Firm-level resource integration effectiveness (FL-RIE):

Conceptualisation and validation of the construct

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ABSTRACT

A firm's recurrent engagement in resource integration processes over time results in developing an attribute called firm-level resource integration effectiveness (FL-RIE). The FL-RIE represents a firm's resource deployment proficiency to create value and has applications in the domains of business-to-business (B2B) relationships, relationship marketing, value cocreation, and resource integration. In practice, despite these applications, due to its metatheoretical nature, there is a lack of progressive conversations about the concept of FL-RIE among academics as well as practitioners. As evidenced from the existing literature, this oversight stands out as a major research gap. Hence, as the first major contribution, this study aims to provide more clarity regarding the concept by defining and conceptualising FL-RIE as a second-order construct with thirteen first-order and three second order dynamic capabilities that firms must continuously develop if they are to improve their resource deployment proficiency.

As the second major contribution, this study tests and validates the proposed conceptual framework of FL-RIE by conducting an empirical study in the context of Australian SMEs that use commercial cloud computing technologies. The empirical study demonstrates the existence of the metatheoretical concept – FL-RIE in practice. Furthermore, following a measurement scale development procedure to test and validate the conceptual framework this study produces a 30-item scale capable of capturing the conceptual domain of FL-RIE in practice.

Overall, while making a mid-range theoretical contribution and bridging the gap between metatheoretical and empirical research, this study informs practitioners regarding the dynamic capabilities they need to nurture if they are to continuously improve a firm's resource deployment proficiency and ultimately the ability to co-create value frequently. The thesis concludes by discussing limitations, future research directions, and key outcomes.

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DECLARATION STATEMENT

I, *Shan Anjana Jayasinghe*, hereby declare that:

- This thesis contains no material which has been accepted for the award to any other candidate of any other degree or diploma in any university or institution.
- To the best of my knowledge, this thesis contains no material previously published or written by another person, except where due reference is made in the text.
- Dr Diane Brown copyedited this thesis. The editing addressed only grammatical issues and not structural content.

Shan Anjana Jayasinghe

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1 INTRODUCTION

1.1 Chapter introduction

This study focuses on achieving two main objectives. The first objective is conceptualising an abstract construct called firm-level resource integration effectiveness (FL-RIE), discussed in the literature related to the service-dominant logic (S-D logic). The second objective is developing a measurement scale for FL-RIE by testing and validating the proposed conceptual framework. Successful achievement of both the objectives has the potential to make a substantial contribution to the existing body of knowledge related to the S-D logic.

The first chapter discusses the rationale for undertaking this study. Section 1.2 discusses background of the study which introduces FL-RIE to readers and discusses the usefulness of this construct. Section 1.3 discusses the research gap followed by the formation of the research problem and objectives of the research. By the end of section 1.3, readers would possess a proper understanding of the rationale for undertaking this study. Section 1.4 summarises the structure of the thesis with an overview for each chapter followed by a chapter summary.

1.2 Background

Post World War II, South Korean and Japanese firms formed strategic alliances with their Western rivals to gain access to technological resources and knowledge they did not possess at that time (Hamel, Doz, & Prahalad, 1989). Furthermore, Asian firms utilised the knowledge of Western firms to systematically diffuse new knowledge throughout their organisations (Hamel et al, 1989). In the 1990s Western firms realised the importance of the exchange of resources with external parties and integrating alien resources (intangible and tangible) into their business processes. At present no firm can survive without the assistance of outside firms (e.g., suppliers, partners) and individuals (e.g., consultants, customers) and learning how to adjust

their business processes to accommodate new resources acquired from external parties and/or created within (Hamel et al, 1989).

According to S-D logic defined with eleven foundational premises (FPs) (see Appendix A), the reason for this market behaviour is micro-specialisation of individuals and firms (Haase & Kleinaltenkamp, 2011; Vargo & Lusch, 2004, 2006). With the progress of human civilisation, knowledge progressed. Since it is impossible for an individual to learn all the knowledge known to mankind, humans started to micro-specialise in one or more discipline/s they were comfortable with. That led to the formation of micro-specialised communities consisting of micro-specialised individuals (e.g., farming and fishing communities). The industrial revolution early 19th century brought about the formation of micro-specialised firms (e.g., telecommunication service providers and hospitality service providers). At present, a firm possesses its own micro-specialisation or a set of micro-specialisations.

For example, Telstra Australia is considered as a telecommunication service provider, because it possesses the micro-specialisation of providing telecommunication services to retail and corporate customers. Wesfarmers Australia is considered as one of the biggest conglomerates in Australia because it possesses multiple micro-specialisations (i.e., retail, chemical, plantation, financial services, and information technology). However, both Telstra and Wesfarmers have many suppliers that exchange micro-specialisations with them. For example, Telstra does not possess the micro-specialisation of manufacturing telecommunication equipment and appliances. They source those from suppliers such as Huawei, Apple, Ericsson, etc. Wesfarmers relies heavily on transportation and logistics service providers such as Toll, Linfox, PFD, etc to fulfil their transportation and logistics requirements. Based on this background, it is evident that micro-specialisation of firms has led them to exchange micro-specialisations with external entities.

Even though the exchange of micro-specialisations is an unavoidable phenomenon for firms operating in today's business context; that alone will not assure business success (Vargo & Lusch, 2006). There can be many other factors that will determine business success. Based on the literature on S-D logic, firms should possess capabilities to co-create value with acquired micro-specialisations to achieve business success (Vargo & Lusch, 2006, 2008, 2016). Value co-creation is a situation where an entity improves its circumstances (Vargo & Lusch, 2008). Consider a situation where Telstra replaces its 3G network equipment with 4G. If Telstra is able to provide better internet speeds, introduce new packages with better value and achieve better energy efficiencies with new hardware equipment, these outcomes can be considered as situations where Telstra is able to co-create value or improve its circumstances.

Firms co-create value through a process called resource integration (Carida, Edvardsson & Colurcio, 2019; Lusch & Nambisan, 2015; Vargo & Lusch, 2006). Resource integration is a set of processes and activities performed on existing and new micro-specialisations (intangible resources) and tangible resources by three types of resource integrating actors in a firm (i. e. ideator, designer and intermediary) (Lusch & Nambisan, 2015). The outcome of a resource integration process can be either co-creation or co-destruction of value (Vargo & Lusch, 2008). Firms are striving towards co-creation of value in every aspect they do (Lusch & Nambisan, 2015). However, there are instances where resource integration processes lead to co-destruction of value. For example, consider the case of Optus Australia failing to successfully stream the FIFA World Cup 2018. Optus is the second largest telecommunication service provider in Australia. They won exclusive streaming rights for the FIFA World Cup 2018. However, they failed to successfully cater the demand. As a result, they had to give up their exclusive deal and allow SBS Australia to stream matches. The deal was a wasted opportunity got Optus and worse, their brand image was tarnished. In S-D logic's terms, the project was a failure because

resource integration carried out by Optus did not improve its circumstance (i.e., co-destructed value).

Based on this background, a firm's ability to frequently co-create value when undertaking daily activities and projects is a key competency that every firm should focus on developing continuously. A firm's ability to co-create value frequently depends on its proficiency in integrating resources. One of the attributes that drives proficiency in integrating resources is firm-level resource integration effectiveness (FL-RIE) (Hibbert, Winklhofer, & Temerak, 2012; Hollebeek, 2019). FL-RIE is an attribute that develops as a result of repeated resource integration processes over time (Hollebeek, 2019) and represents a firm's resource deployment proficiency to create value (Hibbert et al, 2012; Hollebeek, 2019).

1.3 Research gap, research problem and objectives of the research

RIE is still a concept in the metatheoretical level. A meta-theory is a conception or perspective that provides the foundation for understanding and explaining how and why a phenomenon occurs (Brodie & Lobler, 2018). Empirical investigations cannot be conducted using meta-theories because they are broader in scope and context free (Brodie & Lobler, 2018).

Mid-range theories bridge the gap between meta-theories and empirical investigations and allow researchers to conduct empirical research (Brodie & Lobler, 2018; Brodie, Saren, & Pels, 2011; Vargo & Lusch, 2017). The most important characteristic of mid-range theories is that they are context-specific (Brodie & Lobler, 2018). Going by this explanation, since FL-RIE converts RIE to a context-specific concept, it is possible to consider FL-RIE as the mid-range theory capable of providing the foundation for understanding and explaining how and why RIE is applicable at the firm-level.

Vargo and Lusch (2017) explain the significance of mid-range theories for the progression of S-D logic in the coming years. Brodie and Lobler (2018, p. 565) argue that "mid-range theory now has a central role to play" since "S-D logic has reached a stage of maturity" in-terms of meta-theories. Brodie and Lobler (2018) strengthen Vargo and Lusch's (2017) call for more mid-range theoretical contributions by arguing that if the bridge from meta-theory to application fails, households, practitioners, policy makers and others will not be able to enjoy the benefits of S-D logic related meta theories since they will not have any value in use.

Based on this background, to address the call of Vargo and Lusch (2017) and Brodie and Lobler (2018), this study proposes a conceptualisation for FL-RIE. It is a mid-range theoretical contribution. Brodie and Lobler (2018, p. 575) highlight that "there is a need for more tools and instrument-like developments to enable S-D logic to be used more easily by academic and more importantly for managerial application". Therefore, using the conceptualisation of FL-RIE, this study validates and develops a measurement instrument that can be used for academic and managerial applications. Hence, the broad research problem of this study is as follows.

What are the indicators that form the measurement instrument of FL-RIE?

This study determined to formulate the answer to the research problem by achieving two research objectives. They were identified after going through several highly cited studies that have developed measurement scales for constructs in social sciences (e.g., Flatten, Engelen, Zahra & Brettel, 2011; Jaworski & Kohli, 1993) and studies that have proposed measurement scale development and validation procedures. Two objectives are as follows.

- Research Objective 1 – Define the conceptual domain of FL-RIE

  As discussed earlier, FL-RIE was an abstract construct prior to this research. Hence, first, this study had to crystalise the conceptual domain of FL-RIE. This study identified three major studies (i.e., Churchill, 1979; DeVellis, 2012; MacKenzie, Podsakoff &

Podsakoff, 2011) that have proposed procedures to develop and validate measurement scales for abstract constructs. They back the decision of starting a scale development and validation process by defining the conceptual domain of the construct when the construct is abstract.

- Research Objective 2 – Test and validate the conceptual domain of FL-RIE

  Once the conceptual domain of FL-RIE is defined, past studies that have developed and validated measurement scales for constructs in social sciences suggest testing and validating the conceptual domain of the construct. Such studies also suggest testing and validating the conceptual domain of the construct once the conceptual domain is finalised. Once the second research objective is achieved, this study was able to answer the research problem.

1.4 Outline of the thesis

The rest of the thesis is organised into eight chapters. They are as follows.

- Chapter 2 - Literature Review

  Since resource integration and its attributes are a subset of the Service-Dominant logic (S-D logic), an overview of the S-D logic is provided at the start of the literature review. Since the literature review is dedicated to investigating the conceptual domain of FL-RIE, the review was conducted by following a methodology proposed for investigating conceptual domains of abstract constructs. Therefore, in the second section of the literature review the methodology followed to conduct the literature review is discussed. Rather than limiting to a traditional way of conducting this type of a study (i.e., conducting a systematic literature review), this study adopted the methodology suggested by MacKenzie et al (2011) to investigate the conceptual domain of a construct. MacKenzie et al's (2011) methodology consists of four steps. The rest of the

literature review carries out the four-step process. At the end of the literature review the postulated conceptual framework for the study is presented. The framework suggests first- and second-order indicators which forms the conceptual domain of FL-RIE. Hence, at the end of the literature review, the first objective of the research (i.e., define the conceptual domain of FL-RIE) is achieved.

- Chapter 3 - Research Methodology

  The research methodology discusses measurement scale testing and validation procedure in detail. In other words, Chapter 3 discusses the steps performed to achieve the second objective. This study predominantly followed the procedure suggested by MacKenzie et al (2011) to formulate the research methodology. However, whenever required, suggestions of Churchill (1979) and DeVellis (2012) were also considered. The procedure consists of five steps (i.e., item generation process, assessment of content validity, formally specifying the measurement model, pre-test, and re-examination of the scale properties).

- Chapter 4 – Item Generation Process

  According to MacKenzie et al (2011), generating items to represent the focal construct is the second step of the scale development and validation process. The first step defines the conceptual domain of FL-RIE. It is performed in the literature review. The ultimate goal of the second step is to come up with a set of statements capable of fully capturing the conceptual domain of first-order indicators of FL-RIE (Churchill, 1979; MacKenzie et al, 2011). This study had the choice of selecting either one source or a mix of sources to generate items. The present study considered two sources, namely, previous theoretical and empirical research on the indicators and suggestions from experts. The main source of generating statements was previous research on first-order indicators. Since there is no rule of thumb for the number of experts contacted during the item

generation stage, considering the convenience, three senior doctoral students in management were contacted to get their suggestions. The item generation process and its findings are discussed in detail, followed by a summary at the end of the chapter.

- Chapter 5 – Assessment of Content Validity

  Assessment of content validity is carried out for the purpose of understanding "the degree to which elements of an assessment instrument are relevant to and representative of the targeted construct" (Haynes, Richard, & Kubany, 1995, p. 238). During this step, this study mainly focused on finding out the representativeness of each individual statement generated during the item generation process and abandoning repetitive items. Investigators from industry and academia were consulted to understand the representativeness of each statement and abandon repetitive statements. The process carried out to assess content validity and findings is discussed in more detail in this chapter.

- Chapter 6 – Formally Specifying the Measurement Model

  Once a content valid set of items was finalised, this study formally specified the measurement model. In other words, this study had to determine the nature of the relationship among the focal construct, indicators, and items. At the end of this step, the researcher had to finalise whether the focal construct was a reflective construct, a formative construct, or a mix of both constructs. Once the relationship is established the formally specified conceptual framework and hypotheses of the study are presented at the end of the chapter.

- Chapter 7 – Pre-Test

  Pre-test consists of three steps. First, data had to be collected to conduct the statistical analyses that need to be performed during the pre-test. Once data is collected, this chapter discusses the remaining two steps of the pre-test, namely, assessment of

multivariate normality of the indicators, and scale purification and refinement. At the end of this chapter, this study was able to eliminate problematic items and present the purified and refined items that are capable of representing the conceptual domain of FL-RIE in the selected population.

- Chapter 8 – Re-examination of the Scale Properties (Main Study)

  This chapter presents how this study re-examined the scale properties and tested the hypotheses that are presented in chapter 6. The first objective was to collect data to evaluate whether indicators shortlisted in the pre-test were valid indicators of the focal construct – FL-RIE. The second objective was to test the representativeness of the sample collected for the main study and assess scale validity. A summary of hypothesis testing is presented at the end of the chapter. Furthermore, 30 statements capable of capturing the conceptual domain of FL-RIE are also presented. Based on this background, at the end of this chapter, the second objective was achieved.

- Chapter 9 – Discussion and Conclusion

  This chapter discusses and draws conclusions from the findings of the research. To achieve this objective, first, this chapter discusses the findings of the hypothesis testing. Since justifications for each accepted hypothesis are discussed in chapter 2 (i.e., literature review), this study only discussed justifications for rejected hypotheses. The discussion was built with the support of appropriate extant literature. Second, implications, limitations, and future research related to each objective of the study are discussed. Finally, concluding remarks are presented by discussing the overall essence of the study and highlighting the overall impact of this study to the advancement of the S-D logic.

1.5 Chapter summary

This chapter provided readers with the background of the study, the research gap this research is planning to address, the research problem this research is planning to answer, and the research objectives. Once the objectives are achieved, this research will be able to produce a measurement scale capable of measuring the construct – FL-RIE. The property that the scale is measuring is the resource deployment proficiency of a firm when engaged in day-to-day resource integration processes (e.g., projects and daily activities). The measurement scale can be considered as a mid-range theory capable of facilitating empirical researchers to undertake empirical research related to FL-RIE. Furthermore, a discussion on the theoretical contribution of this study is available in chapter 9 (i.e., sections 9.3 and 9.4). Furthermore, this study informs practitioners regarding the dynamic capabilities that they need to nurture if they are to continuously improve a firm's resource deployment proficiency and ultimately the ability to co-create value frequently. An extended discussion regarding the practical contributions of this study is available in chapter 9 (i.e., sections 9.3 and 9.4). Section 1.4 discusses the structure of the thesis and provides a brief overview regarding what readers are going to read in each of the following chapters.

2 LITERATURE REVIEW

2.1 Chapter introduction

This chapter reviews the literature to conceptualise the focal construct of this study – firm-level resource integration effectiveness (FL-RIE). The chapter consists of four sections. The introduction provides an overview of the chapter. The second section provides a brief overview of the S-D logic to introduce the arguments presented. It discusses key concepts in S-D logic such as economic exchange, resources, value co-creation, service providers and beneficiaries. The third section presents the methodology adopted by this study to conduct the literature review. Even though it is not common to present the methodology which is employed to conduct the literature review, the main objective of the literature review (i.e., defining the conceptual domain of FL-RIE) motivated the author to include the methodology. The fourth section defines and conceptualises FL-RIE through the four-step process suggested in the methodology (i.e., section 2.3). The literature review conceptualises FL-RIE as a second-order construct with thirteen first-order constructs and three second-order constructs (see Figure 2.1).

2.2 Service-Dominant logic (S-D logic)

S-D logic is changing the contemporary understanding of the value creation process. According to conventional knowledge, the value creation process occurs on the production floor or at the point of providing a service to a customer. In other words, value is created by producers of good or service and the value is destroyed by the customer during the consumption process (Vargo & Lusch, 2006). However, S-D logic challenges this line of thinking and claims value cannot be added to a product or service during the production process. Value is a factor determined by the customer during the consumption process and more importantly, the customer is a part of the value creation process (Vargo & Lusch, 2004). Suppliers/service providers cannot add value to their products or services. They can only develop value-

propositions (Vargo & Lusch, 2004, 2008, 2016). Customers compare the value propositions presented by suppliers and choose the supplier that is fit for purpose.

Furthermore, the S-D logic is built on the argument that everything is neutral until mankind learns what to do with it (Vargo & Lusch, 2004). S-D logic opposes conventional thinking and argues that a tangible good convert to a resource only when the owners acquire necessary skills and knowledge to utilise it for a purpose. Therefore, skills and knowledge are the basic building blocks of all economic exchange (i.e., any transaction that takes place between two entities such as individuals, firms, etc in the society) (Vargo & Lusch, 2004). This way of thinking is the opposite to conventional thinking of economic exchange, value creation and resources.

Conventional thinking proposes two primary units of economic exchange, namely, goods and services. S-D logic opposes this idea and argues in both instances that what is being exchanged are skills and knowledge (Vargo & Lusch, 2004, 2008, 2016). Goods and services are the mechanisms used by humans to exchange skills and knowledge. As described earlier, goods and services do not have a value until the beneficiary learns what to do with them. Therefore, regardless of tangibility or intangibility of what is being exchanged, the S-D logic refers to the fundamental unit of exchange as *service* (Lusch & Vargo, 2006; Vargo & Lusch, 2004, 2008, 2016). Service is defined as applying one's skills and knowledge for the benefit of another entity. Vargo and Lusch (2004) intentionally used the word service (implies a process) instead of services because the latter is plural and implies units of output which are intangible (Lusch & Vargo 2006).

Skills and knowledge possessed by humans are the most important resource and it can be considered as the foundation of S-D logic. To this end, two types of resources are being discussed in the S-D logic literature, namely, operant and operand resources. Resources such as skills and knowledge, energy, emotions, strength, family relationships, consumer communities, commercial relationships and imagination, which are intangible and dynamic in

nature are referred to as operant resources (Baron & Harris, 2008). Goods, which are tangible and static in nature are referred to as operand resources when humans embed their skills and knowledge in them.

Furthermore, service is exchanged between two parties referred to as the *service provider* and the *beneficiary*. The party that offers the service is referred to as the service provider and the party that benefits from the service is referred to as the beneficiary. The main objective of the service provider is to develop a value proposition that is superior to its competitors. The main objective of the beneficiary is to co-create value through the resource integration process.

The focus of the present study is on FL-RIE, which is an attribute a firm inherits as a result of the resource integrating activities taking place within the firm. There is a metatheoretical argument which claims resource integration as the process which drives value co-creation and ultimately innovation (Carida et al, 2019; Carnabuci & Operti, 2013; Lusch & Nambisan, 2015). Another metatheoretical argument claims that the value experienced by the beneficiary is higher when the resource integration effectiveness is higher and vice versa (Hibbert et al, 2012). When both metatheoretical arguments are combined, the holistic view implies that resource integration effectiveness has a significant impact on the frequency of value co-creation and the ability to innovate. This claim once again is metatheoretical. However, if this claim can be empirically tested and established, S-D logic will gain appreciation and acceptance from various disciplines such as knowledge management, technology management, management information systems, etc. Since the aim is to overcome the barrier to conducting such an empirical study by developing a conceptual framework and a measurement scale for FL-RIE, this study has the potential to contribute to the progression of S-D logic.

2.3 Methodology used to conduct the literature review

The main objective of this chapter is to propose a definition and conceptualisation for FL-RIE. To achieve this objective, this study employs methodology proposed by MacKenzie et al (2011) specifically for conceptualising abstract constructs. Churchill (1979) and DeVellis (2017) have also proposed similar methodologies to conceptualise abstract constructs. All three studies have received a similar reception from the academic community. However, only MacKenzie et al (2011) suggest the main steps of the methodology and explain how to carry out each step in detail. Churchill (1979) and DeVellis (2017) suggest steps but do not explain them in detail.

MacKenzie et al's (2011, p. 299) methodology define the conceptual domain of a construct through a four-step process. The four steps are as follows.

- Step 1 - Examine how the focal construct is used in past research
- Step 2 - Define the construct in unambiguous terms
- Step 3 - Specify the nature of the construct's conceptual domain
- Step 4 - Specify the conceptual theme of the construct

The following sub-sections discuss the purpose of each step and how it is performed.

2.3.1 Step 1 - Examine how the focal construct is used in past research

The main objective of this step is to conduct a systematic literature review and investigate the past uses of FL-RIE. However, except for Hibbert et al (2012), it is hard to find any past studies on FL-RIE. In such instances, researchers have the option of conducting the systematic literature review on closely related construct/constructs (MacKenzie et al, 2011). FL-RIE is an attribute of the firm-level resource integration process. It is also hard to find studies on firm-level resource integration process. However, past researchers have carried out extensive research on resource integration. Therefore, this study systematically reviewed the literature

on resource integration since it is the closely related construct to FL-RIE with a considerable amount of past research.

A systematic literature review is a methodical investigation of a particular aspect using a predetermined plan (Jones & Evans, 2000) that comprises of seven steps (i.e., "preparing a review question, selecting criteria for inclusion of articles in the review, systematically searching the published and unpublished literature, determining which articles meet the predefined inclusion criteria, critically appraising the quality of the research, extracting outcome data from the research report and summarising the best available evidence on the topic of interest" (Jones & Evans, 2000, p. 66)).

By systematically reviewing past research on resource integration, this study intended to understand the definition of resource integration from the perspective of S-D logic. In doing so, it is possible to come up with a definition for firm-level resource integration. Once a definition is formed for firm-level resource integration, it can be utilised to form a definition for FL-RIE by combining the definition of firm-level resource integration and RIE.

Based on this background, the purpose of the systematic literature review is to formulate a definition for resource integration. Therefore, the review question is *what is the definition of resource integration?*

After finalising the review question, article inclusion criteria and search criteria were determined. When determining inclusion criteria, articles written in English were sourced because the author is not proficient in any other language. This approach has been adopted in other review articles as well (e.g., Schlachter, McDowall, Cropley, & Inceoglu, 2018). Furthermore, the author decided to only shortlist peer-reviewed journal articles, book chapters and conference papers that are peer-reviewed. This decision was taken after observing inclusion criterion in review articles published in top-tier journals (e.g., Schlachter et al, 2018).

Subsequently, the search process was carried out in three steps mentioned below.

- Step 1 - Scopus was selected as the search engine to systematically search relevant literature because among the academic search engines, it is the search engine that is capable of producing the longest list of relevant references (Paul & Criado, 2020). Through the understanding gathered from the preliminary literature review, the phrases: *resource integration*, *resource integration process, resource integration AND service-dominant* logic, and *resource integration process AND service-dominant logic* were searched in the Scopus database. Resource integration and resource integration process returned a vast number of irrelevant responses. All the responses of the phrase resource integration process AND service-dominant logic (i.e., 58 responses) overlapped with the responses of resource integration AND service dominant logic (i.e., 112 responses). Therefore, only the responses of the phrase resource integration AND service-dominant logic were considered. 112 unique search results were obtained.
- Step 2 – The author carefully reviewed all the studies obtained from step 1 and identified two types of studies. One type provided their opinion on resource integration in their studies while the other type did not. The latter has used the idea that value co-creation or value co-destruction is a result of service-provisioning and resource integration to develop arguments in their studies. The group that has commented on the nature of resource integration has considered it as an interactive process or an interactive and an emergent process. Peters et al (2014) suggested that resource integration process can be defined as an emergent process, an interactive process, or an intersubjective process. Therefore, this study ignored the studies that did not give an opinion on resource integration and retained those studies that did because according to Peters et al's (2014) explanation, those studies can be used to develop an answer to the review question. Fifty-eight studies out of 112 studies were retained for further review.

- Step 3 – To ensure this study captured a majority of related articles, another search of the phrases *resource integration AND service-dominant logic* and *emergent resource integration AND service-dominant logic* was carried out with the Google Scholar search engine. On both occasions, results up to ten web pages were screened by reading the abstracts of each study. At the end of step 3, thirteen more studies were considered for further review. By the end of this step, this study was able to shortlist 71 studies for further review.

Since 71 selected articles were peer-reviewed, it was assumed that they are of acceptable quality to be used in the review. Next, a careful review of the articles was carried out to develop an answer to the review question. A detailed discussion of the information extracted from the review is presented in section 2.4 – literature review.

2.3.2 Step 2 - Define the construct in unambiguous terms

MacKenzie et al (2011) consider this as the fourth step of the process. However, it is logical to consider this as the second step because, in the next step, the property which the focal construct represents should be specified and extracted from the definition. Churchill (1979) and DeVellis (2017) also recommend defining the construct before specifying the conceptual theme. Therefore, immediately after an answer was developed for the review question in step 1, that answer was utilised to propose a definition for the focal construct of the study - FL-RIE.

2.3.3 Step 3 - Specify the nature of the construct's conceptual domain

The main objective of this step is to specify the nature of the construct's conceptual domain by crystallising the type of property the construct represents and the entity which it applies to (MacKenzie et al, 2011). The type of property specifies the general property a construct measures (e.g., construct – absorptive capacity of a firm; property – a firm's ability to identify, assimilate, transform, and apply valuable external knowledge (Cohen & Levinthal, 1990)). The

entity specifies the object which the property applies to (e.g., construct – absorptive capacity of a firm; entity - firm).

The property and the entity of the focal construct were specified at the point of defining the focal construct.

2.3.4 Step 4 - Specify the conceptual theme of the construct

The main objective of step 4 is to crystallise the following aspects of FL-RIE.

- Identify necessary and sufficient indicators of FL-RIE that are common to all exemplars and uniquely possessed by exemplars
- Specify the dimensionality of FL-RIE
    - Researchers discuss whether the focal construct is unidimensional or multidimensional
- Specify the stability of FL-RIE over time, across situations and across cases

2.4 Literature review – Defining the conceptual domain of FL-RIE

This literature review is dedicated to logically develop a definition and a conceptualisation for the focal construct of the study - FL-RIE. Peters et al (2014) discuss three distinct approaches to define and conceptualise resource integration. They suggest that resource integration can be conceptualised as an emergent process, an interactive process, or an intersubjective process. By reviewing past studies shortlisted through the manuscript search process, in the following section this study explains the approach adopted to define and conceptualise resource integration.

The literature review is divided into two main sections. The first section (2.4.1) is dedicated to developing an answer to the review question of the systematic literature review (i.e., *what is*

the definition of resource integration?). The second section (2.4.2) utilises the definition suggested in the first section and proposes a definition and conceptualisation for FL-RIE.

2.4.1 Defining the resource integration process

The initial version of the S-D logic did not explain the process that co-creates value. Therefore, the concept of resource integration was not part of the first version of the S-D logic. However, the Otago Forum 2005 that was specifically held to discuss the future of the S-D logic motivated Vargo and Lusch to re-think the process of value co-creation. As a result, Vargo and Lusch (2006) introduced resource integration through the ninth FP (see Appendix A for more information on FPs) of the S-D logic and claimed it as the process which "integrate and transform micro-specialised competences residing within organizations into complex services that are demanded in the marketplace" (Vargo & Lusch, 2006, p. 53). The initial idea was that resource integration is the process which entrepreneurs carry out to produce complex services demanded by the customers. Hence, at the beginning it was argued that *organisation* is the only actor that is capable of carrying out resource integration.

However, later Vargo and Lusch (2008, p. 7) modified the ninth FP as "all social and economic actors are resource integrators". By modifying the ninth FP, Vargo and Lusch (2008) got rid of the firm-centric nature of resource integration. Instead, they argued that all the actors in the society are resource integrators who integrate resources in open, complex, and adaptive service systems. Actors in the society are diverse. For example, an individual, a department, a firm or even a country can be considered an actor (Löbler, 2013; Peters, 2016). Due to the involvement of a diverse set of actors, extant literature describes the resource integration process as a collaborative and interactive process (e.g., Aal, Di Pietro, Edvardsson, Renzi & Guglielmetti Mugion, 2016; Kleinaltenkamp et al, 2012; Lusch & Nambisan, 2015). Therefore, one possibility is to consider resource integration as a collaborative and interactive process. However, there are alternative viewpoints that disregard resource integration as only a

collaborative and interactive process. Therefore, the rest of this section is dedicated to developing a clearer definition of resource integration.

The systematic literature review reveals that the shortlisted studies on resource integration can be categorised into two categories (see the third column of Table 2.1). One group of researchers has proposed definitions and conceptualisations for resource integration while the other group used the general understanding of the concept of resource integration to develop metatheories and mid-range theories and carry out empirical research (both qualitative and quantitative).

Furthermore, the systematic literature review suggests that studies on resource integration can be further categorised as studies that consider resource integration as an interactive and collaborative process and studies that consider resource integration as an interactive and emergent process (see the fourth column of Table 2.1). Studies that define resource integration as an interactive and emergent process define emergence as the generation of new emergent properties such as entities, structures, totalities, concepts, qualities, capacities, textures, and mechanism through resource integration (Peters, 2018). A summary of opinions on resource integration of each study mentioned in Table 2.1 is available in Appendix B.

Table 2.1: Summary of the systematic literature review

Type of Study	Related Studies	Does this Study Conceptualise Resource Integration?	Resource Integration: An Interactive Process or an Emergent Process?
Literature Review	Colurcio, Caridà, and Edvardsson (2016)	No	An interactive process
	Pohlmann and Kaartemo (2017)	No	An interactive process
Literature Review/Metatheoretical Study	Mustak and Plé (2020)	No	An interactive process
Midrange Theoretical/Empirical/Qualitative Study	Aal et al (2016)	No	An interactive process
	Akaka et al (2014)	No	An interactive process
	Åkesson, Skålén, Edvardsson, and Stålhammar (2016)	No	An interactive process
	Anttiroiko and Komninos (2019)	No	An interactive process
	Baumann, Meunier-FitzHugh, and Wilson (2017)	No	An interactive process
	Beirão, Patrício, and Raymond (2017)	No	An interactive process
	Botti and Monda (2020)	No	An interactive process
	Brozović, D'Auria, and Tregua (2020)	No	An interactive process
	Canhoto, Quinton, Jackson, and Dibb (2016)	No	An interactive process
	Du and Chou (2020)	No	An interactive process
	Frow et al (2014)	No	An interactive process

	Hasu, Toivonen, Tuominen, and Saari (2015)	No	An interactive process
	Hughes and Vafeas (2018)	No	An interactive and emergent process
	Hughes, Vafeas and Hilton (2018)	No	An interactive and emergent process
	Jefferies, Bishop, and Hibbert (2019)	No	An interactive process
	Johnson and Neuhofer (2017)	No	An interactive process
	Korkman, Storbacka, and Harald (2010)	No	An interactive process
	Koskela-Huotari, Edvardsson, Jonas, Sörhammar, and Witell (2016)	No	An interactive process
	Lampinen and Tossavainen (2014)	No	An interactive process
	Lessard, Amyot, Aswad, and Mouttham (2020)	No	An interactive process
	Löbler (2013)	No	An interactive process
	Löfberg and Åkesson (2018)	No	An interactive process
	Mele et al (2018)	No	An interactive process
	Overkamp, Blomkvist, Rodrigues, Arvola and Holmlid (2018)	No	An interactive process
	Polese, Botti, Grimaldi, Monda, and Vesci (2018)	No	An interactive process
	Rashid, Tanveer, Shaukat and Sadiq (2020)	No	An interactive process
	Skålén, Gummerus, von Koskull, and Magnusson (2014)	No	An interactive process
	Smith (2013)	No	An interactive process
	Truong, Simmons, and Palmer (2012)	No	An interactive process
	Vafeas and Hughes (2020)	No	An interactive process
	Vafeas, Hughes, and Hilton (2016)	No	An interactive process
	Widjojo, Fontana, Gayatri and Soehadi (2020)	Yes	An interactive process
	Zhang, Zhao, Voss, and Zhu (2016)	No	An interactive process
Midrange Theoretical/Empirical/Quantitative Study	Ho, Chung, Kingshott, and Chiu (2020)	No	An interactive process
	Horbel, Buck, Diel, Reith, and Walter (In Press)	No	An interactive process
	Widjojo, Fontana, Gayatri, and Soehadi (2019)	Yes	An interactive process
	Zaborek and Mazur (2019)	No	An interactive process
Metatheoretical Study	Ballantyne, Frow, Varey, and Payne (2011)	No	An interactive process
	Carrillo, Edvardsson, Javier and Egren (2019)	No	An interactive and emergent process
	Eggert, Ulaga, Frow, and Payne (2018)	No	An interactive process
	Lusch and Nambisan (2015)	No	An interactive process
	Luscha, Vargo, and Gustafsson (2016)	No	An interactive and emergent process
	Peters (2016)	Yes	An interactive and emergent process
	Peters (2018)	No	An interactive and emergent process
	Peters et al (2014)	Yes	An interactive and emergent process
	Polese (2018)	No	An interactive process
	Siltaloppi and Vargo (2014)	No	An interactive process
	Vargo (2007)	No	An interactive process
	Vargo (2008)	No	An interactive process
	Vargo and Lusch (2006)	Yes	An interactive process
Midrange Theoretical Study	Akaka, Vargo, and Lusch (2013)	No	An interactive process
	Bruce, Wilson, Macdonald, and Clarke (2019)	Yes	An interactive and emergent process
	Caridà, Edvardsson, and Colurcio (2019)	Yes	An interactive and emergent process
	Edvardsson, Kleinaltenkamp, Tronvoll, McHugh, and Windahl (2014)	Yes	An interactive and emergent process
	Gummesson and Mele (2010)	No	An interactive process
	Hilton and Hughes (2013)	No	An interactive process
	Hilton, Hughes, and Chalcraft (2012)	No	An interactive process
	Hollebeek (2019)	No	An interactive process
	Hollebeek and Andreassen (2018)	No	An interactive process
	Hollebeek, Srivastava, and Chen (2019)	No	An interactive process
	Karpen, Bove, and Lukas (2012)	No	An interactive process
	Kleinaltenkamp et al (2012)	Yes	An interactive process
	Koskela-Huotari, Edvardsson, and Tronvoll (2018)	Yes	An interactive and emergent process
	Laud, Karpen, Mulye, and Rahman (2015)	Yes	An interactive process

	Plé (2016)	No	An interactive process
	Siddike and Hidaka (2017)	No	An interactive process
	Singaraju, Nguyen, Niininen, and Sullivan-Mort (2016)	No	An interactive process
	Wajid, Muhammad, Malik Omer, Malik Shahab, and Khurshid (2019)	No	An interactive process

Studies that have not defined or conceptualised resource integration and instead utilised the general understanding of resource integration have considered resource integration as the process that actors carry out to co-creates value (Bruce et al, 2019; Lusch & Nambisan, 2015) and create new resources (potential) that can be shared with other actors in a service ecosystem through service provision (Koskela-Huotari et al, 2018). Those studies have established the validity of the general understanding of resource integration empirically. Furthermore, they have utilised the general understanding of resource integration to propose novel metatheories and mid-range theories that discuss how resource integration behave with other concepts (i.e., resource allocation, service provisioning, value co-creation, service innovation) in S-D logic.

Even though such studies have advanced S-D logic, it is not possible to answer the review question in this study by merely following the general understanding of resource integration. That is because, while some studies have considered resource integration as an interactive process, another group of studies considered resource integration as an interactive and emergent process. Therefore, the usage of the general understanding created by the existing definitions for resource integration is not consistent.

Based on this background, this study scrutinised the studies that have proposed definitions and conceptualisations for resource integration. Those studies have contributed to the meta- and mid-range theoretical development of the concept by introducing mutually exclusive definitions and conceptualisations. As can be seen in Table 2.1, this study identified eleven such studies (i.e., Bruce et al, 2019; Caridà et al, 2019; Edvardsson et al, 2014; Kleinaltenkamp et al, 2012; Koskela-Huotari et al, 2018; Laud et al, 2015; Peters, 2016; Peters et al, 2014; Vargo & Lusch, 2006; Widjojo et al, 2020a; Widjojo et al, 2020b). They were further reviewed

to investigate the nature of resource integration. The review revealed that the studies which propose definitions and conceptualisations are also fragmented in their viewpoints. Therefore, this study reviewed all the eleven studies to develop a logical answer for the review question.

As discussed earlier, Vargo and Lusch (2006) introduced resource integration through the 9th FP of S-D logic as a firm-centric concept. Let us discuss their argument for positioning resource integration as a firm-centric concept. Today, individuals are micro-specialised due to division of labour. Think of carpenters, electricians, data scientists, etc. A vast majority of professions are highly specialised. Due to this reason, firms must hire multiple individuals who are capable of performing various micro specialised tasks (e.g., accountancy, marketing, engineering and supply chain). To produce complex services that are demanded by the marketplace, entrepreneurs must combine micro specialisations of individuals with other resources in organisations. During the process, individuals must interact with each other and resources because combination without interaction is not possible. Hence, Vargo and Lusch (2006) implicitly discuss the interactive and collaborative nature of resource integration. Do they discuss the emergent nature of resource integration? Yes, they do. However, their discussion on emergence is also implicit. Emergence is the generation of new properties through resource integration (Peters, 2016). Vargo and Lusch (2006, p. 53) claim that entrepreneurs are able to "envision service that people want and will pay to obtain and integrate together micro specialists to offer and provide this service". Furthermore, in the very first ninth FP, Vargo and Lusch (2006, p. 53) also argue that "organisations exist to integrate and transform micro specialised competences into complex services that are demanded in the marketplace". In both instances they are discussing the emergence of a service that does not occur prior to the integration of resources. Therefore, arguably they have implicitly acknowledged the emergent nature of resource integration.

Vargo and Lusch (2008) modified the ninth FP and got rid of the firm-centric nature of resource integration and acknowledged that any actor from an individual to a country can be a resource integrator. However, the modified FP (i.e., "all social and economic actors are resource integrators" (Vargo & Lusch, 2008, p. 7)) did not indicate the interactive or emergent nature of resource integration. Studies that followed Vargo and Lusch (2008) have highlighted the interactive nature of resource integration over emergent nature. Let us consider several such studies to understand how they have discussed the nature of resource integration.

As Vargo (2008, p. 211) note "S-D logic's concept of resource integration is multidirectional (all parties uniquely integrating multiple resources for their own benefit and for the benefit of others) but service-beneficiary centered (i.e., both parties in service-for-service exchange)". Here, even though Vargo (2008) does not explicitly mentioned the interactive nature of resource integration, he implicitly discusses that multiple actors interact to integrate multiple resources for each other's benefit during a resource integration process.

Korkman et al (2010, p. 236) provide the following comment on resource integration:

> This article proposes that a practice-based approach can be used as a conceptual tool to describe resources integration and value creation. Practices are formed as the resources of customers and providers interlink with different contextual elements – these interlinks define value co-creation. A practice-based approach turns attention to the processual aspects of usage and consumption rather than to the outcomes of the exchange of goods. We suggest that the concept of practices contributes to the further development of S-D logic's view on how resources are integrated through interaction.

Korkman et al (2010) discuss the nature of resource integration from a practice-based approach. Hence, they argue that interactive practices drive resource integration. Furthermore, they argue

that resource integration possesses a processual nature rather than an outcome-oriented nature. Therefore, Korkman et al (2010) position resource integration as an interactive process.

In their view, Gummesson and Mele (2010, p. 181) argue that "resource integration is generalized to actor-to-actor (A2A) interaction through which the actors link their resources for mutual benefit". They explicitly position resource integration as an interactive and collaborative process that actors in a service ecosystem carry out to link resources to co-create value. However, they do not discuss the emergent nature of resource integration in their study.

Ballantyne et al (2011, p. 208) suggest that "sales and purchase transactions are only one part of a range of marketing and purchasing interactions between companies, and by extension, within networks of relationships" and resource integration maintains communicative interaction "from procurement to customer delivery to ongoing service". Hence, Ballantyne et al (2011) also explicitly suggest the interactive and collaborative nature of resource integration and do not discuss anything that suggests the emergent nature of resource integration.

Based on this background where a majority of the studies have considered resource integration as an interactive process, Kleinaltenkamp et al (2012, p. 203) propose that resource integration "requires process(es) and forms of collaboration". They argue that "collaboration occurs through commitments between networked actors" to co-create value collectively (Kleinaltenkamp et al, 2012, p. 203). Furthermore, they suggest that the actors (Here, instead of actors, they use the word organisations. However, this study suggests *actors* is more relevant and appropriate than *organisations*.) continuously configure their processes that are responsible for carrying out resource integration to respond to the changes taking place in the external environment. Both collaboration and reconfiguration of resource integrating processes are taking place through interaction between actors. Hence, Kleinaltenkamp et al (2012) acknowledge the interactive nature of resource integration. However, they discuss a property

of resource integration that goes beyond interaction. They present the following argument (Kleinaltenkamp et al, 2012, p. 203):

> We need to look further than the interaction to fully understand the co-creation of value. It is the human and social experience resulting from the interaction with engagement platforms that is crucial. Therefore, we need to understand more about the experiences of the actors within the integrating process.

Through this argument, Kleinaltenkamp et al (2012) argue that a property called *human and social experience* emerges from interaction and call for further investigation. However, it is not clear whether they had the intention of positioning resource integration as an emergent process through the discussion of experience because it is possible to assume that instead of highlighting the emergent nature, they might be indicating the importance of utilising the experiences gathered from prior resource integration processes to improve the collaboration and reconfiguration abilities that are vital for enhanced resource integration in the future. Therefore, while Kleinaltenkamp et al (2012) accepted the interactive nature of resource integration, it is not conclusive whether they intended to position resource integration as an emergent process.

In another study, Edvardsson et al (2014, p. 297) proposed the following definition:

> Resource integration consists of cooperative and collaborative processes between actors, leading to experiential outcomes and outputs, as well as mutual behavioral outcomes for all actors involved

This definition is inspired by Kleinaltenkamp et al's (2012) definition of resource integration. The difference is, unlike Kleinaltenkamp et al (2012), Edvardsson et al (2014) provide a clear opinion regarding the emergent nature of resource integration. Edvardsson et al (2014) highlight the interactive nature of resource integration. At the same time, Edvardsson et al

(2014, p. 297) claim that "experiential outcomes and outputs" are emerging from resource integration. Besides, Edvardsson et al (2014) discuss *outputs*. These outputs can be assumed as new emergent properties such as entities, structures, totalities, concepts, qualities, capacities, textures, and mechanisms. Hence, Edvardsson et al (2014) support the emergent nature of resource integration.

Peters et al (2014) are the first group of researchers that explicitly claimed resource integration as an emergent process while acknowledging its interactive nature. They argue that an ecosystem should maintain its continuation by regularly co-creating value through resource integration. From time to time there can be instances where value is co-destructed. Focusing solely on the interactive nature of resource integration does not indicate the nature of the outcome of resource integration. That is why it is necessary to focus on the properties that emerge from resource integration because "interaction may, or may not, lead to emergent new properties" (Peters et al, 2014, p. 7). Then only each actor in the ecosystem could determine value-in-context and, if required, suggest changes to the resource integration process. Koskela-Huotari et al (2018) and Peters (2016) acknowledge the emergent nature of resource integration and suggest "interaction alone provides an insufficient conceptual foundation for understanding resource integration" (Peters, 2016, p. 3000) and the continuation of an ecosystem.

Carida et al (2019) propose a conceptualisation for resource integration. Their conceptualisation suggests that they are influenced by Peters et al (2014). Carida et al (2019) provide more clarity by positioning resource integration as a process consisting of three phases, namely, matching, resourcing, and valuing. Matching and resourcing involve interaction between actors. Hence, Carida et al (2019) acknowledge the interactive nature of resource integration. Matching "is the pre-phase of the resource integration process that is based on interaction" (Carida et al, 2019, p. 70). Resourcing is the phase which combines and transforms

resources to benefits through coordination mechanisms (i.e., knowledge, skills, and institutional arrangements). At the end of the resourcing phase, an outcome with a positive or negative value emerges. Value assessment is conducted by each actor to determine respective value-in-context during the valuing phase of resource integration (Carida et al, 2019). Inclusion of valuing indicates that Carida et al (2019) acknowledge the emergent nature of the process and the importance of valuing emergent properties for ensuring the wellbeing of each actor and the continuation of the ecosystem.

In another mid-range theoretical study, Laud et al (2015) conceptualise resource integration with six resource integration practices, namely, accessing, adapting, mobilising, internalising, transforming, and applying. Laud et al (2015) discuss the need for interaction when executing each practice. However, they do not highlight the emergent nature of resource integration when discussing any of the six practices. Their discussion is predominantly focused on the process over the outcome.

In a qualitative empirical study, Bruce et al (2019, p. 175) define resource integration as "a process whereby actors combine and apply resources in pursuit of value creation". They claim that the combination and application of resources are carried out through a set of interactive activities that are performed by the actors in an ecosystem. Hence, Bruce et al (2019) acknowledge the interactive nature of resource integration. However, they do not highlight the emergent nature of resource integration in the definition. Instead, Bruce et al (2019) discuss that value appraisal process is taking care of the valuing of emergent properties and indicate valuing as a process external to resource integration. Hence, Bruce et al (2019) position resource integration as an interactive process.

Widjojo et al (2020a, 2020b) propose identical definitions and conceptualisations for resource integration. They propose resource integration is a process backed by collaborative networks and dynamic interactions. Collaborative networks are required "to acquire the needed resources

that cannot be obtained through internal resources" (Widjojo et al, 2020a, p. 4). During the acquisition process actor interact in the ecosystem. Dynamic interaction among actors is required to "leverage the actor capacity to integrate relevant resources and build value co-creation" (Widjojo et al, 2020b, p. 5). Hence, Widjojo et al (2020a, 2020b) position resource integration as an interactive process but do not discuss the emergent nature of the process.

Based on this discussion, it is possible to identify two different opinions regarding the nature of resource integration among studies that propose concept definitions. One group of researchers position resource integration as an interactive process while another position resource integration as an interactive and emergent process.

This study positions resource integration as an interactive and emergent process. There is no doubt that interaction is needed to integrate resources. However, interaction alone does not guarantee continuous enhancement of the ecosystem because continuous enhancement depends on the lessons learnt by actors after each resource integration process. If the majority of actors end up co-destructing value in most instances, it is hard to sustain the continuation of that ecosystem. However, if each actor evaluates their respective outcomes through valuing and sharing the lessons learnt with the other actors in the ecosystem, it allows them to understand knowledge and skill deficiencies of certain actors and identify institutional arrangements that prevent certain actors from co-creating value. Hence, valuing of emergent properties facilitates the identification of enhancements that are required for the existing resource integration activities, fixing issues, and thereby ensuring the wellbeing and the continuation of the ecosystem. Therefore, this study accepts the emergent nature of resource integration.

In this backdrop, this study defines resource integration as a set of collaborative and interactive activities that takes place among a network of actors, potential/unrealised and existing resources in a service ecosystem for the purpose of value co-creation, creation of new resources, and valuing to ensure the wellbeing and the continuation of the ecosystem.

By defining resource integration, this study answered the review question. The next step is to develop a definition for the focal construct of the research – FL-RIE using the definition for resource integration.

2.4.2 Defining firm-level resource integration

Before moving on to the definition of FL-RIE, this study propose a definition for firm-level resource integration because the focus of the current study is on a capability (i.e., FL-RIE) that is developed by a firm as a result of repeated resource integration efforts over time.

Peters et al (2014) suggest viewing the interactivity of resource integration as a set of context-based observable and measurable processes. Since the focus of the present study is on firm level, interactivity can be viewed as a set of observable and measurable organisational processes. The emergent nature of firm-level resource integration is taking care of the firm's wellbeing of the firm and the actors that are collaborating with the firm by continuously demanding knowledge and skill upgrades and appropriate changes in institutional arrangements.

Hence, firm-level resource integration process can be defined as a set of observable and measurable organisational processes that take place among a network of internal and external actors, potential/unrealised and existing resources for the purpose of value co-creation, creation of new resources, and valuing the emergent properties to ensure the wellbeing and the continuation of the firm and the related actors.

2.4.3 Conceptualising FL-RIE

Resource integration effectiveness is a result of repeated resource integration efforts over time (Hollebeek, 2019). Therefore, firm-level resource integration effectiveness (FL-RIE) is a result of firm-level resource integration efforts over time. Hollebeek (2019, p. 93) define resource integration effectiveness as an actor's "resource deployment proficiency to create value". This

definition only focuses on the resource deployment phase (through interaction and resourcing (Carida et al, 2019)) of the resource integration process and ignores the valuing phase. Furthermore, the definition discusses only about value creation and does not mention or imply anything related to the creation of new resources and valuing to ensure the wellbeing and the continuation of the ecosystem which can be considered as outcomes of a resource integration. This has happened because the definition is only focusing on the interactive nature of resource integration and ignores the emergent nature of the process. Therefore, this study proposes a new definition for firm-level resource integration effectiveness by incorporating the emergent nature of firm-level resource integration to the definition.

The word *effectiveness* is defined as "the degree to which something is successful in producing a desired result" (LEXICO powered by OXFORD, 2019). Hence, it is possible to define FL-RIE as the degree to which a set of observable and measurable organisational activities take place among a network of actors, potential/unrealised and existing resources are successful in co-creating value, creating new resources, and valuing the emergent properties to ensure the wellbeing and the continuation of the firm and the related actors when the firm is pursuing its daily activities and projects.

This definition suggests that FL-RIE can be conceptualised as a function of effectiveness of observable and measurable organisational processes that drive value co-creation, creation of new resources, and the valuing of emergent properties to ensure the wellbeing and the continuation of the firm and the related actors.

The dynamic capabilities framework (DCF) proposes three such observable and measurable organisational processes (i.e., internal and external coordination processes, organisational learning processes and organisational transformation processes) (Teece & Pisano, 1994; Teece, Pisano & Sheun, 1997). They are considered as indirect sources of competitive advantage. One of the major forces which drives the evolution of these three processes is interaction and

collaboration between a network of actors (e.g., employees, suppliers, customers, etc) (Allred, Fawcett, Wallin & Magnan, 2011; Eisenhardt & Martin, 2000; Teece & Pisano, 1994; Teece et al, 1997; Teece, 2007). Managers carry out internal coordination activities by managing interaction among employees. Firms carry out external coordination activities by interacting with external parties through strategic alliances, virtual corporations, buyer-supplier relations, and technology collaborations. Learning within an organisation takes place through interaction driven communication and coordinated search procedures. Transformation takes place through interactive activities such as scanning the external environment, evaluating markets and competitors, and accomplishing reconfiguration ahead of competition.

