbon nanotube layer 123 above the water-level of the impure water 16 because of capillary action. The impure water 16 which is soaked up to an upper part of the carbon nanotube layer 123 can be evaporated more quickly, because the water will have a much greater evaporating area.
Therefore, the fastest evaporating rate can be got when the carbon nanotube layer 123 is partially dipped in the impure water 16. Understandably, a water level detector can be disposed in the evaporating chamber 15 for detecting the water level of the impure water. The light concentrator can be another variety of concentrator, such as a rotated parabolic concentrator. More than one light concentrator and heat pipe can be used at the same time for accelerating the evaporating rate. It is believed that the present embodiments and their advantages will be understood from the foregoing description, and it will be apparent that various changes may be made thereto without departing from the spirit and scope of the invention or sacrificing all of its material advantages, the examples herebefore described merely being preferred or exemplary embodiments of the invention.

What is claimed is:

1. A water purification apparatus, comprising:
   - an evaporating chamber for containing impure water, the evaporating chamber having a connecting opening and a vapor outlet;
   - a curved light concentrator for concentrating sunlight;
   - a heat pipe having an evaporating section and a condensing section, the evaporating section being arranged to be irradiated by the concentrated sunlight, the condensing section being disposed in the evaporating chamber through the connecting opening;
   - a carbon nanotube layer formed on a surface of the condensing section of the heat pipe; and
   - a cooling mechanism connected to the vapor outlet

   wherein the vapor outlet is formed on the top of the evaporating chamber, the light concentrator comprising a parabolic reflector for concentrating sunlight onto a focus line; the evaporating section is disposed at the focus line of the light concentrator.

2. An apparatus for evaporating a liquid, the apparatus comprising:
   - an evaporating chamber for containing the liquid, the evaporating chamber having a connecting opening and a vapor outlet;
   - a curved light concentrator for concentrating sunlight;
   - a heat pipe having an evaporating section and a condensing section, the evaporating section being arranged to be irradiated by the concentrated sunlight, the condensing section being disposed in the evaporating chamber and at least partially dipped in the liquid so that when the heat pipe transfers heat of the focused sunlight from the evaporating section to the condensing section thereof, the heat evaporates the liquid out of the evaporating chamber through the vapor outlet thereof; and
   - a carbon nanotube layer formed on a surface of the condensing section of the heat pipe;

   wherein the condensing section is arranged such that an end portion of the condensing section is higher than a liquid level; the light concentrator comprising a parabolic reflector for concentrating sunlight onto a focus line; the evaporating section is disposed at the focus line of the light concentrator.

* * * *
A high temperature solar power tower system includes a molten salt heat transfer medium, a high temperature solar receiver, and an energy conversion system. The molten salt heat transfer medium is capable of being heated to a temperature of at least approximately 1200 degrees Fahrenheit by the high temperature solar receiver. The energy conversion system uses the heated molten salt to generate power.
STORE MOLten SALT in COLD STORAGE TANK

PUMP MOLten SALT TO SOLAR RECEIVER

HEAT MOLten SALT IN SOLAR RECEIVER TO A HIGH TEMPERATURE

STORE HEATED MOLten SALT IN HOT STORAGE TANK

PUMP HEATED MOLten SALT TO ENERGY CONVERSION SYSTEM FOR USE

FIG. 2
HIGH TEMPERATURE MOLTEN SALT RECEIVER

BACKGROUND OF THE INVENTION

[0001] The present invention relates generally to solar power tower generation systems. In particular, the invention relates to a solar power tower generation system with high operating temperatures.

[0002] There is a continuing demand for clean renewable energy sources, such as solar power. Solar power towers generate electric power from sunlight by focusing concentrated solar radiation on a tower-mounted receiver. Solar power tower systems typically include a "cold" storage tank, a solar receiver, heliostats, a "hot" storage tank, and an energy conversion system, such as a steam generator or turbine/generator set. In operation, a heat transfer fluid is pumped from the cold storage tank to the solar receiver. The heat transfer fluid can be any medium that has the capability to transfer heat and thermally maintain the heat in the medium, such as water, liquid metal, or molten salt. The solar receiver is typically positioned 50 feet to 250 feet or more above ground and is heated by the heliostats. The heliostats redirect and concentrate solar radiation from the sun onto the solar receiver, which converts the redirected sunlight to thermal energy. The heat transfer fluid flows through receiver tubes of the solar receiver where it is heated by the concentrated solar energy. In the solar receiver, liquid metals have been used as the heat transfer fluid and can reach temperatures of approximately 1600 degrees Fahrenheit (°F) and molten salts currently being used as the heat transfer fluid can reach temperatures of approximately 1100°F.