Furthermore, DCF highlights how these processes ensure the wellbeing and continuation of an ecosystem. Over time, through a series of resource integration processes, a firm inherits a set of unique internal and external coordination processes which are referred to as routines. Routines enable a firm to enhance its wellbeing and enhance the wellbeing of associated actors through various means such as forming strategic alliances, acquisitions, merges, buyer-supplier relations, etc. Knowledge generated through learning resides in routines and allow firms to continuously enhance their internal and external coordination and transformational processes. Transformational processes allow firms to reconfigure and transform in responding to changes within and outside the firm.

Hence, this study assumes FL-RIE as a function of effectiveness of each of the three observable and measurable organisational processes proposed by the DCF. This argument is further justified in sub-sections 2.4.3.1, 2.4.3.2, and 2.4.3.3.

2.4.3.1 Level of effectiveness of internal and external coordination processes

According to the DCF, coordination is an important organisational and managerial process that determines the competitive position of an organisation (Eisenhardt & Martin, 2000; Teece & Pisano, 1994; Teece et al, 1997; Teece, 2007). The way each organisation conducts internal

and external coordination activities depends on organisational routines (Teece & Pisano, 1994; Teece et al, 1997). Organisational routines are firm specific and are hard to imitate and replicate (Eisenhardt & Martin 2000; Teece & Pisano, 1994; Teece et al, 1997; Wang & Ahmed, 2007). Organisations with superior competitive positions have routines that are superior to its competitors.

According to Lusch and Nambisan (2015) routines are developed by the processes and activities carried out over a considerable period by three types of resource integrating actors (i.e., ideators, designers, and intermediaries). They conduct internal and external coordination for the purpose of effectively integrating resources to co-create value, creating new resources, and ensuring the wellbeing and the continuation of the firm and associated actors.

Ideators conduct external coordination activities for the purpose of identification of needs and wants of the beneficiaries by gathering knowledge regarding the gaps in capabilities. With the use of gathered knowledge, ideators *envision* new services. In the process they create tacit knowledge. Hence, they should have the capability of converting tacit to explicit knowledge for others to understand envisioned service and develop through internal and external coordination activities (Lusch & Nambisan, 2015). Designers mix and match operant and operand resources to *configure* new services. In the process, they do both internal and external coordination to grasp the knowledge component of existing resources. The most important consideration is that designers do not envision new services. They just configure new services with the use of available explicit knowledge. Intermediaries do external coordination activities for the purpose of exporting and importing operant and operand resources between ecosystems. By doing that they create nonobvious connections across ecosystems, explore and discover nonobvious connections among diverse resources and assist ideators and designers to create and configure new services. In all of these roles, resource integrating actors integrate resources to generate new knowledge and service innovations (Lusch & Nambisan, 2015). This

strengthens routines and ensures the continuous contribution of internal and external coordination processes to co-create value, create new resources, and ensure the wellbeing and continuation of the firm and associated actors.

Furthermore, an important aspect of routines at firm level is that they are visible to the external environment as organisational capabilities embedded in internal and external coordination processes because organisational capabilities are attributes which enable organisations to coordinate and utilise their resources (Barney, 2014). Furthermore, organisational capabilities are a special type of (operant) resource which cannot be transferred to another organisation without transferring the ownership of the organisation (Makadok, 2001; Teece & Pisano, 1994; Teece et al, 1997). Organisational capabilities embedded in external coordination processes reach across firm boundaries to involve suppliers, customers, etc, in the resource integration process (Droge, Jayaram & Vickery, 2004). Organisational capabilities embedded in internal coordination processes are responsible for driving three types of resource integrating actors to continuously look for ways firm can improve its circumstances (Dorge et al, 2004; Lusch & Nambisan, 2015). Therefore, due to the coordinative and firm-specific nature of organisational capabilities, it is possible to explain internal and external coordination processes through organisational capabilities.

Based on this backdrop, indicators of organisational capabilities should be able to explain the variations of the level of effectiveness of internal and external coordination processes. Nasution and Mavondo (2008) have introduced five indicators of organisational capabilities (i.e., learning orientation, integrated market orientation, intrapreneurship, effective human resource practices and innovation). Furthermore, Nasution and Movondo (2008) highlight the coordinative and firm-specific nature of organisational capabilities. Therefore, this study adopts the same five indicators to characterise the level of effectiveness of firm-level internal and external coordination processes.

The following sub-sections discuss the five indicators, how they relate to the resource integration process and how each indicator contributes to the variation of resource integration capability of an actor.

2.4.3.1.1 Learning orientation

Learning orientation drives gathering, evaluating, interpreting, and sharing of information to enhance the competitive advantage of a firm through the creation of knowledge (Calantone, Cavusgil, & Zhao, 2002) that can be utilised to co-create value, create new resources, and ensure the wellbeing and the continuation of the firm and the associated actors. Typically, a firm takes time to learn resource integration tasks and achieve a higher level of resource integration capability (Hollebeek, 2019). Learning orientation is one of the attributes that determines the pace at which the firm moves from a lower to higher level of resource integration capability and this will be discussed in more detail below.

Learning orientation drives some of the major tasks conducted by the three types of resource integrating actors (i.e., ideators, designers and intermediaries). Learning orientation drives the process of envisioning new services through continuous improvement of radical innovativeness of a firm (Melton & Hartline, 2012). Furthermore, learning orientation motivates individuals within a firm to maximise the process of transferring tacit knowledge from individuals (i.e., ideators) to groups (Mavondo, Chimhanzi, & Stewart, 2005). Besides, learning orientation is a key attribute that drives the creation of novel services. Hence, it is possible to argue that ideators benefit from a high level of learning orientation that will facilitate the process of envisioning new services regularly and converting tacit knowledge to explicit knowledge. When a firm is highly learning oriented, designers are regularly attempting to configure new services with the readily available explicit knowledge. Furthermore, designers take the initiative to drive the process of creating new value propositions by mixing and matching

existing resources and promoting value propositions among the beneficiaries (Melton & Hartline, 2012). Intermediaries are the individuals that create nonobvious connections across the boundaries of the firm and identify novel opportunities. A firm that is highly learning oriented is known to be equipped with individuals who are open to the outside world and continuously look out for mechanisms to renew the organisation (Mavondo et al, 2005). Hence, learning orientation is a key attribute that determines the quality of the intermediaries within an organisation.

Hence, learning orientation is an attribute that assists resource integrating actors to continuously improve their roles to in turn improve the resource integration capability of the firm. Therefore, learning orientation is an essential component of the firm-level resource integration process.

2.4.3.1.2 Market orientation

Market orientation is dedicated to recognising and generating intelligence regarding expressed and un-expressed market needs, dissemination of generated intelligence across organisations, and creation of organisation-wide responsiveness to the generated intelligence (Kohli & Jaworski, 1990; Nasution & Mavondo, 2008). Generating market intelligence and responding promptly is extremely vital to serve one of the main purposes of firm-level resource integration which is the combining of resources and coming up with products and/or services demanded by the customers (Lusch & Nambisan, 2015; Vargo & Lusch, 2006).

Carida et al (2019) conceptualise resource integration as a process consisting of three-steps, namely, matching, resourcing, and valuing. Market orientation is needed to carry out each of the three steps effectively and efficiently. During the process of matching, interaction among actors enables sharing of ideas, knowledge, and experience between the actors (Carida et al, 2019). In doing so, each actor tries to understand the resources they should mobilise and how

to achieve a higher level of resource density (i.e., mobilising resources in a way that will maximise the benefits of the resource integration process). From an organisation's point of view, mobilising of relevant resources to achieve a higher level of resource density cannot be achieved without having an informed understanding of the market condition that the organisation is responding by integrating resources. Hence, firm-level resource integration processes must be backed by market orientation if an organisation is to develop a higher level of matching skills.

When it comes to resourcing, the focus is on turning a potential resource into a benefit while removing any internal and/or external resistances (Carida et al, 2019). Throughout the resource integration process an organisation must have a clear understanding of the market need they are responding to. That can be achieved only if the generated market intelligence regarding a particular need is accurately disseminated across the organisation. Furthermore, an organisation must generate continuous inflow of market intelligence information regarding current and projected customer needs because customer needs can become obsolete during the resource integration process. Hence, a higher level of resourcing skills is also backed by market orientation.

The valuing phase is where an organisation assesses the value created by a resource integration process. To accurately carry out the evaluation process, the person or the department that does the evaluation should receive accurate information regarding the customer need. For that to happen, the organisation should have a good market intelligence information dissemination mechanism backed by a higher level of market orientation.

Furthermore, market orientation assists resource integrating actors within a firm to achieve desired results through resource integration processes. As discussed earlier, resource integration combines resources to come up with products and/or services driven by customer

demand catering to expressed or unexpressed needs (Vargo & Lusch, 2006). Resource integrating actors develop customer solutions to meet these needs. Some of the actors are generating market intelligence information (e.g., intermediaries) while some are working on unexpressed and expressed market needs to develop new products and/or services (e.g., ideators and designers) (Lusch & Nambisan, 2015). Market orientation determines the quality of the market intelligence information pertaining to prevailing and projected customer needs. Since resource integrating actors utilise generated market intelligence information to work on expressed and unexpressed market needs it is possible to consider market orientation as a firm-level property that determines resource integration capability.

2.4.3.1.3 Intrapreneurship

Intrapreneurship is a managerial strategy that encourages individual employees to think and act as entrepreneurs within an organisation. The main objective of promoting intrapreneurship is to nurture innovativeness, proactiveness and risk-taking mentality of the employees (Antoncic & Hisrich, 2003). These attributes are vital for developing a higher firm-level resource integration capability.

A major objective of resource integration, as previously mentioned, is to combine existing and potential resources to develop innovative products and services (Koskela-Huotari et al, 2016; Lusch & Nambisan, 2015; Mele, Spena & Colurcio, 2010). Therefore, resource integration is referred to as "the fundamental way to innovate" (Lusch & Nambisan, 2015, p. 155). Innovativeness of employees is one of the major drivers of innovation (Verhees & Meulenberg, 2004). Hence, resource integration should be backed by innovativeness of employees in an organisation. Therefore, innovativeness of resource integrating actors is an integral firm-level attribute that drives the continuous development of firm-level resource integration capability.

Proactiveness ensures the wellbeing and the continuation of a service ecosystem. At the end of each resource integration process, each actor evaluates the outcome and determines the status of value generated through valuing. The valuing process generates new insights and learnings that each actor could use to improve themselves and suggest changes to existing institutional arrangements and interaction mechanisms. An actor should be proactive in nature to suggest most suitable changes by envisioning future benefits to itself and the other actors in the ecosystem. Hence, an organisation should develop its level of proactiveness if it is to continuously improve firm-level resource integration capability over time.

Risk-taking mentality encourages organisations to participate in resource integration processes regularly and encourage other actors to participate in the process by allocating the required quantity of resources with the correct quality (Vafeas & Hughes, 2020). From time to time, certain resource integration processes may create negative value due to discrepancies in matching and resourcing phases (Carida et al, 2019). That should not make organisations risk-averse and prevent them from integrating resources regularly. Instead, they should learn from their mistakes, decide, and implement corrective measures, and participate in resource integration processes regularly while applying the learnings to create positive value. This behaviour is driven by the risk-taking mentality of the organisations. Hence, risk-taking mentality has the capability to encourage organisations to participate in repeated resource integration processes that is vital in developing higher firm-level resource integration capability.

Thus, it is possible to argue that the objectives of intrapreneurship are vital drivers of continuous development of the firm-level resource integration capability. Hence, the level of intrapreneurial spirit should be an attribute that determines the level of firm-level resource integration capability.

2.4.3.1.4 Effective human resource practices

Effective human resource practices is an important organisational capability that creates a supportive climate for the employees to perform better and shape their attitudes and behaviours (Nasution & Mavondo, 2008). Human capital carries out firm-level resource integration activities. Therefore, their performance, attitudes, and behaviours impact the continuous improvement of firm-level resource integration capability.

Several past studies discuss the role of effective human resource practices in improving firm-level resource integration capability. By presenting the below-mentioned argument, Hollebeek and Andreassen (2018, p. 4) highlight the importance of effective human resource practices to ensure the continuous development of human capital that is responsible for carrying out resource integration activities that drive value co-creation.

> "Given the importance of competences, skills, and knowledge for S-D logic informed service innovation, the particular actors holding these abilities are crucial for service innovation's future success. Firms are therefore advised to invest in the development of actor (e.g., employee) competencies to foster service innovation (e.g., staff training)" Hollebeek and Andreassen (2018, p. 4)

Baumann, Meunier-FitzHugh, and Wilson (2017, p. 107) highlight that "a significant misalignment between the seller's value proposition and actual co-creative behaviour that can impede the subsequent collaboration and resource integration between the two parties, which could lead to customer dissatisfaction and potentially even service failure". They indicate that a delay of resource integration between a firm and a customer could lead to customer dissatisfaction. Jeon and Choi (2012) highlight that the level of employee satisfaction has a positive relationship with the level of customer satisfaction. Therefore, it is possible to argue that a firm has the capability to prevent customer dissatisfaction by maintaining a higher-level

of employee satisfaction that would drive employees to carry our resource integration in a way that would prevent value proposition disparities. Even if these disparities lead to customer dissatisfaction and service failure in one or two resource integration processes, if employees are satisfied and motivated, they will continuously improve to prevent similar instances from happening in the future. Hence, from an organisation's perspective it is important to make sure that highly effective human resource practices are in place to take care of employee satisfaction and motivation if they are to continuously improve their resource integration capability.

Hilton and Hughes (2013) discuss how highly effective human resource practices allow a firm to implement self-service technologies successfully. When customers use self-service technologies, there can be instances where customer resource integration processes fail. Such failure creates customer dissatisfaction. However, proactive organisations have the option of training employees who can assist customers to re-integrate resources and co-create value.

Apart from the above-mentioned studies, Carrillo et al (2019), Vafeas et al (2016), and Smith (2013) also discuss how the level of effectiveness of human resource practices can improve firm-level resource integration capability by continuously developing skills, knowledge, and abilities of employees. Hence, this study positions the level of effectiveness of human resource practices as a factor that formulates the level of firm-level resource integration capability.

2.4.3.1.5 Innovation

Innovation is a process dedicated to deliver superior customer value propositions relative to competitors (Nasution & Mavondo, 2008). S-D logic does not consider innovation as a process. S-D logic defines innovation as an outcome of the resource integration process (Lusch & Nambisan, 2015; Mele et al, 2010; Widjojo et al, 2020a, 2020b). Lusch and Nambisan (2015, p. 168) position resource integration as the "very process of service innovation". Furthermore, there are some studies which claim resource integration process is an antecedent of innovation

(e.g., Carida et al, 2019; Widjojo et al, 2020a, 2020b). Therefore, based on the available evidence, from the perspective of S-D logic, it is quite clear that innovation is not part of resource integration. Hence, this study does not consider innovation as an indicator of the resource integration process.

Thus, this study considers the level of effectiveness of learning orientation, marketing orientation, intrapreneurship, and effective human resource practices as the indicators that determines the variation of the level of effectiveness of internal and external coordination processes that ultimately impacts the variation of firm-level resource integration effectiveness.

2.4.3.2 Level of effectiveness of organisational learning processes

Learning is one of the key underlying processes that enhances the firm-level resource integration effectiveness (Hollebeek, 2019) and increases the chances of the firm to regularly co-create value, create new resources, and ensure the wellbeing and the continuation of the firm and the related actors. As discussed by Carida et al (2019), learning has a part to play in each of the three phases of a resource integration process.

During the matching phase, interactions take place between actors in an ecosystem. These interactions serve three purposes, namely, setting up a dialog between resource integrating actors, transferring of knowledge and other resources between actors, and learning (Gummesson & Mele, 2010). Hence, learning is one of the main activities that enables actors to mobilise and enable higher resource density, and constructive interactions in the matching phase (Carida et al, 2019).

When the actors move from the matching phase to the resourcing phase, each actor should ensure “the alignment of procedures, understanding and engagements to ensure the mutual matching of actors’ relevant practices through which they contribute to the social context wellbeing” (Carida et al, 2019, p. 70). It demands every actor to gain knowledge regarding

various procedures and practices of other actors through knowledge acquisition and sharing. Not only that, each actor should also digest the acquired knowledge through learning if they are to gain the desired result in the resourcing phase. When the actors move to the resourcing phase, every actor focuses on turning potential resources into benefits (Carida et al, 2019). To perform well in this phase, actors should possess skills and knowledge (acquired through learning) on resource creation and integration. Furthermore, each actor should possess proper knowledge (acquired through learning) on the prevailing institutional arrangements for the purpose of resistance removal. Hence, without the backing of a highly effective learning process, it is impossible for any actor to end the resourcing phase by creating positive value.

Valuing phase is dedicated for each actor to determine the value-in-context (Carida et al, 2019). Regardless of the outcome, valuing phase generates a lot of information related to the performance of each actor in the matching and resourcing phases. Any actor with a highly effective learning process uses this information to evaluate their existing resource integration process and conduct improvements if required.

Furthermore, it is possible to highlight the significance of the level of effectiveness of firm-level learning processes for the continuous improvement of firm-level resource integration capability by discussing how learning impacts roles of the three resource integrating actors. Ideators must study and learn all the relevant information related to existing market offerings, contexts which the customers are operating in, needs of the organisation, and needs of the customers during the process of envisioning new market offerings. Designers must continuously study and learn information relating to existing market offerings to combine and configure new market offerings. They should also have a desire to learn how to interpret existing knowledge components differently, if they are to be successful in their role Intermediaries are also in a continuous learning process that eventually determines the knowledge that should be exported and/or imported across the boundaries of the organisation

and the ecosystem the organisation is operating in. Hence, the level of effectiveness of organisational learning processes can be considered as a significant determinant of the level of resource integration capability of each resource integrating actor.

Several studies have focused on exploring the indicators that have the potential to conceptualise the variation of the level of effectiveness of organisational learning processes. Bontis, Crossan and Hulland (2002) argue organisational learning as a process takes place at various levels of the organisation. Hence, it can be argued that the level of effectiveness of organisational learning processes can be explained by observing variations in the level of effectiveness of learning processes taking place in three levels of the firm, namely, individual-, group-, and organisational levels. Tippins and Sohi (2003) view the organisational learning process as a sequential process explained by five indicators, namely, information acquisition, information disseminations, shared interpretation, declarative memory, and procedural memory. According to Chiva, Alegre and Lapiedra (2008), organisational learning is a function of five indicators, namely, experimentation, risk-taking, interaction with the external environment, dialogue and participative decision making.

The DCF discusses three levels of learning, namely, individual, group and organisational level learning. Lusch and Nambisan (2015) contend that an organisational learning process consists of the three levels suggested in the DCF. Ideators are a symbol of individual-level learning because their main objective is to create tacit knowledge and turn it into explicit knowledge. Designers work in groups because they are mixing and matching existing resources to come up with new resources/services. They are relying on more than one person's contribution to carry out and sustain the process of learning. Hence, they receive the support of ideators and intermediaries. All three types of resource integrating actors are thus contributing to organisational level learning.

Let us discuss an example to further understand how the level of effectiveness of each of the three levels of learning determines the level of effectiveness of organisational learning processes. Let us assume that a drug development company decides to carry out research to discover a novel drug for COVID-19.

As the first step, prior to the start of the research, the corporate planning team and the sales and marketing team carry out a market analysis to understand the business case of the proposed project. When doing that, they might analyse data related to new and potential markets which the company has never served before. In this instance, employees in the corporate planning team and the sales and marketing team acts as intermediaries. At the same time, individual data analysts and data scientists that generate novel findings related to markets acts as ideators. When cross-functional teams come together, discuss, and finalise the strategic plan related to the proposed project by analysing the findings of the data analysts and data scientists, individuals in the cross-functional teams plays the role of designers.

Once the company finalises that the proposed project has a positive business case, the company requests the research and development team to start working on the drug. At the start of the research and development phase, a principal researcher divides the research into several components and allocates each component to the researchers in the team. Then each researcher analyses already available literature and data to envision novel solutions to their allocated problems. When they come up with solutions to the allocated problems, each of them creates tacit knowledge. Up to this point, each researcher plays the role of an ideator. When each of them converts tacit knowledge into explicit knowledge and combine the findings to produce an answer to the bigger problem and discover a drug for COVID-19, each researcher plays the role of a designer. The important point that needs to understand through this discussion is, the level of effectiveness of organisational level learning depends on the level of effectiveness of individual and group level learning. The level of effectiveness of group level learning depends

on the level of effectiveness of individual level learning. The link between these three levels of learning is discussed by Carrillo et al (2019). According to them, if an organisation is good at managing knowledge in a way that contributes to co-create value, the organisation should properly manage "individual competence through team collaboration to organizational learning" (Carrillo et al, 2019, p. 432).

Based on this background, the present study considers the level of effectiveness of organisational learning process is a result of the level of effectiveness of three types of learning processes. Hence, this study adopts the indicators proposed by Bontis et al (2002) to explain the level of effectiveness of organisational learning processes.

2.4.3.2.1 Individual level learning

The key aspect of individual-level learning is intuition (Bontis et al, 2002). The process of intuiting focuses on converting tacit knowledge into explicit knowledge and sharing that knowledge with others (interpreting). For individual-level learning to thrive, a firm should possess individuals with an experimental mindset. Ideators are a set of individuals with an experimental mindset. They are resource integrating actors that create tacit knowledge, convert tacit knowledge into explicit knowledge and encourage other actors to utilise that knowledge for resource integration (Lusch & Nambisan, 2015). Hence, it can be argued that the individual-level learning process impacts the role played by an ideator in a resource integration process.

Bruce et al (2019) discuss the role of learning in resource integration. Their research is on individual customers and how they integrate resources for subscription television usage. However, their findings can be applied for an organisation as well. According to them, learning is a critical activity that determines the resource integrating capability of an actor. Bruce et al (2019) conceptualise resource integration as a process consisting of six activities. Of the six activities, resource mastery develops skills required for future resource integration processes.

If any actor wishes to attain a higher level of resource mastery, it should focus on enhancing individual and collective learning capabilities because they drive resource mastery.

Vafeas et al (2016) discuss how agency-client resource integration efforts can be enhanced by highly effective individual and group level learning capabilities of the client. According to them, "a deficiency in task-related expertise and knowledge might be less of a problem if clients are motivated to learn from agencies" (Vafeas et al, 2016, p. 482) through individual and group level learning. If the responsible individuals and teams within client firms are not willing to learn in a situation of skill and knowledge deficiency, there is more likelihood that negative value for both client and agency will be created.

Thus, if a firm expects to increase its resource integration capability over time, it must have willingness and a plan to continuously improve its employees' experiential knowledge, skills, and abilities through individual and group level learning. Hence, the level of effectiveness of individual level learning can be a decisive factor in determining the development of resource integration capability of the firm over time.

2.4.3.2.2 Group level learning

The main objective of learning at group level is to develop a shared understanding regarding a team task among the individuals of a group that is formed to perform the task. Initially, individuals share their interpretations of the task and related matters within the group. Thereafter, the group has the possibility of analysing the task from many angles and come up with a collective outcome. This procedure of group level learning is extremely important to perform well in a resource integration process because each phase of the process demands for learning skills at group level to be applied in certain tasks.

In the matching phase, each actor tries to mobilise and enable higher resource density, and constructive interaction to access and adapt their own resources (Carida et al, 2019). Mobilising and enabling higher resource density are not easy tasks because the maximum density occurs when the best combination of resources is mobilised for a particular resource integration process (Lusch & Nambisan, 2015). Identification of the best combination of resources for the purpose of accessing and adapting is done through the knowledge generated by individual and group level learning take place during the interaction between the actors. From an organisation's perspective, during the matching phase, group level learning takes place among the employees of the firm (inter-organisational group level learning) or among the employees and the external actors such as suppliers, customers, and partner companies (intra-organisational group level learning) (Gummesson & Mele, 2010).

In the resourcing phase, actors focus on resource creation, integration, and resistance removal for the purpose of converting potential resources to specific benefits (Carida et al, 2019). Resource creation and integration require a certain set of skills and knowledge that are acquired through individual and group level learning. Resistance removal requires knowledge (gathered through individual and group level learning) on existing institutional arrangements to understand the causes of resistance. From an organisation's perspective, if it is to regularly create positive value at the end of a majority of the resource integration processes, it has to have highly effective individual and group level learning capabilities.

During the valuing phase, each actor assesses the individual value-in-context. The assessment process generates valuable information related to the performance of each actor in matching and resourcing phases. Any organisation with a highly effective individual and group level learning capabilities has the ability to generate findings that can be used to improve their performance in future resource integration processes.

Besides, as discussed in the previous section (i.e., section 2.4.3.2.1), Bruce et al (2019) and Vafeas et al (2016) discuss how group level learning contributes to improve the resource integration capability of a firm. Thus, this study positions the level of effectiveness of group level learning as a determinant of FL-RIE.

2.4.3.2.3 Organisational level learning

Organisational level learning is the process of translating the individual and group level learning into organisational routines that are hard to imitate and replicate by the competitors (Bontis et al, 2002). Hence, the development of organisational routines can be considered as an outcome of individual and group level learning. Furthermore, as discussed earlier, group level learning is an outcome of individual level learning. Therefore, individual level learning is the basic building block of the organisational learning processes. Existing research acknowledge that organisational learning is "a process of codification and communication by which individual knowledge is converted into organisational knowledge" (Franco & Haase, 2009, p. 630). Furthermore, organisational learning is known to be "incrementally or radically shaped and changed by individual learning" (Franco & Haase, 2009, p. 632). This is an indication that the level of effectiveness of organisational level learning is not a mandatory indicator to evaluate the level of effectiveness of organisational learning processes.

What about group level learning? This study retains group level learning as an indicator that determines the variation of the level of effectiveness of organisational learning process due to two reasons. Firstly, roles of resource integrating actors highlights the contribution of both inter- and intra-organisational group level learning to improve the resource integration capability of an actor. Secondly, group level learning is the link between individual and organisational level learning (Franco & Haase, 2009). Therefore, organisational level learning does not occur without group level learning.

Based on this backdrop, the present study considers the level of effectiveness of individual and group-level learning as the indicators that determine the variation of the level of effectiveness of organisational learning process.

2.4.3.3 Level of effectiveness of organisational transformation processes

Organisational transformation processes are required to reengineer, redesign, and redefine business systems (Dietz & Mulder, 1998). Teece and Pisano (1994) and Teece et al (1997) highlight the importance of adapting existing processes or adopting new processes by reengineering, redesigning and redefining business systems to accommodate necessary organisational transformations that are required to maintain the competitive position of a firm in a dynamic environment. From an S-D logic's perspective, adapting existing processes or adopting new processes by transforming institutional arrangements to accommodate necessary resource integration activities is an integral part of a resource integration process (Lusch & Nambisan, 2015) because the ability to transform institutional arrangements is necessary to perform well in each stage of a resource integration process.

Adaption of existing processes and adoption of new processes are driven by the changes conducted in the institutional arrangements. The role of institutional arrangements is "to develop ways to respond to uncertainties and influencing resource integration toward the intended and attractive value in context for the involved actors" (Aal et al, 2016, p. 620). According to Teece and Pisano (1994) and Teece et al (1997), an organisation's ability to respond to uncertainties depends on the effectiveness of its organisational transformation processes. Hence, from a firm's perspective, its level of effectiveness of transformation processes impacts its ability to drive a resource integration process toward the intended and attractive value in context for each involved actor.

Furthermore, according to Carida et al (2019), the first phase of a resource integration process (i.e., matching) is enabled or constrained by the existing institutional arrangements of the

service ecosystem. Institutional arrangements is a key factor which determines the effectiveness of coordination takes place between actors in the resourcing stage. Hence, institutional arrangements are key to enabling or inhibiting success in the resourcing stage. The final phase of a resource integration process (i.e., valuing) generates valuable insights for actors regarding their performances. By analysing the insights, actors have the option of proposing, negotiating, and implementing changes to internal and external institutional arrangements to ensure wellbeing and the continuation of the ecosystem.

Thus, it is evident that an organisation must respond to uncertainties by customising institutional arrangements in all three phases of a resource integration process. The level of effectiveness of a customisation conducted by an organisation is determined by the level of effectiveness of its organisational transformation processes. Hence, it is quite clear that the level of effectiveness of organisational transformation processes is one of the firm-level attributes that enables or constraints a firm's resource integration capability.

Firms that have the capability to assess the requirements for transformations and accomplish necessary alterations are referred to as high flex firms with high organisational change capacity. Furthermore, according to Volberda, Baden-Fuller and van den Bosch (2001), organisational change can be considered as a transformational renewal process. Therefore, the indicators of organisational change capacity have the capability to explain the level of effectiveness of organisational transformation processes (Andreeva & Ritala, 2016).

Several studies have investigated the indicators of organisational change capacity. Gravenhorst, Werkman and Boonstra (2003) were the first to introduce a set of sixteen components to explain organisational change capacity. Furthermore, they proposed five types of organisations based on the configuration, namely, innovative organisations, longing organisations, organisations with aged technology, organisations with a clumsy change

approach and cynical organisations. Measuring the change capacity of a firm using the index proposed by Gravenhorst et al (2003) is a two-step process. First, based on the configuration, the type of organisation should be determined. Second, the index should be used to measure the organisational change capacity.

Judge and Douglas (2009) proposed eight components to explain organisational change capacity, namely, trustworthy leadership, trusting followers, capable champions, involved mid-management, innovative culture, accountable culture, effective communication, and systems thinking. Compared to the conceptualisation proposed by Gravenhorst et al (2003) that demands a user to perform two-steps to use the conceptualisation, the one proposed by Judge and Douglas (2009) offers convenience because its usage is straightforward. Therefore, based on convenience and impact (number of citations), the present study adopts the conceptualisation proposed by Judge and Douglas (2009).

2.4.3.3.1 Trustworthy leadership

Trustworthy leaders have two characteristics, namely, securing the trust of middle and operational level employees, and giving them direction to achieve organisational objectives and goals (Judge & Douglas, 2009). Leaders with such characteristics are referred to as transformational leaders or servant leaders (Stone, Robert, & Patterson, 2004). Such leaders empower their followers to perform beyond expectations and think out-of-the-box by using peculiar approaches (e.g., readiness to experiment, the courage to discontinue projects, acceptance of uncertainties, risks and failures, etc), involve them in decision-making processes and recognise and appreciate different needs to develop personal potential (Avolio, Zhu, Koh & Bhatia, 2004; Breevaart et al, 2014). According to Williams, McWilliams, Lawrence, and Waheduzzaman (2020), transformational leaders have four components, namely, charismatic leadership or idealised influence, inspirational motivation, intellectual stimulation, and

individualised consideration. Let us discuss how these components contribute toward developing a higher level of FL-RIE.

Transformational leaders with idealised influence are capable of acting as role models because they maintain a higher level of ethical and personal conduct while doing the right thing (Williams et al, 2020). This behaviour persuades others to emulate them when they perform their on-the-job duties and responsibilities. This characteristic is quite important to ensure the wellbeing and the continuation of all actors in the ecosystem the firm operates in. During all three phases of a resource integration process, a firm has to propose changes to the existing institutional arrangements to enhance the end-results of a current resource integration process and future resource integration processes. When proposing the changes, the firm has to consider the wellbeing of the other actors as well. For example, if a proposed change to an institutional arrangement has the potential to create adverse environmental effects, the firm should not propose the change. There is a higher chance for a firm with unethical charismatic or transactional leaders to proceed with the proposal by thinking of the short-term gains. However, according to Williams et al (2020), if the leaders of a firm are transformational in nature, that firm never proceeds with unethical proposals since such firms are more worried about the wellbeing and the continuation of the whole ecosystem.

Transformational leaders that provide inspirational motivation train, motivate, and inspire followers by providing meaning and challenge to their work (Williams et al, 2020). This component encourages leaders to train, motivate, and inspire followers to envision the future in line with organisational objectives and goals and make decisions accordingly. This component has impacts all three stages of a resource integration process because whatever said and done during the interactions with the other actors of the ecosystem and when proposing changes to institutional arrangements, individuals who represent the firm should always take

decisions that are in line with the organisational objectives and goals. If not, there is a higher chance for the firm to create negative value in a majority of the resource integration processes the firm engages in.

Since transformational leaders provide intellectual stimulation, they "encourage followers to be creative and innovative, to question assumptions, and to look at problems and situations in new ways, even if their ideas are different from the leader's" (Williams et al, 2020, p. 257). In other words, transformational leaders empower their followers to make decisions constructively, even if the decision is different from the leader's. This component of transformational leaders allows a firm to perform better in all the stages of a resource integration process because intellectual stimulation encourages decision making through internal and external constructive discussions. Therefore, leaders should not always involve in dialogues with other actors of the ecosystem during various interactions take place in matching, resourcing, and valuing stages to propose, negotiate, and implement new changes to institutional arrangements because their followers are well trained to carry out constructive dialogues with external parties.

Furthermore, transformational leaders provide individualised consideration to their followers (Williams et al, 2020). This component of transformational leaders encourages them to engage with their followers and identify their performance gaps. In doing so, they have the option of proposing individualised development programs to followers and transforming them appropriately to perform their on-the-job duties and responsibilities better. Hence, this component of transformational leaders is responsible for the transformation of skills and knowledge of their subordinates to perform better in their daily resource integration efforts related to operations and projects.

Based on this background, it is evident that the level of effectiveness of transformational leadership is a factor that determines how a firm is engaged with the proposal, negotiation, and implementation of institutional arrangements during all three stages of a resource integration process. Furthermore, the level of effectiveness of transformational leadership transforms employees' skills and knowledge and allow them to perform better in resource integration processes. Hence, the level of effectiveness of trustworthy leadership of a firm can be considered as a determinant that enables a firm to achieve a higher level of resource integration effectiveness.

2.4.3.3.2 Trusting followers

Followers (middle or operational level employees depending on the scenario) should have the capability to constructively disagree or willingly follow a direction suggested by the leaders (Judge & Douglas, 2009). The most important aspect here is the constructiveness of the decisions of the followers because when the constructiveness of the decision making of the employees is higher, the frequency of value cocreation is also found to be on the higher side (Eisenberger, Fasolo & Davis-LaMastro, 1990).

Leaders of a firm mostly do not involve with tactical and operational level decision making processes. The employees make a majority of the decisions that do not fall under the strategic category. The same thing happens during a resource integration process as well. Hence, the constructiveness and the correctness of the decisions made by the employees in the middle level and the operational level are playing a vital role in determining whether the firm creates positive or negative value at the end of the resourcing stage. Apart from decisions related to coordination and learning, middle and operational level employees might make decisions related to institutional arrangements of an ecosystem. Changes to the institutional arrangements create transformations of various scales. Transformations do not create positive results all the

time. However, a firm needs employees who can create positive transformations through constructive and correct decision making to ensure the wellbeing and the continuation of the ecosystem. Vafeas et al (2016) and Vafeas and Hughes (2020) discusses how resource integration efforts fail when middle and operational level employees make decisions which are not constructive.

Thus, it is evident that the level of effectiveness of constructiveness and correctness of the decision-making process of the middle and operational level employees (i.e., trusting followers) contribute towards continuous development of resource integration effectiveness of a firm.

2.4.3.3.3 Capable change champions

Capable champions are an important group of personnel that assist organisations to carry out micro-scale (e.g., improve performance of an employee) to macro-scale (e.g., change in organisational structure) changes successfully (Judge & Douglas, 2009). According to extant literature, middle level managers (Howell & Higgins, 1990), strategic level managers, and external management consultants (Ginsberg, & Abrahamson, 1991) can become capable champions. Their role is to "start and follow through with change" (Knight, 2017, p. 295).

Capable champions play a vital role in carrying out the entire process of breaking, making, and maintaining institutional arrangements of resource integration. Identifying accurate changes that need to be done in institutional arrangements is a skill that should be possessed by transformational leaders, middle, and operational level employees. However, once a change is initiated, only capable change champions have the "capacity to cling tenaciously to their ideas and to persist in promoting them despite frequent obstacles and seemingly imminent failures" (Howell & Higgins, 1990, p. 41). In an organisation, only a limited number of middle level

managers, strategic level managers, and external management consultants have the skills and knowledge to act as capable change champions (Howell & Higgins, 1990).

According to Koskela-Huotari et al (2016, p. 2964), changes in institutional arrangements "allows actors to cocreate value in novel and useful ways by including new actors, redefining roles of involved actors, and reframing resources within service ecosystems". Existing actors in a service ecosystem have to perform a certain set of tasks when including new actors, and/or redefining roles of involved actors, and/or reframing resources within service ecosystem. Goal commitment is a must when performing a certain set of tasks (Vafeas et al, 2016). In reality, actors lose some of their commitment towards task performance over time (Vafeas et al, 2016). This is where the role of capable change champions is vital because are consistent with their goal commitment. Hence, they are extremely good at executing a proposed change to institutional arrangements successfully.

Thus, presence of capable change champions is vital to continuously develop firm-level resource integration effectiveness since they are extremely good at handling breaking, making, and maintaining institutional arrangements. Hence, this study considers presence of capable change champions as a determinant of FL-RIE.

2.4.3.3.4 Involved mid-management

Middle management is responsible for bridging the gap between the corporate and the operational level of a firm. They implement the business level strategies cascaded down from corporate strategies set by the corporate level managers. Furthermore, they are responsible for converting business-level strategies to operational level strategies while maintaining the strategic integration between three types of strategies (i.e., corporate-level strategies, business-level strategies and operational level strategies) (Wheelen & Hunger, 2012). Therefore, middle-level managers are a critical component of the organisational transformation of any scale.

Interactions of the three types of actors (i.e., ideators, designers and intermediaries) bring about suggestions for change of various scales. However, it is important to evaluate whether these suggested changes hamper or enhance strategic integration. If strategic integration is hampered, value generation effort can fail (i.e., value co-destruction). Hence, involved mid-management can be classified as an indicator that determines the variation of FL-RIE.

2.4.3.3.5 Innovative culture

An organisation with an innovative culture has the capability to institute norms of innovation and inspire and strengthen innovative activities through change champions (Judge & Douglas, 2009). Even though innovation cannot be considered a component of resource integration (because the word innovation denotes an output of a process), innovative culture can be an indicator which determines the variation of FL-RIE. As discussed by Lusch and Nambisan (2015), for resource integrating actors to combine existing resources with acquired goods or services to produce an innovative outcome (co-create value), they should be supported by an innovative culture that promotes adapting existing processes and adopting new ones.

2.4.3.3.6 Accountable culture

An organisation with an accountable culture will conscientiously administer resources and successfully meet pre-defined deadlines (Judge & Douglas, 2009). In an organisational setup, conscientious administration of resources is an important aspect of the resource integration process due to scarcity of resources (both operant and operand resources).

As mentioned previously, in an organisational context the resource integration process should be aligned with corporate, business and operational strategies (or the overall strategic plan) to ensure strategic integration. Each plan has its own timeline (Wheelen & Hunger, 2012). Meeting timelines is critical from a firm's point of view to maintain strategic advantage (Bendoly, Rosenzweig & Stratman, 2009). Hence, resource integrating actors should have the

capability to successfully meet pre-defined deadlines. Furthermore, they should be backed by an accountable culture at firm-level which makes individuals accountable for their own actions. Therefore, due to the influence on strategic integration, accountable culture can be considered as a variable that determines the nature of the outcome of a firm-level resource integration process (i.e., value co-creation or co-destruction). A firm with a highly accountable culture might possess higher FL-RIE; hence they would have more chance of co-creating value when pursuing their consumption goals and projects.

Accountable culture can be thus considered as an indicator that accounts for the variation of FL-RIE.

2.4.3.3.7 Effective communication

Distribution of information is the major role of communication in a service ecosystem (Gummesson & Mele, 2010; Hughes & Vafeas, 2018). Such distribution plays a vital role in carrying out breaking, making, and maintaining institutional arrangements of resource integration and continuously enhancing resource integration effectiveness. Hence, communication is a vital element of any transformation process taking place during the three stages of a resource integration process.

During the matching and resourcing stages, actors carry out transformational processes of various scales by breaking, making, and maintaining institutional arrangements for the purpose of creating positive value (Carida et al, 2019). When making changes to institutional arrangements, every actor should create shared understanding regarding changes. Communication facilitates dialog between actors and ultimately creates shared understanding. During the valuing stage, actors propose future-oriented changes to institutional arrangements with the intention of improving future resource integration efforts. Before implementation,

actors have to ensure a shared understanding regarding the changes among each actor through a healthy dialog that is driven by effective communication.

Hughes and Vafeas (2018), and Vafeas et al (2016) discuss how ineffective communication hampers resource integration efforts. According to them, when certain aspects of a resource integration process is not happening as planned, it is mandatory to change the institutional arrangements that govern problematic aspect. It needs to be done through effective communication among the involved actors. If proper communication does not happen between them to rectify these problematic aspects, there is a higher chance for certain actors to experience negative value in a majority of the future resource integration efforts. Smith (2013) cites ineffective communication as a contributing factor that prevents organisations from fulfilling their value propositions. Whenever a resource integration process does not progress as expected, actors tend to make changes to institutional arrangements that govern resource integration and attempt to rectify the issues that prevent the resource integration process from progressing. If proper communication does not take place between actors, they will not have sufficient information to make constructive decisions and this will lead "to not knowing, inability to make a decision and confusion" (Smith 2013, p. 1897).

Based on this background, it is evident that highly effective communication is required to carry out transformations of any scale effectively during a resource integration process. Therefore, this study considers effective communication as a first-order indicator of firm-level resource integration effectiveness.

2.4.3.3.8 Systems thinking

Systems thinking is a way of helping a person view various ecosystems from a broad perspective that includes seeing overall structures, patterns, and cycles, rather than seeing only specific events in the system (Currie & Galliers, 1999). According to Leban and Zulauf (2004),

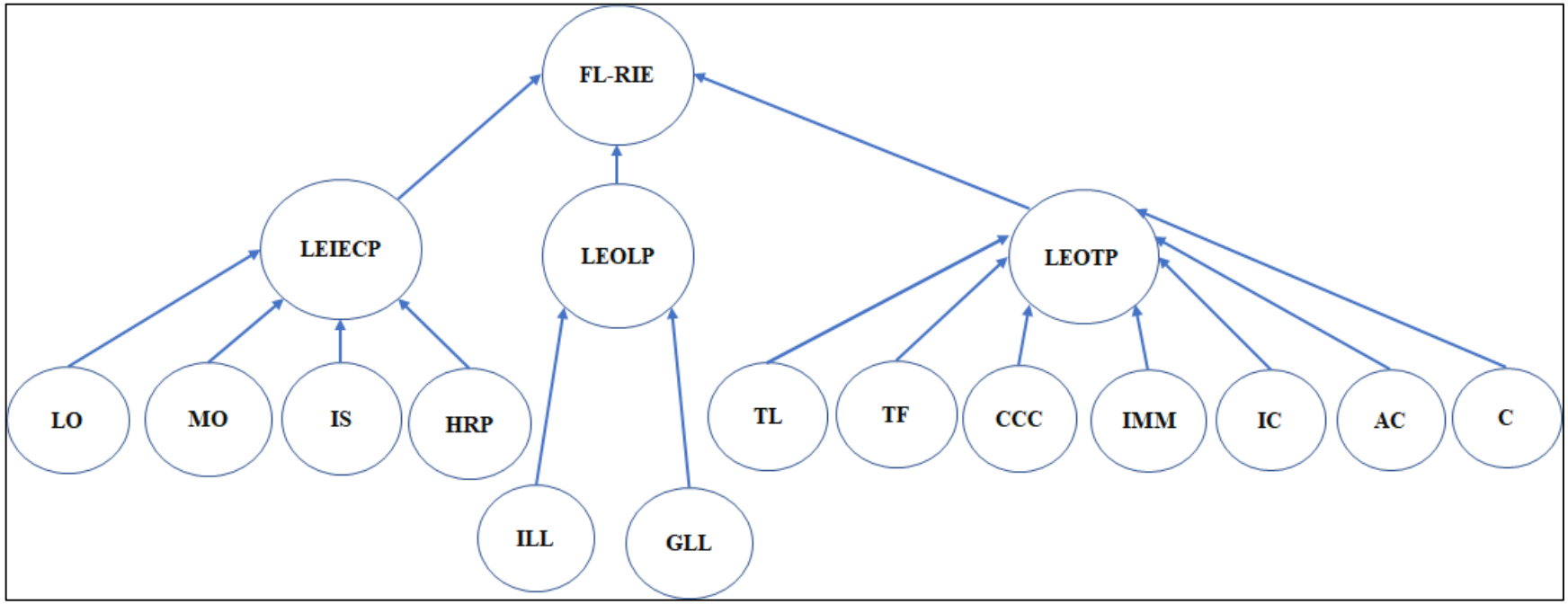
individuals with systems thinking follow a vision, understands what needs to be done, deal with reality, and learn from experience. Furthermore, Leban and Zulauf (2004) argue that transformative leaders have systems thinking ability since they possess four common aspects of a systems thinker. According to Howell and Higgins (1990), capable change champions also possess four common aspects. Hence, capable change champions can also be considered as systems thinkers. Therefore, since the conceptual domains of trustworthy leadership and capable change champions have the capability of capturing the conceptual domain of systems thinking, this study does not consider systems thinking as an indicator that determines the level of effectiveness of organisational transformational processes.

The present study thus considers the level of effectiveness of trustworthy leadership, trusting followers, capable change champions, involved-mid management, innovative culture, accountable culture and communication as the indicators that determine the variation in the level of effectiveness of organisational transformation processes. Since, the level of effectiveness of organisational transformation processes is an indicator or FL-RIE, the indicators of the level of effectiveness of organisational transformation processes can be considered as first-order indicators of FL-RIE. Hence, it can be argued that FL-RIE is a second-order multi-dimensional construct with thirteen first-order indicators and three second-order indicators. As discussed by Hollebeek (2019), FL-RIE is a property developed by a firm as a result of repeated involvement in resource integration processes over time. Hence, the stability of FL-RIE can only be achieved over time. A summary of the important properties of FL-RIE is shown in Table 2.2 and the proposed conceptualisation of the focal construct (i.e., FL-RIE) is depicted in Figure 2.1.

Table 2.2: Summary of the important properties of firm-level resource integration effectiveness

Factors Considered in Construct Conceptualisation	Description
The definition of FL-RIE	The degree to which observable and measurable organisational activities take place among a network of actors, potential/unrealised and existing resources are successful in co-creating value, creating new resources, and valuing the emergent properties to ensure the wellbeing and the continuation of the firm and the related actors when the firm is pursuing its daily activities and projects.
The property FL-RIE measures	A firm's resource deployment proficiency to create value, create new resources, and ensure the wellbeing and the continuation of the firm and the ecosystem the firm operates in.
The entity which FL-RIE applies to	A firm
Dimensionality	Multi-dimensional
Stability	Over time

Figure 2.1: Proposed conceptual framework for firm-level resource integration effectiveness



FL-RIE – Firm-level resource integration effectiveness; LEIECP – Level of effectiveness of internal and external coordination processes; LEOLP – Level of effectiveness of organisational learning processes; LEOTP – Level of effectiveness of organisational transformation processes; LO – Learning orientation; MO – Market orientation; IS – Intrapreneurial spirit; HRP – Effective human resource practices; ILL – Individual-level learning; GLL – Group-level learning; TL – Trustworthy leadership; TF – Trusting followers; CCC – Capable change champions; IMM – Involved mid-management; IC – Innovative culture; AC – Accountable culture; C – Effective Communication

2.5 Chapter summary

The main objective of Chapter two was to address the first objective of this research; to crystalise the conceptual domain of firm-level resource integration effectiveness (FL-RIE). The first objective was addressed by proposing a conceptual framework for FL-RIE (see Figure 2.1). The understanding generated by the proposed conceptual framework notifies firms the dynamic capabilities that they have to nurture if they are to deploy their network of stakeholders, potential resources and existing resources with a higher proficiency in various resource integration efforts.

However, there are several limitations. The purely conceptual nature of the proposed framework is a limitation because there is no guarantee regarding the actual existence of the proposed concept within a firm. Hence, there is a need for testing and validation of the framework. This can be done either qualitatively (e.g., through expert opinions and in-depth interviews with practitioners) or quantitatively (e.g., by following methodologies suggested by Churchill (1979), DeVellis (2012), and MacKenzie et al. (2011)). Furthermore, due to the conceptual nature of this study, the content validity of the proposed conceptual framework was not tested when developing the conceptual framework. This is a limitation that should be resolved before testing and validating the framework. Furthermore, the proposed conceptual framework shown in Figure 2.1 positions FL-RIE as a purely formative construct without formally specifying the measurement model. Hence, the framework must be formally specified using the methodology proposed by Jarvis, MacKenzie, and Podsakoff (2003) before testing and validating the framework. These limitations must be addressed by this study to achieve the second objective – test and validate the proposed conceptual framework. The following chapter discusses the methodology adopted to address the limitations and to test and validate the proposed conceptual framework.

3 RESEARCH METHODOLOGY

3.1 Chapter introduction

This chapter discusses the methodology adopted to fulfil the second objective of this study (i.e., test and validate the proposed conceptual framework). Once the second objective is achieved, the output is a tested and validated measurement scale that is capable of capturing the conceptual domain of FL-RIE. Hence, the steps taken to achieve the second objective are referred to as the scale development and validation procedure.

The methodology selected for this study is justified below. Several past studies have proposed methodologies to test and validate conceptual frameworks proposed for constructs in behavioural research (e.g., Churchill, 1979; DeVellis, 2012; MacKenzie et al, 2011). This study mainly considered the recommendations of MacKenzie et al (2011) because their procedure has overcome two limitations of other measurement scale development and validation procedures. However, recommendations of Churchill (1979), DeVellis (2012) and past studies on construct development and validation are also considered whenever required. Section 3.2 discusses the justification for selecting the methodology suggested by MacKenzie et al (2011). Furthermore, the following section presents the steps taken in scale development and validation procedure. Sections 3.3 to 3.10 discuss each step in more detail.

3.2 Scale development process

As previously discussed, this study mainly considered the scale measurement and validation procedure suggested by MacKenzie et al (2011) to test the empirical validity and propose a measurement scale for FL-RIE. A review of existing procedures revealed that Mackenzie et al's (2011) methodology has the capability to overcome the following limitations of other prevailing methodologies such as Churchill (1979) and DeVellis (2012).

1. Failure to adequately define the construct domain.
    - It is mandatory to have a step in a scale development procedure that explains what a researcher needs to do to adequately define a construct (MacKenzie et al, 2011). Even though other methodologies have highlighted the importance of adequately defining the construct domain, they have not gone into the level of explaining the steps of doing it. This oversight has created certain limitations in scales developed, for example. not specifying the conceptual theme sufficiently (MacKenzie et al, 2011).
2. Failure to correctly specify the measurement model.
    - In the past a majority of the constructs in social science are defined as reflective constructs (Petter, Straub & Rai, 2007). However, over time researchers realised that certain constructs have been miscategorised as reflective even though they are formative (MacKenzie et al, 2011; Petter et al, 2007). To overcome this issue, MacKenzie et al (2011) have introduced a step to specify the measurement model of the construct and explained how to determine the nature of the relationships. Neither Churchill (1979) nor DeVellis (2012) discuss this aspect in their methodologies.

The scale development procedure suggested by MacKenzie et al (2011) is a ten-step process. Ten steps of the suggested procedure fulfil six objectives of a scale development procedure, namely, conceptualisation of the construct (step 1), development of measures (steps 2 and 3), model specification (step 4), scale evaluation and refinement (steps 5 and 6), scale validation (steps 7, 8, and 9) and norm development (step 10). The ten steps are as follows.

1. Develop a conceptual definition for the construct
2. Generate items to represent the construct

3. Assess the content validity of the items
4. Formally specify the measurement model
5. Collect data to conduct the pre-test
6. Scale purification and refinement
7. Gather data from a new sample and re-examine scale properties
8. Assess scale validity
9. Cross-validate the scale
10. Develop norms for the scale

Development of the conceptual domain of FL-RIE has already been discussed in Chapter 2. As depicted in Figure 2.1, this study conceptualises FL-RIE as a second-order construct formed with thirteen first-order indicators and three second-order indicators. The methodology followed to develop the conceptual definition of FL-RIE is explained in section 2.3 in detail. Hence, the first step of MacKenzie et al's (2011) methodology is not discussed here.

Furthermore, this study does not cross-validate and develop norms for the scale. In other words, this study does not perform steps 9 and 10. Churchill (1979) nor DeVellis (2012) suggest cross validating the scale. Furthermore, hardly any past studies that have developed and validated scales using MacKenzie et al's (2011) methodology have carried out the cross validation of the scale (for example, see Craig, Thatcher, and Grover (2019) and Pellathy, Mollenkopf, Stank, and Autry (2019)). When considering widely used scales in social sciences such as SERVQUAL, the cross validation is carried out by other researchers (see Table 1 of Dabholkar, Thorpe, and Rentz (1996)). One reason for this could be the time constraint. Data has to be collected to cross validate a scale. If a researcher follows the methodology of MacKenzie et al (2011), the data has to be collected three times (i.e., for the pre-test, main study, and cross validation) if he/she cross validates the scale. Since data collection is a time-consuming

exercise, most past researchers have preferred collecting data only for the pre-test and main study, leaving cross validation of scales to future researchers. Hence, the current study also adopts this approach.

Hardly any past studies that developed and validated scales using MacKenzie et al's (2011) methodology developed norms (e.g., Craig et al (2019) and Pellathy et al (2019)). Furthermore, when considering widely used scales in social sciences (e.g., SERVQUAL), it is evident that a majority of those studies have also not developed norms for the scales. Therefore, this study did not perform the 10^{th} step of MacKenzie et al's (2011) methodology.

The rest of this chapter discusses the remaining seven steps of MacKenzie et al's (2011) methodology in-detail and how this study performs them to develop and validate a scale for FL-RIE.

3.3 Generate items to represent first-order indicators of FL-RIE

The second step is generating items to represent the conceptually defined construct. This study has to generate items that are capable of representing thirteen first-order indicators of FL-RIE. Generated items should have the capability to fully represent the conceptual domain of the construct (Churchill, 1979; MacKenzie et al, 2011).

A variety of sources can be used to generate items for first-order indicators (Churchill, 1979; MacKenzie et al, 2011). MacKenzie et al (2011) propose to explore the following sources to generate items.

- Previous theoretical and empirical research on the focal construct
- Suggestions from experts in the field
- Interviews and focus group discussions with representatives of the population

Researchers have the choice of selecting one or a mix of sources to generate items. The main objective they should fulfil is "to produce a set of items that fully captures all of the essential aspects of the domain of the focal construct, while minimizing the extent to which the items tap concepts outside of the domain of the focal construct" (MacKenzie et al, 2011, p. 304).

First, the present study aimed to generate items by exploring previous theoretical and empirical research on the focal construct and the first-order indicators. The literature search came across studies that focused solely on generating the initial set of items (e.g., Craig et al (2019) and Pellathy et al (2019)). However, this study decided to contact multiple experts to get their suggestions on generated items. Furthermore, if they had any suggestions about new items, they were also included after consulting the supervisory panel.

Since this study had the freedom of selecting the sources of generating items, the main focus of the present study was on generating items through previous research on the focal construct and first-order constructs. Since there is no rule of thumb for the number of experts that should be contacted during the item generation stage, considering the convenience, 3 experts were contacted to get their suggestions on the item pool. This study did not conduct any focus group discussions or interviews with any representatives of the population.

3.4 Assessment of content validity

Assessment of content validity is carried out for the purpose of understanding "the degree to which elements of an assessment instrument are relevant to and representative of the targeted construct" (Haynes et al, 1995, p. 238). During this step the researcher is supposed to identify the representativeness of each item and allocate them to the most suitable first-order indicator of the focal construct. If a particular item is found to be unrepresentative of any of the indicators, it should be abandoned. Furthermore, any item which was found to be repetitive should also be abandoned.

Past researchers have adopted various methods to assess content validity. One such method is to request a number of experts to indicate whether they agree or disagree whether an item belongs to a particular construct (Sweeney & Soutar, 2001; Vigneron & Johnson, 2004). Before requesting their opinion, researcher must provide working definitions for the focal construct, dimensions and sub-dimensions. At the end of this exercise, researchers abandon the items that the experts marked as unrepresentative and repetitive.

Another popular method of assessing content validity is by setting up a matrix that contains indicators and items. Indicators appear at the top of the columns and items appear at the start of each row. Experts are then asked to rate the relevance of each item to indicators using a five-point Likert scale. A one-way ANOVA test is conducted to find out whether each item can be categorised under different indicators.

Even though MacKenzie et al (2011) propose to use the second method to assess content validity, it only looks at the representativeness of the items and does not provide any clue about the repetitive items. Therefore, the present study decided to employ the first method to assess the content validity.

Before assessing content validity, it is recommended that phases of the assessment process should be planned (Patrick et al, 2011; Rubio, Berg-Weger, Tebb, Lee & Rauch, 2003). As the first step, this study decided to invite the investigators of the assessment process. Certain past studies argue that the investigators should be representatives of the population of interest (Anderson & Gerbing, 1988). Some studies argue that college students with knowledge on the subject of interest can also be considered as investigators (Hinkin & Tracey, 1999). Based on this background, this study decided to source investigators from both the population of interest and the researcher's business school.

By the time content validity was assessed, this study had already decided on the population of interest for the data collection (more clarity on this decision is available in section 3.6 – Pre-Test). Therefore, the researcher invited investigators who were capable of representing the study population. In doing so, this study expected to assess the content validity of the generated statement pool with respect to the entity which the construct applies (i.e., a small and medium sized enterprise). Furthermore, investigators from the industry were requested to make suggestions to improve the clarity of the statements. This study did not request the investigators from the industry to assess the content validity of the generated statement pool with respect to the property each statement represent. The investigators selected from the population did not fully understand the working definition of certain first-order indicators. MacKenzie et al (2011) suggest not to overburden the raters. Since, investigators from industry are not familiar with certain definitions for first-order indicators, they were not asked to assess the content validity of the generated statement pool with respect to the property each statement represent. Apart from industry experts, this study invited experts from academia. In doing so, this study expected to assess the content validity of the generated statement pool with respect to the entity and the properties.

With the involvement of experts from both industry and academia, five rounds of discussions were conducted to obtain a set of statements with content validity. A summary of the five rounds of discussion is shown below in Table 3.1.

Table 3.1: A Summary of the process carried out to test the content validity

Phase	Investigators	Main Objective	Mode of Communication
Phase 1	10 IT Professionals Who Work at SMEs	Evaluate content validity with respect to the entity	Skype
Phase 2	10 IT Professionals Who Work at SMEs	Evaluate content validity with respect to the entity Make suggestions to improve the clarity of the statements	Skype

Phase 3	5 Doctoral Students in Management	Evaluate content validity with respect to the entity	Face-to-Face
Phase 4	3 Doctoral Students in Management Information Systems	Evaluate content validity with respect to the properties	Face-to-Face
Phase 5	5 Doctoral Students (2 in Management and 3 in Management Information Systems	Eliminate repetitive statements and reduce the number of statements below 100	Face-to-Face

3.5 Formally specify the measurement model

This step is unique to MacKenzie et al's (2011) methodology because other popular methodologies on measurement scale development (e.g., Churchill, 1979; DeVellis, 2012) do not provide any recommendations to specify a measurement model. One of the major reasons for that is, in the past, by default, the relationships between a construct and indicators have been considered reflective (Petter et al, 2007). However, several studies have revealed how the past researchers have misspecified formative constructs (e.g., Diamantopoulos, Riefler & Roth, 2008; Jarvis et al, 2003; Petter et al, 2007). Misspecifying a measurement model has a negative knock-on effect because whoever uses the measurement model will produce false findings (Petter et al, 2007). Two reasons have significantly contributed to researchers' mis-specify formative constructs. First, when using covariance-based structural equation modelling (SEM) for data analysis, it is extremely difficult to employ formative constructs (Chin, 1998). Second, researchers have had this perception that formative constructs needlessly complicate measurement models (Howell, Breivik & Wilcox, 2007).

At present, with the popularity of variance-based SEM techniques (e.g., partial least squares analysis), analysis of measurement models with formative constructs has become less complicated. Therefore, Mackenzie et al (2011) and Petter et al (2007) suggest researchers who are developing measurement scales to specify measurement models logically without blindly

considering them as pure reflective measurement models. Hence, the researcher decided to formally specify the measurement model for this study before proceeding with the preliminary data collection, even though this study had the option of omitting this step by citing several past studies which have not carry out this step.

When reviewing past literature, the researcher was able to find only a single method to specify a measurement model. The method has been proposed by Jarvis et al (2003). Jarvis et al (2003) have suggested a four-step process to specify a measurement model. Four steps are as follows.

1. Determine whether the indicators are manifestations of the construct or predict the construct.
2. Determine whether dropping an indicator changes what the construct is measuring.
3. Determine whether there is any covariation among the indicators.
4. Determine whether the indicators of the construct have the same antecedents and consequences.

There is a limitation in the method proposed by Jarvis et al (2003). Since the decision rules of this method should be applied conceptually, if a single person determines the nature of the relationships among the focal construct and the other indicators, personal biases could hinder the outcome of this step. Hence, it is not ideal for a single researcher to engage in the process of specifying a measurement model (Petter et al, 2007). Therefore, this study invited three senior doctoral students in management to evaluate the measurement model of the study based on the four decision rules mentioned above. This study specified the measurement model in four phases. Section 6.2 to section 6.5 discuss the four phases in detail.

3.6 Pre-test

After formally specifying the measurement model, the next step is to collect data and conduct the pre-test to examine the psychometric properties of the scale (i.e., convergent validity, discriminant validity, and reliability). Churchill (1979) and DeVellis (2012) also recommend conducting a pre-test to purify and refine the scale by removing problematic statements before conducting a main study. As the first step of the pre-test, this study selected the population of the study and discussed justification for selecting this population.

3.6.1 The justification for selecting the population and specifying the unit of analysis

This study identified SMEs which use at least one commercial cloud computing technology as an ideal population for data collection. This section discusses the justification for the decision.

A visionary computer scientist, John McCarthy envisioned in the 1960s that future computing would be delivered as a utility just like water, gas, and electricity (Marinescu, 2017). In the first decade of the new millennium, McCarthy's prediction became a reality, because companies such as Amazon, SalesForce, Google, Microsoft, and IBM started providing their computing services as a utility. They used the internet to reach the end customers and deliver their solutions to customers. This relatively new phenomenon is called *cloud computing* (See Appendix D for a more detailed explanation).

This was perceived as a disruptive innovation in the domain of information and communication technology (ICT) (Ross & Blumenstein, 2015) because researchers and practitioners predicted that the purpose of cloud computing fits the definition of disruptive innovation (i. e., “to enable a larger population of less-skilled, less-wealthy people to do things in a more convenient, lower-cost setting, which historically could only be done by a specialist in less convenient settings” (Jönsson, 2017, p. 269)). The main purpose of cloud computing is to foster business

creation and competition by the reduction of the fixed cost of entry in ICT capital (Etro, 2009). Therefore, researchers on the business perspective of cloud computing argue that cloud computing technologies have the potential to flatten the competitive landscape by offering a set of benefits and advantages such as easy access to technology, increased collaboration, reduced opportunity cost, scalability and easy access to global markets that small and medium-sized enterprises (SMEs) didn't have in the past compared to their larger counterparts (Marston, Li, Bandyopadhyay, Zhang & Ghalsasi, 2011; Ross & Blumenstein, 2015; Yazn, Savvas & Feng, 2013). Furthermore, they argue that cloud computing technologies could more easily be adopted by SMEs than larger enterprises because SMEs have fewer or no legacy systems and fewer ingrained attitudinal, technical, operational, and organisational issues to deal with (Doherty, Carcary & Conway 2015; Marston et al, 2011).

Even though cloud computing looks a promising technological model for SMEs at the conceptual level, in practice, compared to large firms SMEs worldwide are struggling to adopt commercial cloud computing technologies (Al-Isma'ili, Li, Shen & He, 2015; Bildosola, Río-Belver, Cilleruelo & Garechana, 2015). SMEs in Australia are no exception. While more than 70% of large firms have already adopted at least one commercial paid cloud computing services successfully, the percentage remains less than 40% for the SMEs due to various challenges (Australian Bureau of Statistics, 2019).

Among the challenges, SMEs' knowledge deficiency on cloud technologies appears to be the most serious impediment to commercial cloud adoption in Australia (Australian Bureau of Statistics, 2019; Bildosola et al, 2015; Love, Irani, Standing, Lin & Burn 2005; MacGregor & Vrazalic, 2005; Senarathna, Wilkin, Warren, Yeoh, & Salzman, 2018). Hence, SMEs that use commercial cloud services can be considered as firms that have overcome the knowledge deficiency by acquiring necessary and appropriate knowledge for cloud adoption. According to Hollebeek (2019), acquisition of new knowledge is an important determinant of FL-RIE.

Therefore, firms that use commercial paid cloud services can be considered as firms with higher FL-RIE compared to the firms that do not use commercial cloud services.

Since it is possible to consider SMEs which already use any commercial cloud computing technology as firms with higher level of FL-RIE, this study decided to select SMEs in Australia which use any commercial cloud computing technology as the population for this study. This decision had two benefits. First, this study was able to validate the proposed conceptual framework by collecting data from a selected sample from the population. Second, the Australian SMEs that struggle to adopt commercial cloud services have the opportunity to identify the areas they need to nurture and strengthen if they are to improve their resource deployment proficiency and increase their chances of successfully adopting commercial cloud services they desire. Based on the population, the researcher specified *an SME in Australia which uses any paid cloud computing technology* as the *unit of analysis* of this study.

3.6.2 Sample and the sample size

Since the unit of analysis is *an SME in Australia which uses any paid cloud computing technology*, this study was supposed to collect data from a sample of SMEs. In the Australian context, organisations that have less than 200 employees are considered as SMEs (Australian Bureau of Statistics, 2019). The main question was, *from whom am I going to collect data from?* After having several rounds of discussions with supervisors and IT professionals contacted to test content validity, the researcher decided to collect data from IT professionals with experience in at least one completed commercial cloud adoption project in an SME setup. The main reason for considering IT professionals is, they have the best understanding of the adoption process takes place within an SME.

Next, the researcher focused on determining the sample size. Past researchers have come up with several arguments to determine the size of the sample. There is an argument which claims

that a sample size between 60 and 100 is sufficient to recover good population parameters if the communality values are on the higher side (>0.4) and factor loadings are strong (>0.5) (MacCallum, Widaman, Zhang & Hong, 1999; MacKenzie et al, 2011). If the communality values are low and factor loadings are weak, the researcher must go for a sample size between 300 and 500. This study decided to adopt this argument to determine the sample size because MacKenzie et al (2011) also recommends this argument.

3.6.3 Sampling approach

Probability and non-probability sampling are the two generally used sampling procedures employed for development and validation of scales (MacKenzie et al, 2011). When using probability sampling, every member of the target population has a chance of being selected (Saunders, Lewis, & Thornhill, 2012). When using non-probability sampling, it is not the case because the probability of each member of the target population being selected is unknown (Zikmund, Babin, Carr, & Griffin, 2010). Non-probability sampling is used in a scenario where there is an absence of sampling frame or operational ease is required (Aaker, 2011). Furthermore, several studies argue that non-probability sampling is more practical and cheaper than probability sampling (McDaniel & Gates, 2011; Zikmund, Alessandro, Winzar, Lowe, & Babin, 2014). When it comes to this study, as it was not possible to obtain a suitable sampling frame and due to the operational ease, convenience sampling was used as the sampling approach. It is a widely used non-probability sampling technique that has developed measurement scales for various social phenomena (e.g., Craig et al, 2019; Pellathy et al, 2019).

3.6.4 Formation of the instrument

Once the population was identified, the researcher shifted his focus toward forming the instrument that was used for the preliminary data collection. After having a discussion within the supervisors, the researcher decided to break the instrument/questionnaire into three sections.

The purpose of the first section is to filter IT professionals (i.e., respondents) that meet the following criteria.

- Have an academic qualification equal to or higher than a diploma in information technology
- Have experience in at least one completed commercial cloud computing solution adoption project in a small or medium-sized (SME) setup
- Played a decision-making role in any of those projects
- The SME he/she is referring to/recalling followed a rigorous evaluation process before making the purchase decision
- The SME he/she is referring to/recalling is located in Australia
- The SME he/she is referring to/recalling is a for-profit firm – There can be IT professionals who work for non-for-profit organisations which have successfully adopted paid cloud computing solutions and have less than 200 employees (e.g., government schools). Non-for-profit organisations, even though they have characteristics of SMEs are not considered as SMEs.

The second section presents the 89 statements which capture the conceptual domain of FL-RIE. Each statement is categorised under a relevant first-order indicator to capture the responses of the respondents.

The third section is dedicated to capturing the demographic information of the respondents and the SMEs they represent. The following demographic information were collected.

1. Gender
2. Working experience
3. Current position

4. Highest education qualification
5. Location of the SME (i.e., the state)
6. Size of the SME (i.e., number of employees)
7. Type of the commercial cloud service adopted by the SME
8. The industry of the SME

In social sciences research, demographic information is collected for the purpose of conducting descriptive data analysis. However, during the pre-test, this study collected demographic data not to conduct a descriptive data analysis, but for the purpose of understanding whether the respondents are keen to respond to eight questions related to demographics. Furthermore, in the same section, this study added a question which captures the name of organisation. It was added for the purpose of avoiding multiple responses from the same organisation.

The instrument/questionnaire used to collect data for the pre-test is available in Appendix E.

3.6.5 Data collection

This study decided to collect data through an online survey distributed via Facebook in closed user-groups with IT professionals as members. The researcher identified a Facebook group that had 556 IT professionals and contacted the administrator of the Facebook group to discuss the possibility of posting the advertisement, the project information sheet and the questionnaire. The administrator agreed to post the advertisement for one week followed by the project information sheet and a link to the questionnaire. He agreed to allow the project information sheet and the questionnaire link to remain and accessible for one month. Furthermore, he agreed to re-post both the project information sheet and the questionnaire link each week for one month. Once agreements were finalised, the advertisement was posted on August 2019. After one week of posting the advertisement, the project information sheet and the link from the questionnaire were posted on August 2019. The post was allowed to stay on the Facebook

page until the end of September 2019. By the end of September 2019, the researcher collected responses from 259 respondents (response rate = 46.60%).

However, when the data screening process was conducted, only 192 responses were recovered. Sixty-seven responses were discarded since some had an unacceptable number of missing values (three responses) and were unengaged (six responses) while the rest were second, third, or fourth response from the same SME. The dataset did not have any issues with outliers. This study conducted the data screening process using the IBM Statistical Package for Social Sciences (SPSS) 27 software package.

3.6.6 Assessment of multivariate normality of the indicators

Scale purification and refinement is performed with the use of multivariate statistical procedures and tests. Multivariate statistical procedures and tests assume that "each variable and all linear combinations of the variables are normally distributed" (Tabachnick & Fidell, 2013, p. 78). Therefore, prior to the scale purification and refinement, this study checked the first-order indicators for normality of distribution.

3.6.7 Scale Purification and Refinement

The purpose of scale purification and refinement is to eliminate the problematic items of the first-order indicators (Churchill, 1979; DeVellis, 2012; MacKenzie et al, 2011). To do that, it is recommended to conduct an exploratory factor analysis (EFA) followed by a reliability analysis (Churchill, 1979; DeVellis, 2012).

The purpose of the EFA is to test the following aspects of the collected dataset. A detailed description of the purpose of testing the following aspects is provided in Chapter 7, section 7.3.1.

1. Appropriateness of data (data adequacy)

2. Communality values
3. Factor structure.

The output of the EFA can be considered as a set of items that are tested for validity. Validity is "the accuracy of a measure or the extent to which a score truthfully represents a concept" (Zikmund et al., 2010, p. 660) and relates to the ability of a scale to measure what it is meant to measure (Aaker, 2011; Zikmund et al., 2014).

After completing the EFA, this study conducted a reliability analysis. Reliability is a measure that denotes the extent to which the findings are consistent if the research is repeated on another occasion by a different researcher (Saunders et al., 2012; Veal, 2005). To test reliability, internal consistency has been frequently used by past researchers. Internal consistency refers to the homogeneity of the measure and it concerns the process of assessing the extent to which multiple items of a scale are correlated if the scale is reflective (Tabachnick & Fidell, 2013; Zikmund et al., 2014). A detailed description of the reliability test conducted by this study is provided in Chapter 7, section 7.3.2.

3.7 Main study

The purpose of the main study is "to evaluate whether responses to the scale behave as one would expect if they were valid indicators of the focal construct" (Mackenzie et al, 2011, p. 317). Prior to conducting the evaluation, this study had to decide whether it is required to conduct a second round of data collection or not. According to MacKenzie et al (2011), if the items are eliminated, but not added or reworded, there is no requirement to collect new data. In the case of this study, during the pre-test, items were eliminated. However, none of the items were added or reworded. Hence, this study had to decide whether to collect a new set of data for the main study or not.

When the researcher went through several past studies, he realised that a majority of the studies have collected a new set of data for the main study. In fact, this study did not come across any study that has not collected a new set of data for the main study. Furthermore, Churchill (1979) and DeVellis (2012) also recommend collecting data for the main study. Therefore, a decision was made to collect a new set of data for the main study from the same population considered for the pre-test. Furthermore, the same criteria employed to determine the sampling approach and sample size during the pre-test were employed for the main study as well. Thus, the rest of this section discusses how this study conducted the data collection for the main study and carried out the assessment of scale validity.

3.7.1 Formation of the instrument

The questionnaire of the main study consists of three sections. The purpose of the first section is to filter IT professionals (i.e., respondents) that can meet the following criteria.

- Have an academic qualification equal to or higher than a diploma in information technology
- Have experience in at least one completed cloud computing solution adoption project in a small or medium-sized (SME) setup
- Played a decision-making role in any of those projects
- The SME he/she is referring to/recalling followed a rigorous evaluation process before making the purchase decision
- The SME he/she is referring to/recalling is located in Australia
- The SME he/she is referring to/recalling is a for-profit firm – There can be IT professionals who work for non-for-profit organisations which have successfully adopted paid cloud computing solutions and have less than 200 employees (e.g.,

government schools). Non-for-profit organisations, even though they have characteristics of SMEs are not considered as SMEs.

The second section presents the 46 shortlisted statements scale purification and refinement process. Each statement is categorised under a relevant first-order indicator to capture the responses. Apart from the 46 statements, 15 additional statements were included to capture the conceptual domain of the construct innovation for the purpose of testing nomological validity. According to Lusch and Nambisan (2015), resource integration process and its properties are the fundamental source of innovation. Therefore, FL-RIE can be considered as an antecedent of innovation. Hence, this study decided to use the variable innovation to test the nomological validity of the scale and adopted the 15-item scale developed by Nasution, Mavondo, Matanda, and Ndubisi (2011) to measure the variable.

Similar to the pre-test, the third section is dedicated to capturing demographic information and SMEs for the purpose of conducting descriptive data analysis. Furthermore, similar to the pre-test, a question which captures the name of the organisation was included for the purpose of avoiding multiple responses from the same organisation.

The instrument/questionnaire used to collect data is available in Appendix F.

3.7.2 Data collection

During the main study, the researcher contacted a Facebook group that had 2453 professionals. Since the researcher is also a member of that group, he knew that there are a considerable number of IT professionals in the group. Hence, the researcher contacted the administrator of the Facebook group and discussed the possibility of posting the advertisement, the project information sheet, and the questionnaire. The administrator agreed to post the advertisement for one week followed by the project information sheet and the link of the questionnaire. The administrator agreed to allow the project information sheet and the link of the questionnaire to

stay for 3 months. Furthermore, he agreed to re-post both the project information sheet and the link of the questionnaire each week within the period of three months. Once the agreements were finalised, the advertisement was posted on the Facebook group in January 2020. After one week of posting the advertisement, the project information sheet and the questionnaire link were posted in the Facebook group in January 2020. The post was allowed to stay on the Facebook page until the end of April 2020. The researcher was then able to collect responses from 262 respondents (response rate = 10.68%)

However, when the data screening process was conducted, only 209 usable responses were recovered. Fifty-three responses were discarded since some had an unacceptable number of missing values (18 responses) and were unengaged (11 responses) while rest (24 responses) were from the same SME. This study conducted the data screening process with the IBM Statistical Package for Social Sciences (SPSS) 27 software package.

3.7.3 Demographic profiles of the respondents

During the data collection, information related to respondent profiles were collected. They were collected for two reasons. First, data related to demographic profiles were used to determine sample representativeness. Second, data related to demographic profiles were used to determine whether some of the demographic factors might comprise important covariates in later analyses.

This study mainly analysed three demographic factors to test the representativeness of the sample. They are as follows.

1. Gender of the respondent
2. Size of the SME
3. Type of cloud computing technology/technologies used by the SME

National level statistics for the remaining demographic factors were not available. Therefore, this study did not use those factors to test the representativeness of the sample. Additional demographic data are presented in Appendix G.

3.7.4 Assessment of scale validity

This step is dedicated for the process of validating the construct. In other words, this step evaluates whether "responses to the scale behave as one would expect if they were valid indicators of the focal construct" (MacKenzie et al, 2011, p. 317). For the scale validation process, this study decided to use partial least squares (PLS) path modelling technique which is a variance-based structural equation modelling technique. The study could have used a covariance-based structural equation modelling technique. However, covariance-based techniques cannot be used when the conceptual model that must be validated has formative indicators. Since the conceptual model of this study has four formative indicators, this study decided to use PLS path modelling technique that has the capability to analyse models with formative constructs. Section 8.3 discusses how this study employed PLS path modelling technique to assess scale validity in detail.

Furthermore, since this study decided to use PLS path modelling, the researcher did not test the multivariate normality of the indicators prior to the assessment of scale validity because according to Rezaei, Shahijan, Amin, and Ismail (2016, p. 424), "PLS is based on the component construct concept (suitable for explaining complex relationships) and does not need strong assumptions, such as distributions, normality, and sample size". This claim is backed by studies such as Henseler, Ringle & Sinkovics (2009), Henseler (2010), and Sarstedt (2008).

3.8 Ethical considerations

Purpose of research ethics is ensuring "the standards of the researcher's behaviour in relation to the rights of those who become the subject of a research project, or who are affected by it" (Saunders et al., 2012, p. 680). Thus, the researcher addressed the importance of adhering to Swinburne University's ethical standards with respect to human research activity by submitting a research ethics application to Swinburne University Human Research Ethics Committee (SUHREC) in May 2019. The details of the research project, including participant recruitment, data collection procedures, description of anticipated risks, data storage and security, and informed consent were included in the application. The project (R/2019/203) received approval from the Swinburne University Human Research Ethics Committee on 20th August 2019 (see Appendix H). The research project was carried out adhering to the protocols mentioned in the research ethics application. Upon the completion of activities mentioned in the research ethics application, the researcher received final ethics clearance from the Swinburne research ethics team on 30th March 2021 to proceed with the thesis submission.

3.9 Chapter summary

This chapter discussed how the author planned to test and validate the proposed conceptual framework and develop a measurement scale for FL-RIE. According to this chapter, the testing and validation of the conceptual framework is a seven-step process (i.e., generate items to represent the construct, assess the content validity of the items, formally specify the measurement model, collect data to conduct the pre-test, scale purification and refinement, gather data from a new sample and re-examine scale properties, and assess scale validity). However, according to MacKenzie et al (2011), the testing and validation of conceptual framework should be a nine-step process. This study decided not to perform the final two steps

(i.e., cross-validate the scale and develop norms for the scale) of the methodology proposed by MacKenzie et al (2011). The rationale for the decision was discussed in section 3.2.

Section 3.3 discussed the overall plan executed during the item generation process to generate items capable of capturing the conceptual domain of each first-order indicator. Section 3.4 discusses how this study tested the content validity of the generated items with the support of personnel from the industry and academia. Section 3.5 presented the overall plan executed to determine the nature of the relationships between the construct, second-order indicators, first-order indicators, and items. During this step, the author received support from personnel from the academia. Section 3.6 discussed how this study collected data for the pre-test (i.e., population, unit of analysis, sampling size, sampling approach, formation of the questionnaire and data collection) and the properties tested during the pre-test (i.e., multivariate normality, appropriateness of the dataset, communality values, factor structure, and reliability values) to eliminate problematic items. Section 3.7 discussed how this study collected data for the main-study (i.e., population, unit of analysis, sampling size, sampling approach, formation of the questionnaire and data collection) and the properties tested during the main-study to re-examine the scale properties. This study predominantly used the recommendations of Henseler et al (2009) to re-examine the scale properties. The following five chapters discuss the processes this study carried out to execute each step discussed in the methodology and the findings.

4 ITEM GENERATION PROCESS

4.1 Chapter introduction

Generating items to represent the focal construct is the second step of the scale development and validation process. The ultimate goal here is to come up with a set of statements capable of fully capturing the conceptual domain of the first-order indicators of FL-RIE (Churchill, 1979; MacKenzie et al, 2011).

As discussed in section 3.3, this study had the choice of selecting either one source or a mix of sources to generate items. Therefore, the present study considered two sources, namely, previous theoretical and empirical research on the indicators and suggestions of experts. Out of the two, the main source of generating statements was previous research on the first-order indicators. Since there is no rule of thumb for the number of experts that should be contacted during the item generation stage, considering convenience, three senior doctoral students in management were contacted to get their suggestions on the item pool. In the past, Vigneron and Johnson (2004) have used doctoral students as experts for item generation.

To generate statements, this study referred to previous research on indicators. The process carried out in the first phase of the item generation process and outcomes are discussed in section 4.2. Second, doctoral students' suggestions were taken for item generation. The process carried out in the second phase of the item generation process and outcomes are discussed in section 4.3. A summary of the item generation process is presented at the end of the chapter, followed by the chapter summary in section 4.4.

4.2 Phase 1 - Generating statements by referring to previous research

When generating statements by referring to previous research, this study searched for already existing measurement scales of first-order indicators of FL-RIE. Scopus and Google Scholar

search engines were used to search measurement scales. When multiple measurement scales were identified for a single indicator, this study ranked each measurement scale based on the number of citations. In all instances the researcher selected the highest cited study for the statement generation process. Furthermore, the researcher went through the remaining measurement scales to check whether they differed significantly from the number one ranked measurement scale. If any of the scales differed, those measurement scales were also adopted for the statement generation process because the purpose of step 2 is to fully capture the conceptual domains of the first-order indicators of FL-RIE and ensuring the comprehensiveness and inclusiveness of FL-RIE (MacKenzie et al, 2011).

During the search process, this study was unable to find standalone measurement scales for five indicators, namely, individual-level learning, group-level learning, trusting followers, involved mid-management and accountable culture. However, there were instances where those indicators have been used as first-order indicators in various measurement scales. Hence, this study adopted the appropriate sections of those measurement scales to represent the conceptual domains of individual learning, group level learning, trusting followers, involved mid-management and accountable culture. Table 4.1 summarises the number of statements which were generated to capture the conceptual domains of the five indicators and the sources which those statements were captured from.

When generating statements for learning orientation, market orientation, intrapreneurship, effective human resource practices, trustworthy leadership, capable champions, innovative culture, and communication multiple measurement scales were used. Section 4.2.1 to section 4.2.8 discuss how the statements were generated for the eight indicators. Furthermore, a summary of the statement generation process is shown in Table 4.1.

4.2.1 Statement generation for learning orientation

There are readily available scales capable of capturing the conceptual domain of firm-level learning orientation (e.g., Calantone et al, 2002; Sinkula, Baker & Noordewier, 1997). Sinkula et al's (1997) scale is the second most widely used measurement scale on learning orientation. They define learning orientation as a first-order construct with three indicators, namely, commitment to learning, shared vision/purpose and open-mindedness. Furthermore, the scale of Sinkula et al (1997) has eleven statements.

Calantone et al (2002) propose a modification to Sinkula et al's (1997) scale by introducing an additional first-order indicator, namely, intra-organisational knowledge sharing that is operationalised with five statements. The modified measurement scale is the most widely used scale on learning orientation. Therefore, this study decided to consider the additional five statements. Based on this background, altogether this study was able to generate sixteen statements to capture the conceptual domain of learning orientation.

4.2.2 Statement generation for market orientation

Even though the concept of market orientation has been around since the 1970s, Kohli, Jaworski and Kumar (1993) were the first group of researchers to propose a measurement scale for the concept. Their scale consists of three first-order indicators (i.e., intelligence generation, intelligence dissemination and responsiveness) that are operationalised with twenty statements. In another study, Jaworski and Kohli (1993) propose a modification to the measurement scale proposed by Kohli et al (1993). The proposed modification conceptualised market orientation as a first-order construct consists of four indicators (i.e., intelligence generation, intelligence dissemination, response design and response implementation) that are operationalised with thirty-two statements. A review of past literature reveals that Jaworski and Kohli's (1993) measurement scale has a better acceptance among the academics than Kohli et al's (1993)

measurement scale. Therefore, this study adopted the thirty-two statements proposed by Jaworski and Kohli (1993) to capture the conceptual domain of market orientation of a firm.

I came across two other studies (i.e., Gray, Matear, Boshoff & Matheson, 1998; Harris, 2002) that propose measurement scales to measure integrated market orientation of a firm. Gray et al (1998) conceptualise market orientation as a first-order construct consists of five indicators (i.e., customer orientation, competitor orientation, inter-functional co-ordination, responsiveness, and profit emphasis) that are operationalised with twenty statements. Harris (2002) conceptualises market orientation as a construct consists of three indicators (i.e., inter-functional co-ordination, customer orientation and competitor orientation) that are operationalised with fifteen statements. Since both the scales are different to each other and different to what Jaworski and Kohli (1993) propose, this study considered the statements in the scales of Gray et al (1998) and Harris (2002). Thus, this study was able to generate sixty-seven statements to capture the conceptual domain of market orientation of a firm.

4.2.3 Statement generation for intrapreneurship

In the past, multiple studies have developed measurement scales to measure intrapreneurial spirit of a firm. Out of those scales, the scale developed by Antoncic and Hisrich (2001) is the most widely accepted scale among academics. They define intrapreneurship as a first-order construct consists of four indicators (i.e., new business venturing, innovativeness, self-renewal and proactiveness) that are operationalised with 21 statements.

Furthermore, this study came across two other studies (i.e., Nasution & Mavondo, 2008; Vargas-Halabí, Mora-Esquivel & Siles, 2016) which propose measurement scales for intrapreneurship. They were also adopted to generate statements because they differed significantly from each other and the scale developed by Antoncic and Hisrich (2001). Nasution and Mavondo (2008) conceptualise intrapreneurship as a first-order construct

consisting of three indicators (i.e., autonomy, risk taking and proactiveness) that is operationalised with thirteen statements. Vargas-Halabí et al (2016) conceptualise intrapreneurship as a first-order construct consists of seven indicators (i.e., exploitation of opportunities, pro-innovation, idea stimulation, planning, resource management, network building and interaction with external parties) that are operationalised with 21 statements. Based on this background, this study was able to generate 55 statements to capture the conceptual domain of intrapreneurship.

4.2.4 Statement generation for effective human resource practices

The search process returned two mutually exclusive measurement scales that can be used to measure the effective human resource practices of a firm (i.e., Knies, Leisink & Schoot, 2017; Nasution & Mavando, 2008). Therefore, this study adopted both the measurement scales to ensure comprehensiveness and inclusiveness of the statement generation process.

Knies et al (2017) conceptualise effective human resource practices as a first-order construct consisting of three indicators (i.e., tailor-made arrangements, support of employees' commitment and support of employees' career development) that are operationalised with eleven statements. Nasution and Mavando (2008) conceptualise effective human resource practices as a first-order construct consisting of two indicators (i.e., job-related and reward-related human resource practices) that are operationalised with ten statements. Hence, in total, this study was able to generate 21 statements to define the conceptual domain of effective human resource practices.

4.2.5 Statement generation for trustworthy leadership

As discussed in sub-section 2.4.3.3.1 in Chapter 2, there are two types of trustworthy leaders, namely, transformational leaders and servant leaders. Therefore, this study searched for

measurement scales capable of measuring transformational leadership qualities and servant leadership qualities.

Ehrhart (2004) proposed a measurement scale to measure servant leadership qualities. Apart from Ehrhart's (2004) scale, this study was unable to find another scale capable of measuring servant leadership qualities from a reliable source. Therefore, this study adopted the fourteen statements suggested by Ehrhart (2004) to capture the conceptual domain of trustworthy leadership qualities.

Since transformational leadership qualities are also a part of trustworthy leadership, this study searched for measurement scales capable of measuring transformational leadership qualities. The search process returned a scale proposed by Callow, Smith, Hardy, Arthur and Hardy (2009). Apart from that source, this study was unable to find a scale which measures transformational leadership qualities. Therefore, this study adopted the thirty-one statements proposed by Callow et al (2009) to capture the conceptual domain of trustworthy leadership qualities.

Apart from Callow et al (2009) and Ehrhart (2004), Judge and Douglas (2009) also propose four statements to capture the conceptual domain of trustworthy leadership qualities. Judge and Douglas (2009) was not returned as a search result. However, since this study adopted the indicators of level of effectiveness of organisational transformation processes from Judge and Douglas (2009), four statements were considered. Thus, this study was able to generate fifty statements to capture the conceptual domain of trustworthy leadership.

4.2.6 Statement generation for the level of effectiveness of capable change champions

During the search process, this study came across only a single measurement scale to measure the level of effectiveness of capable change champions in the firm-level. Warrick (2009) proposes a measurement scale consists of ten statements to measure the level of effectiveness

of capable change champions. Furthermore, this study adopted four statements proposed by Judge and Douglas (2009) to capture the conceptual domain of level of effectiveness of capable change champions because it was the study which the indicators of level of effectiveness of organisational transformation processes were adopted. Hence, the search process was able to generate fourteen statements to capture the conceptual domain of the level of effectiveness of capable change champions.

4.2.7 Statement generation for innovative culture

When searching for measurement scales to generate statements for innovative culture this study faced a dilemma. The search results returned two types of measurement scales. One type is proposed for measuring innovativeness while the other type is proposed for measuring innovative culture. Initially this study was not sure whether to adopt both types of measurement scales or not. However, when the researcher came across the study of Škerlavaj, Song and Lee (2010) the dilemma was solved. Škerlavaj et al (2010) define innovativeness as a combination of innovative culture and innovations. This study considers innovative culture as a first-order indicator of FL-RIE; but not innovation (see section 2.4.3.3.5 for a clarification). Hence, this study did not consider measurement scales of innovativeness for the item generation process.

The researcher came across two mutually exclusive studies which have proposed scales for innovative culture (i.e., Rao & Weintraub, 2013; Škerlavaj et al, 2010). Out of the two, this study adopted only Škerlavaj et al (2010) because Rao and Weintraub (2013) have not adopted an acceptable methodology with proper academic rigour to develop their measurement scale. Škerlavaj et al (2010) propose a scale consists of five statements to capture the conceptual domain of innovative culture of a firm. Hence, this study adopted those five statements.

4.2.8 Statement generation for communication

This study was unable to find a measurement scale which measures the construct communication in the firm-level. However, the researcher was able to find a measurement scale which measures the effectiveness of communication which takes place between managers and employees. It has been developed by Johlke and Duhan (2000). Since communication between managers and employees is a type of communication which happens in a firm, this study adopted fourteen statements in the measurement scale.

Apart from that, this study adopted four statements suggested by Judge and Douglas (2009) to capture the conceptual domain of communication in the firm-level. Hence, altogether this study was able to generate eighteen statements to capture the conceptual domain of communication in the firm-level.

4.3 Phase 2 – Generating statements by considering the suggestion of the experts

During this phase, the researcher requested three senior doctoral students in management to review the generated statement pool and check the comprehensiveness and inclusiveness. In other words, the researcher requested them to check whether the generated statement pool captures the conceptual domain of each first-order indicator of FL-RIE. The researcher clearly requested them not to focus on the content validity, but to focus on the comprehensiveness and the inclusiveness of the already generated statements.

After reviewing the generated statement pool, they proposed two suggestions. First, they requested to add another first-order indicator, namely, *absorptive capacity* to represent the conceptual domain of the level of effectiveness of organisational learning processes. They argued that absorptive capacity is one of the key factors which forms the effectiveness of organisational learning process. It is the organisational attribute which acquires the knowledge

which fuels creativity and learning within a firm (Soo, Devinney & Midgley, 2007). When the absorptive capacity of a firm is higher, the effectiveness of learning in the firm is also higher (Soo et al, 2007). Furthermore, according to Laud et al (2015), resource internalisation is one of the resource integration practices that actors perform during all three phases of a resource integration process to transit acquired explicit knowledge to tacit knowledge (acquisition), transform newly created tacit knowledge back to explicit knowledge that can be understood by the others (assimilation), and eventually merge newly created knowledge into routinised actions of the organisation over time (exploitation). Acquisition, assimilation, and exploitation of external knowledge for the benefit of an organisation is referred to as *organisational absorptive capacity* (Cohen & Levinthal, 1990). According to Cohen and Levinthal (1990), individual and group level learning are not sufficient to develop highly effective organisational learning processes because learning does not take place without the accumulation of knowledge. Knowledge accumulation capability of a firm is determined by the firm's organisational absorptive capacity. Thus, the researcher realised that extant literature also supports the suggestion of the three doctoral students. Therefore, this study added absorptive capacity as a first-order indicator of FL-RIE.

Second, they explained how extant literature has positioned intra- and inter-team learning as part of group-level learning. Since Bron, Endedijk, van Veelen and Veldkamp (2018) also endorse the argument of the three experts, this study considered intra- and inter-team learning as part of group-level learning.

Next, this study focused on generating statements for absorptive capacity, intra-team learning and inter-team learning.

4.3.1 Statement generation for absorptive capacity

When the researcher searched for a measurement scale which measures absorptive capacity of a firm, this study came across two major studies (i.e., Flatten et al, 2011; Jimenez-Barrionuevo, Garcia-Morales & Molina, 2011). They are similar studies because both the studies have defined absorptive capacity as a first-order indicator conceptualised with four indicators (i.e., acquisition, assimilation, transformation, and exploitation). Even though the number of statements is different in both the scales, the conceptual domain both the scales are trying to capture is similar. Flatten et al (2011) had more citations and the three doctoral students also recommended it over Jimenez-Barrionuevo et al (2011). Therefore, this study ignored the measurement scale developed by Jimenez-Barrionuevo et al (2011) and adopted the measurement scale developed by Flatten et al (2011) that consists of fourteen statements.

4.3.2 Statement generation for intra- and inter-team learning

The search process returned one study that has developed a measurement scale to measure intra-team learning and inter-team learning (i.e., Bron et al, 2018). Bron et al (2018) propose eighteen statements to capture the conceptual domain of intra-team learning and seven statements to capture the conceptual domain of inter-team learning. Based on this background, at the end of the statement generation process for intra-team learning and inter-team learning, 25 statements were added to capture the conceptual domain of group-level learning.

At the end of the phase 2, this study completed the statement generation process. Both the phases generated 306 statements. The summary of the statement generation process is shown in the Table 4.1. Furthermore, it shows the contribution of each indicator to form 306 statements.

Table 4.1: Summary of the statement generation process

Second-Order Indicator of FL-RIE	First-Order Indicator of FL-RIE	Indicators of the First-Order Indicator of FL-RIE	Number of Statements	Number of Statements Capturing the First-Order Indicator of FL-RIE	Source
Level of Effectiveness of Internal and External Coordination Processes	Learning Orientation	Commitment to Learning	4	16	Calantone et al (2002); Sinkula et al (1997)
		Shared Vision/Purpose	4		
		Open-Mindedness	3		
		Intra-organisational Knowledge Sharing	5		Calantone et al (2002)
	Integrated Market Orientation	Customer Orientation	5	67	Gray et al (1998)
		Competitor Orientation	3		
		Interfunctional Co-ordination	6		
		Responsiveness	2		
		Profit Emphasis	4		
		Interfunctional Co-ordination	5		Harris (2002)
		Customer Orientation	5		
		Competitor Orientation	5		
		Intelligence Generation	10		Jaworski and Kohli (1993)
		Intelligence Dissemination	8		
		Response Design	7		
		Response Implementation	7		
	Intrapreneurship	New Business Venturing	4	55	Antoncic and Hisrich (2001)
		Innovativeness	4		
		Self-Renewal	10		
		Proactiveness	3		
		Exploitation of Opportunities	3		Vargas-Halabí et al (2016)
		Pro-innovation	3		
		Idea Stimulation	3		
		Planning	3		

		Resource Management	3		
		Network Building	3		
		Interaction with External Parties	3		
		Autonomy	3		Nasution and Mavondo (2008)
		Risk Taking	5		
		Proactiveness	5		
	Effective human resource practices	Job-Related	7	21	Nasution and Mavondo (2008)
		Reward-Related	3		
		Tailor-Made Arrangements	3		Knies et al (2017)
		Support of Employees' Commitment	4		
		Support of Employees' Career Development	4		
Level of Effectiveness of Organisational Learning Processes	Individual-Level Learning		5	5	Bontis et al (2002)
	Group-Level Learning		5	5	Bontis et al (2002)
		Intra-Team Learning	18	18	Bron et al (2018)
		Inter-Team Learning	7	7	
	Absorptive Capacity	Acquisition	3	14	Flatten et al (2011)
		Assimilation	4		
		Transformation	4		
		Exploitation	3		
Level of Effectiveness of Organisational Transformation Processes	Trustworthy Leadership	Servant Leadership Qualities	14	49	Ehrhart (2004)
			4		Judge and Douglas (2009)
		Individual Consideration	4		Callow, Smith, Hardy, Arthur and Hardy (2009)
		Inspirational Motivation	4		
		Intellectual Stimulation	4		
		Fostering Acceptance of Group Goals and Promoting Teamwork	3		

		High Performance Expectations	5		
		Appropriate Role Model	5		
		Contingent Reward	6		
	Trusting Followers		4	4	Judge and Douglas (2009)
	Capable Champions		4	14	Judge and Douglas (2009)
			10		Warrick (2009)
	Involved Mid-Management		4	4	Judge and Douglas (2009)
	Innovative Culture		5	5	Škerlavaj, Song and Lee (2010)
	Accountable Culture		4	4	Judge and Douglas (2009)
	Effective Communication		4	18	Judge and Douglas (2009)
		Effective Communication with the Manager/Team Lead	14		Johlke and Duhan (2000)
				Total = 306	

4.4 Chapter summary

The aim of this chapter was to come up with a set of statements capable of fully capturing the conceptual domain of the first-order indicators of FL-RIE. Based on the recommendation of past studies, this study selected previous theoretical and empirical research on the indicators and suggestions of the experts as the sources for generating items.

As discussed in section 4.2, this study generated 267 statements by going through previous theoretical and empirical research on first-order indicators. Subsequently, the author invited three senior doctoral students in management to comment on the comprehensiveness and inclusiveness of the generated item pool. After examining the item pool, they suggested to include absorptive capacity as an indicator of the level of effectiveness of organisational

learning processes. Furthermore, senior doctoral students suggested to consider inter-team learning and intra-team learning as indicators of group-level learning. The author accepted their suggestions since they had a strong theoretical backing. Hence, 39 additional statements capable of capturing the conceptual domains of absorptive capacity, inter-team learning, and intra-team learning were generated by going through previous theoretical and empirical research on the three indicators. At the end of the item generation process, the author was able to generate 306 statements that are potentially capable of capturing the conceptual domain of FL-RIE.

5 ASSESSMENT OF CONTENT VALIDITY

5.1 Chapter introduction

In this chapter content validity is assessed in order to understand "the degree to which elements of an assessment instrument are relevant to and representative of the targeted construct" (Haynes et al, 1995, p. 238). During this step, this study mainly focused on the representativeness of each individual statement generated during the item generation process and abandoning repetitive items. This study invited investigators from industry and academia to undertake this task. content validity was tested with a five-step process.

During the first phase, content validity of the statement pool with respect to the entity (i.e., an SME) was tested. To carry out the first phase, this study received the support of 10 information technology professionals who work at SMEs. During the second phase, this study tested the content validity of the statement pool with respect to the entity and requested the investigators to comment on the clarity of the statements. To carry out the second phase, once again the researcher invited 10 information technology professionals who work at SMEs. To carry out the third phase, this study received the support of five senior doctoral students in management. They were requested to test the content validity of the statement pool with respect to the entity. During the fourth phase, for the first instance, the content validity of the statement pool was tested with respect to the properties they are related. This study received the support of three senior doctoral students in management information systems to carry out the fourth phase. During the fifth and final phase, 100 or less appropriate statements that represented the conceptual domain of the focal construct were selected. During the final phase, this study received the support of three senior doctoral student in management information systems and two senior doctoral students in management. The rest of this chapter discusses each phase in detail and summarises the outcomes in Table 5.5.

5.2 Phase 1 – Assess content validity with experts from industry (round 1)

During the first phase, this study invited ten IT professionals who worked for SMEs and had experience in at least one paid cloud adoption project in an SME setup. With the support of the IT professionals, this study planned to assess the content validity of the statement pool with respect to both the entity and the properties. Therefore, the researcher provided the investigators with a working definition for each of the indicators (both first-order and second-order indicators) and FL-RIE. However, from the comments received, the researcher realised that some of the investigators had an issue of digesting the meanings of certain indicators. Therefore, the researcher decided to assess the content validity of the statement pool only with respect to the entity during phase 1.

Once the assessment was started, the researcher administered the process and investigators were taken through each statement. When assessing the content validity of each statement, the following evaluation criteria shown in Table 5.1 suggested by Patrick et al (2011) were used.

Table 5.1: Criteria used in phase 1 and phase 2 to assess the content validity

Criteria	Statement Meets Criteria (Yes/No)
The statement is relevant to all the members of the target population.	
The content of the statement is appropriate for the recall period.	
The content of the statement is appropriate for the mode of administration	

When evaluating each statement, first, the investigators were requested to determine whether the statement is relevant to all the members of the target population. Then they were requested to decide whether the respondents will be able recall the period that they were engaged with the project and respond to the statement. Finally, they were requested to decide whether the statement is appropriate for a survey type questionnaire. If all the investigators agreed that a particular statement has the capability to meet all the three criteria, such statements were

retained. By doing that this study was able to abandon 86 statements and retain 220 statements out of the initial 306.

5.3 Phase 2 – Assess content validity with experts from industry (round 2)

The focus of this phase was also to assess the content validity of the remaining statement pool with respect to the entity. From an evaluation point of view, during the second phase, the researcher focused on two aspects. First, this study focused on evaluating the statements based on the criteria mentioned in Table 5.1. Second, this study focused on getting the investigators to make appropriate changes to the statements to increase the clarity of them. During this phase, another group of ten IT professionals were invited to become investigators. They also worked for SMEs at that time and had experience in at least one paid cloud adoption project in an SME setup.

Similar to the previous phase, in this phase also, if all the investigators agreed that a particular statement has the capability to meet all the three criteria, such statements were retained. By doing that this study was able to abandon 23 statements and retain 197 statements out of the 220 statements retained from phase 1.

As mentioned earlier, during this phase, the researcher requested investigators to comment on the clarity of each statement and make suggestions for changes if there are any. As a result, investigators suggested changes to 17 statements. One of the changes they suggested was to replace the word *departments* with *teams* because SMEs in Australia consider using the term teams rather than departments to refer a department or a division (e.g., engineering team, marketing team, etc). Furthermore, they raised a concern regarding the indicators; *involved middle-management*. According to investigators, there is a less chance of having an involved middle-management in an SME in Australia. In their firms, there are hardly any middle management teams even though there are team leads. However, the researcher did not omit

involved middle-management because the main objective of this phase is to assess the content validity of the statement pool with respect to entity.

5.4 Phase 3 – Assess content validity with experts from academia (round 1)

During this phase, the researcher invited five senior doctoral students in management to review the remaining statement pool with respect to the entity (i.e., an SME). At the start of the assessment, the researcher explained the sampling framework to provide them with an understanding of the target population and the entity. The researcher did not provide the working definitions of definitions for indicators and FL-RIE to the investigators because this study wanted the investigators to provide their feedback on the suitability of the remaining statements to capture various information regarding an SME. Thus, they were requested to evaluate the content validity of the remaining statement pool based on the following evaluation criteria borrowed from the study of Patrick et al (2011).