[0004] After the heat transfer fluid has been heated in the solar receiver, the heat transfer fluid flows into the hot thermal storage tank. The heat transfer fluid is then stored in the hot thermal storage tank until it is needed for electrical power generation. The hot thermal storage tank allows for electrical power production that is not concurrent with the availability of sunlight. When electrical energy is needed, the heated heat transfer fluid is pumped from the hot thermal storage tank and circulated through the energy conversion system. The heat transfer fluid transfers the heat within the energy conversion system. The energy conversion system can be, for example, a Rankine cycle conversion system or a Brayton cycle conversion system. After the heat has been removed from the heat transfer fluid, the heat transfer fluid is transported back to the cold storage tank for reuse. In general, the higher the temperature of the heat transfer fluid, the more efficient the solar tower power system. Thus, heat transfer fluids and systems capable of withstanding higher temperatures are desirable.

BRIEF SUMMARY OF THE INVENTION

[0005] A high temperature solar power tower system includes a molten salt heat transfer medium, a high temperature solar receiver, and an energy conversion system. The molten salt heat transfer medium is capable of being heated to high temperatures, for example, a temperature of at least approximately 1200 degrees Fahrenheit by the high temperature solar receiver. The energy conversion system uses thermal energy from the molten salt heat transfer medium to generate power.

BRIEF DESCRIPTION OF THE DRAWING

[0006] FIG. 1 is a schematic of a solar power tower system using high temperature molten salt.

[0007] FIG. 2 is a diagram of a method of using the high temperature molten salt as the heat transfer medium of the solar power tower system.

DETAILED DESCRIPTION

[0008] FIG. 1 shows a schematic of a solar power tower system 10 using high temperature molten salt. Solar power tower system 10 generally includes cold storage tank 12, solar receiver 14, heliostats 16, hot storage tank 18, and energy conversion system 20. A high temperature molten salt is used as the heat transfer medium through solar power tower system 10. The use of high temperature molten salt and hot thermal storage tank 18 enables solar power tower system 10 to provide electricity (and heat energy) up to 24 hours a day and to operate at sufficiently high temperatures so that the heat energy can be used in a reasonably efficient manner to operate a gas turbine, simplifies solar power conversion system 20, and reduces system dependency on water when compared to other cycles, such as Rankine steam cycles.

[0009] As described above, the heat transfer medium is stored in cold storage tank 12. When needed, the heat transfer medium is pumped to solar receiver 14, which is heated by solar radiation reflected from a field of multiple heliostats 16. Solar receiver 14 is capable of withstanding high temperatures, for example, temperatures of at least approximately 1200 degrees Fahrenheit (°F), preferably at least approximately 1500°F, more preferably at least approximately 1700°F, and most preferably at least approximately 1800°F. Suitable materials for constructing solar receiver 14 include, but are not limited to: nickel based alloys, iron based alloys, and cobalt based alloys. Examples of suitable commercially available nickel based alloys include: Hastelloy X, Hastelloy N, Hastelloy C, and Inconel 718, available from Special Metals Inc., Course, Tex. Examples of suitable commercially available iron based alloys include: A-286 and PM2000, available from Metallwerke Plansee, Austria. An example of a suitable commercially available cobalt based alloy includes: Haynes 25, available from Haynes International Inc., Windor, Conn.

[0010] After the heat transfer medium has been heated to its desired temperature, the heat transfer medium is pumped to hot storage tank 18, where it is stored until needed by energy conversion system 20. The heated heat transfer medium is pumped to energy conversion system 20 to generate power. Solar power tower system 10 is used in conjunction with an air Brayton cycle conversion system as energy conversion system 20. The use of a Brayton cycle conversion system as energy conversion system 20 eliminates the need for a steam Rankine cycle conversion system, reducing a significant amount of plant equipment. For example, a steam generator system, steam turbine, electric generator, cooling tower, water purification equipment, steam drum, acid scrubber, water treatment system, and make-up water are no longer necessary. Instead, energy conversion system 20 requires only heat exchanger 22, compressor 24,
expander 26, generator 28, and recuperator 30. The heat transfer medium is sent to heat exchanger 22 where the thermal energy from hot heat transfer medium is transferred to the air flowing through heat exchanger 22. The air is then sent through energy conversion system 20 to generate electricity. Use of an air Brayton cycle conversion system with a solar power tower system is described in U.S. Pat. No. 6,557,536 (Linthin et al.), which is hereby incorporated by reference.

[0011] After the heat transfer medium has passed through energy conversion system 20, the extracted thermal energy results in a drastic drop in the heat transfer medium temperature and it is sent back to cold storage tank 12. The heat transfer medium is reused in the closed cycle solar tower power system 10 and is stored in cold storage tank 12 until needed.

[0012] The heat transfer medium of solar power tower system 10 is a molten salt capable of being heated to high temperatures. The molten salt used to transfer heat from solar receiver 14 to energy conversion system 20 is capable of being heated to high temperatures, for example, to a temperature of at least approximately 1200 degrees Fahrenheit (°F), preferably at least approximately 1500°F, more preferably at least approximately 1700°F, and most preferably at least approximately 1800°F. The molten salt can be salts composed of alkali earth fluorides and alkali metal fluorides, and combinations thereof. Suitable elements of the molten salt include Lithium (Li), Sodium (Na), Potassium (K), Indium (In), Cesium (Cs), Francium (Fr), Beryllium (Be), Magnesium (Mg), Calcium (Ca), Strontium (Sr), Barium (Ba), Radium (Ra), and Fluorine (F). Examples of suitable fluorides of the molten salts include, but are not limited to FLINaK, FLiBe, FLiNaBe, FLiKBe, and combinations thereof.

[0013] Suitable component concentrations in the composition of FLINaK range from about 10 mol % to about 90 mol % LiF, about 1 mol % to about 30 mol % NaF, and about 10 mol % to about 90 mol % KF. Particularly suitable component concentrations in the composition of the present invention range from about 44 mol % to about 45 mol % LiF, about 9 mol % to about 12 mol % NaF, and about 40 mol % to about 44 mol % KF. Those skilled in the art will appreciate other suitable component concentration ranges for obtaining comparable physical properties of the molten salt.

[0014] Suitable component concentrations in the composition of FLiBe range from about 10 mol % to about 90 mol % LiF and about 10 mol % to about 90 mol % BeF₂. Particularly suitable component concentrations in the composition of the present invention range from about 44 mol % to about 45 mol % LiBeF₂, about 1 mol % to about 35 mol % NaF, and about 10 mol % to about 90 mol % KF. Particularly suitable component concentrations in the composition of the present invention range from about 25 mol % to about 35 mol % NaFBeF₄, and about 65 mol % to about 75 mol % Li₂BeF₆. Those skilled in the art will appreciate other suitable component concentration ranges for obtaining comparable physical properties of the molten salt.

[0015] Suitable component concentrations in the composition of FLiNaBe range from about 10 mol % to about 90 mol % BeF₂, about 10 mol % to about 90 mol % NaF, and about 10 mol % to about 90 mol % LiF. Particularly suitable component concentrations in the composition of the present invention range from about 25 mol % to about 35 mol % NaFBeF₄, and about 65 mol % to about 75 mol % Li₂BeF₆. Those skilled in the art will appreciate other suitable component concentration ranges for obtaining comparable physical properties of the molten salt.

[0016] Suitable component concentrations in the composition of FLiKBe range from about 10 mol % to about 90 mol % KF, about 10 mol % to about 90 mol % LiF, and about 10 mol % to about 90 mol % BeF₂. Those skilled in the art will appreciate other suitable component concentration ranges for obtaining comparable physical properties of the molten salt.

[0017] FIG. 2 shows a diagram of a method of using high temperature molten salt as the heat transfer medium of solar power tower system 10. As previously mentioned, the molten salt is initially stored in cold storage tank 12, Box 32. When needed, the molten salt is pumped to solar receiver 14 (Box 34) and heated to a high temperature, for example, a temperature of at approximately least 1200°F, Box 36. As shown in Box 38, the heated molten salt is then sent to hot storage tank 18 until needed by energy conversion system 20. The heated molten salt is pumped to energy conversion system 20, where the power generated by exchanging the heat from the molten salt to air is used to operate an external system, Box 40. At higher temperatures, solar power tower system 10 is more efficient than conventional energy conversion systems and can be used for a large variety of purposes. For example, the power generated by solar power tower system 10 can be used to produce hydrogen, desalinate water, process heat, operate thermochemical plants, and provide electric power.

[0018] The solar power tower system of the present invention uses a molten salt heat transfer medium capable of being heated to high temperatures in combination with a solar receiver capable of withstanding high temperatures to run an energy conversion system. The energy conversion system is an air Brayton cycle conversion system with a solar receiver and the molten salt is similar to the molten salt used in a conventional Rankine cycle conversion system. At high temperatures of, for example, at least approximately 1200°F, preferably at least approximately 1500°F, more preferably at least approximately 1700°F, and most preferably at least approximately 1800°F, the solar power tower system is more efficient and capable of producing energy for numerous types of systems, such as a gas power turbine coupled to an electric generator.

[0019] Although the present invention has been described with reference to preferred embodiments, workers skilled in the art will recognize that changes may be made in form and detail without departing from the spirit and scope of the invention.

1. A high temperature solar power tower system comprising:
   a. a molten salt heat transfer medium capable of being heated to a temperature of at least about 1200 degrees Fahrenheit;
   b. a high temperature solar receiver for heating the molten salt;
   c. an energy conversion system for generating power with the heated molten salt.
2. The system of claim 1, wherein the heat transfer medium is a fluoride molten salt.
3. The system of claim 2, wherein the fluoride molten salt is selected from the group consisting of: FLiNaK, FLiBe, FLiNaBe, FLiKBe, and combinations thereof.

321
5. The system of claim 1, wherein the molten salt capable of being heated to a temperature of at least about 1500 degrees Fahrenheit.

6. The system of claim 5, wherein the molten salt capable of being heated to a temperature of at least about 1700 degrees Fahrenheit.

7. The system of claim 6, wherein the molten salt capable of being heated to a temperature of at least about 1800 degrees Fahrenheit.