Table 5.2: Criteria used in phase 3 to assess the content validity

Criteria	Statement Meets Criteria (Yes/No)
The statement is relevant to all members of the target population	
The statement is worded in a manner consistent with the expressions used in the academia	
The content of the statement is appropriate for the mode of administration	

The evaluation process was conducted through a face-to-face discussion. Similar to the previous phases, the researcher administered the evaluation process and took the investigators through each statement. When evaluating each statement, first, the investigators were requested to determine whether the statement is relevant to all the members of the target population. Then they were requested to decide whether the statement is worded in a manner consistent with the expressions used in the academia. Finally, they were requested to decide whether the statement is appropriate for a survey type questionnaire. If all the investigators agreed that a particular statement has the capability to meet all the three criteria, such statements were retained. By

doing that this study was able to abandon 16 statements and retain 181 statements out of the 197 statements brought forward from phase 2.

With the completion of phase 3, this study concluded the assessment of content validity of the statement pool with respect to the entity of the study. Hence, this study was able to retain a pool of statements that are content valid and capable of capturing information regarding an SME. The overall process eliminated 125 statements and retained 181 statements out of 306.

5.5 Phase 4 – Assess content validity with experts from academia (round 2)

The main objective of this phase was to evaluate the content validity of the remaining statements with respect to the property that each statement represents. In other words, this phase was supposed to select the most appropriate statements that capable of representing each first-order indicator of the proposed conceptual framework. This study invited three senior doctoral students in management information systems (MIS) to conduct the evaluation. This study invited senior doctoral students in MIS because they have a clear understanding of both the context of the research and the first-order indicators. At the start of the process, the researcher provided the investigators with working definitions for each indicator (both first-order indicators and second-order indicators) and FL-RIE. Furthermore, the researcher explained to them the sampling framework of the study to provide them with an understanding of the target population.

Thereafter, the researcher requested the investigators to evaluate each statement to determine the statement's ability to represent its respective indicator. The researcher requested the investigators to evaluate the representativeness of the statements based on the following evaluation criteria borrowed from the study of Patrick et al (2011).

Table 5.3: Criteria used in phase 4 to assess the content validity

Criteria	Statement Meets Criteria (Yes/No)
The statement captures the concept that is intended	
The statement represents a single concept, rather than a multidimensional concept	
The statement is worded in a manner consistent with the expressions used in the academia	
The content of the statement is appropriate for the mode of administration	

The evaluation process was conducted through a face-to-face discussion. Similar to the previous phases, the researcher administered the evaluation process and took the investigators through each statement. When evaluating each statement, first, the investigators were requested to determine whether a particular statement is suitable to capture the conceptual domain of the indicator it represents. Then they were requested to decide whether each statement has the capability to represent only a single first-order indicator or they can represent multiple first-order indicators of the proposed conceptual framework. Third, they were requested to decide whether each statement is worded in a manner consistent with the expressions used in academia. Finally, they were requested to decide whether each statement is appropriate for a survey type questionnaire. If all the investigators agreed that a particular statement has the capability to meet all the three criteria, such statements were retained. By doing that this study was able to abandon 44 statements and retain 137 statements out of 181.

5.6 Phase 5 – Assess content validity with experts from academia (round 3)

This phase was dedicated to eliminating repetitive statements and reduce the number of statements below 100. When the past studies on measurement scales development were reviewed, the researcher realised that hardly any studies had considered more than 100 statements for the pre-test. Out of many studies reviewed, the maximum number of statements retained for a pre-test after content validity test was 97 (see Parasuraman, Zeithaml & Berry, 1988). Therefore, the researcher decided to instruct the investigators to eliminate repetitive

statements first. If the number of statements is still above 100, the researcher decided to use forceful reduction of items to select the best 100 statements to represent the conceptual domain of FL-RIE because past studies have used the method of forceful reduction (e.g., Vigneron & Johnson, 2004).

To carry out phase 5, this study invited five senior doctoral students (2 in management and 3 in MIS). All of them participated in evaluating the content validity of the statement pool in either phase 3 or phase 4. Therefore, the researcher did not provide them with the background information of the study. However, the researcher provided them with the working definition for each indicator and FL-RIE because doctoral students in management were not provided with working definitions in phase 3. Thereafter, this study requested them to eliminate repetitive statements. Upon the approval of all the investigators, this study abandoned 26 statements and retained 111 statements out of 137.

Since the number of remaining statements were above 100, this study requested the investigators to select 100 most appropriate statements to capture the conceptual domain of FL-RIE. To carry out the evaluation process, the researcher provided them with the following evaluation criteria borrowed from the study of Patrick et al (2011).

Table 5.4: Criteria used in phase 5 to assess the content validity

Criteria	Statement Meets Criteria (Yes/No)
The statement captures the concept that is intended	
The statement is relevant to all members of the target population	
The statement represents a single concept, rather than a multidimensional concept	
The statement is worded in a manner consistent with the expressions used in the academia	
The content of the statement is appropriate for the mode of administration	

The evaluation process was conducted through a face-to-face discussion. Similar to the previous phases, the researcher administered the evaluation process and took the investigators through each statement. When evaluating each statement, first, the investigators were requested

to determine whether each statement is suitable to capture the conceptual domain of the indicator it represents. Second, the investigators were requested to determine whether each statement is relevant to all the members of the target population. Third, they were requested to decide whether each statement has the capability to represent only a single first-order indicator or they can represent multiple first-order indicators of the proposed conceptual framework. Fourth, they were requested to decide whether each statement is worded in a manner consistent with the expressions used in the academia. Finally, they were requested to decide whether the statement is appropriate for a survey type questionnaire. If all the investigators agreed that a particular statement has the capability to meet all the three criteria, such statements were retained. In doing so, this study was able to abandon 22 statements and retain 89 statements out of 111.

In conclusion, after a robust evaluation process, this study was able to retain 89 statements with content validity. Of note, the evaluation process eliminated two first-order indicators, namely, trusting followers and involved middle-management. Trusting followers was eliminated during phase 4 of the evaluation process because the investigators decided that statements generated to capture the conceptual domain of trusting followers do not represent the conceptual domain of the second-order indicator (i.e., the level of effectiveness of organisational transformation processes) to which it relates. Involved middle-management was eliminated during phase 5 of the evaluation process because the investigators decided that the statements of involved middle-management are repetitive.

Furthermore, during phase 4 of the evaluation process investigators suggested introducing learning orientation as an indicator of the level of effectiveness of organisational learning processes. To support their suggestion, they quoted a phrase from a past study - “learning orientation is the manifestation of the organisation's propensity to learn” (Mavondo et al, 2005, p. 1237). According to Mavondo et al (2005), individual and group level learning alone are not

capable of assuring the continuous development of the level of effectiveness of organisational learning processes because learning alone cannot transform an organisation to keep up with the changing external realities. This is an indication that learning alone does not guarantee change and adaption of appropriate skills, knowledge, and institutional arrangements necessary for the continuous improvement of resource integration effectiveness of an actor. If a firm wants the following to take place, learning should be supported by a higher level of learning orientation (Mavondo et al, 2005, p. 1237).

> "…the transfer of learning from individuals to groups, commitment to learning, an openness to the outside world, overall commitment to knowledge, systems for developing learning, and mechanisms for renewing the organisation"

Therefore, this study decided to accept the suggestion to modify the conceptual framework by proposing learning orientation as an indicator that is capable of contributing to the variation of the level of effectiveness of organisational learning processes because past studies position learning orientation as a concept that is most appropriate for driving learning processes rather than coordination processes. Thus, a summary of the assessment of content validity is given in Table 5.5. Statements that were retained after the content validity test is available in Appendix C.

Table 5.5: Summary of the process carried out to test content validity

Phase	Investigators	Main Objective	Mode of Communication	Number of Statements at the Start of the Phase	Number of Statements at the End of the Phase	Comment
Phase 1	10 IT Professionals	Evaluate content validity with respect to the entity	Skype	306	220	
Phase 2	10 IT Professionals	Evaluate content validity with respect to the entity	Skype	220	197	

		Make suggestions to improve the clarity of the statements				
Phase 3	5 Doctoral Students in Management	Evaluate content validity with respect to the entity	Face-to-Face	197	181	
Phase 4	3 Doctoral Students in Management Information Systems	Evaluate content validity with respect to the property	Face-to-Face	181	137	Eliminated the first-order indicator *trusting followers* Introduced *learning orientation* as an indicator of the second-order indicator *level of effectiveness of organisational learning processes*
Phase 5	5 Doctoral Students (2 in Management and 3 in Management Information Systems	Eliminate repetitive statements and reduce the number of statements below 100	Face-to-Face	137	89	Eliminated the first-order indicator *involved mid-management*

5.7 Chapter summary

The aim of this chapter was to understand "the degree to which elements of an assessment instrument are relevant to and representative of the targeted construct" (Haynes et al, 1995, p. 238). Hence, during this step, this study mainly focused on the representativeness of each individual statement generated during the item generation process and abandoning repetitive items. This study invited investigators from the industry and academia to understand the representativeness of each statement and abandon repetitive statements. The content validity was tested with a five-step process. A summary of the process is shown in Table 5.5. At the end of the five steps, this study was able to retain 89 items that are content valid.

Furthermore, during phase 4 and phase 5, two first-order indicators were eliminated due to the elimination of all the items that are supposed to capture the conceptual domains of each of the

two first-order indicators. During phase 4, trusting followers was eliminated. Subsequently, during phase 5, involved mid-management was eliminated. Besides, during phase 4, upon the recommendation of the experts, the author decided to introduce learning orientation as an indicator of the second-order indicator level of effectiveness of organisational learning processes.

6 FORMALLY SPECIFY THE MEASUREMENT MODEL

6.1 Chapter introduction

Once a content valid set of items was finalised, this study had to formally specify the measurement model. In other words, this study had to determine the nature of the relationship among the focal construct, second-order indicators, first-order indicators, and items. At the end of this step, the researcher had to finalise whether the focal construct is a reflective construct, a formative construct, or a mix of reflective and formative constructs.

If the focal construct is a reflective construct, changes in the focal construct causes changes in the indicator (Henseler et al, 2009). If the focal construct is a formative construct, changes in the indicators cause changes in the formative construct (Freeze & Rascke, 2007) (Please refer Henseler et al (2009) for a detailed explanation on reflective and formative constructs). Furthermore, when determining whether a focal construct is reflective or formative, it is mandatory to provide the theoretical reasoning from prior literature (Freeze & Rascke, 2007).

During this step, this study formally specified four components of the proposed conceptual framework. First, the researcher formally specified the relationship between the level of effectiveness of internal and external coordination processes and its indicators (see section 6.2). Second, this study formally specified the relationship between the level of effectiveness of organisational learning processes and its indicators (see section 6.3). Third, this study formally specified the relationship between the level of effectiveness of organisational transformation processes and its indicators (see section 6.4). Finally, the researcher formally specified the relationship between the three second-order indicators and FL-RIE (see section 6.5). As discussed in section 3.5 of the methodology, this study received the support of three senior

doctoral students in management to develop justifications for directions of all the relationships that form the final measurement model. The methodology suggested by Jarvis et al (2003) was followed to formally specify the measurement model.

6.2 Phase 1 - Formally specify the relationship between the level of effectiveness of internal and external coordination processes and its indicators

The indicators of the level of effectiveness of internal and external coordination processes are market orientation, intrapreneurship, and effective human resource practices. With the participation of three senior doctoral students in management, the researcher brainstormed whether the relationships between the indicators are reflective, formative, or mixed. Even though the investigators participated in evaluating the content validity of the statements, at the start of the process, the researcher provided them with the working definitions of each indicator (both first- and the second-order indicators) and the focal construct – FL-RIE.

First, this study had to determine the theoretical direction of causality between the level of effectiveness of internal and external coordination processes and the three first-order indicators. In other words, this study had to decide whether the three indicators define the level of effectiveness of internal and external coordination processes or whether they are manifestations of the level of effectiveness of internal and external coordination processes.

Since the researcher best understands the indicators in this study, he initiated the brainstorming session, expressing that the level of effectiveness of the three indicators are defines the level of effectiveness of internal and external coordination processes. The researcher backed his decision with the argument presented in sub-section 2.4.3.1; the level of effectiveness of internal and external coordination processes are formed by the organisational capabilities embedded in external coordination processes and internal coordination processes (Droge et al,

2004; Lusch & Nambisan, 2015). The three senior doctoral students did not have any counter arguments and agreed that the researcher's argument is sufficient to address the first decision rule.

Second, this study had to determine whether dropping an indicator changes the property measured by the level of effectiveness of internal and external coordination processes. In other words, this study had to determine whether indicators are interchangeable or not. In order to do this, one must judge whether they share a common theme or not (Petter et al, 2007). In doing so, investigators suggested that definitions for indicators should be examined (see Table 6.1).

Table 6.1: Definitions for the indicators of level of effectiveness of internal and external coordination processes

Indicator	Definition
Market Orientation	Organisation-wide generation of market intelligence pertaining to current and future customer needs, dissemination of intelligence across departments, and organisation-wide responsiveness to it
Intrapreneurship	A managerial strategy that encourages individual employees to think and act as entrepreneurs within an organisation
Effective human resource practices	An important organisational capability that creates a supportive climate for the employees to perform better and shapes their attitudes and behaviour

Once the researcher and the investigators examined the definitions of each indicator, they evaluated that each indicator is addressing a unique firm-level attribute. Therefore, they agreed that dropping at least one of the indicators may affect the meaning of the level of effectiveness of internal and external coordination processes.

Third, this study had to determine whether there is covariation among indicators. Without a statistical test, it is not possible to determine whether there is covariation among the indicators or not (Petter et al, 2007). Therefore, Petter et al (2007) suggest to conceptually determine whether the indicators covary or not and recommend using the output of step 2. According to

this output, indicators of the level of effectiveness of internal and external coordination processes are not interchangeable. Therefore, this study conceptually determined that the three indicators do not have a strong correlation.

Fourth, this study had to determine whether the indicators have the same antecedents and consequences. After going through the remaining statements of each of the three indicators, the investigators commented that the chances are extremely low for effective human resource practices to share the same antecedents and consequences with the other two indicators. However, they suggested conducting a review of the antecedents and consequences of integrated market orientation and intrapreneurship. When the researcher conducted a review of several most cited studies on antecedents and consequences of integrated market orientation (e.g., Jaworski & Kohli, 1993; Kirca, Jayachandran & Bearden, 2005) and intrapreneurship (e.g., Antoncic, 2007; Rigtering & Weitzel, 2013), he realised that they do not share the same antecedents and consequences.

The summary of phase 1 is as follows.

1. Step 1 – Three indicators define the level of effectiveness of internal and external coordination processes
2. Step 2 – Three indicators are not interchangeable
3. Step 3 – Three indicators do not covary
4. Step 4 – Three indicators do not share the same antecedents and consequences

According to Jarvis et al (2003), when a relationship between a set of indicators and a construct is having the characteristics mentioned above, the construct is considered as formative. Thus, this study concluded that the level of effectiveness of internal and external coordination processes is a formative construct.

6.3 Phase 2 - Formally specify the relationship between the level of effectiveness of organisational learning processes and its indicators

The indicators of the level of effectiveness of organisational learning processes are individual-level learning, group-level learning, absorptive capacity and learning orientation. To evaluate the nature of the relationship between the first-order indicators and the second-order indicators, this study received the support of investigators from the first phase. To start the evaluation process, the researcher provided them with working definitions for indicators (both first- and the second-order indicators).

During the second phase, this study followed the same procedure which was carried out in the first phase (see section 6.2). First, this study determined the direction of causality between the level of effectiveness of organisational learning processes and its indicators. The researcher initiated the discussion and explained how ideators, designers and intermediaries learn individually and as groups to form highly effective organisational learning processes (Lusch & Nambisan, 2015). In other words, individual- and group-level learning define the construct. The researcher argued that learning orientation is also an indicator which defines the construct because learning orientation drives four key processes of organisational learning (i.e., knowledge acquisition, information distribution, information interpretation and organisational memory) (Calantone et al, 2002; Huber, 1991). On the other hand, absorptive capacity determines the extent to which a firm is capable of acquiring, distributing, interpreting and exploiting new and existing knowledge to enhance the effectiveness of organisational learning processes (Flatten et al, 2011). Therefore, the researcher argued that absorptive capacity is an indicator which defines the construct. The investigators agreed that the argument of the researcher is sufficient to conceptually justify that the four indicators are defining the construct.

Second, to determine the interchangeability of the indicators, this study examined the definition for each indicator as detailed in Table 6.2.

Table 6.2: Definitions for the indicators of level of effectiveness of organisational learning processes

Indicator	Definition
Individual-Level Learning	The process of developing and converting tacit knowledge into explicit knowledge and sharing that knowledge with others (interpret)
Group-Level Learning	The process of developing a shared understanding among individuals
Learning Orientation	Organisation-wide activities which drive gathering, evaluating, interpreting, and sharing of information to enhance the competitive advantage of a firm through creation and utilisation of knowledge
Absorptive Capacity	The extent to which a firm is capable of acquiring, distributing, interpreting, and exploiting new and existing knowledge

Once the researcher and the investigators examined the definitions, they determined that each indicator represents a unique firm-level attribute (i.e., learning orientation and absorptive capacity) or a function (i.e., individual- and group-level learning). Hence, they concluded that the indicators are not interchangeable. Since the indicators are not interchangeable, this study determined that they do not covary.

Next, the researcher and the investigators determined whether the indicators share the same antecedents and consequences. Similar to the previous phase, the researcher conducted a review of past literature on antecedents and consequences of each indicator. He failed to find any study on the antecedents or consequences of individual-level learning or group-level learning. However, he was able to find several studies on the antecedents and consequences of absorptive capacity (e.g., Jansen, Van den Bosch & Volberda, 2005; Roberts, 2015; Vega-Jurado, Gutierrez-Gracia & Fernandez-de-Lucio, 2008) and learning orientation (e.g., Calantone et al, 2002; Farrell, 1999). Once the researcher reviewed those studies, he understood

that absorptive capacity and learning orientation do not share the same set of antecedents or consequences.

The summary of phase 2 is as follows.

1. Step 1 – Four indicators define the level of effectiveness of organisational learning processes
2. Step 2 – Four indicators are not interchangeable
3. Step 3 – Four indicators do not covary
4. Step 4 – Four indicators do not share the same antecedents and consequences

Based on the summary, this study concluded that the level of effectiveness of organisational learning processes and its indicators have a formative relationship.

6.4 Phase 3 - Formally specify the relationship between the level of effectiveness of organisational transformation processes and its indicators

The construct considered in phase 3 is the level of effectiveness of organisational transformation processes. It has five indicators, namely, trustworthy leadership, capable change champions, innovative culture, accountable culture, and communication. During this phase, the researcher received the support of the same group of investigators. To start the evaluation process, the researcher provided them with the working definitions of each indicator (both first-order indicators and the second-order indicator).

First, this study determined the direction of causality between the level of effectiveness of organisational transformation processes and its indicators. To start the process, the researcher explained his argument to the investigators. The researcher mainly tabled the arguments discussed from sub-sections 2.4.3.3.1 to 2.4.3.3.7. This study argued that the trustworthy

leaders had the capability to influence how a firm is engaged with the proposal, negotiation, and implementation of institutional arrangements during all three stages of a resource integration process through charismatic leadership, inspirational motivation, intellectual stimulation, and individualised consideration. Capable change champions are consistent with their goal commitment. Hence, they are extremely good at executing a proposed change to institutional arrangements successfully and increase the level of effectiveness of organisational transformation processes.

An organisation with an innovative culture has the capability to institute norms of innovation and inspire and strengthen innovative activities through change champions (Judge & Douglas 2009). From the perspective of a resource integration process, instituting norms of innovation and inspiring and strengthening innovative activities is important since resource integration is the fundamental way to innovate (Lusch & Nambisan 2015). Furthermore, when proposing, negotiating, and implementing changes to institutional arrangements and carrying out transformations of various scales the level of innovativeness of the culture of an organisation could determine the effectiveness of the outcome. Accountability of an organisational culture can be defined as "the perception of being answerable for actions or decisions, in accordance with interpersonal, social, and structural contingencies, all of which are embedded in particular sociocultural contexts" (Gelfand, Lim, & Raver, 2004, p. 137).

From the perspective of a resource integration process, the quality of being answerable for actions or decisions, in accordance with interpersonal, social, and structural contingencies is necessary for anyone or any group that propose, negotiate, and implement changes to institutional arrangements. The rationale is individuals and teams functioning in a highly accountable culture tend to take ownership of what they do and try to be as constructive as possible when making decisions. Hence, the changes they propose to institutional arrangements

are more likely to ensure wellbeing and the continuation of the whole ecosystem. Distribution of information plays a vital role in carrying out breaking, making, and maintaining institutional arrangements of resource integration and continuously enhancing resource integration effectiveness of any actor. Hence, communication is a vital element of any transformation process taking place during the three stages of a resource integration process. Thus, it is evident that the indicators are determining the level of effectiveness of organisational transformation processes. Therefore, the researcher suggested that the five indicators are defining the construct. Since his argument had a theoretical backing, the investigators agreed.

Second, this study examined the definitions for each indicator to determine whether they are interchangeable or not.

Table 6.3: Definitions for the indicators of level of effectiveness of organisational transformation processes

Indicator	Definition
Trustworthy Leadership	Leaders who secure the trust of the middle level and operational level employees and show the direction to achieve organisational objectives and goals
Capable Change Champions	The personnel that assist organisations to carry out micro-scale to macro-scale changes. They are the major contributing factor behind the evolvement and emergence of firms.
Innovative Culture	A culture that has the capability to institute norms of innovation and inspire and strengthen innovative activities through change champions
Accountable Culture	A culture that has the capability to conscientiously administer resources and successfully meet pre-defined deadlines
Effective Communication	Horizontal and vertical communication within the firm and communication with the external parties such as customers, suppliers and other relevant stakeholders in the process of implementing strategic, business and operational level strategic plans

The researcher along with the support of the investigators brainstormed to determine the interchangeability of the indicators. One of the investigators brought up the argument that

trustworthy leadership and capable champions are interchangeable. However, by quoting the definitions, the researcher counter-argued that the purposes of a trustworthy leader and a capable champion are different from each other. Furthermore, when the researcher reviewed literature he understood that the term trustworthy leadership is used for personnel in the strategic-level of an organisation. Change champions can emerge from any level in the organisation. Due to this argument, everyone agreed that the two indicators are not interchangeable. When it comes to the other three indicators everyone agreed that they represent three different attributes or characteristics of a firm. Therefore, this study determined that the five indicators of the construct are not interchangeable. Due to the non-interchangeability, this study determined that there is no covariation among the indicators.

Next, this study had to determine whether the five indicators share the same antecedents and consequences. When the researcher conducted a review, he was unable to find any studies on the antecedents or consequences of the capable change champions, innovative culture, accountable culture, and communication. There were a few studies on the antecedents and consequences of trustworthy leadership. Since those antecedents and consequences are not shared by other indicators, reviewing of those studies was not required.

The summary of phase 3 is as follows.

1. Step 1 – Five indicators define the level of effectiveness of organisational transformation processes
2. Step 2 – Five indicators are not interchangeable
3. Step 3 – Five indicators do not covary
4. Step 4 – Five indicators do not share the same antecedents and consequences

Based on the summary, this study concluded that the level of effectiveness of organisational transformation processes is a formative construct formed by its indicators.

6.5 Phase 4 - Formally specify the relationship between FL-RIE and its indicators

The construct considered in phase 4 is FL-RIE. It has three second-order indicators of the proposed conceptual framework (see Figure 2.1). During this phase, the researcher followed the same procedure as in previous phases and received support from the same group of investigators. The researcher started the process by providing the investigators with the working definitions for each indicator and FL-RIE.

First, this study determined the direction of causality between FL-RIE and its indicators. Similar to the other three occasions the researcher explained his conceptual justification to the investigators. This study defines FL-RIE as the degree to which a set of observable and measurable organisational activities take place among a network of actors, potential/unrealised and existing resources are successful in co-creating value, creating new resources, and valuing the emergent properties to ensure the wellbeing and the continuation of the firm and the related actors when the firm is pursuing its daily activities and projects. The definition itself suggests that FL-RIE is formed with the level of effectiveness of a set of observable and measurable organisational processes. Thus, the researcher argued that the causality is from the level of effectiveness of three firm-level observable and measurable processes to FL-RIE. Since the researcher's argument is logical, the investigators agreed.

To determine the interchangeability of the indicators, this study evaluated organisational functions carried out by each process. The level of effectiveness of internal and external coordination processes is a representation of the level effectiveness of how external coordination processes reach across firm boundaries to get the involvement of suppliers, customers, etc in resource integration efforts and how internal coordination processes are driving three types of resource integrating actors to continuously look for ways to improve a

firm's circumstances (Dorge et al, 2004; Lusch & Nambisan, 2015). The level of effectiveness of organisational learning processes is a representation of the level of effectiveness of how the three types of actors are carrying out individual-level and group-level learning processes. The level of effectiveness of organisational transformation processes is a representation of the level of effectiveness of how the three types of actors are reengineering, redesigning and redefining business systems to accommodate necessary organisational transformations that are required to maintain the competitive position of a firm in a dynamic environment. Because of the uniqueness of the functions carried out by the three indicators, the researcher suggested that the indicators are not interchangeable. The investigators were satisfied with his explanation and accepted that the indicators are not interchangeable. Hence, due to the non-interchangeability, this study determined that the indicators do not covary.

To determine whether the indicators share the same antecedents and consequences, the researcher conducted a review of past literature. Eriksson (2014) has proposed that all dynamic capabilities at firm level are sharing a common set of antecedents and consequences. Since second-order indicators are attributes of three firm-level dynamic capabilities, they should be sharing a common set of antecedents and consequences. Therefore, even though the researcher was unable to find a clear answer by reviewing past literature, based on the findings of Eriksson (2014), he concluded that there is a chance for the indicators to share the same set of antecedents and consequences.

The summary of phase 4 is as follows.

1. Step 1 – Three indicators define FL-RIE
2. Step 2 – Three indicators are not interchangeable
3. Step 3 – Three indicators do not covary
4. Step 4 – Three indicators might be sharing the same antecedents and consequences

When compared to the summaries of the previous three phases, the outcome of step 4 of this phase is different. In previous phases, indicators did not share common antecedents and/or consequences. However, there is a chance for the indicators of this phase to share common antecedents and consequences. According to Jarvis et al (2003), even if the indicators share a common set of antecedents and consequences, if the outcomes of step 1, 2 and 3 are similar to the outcomes of this phase, the construct is considered formative. Therefore, this study considered that FL-RIE and its indicators have a formative relationship.

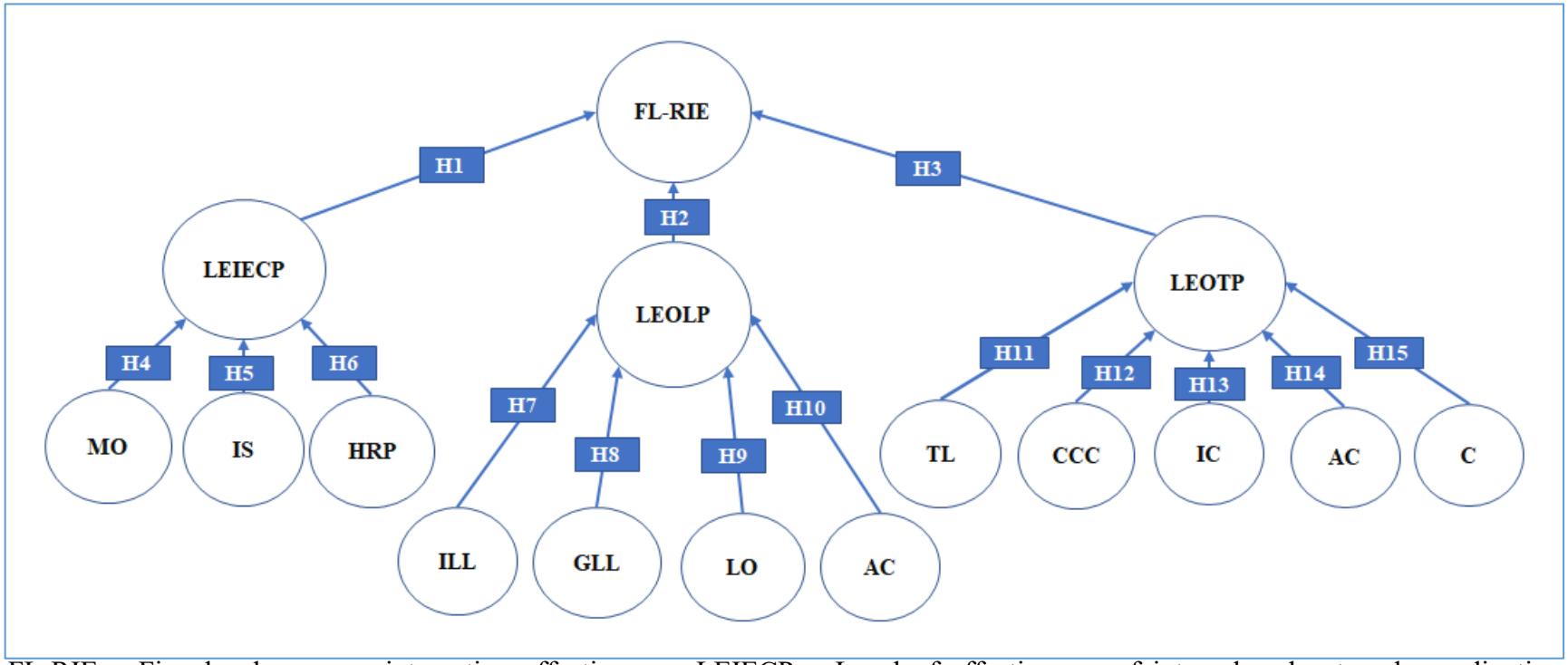
At the end of phase 4, specifying the measurement model was completed. By specifying the measurement model, this study positioned four components of the proposed conceptual framework as relationships that are formative in nature. Since the measurement model is finalised and ready for validation, this study formed hypotheses of the study that are shown in Table 6.4. Furthermore, the formally specified measurement model adhering to Jarvis et al's (2003) criteria is shown in Figure 6.1.

Table 6.4: Hypotheses of the study

Hypothesis Number	Hypothesis
H1	The level of effectiveness of internal and external coordination processes is a second-order formative indicator of FL-RIE
H2	The level of effectiveness of organisational learning processes is a second-order formative indicator of FL-RIE
H3	The level of effectiveness of organisational transformation processes is a second-order formative indicator of FL-RIE
H4	Market orientation is a first-order indicator of FL-RIE and a formative indicator of the level of effectiveness of internal and external coordination processes
H5	Intrapreneurial spirit is a first-order indicator of FL-RIE and a formative indicator of the level effectiveness of internal and external coordination processes
H6	Effective human resource practices is a first-order indicator of FL-RIE and a formative indicator of the level of effectiveness of internal and external coordination processes

H7	Individual level learning is a first-order indicator of FL-RIE and a formative indicator of the level of effectiveness of organisational learning processes
H8	Group level learning is a first-order indicator of FL-RIE and a formative indicator of the level of effectiveness of organisational learning processes
H9	Learning orientation is a first-order indicator of FL-RIE and a formative indicator of the level of effectiveness of organisational learning processes
H10	Absorptive capacity is a first-order indicator of FL-RIE and a formative indicator of the level of effectiveness of organisational learning processes
H11	Trustworthy leadership is a first-order indicator of FL-RIE and a formative indicator of the level of effectiveness of organisational transformation processes
H12	Capable change champions is a first-order indicator of FL-RIE and a formative indicator of the level of effectiveness of organisational transformation processes
H13	Innovative culture is a first-order indicator of FL-RIE and a formative indicator of the level of effectiveness of organisational transformation processes
H14	Accountable culture is a first-order indicator of FL-RIE and a formative indicator of the level of effectiveness of organisational transformation processes
H15	Effective communication is a first-order indicator of FL-RIE and a formative indicator of the level of effectiveness of organisational transformation processes

Figure 6.1: Conceptual Framework of the Study after Specifying the Measurement Model



FL-RIE – Firm-level resource integration effectiveness; LEIECP – Level of effectiveness of internal and external coordination processes; LEOLP – Level of effectiveness of organisational learning processes; LEOTP – Level of effectiveness of organisational transformation processes; MO – Market orientation; IS – Intrapreneurial spirit; HRP – Effective human resource practices; ILL – Individual-level learning; GLL – Group-level learning; LO – Learning orientation; AC – Absorptive capacity; TL – Trustworthy leadership; TF – Trusting followers; CCC – Capable change champions; IC – Innovative culture; AC – Accountable culture; C – Communication

6.6 Chapter summary

The aim of this chapter was to determine the nature of the relationship among focal construct, second- and first-order indicators, and items. As discussed in the methodology, this study received the support of three senior doctoral students in management to develop justifications for directions of all the relationships that form the final measurement model. The methodology suggested by Jarvis et al (2003) was followed to formally specify the measurement model. The researcher concluded that the focal construct – FL-RIE is a formative construct formed with 12 first-order indicators and 3 second-order indicators (see Figure 6.1). Based on the findings, this study formulated 15 hypotheses (see Table 6.4).

7 PRE-TEST

7.1 Chapter introduction

After formally specifying the measurement model, the next step was to collect data and conducting the pre-test to examine the psychometric properties of the scale. This study selected SMEs which use commercial cloud computing technologies as the population for this study. Once the population was identified and clearly specified, a sample that represents the same population was selected for the purpose of data collection. The researcher then collected data from a sample of 556 IT professionals. The researcher received 192 usable responses out of 556. A detailed description of the aspects discussed thus far is provided in section 3.6. Two aspects of the pre-test, namely, assessment of multivariate normality of the indicators (see section 7.2), and scale purification and refinement (see section 7.3) as discussed below.

7.2 Assessment of multivariate normality of the indicators

Prior to the scale purification and refinement process, this study assessed whether each item was normally distributed. According to Hair, Black, Babin, and Anderson (2010), when a data distribution of an item fits the shape of a theoretical normal distribution, the data distribution of the item is considered as normal. However, it is extremely hard to find data distributions that are normal.

There are several tests that researchers employ to test normality. One of the most widely used methods is to test the skewness and kurtosis of data distributions. It is generally accepted that normal data distribution has absolute skewness and kurtosis values less than three times their standard errors (Gaskin, 2019). Blanca, Arnau, López-Montiel, Bono, and Bendayan's (2013) study was conducted to understand how skewness and kurtosis values behave in various datasets. They analysed 693 data distributions and realised that only 5.5% were close to

expected values under normality. This clearly indicates that a majority of data distributions cannot meet the perfect criteria of a normal distribution. Therefore, a certain level of tolerance is allowed for both the skewness value and kurtosis value of a distribution. This study followed the suggestion of Lin et al (2012) to decide the normality of data distributions. According to Lin et al (2012), the absolute value of skewness should be less than 3 and the absolute value of kurtosis should be less than 10.

Thus, this study performed the normality test. The results are shown below in Table 7.1. As can be seen, absolute values for skewness and kurtosis of every data distribution adhere to the criteria suggested by Lin et al (2012). Hence, this study concluded that all the data distributions of the collected dataset are normal.

Table 7.1: Skewness and kurtosis statistics

First-Order Indicator	Skewness	Kurtosis
Market Orientation (MO)	0.621	0.206
Intrapreneurship (Intra)	0.000	-0.136
Effective human resource practices (EHRPrac)	-0.007	-0.383
Individual Level Learning (ILLearn)	-0.322	-0.192
Group Level Learning (GLLearn)	-0.496	1.477
Learning Orientation (LOrient)	-0.619	0.618
Absorptive Capacity (AbCap)	-0.644	0.905
Trustworthy Leadership (TrustLead)	-0.829	3.085
Capable Change Champions (CapChamp)	-0.157	0.759
Innovative Culture (InnCult)	-0.297	-0.638
Accountable Culture (AccCult)	-0.428	-0.762
Communication (Comm)	-1.217	4.056

7.3 Scale purification and refinement process

Scale purification and refinement was conducted to evaluate the psychometric properties of 89 statements which were shortlisted by assessing the content validity of the generated statement pool. According to past research, statements which capture conceptual domains of latent

constructs and their indicators have to be verified empirically (Churchill, 1979; DeVellis, 2012) because in practice a statement might not belong to a common underlying variable or might belong to multiple underlying variables (DeVellis, 2012). Even though the assessment of content validity is supposed to get rid of such statements, it is not possible to do that without assessing their dimensionality, reliability of the indicators and the latent construct, the reflective measurement models within the conceptual framework, the formative measurement models within the conceptual framework and the structural model (Churchill, 1979; DeVellis, 2012; Henseler et al, 2009; MacKenzie et al, 2011).

During the scale purification and refinement process (pre-test), it is recommended to focus on two aspects, namely, assessing the dimensionality of the statements and the reliability of the indicators and the latent construct (Churchill, 1979; DeVellis, 2012; MacKenzie et al, 2011). Therefore, this study also conducted a dimensionality test and a reliability test with the collected data. Based on the recommendations of DeVellis (2012) and Gaskin (2019), the dimensionality test was conducted first followed by the reliability test.

7.3.1 Dimensionality test (Exploratory Factor Analysis)

The dimensionality test was conducted by carrying out an exploratory factor analysis (EFA) because of the following justifications.

- EFA is considered as the most suitable dimensionality test when the variables are reflective (Churchill, 1979; Gaskin, 2019).
- All the first-order indicators of the conceptual framework are reflective variables and the 89 statements are directly related to the first-order indicators.

The IBM SPSS 26 software package was used to conduct EFA. Principal component analysis was used as the factor extraction method because it is popular among researchers and promax

was used as the rotation type because it is an oblique rotation method which theoretically renders more accurate and reproducible solutions over orthogonal rotation methods such as verimax, quartimax, and equamax. When analysing output, based on Gaskin's (2019) recommendation, this study mainly focused on three aspects. They are as follows.

- Appropriateness of data (data adequacy) – This is monitored through KMO statistics and Bartlett's Test of Sphericity. The KMO statistic is a measure of suitability of the collected dataset for factor analysis. If the KMO statistic is greater than 0.7, the data set is suitable for EFA. Bartlett's Test of Sphericity demonstrates whether the variables are sufficiently related to each other to run a meaningful EFA. For an EFA to be acceptable, Bartlett's test of sphericity should produce a significant result (Sig. < 0.05).
- Communality values – Communality value is an indicator whether a statement may load significantly on a factor or not. In social science research, it is considered that the statements with communality values between 0.0-0.4 might struggle to load significantly on any factor. Those statements can be eliminated after examining the pattern matrix. Furthermore, as discussed in the section 3.6.2, communality values indicate whether the sample size is sufficient or not. Therefore, from the point of views of both EFA and the sample size, this study focused on retaining the statements which had communality values greater than 0.4.
- Factor structure – The pattern matrix represents the factor structure. Factor structure is a grouping of items (statements) based on strong correlations. The first-order indicators of this research are reflective indicators. Therefore, the items (statements) of each first-order indicator should have a strong correlation. The items (statements) which have a strong correlation load into a single factor. Factor loadings of each item (statement) should be greater than 0.5. The items (statements) which have factor loadings less than 0.5 become candidates for elimination. Furthermore, any item (statement) loading onto

more than one factor should be eliminated if it is not possible to remove the cross-loading. The other important aspect of the factor loadings is, similar to communality values, factor loadings are also indicators of whether the sample size is sufficient or not. As discussed in the section 3.6.2, factors loadings of all the remaining indicators (statements) should be greater than 0.5.

At the end of EFA, 46 statements were retained after eliminating 43 out of 89 statements. Furthermore, items related to first-order indicator *accountable culture* had continuous and unavoidable cross-loadings. Therefore, *accountable culture* was eliminated. The parameters related to the remaining 46 statements are presented in Table 7.4 below.

7.3.1.1 Appropriateness of data (data adequacy)

The KMO statistic related to the remaining 46 statements is 0.835 (see Table 7.2). Since the KMO statistic is greater than 0.7, the dataset which produced the final output of the EFA is suitable for an EFA. Furthermore, since the Bartlett's Test of Sphericity value is significant (Sig. < 0.05) (see Table 7.2), it is possible to conclude that the items are sufficiently related to run meaningful EFA. Thus, both the KMO statistic and Bartlett's test demonstrated the suitability of the dataset to carry out factor analysis.

Table 7.2: KMO and Bartlett's Test of Sphericity

Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy		0.835
Bartlett's Test of Sphericity	Approx. Chi-Square	6350.760
	Df	1035
	Sig.	0.000

7.3.1.2 Communality values

As discussed in section 3.6.7, this study monitored the communality values of each indicator throughout the EFA. As shown in Table 7.3, the communalities of each indicator extracted from the final factor structure are greater than 0.4. It demonstrates that the indicators of the final factor structure have the capability to load significantly on a factor. Furthermore, it fulfils

one criterion which determines whether the sample size is sufficient or not (i.e., extraction values > 0.4).

Table 7.3: Communalities

Statement	Extraction
My company encourages customer comments and complaints because they help us do a better job (IMO_1)	0.804
My company's marketing team regularly discusses customer needs with other teams (IMO_4)	0.810
This company does a good job in integrating the activities of all teams (IMO_6)	0.862
My company periodically circulates documents (e.g., reports, newsletters) that provide information on its customers (IMO_10)	0.846
When something important happens to a major customer or market, all the teams know about it in a short period (IMO_11)	0.820
My company is willing to spend on new product/service development activities (Intra_2)	0.602
Employees are supposed to get the job done with minimum supervision (Intra_5)	0.814
In my company uncertainty is treated as a challenge (Intra_7)	0.730
In my company employees are encouraged to venture into unexplored territories (Intra_8)	0.709
My company constantly seek new opportunities related to the present operations (Intra_9)	0.776
My company constantly seek opportunities to improve our business performance (Intra_10)	0.795
My company treats employees as the most valuable resource within the company (HRPrac_2)	0.644
My company emphasises the importance of having satisfied employees (HRPrac_4)	0.706
In my company employees receive benefits linked to their performance (HRPrac_6)	0.625
All employees receive effective feedback on their performance (HRPrac_7)	0.655
In my company, individuals are able to break out of traditional mindsets to see things in new and different ways (ILLearn_1)	0.860
In my company individuals are aware of the critical issues that affect their work (ILLearn_3)	0.898
In my company, individuals generate many new insights (ILLearn_4)	0.907
In my company different point of views are encouraged in group work (GLLearn_1)	0.807
In my company teams are prepared to rethink decisions when presented with new information (GLLearn_2)	0.849
Teams have the right people involved in addressing the issues (GLLearn_3)	0.855
The management team motivates the employees to use information sources within our industry (AbCap_1)	0.773
The management team expects the employees to deal with information beyond our industry (AbCap_2)	0.800
In my company, there is a quick information flow (AbCap_4)	0.812
In my company employees successfully link existing knowledge with new insights (AbCap_7)	0.719
My company regularly reconsiders technologies and adapts them accordant to new knowledge (AbCap_8)	0.435
The sense around my company is that employee learning is an investment, not an expense (LOrient_2)	0.848
There is total agreement on our company vision across all levels, functions and teams (LOrient_4)	0.824
Top management repeatedly emphasises the importance of knowledge sharing in our company (LOrient_5)	0.866
The management team of my company protects the core values while encouraging change (TrustLead_3)	0.564
The management team of my company demonstrates humility while fiercely pursuing the vision (TrustLead_5)	0.604
The management team and the team leads talk in a way that makes employees believe they can succeed (TrustLead_6)	0.598
The management team and the team leads challenge employees to think about problems in new ways (TrustLead_8)	0.656
The management team and the team leads show performers how to look at difficulties from a new angle (TrustLead_9)	0.447
In my company, there are several individuals who are well informed about the issues, opportunities and how to get things done (CapChamp_3)	0.691
In my company, there are several individuals who have the capability of networking and getting the right people together (CapChamp_5)	0.663

In my company, there are several individuals who have the capability of planning and managing the change process (CapChamp_6)	0.619
In my company, there are several individuals who have the capability of keeping people focused and motivated (CapChamp_7)	0.560
In my company, there are several individuals who have the capability of persevering until the change succeeds (CapChamp_9)	0.696
In my company, people are not penalised for new ideas that do not work (InnCult_3)	0.794
Managers/team leads in my company promote and support innovative ideas, experimentation and creative processes (InnCult_4)	0.727
My company is willing to reorganise teams to increase innovative outputs (InnCult_5)	0.738
Employees in my company experience consequences for outcomes of their actions (Comm_1)	0.781
Employees in my company often discuss their work with the managers/team leads (Comm_4)	0.771
Managers/team leads communicate with the employees about work to agree upon the best actions possible (Comm_5)	0.653
In my company, communication flows both from the managers/team leads to and from the team members to the managers/team leads (Comm_7)	0.727

7.3.1.3 Factor structure

The final factor structure with eleven factors and 46 items is shown in Table 7.4. All items are loaded on their respective factor (indicator) with loadings greater than 0.6. Forty-three items were eliminated due to poor factor loadings and/or cross-loading issues. During the process of finalising the factor structure, one of the first order indicators – accountable culture was eliminated. Its items (statements) had lower loadings and continuous cross-loading issues. Therefore, all the items of accountable culture had to be eliminated. Hence, accountable culture was also eliminated.

Furthermore, since the factor loadings of the remaining items are greater than 0.5, the second criteria which determine whether the sample size is sufficient or not was also fulfilled. Therefore, it was possible to conclude that the sample size of the pre-test is sufficient.

Once the factor structure was finalised with acceptable parameters, this study completed the dimensionality test and moved to the next step of the data purification and refinement process, namely, conducting the reliability test.

Table 7.4: Output of the dimensionality test and the reliability test

	Component												
	1	2	3	4	5	6	7	8	9	10	11	Cronbach's Alpha	Cronbach's Alpha if Item Deleted
IMO_1		0.832										0.944	0.934
IMO_4		0.898											0.935
IMO_6		0.933											0.926
IMO_10		0.904											0.927
IMO_11		0.864											0.932
Intra_2					0.705							0.915	0.917
Intra_5					0.915								0.889
Intra_7					0.809								0.897
Intra_8					0.654								0.907
Intra_9					0.901								0.894
Intra_10					0.919								0.891
HRPrac_2						0.795						0.808	0.768
HRPrac_4						0.807							0.743
HRPrac_6						0.786							0.773
HRPrac_7						0.768							0.752
ILLearn_1										0.913		0.933	0.930
ILLearn_3										0.946			0.892
ILLearn_4										0.948			0.887
GLLearn_1											0.867	0.906	0.881
GLLearn_2											0.856		0.841
GLLearn_3											0.943		0.874
AbCap_1			0.863									0.873	0.827
AbCap_2			0.875										0.828
AbCap_4			0.891										0.824
AbCap_7			0.834										0.845
AbCap_8			0.646										0.904
LOrient_2								0.888				0.907	0.873
LOrient_4								0.847					0.870
LOrient_5								0.926					0.857
TrustLead_3				0.575								0.850	0.810
TrustLead_5				0.575									0.809
TrustLead_6				0.675									0.808
TrustLead_8				0.775									0.811
TrustLead_9				0.679									0.857
CapChamp_3	0.825											0.833	0.780
CapChamp_5	0.798												0.794
CapChamp_6	0.764												0.801
CapChamp_7	0.692												0.831
CapChamp_9	0.816												0.791
InnCult_3									0.901			0.832	0.730
InnCult_4									0.845				0.793
InnCult_5									0.845				0.777
Comm_1							0.902					0.918	0.886
Comm_4							0.917						0.883
Comm_5							0.836						0.910
Comm_7							0.820						0.895

7.3.2 The reliability test

The reliability test is conducted to test the internal consistency of each factor extracted from EFA (Gaskin, 2019). If the internal consistency of a particular factor is high, the factor is considered unidimensional or all the indicators (statements) attached to the factor is measuring a single variable.

This study measured the internal consistency of the factors (i.e., first-order indicators) by observing the Cronbach's Alpha value of each factor. According to past studies, if Cronbach's Alpha value is greater than 0.7 this indicates higher internal consistency. Table 7.4 shows Cronbach's Alpha values of each factor. Since all the factors have values greater than 0.7, this study concluded they are unidimensional. Furthermore, due to high Cronbach Alpha values none of the indicators were eliminated during the reliability test. One important point to notice about the reliability test is that this study did not conduct reliability tests for second-order indicators and FL-RIE because they are formative in nature.

Once the reliability test was completed, this study concluded the data purification and refinement process. During the process, 43 statements were eliminated, and 46 statements were retained. Furthermore, due to the elimination of all the statements related to a first-order indicator (i.e., accountable culture), it was omitted from the final factor structure.

During the next step, 46 shortlisted statements were used to develop the questionnaire for data collection from a new sample to re-examine scale properties.

7.4 Chapter summary

The aim of this step was to collect data and conduct the pre-test to examine the psychometric properties of the scale. This study selected SMEs which use commercial cloud computing technologies as the population. At the end of the data collection and data screening processes, the researcher received 192 usable responses from SMEs that use commercial cloud computing services. Once data was collected, the author tested the multivariate normality of the dataset by analysing skewness and kurtosis values of each indicator. Subsequently, this study carried out an EFA and a reliability analysis to test psychometric properties of the proposed conceptual framework. While carrying out the EFA, the author eliminated 43 problematic items due to poor factor loadings and continuous cross-loadings. Furthermore, the first-order indicator –

accountable culture was eliminated during the EFA. All of its items had either poor factor loadings or cross loading issues. After the elimination of all the problematic items, this study was able to retain 46 items for the re-examination of scale properties.

8 RE-EXAMINATION OF THE SCALE PROPERTIES (MAIN STUDY)

8.1 Chapter introduction

The main study had two objectives. The first objective was to collect data to evaluate whether indicators shortlisted in the pre-study are valid indicators of the focal construct. In instances where indicators are eliminated, but not reworded or added, MacKenzie et al (2011) recommend not to collect data and re-use the same dataset used for the pre-test. However, Churchill (1979) and DeVellis (2017) recommend re-collecting data. Furthermore, most of the past studies that have developed scales for constructs have also re-collected data after testing the psychometric properties of the scale (e.g., Pellathy et al, 2019). Therefore, this study decided to re-collect data from another sample of the same population even though none of the indicators were reworded and no new indicators were added. As discussed in section 3.7.2 of the methodology, this study was able to collect 209 valid responses for the main study.

The second objective was to test the representativeness of the sample that was collected for the main study and assess scale validity. Section 8.2 discusses the representativeness of the sample by presenting the profiles of three demographic factors and comparing them with the national demographic factors. Section 8.3 discusses the scale validity process executed to test whether scale behave as one would expect if they were valid indicators of the focal construct.

8.1.1 Demographic profiles of the respondents

As discussed in the introduction to this chapter, the main objective here is to discuss the representativeness of the sample by presenting the demographic profiles of four demographic factors, namely, gender of the respondent, size of the SME, and type of cloud computing technology/technologies used by the SME.

When it comes to gender, 168 (80.38%) out of 209 respondents were males with only 41 females (19.62%). According to Deloitte (2020), 71% of the Australian information and communication technology (ICT) workforce is male and 29% female. Even though the sample does not perfectly represent the population of the Australian ICT workforce, the sample denotes that women are underrepresented. Hence, the sample can be considered as a partial representation of the Australian ICT workforce. A summary of the representativeness of the sample with respect to the Australian ICT workforce is shown in Table 8.1.

Table 8.1: Representativeness of the sample with respect to the Australian ICT workforce

Gender of the Respondent	Sample	National Statistics
Male	168 (80.38%)	548,209 (71%)
Female	41 (19.62%)	223,916 (29%)
Total	209	772,125

A summary of the representativeness of the sample with respect to the size of the SMEs is shown in Table 8.2. According to ABS (2017) and Commonwealth of Australia (2019), out of the small and medium size businesses that use paid cloud computing services, 156,276 (61.42%) are micro businesses (i.e., 1 < number of employees < 4). The numbers are 75,899 (29.83%) and 22,249 (8.75%) for small businesses (i.e., 5 < number of employees < 19) and medium size businesses (i.e., 19 < number of employees < 199), respectively. When it comes to the sample, 191 responses (91.38%) were from medium sized businesses. There were 16 responses (7.65%) from small businesses. Furthermore, there were two responses (0.97%) from micro businesses. By observing these percentages, it can be argued that the sample does not represent the population. The ABS (2017) has considered an SME that uses a paid email service such as Gmail also as a business that uses paid cloud computing services. However, when determining the purchase decision of such a paid cloud computing service, a firm does not have to do a rigorous vendor selection process. However, when purchasing a paid cloud solution such as a customer relationship management (CRM) solution, a firm must conduct a rigorous

vendor selection process. This study collected data from SMEs that have conducted rigorous vendor selection processes prior to the purchase of commercial cloud computing services. Thus, this study was unable to find sources that had national level data on SMEs that have followed rigorous vendor selection processes prior to the purchase of commercial cloud computing services. Therefore, it was not possible to determine the representativeness of the sample with respect to the size of the SMEs.