8. The system of claim 1, wherein the high temperature solar receiver is formed from a material selected from the group consisting of: a iron based alloy, a nickel based alloy, and a cobalt based alloy.

9. The system of claim 1, wherein the energy conversion system comprises a Brayton cycle conversion system.

10. A solar power tower system capable of converting solar power to useful energy, the system comprising:

    a molten salt heat transfer medium for powering a conversion system; and

    a high temperature solar receiver for heating the molten salt to a temperature of at least about 1200 degrees Fahrenheit.

11. The system of claim 10, wherein the conversion system is a Brayton cycle conversion system.

12. The system of claim 10, wherein the high temperature solar receiver heats the molten salt to a temperature of at least about 1500 degrees Fahrenheit.

13. The system of claim 12, wherein the high temperature solar receiver heats the molten salt to a temperature of at least about 1700 degrees Fahrenheit.

14. The system of claim 13, wherein the high temperature solar receiver heats the molten salt to a temperature of at least about 1800 degrees Fahrenheit.

15. The system of claim 10, wherein the molten salt is a fluoride salt.

16. The system of claim 15, wherein the fluoride salt is selected from the group consisting of: alkali earth fluoride salts and alkali metal fluoride salts.

17. The system of claim 16, wherein the fluoride salt is selected from the group consisting of: FLK, FLBe, FLaF, and combinations thereof.

18. The system of claim 10, wherein the high temperature solar receiver is formed from a high temperature material selected from the group consisting of: an iron based alloy, a nickel based alloy, and a cobalt based alloy.

19. A method of using high temperature molten salt in a solar power tower system, the method comprising:

    storing the molten salt in a cold storage tank;

    pumping the molten salt to a solar tower;

    heating the molten salt to a temperature of at least 1200° C;

    storing the heated molten salt in a hot storage tank;

    pumping the heated molten salt to an energy conversion system to generate power; and

    returning the molten salt to the cold storage tank.

20. The method of claim 19, wherein the power generated by the energy conversion system is used for at least one of:

    hydrogen production, desalination of water, powering a heat/thermo-chemical plant, and producing electrical power.

21. The system of claim 19, wherein the molten salt is selected from the group consisting of: alkali earth fluoride salts, alkali metal fluoride salts, and combinations thereof.
Appendix XI
Phase II – Online patent3 survey; STP experts

‘High Temperature Molten Salt Receiver’ (US Patent #2008/0000231A1) has been selected to develop a list of potential business models of businesses that would create multiple benefits (benefits for society, environment, economy, governance, and sustainable human development). Prior developing of a list of such business models and potential usages of the patent have to be identified.

Based on your expertise and knowledge, recommend usages of the patent that will minimise pollutants and waste, and will protect clean water. Your recommended usages will need to improve both individual and collective leadership capacity, whilst being collectively responsible, creating a sustainability-aware policy environment, and emphasising local governance, integrated with regional and national governance. Your recommended usages shall not abuse public office for private gain, and shall not discriminate against anyone. Your recommended usages should help schools, promote partnership and cooperation, and simplify international investment and trading.

(Note: please refer to the documents you had received via email for description of the patent, and a list of core values/ideals with examples.)

QUESTION 1:
USAGE #1:
Based on your expertise and knowledge, recommend usage of the patent.
Explain how the core values/ideals are going to be achieved by your recommended usage of the patent.
Describe what measures you would use to test whether the above core values/ideals are achieved by your recommended usage of the patent.

QUESTION 2:
USAGE #2:
(Note: skip this question and submit the survey if you cannot think of any other usage of the patent.)
Based on your expertise and knowledge, recommend usage of the patent.
Explain how the core values/ideals are going to be achieved by your recommended usage of the patent.
Describe what measures would you use to test whether the above core values/ideals are achieved by your recommended usage of the patent.)
QUESTION 3:

USAGE #3:

(Note: skip this question and submit the survey if you cannot think of any other usage of the patent. If you can think of more than three usages of the patent, visit the survey again and submit more responses.)

Based on your expertise and knowledge, recommend usage of the patent.

Explain how the core values/ideals are going to be achieved by your recommended usage of the patent.

Describe what measures would you use to test whether the above core values/ideals are achieved by your recommended usage of the patent.
Appendix XII
Phase II – Online discussion forum

Dear business entrepreneurs and solar thermal power experts,

The following is a list of potential usages of the 'High Temperature Molten Salt Receiver' (US Patent #2008/0000231A1), suggested by solar thermal power experts:

- **Usage #1:** ‘Desalinating seawater, sterilising wastewater, generating electrical power, processing agricultural products in developing Third World Nations’ – large scale, multinational development and implementation of the patent

- **Usage #2:** ‘Desalinating seawater for human consumption and for growing new crops, drying agricultural produce or timber, generating renewable energy’ – small to medium scale implementation of the patent

- **Usage #3:** ‘Purifying water, sterilising surgical equipment, absorbing heat for chiller, heating and air-conditioning a small medical clinic in a remote village’ – small scale implementation of the patent

Comment and discuss each individual usage by going to the discussion threads and typing your comments.

Discussion thread #1:
Desalinating seawater, sterilising wastewater, generating electrical power, processing agricultural products in developing Third World Nations – large scale, multinational development and implementation of the patent

Discussion thread #2:
Desalinating seawater for human consumption and for growing new crops, drying agricultural produce or timber, generating renewable energy – small to medium scale implementation of the patent

Discussion thread #3:
Purifying water, sterilising surgical equipment, absorbing heat for chiller, heating and air-conditioning a small medical clinic in a remote village – small scale implementation of the patent
Discussion thread #1:

Desalinating seawater, sterilising wastewater, generating electrical power, processing agricultural products in developing Third World Nations – large scale, multinational development and implementation of the patent

Please comment and discuss usage of the 'High Temperature Molten Salt Receiver' patent, which could be manufactured and supplied to a number of Third World Nations that need sustainable energy to desalinate seawater to grow crops without reliance on the fickleness of rainfall / sterilised wastewater, to produce electrical power, and to process agricultural products. Discuss characteristics of future businesses addressing the following headings:

- Identity (how the business could be known)
- Purpose (why the business would exist)
- Structure (how the business would be organised)
- Participants (who would be involved in the business)
- Enablers (what the business would make a use of)
- Activities (what the business would do)
- Deliverables (what the business would deliver)
- Influences (what would influence the business)
- Culture (how people in the business would behave)
- Performance (how the businesses would perform)

Please note that recommendations you make will need to help the modelled business to minimise pollutants and waste production, and will need to protect clean water sources. The modelled business will need to improve both individual and collective leadership capacity, whilst being collectively responsible, creating a sustainability-aware policy environment, and emphasising local governance, integrated with regional and national governance. The modelled business cannot abuse public office for private gain, and cannot discriminate against anyone. The modelled business should help schools, promote partnership and cooperation, and simplify international investment and trading. (Note: the above requirements have been developed based on core values/ideals of major typological groupings identified, verified, and validated by Corporate Social Responsibility (CSR) experts.)

Identity:
The business will be known as a multinational business partly funded by charitable organisations (e.g. WHO, World Bank, etc.). Sufficiently large units of the apparatus will be manufactured in developed countries and supplied to Third World Nations who are in the need of sustainable energy to desalinate/sterilise water, produce electrical power, and
process agricultural produce. The business will have a reputation for helping undeveloped countries to generate their own electrical power, desalinate/sterilise water, and process their own agricultural produce.

**Purpose:**
Variable sizes of the apparatus will be manufactured and exported to Third World Nations to meet their power and clean water supply requirements. Great importance will be placed on creating long term relationships among developed countries and developing countries, and between cooperating multinational countries who are directly involved in the business (e.g. suppliers of raw materials, researchers and developers of new technologies relative to the patent, etc.). As the business grows, it will expand globally – on the one hand, cooperating with multinational businesses to manufacture the apparatus, and on the other hand, to supply the apparatus to more and more undeveloped countries worldwide.

**Structure:**
The business will create an international committee to monitor and control development of the business. The committee will assist to make political and technical decisions made by government organisations of the countries directly and indirectly involved in the business.

The business will construct and put into operation small demo plants (e.g. 5 MWe to 15 MWe) in the target market to promote the technology and to find sponsors, so the business can promote itself and grow globally. These will be funded by international financial institutions (e.g. European Investment Bank, International Finance Corporation, etc.). The World Trade Organisation to develop and implement international trading and investment rules for renewable energy projects around the world.

**Participants:**
The business will be owned by multinational organisations at the start up stage, and then potentially owned by the public in the form of shares. The business will build up a network of multinational suppliers of raw materials, focusing on reusing non-toxic, waste recyclable materials. The business will have a strong sense of responsibility towards the local community where the apparatus will be manufactured, as well as where the apparatus will be supplied and put into operation. The business will be involved in a number of international research and development projects relative to the patent.

The business will create special training groups to give support to all employees, research institutions and universities who will have some form of relationship with the business. (For example, in the US, Solar Trust of America makes donations to universities to train students for future solar jobs; those trained students are then hired in the future to help development of the solar projects in the US.)
**Enablers:**
The business will have very experienced staff who will be encouraged to make suggestions as to how the apparatus could be further improved, simplified, and innovated. All staff will receive regular training and will be encouraged to attend international exhibitions and conferences relative to the patent and technologies used. Staff attending such events will be sponsored by the business.

**Activities:**
The business will have a close relationship with sponsors and charities. The business will be partly sponsored by charitable organisations at the start up stage, however, at the later stage will itself be sponsoring charitable events organised for promoting green technologies around the world.

The business will support the local community and economy of the country where the patent is put into operation, by not only creating employment of the country (e.g. maintenance of the apparatus), but also by providing new green technology and training in how to use it. The business is to create partnerships with local governments and local businesses, and explore new business opportunities for future development projects (e.g. local infrastructure development projects).