Table 8.2: Representativeness of the sample with respect to the size of the SMEs

Size of the SME	Sample	National Statistics
Micro Businesses	2 (0.97%)	156,276 (61.42%)
Small Businesses	16 (7.65%)	75,899 (29.83%)
Medium Size Businesses	191 (91.38%)	22,249 (8.75%)
	209	254,424

Next, this study tested the representativeness of the sample with respect to the cloud computing technology used by the SME. There are three types of cloud computing technologies, namely, software-as-a-service (SaaS), platform-as-a-service (PaaS), and infrastructure-as-a-service (IaaS) (Abdel-Basset, Mohamed, & Chang, 2018). As shown in Table 8.3, out of the micro businesses that uses paid cloud computing technologies, SaaS technology is the most popular cloud computing technology. Second and third most popular technologies among the micro businesses that uses paid cloud computing technologies are IaaS and PaaS, respectively. At the national level, the trend is similar for small businesses and medium size businesses. That is, among small and medium size businesses that are using paid cloud computing technologies, SaaS is the most popular cloud computing technology followed by IaaS and PaaS technologies. As can be seen in Table 8.3, the same trend can be seen in the sample as well. Therefore, the sample can be considered as a representation of the paid cloud computing technologies used by the Australian SMEs.

Table 8.3: Representativeness of the sample with respect to the paid cloud computing technologies used by the Australian SMEs

Type of Business	Type of Technology	Sample	National Level
Micro Businesses	SaaS	2 (100%)	526,598 (84%)
	PaaS	0 (0%)	68,959 (11%)
	IaaS	1 (50%)	400,590 (63.9)
Small Businesses	SaaS	16 (100%)	171,461 (87.2%)
	PaaS	5 (31.25%)	16,910 (8.6%)
	IaaS	11 (68.75%)	105,787 (53.8)
Medium Size Businesses	SaaS	174 (91.1%)	43227 (85%)
	PaaS	43 (22.51%)	8,188 (16.1%)
	IaaS	125 (65.45%)	32,547 (64%)

Thus, it is possible to assume that the sample collected to assess scale validity sufficiently represent the population of the study. See Appendix G for a summary of the demographic profiles for the remaining five factors.

8.2 Assess scale validity

This step validates the construct. In other words, this step evaluates whether "responses to the scale behave as one would expect if they were valid indicators of the focal construct" (MacKenzie et al, 2011, p. 317). For the scale validation process, this study decided to use partial least square (PLS) path modelling technique which is a variance-based structural equation modelling technique. The study could have used a covariance-based structural equation modelling technique and used a tool such as AMOS. However, covariance-based techniques cannot be used when the model that needs to be validated has formative constructs. Since the conceptual model of this study has four formative constructs, this study decided to use PLS path modelling technique that has the capability to analyse models with formative constructs.

Furthermore, PLS path modelling is used in situations where researchers have to do "causal-predictive analysis in situations of high complexity but low theoretical information" (Henseler et al, 2009, p. 311). As discussed in the literature review, FL-RIE is an abstract construct with

low theoretical information. Only Hibbert et al (2012) and Hollebeek (2019) have discussed the existence of RIE. Furthermore, the conceptual framework of this study can be considered as complex because FL-RIE is conceptualised as a second order construct with 12 first-order indicators conceptualised with reflective indicators and 3 second-order indicators (see Figure 6.1). Once the justification was established for the use of PLS path modelling, this study finalised SmartPLS as the tool that would be used for the scale validation because it is the most popular tool used by the past studies to carry out PLS path modelling.

When validating a scale with PLS path modelling, a researcher must perform two steps to test whether the proposed scale meets the criteria suggested in each step (Chin, 1998). First, the researcher must test the outer model of the study. An outer model is "concerned with the relationships between the latent variables, that is and their manifestations" (Niehaves & Ortbach, 2016, p. 307). An outer model might consist of a reflective measurement model and/or a formative measurement model. The outer model of this study consists of a reflective measurement model and a formative measurement model. Hence, this study had to perform two sub-steps to assess the outer model (see Table 8.4 and Table 8.5). Second, the researcher must test the inner model (i.e., structural model) of the study (see Table 8.6). An inner model consists of the "relationships between variables that are visualised using interconnected paths" (Niehaves & Ortbach, 2016, p. 307). These relationships should be supported by extant literature. Two steps and criteria that should be tested are as follows.

1. Assessment of the outer model
    a. Assessment of the reflective measurement model

Table 8.4: Criterion for assessing the reflective measurement model (Source: Henseler et al (2009))

Criterion	Description
Composite Reliability	The composite reliability is a measure of internal consistency and must not be lower than 0.6.
Indicator reliability	Absolute standardised outer (component) loadings should be higher than 0.7.
Average variance extracted (AVE)	The average variance extracted should be higher than 0.5.
Fornell–Larcker criterion	In order to ensure discriminant validity, the AVE of each latent variable should be higher than the squared correlations with all other latent variables. Thereby, each latent variable shares more variance with its own block of indicators than with another latent variable representing a different block of indicators.
Cross-loadings	Cross-loadings offer another check for discriminant validity. If an indicator has a higher correlation with another latent variable than with its respective latent variable, the appropriateness of the model should be reconsidered.

b. The assessment of the formative measurement model

Table 8.5: Criterion for assessing the formative measurement model (Source: Henseler et al (2009))

Criterion	Description
Nomological validity	The relationships between the formative index and other constructs in the path model, which are sufficiently well known through prior research, should be significant.
External validity	The formative index should explain a big part of the variance of an alternative reflective measure of the focal construct.
Significance of weights	Estimated weights of formative measurement models should be significant.
Multicollinearity	Manifest variables in a formative block should be tested for multicollinearity. The variance inflation factor (VIF) can be used for such tests. As a rule of thumb, a VIF greater than ten indicates the presence of harmful collinearity. However, any VIF substantially greater than one indicates multicollinearity

2. Assessment of the inner model

Table 8.6: Criterion for assessing structural model (Source: Henseler et al (2009))

Criterion	Description
R^2 of endogenous latent variables	R^2 values of 0.67, 0.33, or 0.19 for endogenous latent variables in the inner path model are described as substantial, moderate, or weak
Estimates for path coefficients	The estimated values for path relationships in the structural model should be evaluated in terms of sign, magnitude, and significance (the latter via bootstrapping).
Effect size f^2	Values of 0.02, 0.15, and 0.35 can be viewed as a gauge for whether a predictor latent variable has a weak, medium, or large effect at the structural level.
Prediction relevance (Q^2)	Q^2-values above zero give evidence that the observed values are well reconstructed and that the model has predictive relevance (Q^2-values below zero indicate a lack of predictive relevance).

The rest of this chapter presents the findings of the assessment of the outer model and the inner model of the proposed conceptual framework.

8.2.1 Assessment of the Outer Model

As the first step of the assessment of the outer model, this study carried out the assessment of the reflective measurement model of the conceptual framework. As the second step, formative measurement model of the study was carried out. When assessing the outer model, this study focuses on the relationship between latent variables and their measurements (manifestations) (Niehaves & Ortbach, 2016). The main objectives are to establish the validity and reliability of the reflective measurement model and establish the validity of the formative measurement model. According to the measurement model, latent variables and manifestations of reflective measurement model and formative measurement model are shown in Table 8.7 and Table 8.8, respectively.

Table 8.7: Latent variables and manifestations of the reflective measurement model

Latent Variable	Manifestation
Integrated Market Orientation (**IMO**)	IMO_1
	IMO_4
	IMO_6
	IMO_10
	IMO_11
Intrapreneurship (**Intra**)	Intra_2
	Intra_5
	Intra_7
	Intra_8
	Intra_9
	Intra_10
Effective human resource practices (**EHRPrac**)	EHRPrac_2
	EHRPrac_4
	EHRPrac_6
	EHRPrac_7
Individual-Level Learning (**ILLearn**)	ILLearn_1
	ILLearn_3
	ILLearn_4
Group-Level Learning (**GLLearn**)	GLLearn_1
	GLLearn_2
	GLLearn_3
Absorptive Capacity (**AbCap**)	AbCap_1
	AbCap_2
	AbCap_4
	AbCap_7
	AbCap_8
Learning Orientation (**LOrient**)	LOrient_2
	LOrient_4
	LOrient_5
Trustworthy Leadership (**TrusLead**)	TrustLead_3
	TrustLead_5
	TrustLead_6
	TrustLead_8
	TrustLead_9
Capable Champions (**CapChamp**)	CapChamp_3
	CapChamp_5
	CapChamp_6
	CapChamp_7
	CapChamp_9
Innovative Culture (**InnCult**)	InnCult_3
	InnCult_4
	InnCult_5
Effective Communication (**EffComm**)	EffComm_1
	EffComm_4
	EffComm_5
	EffComm_7

Table 8.8: Latent variables and manifestations of the formative measurement model

Latent Variable	Second Order Manifestation of FL-RIE	First Order Manifestation of FL-RIE
Firm-Level Resource Integration Process Effectiveness (**FL-RIE**)	Level of Effectiveness of Internal and External Coordination Processes (**LEIECP**)	Integrated Market Orientation (**IMO**)
		Intrapreneurship (**Intra**)
		Effective human resource practices (**EHRPrac**)

	Level of Effectiveness of Organisational Learning Processes (**LEOLP**)	Individual-Level Learning (**ILLearn**)
		Group-Level Learning (**GLLearn**)
		Absorptive Capacity (**AbCap**)
		Learning Orientation (**LOrient**)
	Level of Effectiveness of Organisational Transformational Processes (**LEOTP**)	Trustworthy Leadership (**TrusLead**)
		Capable Champions (**CapChamp**)
		Innovative Culture (**InnCult**)
		Effective Communication (**EffComm**)

When assessing the reflective measurement model, this study focused on the relationships between the latent variables and manifestations shown in Table 8.7. When assessing the formative measurement model, this study focused on the relationships between the latent variables and manifestations shown in Table 8.8. The special thing that should be noted in Table 8.8 is FL-RIE has manifestations in two level (i.e., first order and second order manifestations). Furthermore, the other important aspect is first-order manifestations of FL-RIE are manifestations of second order manifestations of FL-RIE. Once this study generated a clear understanding regarding the latent variables and their manifestations, this study initiated the assessment of the reflective measurement model.

8.2.1.1 Assessment of the reflective measurement model

By assessing the reflective measurement model, the reliability and validity of the reflective indicators and latent variables (i.e., first order indicators) in the conceptual framework were established (Henseler et al, 2009). To establish the reliability and validity of the reflective indicators, this study assessed five criteria mentioned in Table 8.4 using PLS path modelling technique.

Version 3 of the SmartPLS software was used to carry out the PLS path modelling algorithm. To start the assessment of the reflective measurement model, the original measurement model was developed with SmartPLS 3 software. The original measurement model is shown in Figure 8.1. Table 8.9 lists each item, first-, second-order indicators and focal construct shown in the original measurement model. Once the original measurement model was developed first criteria of the assessment of reflective measurement model – composite reliability was tested.

Figure 8.1: Original measurement model

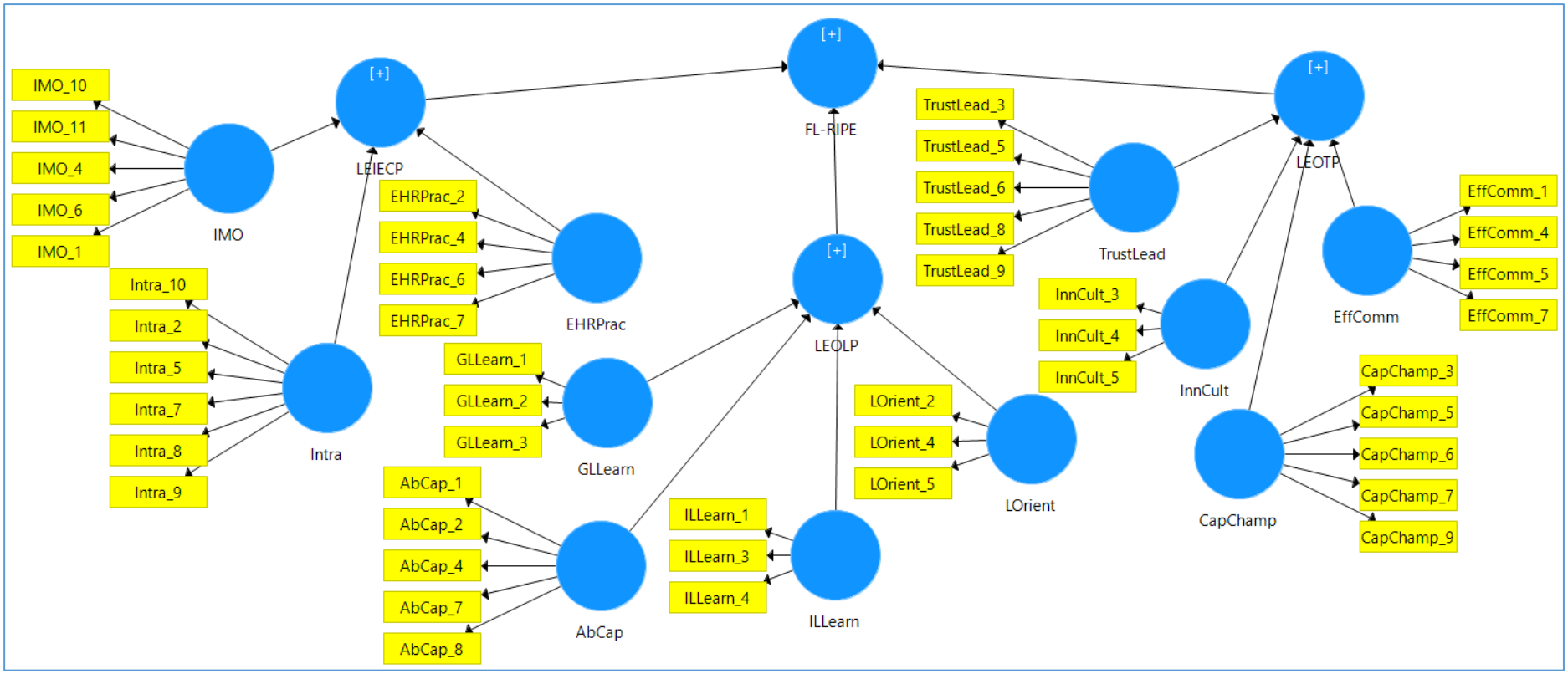


Table 8.9: List of indicators, sub-constructs and focal constructs in the original measurement model

Focal Construct	Second Order Indicator	First Order Indicator	Items
Firm-Level Resource Integration Effectiveness (**FL-RIE**)	Level of Effectiveness of Internal and External Coordination Processes (**LEIECP**)	Integrated Market Orientation (**IMO**)	IMO_1
			IMO_4
			IMO_6
			IMO_10
			IMO_11
		Intrapreneurship (**Intra**)	Intra_2
			Intra_5
			Intra_7
			Intra_8
			Intra_9
			Intra_10
		Effective human resource practices (**EHRPrac**)	EHRPrac_2
			EHRPrac_4
			EHRPrac_6
			EHRPrac_7
	Level of Effectiveness of Organisational Learning Processes (**LEOLP**)	Individual-Level Learning (**ILLearn**)	ILLearn_1
			ILLearn_3
			ILLearn_4
		Group-Level Learning (**GLLearn**)	GLLearn_1
			GLLearn_2
			GLLearn_3
		Absorptive Capacity (**AbCap**)	AbCap_1
			AbCap_2
			AbCap_4
			AbCap_7
			AbCap_8
		Learning Orientation (**LOrient**)	LOrient_2
			LOrient_4
			LOrient_5
	Level of Effectiveness of Organisational Transformational Processes (**LEOTP**)	Trustworthy Leadership (**TrusLead**)	TrustLead_3
			TrustLead_5
			TrustLead_6
			TrustLead_8
			TrustLead_9
		Capable Champions (**CapChamp**)	CapChamp_3
			CapChamp_5
			CapChamp_6
			CapChamp_7
			CapChamp_9
		Innovative Culture (**InnCult**)	InnCult_3
			InnCult_4
			InnCult_5
		Effective Communication (Eff**Comm**)	Comm_1
			Comm_4
			Comm_5
			Comm_7

8.2.1.1.1 Analysis of composite reliability of first order variables

This step checks internal consistency of each reflective first-order variable. Internal consistency measures estimate the reliability based on the interconnection between the indicators and each variable. In other words, internal consistency is an indication of the degree to which a set of measures that measure a variable yields a similar number or score each time

it is estimated. In a majority of the studies, a benchmark value of 0.7 is used as the minimum acceptable value of internal consistency (Nunnally & Bernstein, 1994). However, some studies considered a minimum value of 0.6 as the accepted value of internal consistency (Henseler et al, 2009). When using PLS path modelling for data analysis, internal consistency is tested by composite reliability. Therefore, this study considered any composite reliability value less than 0.6 as an indication of lack of reliability.

Cronbach's Alpha is also used to test internal consistency of latent variables. However, literature on PLS path modelling recommends using composite reliability values to test the internal consistency of latent variables. The reason is, to calculate the internal consistency of the latent variable, composite reliability uses the standardised loadings of the manifest variables whereas Cronbach's Alpha does not (Fornell & Larcker, 1981). This study therefore used composite reliability value to test internal consistency of reflective variables.

When running the PLS path modelling to test composite reliability, path weighting scheme was used since it provides the highest R^2 value for endogenous latent variables and is relevant for a wide range of PLS path model estimations. Table 8.10 shows composite reliability values of each first-order reflective indicator. According to the table, two variables have composite reliability values less than 0.6. They are effective human resource practices (EHRPrac) and individual-level learning (ILLearn). Therefore, EHRPrac and ILLearn were removed from the measurement model.

Table 8.10: Composite reliability of each first-order indicator

Focal Construct	Second-Order Indicator	First-Order Indicator	Composite Reliability
FL-RIE	LEIECP	IMO	0.808
		Intra	0.909
		HRPrac	0.539
	LEOLP	ILLearn	0.225
		GLLearn	0.695
		Lorient	0.875

Note: The shaded area represents the variables deleted from the original measurement model

		AbCap	0.835
	LEOTP	TrustLead	0.942
		CapChamp	0.784
		InnCult	0.913
		Comm	0.979

8.2.1.1.2 Assessment of the indicator reliability

Composite reliability typically measures the reliability of reflective variables (such as IMO). In this study, composite reliability measured the reliability of first-order indicators (e.g., IMO and Intra). However, composite reliability does not measure the reliability of items (e.g., IMO_1 and Intra_2) of the first-order reflective indicators. Therefore, this step measured the reliability of each reflective item of the measurement model.

In PLS path modelling, indicator reliability is denoted by a parameter called outer loading. If a latent variable sufficiently explains part of an indicator's variance, the value of absolute standardised outer loading of the indicator should be greater than 0.7 (Henseler et al, 2009). Hulland (1999) argues that an outer loading value greater than 0.4 is also an acceptable value. Since this study is keen on retaining maximum number of indicators at this point of the analysis, this study adopted the recommendation of Hulland (1999). Any indicator that had an outer loading of less than 0.4 was deleted from the measurement model. However, it is not sufficient to have an outer loading value greater than 0.4 to retain an item. Every value with an outer loading greater than 0.4 should be significant ($p<0.05$) to consider for retention (Henseler et al, 2009).

To test the outer loading of each indicator the PLS path modelling algorithm was administered with the path weighting scheme. Significance level of each outer loading was tested by administering bootstrapping with 10,000 subsamples. The recommended number of subsamples is 5,000 (SmartPLS, 2020). Therefore, this study used twice the recommended

number of subsamples – 10,000. The output of the administered PLS path modelling algorithm and bootstrapping are shown in Table 8.11. As discussed earlier, all the indicators that has outer loadings less than 0.4 or not significant were eliminated. Due to the elimination of indicators, two 1st order variables, namely, GLLearn and InnCult were eliminated from the model.

Table 8.11: Summary of the assessment of indicator reliability

Focal Construct	Second-Order Indicator	First-Order Indicator	Items	Outer Loading	T-Value	P-Value
Firm-Level Resource Integration Effectiveness (**FL-RIE**)	Level of Effectiveness of Internal and External Coordination Processes (**LEIECP**)	Integrated Market Orientation (**IMO**)	IMO_1	0.809	26.562	p<0.001
			IMO_4	0.804	17.183	p<0.001
			IMO_6	0.793	22.949	p<0.001
			IMO_10	0.773	22.351	p<0.001
			IMO_11	0.047	0.533	0.598
		Intrapreneurship (**Intra**)	Intra_2	0.823	33.147	p<0.001
			Intra_5	0.878	43.990	p<0.001
			Intra_7	0.717	12.444	p<0.001
			Intra_8	0.749	15.912	p<0.001
			Intra_9	0.796	22.533	p<0.001
			Intra_10	0.771	24.997	p<0.001
	Level of Effectiveness of Organisational Learning Processes (**LEOLP**)	Group-Level Learning (**GLLearn**)	GLLearn_1	0.825	1.136	0.256
			GLLearn_2	0.501	1.348	0.178
			GLLearn_3	0.601	1.181	0.238
		Absorptive Capacity (**AbCap**)	AbCap_1	0.853	37.830	p<0.001
			AbCap_2	0.776	19.128	p<0.001
			AbCap_4	0.839	33.226	p<0.001
			AbCap_7	0.861	35.100	p<0.001
			AbCap_8	0.024	0.240	0.811
		Learning Orientation (**LOrient**)	LOrient_2	0.853	46.581	p<0.001
			LOrient_4	0.839	29.939	p<0.001
			LOrient_5	0.817	22.060	p<0.001
	Level of Effectiveness of Organisational Transformational Processes (**LEOTP**)	Trustworthy Leadership (**TrusLead**)	TrustLead_3	0.838	2.652	p<0.05
			TrustLead_5	0.906	2.614	p<0.05
			TrustLead_6	0.888	2.613	p<0.05
			TrustLead_8	0.899	2.592	p<0.05
			TrustLead_9	0.838	2.561	p<0.05
		Capable Champions (**CapChamp**)	CapChamp_3	0.636	5.840	p<0.001
			CapChamp_5	0.631	3.910	p<0.001
			CapChamp_6	0.755	5.345	p<0.001
			CapChamp_7	0.687	5.502	p<0.001
			CapChamp_9	0.523	4.151	p<0.001
		Innovative Culture (**InnCult**)	InnCult_3	0.897	1.547	0.122
			InnCult_4	0.837	1.363	0.173
			InnCult_5	0.907	1.488	0.137
		Effective Communication (**EffComm**)	EffComm_1	0.958	7.901	p<0.001
			EffComm_4	0.961	7.937	p<0.001
			EffComm_5	0.963	8.020	p<0.001
			EffComm_7	0.954	7.911	p<0.001

8.2.1.1.3 Assessment of Average Variance Extracted (AVE) of reflective variables

According to Table 8.4, after examining composite reliability and outer loadings, convergent validity and discriminant validity of the reflective variables should be examined. Since, in PLS

path modelling, the results of the convergent validity test are used to conduct the discriminant validity test, first, this study conducted the convergent validity test. Convergent validity demonstrates the extent to which an item correlates with similar items of a specific reflective construct (Brennan, Camm, & Tanas, 2007). If a particular indicator demonstrates convergent validity, it is an indication that the indicator's items are capable of representing the indicator successfully (Henseler et al, 2009).

In PLS path modelling, AVE value indicates the convergent validity of the reflective variables (Fornell & Larcker, 1981). AVE is a measure that indicates the extent to which a latent variable is capable of explaining the variance of its indicators (Hair, Black, Babin, & Anderson, 2013; Henseler et al, 2009). This value should be greater than 0.5 to retain a reflective variable without eliminating it from the measurement model (Henseler et al, 2009; Richard, 2008).

Thus, this study executed the PLS path modelling algorithm on the revised measurement models with the path weighting scheme to test AVE values related to each reflective first-order indicator. The initial outcome of the PLS algorithm is shown in Table 8.12. According to the outcome, CapChamp was eliminated from the measurement model. However, based on the recommendation of Richard (2008) this study checked for problematic outer loadings without eliminating the indicator.

Table 8.12: Average Variance Extracted (AVE) values of reflective variables (1st run)

Focal Construct	Second-Order Indicator	First-Order Indicator	Average Variance Extracted (AVE)
Firm-Level Resource Integration Process Effectiveness (**FL-RIE**)	Level of Effectiveness of Internal and External Coordination Processes (**LEIECP**)	Integrated Market Orientation (**IMO**)	0.632
		Intrapreneurship (**Intra**)	0.625
	Level of Effectiveness of Organisational Learning Processes (**LEOLP**)	Absorptive Capacity (**AbCap**)	0.555
		Learning Orientation (**LOrient**)	0.700

Note: The shaded area represents the variables with poor AVE values

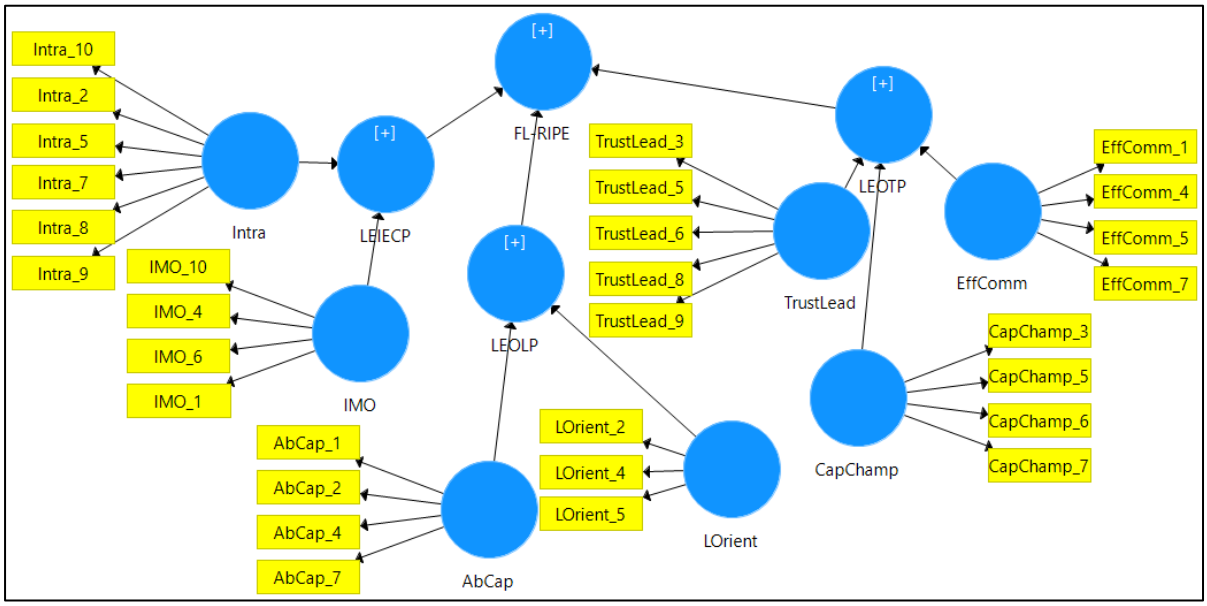
	Level of Effectiveness of Organisational Transformational Processes (**LEOTP**)	Trustworthy Leadership (**TrusLead**)	0.764
		Capable Champions (**CapChamp**)	0.424
		Effective Communication (**EffComm**)	0.919

The item CapChamp_9 had an outer loading value of 0.513. Since the rest of the indicators had outer loading values greater than 0.6, this study decided to eliminate CapChamp_9 and re-run the PLS algorithm with path weighting scheme. The outcome is shown in Table 8.13.

Table 8.13: Average Variance Extracted (AVE) values of reflective variables (2nd run)

Focal Construct	Second-Order Indicator	First-Order Indicator	Average Variance Extracted (AVE)
Firm-Level Resource Integration Effectiveness (**FL-RIE**)	Level of Effectiveness of Internal and External Coordination Processes (**LEIECP**)	Integrated Market Orientation (**IMO**)	0.632
		Intrapreneurship (**Intra**)	0.625
	Level of Effectiveness of Organisational Learning Processes (**LEOLP**)	Absorptive Capacity (**AbCap**)	0.555
		Learning Orientation (**LOrient**)	0.700
	Level of Effectiveness of Organisational Transformational Processes (**LEOTP**)	Trustworthy Leadership (**TrusLead**)	0.764
		Capable Champions (**CapChamp**)	0.501
		Effective Communication (**EffComm**)	0.919

Figure 8.2: Revised measurement model with convergent validity of the 1st order reflective indicators



Elimination of CapChamp_9 improved the AVE value of the variable CapChamp from 0.424 to 0.501 (>0.5). Therefore, this study retained the variable CapChamp since it had an AVE value of greater than 0.5. The revised measurement model with convergent validity of the first-order reflective variable is shown above in Figure 8.2.

8.2.1.1.4 Assessment of the Fornell-Larcker criterion

Once the convergent validity of first-order latent variables was tested, this study focused on testing the discriminant validity of first-order reflective latent variables. Discriminant validity tests whether seven first-order variables which are not supposed to relate to each other are actually not related (Hubley, 2014). In other words, discriminant validity test whether conceptually different concepts demonstrate sufficient difference in a given context (Henseler et al, 2009).

Discriminant validity is established when the squared correlation coefficients of a variable with other variables are noticeably smaller in magnitude than convergent validity coefficient of the variable (i.e., AVE value) (Churchill, 1979; Henseler et al, 2009; Hubley, 2014). For example, individual squared correlation coefficients between Intra and other first-order variables should be less than the AVE value of Intra. Fornell-Larcker criterion was used to assess discriminant validity. Similar to the previous steps, the PLS path modelling algorithm was administered with path weighting scheme. The output is shown in Table 8.14 below.

Table 8.14: Discriminant validity results using the Fornell-Larcker criterion

	AbCap	CapChamp	EffComm	IMO	Intra	Lorient	TrustLead
AVE	0.555	0.501	0.919	0.632	0.625	0.700	0.764
AbCap	**0.833**						
CapChamp	0.280	**0.708**					
EffComm	0.264	0.189	**0.959**				
IMO	0.595	0.208	0.282	**0.795**			
Intra	0.326	0.061	0.220	0.427	**0.791**		
Lorient	0.436	0.184	0.188	0.593	0.390	**0.836**	
TrustLead	0.050	0.102	0.106	0.013	-0.028	0.015	**0.874**

As can be seen in Table 8.14, all the AVE values of first-order indicators are higher than the squared correlation coefficients (i.e., values that are along and below the diagonal of the table) of any other first-order indicator. Therefore, it is possible to confirm that discriminant validity is demonstrated in the measurement model shown in Figure 8.2. However, Henseler et al (2009) recommends conducting a test at the item-level also to test discriminant validity since the Fornell-Larcker criterion tests discriminant validity only in the indicator-level.

8.2.1.1.5 Assessment of cross-loadings to test discriminant validity

To test discriminant validity of first-order reflective indicators from the item level, Henseler et al (2009) recommend checking whether the loading of each item is greater than its cross-loadings. Loadings and cross-loadings are shown in Table 8.15. As can be seen, none of the items have cross-loadings that are greater than loadings. Therefore, it is possible to conclude that the discriminant validity of the measurement model is demonstrated.

Table 8.15: Loadings and cross-loadings of items

	AbCap	CapChamp	EffComm	IMO	Intra	LOrient	TrustLead
AbCap_1	**0.854**	0.196	0.259	0.499	0.259	0.399	0.037
AbCap_2	**0.776**	0.283	0.176	0.413	0.228	0.269	0.049
AbCap_4	**0.837**	0.214	0.270	0.529	0.346	0.415	0.075
AbCap_7	**0.863**	0.251	0.167	0.534	0.248	0.358	0.008
CapChamp_3	0.344	**0.587**	0.159	0.333	0.166	0.278	0.142
CapChamp_5	0.089	**0.707**	0.118	0.081	-0.029	-0.011	-0.028
CapChamp_6	0.172	**0.798**	0.148	0.061	-0.030	0.058	0.002
CapChamp_7	0.147	**0.722**	0.100	0.080	0.037	0.147	0.142
EffComm_1	0.244	0.195	**0.958**	0.286	0.223	0.201	0.085
EffComm_4	0.220	0.186	**0.961**	0.232	0.205	0.153	0.116
EffComm_5	0.294	0.203	**0.963**	0.275	0.205	0.201	0.114
EffComm_7	0.254	0.139	**0.954**	0.291	0.210	0.163	0.090
IMO_1	0.527	0.157	0.248	**0.809**	0.379	0.518	0.054
IMO_4	0.477	0.068	0.241	**0.803**	0.264	0.548	-0.031
IMO_6	0.459	0.211	0.222	**0.794**	0.342	0.466	-0.028
IMO_10	0.426	0.219	0.186	**0.774**	0.366	0.359	0.042
Intra_10	0.319	0.018	0.181	0.485	**0.771**	0.365	-0.037
Intra_2	0.244	0.121	0.241	0.318	**0.823**	0.320	-0.108
Intra_5	0.282	0.085	0.175	0.322	**0.877**	0.288	-0.011
Intra_7	0.110	-0.018	0.078	0.167	**0.717**	0.157	0.025
Intra_8	0.197	-0.024	0.189	0.217	**0.749**	0.264	0.005
Intra_9	0.349	0.081	0.164	0.455	**0.796**	0.413	0.004
LOrient_2	0.421	0.132	0.158	0.553	0.301	**0.853**	-0.008
LOrient_4	0.328	0.089	0.169	0.465	0.329	**0.839**	0.039
LOrient_5	0.340	0.245	0.144	0.465	0.351	**0.817**	0.010

TrustLead_3	0.027	0.159	0.141	0.058	0.007	0.030	**0.838**
TrustLead_5	0.009	0.072	0.105	-0.037	-0.007	-0.034	**0.906**
TrustLead_6	0.112	0.058	0.113	0.032	-0.012	0.026	**0.888**
TrustLead_8	0.027	0.086	0.054	0.003	-0.077	0.038	**0.899**
TrustLead_9	0.047	0.063	0.036	0.000	-0.042	0.009	**0.838**

Once loadings and cross-loadings are tested to establish discriminant validity, the assessment of the reflective measurement model was completed. During the assessment, 16 items and 4 first-order reflective indicators were eliminated. The remaining first-order reflective indicators were able to fulfil the criteria to conclude that they are reliable and valid. This was tested and established through composite reliability, AVE and the Fornell-Larcker criterion. The reliability and validity of the remaining indicators were tested and established through indicator loadings and cross-loadings. The revised measurement model consists of 30 indicators and 7 first-order reflective variables as shown in Figure 8.2. It was carried forward to assess the formative measurement model.

A summary of the measurement model carried forward to the assessment of the formative measurement model is shown in Table 8.16. It summarises items and first-order indicators that are in the measurement model at the end of the assessment of reflective measurement model. Furthermore, it summarises composite reliability (should be greater than 0.6) and AVE (should be greater than 0.5) values of each first-order reflective indicator, and outer-loadings (should be greater than 0.4 and significant) of each item with t- and p-values. As can be seen in Table 8.16, parameters of the remaining first-order reflective indicators and items meet recommended values.

Table 8.16: Summary of the measurement model after the assessment of the reflective measurement model

Focal Construct	Second-Order Indicator	First-Order Indicator	Indicator	Composite Reliability	AVE	Outer Loading	T-Value	P-Value
Firm-Level Resource Integration Effectiveness (**FL-RIE**)	Level of Effectiveness of Internal and External Coordination	Integrated Market Orientation (**IMO**)	IMO_1	0.873	0.632	0.809	25.150	p<0.001
			IMO_4			0.803	18.550	p<0.001
			IMO_6			0.794	23.036	p<0.001
			IMO_10			0.774	24.364	p<0.001
		Intrapreneurship (**Intra**)	Intra_2	0.909	0.625	0.823	30.972	p<0.001
			Intra_5			0.877	44.563	p<0.001

	Processes (**LEIECP**)		Intra_7			0.717	12.521	p<0.001
			Intra_8			0.749	16.117	p<0.001
			Intra_9			0.796	22.290	p<0.001
			Intra_10			0.771	24.612	p<0.001
	Level of Effectiveness of Organisational Learning Processes (**LEOLP**)	Absorptive Capacity (**AbCap**)	AbCap_1	0.901	0.694	0.854	34.102	p<0.001
			AbCap_2			0.777	17.990	p<0.001
			AbCap_4			0.837	32.651	p<0.001
			AbCap_7			0.863	35.194	p<0.001
		Learning Orientation (**LOrient**)	LOrient_2	0.875	0.700	0.853	50.022	p<0.001
			LOrient_4			0.839	31.835	p<0.001
			LOrient_5			0.817	20.916	p<0.001
	Level of Effectiveness of Organisational Transformational Processes (**LEOTP**)	Trustworthy Leadership (**TrusLead**)	TrusLead_3	0.942	0.764	0.838	4.262	p<0.001
			TrusLead_5			0.906	4.243	p<0.001
			TrusLead_6			0.888	4.208	p<0.001
			TrusLead_8			0.899	4.219	p<0.001
			TrusLead_9			0.838	4.182	p<0.001
		Capable Champions (**CapChamp**)	CapChamp_3	0.799	0.501	0.587	4.435	p<0.001
			CapChamp_5			0.707	4.528	p<0.001
			CapChamp_6			0.798	6.518	p<0.001
			CapChamp_7			0.722	5.657	p<0.001
		Effective Communication (**EffComm**)	EffComm_1	0.979	0.919	0.958	85.728	p<0.001
			EffComm_4			0.961	97.738	p<0.001
			EffComm_5			0.963	107.120	p<0.001
			EffComm_7			0.954	94.139	p<0.001

8.2.1.2 Assessment of the formative measurement model

The second step of the process of assessing the outer model is the assessment of the formative measurement model. It is not meaningful to employ traditional reliability and validity tests to assess a formative measurement model (Diamantopoulos et al, 2008; Henseler et al, 2009; McKenzie et al, 2011). In other words, internal consistency, convergent validity, and discriminant validity tests are not applicable when testing a formative measurement model. Therefore, an alternative approach had to be adopted to assess the formative measurement model of the proposed conceptual framework.

Two approaches are recommended for assessment. The first approach is to establish the validity of the formative constructs through theoretic rationale and expert opinion (Diamantopoulos et al, 2008; Rossiter, 2002). The second approach is to assess the validity of formative constructs through statistical analyses. Statistical analysis must be carried out at the construct level and the indicator level. Out of the two approaches, the first approach is highly recommended (Henseler et al, 2009). Some researchers argue not to carry out any statistical analyses to check

the validity of formative measurement models because of the limited applicability (e.g., Rossiter, 2002). However, there is another school of thought that argues that statistical analysis must be carried out to test the validity of formative measurement models to complement the content validity and model specification process (e.g., Edwards & Bagozzi, 2000). Therefore, this study carried out statistical analyses also by conducting the steps presented in Table 8.5.

The revised measurement model (see Figure 8.2) has four formative constructs. Three of them are second-order indicators (i.e., LEIECP, LEOLP and LEOTP) and the fourth is the focal construct of the study (i.e., FL-RIE). Content validity of the four formative constructs has already been established through theoretical justifications (see Chapter 2 and 6) and expert opinion (see Chapter 5 and 6). Thus, this study did not conduct statistical analyses on LEIECP, LEOLP and LEOTP. Validity of LEIECP, LEOLP and LEOTP are already established through the literature review, content validity test and formal specification of the measurement model. However, since FL-RIE is the focal construct of the study, a statistical analysis was conducted by following the steps suggested in Table 8.5.

8.2.1.2.1 Assessment of the nomological validity of the focal construct

The main purpose of this step is to test whether the focal construct – FL-RIE possesses the intended meaning. It is done by empirically testing whether FL-RIE is an antecedent or a consequence of another variable that has a well-established scale (Liu, Li & Zhu, 2012; MacKenzie et al, 2011). This type of test is called a nomological validity test. Therefore, to test the nomological validity, this research had to identify an antecedent or a consequence of FL-RIE from the extant literature.

As discussed in sub-section 2.4.3.1.5, this study has already identified *innovation* as a consequence of FL-RIE. In other words, FL-RIE is an antecedent of the construct – innovation. Lusch and Nambisan (2015) refer to resource integration process as the very process of service

innovation. Roberts, Hughes and Kertbo (2014) argues that innovation is an outcome of value co-creation. Carida et al (2019) refer to the resource integration process as an antecedent of value co-creation. When the arguments of Carida et al (2019) and Roberts et al (2014) are combined, it is possible to argue that the resource integration process is an antecedent of innovation. FL-RIE is a property of a firm's resource integration process. Therefore, it is possible to hypothesise FL-RIE as an antecedent of the construct – innovation.

Thus, when preparing the questionnaire for the second round of data collection, a separate section was added to include the questions of the construct – innovation. Nasution et al (2011) propose a 15-item scale to measure innovation. It was adopted and included in the questionnaire distributed for the second round of data collection (see Appendix F).

Once data was collected, innovation was tested for reliability and validity to identify any problematic items that needed to be eliminated before testing the nomological validity of FL-RIE. Reliability was tested by checking composite reliability and item reliability. As discussed earlier, composite reliability of an indicator should be greater than 0.6 and item reliability value of each reflective item should be greater than 0.4. Since the assessment of reflective measurement model is already completed, this study adopted a stricter approach when analysing item reliability of innovation. Hence, any item with a reliability value of less than 0.6 was eliminated. Furthermore, any item that was not significant was also eliminated from the measurement model. As a result of following this criterion, 8 out of 15 items were eliminated. A summary of the remaining indicators is shown in Table 8.17.

Table 8.17: Summary of reliability and convergent validity tests of each indicator and item after including innovation to the measurement model

Reflective Indicator	Items	Composite Reliability	AVE	Outer Loading	T-Value	P-Value
Integrated Market Orientation (**IMO**)	IMO_1	0.873	0.632	0.809	25.809	p<0.001
	IMO_4			0.803	18.394	p<0.001
	IMO_6			0.793	22.971	p<0.001
	IMO_10			0.774	21.908	p<0.001
	Intra_2	0.909	0.625	0.824	32.747	p<0.001

Intrapreneurship (**Intra**)	Intra_5			0.878	44.708	p<0.001
	Intra_7			0.717	12.468	p<0.001
	Intra_8			0.749	16.023	p<0.001
	Intra_9			0.796	24.293	p<0.001
	Intra_10			0.771	26.033	p<0.001
Absorptive Capacity (**AbCap**)	AbCap_1	0.901	0.694	0.854	35.697	p<0.001
	AbCap_2			0.777	19.293	p<0.001
	AbCap_4			0.837	32.353	p<0.001
	AbCap_7			0.862	33.713	p<0.001
Learning Orientation (**LOrient**)	LOrient_2	0.875	0.700	0.853	47.203	p<0.001
	LOrient_4			0.839	30.732	p<0.001
	LOrient_5			0.817	22.675	p<0.001
Trustworthy Leadership (**TrusLead**)	TrusLead_3	0.942	0.764	0.840	2.189	p<0.050
	TrusLead_5			0.906	2.104	p<0.050
	TrusLead_6			0.889	2.125	p<0.050
	TrusLead_8			0.898	2.077	p<0.050
	TrusLead_9			0.836	2.047	p<0.050
Capable Champions (**CapChamp**)	CapChamp_3	0.797	0.498	0.605	4.353	p<0.001
	CapChamp_5			0.699	4.535	p<0.001
	CapChamp_6			0.796	7.124	p<0.001
	CapChamp_7			0.710	6.007	p<0.001
Effective Communication (**EffComm**)	Comm_1	0.978	0.918	0.958	93.172	p<0.001
	Comm_4			0.961	97.836	p<0.001
	Comm_5			0.961	104.041	p<0.001
	Comm_7			0.954	91.568	p<0.001
Innovation (**Innov**)	Innov_2	0.906	0.582	0.711	17.100	p<0.001
	Innov_3			0.851	42.391	p<0.001
	Innov_5			0.764	24.388	p<0.001
	Innov_7			0.665	14.118	p<0.001
	Innov_12			0.783	23.844	p<0.001
	Innov_13			0.812	29.337	p<0.001
	Innov_14			0.740	20.185	p<0.001

Once reliability of innovation was tested, this study tested the convergent validity of the indicator. If the AVE value of innovation is greater than 0.5, it is possible to conclude that it has convergent validity. As shown in Table 8.17, the AVE value of innovation is greater than 0.5. Therefore, this study concluded that innovation has convergent validity. Subsequently, discriminant validity of innovation was tested by checking the Fornell-Lacker criterion (see Table 8.18) and cross-loadings (see Table 8.19). As shown in Table 8.18, none of the squared correlation coefficients are higher than the AVE values of any of the indicators including innovation. Therefore, it is possible to confirm that discriminant validity of each indicator in the measurement model is demonstrated even after including innovation.

Table 8.18: Discriminant validity results using the Fornell-Larcker criterion after including innovation to the measurement model

	AbCap	CapChamp	EffComm	IMO	Innov	Intra	LOrient	TrustLead
AVE	0.694	0.498	0.918	0.632	0.582	0.625	0.700	0.764
AbCap	**0.833**							
CapChamp	0.285	**0.706**						
EffComm	0.263	0.191	**0.958**					
IMO	0.595	0.214	0.283	**0.795**				
Innov	0.585	0.199	0.307	0.481	**0.763**			
Intra	0.326	0.064	0.219	0.427	0.341	**0.791**		
Lorient	0.436	0.188	0.187	0.593	0.485	0.389	**0.836**	
TrustLead	0.051	0.104	0.106	0.014	0.040	-0.028	0.015	**0.874**

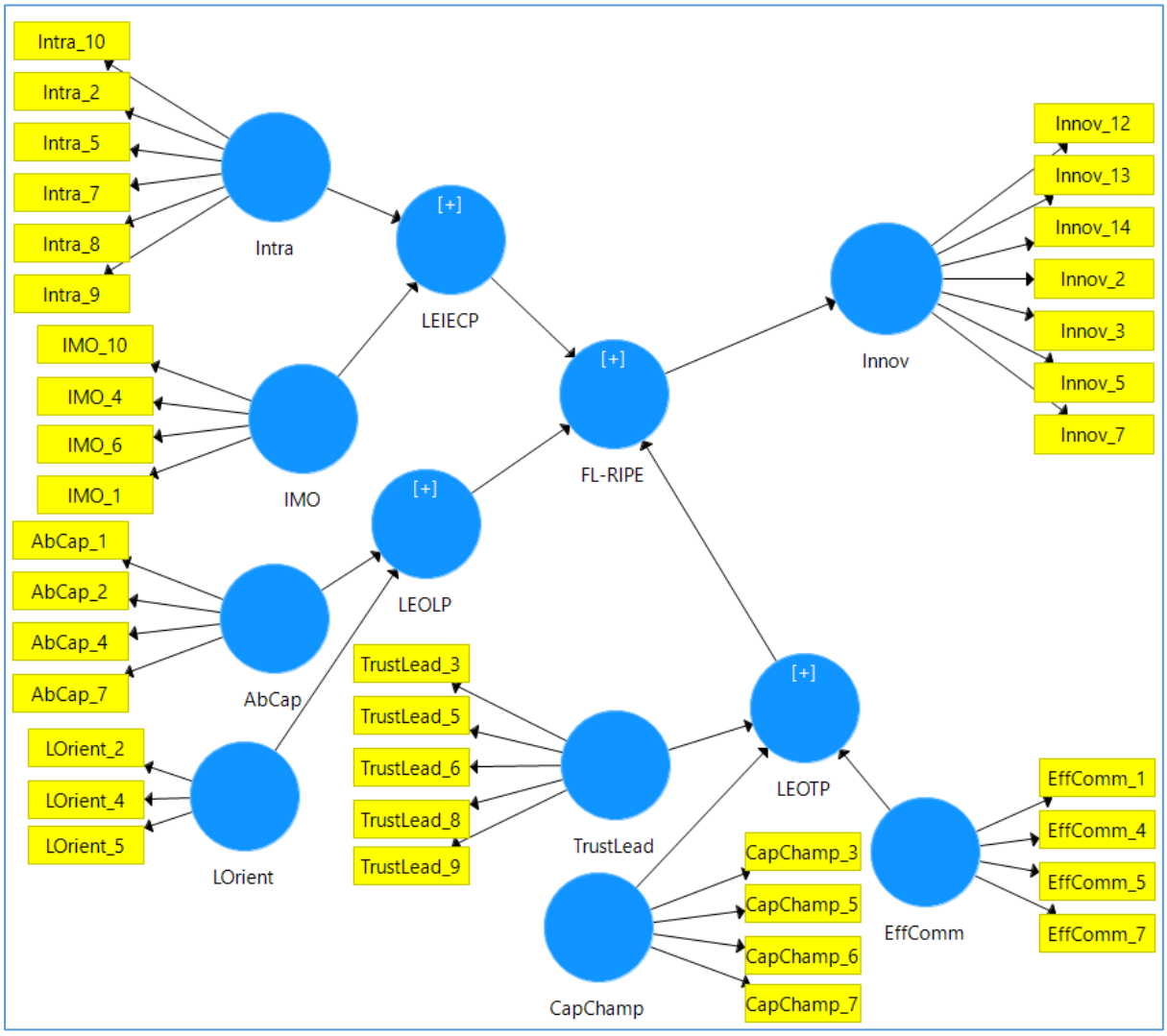
Discriminant validity at the item-level was tested by checking the cross loadings. As shown in Table 8.19, loadings of each indicator are greater than their cross-loadings. Therefore, this study confirmed that the variable innovation possesses item-level discriminant validity as well. Thus, this study was able to establish the reliability and the validity of the variable, innovation. Once the reliability and validity were established, only 7 out of 15 indicators of innovation remained in the measurement model to test nomological validity of FL-RIE (see Figure 8.3).