Countries where the apparatus is put into operation could benefit also from selling generated electricity. For example, under the Desertec project, the German electricity consumers could consume electricity from North Africa, which would transfer revenues to developing countries and promote usage of the molten salt tower technology.

**Deliverables:**
The main products are apparatuses of various sizes designed and manufactured for Third World Nations to give them an option of generating their own electric power, desalinate/sterilise water, and process their agricultural produce.

**Influences:**
Being a multinational business supplying apparatus to Third World Countries, government regulations and corruption of some undeveloped countries will be barriers to overcome.

The business is to sign international agreements among countries that are directly, and indirectly, involved in the business, not to discriminate against anyone, to promote partnership and cooperation, and to simplify international investment and trading. It will lobby governments of countries (where the apparatus will be supplied) to promote usage of the patent and by doing so, to promote use of green technology and protect the environment; decrease unemployment by creating new jobs (the apparatus will need to be
installed and serviced); and to contribute to the economy of the country.

The business will negotiate and develop a code of conduct between developed countries and Third World Countries, which will be signed among all cooperating businesses and the countries that are involved in the project, to protect human rights in every country the business is directly, and indirectly, working with. The code of conduct is to cover general rules to combat bribery and corruption. A more detailed content of code of conduct to be suggested by all cooperating businesses. The code of conduct to be introduced and followed up by governments of Third World Nations, as well as governments of developed countries.

**Culture:**
Senior management is to take a keen interest in staff, and to encourage staff to make suggestions that will lead to continuous improvement of the business. A strong emphasis will be placed on training all staff to give them a professional attitude and image.

**Performance:**
The business will strive to be particularly good at introducing green technologies to Third World Nations and creating loyal multinational relationships.
Discussion thread #2:

Desalinating seawater for human consumption and for growing new crops, drying agricultural produce or timber, generating renewable energy – small to medium scale implementation of the patent

Please comment and discuss usage of the ‘High Temperature Molten Salt Receiver’ patent, which could be used for generating renewable energy, desalinating seawater for growing new crops, dry agricultural produce, process for transport other agricultural products to prevent spoilage, and to dry timber. Discuss the characteristics of future businesses addressing the following headings:

- **Identity** (how the business could be known)
- **Purpose** (why the business would exist)
- **Structure** (how the business would be organised)
- **Participants** (who would be involved in the business)
- **Enablers** (what the business would make a use of)
- **Activities** (what the business would do)
- **Deliverables** (what the business would deliver)
- **Influences** (what would influence the business)
- **Culture** (how people in the business would behave)
- **Performance** (how the businesses would perform)

Please note that recommendations you make will need to help the modelled business to minimise pollutants and waste production, and will need to protect clean water sources. The modelled business will need to improve both individual and collective leadership capacity, whilst being collectively responsible, creating a sustainability-aware policy environment, and emphasising local governance, integrated with regional and national governance. The modelled business cannot abuse public office for private gain, and cannot discriminate against anyone. The modelled business should help schools, promote partnership and cooperation, and simplify international investment and trading. (Note: the above requirements have been developed based on core values/ideals of major typological groupings identified, verified, and validated by Corporate Social Responsibility (CSR) experts.)

**Identity:**

The business will be known as a small to medium size private business. It will have a reputation for manufacturing apparatuses of small to medium sizes, primarily for farmers, designed for generating renewable energy, desalinating seawater that could be used for agricultural purposes, and at the same time used for drying agricultural produce to prevent spoilage; or for drying timber.
**Purpose:**
The business will manufacture the apparatus for local and international markets. Great importance will be placed on creating relationships with clients/farmers to understand their needs and get direct feedback about the manufactured apparatuses, so they could be further enhanced.

(Please suggest where the first manufacturing business should be establish and explain why.)

The business could grow in size by replication/duplication, opening more manufacturing businesses worldwide; and by franchising.

**Structure:**
The business will grow gradually at first in the country of its origin and then expand into the international market. Although the business will plan to increase in size, the aim will be to have minimal hierarchical structure without introducing more levels of management.

**Participants:**
At the start up, the business will be owned by small numbers of individuals creating a network of small business partners (e.g. suppliers of materials). The business will have a strong sense of responsibility towards its employees, customers, and local community where the business will operate.

**Enablers:**
The business will have very experienced staff who will be encouraged to make suggestions as to how the apparatus can be improved, simplified, and innovated. All staff will receive regular training and will be encouraged to attend international exhibitions and conferences relative to the patent and technologies used. Staff attending such events will be sponsored by the business.

**Activities:**
Emphasis will be placed on manufacturing and selling apparatuses of various sizes to satisfy needs of the customers. Whist a few apparatuses will be manufactured for display, most of production will be manufactured according to incoming orders.

**Deliverables:**
The main products are apparatuses of various sizes designed and manufactured for generating renewable energy, for desalinating seawater, and drying agricultural produce or timber. The business will provide also installation of the apparatuses and post-purchase servicing.
Influences:
Being a relatively small business at the start up stage, government regulations might be barriers to overcome. It is not expected competition will be an issue at the start up stage, nevertheless, the business will need to protect its competitive advantage. The business will negotiate rights for using the patent with authors of the patent and other businesses operating within the same sector.