Table 8.19: Loadings and cross loadings of indicators after including innovation to the measurement model

	AbCap	CapChamp	EffComm	IMO	Innov	Intra	LOrient	TrustLead
AbCap_1	**0.854**	0.199	0.259	0.499	0.533	0.259	0.399	0.037
AbCap_2	**0.777**	0.286	0.176	0.413	0.384	0.228	0.269	0.049
AbCap_4	**0.837**	0.220	0.270	0.529	0.552	0.346	0.415	0.075
AbCap_7	**0.862**	0.255	0.166	0.534	0.470	0.248	0.358	0.009
CapChamp_3	0.344	**0.605**	0.158	0.333	0.276	0.166	0.278	0.142
CapChamp_5	0.089	**0.699**	0.119	0.081	0.076	-0.029	-0.011	-0.028
CapChamp_6	0.172	**0.796**	0.148	0.061	0.048	-0.030	0.058	0.003
CapChamp_7	0.147	**0.710**	0.101	0.080	0.122	0.037	0.147	0.141
EffComm_1	0.244	0.197	**0.958**	0.285	0.305	0.223	0.201	0.086
EffComm_4	0.221	0.186	**0.961**	0.232	0.261	0.205	0.153	0.117
EffComm_5	0.290	0.206	**0.961**	0.277	0.301	0.202	0.200	0.112
EffComm_7	0.253	0.141	**0.954**	0.291	0.311	0.210	0.163	0.091
IMO_1	0.527	0.161	0.249	**0.809**	0.527	0.379	0.518	0.054
IMO_4	0.477	0.071	0.242	**0.803**	0.385	0.264	0.548	-0.030
IMO_6	0.459	0.217	0.222	**0.793**	0.335	0.342	0.466	-0.028
IMO_10	0.427	0.223	0.187	**0.774**	0.275	0.366	0.359	0.043
Innov_2	0.451	0.057	0.186	0.395	**0.711**	0.266	0.414	0.004
Innov_3	0.481	0.252	0.269	0.323	**0.851**	0.268	0.326	0.018
Innov_5	0.438	0.173	0.179	0.398	**0.764**	0.314	0.411	0.053
Innov_7	0.456	0.098	0.275	0.405	**0.665**	0.122	0.322	0.031
Innov_12	0.459	0.151	0.267	0.370	**0.783**	0.247	0.346	0.002
Innov_13	0.437	0.157	0.266	0.341	**0.812**	0.266	0.416	0.003
Innov_14	0.401	0.165	0.201	0.340	**0.740**	0.322	0.347	0.101
Intra_2	0.243	0.122	0.240	0.318	0.338	**0.824**	0.320	-0.108
Intra_5	0.282	0.087	0.174	0.322	0.234	**0.878**	0.288	-0.011

Intra_7	0.110	-0.016	0.078	0.167	0.025	**0.717**	0.157	0.025
Intra_8	0.197	-0.023	0.189	0.217	0.205	**0.749**	0.264	0.006
Intra_9	0.348	0.084	0.164	0.455	0.411	**0.796**	0.413	0.005
Intra_10	0.319	0.024	0.180	0.485	0.337	**0.771**	0.365	-0.037
LOrient_2	0.420	0.136	0.158	0.553	0.386	0.301	**0.853**	-0.008
LOrient_4	0.328	0.091	0.169	0.465	0.434	0.329	**0.839**	0.039
LOrient_5	0.340	0.248	0.143	0.465	0.400	0.351	**0.817**	0.010
TrustLead_3	0.027	0.160	0.142	0.058	0.024	0.007	0.030	**0.840**
TrustLead_5	0.009	0.073	0.103	-0.037	-0.017	-0.007	-0.034	**0.906**
TrustLead_6	0.112	0.060	0.114	0.032	0.143	-0.012	0.026	**0.889**
TrustLead_8	0.027	0.086	0.055	0.003	-0.017	-0.077	0.038	**0.898**
TrustLead_9	0.046	0.064	0.034	0.000	0.037	-0.042	0.009	**0.836**

Figure 8.2: Measurement model used to test the nomological validity of FL-RIE



If FL-RIE is nomologically valid, the relationship between FL-RIE and innovation should be significant (see Table 8.5). In PLS path modelling significance is tested either by observing the t-value or the p-value of the relationship. If the t-value is greater than 1.96 or the p-value is less than 0.05 it is accepted that the relationship is significant. To observe the t-value or the p-value of the relationship between FL-RIE and innovation, PLS path modelling algorithm was administered.

The visual output of PLS path modelling algorithm is shown in Figure 8.4. According to Figure 8.4, the relationship between FL-RIE and innovation is significant because the t-value of the relationship is 15.662 (>1.96). T-values and p-values of all the relationships in the measurement model are shown in Table 8.20. According to Table 8.20, the relationship between FL-RIE and innovation has a p-value<0.001. Therefore, it is possible to conclude that the hypothesised relationship between FL-RIE and innovation based on the knowledge obtained from prior research is significant. Hence, FL-RIE demonstrates nomological validity.

Figure 8.3: T-values of the relationships between the latent variables in the measurement model

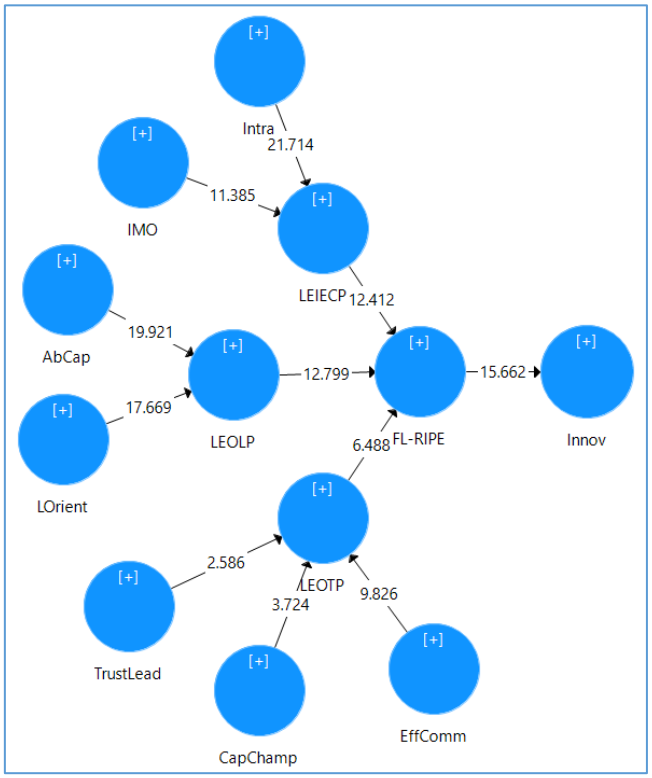


Table 8.20: T-values and P-values of relationships between the variables in the measurement model

Relationships	T-Values	P-Values
AbCap -> LEOLP	19.921	p<0.001
CapChamp -> LEOTP	3.724	p<0.001
Comm -> LEOTP	9.826	p<0.001
FL-RIE -> Innov	15.662	p<0.001
IMO -> LEIECP	11.385	p<0.001
Intra -> LEIECP	21.714	p<0.001
LEIECP -> FL-RIE	12.412	p<0.001
LEOLP -> FL-RIE	12.799	p<0.001
LEOTP -> FL-RIE	6.488	p<0.001
LOrient -> LEOLP	17.669	p<0.001
TrustLead -> LEOTP	2.586	p<0.05

Note: The shaded area represents the t-value and the p-value of the relationship between FL-RIE and Innov

8.2.1.2.2 Assessment of the external validity of FL-RIE

When a focal construct is defined only with formative indicators, external validity shows "the extent to which the formative indicators of the focal construct actually capture the construct" (Jahner, Leimeister, Knebel & Krcmar, 2008, p. 409). In this study, FL-RIE is defined by three formative constructs, namely, LEIECP, LEOLP and LEOTP. If FL-RIE is externally valid, three formative indicators should capture a big part of the variance of FL-RIE. If three formative indicators are capturing a big part of the variance of FL-RIE, it should be able to significantly link with an antecedent or a consequence (Andreev, Heart, Maoz, & Pliskin, 2009). In other words, FL-RIE should be nomologically valid.

Furthermore, according to Diamantopoulos and Winklhof (2001), the antecedent/s or the consequence/s of FL-RIE should have the following characteristics.

- Information should be gathered for at least one more construct than the ones captured by the conceptual framework
- The consequence or the antecedent should be measured by means of reflective indicators
- A theoretical relationship should exist between the antecedent/consequence and the focal construct

The construct identified to test the nomological validity of FL-RIE – innovation has all the above characteristics. On top of that, this study successfully established the nomological validity of FL-RIE by empirically finding that the relationship between FL-RIE and innovation is significant. Thus, since the nomological validity of FL-RIE is already established, it is possible to conclude that FL-RIE demonstrates external validity.

8.2.1.2.3 Assessment of the significance of weights

The purpose of this step is to statistically determine whether the indicators of FL-RIE contribute to the overall meaning of the focal construct by carrying the intended meaning (Chin, 1998; Henseler et al, 2009). This was discussed when establishing the content validity. However, Henseler et al (2009) recommend testing the statistical significance of weights of the formative indicators of FL-RIE.

As shown in the revised measurement model in Figure 8.2, FL-RIE has seven first-order indicators and three second-order indicators, and their relationships are formative in nature. This is also the case between FL-RIE, and second-order variables. Therefore, this study tested the significance of weights related to all formative relationships between FL-RIE, second-order indicators and first-order indicators by means of bootstrapping. Results of the test is shown in Table 8.21.

Table 8.21: Significance of weights of formative relationships in the measurement model

Relationship	T-Value	P-Value
AbCap -> LEOLP	20.249	p<0.001
CapChamp -> LEOTP	3.558	p<0.001
Comm -> LEOTP	9.859	p<0.001
FL-RIE -> Innov	15.623	p<0.001
IMO -> LEIECP	12.116	p<0.001
Intra -> LEIECP	20.695	p<0.001
LEIECP -> FL-RIE	12.257	p<0.001
LEOLP -> FL-RIE	13.615	p<0.001
LEOTP -> FL-RIE	6.633	p<0.001
LOrient -> LEOLP	17.426	p<0.001
TrustLead -> LEOTP	2.41	p<0.05

As shown in the Table 8.21, weights of formative relationships are significant because all the t-values are greater than 1.96 and p-values are less than 0.05. Therefore, it is possible to conclude that each first and second-order indicator delivers a contribution to FL-RIE by carrying intended meanings.

8.2.1.2.4 Assessment of multicollinearity

Even though the indicators deliver a contribution to FL-RIE by carrying the intended meaning, there can be instances where certain indicators are redundant due to multicollinearity (Diamantopoulos & Winklhofer, 2001; Henseler et al, 2009). Multicollinearity demonstrates whether manifestations of a formative construct are correlated. Ideally, there should not be harmful multicollinearity among the manifestations of a formative construct. If an indicator is redundant, it can be identified by observing the variance inflation factor (VIF) value of the indicator.

If the VIF value of an indicator is greater than 10, it is accepted that harmful multicollinearity is present (Ferguson & Garza, 2010; Henseler et al, 2009). If an indicator has a VIF value greater than 10, it can be considered redundant and eliminated. Furthermore, any VIF value greater than 1 is an indication of multicollinearity. However, a VIF value less than 10 is tolerable (Henseler et al, 2010). Therefore, this study decided to retain any reflective or formative indicator with a VIF value less than 10 and eliminate any indicator with a VIF value greater than 10. To obtain VIF values of each indicator, the PLS path model algorithm was executed.

SmartPLS 3 provides two VIF tables, namely, inner and outer VIF tables. In this study, the inner VIF values represent whether there is any multicollinearity in any of the first- or second-order formative indicators. Outer VIF values represent whether there is any multicollinearity

in any of the reflective indicators of the first-order constructs. Both inner VIF Table (table 8.22) and outer VIF Table (table 8.23) are shown below.

Table 8.22: Inner VIF values

Formative Relationship	VIF Value
AbCap-->LEOLP	1.235
CapChamp-->LEOTP	1.045
Comm-->LEOTP	1.046
IMO-->LEIECP	1.223
Intra-->LEIECP	1.223
LEIECP-->FL-RIE	1.631
LEOLP-->FL-RIE	1.671
LEOTP--FL-RIE	1.109
Lorient-->LEOLP	1.235
TrustLead-->LEOTP	1.019

Table 8.23: Outer VIF values

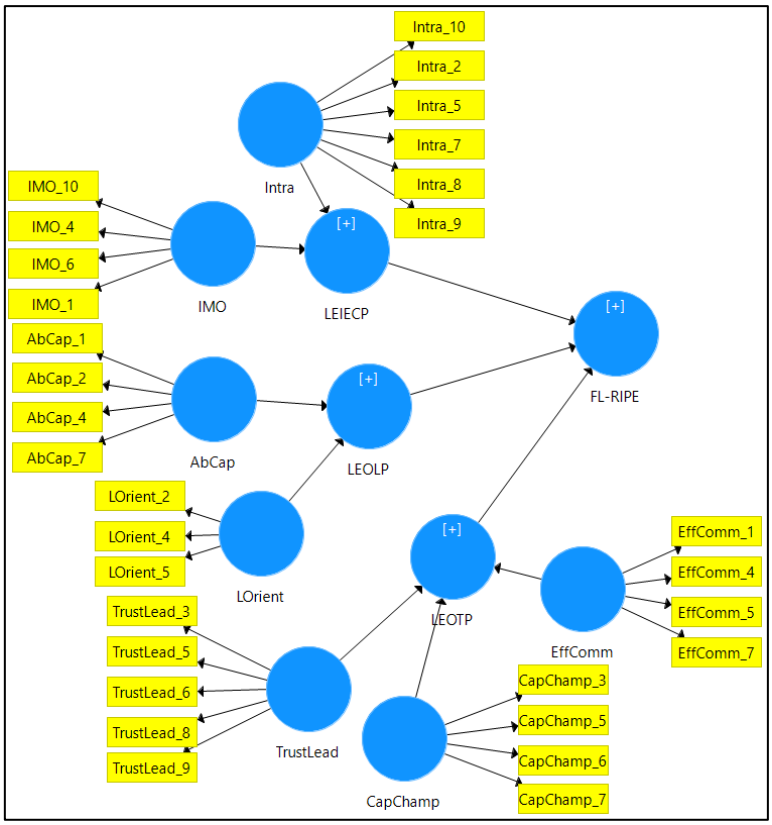
Reflective Indicator	VIF Value
AbCap_1	2.118
AbCap_2	1.667
AbCap_4	1.928
AbCap_7	2.304
CapChamp_3	1.085
CapChamp_5	1.467
CapChamp_6	1.580
CapChamp_7	1.393
EffComm_1	6.912
EffComm_4	7.537
EffComm_5	7.467
EffComm_7	6.443
IMO_1	1.695
IMO_4	1.899
IMO_6	1.713
IMO_10	1.640
Intra_2	2.257
Intra_5	3.058
Intra_7	1.799
Intra_8	1.763
Intra_9	2.191
Intra_10	1.815
LOrient_2	1.879
LOrient_4	1.733
LOrient_5	1.620
TrustLead_3	2.223
TrustLead_5	3.634
TrustLead_6	3.123
TrustLead_8	3.573
TrustLead_9	2.553

When both inner and outer VIF tables are observed, it is possible to see that VIF values of reflective indicators and formative relationships are less than 10. However, none of the VIF values are less than 1. It is an indication that there is certain degree of multicollinearity in both

formative indicators and reflective indicators. As discussed earlier, any VIF value less than 10 indicates an acceptable level of multicollinearity. Therefore, it is possible to conclude that the measurement model does not have any issue related to multicollinearity.

The assessment of formative measurement model ended with the multicollinearity check. As mentioned earlier, formative measurement model developed through the findings of the literature review, the content validity and formally specifying the measurement model is superior to the results obtained by statistically testing the formative measurement model (Henseler et al, 2009). However, statistical analysis demonstrated the validity of the formative construct FL-RIE quantitatively. It is a complement to the content validity and formal specification of FL-RIE.The measurement model with reliable and valid reflective indicators and valid formative indicators is shown in Figure 8.5. This diagram represents the final output of the outer model assessment.

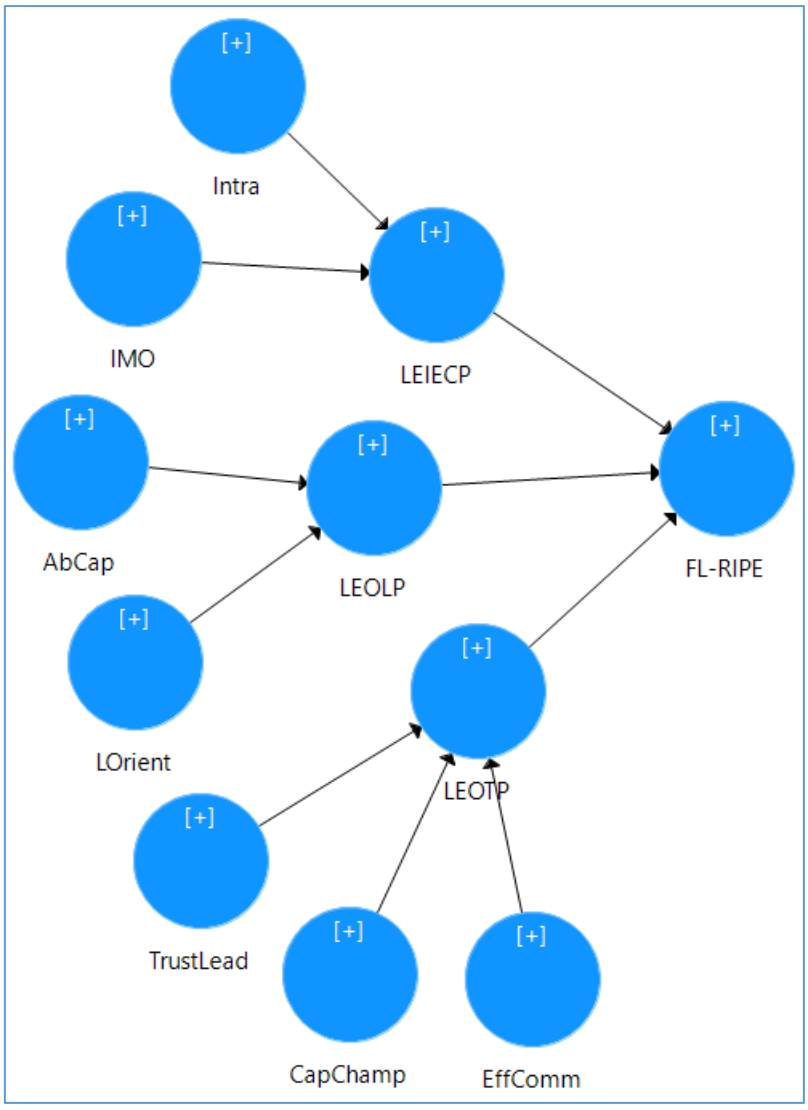
Figure 8.4: Final measurement model at the end of the assessment of the outer model



8.2.2 Assessment of the structural (inner) model

Once reliability and validity measures of the measurement model were assessed, the next step was to assess the inner model of the measurement model. When assessing the inner model, relationships between latent variables are tested statistically (Niehaves & Ortbach, 2016). In other words, the assessment of the inner model tests whether the proposed relationships exist between the latent variables (Henseler et al, 2009). It is conducted by assessing the structural model. The structural model of this study is shown below in Figure 8.6.

Figure 8.5: Structural (inner) model



The structural model was assessed by testing the criteria mentioned in Table 8.6. According to Henseler et al (2009) and Hair, Sarstedt, Ringle and Mena (2012), the assessment of the structural model is conducted by testing the coefficient of determination (R^2) of all the endogenous latent variables, estimates for path coefficients, effect sizes (f^2), and predictive relevance (Q^2).

8.2.2.1 Assessment of coefficient of determination (R^2) of endogenous latent variables

The structural model of this study (see Figure 8.6) has four endogenous latent variables. They are LEIECP, LEOLP, LEOTP and FL-RIE. According to the recommendation of Hair et al (2012) and Henseler et al (2009), the first step of assessing a structural model is to assess coefficient of determination values of all the endogenous latent variables.

Coefficient of determination (R^2) is defined as the proportion of variance explained in the endogenous variable by the predicting variables (Nagelkerke, 1991). For example, R^2 value of FL-RIE denotes the proportion of variance explained in FL-RIE by LEIECP, LEOLP, and LEOTP. It is generally accepted that R^2 values of 0.67, 0.33 or 0.19 represents strong, moderate, or weak variance values respectively (Chin, 1998). If the conceptualisation of each endogenous variable is properly carried out, R^2 values should be greater than 0.67 or strong. Only then can the conceptual connection between sub-dimensions and the endogenous variable can be empirically established (MacKenzie et al, 2011).

Thus, to test the R^2 values of endogenous latent variables in the structural model, the PLS algorithm was administered. R^2 values of each endogenous latent variable are shown in Table 8.24.

Table 8.24: Coefficient of determination (R^2) values of each endogenous latent variable in the structural model

	R Square	R Square Adjusted
FL-RIE	0.997	0.997
LEIECP	1	1
LEOLP	1	1
LEOTP	1	1

As can be seen in Table 8.24, LEIECP, LEOLP and LEOTP explain 99.7% of the variance of FL-RIE. Intrapreneurship (Intra) and integrated market orientation (IMO) explain 100% of the variance of LEIECP. Learning orientation (LOrient) and absorptive capacity (AbCap) explain 100% variance of LEOLP. Trustworthy leadership (TrustLead), capable champions (CapChamp) and effective communication (Comm) explain 100% variance of LEOTP. Since all R^2 values are greater than 0.67, it is possible to conclude that variances of all endogenous latent variables in the structural model are strongly explained by their respective indicators. According to Henseler et al (2009), strong R^2 value is an indication of strong theoretical underpinning. Hence, it is possible to conclude that the proposed conceptual framework has a strong theoretical underpinning that is capable of explaining endogenous latent variables strongly.

8.2.2.2 Assessment of the estimates for path coefficients

The second step of testing the structural model is to assess the estimates of the path coefficients. By assessing estimates of the path coefficients, each linked path between latent variables in the conceptual framework was tested. According to Figure 8.6, there are 10 links between latent variables. Estimates for path coefficients of the 10 links were assessed by testing the sign, magnitude, and significance of each link (Hair et al, 2012; Henseler et al, 2009).

The sign and magnitude of a path coefficient is estimated by running the PLS algorithm (Richard, 2008). The significance of a path coefficient is estimated by running the

bootstrapping resampling technique (Henseler, 2009; Richard, 2008). The outcome of the PLS algorithm and bootstrapping resampling procedure is shown in Table 8.25.

Table 8.25: Inner model path coefficients and significance levels

Relationship	Path Coefficient	T-Value	P-Value
IMO --> LEIECP	0.467	11.651	p<0.001
Intra --> LEIECP	0.707	21.110	p<0.001
AbCap --> LEOLP	0.701	20.042	p<0.001
Lorient --> LEOLP	0.470	18.111	p<0.001
CapChamp --> LEOTP	0.199	3.449	p<0.001
Comm --> LEOTP	0.803	10.114	p<0.001
TrustLead --> LEOTP	0.409	2.686	p<0.001
LEIECP --> FL-RIE	0.529	12.864	p<0.001
LEOLP --> FL-RIE	0.423	13.379	p<0.001
LEOTP --> FL-RIE	0.313	6.851	p<0.001

According to Table 8.25, all the path coefficients are positive and significant. When determining the effect of path coefficients, this study followed the recommendations of Kline (2011). According to Kline (2011), path coefficients less than 0.10 indicates a small effect. Values around 0.30 indicate a medium effect. Values greater than 0.50 indicate a large effect. Based on Kline's (2011) guidelines on the magnitude of path coefficients, the structural model has four relationships with large coefficient effects (i.e., Intra --> LEIECP, AbCap --> LEOLP, Comm --> LEOTP, and LEIECP --> FL-RIE) and seven relationships with medium coefficient effects (i.e., IMO --> LEIECP, LOrient --> LEOLP, CapChamp --> LEOTP, TrustLead --> LEOTP, LEOLP --> FL-RIE, and LEOTP --> FL-RIE).

Thus, it is possible to conclude that the results of the assessment of path coefficient provides partial empirical validation for the theoretically formed relationships between latent variables in the structural model (Henseler et al, 2009).

8.2.2.3 Assessment of effect sizes (f^2)

Effect size (f^2) is used to report the strength of a relationship between two or more variables (Allen, 2017). As discussed in the previous sub-section, estimates for path coefficients also represent a similar property. However, it mainly tests whether the relationships are significant

or not. PLS path modelling technique recommends assessing effect sizes related to all the relationships since f^2 represents the sum of direct and all the indirect effects (e.g., IMO is indirectly connected with FL-RIE through LEIECP) of a latent variable (Hair et al, 2012; Henseler et al, 2009).

Estimates for path coefficients do not consider indirect effects even though they are a good measure to determine the existence or non-existence of the theoretically formed relationships between latent variables through the observation of significance levels (Henseler et al, 2009). As a result, there is a chance for certain relationships to decline due to the effect of indirect relationships (Henseler et al, 2009). Therefore, PLS path modelling technique recommends assessing Cohen's (1988) f^2 to calculate the sum of direct and indirect effects and calculate the total effect size. According to Cohen (1988), three types of effects can be defined based on the value of the effect size (f^2). They are small ($0.02<f^2<0.15$), medium ($0.15<f^2<0.35$), and large ($0.35<f^2$) effects.

Thus, this study executed the PLS algorithm to assess effect sizes of all the relationships in the structural model (see Figure 8.6). The outcome of the PLS algorithm is shown in Table 8.26.

Table 8.26: Inner model effect sizes

Relationship	Effect Size (f^2)
IMO --> LEIECP	2478.234
Intra --> LEIECP	5693.258
AbCap --> LEOLP	17727.912
Lorient --> LEOLP	7959.104
CapChamp --> LEOTP	136.478
Comm --> LEOTP	2217.709
TrustLead --> LEOTP	591.865
LEIECP --> FL-RIE	65.701
LEOLP --> FL-RIE	40.933
LEOTP --> FL-RIE	33.757

Since all the relationships have effect sizes greater than 0.35, it is possible to argue that all the relationships in the structural model have large effect sizes. In other words, the strengths of the relationships are quite high. Therefore, this study safely concluded that the relationships shown

in Table 8.26 are significant (tested through T-Values) and strong due to high effect sizes. This could be the reason for high coefficient of determination (R^2) values of the endogenous latent variables.

8.2.2.4 Assessment of predictive relevance

The final property that was tested when assessing the structural model is predictive relevance (see Table 8.6) (Hair et al, 2012; Henseler et al, 2009). Predictive relevance (Q^2) is the property that demonstrates the structural model's ability to predict (Hair et al, 2012; Henseler et al, 2009). In other words, predictive relevance value is an indication of whether the structural model has the capability to reproduce observed values (Geisser, 1975; Richard, 2008). This study used the blindfolding procedure to calculate the predictive relevance of the latent variables because it is a sample reuse technique that is used to calculate the predictive relevance of the latent variables (Hair et al, 2012; Henseler et al, 2009).

Blindfolding procedure is a technique which deletes datapoints systematically and predicts their original values. The researcher defined an omission distance (D) for the procedure to carry out the deletion process and predict original values. An omission distance between five and 12 can be seen in literature (Hair, Hult, Ringle, & Sarstedt, 2017). For example, an omission distance of seven means that in one blindfolding round every seventh datapoint of a latent variable's indicators will be deleted. If the omission distance is seven, there will be seven blindfolding rounds since the blindfolding procedure will delete and predict every datapoint of the selected latent variable.

After executing the blindfolding procedure, if a particular variable's predictive relevance is found to be greater than zero, it is an indication that the PLS path model has predictive relevance for the latent variable (Fornell & Cha, 1994). If the predictive relevance value of a particular latent variable is less than zero, it is an indication of lack of predictive relevance.

Hence, this study tested predictive relevance of four endogenous latent variables, namely, LEIECP, LEOLP, LEOTP, and FL-RIE.

Since some studies have tested predictive relevance of endogenous latent variables for two omission distances (e.g., Richard, 2008), this study also tested the predictive relevance for two omission distances (i.e., D=7 and D=12). The outcome of the blindfolding procedure presents two types of predictive relevance types. They are redundancy predictive relevance and communality predictive relevance. Out of the two types, redundancy predictive relevance is the stronger test (Fornell & Bookstein, 1982). Therefore, this study considered only redundancy predictive relevance. The outcome of the blindfolding procedure is shown in Table 8.27.

Table 8.27: Predictive relevance of endogenous latent variables (D=7 and D=12)

Endogenous Latent Variable	Omission Distance=7	Omission Distance=12
	Redundancy Q^2	Redundancy Q^2
FL-RIE	0.238	0.240
LEIECP	0.448	0.450
LEOLP	0.496	0.499
LEOTP	0.311	0.307

According to Table 8.27, results suggests that the structural model demonstrates predictive relevance since Q^2 values are positive. Furthermore, model estimates are stable since Q^2 values are similar across omission distances. It is also an indication that denotes the predictive relevance of the structural model.

With the assessment of predictive relevance, the assessment of the structural model was completed. With the completion of the assessment of structural model, the evaluation of the PLS path model was also completed. To summarise, the proposed conceptualisation for FL-RIE was evaluated and validated through a three-step process suggested by Henseler et al (2009). First, by assessing the reflective measurement model, the validity and reliability of reflective measurement model was established. 16 indicators were omitted from the measurement model due to reliability and validity issues. Second, this study carried out the

assessment criterion for formative measurement model on FL-RIE and statistically established the validity of FL-RIE as a formative construct. Third, this study assessed the inner model or the structural model of the study. During the assessment of the structural model this study was able to establish that relationships were significant and strong. Furthermore, goodness of fit of the structural model was assessed through coefficient of determination and predictive relevance. Since both criteria met the conditions suggested by Hair et al (2012) and Henseler et al (2009), this study concluded that the structural model demonstrates satisfactory model fit.

Thus, it is possible to conclude that the following 30 statements shown in Table 8.28 are capable of capturing the measuring the construct FL-RIE.

Table 8.28: Statements that measure FL-RIE

	Statement	Label
1	My company encourages customer comments and complaints because they help us do a better job	IMO_1
2	My company's marketing team regularly discusses customer needs with other teams	IMO_4
3	This company does a good job in integrating the activities of all teams	IMO_6
4	My company periodically circulates documents (e.g., reports, newsletters) that provide information on its customers	IMO_10
5	My company is willing to spend on new product/service development activities	Intra_2
6	Employees are supposed to get the job done with minimum supervision	Intra_5
7	In my company uncertainty is treated as a challenge	Intra_7
8	In my company employees are encouraged to venture into unexplored territories	Intra_8
9	My company constantly seek new opportunities related to the present operations	Intra_9
10	My company constantly seek opportunities to improve our business performance	Intra_10
11	The management team motivates the employees to use information sources within our industry	AbCap_1
12	The management team expects the employees to deal with information beyond our industry	AbCap_2
13	In my company, there is a quick information flow	AbCap_4
14	In my company employees successfully link existing knowledge with new insights	AbCap_7
15	The sense around my company is that employee learning is an investment, not an expense	LOrient_2
16	There is total agreement on our company vision across all levels, functions, and teams	LOrient_4
17	Top management repeatedly emphasises the importance of knowledge sharing in our company	LOrient_5
18	The management team of my company protects the core values while encouraging change	TrustLead_3
19	The management team of my company demonstrates humility while fiercely pursuing the vision	TrustLead_5
20	The management team and the team leads talk in a way that makes employees believe they can succeed	TrustLead_6
21	The management team and the team leads challenge employees to think about problems in new ways	TrustLead_8
22	The management team and the team leads show performers how to look at difficulties from a new angle	TrustLead_9
23	In my company, there are several individuals who are well informed about the issues, opportunities and how to get things done	CapChamp_3
24	In my company, there are several individuals who have the capability of networking and getting the right people together	CapChamp_5
25	In my company, there are several individuals who have the capability of planning and managing the change process	CapChamp_6
26	In my company, there are several individuals who have the capability of keeping people focused and motivated	CapChamp_7
27	Employees in my company experience consequences for outcomes of their actions	Comm_1
28	Employees in my company often discuss their work with the managers/team leads	Comm_4
29	Managers/team leads communicate with the employees about work to agree upon the best actions possible	Comm_5
30	In my company, communication flows both from the managers/team leads to and from the team members to the managers/team leads	Comm_7

8.3 Hypothesis testing

Hypotheses can be statistically accepted or rejected based on the findings of a data analysis. This study had fifteen hypotheses. To test whether they can be accepted or rejected, this study conducted a statistical analysis. Hypotheses can be accepted or rejected by conducting a qualitative analysis as well. Hence, in the case of this study, accepting the hypothesis simply means that there is not sufficient statistical evidence to actually reject the hypothesis.

After analysing the outer and inner (structural) model of the proposed conceptual framework, this study was able to identify hypotheses that should be accepted and determine those that should be rejected. A summary of hypothesis testing is shown in Table 8.29 and denotes the hypotheses that are accepted and rejected.

Table 8.29: Summary of hypothesis testing

Hypothesis Number	Hypothesis	Accepted or Rejected
H1	The level of effectiveness of internal and external coordination processes is a second-order formative indicator of FL-RIE	Accepted
H2	The level of effectiveness of organisational learning processes is a second-order formative indicator of FL-RIE	Accepted
H3	The level of effectiveness of organisational transformation processes is a second-order formative indicator of FL-RIE	Accepted
H4	Market orientation is a first-order indicator of FL-RIE and a formative indicator of the level of effectiveness of internal and external coordination processes	Accepted
H5	Intrapreneurial spirit is a first-order indicator of FL-RIE and a formative indicator of the level effectiveness of internal and external coordination processes	Accepted
H6	Effective human resource practices is a first-order indicator of FL-RIE and a formative indicator of the level of effectiveness of internal and external coordination processes	Rejected
H7	Individual level learning is a first-order indicator of FL-RIE and a formative indicator of the level of effectiveness of organisational learning processes	Rejected
H8	Group level learning is a first-order indicator of FL-RIE and a formative indicator of the level of effectiveness of organisational learning processes	Rejected
H9	Learning orientation is a first-order indicator of FL-RIE and a formative indicator of the level of effectiveness of organisational learning processes	Accepted

H10	Absorptive capacity is a first-order indicator of FL-RIE and a formative indicator of the level of effectiveness of organisational learning processes	Accepted
H11	Trustworthy leadership is a first-order indicator of FL-RIE and a formative indicator of the level of effectiveness of organisational transformation processes	Accepted
H12	Capable change champions is a first-order indicator of FL-RIE and a formative indicator of the level of effectiveness of organisational transformation processes	Accepted
H13	Innovative culture is a first-order indicator of FL-RIE and a formative indicator of the level of effectiveness of organisational transformation processes	Rejected
H14	Accountable culture is a first-order indicator of FL-RIE and a formative indicator of the level of effectiveness of organisational transformation processes	Rejected
H15	Effective communication is a first-order indicator of FL-RIE and a formative indicator of the level of effectiveness of organisational transformation processes	Accepted

According to Table 8.29, this study rejected five hypotheses based on the findings of the statistical analysis. During the process followed to analyse data, H14 was the first hypothesis to be rejected. It was rejected during the EFA. The researcher experienced continuous cross-loading issues with the indicator – accountable culture. Hence, accountable culture was removed from the original measurement model that was carried forward for the assessment of outer model. The next hypotheses to be rejected during the process were H6 and H7. They were rejected because the indicators – effective human resource practices and individual level learning had to be eliminated due to poor composite reliability. This study then eliminated group level learning and innovative culture due to poor indicator reliability. Hence, this study had to reject H8 and H13.

Above discussion discussed the statistical rationale that led to the rejection or acceptance of the hypotheses. However, it did not discuss any theoretical underpinnings that could be used to explain the rationale behind each finding. More in-depth discussion on the rationale behind the findings of this study is given in the discussion of the thesis.

8.4 Chapter summary

Chapter 8 presented two main aspects of the re-examination of the scale properties. First, the chapter discussed regarding the representativeness of the sample that was collected for the main study. This study had difficulty is sourcing reliable information related to SMEs that use commercial cloud computing services in Australia. However, this study examined the representativeness of the sample with the assistance of three demographic factors, namely, gender of the respondent, size of the SME, and type of cloud computing technology/technologies used by the SME.

Section 8.3 discussed the scale validity process that was executed to test whether the scale behave as one would expect if they were valid indicators of the focal construct. Since the conceptual framework has formative relationships, this study used PLS path modelling technique to test the scale validity. Henseler et al (2009) propose a step-by-step guide on how to use PLS path modelling technique to test the validity of a conceptual framework. Hence, this study adopted the three-step procedure suggested by Henseler et al (2009) to test the validity of the proposed conceptual framework. First, this study carried out the assessment of the reflective measurement model. Five aspects, namely, composite reliability, item-level reliability, AVE, Fornell Larcker criteria and item-level cross-loadings were analysed to test the reflective measurement model. During the assessment, 16 items and four first-order reflective indicators were eliminated. Second, formative measurement model was analysed. Four aspects, namely, nomological validity, external validity, significance of weights, and multicollinearity were assessed. Finally, the author assessed the structural model of the revised measurement model. When assessing the structural model, four aspects, namely, R^2 of endogenous latent variables, estimates for path coefficients, effect size, and predictive relevance were tested.

At the end of the re-examination of scale properties, this study was able to shortlist 30 items capable of capturing the conceptual domain of FL-RIE is the context of SMEs in Australia that use commercial cloud computing services (see Table 8.28). The assessment of scale properties eliminated four first-order indicators (i.e., effective human resource practices, individual-level learning, group-level learning, and innovative culture). Thus, this study rejected five hypotheses and accepted 10 hypotheses presented in chapter 6.

9 DISCUSSION AND CONCLUSION

9.1 Chapter introduction

The primary objective of this study was to develop an answer to the research problem - what are the indicators that form the measurement instrument of FL-RIE? Since FL-RIE was an abstract concept prior to this study, the researcher divided the study into two parts and formed two objectives. The aim of the first objective was to define the conceptual domain of FL-RIE by following the methodology suggested by MacKenzie et al (2011). This study fulfilled the aim of the first objective by defining the conceptual domain of FL-RIE in chapter 2. The aim of the second objective was to test and validate the conceptual domain of FL-RIE and formulate the answer to the research problem. It was achieved by predominantly following the methodology suggested by MacKenzie et al (2011). When needed, the suggestions of Churchill (1979) and DeVellis (2012) were also considered. Chapters 3 to 8 discussed the process that was followed to achieve the second objective. This study was able to formulate the answer to the research problem at the end of chapter 8 by presenting 30 statements capable of capturing the conceptual domain of FL-RIE. Those statements represent seven first-order indicators and three second-order indicators.

The main objective of this chapter is to discuss and draw conclusions from the findings of the research. First, this chapter discusses the rationale behind the main findings related to the empirical study (see section 9.2). In particular, the rationale for the elimination of certain items is discussed with the support of relevant extant literature. Second, this chapter discusses the implications generated by successfully achieving the first objective of this study (see section 9.3). In the same section, this study discusses the limitations of the proposed conceptual framework and suggestions for future research. Third, this chapter discusses the implications that are generated by successfully achieving the second objective (see section 9.4).

Furthermore, in the same section, this study discusses the limitations of the validated measurement scale of FL-RIE and suggestions for future research. This chapter and the study end with the conclusion (see section 9.5). Conclusion summarises the essence of this study.

9.2 Discussion on the findings

The findings accept 10 and rejects five hypotheses (see Table 8.29). Chapter 2 (i.e., Literature Review) provides justifications for accepted hypotheses. Hence, this section does not discuss the rationale behind accepted hypotheses. This section focuses on discussing possible causes that led to the rejection of five hypotheses.

9.2.1 Rejection of the hypothesis related to *effective human resource practices*

Effective human resource practices is an important organisational capability that creates a supportive climate for the employees to perform better and shape their attitudes and behaviours. Human capital carries out the firm-level resource integration activities. Therefore, performance, attitudes, and behaviours impact the continuous improvement of firm-level resource integration effectiveness. Therefore, this study considered effective human resource practices as a first-order indicator of FL-RIE. However, the data analysis suggests that effective human resource practices is not a factor that is necessary to measure FL-RIE of Australian SMEs that use commercial cloud computing services.

The rationale behind this finding could be the presence of transformational leaders within the Australian SMEs that use commercial paid cloud computing services. After the content validity test, four statements were finalised to capture the conceptual domain of effective human resource practices. They are follows.

- My company treats employees as the most valuable resource within the company
- My company emphasises the importance of having satisfied employees

- In my company employees receive benefits linked to their performance
- All employees receive effective feedback on their performance

Transformational leaders are extremely good at driving employees toward a common organisational goal because they understand the importance of employees to execute a business model successfully (Singh & Lokotsch, 2005). Hence, they consider employees as the most valuable asset of a firm. Furthermore, transformational leaders acknowledge the significance of possessing satisfied employees. Hence, they go into the extent of providing individualised consideration for job-related goals and needs of their employees (Zhu, Chew, & Spangler, 2005). Due to the charismatic nature of transformational leaders, they provide regular feedback on the performance of employees for the purpose of inspiring them and intellectually stimulating them (Yammarino, Spangler, & Bass, 1993).

Thus, it is possible to assume that when a firm possesses transformational leaders, they have the qualities and potential to develop effective human resource practices that creates a supportive climate for their employees. This could be the rationale for the rejection of the hypothesis related to effective human resource practices. In other words, in the context of Australian SMEs that use commercial cloud computing services, transformational leaders have the potential to create a supportive climate for employees by implementing effective human resource practices. Hence, effective human resource practices is not a first-order indicator that determines the resource deployment proficiency of an Australian SME that uses commercial cloud computing services.

9.2.2 Rejection of hypotheses related to *individual-level and group-level learning*

During the conceptualisation stage (see chapter 2), this study justified individual-level learning and group-level learning as first-order indicators of FL-RIE. However, the empirical study revealed that both the indicators are not contributing to form FL-RIE of Australian SMEs that

use commercial cloud computing services. Extant literature has implicitly discussed possible causes for these findings.

According to Mavondo et al (2005, p. 1237), "learning orientation is the manifestation of the organisation's propensity to learn and adapt". In other words, if the level of learning orientation of a firm is higher, it is an indication that the level of effectiveness of individual-level learning and group-level learning is higher. Furthermore, Mavondo et al (2005) lists several characteristics of a firm that possesses a higher level of learning orientation. Two characteristics (i.e., commitment to learning and systems for developing learning) implicitly suggest that when a firm is learning oriented, it has the capability to build commitment and system for learning in every layer of the firm.

Hence, this could possibly be the case with Australian SMEs that use commercial cloud computing services. They may have higher levels of learning orientation with the capability to drive individual and group-level learning within their firms. Hence, individual- and group-level learning are not first-order indicators that determine resource deployment proficiency of Australian SMEs that use commercial cloud computing services.

9.2.3 Rejection of hypothesis related to *innovative culture*

An organisation with an innovative culture has the capability to institute norms of innovation and inspire and strengthen innovative activities through change champions (Judge & Douglas, 2009). From the perspective of a resource integration process, instituting innovation and inspiring and strengthening innovative activities is quite important since resource integration is the fundamental way to innovate (Lusch & Nambisan, 2015). Furthermore, when proposing, negotiating, and implementing changes to institutional arrangements and carrying out transformations of various scales the level of innovativeness of the culture of an organisation could determine the effectiveness of the outcome of the change. However, the empirical

investigation of this study suggests that innovative culture does not contribute to form FL-RIE of Australian SMEs that use commercial cloud computing services.

According to Dombrowski et al (2009), *innovative culture* is conceptualised with eight elements, namely, innovative mission and vision statements, democratic communication, safe spaces, flexibility, collaboration, boundary spanning, incentives, and leadership. If a firm is led by transformational leaders, they have the capability to ensure that the firm will be driven by innovative mission and vision statements (Judge & Douglas, 2009). Furthermore, transformational leaders are capable of ensuring democratic communication of all the valuable information across the organisation and creating a safe working environment for all workers (Callow et al, 2009; Ehrhart, 2004). The flexibility experienced by employees and the quality of the incentives received by the employees are determined by the level of effectiveness of the effective human resource practices of an organisation that are being driven by transformational leaders. Employees challenge themselves and try to span boundaries and challenge the status quo when the intrapreneurial spirit of the employees are higher. The level of effectiveness of internal and external collaborative processes are determined jointly by the market orientation of the firm, intrapreneurial spirit of the employees, and the level of effectiveness of the firm's effective human resource practices.

Hence, it is evident that this study has already identified indicators capable of covering the conceptual domain of innovative culture. Australian SMEs therefore do not have to consider innovative culture as a component that determines the firm-level resource integration effectiveness.

9.2.4 Rejection of the hypothesis related to *accountable culture*

Accountable culture in an organisation can be defined as "being answerable for actions or decisions, in accordance with interpersonal, social, and structural contingencies, all of which

are embedded in particular sociocultural contexts" (Gelfand et al, 2004, p. 137). From the perspective of a resource integration process, the quality of being answerable for actions or decisions, in accordance with interpersonal, social, and structural contingencies is necessary for anyone or any group that propose, negotiate, and implement changes to institutional arrangements. The reason is individuals and teams functioning in a highly accountable culture tend to take ownership of what they do and try to be as constructive as possible when making decisions. Hence, the changes they propose to institutional arrangements are more likely to ensure wellbeing and the continuation of the whole ecosystem.

The level of accountability of a firm's culture is determined by three aspects, namely, individualism vs collectivism, cultural tightness vs looseness, and hierarchy vs egalitarianism (Gelfand et al, 2004). Aspects of cultural dimension of individualism versus collectivism are captured by market orientation, trustworthy leadership, trusting followers, absorptive capacity, learning orientation, and group-level learning. Aspects of cultural dimension of tightness versus looseness are captured by market orientation, learning orientation, trustworthy leadership, trusting followers, and communication. And finally, aspects of the cultural dimension of hierarchy versus egalitarianism are captured by trustworthy leadership, trusting followers, and communication.

Hence, it is evident that this study has already identified indicators capable of covering the conceptual domain of accountable culture. Thus, Australian SMEs do not have to consider accountable culture as a component that determines resource integration effectiveness at firm level.

9.3 Objective 1 – Implications, limitations, and future research

The first objective of this study was to propose a definition and a conceptualisation for FL-RIE. By achieving the first objective, this study provides a midrange theoretical contribution

by developing a conceptual framework for the metatheoretical concept FL-RIE that represents a firm's resource deployment proficiency. This conceptualisation has the potential to advance several areas of marketing management such as business-to-business (B2B) relationships, relationship marketing, value cocreation, and resource integration.

FL-RIE can be considered as one of the antecedents of a firm's engagement with external parties such as suppliers and customers (Hollebeek, 2019). Vafeas et al (2016) discuss how B2B resource integration efforts fail due to resource deficiencies and resource misuse by relational partners. They cite five reasons for this failure, namely, inadequate communication, absence of trust, inadequate coordination, inadequate human capital, and power imbalance, for the failure of resource integration efforts. This study extends the findings of Vafeas et al (2016) and introduce more factors that could create resource deficiencies and resource misuse during a B2B relationship. For example, if a firm does not possess a higher level of absorptive capacity, the firm might fail to realise or make use of the full potential of a product or service purchased from a supplier. Similarly, the other ten dynamic capabilities proposed in the conceptual framework can also be positioned as factors capable of creating resource deficiencies and resource misuse. Hence, the proposed conceptual framework has the capability to advance research on B2B resource integration by assisting with understanding aspects a firm should continuously develop to avoid diminished value outcomes by preventing resource deficiencies and misuse. Such studies have the potential to generate implications that are instrumental in enhancing client-supplier relations (B2B relationships).

The findings of this study have implications for research on customer engagement as well. Engaged customers are an asset for an organisation because they normally stay loyal, and likely to contribute to new product development and viral marketing activities by providing referrals (Hollebeek et al, 2019). Furthermore, customer engagement facilitates sales growth, superior

competitive advantage, and profitability (Hollebeek et al, 2019). A firm should possess a higher level of resource deployment proficiency to realise the benefits offered by the engaged customers. This study informs the dynamic capabilities that a firm should nurture if it is to develop a higher level of resource deployment proficiency that would increase the firm's engagement with the customers to ensure their wellbeing. When a firm deploys necessary resources to enhance the experience and ensure the wellbeing of the customers, customers are more likely to engage with the firm in various resource integration efforts that could ensure the wellbeing of the firm. Hence, FL-RIE has the potential to ensure a long-term relationship between a firm and its customers. Therefore, FL-RIE and its conceptualisation might have interesting applications in the domain of relationship marketing.

FL-RIE is a property inherited by an organisation as a result of its engagement with repeated resource integration efforts over time. At the initial stages, firms normally possess lower levels of FL-RIE. However, over time and with repeated resource integration efforts, FL-RIE tends to increase (Hollebeek, 2019). According to the proposed conceptual framework, what actually happens is, organisations strengthen their internal and external coordination processes, learning processes, and transformation processes over time. As a result, they improve their overall resource deployment proficiency (i.e., FL-RIE). When FL-RIE improves, resource integration capability of a firm improves because FL-RIE plays a vital role in each phase of a resource integration process. Hence, a firm with a higher FL-RIE might experience positive value in most of its resource integration efforts. Furthermore, if an organisation experiences negative value-in-context in a majority of its resource integration efforts over time, FL-RIE can be used as one of the diagnostic tools to find the root cause behind the failure. Hence, FL-RIE could be considered as a potential antecedent of value cocreation. Therefore, FL-RIE can be used to generate novel insights related to dyadic and networked value creation efforts.

There are studies that discuss the type of resources that need to be deployed by a firm in a resource integration process to create value (e.g., Hilton & Hughes, 2013, Hilton et al, 2013). However, few studies discussed firm-level dynamic capabilities responsible for carrying out the actual deployment of the resources and determining the resource deployment proficiency of a firm. This study addresses this gap and proposes eleven first-order dynamic capabilities and three second-order dynamic capabilities that are responsible for carrying out the actual deployment of the resources and determining the resource deployment proficiency of a firm. Hence, the proposed conceptual framework has the potential to initiates a new stream of empirical research on how firms deploy and integrate various resources in resource integration processes to create value in various instances. For example, the study conducted by Hilton and Hughes (2013) can be re-run to understand how firms deploy and integrate various resources to provide superior experience to customers when using self-service technologies.

This study has the potential to generate implications for practice as well. According to the proposed conceptual framework, a firm's resource deployment proficiency is driven by three observable and measurable organisational processes that are conceptualised with eleven dynamic capabilities. By following this study, any practitioner has the opportunity to get a holistic view of the areas a firm should improve if it is to develop superior resource deployment proficiency. Furthermore, this study informs practitioners that limited focus on continuous development of one process has the potential to tarnish a firm's chances of cocreating value regularly in projects and daily activities and ensuring wellbeing and continuation of the firm and the ecosystem it operates in. For example, if a firm is driven by transactional leaders, it is more likely to adopt a shareholder model when implementing strategic, business, and operational strategies (Williams et al, 2020). Firms that adopt the shareholder model focus on maximising profits to ensure the wellbeing of shareholders. Hence, such firms are not good at ensuring the wellbeing and the continuation of the firm and its stakeholders. On the contrary,

when a firm is driven by transformational leaders, it is likely to adopt the stakeholder model when implementing its plans. Firms that adopt the stakeholder model assume they have an obligation to ensuring the wellbeing and the continuation of stakeholders while maximising profits (Williams et al, 2020). This indicates that a limited focus on transformation processes has the potential to weaken overall resource deployment proficiency, threatening the wellbeing and the continuation of the firm and its stakeholders.

Thus, it is evident that the proposed conceptual framework for FL-RIE has potential applications in both academia and practice. Researchers have the luxury of using this framework for theory building and empirical research while practitioners have the luxury of using the framework to improve resource deployment proficiency of firms. However, they must be mindful of the limitations of the proposed conceptual framework that are discussed in the following paragraph.

The empirical study in the context of Australian SMEs that use commercial cloud computing services revealed the actual existence of FL-RIE. However, there is no guarantee regarding the actual existence of the proposed concept within other types of firms. Hence, there is a need for future testing and validation of the framework. It can be done either qualitatively (e.g., through expert opinions and in-depth interviews with practitioners) or quantitatively (e.g., by following methodologies suggested by Churchill (1979), DeVellis (2012), and MacKenzie et al. (2011)). Even though this study predominantly adopted MacKenzie et al.'s (2011) methodology, one recommendation was not performed, that is, contacting experts in academia and practice when finding the answer to the review question. This study did not follow that recommendation. Hence, future researchers have the opportunity to improve the proposed conceptual framework further by getting the opinions of the experts in academia and practice to strengthen the answer to the review question. Furthermore, the definition of resource integration proposed by this

study only addresses situations where value is co-created. However, resource integration can hinder the experience of some actors. This study did not capture this aspect. Hence, this scenario should be addressed through future research.

S-D logic has gained a lot of interest from the academia and practice. However, the interest can further improve by conducting more empirical research that will demonstrate the practical usage of the S-D logic concepts. The same applies to the concept developed through this research. Future research is required to elevate FL-RIE to a more practical and user friendly concept that would benefit the practitioners.

9.4 Objective 2 – Implications, limitations, and future research

The second objective of this study was to test and validate the conceptual framework of FL-RIE. This study achieved the second objective by conducting an empirical study that was performed predominantly by following the methodology suggested by MacKenzie et al (2011). The findings of the empirical study have several theoretical implications capable of contributing to the advancement of S-D logic. Furthermore, this study offers several theoretical implications for the research on cloud adoption. Apart from the theoretical implications, the empirical study has practical implications as well. Both theoretical and practical implications are discussed in the rest of this section. The section ends with a discussion on the limitations of the empirical study and opportunities for future research.

The findings of the empirical study are quite significant from the perspective of S-D logic. At present, one of the major barriers that prevents quantitative researchers from testing the relationships proposed in S-D logic related metatheoretical studies is the nonavailability of tested and validated measurement scales for various constructs. Ranjan and Read (2016) have proposed a tested and validated measurement scale for *value co-creation*. Apart from that, there are hardly any studies that have tested and validated major constructs in S-D logic. As a result,

some of the quantitative studies that have used S-D logic as the underlying theory have developed their own scales to measure certain constructs. Wilden, Gudergan, Akaka, Averdung, and Teichert (2019) have developed a measurement scale to measure *cocreation capabilities*. They have used the developed scale to test how cocreation capabilities of a professional service firm behave with dynamic capabilities and service provisioning capabilities of the firm. Ho et al (2020) and Widjojo et al (2020b) have developed two different measurement scales to measure *resource integration*. Neither Ho et al (2020), Widjojo et al (2020b), and Wilden et al (2019) have used an accepted scale testing and validation procedure to develop the above-mentioned scales. Furthermore, such scales are not backed by a proper conceptual foundation. Hence, they might fail to capture the conceptual domain of the intended construct. Therefore, at present, there is a need for tested and validated scales for S-D logic related metatheoretical concepts. This study does that by developing a 30-item scale that is capable of capturing the conceptual domain of FL-RIE. Hence, this study makes a mid-range theoretical contribution by proposing a tested and validated measurement scale for FL-RIE that is capable of driving S-D logic backed evidence-based studies.

Another theoretical implication of the proposed 30-item measurement scale is related to the research on cloud adoption. According to S-D logic, when a firm successfully adopts a cloud solution, the situation can be considered as an instance where the firm has enhanced its circumstances (i.e., positive value-in-use). For the purpose of successfully adopting the cloud solution the firm engages in resource integration activities with various actors such as service providers, customers, regulatory bodies, etc. One of the factors that determine the success of those resource integration activities is the resource deployment proficiency (i.e., FL-RIE) of the firm. Justification for this argument can be strengthened by exploring the findings of Hollebeek (2019). According to Hollebeek (2019), FL-RIE can be considered as an antecedent of *firm engagement*. Firm engagement happens through various interactions driven by resource

integration activities performed with the participation of different actors. Since resource integration activities are taking place during a cloud adoption effort, firm engagement with various actors also takes place during a cloud adoption effort. Based on this background, FL-RIE can be considered as a potential factor that determines the success or failure of a cloud adoption effort. Since this study tested and validated a measurement scale that is capable of capturing the conceptual domain of FL-RIE in the context of Australian SMEs that use commercial cloud computing services, future researchers have the option of using the 30-item scale to drive research on cloud adoption.

The tested and validated measurement scale of FL-RIE has the potential to generate practical implications for Australian SMEs that use commercial cloud computing services. According to the ABS (2019), more than 60% of Australian SMEs are not using commercial cloud computing solutions despite the benefits offered by cloud technologies. Hence, Australia is a market with a huge potential for cloud service providers. Out of many challenges knowledge deficiency on cloud technologies is the major challenge that prevents SMEs from adoption of cloud technologies. Since acquisition of new knowledge is an important determinant of FL-RIE, firms that use commercial cloud computing services can be considered as firms with higher FL-RIE compared to those that do not use commercial cloud computing services. Thus, if Australian SMEs focus on nurturing and developing the seven firm-level properties this empirical study shortlisted as first-order indicators of FL-RIE, they might be able to develop competencies that are necessary to adopt commercial cloud computing services successfully.

Furthermore, cloud service providers that are willing to grow their businesses in the Australian market have the option of employing the proposed 30-item scale for diagnostic purposes. Normally, when a corporate client lodge an expression of interest to adopt a commercial cloud computing service, well-known cloud service providers conduct a health analysis of the

business before proceeding with the deployment of the commercial cloud solution. For example, Accenture has their own rapid cloud assessment tool (i.e., fit-for-cloud assessment tool) to analyse whether a US federal government agency is ready to adopt a commercial cloud solution or not (Accenture, 2019). Similarly, every other well-known cloud service provider has their own health check tools to understand the statuses of various customers. Based on this background, since FL-RIE is a potential antecedent of cloud adoption, cloud service providers operating in the Australian market have the option of incorporating the proposed 30-item scale into their health check tools. That would provide them an idea regarding the resource deployment proficiency of each client.

The empirical study has several limitations as well that need to be addressed by future researchers. During the content validity test and formal specification of the measurement model, this study requested and received consultation from industry personnel and senior doctoral students. This study requested the support of industry personnel and senior doctoral students based on the recommendation of Vigneron and Johnson (2004). However, MacKenzie et al (2011) recommend the support of experts in academia when conducting the content validity test and specifying the measurement model. This study did not follow their recommendation. Hence, future researchers that would test and validate the proposed conceptual framework in other contexts have the opportunity to strengthen the content validity test and the formal specification of the measurement model by getting the opinions of the experts in both academia and in practice.

The findings of the empirical study are applicable to the Australian SME community. Due to differences in demographic profiles, the findings cannot to directly applied in another context even though it is common in quantitative research in social sciences to directly adopt measurement scales. Therefore, future researchers must conduct research to validate the

findings of this study in other contexts. In doing so, they will have the option of following the recommendations of Churchill (1979) or DeVellis (2012) or MacKenzie et al (2011).

Both Churchill (1979) and MacKenzie et al (2011) suggest developing norms as the final step of measurement scale development and validation process because these norms helps those who use the measurement scale to interpret scores. However, this study did not develop norms for the proposed measurement scale due to the time limitation and the rarity of the development of norms by the past studies that have proposed measurement scales for constructs in social sciences (e.g., Craig et al, 2019; Pellathy et al, 2019). Past studies suggest that non-development of norms is not a barrier that prevents future researchers from using a measurement scale. However, when norms are developed and interpreted by empirical research, it is easier to incorporate such measurement scales into commercial assessment tools such as Accenture's fit-for-cloud assessment tool. Therefore, future researchers have the option of developing norms for the measurement scale of FL-RIE to encourage the usage of the scale in practice.

9.5 Conclusion

This study defines and proposes a conceptual framework for FL-RIE. Furthermore, this study tests and validates the proposed conceptual framework to propose a measurement scale for FL-RIE. By performing these tasks, this research addresses the calls of Vargo and Lusch (2017) and Brodie and Lobler (2018) to develop more midrange theoretical contributions capable of bridging the gap between S-D logic related metatheories and empirical research. The understanding generated by the proposed conceptual framework notifies firms of the dynamic capabilities they must nurture if they are to deploy their network of stakeholders, potential resources and existing resources with a higher proficiency in various resource integration efforts.

As highlighted in the discussion, the proposed framework has definite applications in the domain of marketing management and cloud adoption. At the same time, the proposed framework might have applications in other disciplines as well because effective deployment of resources is a common issue discussed in many other disciplines due to the scarcity of resources. For example, FL-RIE could be an antecedent of sustained competitive advantage because resource deployment proficiency of a firm has an impact on the firm's competitive position of the market (Sirmon, Gove, & Hitt 2008). Hence, FL-RIE might have applications in strategic management. This is an indication of the potential FL-RIE possesses to promote cross disciplinary research between S-D logic and other disciplines. Hence, the proposed framework for FL-RIE has the potential to assist S-D logic to fulfil one of the criteria it needs to attain the paradigmatic status (i.e., initiating a cross-disciplinary debate (Brodie, Löbler, & Fehrer 2019)).

In conclusion, the contribution of this study helps to identify and integrate the salient themes and concepts that assume considerable importance in forming the resource deployment proficiency of a firm. It is up to the S-D logic research community and other future researchers to address the limitations of the proposed definition and the conceptual framework and ensure the actual application of the framework in empirical research.

REFERENCES

Aaker, D. A. (2011). *Marketing research* (10th ed.). Hoboken, New Jersey: Wiley.

Aal, K., Di Pietro, L., Edvardsson, B., Renzi, M. F., & Guglielmetti Mugion, R. (2016). Innovation in service ecosystems: An empirical study of the integration of values, brands, service systems and experience rooms. *Journal of Service Management, 27*(4), 619-651. doi:10.1108/JOSM-02-2015-0044

Abdel-Basset, M., Mohamed, M., & Chang, V. (2018). NMCDA: A framework for evaluating cloud computing services. *Future Generation Computer Systems, 86*, 12-29. doi:10.1016/j.future.2018.03.014

Accenture. (2019). Roadmap to the cloud. Retrieved from https://www.accenture.com/us-en/services/us-federal-government/rapid-cloud-assessment

Akaka, M. A., Corsaro, D., Kelleher, C., Maglio, P. P., Seo, Y., Lusch, R. F., & Vargo, S. L. (2014). The role of symbols in value cocreation. *Marketing Theory, 14*(3), 311-326. doi:10.1177/1470593114534344

Akaka, M. A., Vargo, S. L., & Lusch, R. F. (2013). The complexity of context: A service ecosystems approach for international marketing. *Journal of International Marketing, 21*(4), 1-20. doi:10.1509/jim.13.0032

Åkesson, M., Skålén, P., Edvardsson, B., & Stålhammar, A. (2016). Value proposition test-driving for service innovation: How frontline employees innovate value propositions. *Journal of Service Theory and Practice, 26*(3). 338-362. doi:10.1108/JSTP-10-2014-0242

Al-ismaili, S., Li, M., Shen, J., & He, Q. (2015, Nov 30th - Dec 4th 2015). *A multi perspective approach for understanding the determinants of cloud computing adoption among Australian SMEs.* Paper presented at the Australasian Conference on Information Systems.

Allen, M. (2017). *The SAGE encyclopedia of communication research methods*. Thousand Oaks, California; SAGE.

Allred, C. R., Fawcett, S. E., Wallin, C., & Magnan, G. M. (2011). A dynamic collaboration capability as a source of competitive advantage. *Decision Sciences, 42*(1), 129-161. doi:10.1111/j.1540-5915.2010.00304.x

Anderson, J. C., & Gerbing, D. W. (1988). Structural equation modeling in practice: A review and recommended two-step approach. *Psychological Bulletin, 103*(3), 411-423.

Andreev, P., Heart, T., Maoz, H., & Pliskin, N. (2009). *Validating formative partial least squares (PLS) models: Methodological review and empirical illustration*. Paper presented at the Thirtieth International Conference on Information Systems 2009 (ICIS 2009), Phoenix, Arizona.

Andreeva, T., & Ritala, P. (2016). What are the sources of capability dynamism? Reconceptualizing dynamic capabilities from the perspective of organizational change. *Baltic Journal of Management, 11*(3), 238-259. doi:10.1108/BJM-02-2015-0049

Antoncic, B. (2007). Intrapreneurship: A comparative structural equation modeling study. *Industrial Management & Data Systems, 107*(3), 309-325. doi:10.1108/02635570710734244

Antoncic, B., & Hisrich, R., D. (2003). Clarifying the intrapreneurship concept. *Journal of Small Business and Enterprise Development, 10*(1), 7-24. doi:10.1108/14626000310461187

Antoncic, B., & Hisrich, R. D. (2001). Intrapreneurship: Construct refinement and cross-cultural validation. *Journal of Business Venturing, 16*(5), 495-527. doi:10.1016/S0883-9026(99)00054-3

Anttiroiko, A. V., & Komninos, N. (2019). Smart public services: Using smart city and service ontologies in integrative service design. In R. Bolivar & M. Pedro (Eds.), *Setting Foundations for the Creation of Public Value in Smart Cities* (pp. 17-47). Cham: Springer International Publishing.

Australian Bureau of Statistics. (2017). Business use of information technology statistics. 20/07/2017. Retrieved from https://www.abs.gov.au/statistics/industry/technology-and-innovation/business-use-information-technology/latest-release

Australian Bureau of Statistics. (2019). 8167.0 - Characteristics of Australian business (2017-18). Retrieved from https://www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/8167.0Main+Features12017-18?OpenDocument

Avolio, B. J., Zhu, W., Koh, W., & Bhatia, P. (2004). Transformational leadership and organizational commitment: Mediating role of psychological empowerment and moderating role of structural distance. *Journal of Organizational Behavior, 25*(8), 951-968. doi:10.1002/job.283

Ballantyne, D., Frow, P., Varey, R. J., & Payne, A. (2011). Value propositions as communication practice: Taking a wider view. *Industrial Marketing Management, 40*(2), 202-210. doi:10.1016/j.indmarman.2010.06.032

Barney, J. (2014). *Gaining and sustaining competitive advantage* (4th ed.). Harlow, Essex, England: Pearson Publication Limited.

Baron, S., & Harris, K. (2008). Consumers as resource integrators. *Journal of Marketing Management, 24*(1-2), 113-130. doi:10.1362/026725708X273948

Baumann, J., Meunier-FitzHugh, K. L., & Wilson, H. N. (2017). The challenge of communicating reciprocal value promises: Buyer-seller value proposition disparity in professional services. *Industrial Marketing Management, 64*, 107-121. doi:10.1016/j.indmarman.2017.02.002

Beirão, G., Patrício, L., & Raymond, P. F. (2017). Value cocreation in service ecosystems: Investigating health care at the micro, meso, and macro levels. *Journal of Service Management, 28*(2), 227-249. doi:10.1108/JOSM-11-2015-0357

Bendoly, E., Rosenzweig, E. D., & Stratman, J. K. (2009). The efficient use of enterprise information for strategic advantage: A data envelopment analysis. *Journal of Operations Management, 27*(4), 310-323. doi:10.1016/j.jom.2008.11.001

Bildosola, I., Río-Belver, R., Cilleruelo, E., & Garechana, G. (2015). Design and implementation of a cloud computing adoption decision tool: Generating a cloud road. *PLoS ONE, 10*(7), 1-20. doi:10.1371/journal.pone.0134563

Blanca, M. J., Arnau, J., López-Montiel, D., Bono, R., & Bendayan, R. (2013). Skewness and kurtosis in real data samples. *Methodology: European Journal of Research Methods for the Behavioral and Social Sciences, 9*(2), 78-84. doi:10.1027/1614-2241/a000057

Bontis, N., Crossan, M. M., & Hulland, J. (2002). Managing an organizational learning system by aligning stocks and flows. *Journal of Management Studies, 39*(4), 437-469. doi:10.1111/1467-6486.t01-1-00299

Botti, A., & Monda, A. (2020). Sustainable value co-creation and digital health: The case of trentino eHealth ecosystem. *Sustainability, 12*(13), 1-17.

Breevaart, K., Bakker, A., Hetland, J., Demerouti, E., Olsen, O. K., & Espevik, R. (2014). Daily transactional and transformational leadership and daily employee engagement. *Journal of Occupational and Organizational Psychology, 87*(1), 138-157. doi:10.1111/joop.12041

Brennan, L., Camm, J., & Tanas, J. K. (2007). Validity in market research practice: 'New' is not always 'improved'. *International Journal of Marketing, 46*(1), 6-16. doi:10.1007/BF03032173

Brodie, R., & Löbler, H. (2018). Advancing knowledge about service-dominant logic: The role of midrange theory. In S. L. Vargo & R. F. Lusch (Eds.), *The Sage Handbook of Service-Dominant Logic* (pp. 565-577). London: SAGE Publications Ltd.

Brodie, R. J., Löbler, H., & Fehrer, J. A. (2019). Evolution of service-dominant logic: Towards a paradigm and metatheory of the market and value cocreation? *Industrial Marketing Management, 79*, 3-12. doi:10.1016/j.indmarman.2019.03.003

Brodie, R. J., Saren, M., & Pels, J. (2011). Theorizing about the service dominant logic: The bridging role of middle range theory. *Marketing Theory, 11*(1), 75-91. doi:10.1177/1470593110393714

Bron, R., Endedijk, M. D., van Veelen, R., & Veldkamp, B. P. (2018). The joint influence of intra- and inter-team learning processes on team performance: A constructive or destructive combination? *Vocations and Learning, 11*(3), 449-474. doi:10.1007/s12186-018-9197-z

Brozović, D., D'Auria, A., & Tregua, M. (2020). Value creation and sustainability: Lessons from leading sustainability firms. *Sustainability, 12*(11), 1-19.

Bruce, H. L., Wilson, H. N., Macdonald, E. K., & Clarke, B. (2019). Resource integration, value creation and value destruction in collective consumption contexts. *Journal of Business Research, 103*, 173-185. doi:10.1016/j.jbusres.2019.05.007

Calantone, R. J., Cavusgil, S. T., & Zhao, Y. (2002). Learning orientation, firm innovation capability, and firm performance. *Industrial Marketing Management, 31*(6), 515-524. doi:10.1016/S0019-8501(01)00203-6

Callow, N., Smith, M. J., Hardy, L., Arthur, C. A., & Hardy, J. (2009). Measurement of transformational leadership and its relationship with team cohesion and performance level. *Journal of Applied Sport Psychology, 21*(4), 395-412. doi:10.1080/10413200903204754

Canhoto, A. I., Quinton, S., Jackson, P., & Dibb, S. (2016). The co-production of value in digital, university–industry R&D collaborative projects. *Industrial Marketing Management, 56*, 86-96. doi:10.1016/j.indmarman.2016.03.010

Caridà, A., Edvardsson, B., & Colurcio, M. (2019). Conceptualizing resource integration as an embedded process: Matching, resourcing and valuing. *Marketing Theory, 19*(1), 65-84. doi:10.1177/1470593118772215

Carnabuci, G., & Operti, E. (2013). Where do firms' recombinant capabilities come from? Intraorganizational networks, knowledge, and firms' ability to innovate through technological recombination. *Strategic Management Journal, 34*(13), 1591-1613. doi:10.1002/smj.2084

Carrillo, J. F., Edvardsson, B., Reynoso, J., & Maravillo, E. (2019). Alignment of resources, actors and contexts for value creation: Bringing knowledge management into service-dominant logic. *International Journal of Quality and Service Sciences, 11*(3), 424-438. doi:10.1108/IJQSS-08-2018-0077

Chin, W. W. (1998). Commentary: Issues and opinion on structural equation modeling. *MIS Quarterly, 22*(1), 7-16.

Chiva, R., Alegre, J., & Lapiedra, R. (2007). Measuring organisational learning capability among the workforce. *International Journal of Manpower, 28*(3/4), 224-242. doi:10.1108/01437720710755227

Churchill, G. A. (1979). A paradigm for developing better measures of marketing constructs. *Journal of Marketing Research, 16*(1), 64-73. doi:10.2307/3150876

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale: Lawrence Erlbaum Associates.

Cohen, W. M., & Levinthal, D. A. (1990). Absorptive capacity: A new perspective on learning and innovation. *Administrative Science Quarterly, 35*(1), 128-152. doi:10.2307/2393553

Colurcio, M., Caridà, A., & Edvardsson, B. (2017). Conceptualizing resource integration to advance service innovation. In T. Russo-Spena, C. Mele, & M. Nuutinen (Eds.),

Innovating in Practice: Perspectives and Experiences (pp. 237-259). Cham: Springer International Publishing.

Commonwealth of Australia. (2019). *Small business counts: Small business in the Australian economy*. Retrieved from Australia: https://www.asbfeo.gov.au/sites/default/files/documents/ASBFEO-small-business-counts2019.pdf

Craig, K., Thatcher, J. B., & Grover, V. (2019). The IT identity threat: A conceptual definition and operational measure. *Journal of Management Information Systems, 36*(1), 259-288. doi:10.1080/07421222.2018.1550561

Currie, W. L., & Galliers, B. (1999). *Rethinking management information systems: An interdisciplinary perspective*. New York: Oxford University Press, Inc.

Dabholkar, P. A., Thorpe, D. I., & Rentz, J. O. (1996). A measure of service quality for retail stores: Scale development and validation. *Journal of the Academy of Marketing Science, 24*(1), 3-16. doi:10.1007/BF02893933

Deloitte. (2020). *ACS Australia's digital pulse: Unlocking the potential of Australia's technology workforce*. Retrieved from https://www2.deloitte.com/au/en/pages/economics/articles/australias-digital-pulse.html

DeVellis, R. F. (2012). *Scale development: Theory and applications*. California: SAGE Publications.

Diamantopoulos, A., Riefler, P., & Roth, K. P. (2008). Advancing formative measurement models. *Journal of Business Research, 61*(12), 1203-1218. doi:10.1016/j.jbusres.2008.01.009

Diamantopoulos, A., & Winklhofer, H. M. (2001). Index construction with formative indicators: An alternative to scale development. *Journal of Marketing Research, 38*(2), 269-277. doi:10.1509/jmkr.38.2.269.18845

Dietz, J. L. G., & Mulder, H. B. F. (1998, 9-9 Jan. 1998). *Organisational transformation requires constructional knowledge of business systems.* Paper presented at the Proceedings of the Thirty-First Hawaii International Conference on System Sciences, Kohala Coast, HI, USA.

Doherty, E., Carcary, M., & Conway, G. (2015). Migrating to the cloud: examining the drivers and barriers to adoption of cloud computing by SMEs in Ireland: An exploratory study. *Journal of Small Business and Enterprise Development, 22*(3), 512-527. doi:10.1108/JSBED-05-2013-0069

Dombrowski, C., Kim, J. Y., Desouza, K. C., Braganza, A., Papagari, S., Baloh, P., & Jha, S. (2007). Elements of innovative cultures. *Knowledge and Process Management, 14*(3), 190-202. doi:10.1002/kpm.279

Droge, C., Jayaram, J., & Vickery, S. K. (2004). The effects of internal versus external integration practices on time-based performance and overall firm performance. *Journal of Operations Management, 22*(6), 557-573. doi:10.1016/j.jom.2004.08.001

Du, P., & Chou, H.-H. (2020). Sociomaterial practices for value co-creation in the sharing economy: Evidence from Xbed's access-based accommodation service. *Information Technology & People, 33*(3), 963-982. doi:10.1108/ITP-10-2018-0477

Edvardsson, B., Kleinaltenkamp, M., Tronvoll, B., McHugh, P., & Windahl, C. (2014). Institutional logics matter when coordinating resource integration. *Marketing Theory, 14*(3), 291-309. doi:10.1177/1470593114534343

Edwards, J. R., & Bagozzi, R. P. (2000). On the nature and direction of relationships between constructs and measures. *Psychological Methods, 5*(2), 155-174. doi:10.1037/1082-989x.5.2.155

Eggert, A., Ulaga, W., Frow, P., & Payne, A. (2018). Conceptualizing and communicating value in business markets: From value in exchange to value in use. *Industrial Marketing Management, 69*, 80-90. doi:10.1016/j.indmarman.2018.01.018

Ehrhart, M. G. (2004). Leadership and procedural justice climate as antecedents of unit-level organizational citizenship behavior. *Personnel Psychology, 57*(1), 61-94. doi:10.1111/j.1744-6570.2004.tb02484.x

Eisenberger, R., Fasolo, P., & Davis-LaMastro, V. (1990). Perceived organizational support and employee diligence, commitment, and innovation. *Journal of Applied Psychology, 75*(1), 51-59.

Eisenhardt, K. M., & Martin, J. A. (2000). Dynamic capabilities: What are they? *Strategic Management Journal, 21*(10/11), 1105-1121.

Eriksson, T. (2014). Processes, antecedents and outcomes of dynamic capabilities. *Scandinavian Journal of Management, 30*(1), 65-82. doi:10.1016/j.scaman. 2013.05.001

Etro, F. (2009). The economic impact of cloud computing on business creation, employment and output in Europe. *Review of Business and Economics, 54*(2), 179-208.

Farrell, M. A. (1999). Antecedents and consequences of a learning orientation. *Marketing Bulletin, 10*, 38-51.

Ferguson, C. J., & Garza, A. (2011). Call of (civic) duty: Action games and civic behavior in a large sample of youth. *Computers in Human Behavior, 27*(2), 770-775. doi:10.1016/j.chb.2010.10.026

Flatten, T. C., Engelen, A., Zahra, S. A., & Brettel, M. (2011). A measure of absorptive capacity: Scale development and validation. *European Management Journal, 29*(2), 98-116. doi:10.1016/j.emj.2010.11.002

Fornell, C., & Bookstein, F. L. (1982). Two structural equation models: LISREL and PLS applied to consumer exit-voice theory. *Journal of Marketing Research, 19*(4), 440-452. doi:10.2307/3151718

Fornell, C., & Cha, J. (1994). Partial least squares. In R. P. Bagozzi (Ed.), *Advanced methods of marketing research*. Malden, MA: Blackwell Publishers.

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and masurement error. *Journal of Marketing Research, 18*(1), 39-50. doi:10.1177/002224378101800104

Franco, M., & Haase, H. (2009). Entrepreneurship: An organisational learning approach. *Journal of Small Business and Enterprise Development, 16*(4), 628-641. doi:10.1108/14626000911000965

Freeze, R., & Raschke, R. L. (2007). *An assessment of formative and reflective constructs in IS research*. Paper presented at the European Conference on Information Systems, St. Gallen, Switzerland.

Frow, P., McColl-Kennedy, J. R., Hilton, T., Davidson, A., Payne, A., & Brozovic, D. (2014). Value propositions: A service ecosystems perspective. *Marketing Theory, 14*(3), 327-351. doi:10.1177/1470593114534346

Gaskin, J. (2019). Exploratory factor analysis. Retrieved from http://statwiki.kolobkreations.com/index.php?title=Exploratory_Factor_Analysis

Geisser, S. (1975). The predictive sample reuse method with applications. *Journal of the American Statistical Association, 70*(350), 320-328. doi:10.1080/01621459.1975.10479865

Gelfand, M. J., Lim, B. C., & Raver, J. L. (2004). Culture and accountability in organizations: Variations in forms of social control across cultures. *Human Resource Management Review, 14*(1), 135-160. doi:10.1016/j.hrmr.2004.02.007

Ginsberg, A., & Abrahamson, E. (1991). Champions of change and strategic shifts: The role of internal and external change advocates. *Journal of Management Studies, 28*(2), 173-190. doi:10.1111/j.1467-6486.1991.tb00276.x

Gray, B., Matear, S., Boshoff, C., & Matheson, P. (1998). Developing a better measure of market orientation. *European Journal of Marketing, 32*(9/10), 884-903. doi:10.1108/03090569810232327

Gummesson, E., & Mele, C. (2010). Marketing as value co-creation through network interaction and resource integration. *Journal of Business Market Management, 4*(4), 181-198. doi:10.1007/s12087-010-0044-2

Haase, M., & Kleinaltenkamp, M. (2011). Property rights design and market process: Implications for market theory, marketing theory, and S-D logic. *Journal of Macromarketing, 31*(2), 148-159. doi:10.1177/0276146710397662

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate data analysis* (7th ed.). Upper Saddle River, New Jersey: Prentice Hall.

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2013). *Multivariate data analysis*. Harlow: Pearson Education Limited.

Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2017). *A primer on partial least squares structural equation modeling (PLS-SEM)* (2nd ed.). Thousand Oaks: Sage Publications.

Hair, J. F., Sarstedt, M., Ringle, C. M., & Mena, J. A. (2012). An assessment of the use of partial least squares structural equation modeling in marketing research. *Journal of the Academy of Marketing Science, 40*(3), 414-433. doi:10.1007/s11747-011-0261-6

Hamel, G., Doz, Y. L., & Prahalad, C. K. (1989). Collaborate with your competitors and win. *Harvard Business Review, 67*(1), 133-139.

Harris, L. C. (2002). Developing market orientation: An exploration of differences in management approaches. *Journal of Marketing Management, 18*(7-8), 603-632. doi:10.1362/0267257022780624

Hasu, M., Toivonen, M., Tuominen, T., & Saari, E. (2015). Employees and users as resource integrators in service innovation: A learning framework. In R. Agarwal, W. Selen, G. Roos, & R. Green (Eds.), *The handbook of service innovation* (pp. 169-192). London: Springer.

Haynes, S. N., Richard, D., & Kubany, E. S. (1995). Content validity in psychological assessment: A functional approach to concepts and methods. *Psychological Assessment, 7*(3), 238-247.

Henseler, J. (2010). On the convergence of the partial least squares path modeling algorithm. *Computational Statistics, 25*(1), 107-120. doi:10.1007/s00180-009-0164-x

Henseler, J., Ringle, C. M., & Sinkovics, R. R. (2009). The use of partial least squares path modeling in international marketing. In R. R. Sinkovics & N. G. Pervez (Eds.), *New challenges to international marketing* (Vol. 20, pp. 277-319). Bingley: Emerald Group Publishing Limited.

Hibbert, S., Winklhofer, H., & Temerak, M. S. (2012). Customers as resource integrators: Toward a model of customer learning. *Journal of Service Research, 15*(3), 247-261. doi:10.1177/1094670512442805

Hilton, T., & Hughes, T. (2013). Co-production and self-service: The application of service-dominant logic. *Journal of Marketing Management, 29*(7-8), 861-881. doi:10.1080 /0267257X.2012.729071

Hilton, T., Hughes, T., & Chalcraft, D. (2012). Service co-creation and value realisation. *Journal of Marketing Management, 28*(13-14), 1504-1519. doi:10.1080/0267257X .2012.736874

Hinkin, T. R., & Tracey, J. B. (1999). An analysis of variance approach to content validation. *Organizational Research Methods, 2*(2), 175-186. doi:10.1177/109442819922004

Ho, M. H.-W., Chung, H. F. L., Kingshott, R., & Chiu, C.-C. (2020). Customer engagement, consumption and firm performance in a multi-actor service eco-system: The

moderating role of resource integration. *Journal of Business Research, 121*, 557-566. doi:10.1016/j.jbusres.2020.02.008

Hollebeek, L., D., & Andreassen, T., W. (2018). The S-D logic-informed "hamburger" model of service innovation and its implications for engagement and value. *Journal of Services Marketing, 32*(1), 1-7. doi:10.1108/JSM-11-2017-0389

Hollebeek, L. D. (2019). Developing business customer engagement through social media engagement-platforms: An integrative S-D logic/RBV-informed model. *Industrial Marketing Management, 81*, 89-98. doi:10.1016/j.indmarman.2017.11.016

Hollebeek, L. D., Srivastava, R. K., & Chen, T. (2019). S-D logic–informed customer engagement: Integrative framework, revised fundamental propositions, and application to CRM. *Journal of the Academy of Marketing Science, 47*(1), 161-185. doi:10.1007/s11747-016-0494-5

Horbel, C., Buck, C., Diel, S., Reith, R., & Walter, Y. (In Press). Stadium visitors' smartphone usage and digital resource integration. *Sport, Business and Management*. doi:10.1108/SBM-10-2019-0099

Howell, J. M., & Higgins, C. A. (1990). Champions of change: Identifying, understanding, and supporting champions of technological innovations. *Organizational Dynamics, 19*(1), 40-55. doi:10.1016/0090-2616(90)90047-S

Howell, R. D., Breivik, E., & Wilcox, J. B. (2007). Is formative measurement really measurement? Reply to Bollen (2007) and Bagozzi (2007). *Psychological Methods, 12*(2), 238-245. doi:10.1037/1082-989X.12.2.238

Huber, G. P. (1991). Organizational learning: The contributing processes and the literatures. *Organization Science, 2*(1), 88-115. doi:10.1287/orsc.2.1.88

Hubley, A. M. (2014). Discriminant validity. In A. C. Michalos (Ed.), *Encyclopedia of quality of life and well-being research* (pp. 1664-1667). Dordrecht: Springer Netherlands.

Hughes, T., & Vafeas, M. (2018). Service-dominant logic as a framework for exploring research utilization. *Marketing Theory, 18*(4), 451-472. doi:10.1177/1470593118764019

Hughes, T., Vafeas, M., & Hilton, T. (2018). Resource integration for co-creation between marketing agencies and clients. *European Journal of Marketing, 52*(5/6), 1329-1354. doi:10.1108/EJM-10-2015-0725

Hulland, J. (1999). Use of partial least squares (PLS) in strategic management research: A review of four recent studies. *Strategic Management Journal, 20*(2), 195-204. doi:10.1002/(sici)1097-0266(199902)20:2<195::aid-smj13>3.0.co;2-7

Jahner, S., Leimeister, J. M., Knebel, U., & Krcmar, H. (2008). *A cross-cultural comparison of perceived strategic importance of RFID for CIOs in Germany and Italy.* Paper presented at the 41st Annual Hawaii International Conference on System Sciences (HICSS 2008), Waikoloa, HI, USA.

Jansen, J. J. P., Van Den Bosch, F. A. J., & Volberda, H. W. (2005). Managing potential and realized absorptive capacity: How do organizational antecedents matter? *Academy of Management Journal, 48*(6), 999-1015. doi:10.5465/AMJ.2005.19573106

Jarvis, C. B., MacKenzie, S. B., & Podsakoff, P. M. (2003). A critical review of construct indicators and measurement model misspecification in marketing and consumer research. *Journal of Consumer Research, 30*(2), 199-218. doi:10.1086/376806

Jaworski, B. J., & Kohli, A. K. (1993). Market orientation: Antecedents and consequences. *Journal of Marketing, 57*(3), 53-70. doi:10.1177/002224299305700304

Jefferies, G. J., Bishop, S., & Hibbert, S. (2019). Service innovation through resource integration: An empirical examination of co-created value using telehealth services. *Public Policy and Administration, 36*(1), 69-88. doi:10.1177/0952076718822715

Jeon, H., & Choi, B. (2012). The relationship between employee satisfaction and customer satisfaction. *Journal of Services Marketing, 26*(5), 332-341. doi:10.1108/08876041211245236

Jiménez-Barrionuevo, M. M., García-Morales, V. J., & Molina, L. M. (2011). Validation of an instrument to measure absorptive capacity. *Technovation, 31*(5), 190-202. doi:10.1016/j.technovation.2010.12.002

Johlke, M. C., & Duhan, D. F. (2000). Supervisor communication practices and service employee job outcomes. *Journal of Service Research, 3*(2), 154-165. doi:10.1177/109467050032004

Johnson, A. G., & Neuhofer, B. (2017). Airbnb – an exploration of value co-creation experiences in Jamaica. *International Journal of Contemporary Hospitality Management, 29*(9), 2361-2376. doi:10.1108/IJCHM-08-2016-0482

Jones, T., & Evans, D. (2000). Conducting a systematic review. *Australian Critical Care, 13*(2), 66-71. doi:10.1016/S1036-7314(00)70624-2

Jönsson, B. (2017). Disruptive innovation and EU health policy. *The European Journal of Health Economics, 18*(3), 269-272. doi:10.1007/s10198-016-0840-z

Judge, W., & Douglas, T. (2009). Organizational change capacity: The systematic development of a scale. *Journal of Organizational Change Management, 22*(6), 635-649. doi:10.1108/09534810910997041

Karpen, I. O., Bove, L. L., & Lukas, B. A. (2012). Linking service-dominant logic and strategic business practice: A conceptual model of a service-dominant orientation. *Journal of Service Research, 15*(1), 21-38. doi:10.1177/1094670511425697

Kirca, A. H., Jayachandran, S., & Bearden, W. O. (2005). Market orientation: A meta-analytic review and assessment of its antecedents and impact on performance. *Journal of Marketing, 69*(2), 24-41. doi:10.1509/jmkg.69.2.24.60761

Kleinaltenkamp, M., Brodie, R. J., Frow, P., Hughes, T., Peters, L. D., & Woratschek, H. (2012). Resource integration. *Marketing Theory, 12*(2), 201-205. doi:10.1177/1470593111429512

Kline, R. B. (2011). *Principles and practice of sructural euation mdeling* (2nd ed.). New York: Guilford Publications.

Knies, E., Leisink, P., & Schoot, R. v. d. (2017). People management: Developing and testing a measurement scale. *The International Journal of Human Resource Management*, 1-33. doi:10.1080/09585192.2017.1375963

Knight, J. A. (2017). Academic librarians as change champions: A framework for managing change. *Library Management, 38*(6/7), 294-301. doi:10.1108/LM-03-2017-0031

Kohli, A. K., & Jaworski, B. J. (1990). Market orientation: The construct, research propositions, and managerial implications. *Journal of Marketing, 54*(2), 1-18. doi:10.1177/002224299005400201

Kohli, A. K., Jaworski, B. J., & Kumar, A. (1993). MARKOR: A measure of market orientation. *Journal of Marketing Research, 30*(4), 467-477. doi:10.2307/3172691

Korkman, O., Storbacka, K., & Harald, B. (2010). Practices as markets: Value co-creation in e-invoicing. *Australasian Marketing Journal, 18*(4), 236-247. doi:10.1016/j.ausmj. 2010.07.006

Koskela-Huotari, K., Edvardsson, B., Jonas, J. M., Sörhammar, D., & Witell, L. (2016). Innovation in service ecosystems—Breaking, making, and maintaining institutionalized rules of resource integration. *Journal of Business Research, 69*(8), 2964-2971. doi:10.1016/j.jbusres.2016.02.029

Koskela-Huotari, K., Edvardsson, B., & Tronvoll, B. (2018). Emergence of novel resources in service ecosystems. In S. L. Vargo & R. F. Lusch (Eds.), *The Sage handbook of service-dominant logic* (pp. 372-386). London: SAGE Publications Ltd.

Lampinen, M., & Tossavainen, P. J. (2014). *Learnings from joint service spheres*. Paper presented at the NordDesign 2014, Espoo, Finland.

Laud, G., Karpen, I. O., Mulye, R., & Rahman, K. (2015). The role of embeddedness for resource integration: Complementing S-D logic research through a social capital perspective. *Marketing Theory, 15*(4), 509-543. doi:10.1177/1470593115572671

Leban, W., & Zulauf, C. (2004). Linking emotional intelligence abilities and transformational leadership styles. *Leadership & Organization Development Journal, 25*(7), 554-564. doi:10.1108/01437730410561440

Lessard, L., Amyot, D., Aswad, O., & Mouttham, A. (2020). Expanding the nature and scope of requirements for service systems through service-dominant logic: The case of a telemonitoring service. *Requirements Engineering, 25*(3), 273-293. doi:10.1007/s00766-019-00322-z

LEXICO powered by OXFORD. (2019). Definition of effective in English.

Lin, C. Y., Luh, W. M., Yang, A. L., Su, C. T., Wang, J. D., & Ma, H. I. (2012). Psychometric properties and gender invariance of the Chinese version of the self-report pediatric quality of life inventory version 4.0: Short form is acceptable. *Quality of Life Research, 21*(1), 177-182. doi:10.1007/s11136-011-9928-1

Liu, L., Li, C., & Zhu, D. (2012). A new approach to testing nomological validity and its application to a second-order measurement model of trust. *Journal of the Association for Information Systems, 13*(12), 950-975. doi:10.17705/1jais.00320

Löbler, H. (2013). Service-dominant networks: An evolution from the service-dominant logic perspective. *Journal of Service Management, 24*(4), 420-434. doi:10.1108/JOSM-01-2013-0019

Löfberg, N., & Åkesson, M. (2018). Creating a service platform – How to co-create value in a remote service context. *Journal of Business & Industrial Marketing, 33*(6), 768-780. doi:10.1108/JBIM-10-2015-0202

Love, P. E. D., Irani, Z., Standing, C., Lin, C., & Burn, J. M. (2005). The enigma of evaluation: Benefits, costs and risks of IT in Australian small–medium-sized enterprises. *Information & Management, 42*(7), 947-964. doi:10.1016/j.im.2004.10.004

Lusch, R. F., & Nambisan, S. (2015). Service innovation: A service-dominant logic perspective. *MIS Quarterly, 39*(1), 155-175.

Lusch, R. F., & Vargo, S. L. (2006). Service-dominant logic: reactions, reflections and refinements. *Marketing Theory, 6*(3), 281-288. doi:10.1177/1470593106066781

Lusch, R. F., Vargo, S. L., & Gustafsson, A. (2016). Fostering a trans-disciplinary perspectives of service ecosystems. *Journal of Business Research, 69*(8), 2957-2963. doi:10.1016/j.jbusres.2016.02.028

MacCallum, R. C., Widaman, K. F., Zhang, S., & Hong, S. (1999). Sample size in factor analysis. *Psychological Methods, 4*(1), 84-99.

MacGregor, R. C., & Vrazalic, L. (2005). A basic model of electronic commerce adoption barriers: A study of regional small businesses in Sweden and Australia. *Journal of Small Business and Enterprise Development, 12*(4), 510-527. doi:10.1108/14626000510628199

MacKenzie, S. B., Podsakoff, P. M., & Podsakoff, N. P. (2011). Construct measurement and validation procedures in MIS and behavioral research: Integrating new and existing techniques. *MIS Quarterly, 35*(2), 293-334. doi:10.2307/23044045

Makadok, R. (2001). Toward a synthesis of the resource-based and dynamic-capability views of rent creation. *Strategic Management Journal, 22*(5), 387-401.

Marinescu, D. C. (2017). *Cloud computing: Theory and practice*. Waltham, USA: Morgan Kaufmann.

Marston, S., Li, Z., Bandyopadhyay, S., Zhang, J., & Ghalsasi, A. (2011). Cloud computing — The business perspective. *Decision Support Systems, 51*(1), 176-189. doi:10.1016/j.dss.2010.12.006

Mavondo, F, T., Chimhanzi, J., & Stewart, J. (2005). Learning orientation and market orientation: Relationship with innovation, effective human resource practices and performance. *European Journal of Marketing, 39*(11/12), 1235-1263. doi:10.1108/03090560510
623244

McDaniel, C. D., & Gates, R. H. (2011). *Marketing research* (9th ed.). Hoboken, New Jersey: Wiley.

Mele, C., Nenonen, S., Pels, J., Storbacka, K., Nariswari, A., & Kaartemo, V. (2018). Shaping service ecosystems: Exploring the dark side of agency. *Journal of Service Management, 29*(4), 521-545. doi:10.1108/JOSM-02-2017-0026

Mele, C., Spena, T. R., & Colurcio, M. (2010). Co-creating value innovation through resource integration. *International Journal of Quality and Service Sciences, 2*(1), 60-78. doi:10.1108/17566691011026603

Mell, P., & Grance, T. (2011). *The NIST definition of cloud computing*. Retrieved from https://nvlpubs.nist.gov/nistpubs/Legacy/SP/nistspecialpublication800-145.pdf

Melton, H. L., & Hartline, M. D. (2012). Employee collaboration, learning orientation, and new service development performance. *Journal of Service Research, 16*(1), 67-81. doi:10.1177/1094670512462139

Mustak, M., & Plé, L. (2020). A critical analysis of service ecosystems research: Rethinking its premises to move forward. *Journal of Services Marketing, 34*(3), 399-413. doi:10.1108/JSM-02-2019-0084

Nagelkerke, N. (1991). A note on a general definition of the coefficient of determination. *Biometrika, 78*(3), 691-692.

Nasution, H., N., & Mavondo, F. T. (2008). Organisational capabilities: Antecedents and implications for customer value. *European Journal of Marketing, 42*(3/4), 477-501. doi:10.1108/03090560810853020

Nasution, H. N., Mavondo, F. T., Matanda, M. J., & Ndubisi, N. O. (2011). Entrepreneurship: Its relationship with market orientation and learning orientation and as antecedents to innovation and customer value. *Industrial Marketing Management, 40*(3), 336-345. doi:10.1016/j.indmarman.2010.08.002

Niehaves, B., & Ortbach, K. (2016). The inner and the outer model in explanatory design theory: The case of designing electronic feedback systems. *European Journal of Information Systems, 25*(4), 303-316. doi:10.1057/ejis.2016.3

Nunnally, J., & Bernstein, I. (1994). *Psychometric theory*. New York: McGraw-Hill.

Overkamp, T., Blomkvist, J., Rodrigues, V., Arvola, M., & Holmlid, S. (2018). *Resource integration as a perspective on value in interaction design.* Paper presented at the 32nd International BCS Human Computer Interaction Conference.

Parasuraman, A., Zeithaml, V. A., & Berry, L. L. (1988). SERVQUAL: A multiple-item scale for measuring consumer perception of service quality. *Journal of Retailing, 64*(1), 12-40.

Patrick, D. L., Burke, L. B., Gwaltney, C. J., Leidy, N. K., Martin, M. L., Molsen, E., & Ring, L. (2011). Content validity—establishing and reporting the evidence in newly developed patient-reported outcomes (PRO) instruments for medical product evaluation: ISPOR PRO good research practices task force report: Part 2—assessing respondent understanding. *Value in Health, 14*(8), 978-988. doi:10.1016/j.jval.2011.06.013

Paul, J., & Criado, A. R. (2020). The art of writing literature review: What do we know and what do we need to know? *International Business Review, 29*(4), 101717. doi:10.1016/j.ibusrev.2020.101717

Pellathy, D. A., Mollenkopf, D. A., Stank, T. P., & Autry, C. W. (2019). Cross-functional integration: Concept clarification and scale development. *Journal of Business Logistics, 40*(2), 81-104. doi:10.1111/jbl.12206

Peters, L. (2018). Resource integration: Concepts and processes. In S. L. Vargo & R. F. Lusch (Eds.), *The Sage handbook of service-dominant logic* (pp. 341-356). London: SAGE Publications Ltd.

Peters, L. D. (2016). Heteropathic versus homopathic resource integration and value co-creation in service ecosystems. *Journal of Business Research, 69*(8), 2999-3007. doi:10.1016/j.jbusres.2016.02.033

Peters, L. D., Löbler, H., Brodie, R. J., Breidbach, C. F., Hollebeek, L. D., Smith, S. D., . . . Varey, R. J. (2014). Theorizing about resource integration through service-dominant logic. *Marketing Theory, 14*(3), 249-268. doi:10.1177/1470593114534341

Petter, S., Straub, D., & Rai, A. (2007). Specifying formative constructs in information systems research. *MIS Quarterly, 31*(4), 623-656. doi:10.2307/25148814

Plé, L. (2016). Studying customers' resource integration by service employees in interactional value co-creation. *Journal of Services Marketing, 30*(2), 152-164. doi:10.1108/JSM-02-2015-0065

Pohlmann, A., & Kaartemo, V. (2017). Research trajectories of service-dominant logic: Emergent themes of a unifying paradigm in business and management. *Industrial Marketing Management, 63*, 53-68. doi:10.1016/j.indmarman.2017.01.001

Polese, F. (2018). Successful value co-creation exchanges: A VSA contribution. In S. Barile, M. Pellicano, & F. Polese (Eds.), *Social dynamics in a systems perspective* (pp. 19-37). Cham: Springer International Publishing.

Polese, F., Botti, A., Grimaldi, M., Monda, A., & Vesci, M. (2018). Social innovation in smart tourism ecosystems: How technology and institutions shape sustainable value co-creation. *Sustainability, 10*(1), 140-163.

Ranjan, K. R., & Read, S. (2016). Value co-creation: Concept and measurement. *Journal of the Academy of Marketing Science, 44*(3), 290-315. doi:10.1007/s11747-014-0397-2

Rao, J., & Weintraub, J. R. (2013). How innovative is your company's culture? *MIT Sloan Management Review, 54*(3), 29-37.

Rashid, Y., Tanveer, A., Shaukat, Z., & Sadiq, I. (2020). Value co-creation features: An empirical case study of B2B collaboration and interactions in New Zealand. *Digital Library Perspectives, 36*(3), 219-229. doi:10.1108/DLP-02-2020-0006

Rezaei, S., Shahijan, M. K., Amin, M., & Ismail, W. K. W. (2016). Determinants of app stores continuance behavior: A PLS path modelling approach. *Journal of Internet Commerce, 15*(4), 408-440. doi:10.1080/15332861.2016.1256749

Richard, J. E. (2008). *The impact of customer relationship management (CRM) technology on business-to-business customer relationships.* (Doctor of Philosophy), Victoria University of Wellington, Wellington, New Zealand.

Rigtering, J. P. C., & Weitzel, U. (2013). Work context and employee behaviour as antecedents for intrapreneurship. *International Entrepreneurship Management Journal, 9*(3), 337-360. doi:10.1007/s11365-013-0258-3

Roberts, D., Hughes, M., & Kertbo, K. (2014). Exploring consumers' motivations to engage in innovation through co-creation activities. *European Journal of Marketing, 48*(1/2), 147-169. doi:10.1108/EJM-12-2010-0637

Ross, P. K., & Blumenstein, M. (2015). Cloud computing as a facilitator of SME entrepreneurship. *Technology Analysis & Strategic Management, 27*(1), 87-101. doi:10.1080/09537325.2014.951621

Rossiter, J. R. (2002). The C-OAR-SE procedure for scale development in marketing. *International Journal of Research in Marketing, 19*(4), 305-335. doi:10.1016/S0167-8116(02)00097-6

Rubio, D. M., Berg-Weger, M., Tebb, S. S., Lee, E. S., & Rauch, S. (2003). Objectifying content validity: Conducting a content validity study in social work research. *Social Work Research, 27*(2), 94-104. doi:10.1093/swr/27.2.94

Sarstedt, M. (2008). A review of recent approaches for capturing heterogeneity in partial least squares path modelling. *Journal of Modelling in Management, 3*(2), 140-161. doi:10.1108/17465660810890126

Saunders, M., Lewis, P., & Thornhill, A. (2012). *Research methods for business students*. Harlow, Essex: Pearson.

Schlachter, S., McDowall, A., Cropley, M., & Inceoglu, I. (2018). Voluntary work-related technology use during non-work time: A narrative synthesis of empirical research and research agenda. *International Journal of Management Reviews, 20*(4), 825-846. doi:10.1111/ijmr.12165

Senarathna, I., Wilkin, C., Warren, M., Yeoh, W., & Salzman, S. (2018). Factors that influence adoption of cloud computing: An empirical study of Australian SMEs. *Australasian Journal of Information Systems, 22*. doi:10.3127/ajis.v22i0.1603

Siddike, M. A. K., & Hidaka, K. (2017). Toward a value metrics—A service-dominant logic view. In T. Z. Ahram & W. Karwowski (Eds.), *Advances in The Human Side of Service Engineering* (pp. 187-197). Cham: Springer International Publishing.

Siltaloppi, J., & Vargo, S. L. (2014). *Reconciling resource integration and value propositions - The dynamics of value co-creation.* Paper presented at the 47th Hawaii International Conference on System Sciences.

Singaraju, S. P., Nguyen, Q. A., Niininen, O., & Sullivan-Mort, G. (2016). Social media and value co-creation in multi-stakeholder systems: A resource integration approach. *Industrial Marketing Management, 54*, 44-55. doi:10.1016/j.indmarman.2015.12.009

Singh, P., & Lokotsch, K. (2005). Effects of transformational leadership on human resource management in primary schools. *South African Journal of Education, 25*(4), 279-286.

Sinkula, J. M., Baker, W. E., & Noordewier, T. (1997). A framework for market-based organizational learning: Linking values, knowledge, and behavior. *Journal of the Academy of Marketing Science, 25*(4), 305. doi:10.1177/0092070397254003

Sirmon, D. G., Gove, S., & Hitt, M. A. (2008). Resource management in dyadic competitive rivalry: The effects of resource bundling and deployment. *The Academy of Management Journal, 51*(5), 919-935. doi:10.2307/20159548

Skålén, P., Gummerus, J., von Koskull, C., & Magnusson, P. R. (2015). Exploring value propositions and service innovation: A service-dominant logic study. *Journal of the Academy of Marketing Science, 43*(2), 137-158. doi:10.1007/s11747-013-0365-2

Škerlavaj, M., Song, J. H., & Lee, Y. (2010). Organizational learning culture, innovative culture and innovations in South Korean firms. *Expert Systems with Applications, 37*(9), 6390-6403. doi:10.1016/j.eswa.2010.02.080

SmartPLS. (2020). Bootstrapping. Retrieved from https://www.smartpls.com/documentation/algorithms-and-techniques/bootstrapping

Smith, A. M. (2013). The value co-destruction process: A customer resource perspective. *European Journal of Marketing, 47*(11/12), 1889-1909. doi:10.1108/EJM-08-2011-0420

Soo, C. W., Devinney, T. M., & Midgley, D. F. (2007). External knowledge acquisition, creativity and learning in organisational problem solving. *International Journal of Technology Management, 38*(1-2), 137-159. doi:10.1504/ijtm.2007.012433

Stone, A. G., Robert, F. R., & Patterson, K. (2004). Transformational versus servant leadership: A difference in leader focus. *Leadership & Organization Development Journal, 25*(4), 349-361. doi:10.1108/01437730410538671

Sweeney, J. C., & Soutar, G. N. (2001). Consumer perceived value: The development of a multiple item scale. *Journal of Retailing, 77*(2), 203-220. doi:10.1016/S0022-4359(01)00041-0

Tabachnick, B. G., & Fidell, L. S. (2013). *Using multivariate statistics* (6th ed.). Boston, USA: Pearson.