Culture:
The atmosphere will be much of a small family run business with senior management taking a keen interest in staff and having a close, friendly, and supportive relationship. Emphasis will be placed on training to give the staff knowledge and a professional attitude. Continuous improvement strategies will be implemented across the entire business where staff will be encouraged to further innovate and improve performance of the business.

Performance:
The business is expected to grow by 30 to 40% each year for the first 3 years. An experienced management will be required to manage high growth of the business with the focus on creating a reliable network of cooperating business (e.g. material supplier network, distribution network, etc.).
Discussion thread #3:

Purifying water, sterilising surgical equipment, absorbing heat for chiller, heating and air-conditioning a small medical clinic in a remote village – small scale implementation of the patent

Please comment and discuss usage of the ‘High Temperature Molten Salt Receiver’ patent, which could be used as a small plot in a remote village to purify water, sterilise surgical equipment, and to operate absorption chiller to air-condition a small medical clinic. Discuss characteristics of future businesses addressing the following headings:

- Identity (how the business could be known)
- Purpose (why the business would exist)
- Structure (how the business would be organised)
- Participants (who would be involved in the business)
- Enablers (what the business would make a use of)
- Activities (what the business would do)
- Deliverables (what the business would deliver)
- Influences (what would influence the business)
- Culture (how people in the business would behave)
- Performance (how the businesses would perform)

Please note that recommendations you make will need to help the modelled business to minimise pollutants and waste production, and will need to protect clean water sources. The modelled business will need to improve both individual and collective leadership capacity, whilst being collectively responsible, creating a sustainability-aware policy environment, and emphasising local governance, integrated with regional and national governance. The modelled business cannot abuse public office for private gain, and cannot discriminate against anyone. The modelled business should help schools, promote partnership and cooperation, and simplify international investment and trading. (Note: the above requirements have been developed based on core values/ideals of major typological groupings identified, verified, and validated by Corporate Social Responsibility (CSR) experts.)

Identity:

The business is to be known as a small to medium size, privately owned, business that manufactures apparatuses of small sizes for small medical clinics in rural areas. The business will have a reputation for providing environmentally friendly solutions to small medical clinics to purify water, sterilise equipment, absorbing heat for chillers, and air-conditioning buildings – one apparatus, designed and manufactured to meet the requirements of each individual clinic that will do it all at once. Furthermore, the apparatus could be used for central heating during winter months. The business will have a reputation for its professional image,
providing professional advices and solutions, and excellent post-purchase service.

**Purpose:**
Very high quality, custom made apparatuses will be designed and manufactured to suit the individual needs of its customers. Great importance will be placed on creating a network of cooperating business partners and creating a network of loyal clients. The business will not only manufacture the apparatuses, but it will also provide installations and servicing of the sold products. The business will be established in one country (please suggest where the first manufacturing business should be established) and then it will gradually expand into other nations worldwide.

**Structure:**
The business will be established as a single manufacturing unit, and then it could expand by duplicating or franchising. Since the business is expected to have a high-growth profile, there will be a requirement to have an experienced management. As the business grows (e.g. by duplication), independent manufacturing units could operate under a decentralised structure, however, sharing the same vision, mission, and core values/ideals.

**Participants:**
At the start up stage, the business will be owned by a few individuals and angel investors, however, as the business grows in size, it could be sold to the public in the form of shares. The business will have a strong sense of responsibility towards its employees, clients, business partners, and the local community where it will operate.

**Enablers:**
The business will be established in an industrial area with easy access to its suppliers and distributors. The business will have very experienced staff with interests in solar energy. All staff will be provided training, and encouraged to attend expo shows and conferences dedicated to solar thermal power. Staff attending such events will be sponsored by the business.

**Activities:**
Emphasis will be placed on the high image of the business, designing and manufacturing environmentally friendly apparatuses of a very high quality and durability, and providing professional advices to its clients and excellent service. The business will be promoting the use of environmentally friendly technologies by sponsoring a number of local and national events. As the business will grow bigger, the business will become a promoter of green technologies worldwide.
**Deliverables:**
The main products are apparatuses designed and manufactured for small medical clinics in remote areas and small villages. Advice, installation, and servicing of sold apparatuses will be provided.

**Influences:**
Being a relatively small business at the start up stage, government regulations will influence the business. It is not expected there will be competition at the start up stage, however, there is a high probability that more and more competitors will emerge gradually. The business will need to protect its competitive advantage and their own innovation of the patent.

**Culture:**
The culture of the business will be much of a family run business where management has some form of relationship with its employees, and where employees are supported and encouraged to be proactive, innovative, and ambitious. Strong emphasis will be placed on training and continuous improvement within the business.

**Performance:**
There is a high probability the business could to grow 30 to 50% each year for the first 5 years. The business will need to have experienced management, and continuously research and introduce new innovations and new technologies relative to the patent.
Appendix XIII
Phase II – Online survey questionnaire -feedback

Please provide feedback relative to online, text-based discussions between business entrepreneurs and post-incubation innovation domain experts, conducted throughout the online discussion forum.

(Note: you can revisit the forum again using your username and password http://wiki.swinburne.edu.au/display/businessmodelling/Home)

QUESTION 1:
Do you agree that information from the online discussions with innovation experts can provide enough knowledge for development of business models? Please explain your answer.

QUESTION 2:
Provide comments and explanations if your answer is No.
The following list of potential business models has been created based on information obtained from online discussions of post-incubation innovation domain experts and business entrepreneurs:

1. Manufacturer of an apparatus for desalinating seawater, sterilising wastewater, generating electrical power, processing agricultural products in developing Third World Nations - large scale multinational business

2. Manufacturer of an apparatus for desalinating seawater for human consumption and for growing new crops, drying agricultural produce or timber, generating renewable energy - small to medium scale national or international business

3. Manufacturer of an apparatus for purifying water, sterilising surgical equipment, absorbing heat for chiller, heating and air-conditioning a small medical clinic in a remote village - small scale national or international business

**QUESTION 1:**

Looking at the list of potential business models you have received by email, do you agree with the details provided for each presented business model? (Refer to the descriptions of each proposed business model, which you have received by email.)

Suggest changes to the presented business models and provide further comments.

**QUESTION 2:**

Do you agree that 10 aspects (Identity, Purpose, Structure, etc.) described for each potential business model, based on information collected from discussions of post-incubation innovation domain experts and business entrepreneurs can supply sufficient details for prototyping business models? (Please comment and explain your answer.)

**QUESTION 3:**

Based on the potential probability of success, prioritise the following business models for the potential usages of the patent by ranking them, using details about the 10 aspects as the assessment criteria. For each of the listed business model 1 to 3 assign a priority number 1 (to a business model you believe is potentially the most successful) to 3 (to a business model you believe is potentially least successful). (Note: you can use each priority number once only. For a description of each business model refer to the information received by email.)
QUESTION 4:
Rate the following business models (from 1 to 10) in terms of probable success.
(For example, a business model X is worth 7/10; a business model Y is worth 1/10, etc.)
QUESTION 1:

From the presented list of potential business models, select the business model you believe it is the most beneficial from Corporate Social Responsibility (CSR) perspective. (For information relative to each business model, refer to the information received by email.)

a) Manufacturer of an apparatus for desalinating seawater, sterilising wastewater, generating electrical power, processing agricultural products in developing Third World Nations – large scale multinational business

b) Manufacturer of an apparatus for desalinating seawater for human consumption and for growing new crops, drying agricultural produce or timber, generating renewable energy – small to medium scale national or international business

c) Manufacturer of an apparatus for purifying water, sterilising surgical equipment, absorbing heat for chiller, heating and air-conditioning a small medical clinic in a remote village – small scale national or international business

QUESTION 2:

Briefly explain why you believe the business model you have selected is potentially the most beneficial.
Appendix XVI
Ethics clearance

Dear Prof Calway,

SUHREC Project 2010/156 Beyond Profit-Centric - Transcendent Business Modelling
Prof Bruce Calway, FHEL/ Mr Miroslav Cincura
Approved Duration: 02/08/2010 To 31/03/2011 [Adjusted]

I refer to the ethical review of the above project protocol undertaken on behalf of Swinburne's Human Research Ethics Committee (SUHREC) by SUHREC Subcommittee (SHESC4) at a meeting held on 16 July 2010. Your response to the review as e-mailed on 30 July was considered for sufficiency.

I am pleased to advise that, as submitted to date, the project has approval to proceed in line with standard on-going ethics clearance conditions here outlined.

- All human research activity undertaken under Swinburne auspices must conform to Swinburne and external regulatory standards, including the National Statement on Ethical Conduct in Human Research and with respect to secure data use, retention and disposal.

- The named Swinburne Chief Investigator/Supervisor remains responsible for any personnel appointed to or associated with the project being made aware of ethics clearance conditions, including research and consent procedures or instruments approved. Any change in chief investigator-supervisor requires timely notification and SUHREC endorsement.

- The above project has been approved as submitted for ethical review by or on behalf of SUHREC. Amendments to approved procedures or instruments ordinarily require prior ethical appraisal/clearance. SUHREC must be notified immediately or as soon as possible thereafter of (a) any serious or unexpected adverse effects on participants and any redress measures; (b) proposed changes in protocols; and (c) unforeseen events which might affect continued ethical acceptability of the project.

- At a minimum, an annual report on the progress of the project is required as well as at the conclusion (or abandonment) of the project.
- A duly authorised external or internal audit of the project may be undertaken at any time.

Please contact me if you have any queries about on-going ethics clearance. The SUHREC project number should be quoted in communication. Chief Investigators/Supervisors and Student Researchers should retain a copy of this e-mail as part of project record-keeping.

Best wishes for the project.
Yours sincerely

Kaye Goldenberg
Secretary, SHESC4
*******************************************
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