Teece, D., & Pisano, G. (1994). The dynamic capabilities of firms: An introduction. *Industrial and Corporate Change, 3*(3), 537-556. doi:10.1093/icc/3.3.537-a

Teece, D. J. (2007). Explicating dynamic capabilities: The nature and microfoundations of (sustainable) enterprise performance. *Strategic Management Journal, 28*(13), 1319-1350. doi:10.1002/smj.640

Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic Management Journal, 18*(7), 509-533. doi:10.1002/(SICI)1097-0266(199708)18:7%3C509::AID-SMJ882%3E3.0.CO;2-Z

Tippins, M. J., & Sohi, R. S. (2003). IT competency and firm performance: Is organizational learning a missing link? *Strategic Management Journal, 24*(8), 745-761. doi:10.1002/smj.337

Truong, Y., Simmons, G., & Palmer, M. (2012). Reciprocal value propositions in practice: Constraints in digital markets. *Industrial Marketing Management, 41*(1), 197-206. doi:10.1016/j.indmarman.2011.11.007

Vafeas, M., & Hughes, T. (2020). Resource integration: Adopting a paradox perspective to inform the management of tensions in customer resource allocation. *Industrial Marketing Management, 91*, 596-609. doi:10.1016/j.indmarman.2020.03.014

Vafeas, M., Hughes, T., & Hilton, T. (2016). Antecedents to value diminution: A dyadic perspective. *Marketing Theory, 16*(4), 469-491. doi:10.1177/1470593116652005

Vargas-Halabí, T., Mora-Esquivel, R., & Siles, B. (2017). Intrapreneurial competencies: Development and validation of a measurement scale. *European Journal of Management and Business Economics, 26*(1), 86-111. doi:10.1108/EJMBE-07-2017-006

Vargo, S. L. (2007). On a theory of markets and marketing: From positively normative to normatively positive. *Australasian Marketing Journal, 15*(1), 53-60. doi:10.1016/S1441-3582(07)70029-0

Vargo, S. L. (2008). Customer integration and value creation: Paradigmatic traps and perspectives. *Journal of Service Research, 11*(2), 211-215. doi:10.1177/1094670508324260

Vargo, S. L., & Lusch, R. F. (2004). Evolving to a new dominant logic for marketing. *Journal of Marketing, 68*(1), 1-17.

Vargo, S. L., & Lusch, R. F. (2006). Service-dominant logic: What it is, what it is not, what it might be. In R. F. Lusch & S. L. Vargo (Eds.), *The service-dominant logic of marketing: Dialog, debate, and directions* (pp. 43-56). Armonk, New York: MESharp.

Vargo, S. L., & Lusch, R. F. (2008). Service-dominant logic: Continuing the evolution. *Journal of the Academy of Marketing Science, 36*(1), 1-10.

Vargo, S. L., & Lusch, R. F. (2016). Institutions and axioms: An extension and update of service-dominant logic. *Journal of the Academy of Marketing Science, 44*(1), 5-23. doi:10.1007/s11747-015-0456-3

Vargo, S. L., & Lusch, R. F. (2017). Service-dominant logic 2025. *International Journal of Research in Marketing, 34*(1), 46-67. doi:10.1016/j.ijresmar.2016.11.001

Veal, A. J. (2005). *Business research methods: A managerial approach*. South Melbourne, Victoria: Pearson Education Australia.

Vega-Jurado, J., Gutiérrez-Gracia, A., & Fernández-de-Lucio, I. (2008). Analyzing the determinants of firm's absorptive capacity: Beyond R&D. *R & D Management, 38*(4), 392-405. doi:10.1111/j.1467-9310.2008.00525.x

Verhees, F. J. H. M., & Meulenberg, M. T. G. (2004). Market orientation, innovativeness, product innovation, and performance in small firms. *Journal of Small Business Management, 42*(2), 134-154. doi:10.1111/j.1540-627X.2004.00102.x

Vigneron, F., & Johnson, L. W. (2004). Measuring perceptions of brand luxury. *Journal of Brand Management, 11*(6), 484-506. doi:10.1057/palgrave.bm.2540194

Volberda, H. W., Baden-Fuller, C., & van den Bosch, F. A. J. (2001). Mastering strategic renewal: Mobilising renewal journeys in multi-unit firms. *Long Range Planning, 34*(2), 159-178. doi:10.1016/S0024-6301(01)00032-2

Wajid, A., Raziq Muhammad, M., Malik Omer, F., Malik Shahab, A., & Khurshid, N. (2019). Value co-creation through actor embeddedness and actor engagement. *Marketing Intelligence & Planning, 37*(3), 271-283. doi:10.1108/MIP-07-2018-0241

Wang, C. L., & Ahmed, P. K. (2003). Organisational learning: A critical review. *The Learning Organization, 10*(1), 8-17.

Warrick, D. (2009). Developing organization change champions. *OD Practitioner, 41*(1), 14-19.

Wheelen, T. L., & Hunger, J. D. (2012). *Strategic management and business policy: Toward global sustainability* (13th ed.). New Jersey, USA: Pearson Education, Inc.

Widjojo, H., Fontana, A., Gayatri, G., & Soehadi Agus, W. (2020a). Value co-creation for innovation: Evidence from Indonesian organic community. *Asia Pacific Journal of Marketing and Logistics, 32*(2), 428-444. doi:10.1108/APJML-02-2019-0105

Widjojo, H., Fontana, A., Gayatri, G., & Soehadi, A. W. (2020b). Value co-creation for marketing innovation: Comparative study in the SME community. *International Journal of Innovation Management, 24*(3), 1-22. doi:10.1142/S1363919620500309

Wilden, R., Gudergan, S., Akaka, M. A., Averdung, A., & Teichert, T. (2019). The role of cocreation and dynamic capabilities in service provision and performance: A configurational study. *Industrial Marketing Management, 78*, 43-57. doi:10.1016/j.indmarman.2018.06.008

Williams, C., McWilliams, A., Lawrence, R., & Waheduzzaman, W. (2020). *MGMT4* (4th ed.). South Melbourne, Victoria, Australia: Cengage Learning Australia Pty Limited.

Yammarino, F. J., Spangler, W. D., & Bass, B. M. (1993). Transformational leadership and performance: A longitudinal investigation. *The Leadership Quarterly, 4*(1), 81-102. doi:10.1016/1048-9843(93)90005-E

Yazn, A., Savvas, P., & Feng, L. (2013). Cloud computing adoption by SMEs in the north east of England: A multi-perspective framework. *Journal of Enterprise Information Management, 26*(3), 250-275. doi:10.1108/17410391311325225

Zaborek, P., & Mazur, J. (2019). Enabling value co-creation with consumers as a driver of business performance: A dual perspective of Polish manufacturing and service SMEs. *Journal of Business Research, 104*, 541-551. doi:10.1016/j.jbusres.2018.12.067

Zhang, M., Zhao, X., Voss, C., & Zhu, G. (2016). Innovating through services, co-creation and supplier integration: Cases from China. *International Journal of Production Economics, 171*, 289-300. doi:10.1016/j.ijpe.2015.09.026

Zhu, W., Chew, I. K. H., & Spangler, W. D. (2005). CEO transformational leadership and organizational outcomes: The mediating role of human–capital-enhancing human resource management. *The Leadership Quarterly, 16*(1), 39-52. doi:10.1016/j.leaqua.2004.06.001

Zikmund, W. G., Alessandro, S., Winzar, H., Lowe, B., & Babin, B. J. (2014). *Marketing research* (Asia-Pacific ed.). South Melbourne, Victoria: Cengage Learning.

Zikmund, W. G., Babin, B. J., Carr, J. C., & Griffin, M. (2010). *Business research methods* (8th ed.). Mason, Ohio: South-Western Cengage Learning.

APPENDICES

Appendix A - Service-Dominant logic (S-D logic)

The Service-Dominant Logic (S-D Logic) was first introduced by Vargo and Lusch (2004). S-D logic argues that there is no distinction between goods and services. Vargo and Lusch (2004) argue that goods and appliances are used in service provisioning; hence, goods and services have a nested relationship. Based on this rationale, they proposed the S-D logic which converged physical goods marketing and service marketing, where service-oriented principles dominate. The S-D logic is defined with six attributes (see Table A.1) and eleven foundational premises (FPs) (see Table A.2). FPs were formed with the intention of establishing a framework for the service-cantered mindset.

Furthermore, S-D logic discusses two resource types, namely, operand resources and operant resources. Operand resources are defined as resources that are tangible and static (Vargo & Lusch, 2004; Lusch & Nambisan, 2015). For them to become useful, someone has to act on them. Operant resources are defined as resources that are intangible and dynamic (Vargo & Lusch, 2004; Lusch & Nambisan, 2015). Operant resources normally act upon operand resources to increase their resourcefulness.

Table A.1: Six differences between the G-D logic and the S-D logic [©Source: Vargo and Lusch, 2004]

Attribute	Conventional Thinking	S-D Logic
The primary unit of exchange	People exchange for goods. These goods serve primarily as operand resources.	People exchange to acquire the benefits of specialized competences (knowledge and skills), or services. Knowledge and skills are operant resources.
Role of goods	Goods are operand resources and end products. Marketers take matter and	Goods are transmitters of operant resources (embedded knowledge); they are

	change its form, place, time, and possession.	intermediate 'products' that are used by other operant resource (customers) as appliances in value creation processes.
Role of customer	The customer is the recipient of goods. Marketers do things to customers; they segment them, penetrate them, distribute to them, and promote to them. The customer is an operand resource.	The customer is a co-creator of service. Marketing is a process of doing things in interaction with the customer. The customer is primarily an operant resource, only functioning occasionally as an operand resource.
Determination and meaning of value	Value is determined by the producer. It is embedded in the operand resource (goods) and is defined in terms of 'exchange-value'	Value is perceived and determined by the consumer on the basis of 'value in use.' Value results from the beneficial application of operant resources sometimes transmitted through operand resources. Firms can only make value propositions.
Firm-customer interaction	The customer is an operand resource. Customers are acted on to create transactions with resources.	The customer is primarily an operant resource. Customers are active participants in relational exchanges and co-production.
Source of economic growth	Wealth is obtained from surplus resources and goods. Wealth consists of owning, controlling and producing operand resources.	Wealth is obtained through the application and exchange of specialized knowledge and skills. It represents the right to the future use of operant resources.

Table A.2: Eleven foundational premises (FPs) of S-D logic [©Source: Vargo and Lusch, 2016]

	Foundational Premise
FP1	Service is the fundamental basis of exchange
FP2	Indirect exchange masks the fundamental basis of exchange
FP3	Goods are distribution mechanisms for service provision
FP4	Operant resources are the fundamental source of strategic benefit
FP5	All economies are service economies
FP6	Value is co-created by multiple actors, always including the beneficiary
FP7	Actors cannot deliver value but can participate in the creation and offering of value propositions

FP8	A service-centered view is inherently beneficiary oriented and relational
FP9	All social and economic actors are resource integrators
FP10	Value is always uniquely and phenomenologically determined by the beneficiary
FP11	Value co-creation is coordinated through actor-generated institutions and institutional arrangements

A detailed discussion of the eleven FPs is given below.

FP1 - Service is the fundamental basis of exchange

According to the Goods-Dominant Logic (G-D Logic), the fundamental basis of exchange is goods (i.e., tangible products). Vargo and Lusch (2004) argue that 'service' is the fundamental basis of exchange. Service is defined as applying one's skills and knowledge for the benefit of another entity. According to Vargo and Lusch (2004) micro-specialisations has caused the division of labour and thereby lack of skills and knowledge to survive. Therefore, exchange of service has become mandatory. Goods or tangible products are identified as vehicles that carry service from service providers to beneficiaries (Vargo & Lusch, 2004, 2008).

FP2 - Indirect exchange masks the fundamental basis of exchange

Vargo and Lusch (2004, 2016) assert that, in today's world, the one-to-one nature of the service exchange process has disappeared due to the increasing division of labour, vertical market systems and large bureaucratic and hierarchical organisations. In ancient time, even though there had been a division of labour, market systems were not sophisticated and there were hardly any hierarchical organisations in the society. For example, consider an exchange process happen between a fisherman and a farmer. Fisherman exchanged his fishing skills and knowledge with the farming skills and knowledge of the farmer. Fish and grains were used as vehicles to exchange service.

In today's context, an organisation is made up of a large number of micro-specialised employees and each of them do tiny contributions to the complete service the organisation provide to the end customer. However, apart from the frontline employees, no other employee is interacting directly with customers. On the other hand, organisations are also micro-specialised. Therefore, organisations are also not engaged in one-to-one service exchange. For example, consider a situation where an Edtech (education technology) cloud service provider providing its services to a school. Only the sales team and the implementation team is interacting with the school. The suppliers of the service provider (who provides the development platform, servers to host the data, etc) are not interacting with the school even though they have contributed with their micro-specialisation to develop the EdTech solution.

FP3 – Goods are distribution mechanisms for service provision

As mentioned earlier, tangible goods are just a mechanism of indirectly transferring skills and knowledge to a beneficiary (Vargo & Lusch, 2004). They are not the fundamental basis of exchange.

FP4 – Operant resources are the fundamental source of strategic benefit

Vargo and Lusch (2016) changed the FP4 to its current form from 'operant resources are the fundamental source of competitive advantage' (Vargo & Lusch, 2008, p. 6). They argue that the term *competitive advantage* takes the focus of the service provider towards the competitors rather than the beneficiary and service provisioning. Even though the competitors are an important aspect, Vargo and Lusch (2016) contend that it is not as important as value co-creation through service provisioning. As mentioned in the FP1, operant resources are transferred to the beneficiary to utilise in their value co-creation process. If the operant resources transferred has the capability to assist the value co-creation process of the beneficiary, that resource provides strategic benefit for the service provider. The service

provider that has the set of operant resources capable of creating the highest value in the minds of a majority of the beneficiaries will have the competitive advantage.

FP5 – All economies are service economies

Economists taught management and marketing scholars about eras of economic development; hunter-gatherer, agriculture, industrial and service, and information (Vargo & Lusc, 2004). They categorized those eras based on the outputs or operand resources produced in each of the eras. In other words, economists believe that goods are the fundamental basis of economic exchange. Vargo and Lusch (2004) argue otherwise and propose that FP1 is applicable to all the economic eras. They argue that service has been the fundamental basis of economic exchange. In the hunter-gatherer era, the foraging and hunting knowledge and skills have been the fundamental source of exchange. In the agriculture era knowledge and skills on cultivation has been the fundamental source of economic exchange. In the industrial era knowledge and skills on large scale mass-production and firm-level management have been the fundamental source of economic exchange. In the service and industrial era knowledge and skills in sharing information and pure unembedded knowledge is the fundamental source of economic exchange. Therefore, they argue that throughout human history all the economies have been service economies and, in the future, the same will prevail.

FP6 – Value is co-created by multiple actors, always including the beneficiary

Value co-creation is a result of integrating resources received from several parties (Lusch & Nambisan, 2015; Vargo & Lusch, 2016). Hence, Vargo and Lusch (2016) assert that it cannot be considered as an outcome of a dyadic service exchange process take place between a service provider and a beneficiary. The beneficiary is always involved in the value co-creation process. Beneficiary uses existing resources acquired from different service providers, customers and other stakeholders and combine those resources to co-create value. Consider a scenario where

an EdTech service provider has implemented a cloud-based solution in a school. In this scenario school is the beneficiary. In order to get the expected outcome of the newly implemented EdTech cloud solution (to co-create value), they need the support of the school and various other actors such as hardware service providers (computers), electricity service providers (electricity), personnel at the department of education (consultancy), parents (feedback), etc.

FP7 – Actors cannot deliver value but can participate in the creation and offering of value propositions

According to the G-D logic, value is embedded into the products at the production process by the service provider. S-D logic opposes this idea and proposes that the service provider cannot embed and deliver value to the beneficiary. Instead, what a service provider does is, incorporating co-created value, and developing and offering a value proposition that is superior to its competitors. After assessing the value propositions offered by different service providers, beneficiaries decide which options to select. According to the FP6, once the service exchange happens, beneficiary co-creates value along with the other relevant actors in the network.

FP8 – A service-centered view is inherently beneficiary oriented and relational

In a service exchange process, one's skills and knowledge is being applied for the benefit of another entity. Vargo and Lusch (2016) argue that beneficiary orientedness of the S-D logic can be seen in the definition of the service, because the service provider applies its skills and knowledge for the benefit of the beneficiary. Furthermore, the service provider does not stop its involvement with the beneficiary after the service exchange process. Instead, the service provider participates in the value co-creation process as well.

The relational nature of the S-D logic is not related to the repeated transactions between the service provider and the beneficiary after the service exchange process. According to Vargo and Lusch (2016), the relational nature of the S-D logic is related to the reciprocity of the service exchange process.

FP9 – All social and economic actors are resource integrators

According to Lusch and Nambisan (2015), for value co-creation to happen the correct resource density should be achieved. Resource density is defined as the mobilisation of relevant knowledge contextually in the most effective and efficient way (Lusch & Nambisan, 2015). No one possesses the skills and knowledge that is required to survive due to micro-specialisation. Therefore, everyone does service exchange and acquire the required resources and combine with existing resources to co-create value. Therefore, all the individual actors do combine resources regardless of the level (individual, group, firm, network or industry) that the combining process takes place. Therefore, Vargo and Lusch (2008) contend that all the social and economic actors are resource integrators regardless of the social context they belong.

FP10 – Value is always uniquely and phenomenologically determined by the beneficiary

According to the G-D logic, the service provider adds value to products or services during the production process or in other words, before reaching the beneficiary. As mentioned in the FP7, the S-D logic opposes this idea and argue that a service provider can only create and offer a value proposition to potential beneficiaries. After examining available value propositions, the beneficiary decides which offer to accept. Then the service exchange process takes place between the service provider and the beneficiary. Then the beneficiary integrates resources to combine existing resources with the new resources acquired through the exchange process. As a result value co-creation or value destruction happens. Vargo and Lusch (2008) argue that the decision whether a value is created or not is taken by the beneficiary. The value that is

determined by the beneficiary is referred to as value in use (Vargo et al, 2008). Value is a psychological phenomenon. Therefore, value for a particular service cannot be the same for different beneficiaries. Further, Vargo and Lusch (2008) argue that value depends on the experience and consciousness of the beneficiary. In summary, value is a phenomenon that is unique to each individual was and it depends on the phenomenology (experience and consciousness) of each individual.

FP11 – Value co-creation is coordinated through actor-generated institutions and institutional arrangements

Lusch and Vargo (2016, p. 10) define a service ecosystem as a 'relatively self-contained, self-adjusting system of resource integrating actors connected by shared institutional arrangements and mutual value creation through service exchange.' This definition informs that institutional arrangements are required for the functioning of a service ecosystem. Institutional arrangements are made up of institutions (Vargo & Lusch, 2016). Here institution does not mean organisation. Institutions are rules of the game (Vargo & Lusch, 2018). In other words, institutions are the rules, norms and beliefs that enable actors in a service ecosystem to do service exchange in a constrained, predictable and meaningful way. Institutional arrangements are defined as interrelated institutions.

When a service ecosystem expands, the number of service exchanges also increases. Without a set of formal rules, informal social norms and conventions, there is a chance for the service ecosystem to collapse. Coordinative institutional arrangements minimise the chance of a collapse by facilitating value co-creation through resource integration by making all the service exchanges constrained, predictable and meaningful. Even though value co-creation is an outcome of resource integration, all the service exchange processes that inject resources to the resource integration process is coordinated by institutions and institutional arrangements.

Appendix B - Opinions of past research regarding the nature of resource integration

Table B.1: Opinions of past research regarding the nature of resource integration

Source	Conceptualisation of Resource Integration	Resource Integration: An Interactive Process or an Emergent Process?
Aal et al (2016, p. 621)	"Service innovation as a collaborative process involving a diverse network of actors engaged in resource integration systems"	An interactive process
Akaka et al (2014, p. 311)	"Value cocreation results from the integration of resources and interactions among multiple actors"	An interactive process
Akaka et al (2013, p. 1)	"Authors articulate the way the (co)creation of value influences and is influenced by the enactment of practices and the integration of resources through various levels (micro, meso, and macro) of interaction and institutions."	An interactive process
Åkesson et al (2016, p. 342)	"Integration requires process(es) and forms of collaboration"	An interactive process
Anttiroiko and Komninos (2019, p. 22)	"value is cocreated jointly in interaction among providers and beneficiaries through the integration of resources and the application of competencies."	An interactive process
Ballantyne et al (2011)	Resource integration is one of the three stages of communicative interactions	An interactive process
Baumann et al (2017, p. 109)	"The salesperson personifies the firm's expertise and can thereby contribute to the customer's own knowledge expansion and learning necessary for resource integration (developmental interaction capability)"	An interactive process
Beirão et al (2017, p. 240)	"Study results showed that the health care ecosystem levels (macro, meso and micro) are intertwined as multiple actors (governmental, organizational and individual) engage in dynamic, simultaneous, and interdependent interactions in their resource integration process to cocreate value"	An interactive process
Botti and Monda (2020, p. 4)	"Resource integration occurs during actor interactions"	An interactive process
Brozović et al (2020, p. 11)	"Firms are aiming at a sustainable future, and the participation of multiple actors in resource integration is pivotal because actors are expected to integrate their knowledge, their understanding of contexts, and their perspectives on complex issues"	An interactive process
Canhoto et al (2016, p. 86)	"Value is therefore created through active interactions between the firm and the consumer or, in business-to-business markets, from the integration of resources between two firms to create a valued outcome"	An interactive process

Caridà et al (2019, p. 65)	"This article analyses RI as an embedded process within the wider process of interactive value formation" "It provides a granular perspective on RI and proposes a framework that depicts RI as a process that shapes and results from a complex service context through a sequence of three phases: matching, resourcing and valuing"	An interactive and emergent process
Carrillo et al (2019, p.425)	"Actors' knowledge and skills (operant resources) are crucial to understand and explain how and why they join forces with other actors (collaboration for resource integration)"	An interactive process
Colurcio et al (2016, p. 251)	"Resource integration consists of cooperative and collaborative processes between actors, leading to experiential outcomes and outputs, as well as mutual behavioral outcomes for all actors involved"	An interactive process
Du and Chou (2020, p. 968)	"The notion of the community is similar to S-D logic's service systems or ecosystems, both of which are structured by A2A interaction that is characterized by boundary-spanning resource integration"	An interactive process
Edvardsson et al (2014, p. 297)	"Resource integration consists of cooperative and collaborative processes between actors, leading to experiential outcomes and outputs, as well as mutual behavioral outcomes for all actors involved"	An interactive process
Eggert et al (2018, p. 82)	"The resource integration process shifts from the customer's sphere to the joint sphere, that is, creating value in use becomes the responsibility of the customer and the provider firm"	An interactive process
Frow et al (2014, p. 332)	"Within a service ecosystem, exchange occurs because no one actor has all the resources to operate in isolation and is therefore required to participate in resource integration practices, even in the face of sometimes competing and conflicting priorities and preferences"	An interactive process
Gummesson and Mele (2010, p. 181)	"Resource integration is generalized to actor-to-actor (A2A) interaction through which the actors link their resources for mutual benefit"	An interactive process
Hasu et al (2015, p. 178)	"we suggest an integrative framework in order to better understand and enhance users' and employees' interaction, especially the integration of resources for co-creation of use value in service innovations"	An interactive process
Hilton and Hughes (2013)	The model of resource integration using self-service technology suggests that resource integration is an interactive process that happens for the purpose of value creation	An interactive process
Hilton et al (2012, p. 1504)	"When applying S-D logic to a range of practical contexts, we find the concept of resource integration useful because it reflects what actually occurs when actors (e.g., customers, buyers, suppliers) interact."	An interactive process

Ho et al (In Press)	"Resource integration refers to the recombination/re bundling of the firm's existing resources to enhance the current service mix and/or a change in the service delivery process, business log/model, innovation procedures, core competencies and market structure.	An interactive process
Hollebeek (2019, p. 92)	"The model's RBV-informed (business customer resources, and S-D logic's (business customer) actors offer the main building blocks for BCRI, which denotes an industrial customer's incorporation, assimilation and application of operant and/or operand resources with those of other actors for value-creating purposes"	An interactive process
Hollebeek and Andreassen (2018, p. 2)	"incorporation, assimilation, and application of operant/operand resources into the processes of other actors in brand-related utility optimization processes"	An interactive process
Hollebeek et al (2019, p. 165)	"Resource integration, which entails the assimilation of specific operant and/or operand resources in particular interactions, motivates and constitutes exchange"	An interactive process
Horbel et al (In Press)	"Smartphones facilitate network-embedded resource integration because they allow sport event visitors and other actors to integrate additional digital resources that were formerly unobtainable or not as easily available to them"	An interactive process
Hughes and Vafeas (2018, p. 10)	"Resource integration can be seen as emergent, as experienced by resource integrators, and interactive, as viewed through considering the relationship between interaction and resources"	An interactive and emergent process
Hughes et al (2018, p. 1331)	"Resource integration can be seen to require engagement between actors"	An interactive process
Jefferies et al (2019)	"We argue that service innovation takes place through processes of individual resource integration that indirectly alters designed-in, proposed value"	An interactive process
Johnson and Neuhofer (2017, p. 2371)	"They are dependent on the integration of operant resources, such as the competences, local knowledge, help and advice of hosts to determine the home's location and the hosts in their two-fold role as 'resource' themselves and 'resource integrators', which complement each other in an effort to generate value with and for guests"	An interactive process
Karpen et al (2012, p. 23)	"In conceptualizing service as a value cocreating process, interaction becomes the defining aspect of resource integration efforts"	An interactive process
Kleinaltenkamp et al (2012, p. 203)	"Integration requires process(es) and forms of collaboration" "As the collaborations are usually voluntary, the actors need to recognize the benefit from participation. If the benefit is not evident to the actors, then collaborative activity is unlikely."	An interactive process
Korkman et al (2010, p. 236)	"The concept of practices contributes to the further development of S-D logic's view on how resources are integrated through interaction"	An interactive process

Koskela-Huotari et al (2018, p. 372)	"In viewing novel resources as emergent properties of service ecosystems, we draw on recent work in S-D logic arguing that novel resources become from existing resources through combinatorial processes, in which resource integration leads to heteropathic effects"	An interactive and emergent process
Koskela-Huotari et al (2016, p. 2965)	"In a nutshell, institutions both enable and constrain value cocreation by guiding resource integration and service exchange among actors"	An interactive process
Lampinen and Tossavainen (2014, p. 277)	" resource integration may take place as a result of spontaneous actions or as planned interaction"	An interactive process
Laud et al (2015, p. 510)	"Resource integration here refers to actors' interaction with and/or use of resources"	An interactive process
Laud et al (2015, p. 513)	"S-D logic argues that individual actors interact with each other and with various resources to improve their own circumstances (or well-being) and, in doing so, to improve the circumstances of others through mutual service provision"	An interactive process
Lessard et al (2020, p. 273)	"A service system has been defned as a complex socio-technical system that enables collaborative value creation through value propositions, service exchange, and resource integration processes"	An interactive process
Löbler (2013, p. 424)	"Things become resources if they are integrated through interaction "	An interactive process
Löfberg and Åkesson (2018)	In a remote service context, service platforms provide opportunities for ongoing resource integration between the firm and its customers	An interactive process
Lusch and Nambisan (2015, p. 169)	"Actors integrate their knowledge resources with those obtained from one or more other actors, which leads to new service innovation opportunities. Interactions among actors are important to understand because it is through interaction that information is shared and knowledge is generated"	An interactive process
Lusch et al (2016, p. 2959)	"Resources are everywhere in a service ecosystem and even more resources come from resource integration" "Novelty and unpredictability in service ecosystems is bound up in heteropathic resource integration processes"	An interactive and emergent process
Mele et al (2018, p. 526)	"The S-D logic does not distinguish between consumers and producers; all actors contribute similarly to and benefit from the interaction, apply their competences (knowledge and skills) for the benefit of others and perform resource integration"	An interactive process
Mustak and Plé (2020, p. 406)	"Interacting actors have both the ability and the willingness to integrate their own and other actors' resources within or across the levels of service ecosystems"	An interactive process
Overkamp et al (2018)	"Value co-creation builds on the idea that actors produce, exchange, and integrate resources with other actors to realise outcomes that they cannot achieve alone."	An interactive process

Peters (2016, p. 3000)	"While interaction represents a necessary condition for resource integration processes, it is not in itself a sufficient condition for all instances of resource integration because interaction may result in two distinct kinds of effect."	An interactive and emergent process
Peters (2018, p. 347)	"Relationship between resource integration and service ecosystem development is not limited to the actions of individuals alone, but includes the collective role actors perform as they exchange resources in their interactions. With continued exchanges, these emergent features stabilise around rules, routines and practices that are evidenced in what they termed shared intentionality."	An interactive and emergent process
Peters et al (2014)	Resource integration can be theorised as an emergent process, an interactive process or both at the same time	An interactive and emergent process
Plé (2016, p. 153)	"The result of this combination then can be applied through interactions among entities to either create new resources or co-create value – that is, to improve the wellbeing of one or more of the entities involved"	An interactive process
Pohlmann and Kaartemo (2017, p. 63)	"Regulative, normative and cognitive institutions, as well as institutional logics influence the use of resources and the coordination of resource integration processes"	An interactive process
Polese (2018, p. 21)	"Successful value co-creation represents effective resource integration between actors and with structural and behavioral enablers of viable behaviors"	An interactive process
Polese et al (2018, p. 148)	"The two perspective emphasize the need to reinterpret smart tourism ecosystems as: systems of actors (people-organization) actively engaged in resource integration and sharing information (shared information) through ICTs (technology) which at the same time produces new social rules (institutions) to enhance value co-creation and innovation"	An interactive process
Rashid et al (2020, p. 221)	"Value is co-created jointly and reciprocally in interactions among actors through integration of resources"	An interactive process
Siddike and Hidaka (2017, p. 189)	"Value is co-created through the application of resource integration by providers and customers"	An interactive process
Siltaloppi and Vargo (2014, p. 1279)	"resource integration captures the broad range of interactive behaviors in which an actor or a service system applies knowledge and skills, in conjunction with other available operant and operand resources, to improve the state of others, and reciprocally, the state of oneself"	An interactive process
Singaraju et al (2016, p. 46)	"The S-D literature more implicitly views interaction between actors as social and economic processes of value co-creation through resource integration episodes"	An interactive process
Skålén et al (2014, p. 139)	"Customers and firms collaboratively integrate resources while directly interacting in order to co-create value"	An interactive process

Smith (2013, p. 1900)	"Value co-destruction is an interactional process between systems resulting in a decline in at least one of the system's well-being"	An interactive process
Truong et al (2012, p. 202)	"Information sharing, dyadically and across the network, and technological linkages at the same levels, related to specific integrative network linkages as resource integration"	An interactive process
Vafeas and Hughes (2020)	"Service-dominant logic maintains that value is created collaboratively through a process of resource integration"	An interactive process
Vafeas et al (2016, p. 482)	"We refer to this as untimely stakeholder intervention and it is an example of institutional norms and processes – coordinating mechanisms – shaping actors' behaviour and, in this instance, constraining resource integration and value co-creation"	An interactive process
Vargo (2007, p. 58)	"It begins to paint a picture of economic entities exchanging their own unique combinations of resources (sometimes operand but always operant) with other resource integrators to improve their own resource accessibility"	An interactive process
Vargo (2008, p. 211)	"S-D logic's concept of "resource integration" is multidirectional (all parties uniquely integrating multiple resources for their own benefit and for the benefit of others) but service-beneficiary centered"	An interactive process
Vargo and Akaka (2012, p. 211)	"Resource integration can be conceptualized as a central practice in value cocreation. This is because as actors enact practices to integrate resources, they interact with other actors and contribute to value cocreation processes"	An interactive process
Wajid et al (2019, p. 279)	"value co-creation as a macro concept and the perception of value as a micro (actor) level mechanism shows how the aggregate behaviors of various actors at the micro level (actor engagement) lead to resource integration patterns, which can be perceived as value co-creation at the macro level"	An interactive process
Widjojo et al (2020, p. 6)	"Resource integration occurs when mutual service exchange generates benefits from multi-actor interactions"	An interactive process
Widjojo et al (2020, p. 429)	"Interaction within the community drives the exchange of service (knowledge and skills) for resource integration as a value co-creation platform to perform innovation in a nested ecosystem"	An interactive process

Zaborek and Mazur (2019, p. 543)	"SDL's major contribution to management science is identifying the difference between expected value (value proposition) and experienced value (value-in-use). We share this view, acknowledging that final value perceptions are created through experience processes influenced by the context. However, we also argue that the context is what differentiates service experiences from experiences using tangible products. Contrary to material goods, services are often rendered in an interactive way. Their users, and other actors involved (such as process participants), determine service quality. Resource integration takes place during these interactions and is a form of VCC."	An interactive process
Zhang et al (2016, p. 293)	"Internal integration refers to the formal interactions and collaboration among functional departments" "A manufacturer collaborates and interacts with supply network partners and involves them in internal operations to serve customers together."	An interactive process

Appendix C - Statements that are finalised after the content validity test

Table C.1: Statements that are finalised after the content validity test

First-Order Indicator	Statement
Integrated Market Orientation	My company encourage customer comments and complaints because they help us do a better job
	After-sales service is an important part of my company's business strategy
	My company regularly monitor our competitors' marketing efforts
	My company's marketing team regularly discuss customer needs with other teams
	The marketing team regularly interact with other teams on a formal basis
	This company does a good job in integrating the activities of all teams
	The management team of my company collect industry information through informal means (e.g., lunch with industry friends, talks with trade partners)
	We periodically review the likely effect of changes in our business environment (e.g., regulation) on customers
	We have inter team meetings at least once a quarter to discuss market trends and developments
	My company periodically circulates documents (e.g., reports, newsletters) that provide information on its customers
	When something important happens to a major customer or market, all the teams know about it in a short period
	Data on customer satisfaction are disseminated among all the teams on a regular basis
	The activities of the different teams in my company are well coordinated
	My company is quick to respond to significant changes in our competitors' pricing structures
Intrapreneurship	My company understands the importance of finding new niches for products in current markets
	My company is willing to spend on new product/service development activities
	My company introduces new products/services to its customers frequently
	The owner/s/management of my firm has an aggressive decision-making style
	Employees are supposed to get the job done with minimum supervision
	Employees are encouraged to prioritise their work
	In my company uncertainty is treated as a challenge
	In my company employees are encouraged to venture into unexplored territories
	My company constantly seek new opportunities related to the present operations
	My company constantly seek opportunities to improve our business performance
Effective human resource practices	My company seeks to match employees to specific job requirements
	My company treats employees as the most valuable resource within the company
	Extensive training programs are provided for individuals in my company

	My company emphasises the importance of having satisfied employees
	My company seeks to maintain high level of employee motivation
	In my company employees receive benefits linked to their performance
	All employees receive effective feedback on their performance
	Managers/team leads support employees in utilising opportunities for vertical mobility
	In general, managers/team leads supports employees in utilising opportunities for horizontal mobility
Individual-Level Learning	In my company individuals are able to break out of traditional mind-sets to see things in new and different ways
	In my company individuals have a clear sense of direction in their work
	In my company individuals are aware of the critical issues that affect their work
	In my company individuals generate many new insights
Group-Level Learning	In my company different point of views are encouraged in group work
	In my company teams are prepared to rethink decisions when presented with new information
	Teams have the right people involved in addressing the issues
Absorptive Capacity	The management team motivates the employees to use information sources within our industry
	The management team expects the employees to deal with information beyond our industry
	The management team emphasises cross-team support to solve problems
	In my company there is a quick information flow
	In my company employees have the ability to structure and to use collected knowledge
	In my company employees are used to absorb new knowledge as well as to prepare it for further purposes and to make it available
	In my company employees successfully link existing knowledge with new insights
	My company regularly reconsiders technologies and adapts them accordant to new knowledge
	My company has the ability to work more effective by adopting new technologies
Learning Orientation	Managers/team leaders basically agree that my company's ability to learn is the key to our competitive advantage
	The sense around my company is that employee learning is an investment, not an expense
	There is a commonality of purpose in my company
	There is total agreement on our company vision across all levels, functions and teams
	Top management repeatedly emphasises the importance of knowledge sharing in our company
Trustworthy Leadership	My manager/team lead tries to reach consensus among team members on important decisions
	My department manager balances concern for day-to-day details with projections for the future
	The management team of my company protects the core values while encouraging change

	The management team of my company shows courage in their support of change initiatives
	The management team of my company demonstrates humility while fiercely pursuing the vision
	The management team and the team leads talk in a way that makes employees believe they can succeed
	The management team and the team leads often get employees to re-think the way they do things
	The management team and the team leads challenge employees to think about problems in new ways
	The management team and the team leads show performers how to look at difficulties from a new angle
	The management team and the team leads expects us to achieve high standards
Capable Champions	In my company, there are several individuals who have the capability of developing a change mindset
	In my company, there are several individuals who have the capability of providing visionary leadership
	In my company, there are several individuals who are well informed about the issues, opportunities and how to get things done
	In my company, there are several individuals who have the capability of involving key stakeholders and building commitment in key initiatives
	In my company, there are several individuals who have the capability of networking and getting the right people together
	In my company, there are several individuals who have the capability of planning and managing the change process
	In my company, there are several individuals who have the capability of keeping people focused and motivated
	In my company, there are several individuals who have the capability of developing feedback mechanisms to evaluate and monitor progress
	In my company, there are several individuals who have the capability of persevering until the change succeeds
Innovative Culture	Innovation proposals are welcome in my company
	The management team of my company actively seeks innovative ideas
	In my company, people are not penalised for new ideas that do not work
	Managers/team leads in my company promote and support innovative ideas, experimentation and creative processes
	My company is willing to reorganise teams to increase innovative outputs
	My company adopts a flexible organisational structure to encourage and increase innovative outputs
Accountable Culture	People in my company understands the interdependent systems implications of change
	The management team of my company understands the importance of institutionalising change
	The management team of my company understands the need to realign incentives with desired changes
Communication	Employees in my company experience consequences for outcomes of their actions

	Employees in my company meet deadlines and honour resource commitments
	Employees in my company accept responsibility for getting work done
	Employees in my company often discuss their work with the managers/team leads
	Managers/team leads communicate with the employees about work to agree upon the best actions possible
	Managers/team leads normally communicate how what employees do fits into the firm's overall effort
	In my company, communication flows both from the managers/team leads to and from the team members to the managers/team leads

Appendix D - What is cloud computing?

Cloud computing is defined as a computing model that enables on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) (Mell & Grance, 2011). This model has brought about a fundamental change in the way information technology (IT) services are invented, developed, deployed, scaled, updated, maintained and paid for (Marston et al, 2011). In addition, cloud computing has also ensured that consumers are relieved of the burden of maintaining on-premise infrastructure. The cloud model has three service models and four deployment models (Mell & Grance, 2011).

The three service models are Software – as – a - Service (SaaS), Infrastructure – as – a - Service (IaaS) and Platform – as – a – Service (PaaS). The SaaS service model ensures that all software applications used by the consumer through various devices, thin-client interfaces (e.g. web browsers) or program interfaces that run on cloud infrastructure owned by the service provider. The consumer hereby does not control or manage infrastructure or software applications; and thus, the burden of doing so falls onto the shoulders of the service provider. Microsoft Office 365, Turnitin, SalesForce CRM and Google Apps are some popular examples for SaaS. In the IaaS service model, consumers have access to instant computing infrastructure and the infrastructure can be provisioned and managed over the Internet. The consumers hereby can quickly scale up and down with demand and only pay for what is being used. IaaS helps consumers to avoid the expenses and complexity of buying and managing their own physical servers and other data centre infrastructure. DigitalOcean, Linode, Rackspace, Amazon Web Services (AWS), Cisco Metapod, Microsoft Azure and Google Compute Engine (GCE) are some popular examples of IaaS. The third service model; PaaS, is a complete development and deployment environment in the cloud; wherein consumers purchase the resources they need

from a cloud service provider on a ‘pay-as-you-go’ basis and access them over a secure internet connection. Heroku, Force.com and Microsoft Azure are some popular examples of PaaS.

The four deployment models are private cloud, community cloud, public cloud and hybrid cloud. The private cloud is a cloud computing model operated solely for a single organisation. It can be managed internally or by a third party. The community cloud model, on the other hand, refers to a shared cloud computing service environment that is targeted to a limited set of organisations or employees (such as banks or heads of trading firms). In the public cloud model, computing services are offered by third-party providers over the public Internet, making them available to anyone who wants to use or purchase them. The final deployment model, the hybrid cloud is a deployment model which combines a public cloud and a private cloud by allowing data and applications to be shared between them. This model gives businesses the ability to seamlessly scale their on-premise infrastructure up to the public cloud to handle any data overflow.

Appendix E - Questionnaire (pre-test)

Questionnaire

Title of the Project: Multiple-Item Scale for Measuring Effectiveness of Resource Integration Processes within Paid Cloud Computing Service Environments

This self-administered questionnaire seeks to explore the indicators that explain the organisational property – resource integration process effectiveness that impacts paid cloud technology adoption by small and medium-sized firms (SME). Kindly answer the following questions before proceeding to the survey. The survey will end automatically end if the respondent answer 'No' to any of the first five questions.

Section 1 – Eligibility Check

Do you have an academic qualification equal to or higher than a diploma in information technology?

☐ Yes
☐ No (Thank you for your time)

Do you have experience in at least one completed enterprise commercial cloud computing solution adoption project in a small or medium-sized (SME) firm setup? (SME is an organisation with less than 200 employees)

☐ Yes
☐ No (Thank you for your time)

Did the SME use a rigorous vendor selection process when selecting the cloud service provider/providers?

☐ Yes
☐ No (Thank you for your time)

Did you play a decision-making role in any of those projects?

☐ Yes
☐ No (Thank you for your time)

Is the SME you are referring to/recalling located in Australia?

☐ Yes
☐ No (Thank you for your time)

Is the firm you are referring to/recalling a for-profit firm?

☐ Yes
☐ No (Thank you for your time)

Section 2

Directions:

Please recall your experience in any successful paid cloud computing solution adoption project in an SME when answering the questionnaire.

Please read each question carefully and respond by choosing the most appropriate response.

Please ensure you answer all questions. Failing to respond to all questions could make the questionnaire invalid. There are no right or wrong answer.

This questionnaire is divided into four parts.

Section A consists of a set of statements related to *internal and external coordination processes* of the SME you are recalling.

Section B consists of a set of statements related to *organisational learning processes* of the SME you are recalling.

Section C consists of a set of statements related to *organisational transformational processes* of the SME you are recalling.

Section D consists of a set of statements that collects your background information. They will be used for statistical purposes only.

Section A

When answering questions in this section, think of the *internal and external coordination processes* of the SME that successfully adopted paid cloud computing solution/solutions. Even though you are not currently working in that firm, please assume that you are working in that firm and answer the questions.

Section A consists of items under three factors that explain internal and external coordination processes of a firm, namely, integrated market orientation, intrapreneurship and effective human resource practices.

Rate each item in this section on the scale of *1 = Strongly Disagree to 5 = Strongly Agree.*

	Integrated Market Orientation	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
1	My company encourages customer comments and complaints because they help us do a better job					
2	After-sales service is an important part of my company's business strategy					
3	My company regularly monitors our competitors' marketing efforts					
4	My company's marketing team regularly discusses customer needs with other teams					
5	The marketing team regularly interacts with other teams on a formal basis					
6	This company does a good job in integrating the activities of all teams					
7	The management team of my company collects industry information through informal means (e.g., lunch with industry friends, talks with trade partners)					
8	We periodically review the likely effect of changes in our business environment (e.g., regulation) on customers					
9	We have inter-team meetings at least once a quarter to discuss market trends and developments					
10	My company periodically circulates documents (e.g., reports, newsletters) that provide information on its customers					
11	When something important happens to a major customer or market, all the teams know about it in a short period					
12	Data on customer satisfaction are disseminated among all the teams on a regular basis					
13	The activities of the different teams in my company are well coordinated					

14	My company is quick to respond to significant changes in our competitors' pricing structures					
	Intrapreneurship	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
15	My company understands the importance of finding new niches for products in current markets					
16	My company is willing to spend on new product/service development activities					
17	My company introduces new products/services to its customers frequently					
18	The owner/s/management of my firm has an aggressive decision-making style					
19	In my company employees are supposed to get the job done with minimum supervision					
20	In my company employees are encouraged to prioritise their work					
21	In my company uncertainty is treated as a challenge					
22	In my company employees are encouraged to venture into unexplored territories					
23	My company constantly seek new opportunities related to the present operations					
24	My company constantly seek opportunities to improve our business performance					
	Effective human resource practices	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
25	My company seeks to match employees to specific job requirements					
26	My company treats employees as the most valuable resource within the company					
27	Extensive training programs are provided for individuals in my company					
28	My company emphasises the importance of having satisfied employees					
29	My company seeks to maintain high level of employee motivation					
30	In my company employees receive benefits linked to their performance					
31	All employees receive effective feedback on their performance					
32	Managers/team leads support employees in utilising opportunities for vertical mobility					
33	In general, managers/team leads supports employees in utilising opportunities for horizontal mobility					

Section B

When answering questions in this section, think of the *organisational learning processes* of the SME that successfully adopted paid cloud computing solution/solutions. Even though you are not currently working in that firm, please assume that you are working in that firm and answer the questions.

Section B consists of items under four factors that explain the organisational learning processes of a firm, namely, individual level learning, group level learning, absorptive capacity and learning orientation.

Rate each item in this section on the scale of *1 = Strongly Disagree to 5 = Strongly Agree.*

	Individual Level Learning	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
34	In my company individuals are able to break out of traditional mind-sets to see things in new and different ways					
35	In my company individuals have a clear sense of direction in their work					
36	In my company individuals are aware of the critical issues that affect their work					
37	In my company individuals generate many new insights					
	Group Level Learning	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
38	In my company different point of views are encouraged in group work					
39	In my company teams are prepared to rethink decisions when presented with new information					
40	Teams have the right people involved in addressing the issues					
	Absorptive Capacity	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
41	The management team motivates the employees to use information sources within our industry					
42	The management team expects the employees to deal with information beyond our industry					
43	The management team emphasises cross-team support to solve problems					
44	In my company there is a quick information flow					
45	In my company employees have the ability to structure and to use collected knowledge					
46	In my company employees are used to absorb new knowledge as well as to prepare it for further purposes and to make it available					
47	In my company employees successfully link existing knowledge with new insights					
48	My company regularly reconsiders technologies and adapts them accordant to new knowledge					
49	My company has the ability to work more effective by adopting new technologies					
	Learning Orientation	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
50	The management team motivates the employees to use information sources within our industry					
51	The management team expects the employees to deal with information beyond our industry					
52	The management team emphasises cross-team support to solve problems					
53	In my company there is a quick information flow					

54	In my company employees have the ability to structure and to use collected knowledge					

Section C

When answering questions in this section, think of the *organisational transformational processes* of the SME that successfully adopted paid cloud computing solution/solutions. Even though you are not currently working in that firm, please assume that you are working in that firm and answer the questions.

Section C consists of items under six factors that explain the organisational transformational processes of a firm, namely, trustworthy leadership, trusting followers, capable champions, innovative culture, accountable culture and effective communication.

Rate each item in this section on the scale of *1 = Strongly Disagree to 5 = Strongly Agree.*

	Trustworthy Leaders	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
55	My manager/team lead tries to reach consensus among team members on important decisions					
56	My department manager balances concern for day-to-day details with projections for the future					
57	The management team of my company protects the core values while encouraging change					
58	The management team of my company shows courage in their support of change initiatives					
59	The management team of my company demonstrates humility while fiercely pursuing the vision					
60	The management team and the team leads talk in a way that makes employees believe they can succeed					
61	The management team and the team leads often get employees to re-think the way they do things					
62	The management team and the team leads challenge employees to think about problems in new ways					
63	The management team and the team leads show performers how to look at difficulties from a new angle					
64	The management team and the team leads expects us to achieve high standards					
	Capable Champions	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
65	In my company, there are several individuals who have the capability of developing a change mind-set					
66	In my company, there are several individuals who have the capability of providing visionary leadership					
67	In my company, there are several individuals who are well informed about the issues, opportunities and how to get things done					
68	In my company, there are several individuals who have the capability of involving key stakeholders and building commitment in key initiatives					
69	In my company, there are several individuals who have the capability of networking and getting the right people together					
70	In my company, there are several individuals who have the capability of planning and managing the change process					

71	In my company, there are several individuals who have the capability of keeping people focused and motivated					
72	In my company, there are several individuals who have the capability of developing feedback mechanisms to evaluate and monitor progress					
73	In my company, there are several individuals who have the capability of persevering until the change succeeds					
	Innovative Culture	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
74	Innovation proposals are welcome in my company					
75	The management team of my company actively seeks innovative ideas					
76	In my company, people are not penalised for new ideas that do not work					
77	Managers/team leads in my company promote and support innovative ideas, experimentation and creative processes					
78	My company is willing to reorganise teams to increase innovative outputs					
79	My company adopts a flexible organisational structure to encourage and increase innovative outputs					
	Accountable Culture	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
80	People in my company understands the interdependent systems implications of change					
81	The management team of my company understands the importance of institutionalising change					
82	The management team of my company understands the need to realign incentives with desired changes					
	Effective Communication	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
83	Employees in my company experience consequences for outcomes of their actions					
84	Employees in my company meet deadlines and honour resource commitments					
85	Employees in my company accept responsibility for getting work done					
86	Employees in my company often discuss their work with the managers/team leads					
87	Managers/team leads communicate with the employees about work to agree upon the best actions possible					
88	Managers/team leads normally communicate how what employees do fits into the firm's overall effort					
89	In my company, communication flows both from the managers/team leads to and from the team members to the managers/team leads					

Section 3 – Background Information

Please tick the most appropriate answer.

1. Gender

☐ Male
☐ Female
☐ Other
☐ Prefer not to mention

2. How many years of work experience do you have?

☐ Less than 1 year
☐ Between 1 and 5 years
☐ More than 5 years

3. Where is your organisation (the one that did successful cloud adoption) located?

☐ Victoria
☐ New South Wales
☐ Western Australia
☐ South Australia
☐ Northern Territory
☐ Queensland
☐ Capital Territory

4. What is the level of your current position?

☐ Operational level
☐ Mid-level
☐ Corporate level

5. What is your highest education qualification?

☐ Doctoral Degree
☐ Master's Degree
☐ Bachelor's Degree
☐ Other

6. What is the size of the SME you are working for/provided advises to adopt paid cloud computing services?

☐ Between 1-5 Employees
☐ Between 6-19 Employees
☐ Between 20-50 Employees
☐ Between 50-100 Employees
☐ Between 100-200 Employees

7. Which paid cloud computing technologies are used by your organisation?

☐ Software-as-a-Service
☐ Platform-as-a-Service
☐ Infrastructure-as-a-Service

8. What industry sector does your organisation operate in?

☐ Agriculture, Forestry and Fishing
☐ Mining
☐ Manufacturing
☐ Electricity, Gas, Water and Waste Services
☐ Construction
☐ Wholesale Trade
☐ Retail Trade
☐ Accommodation and Food Services
☐ Transport, Postal and Warehousing
☐ Information Media and Telecommunications
☐ Financial and Insurance Services
☐ Rental, Hiring and Real Estate Services
☐ Professional, Scientific and Technical Services
☐ Administrative and Support Services
☐ Health Care and Social Assistance
☐ Arts and Recreation Services
☐ Other Services

9. What is the name of your organisation? _____

Appendix F – Questionnaire (main study)

Questionnaire (main study)

Title of the Project: Multiple-Item Scale for Measuring Effectiveness of Resource Integration Processes within Paid Cloud Computing Service Environments

This self-administered questionnaire seeks to explore the indicators that explain the organisational property – resource integration process effectiveness that impacts paid cloud technology adoption by small and medium-sized firms (SME). Kindly answer the following questions before proceeding to the survey. The survey will end automatically end if the respondent answer 'No' to any of the first five questions.

Section 1 – Eligibility Check

Do you have an academic qualification equal to or higher than a diploma in information technology?

☐ Yes
☐ No (Thank you for your time)

Do you have experience in at least one completed enterprise commercial cloud computing solution adoption project in a small or medium-sized (SME) firm setup? (SME is an organisation with less than 200 employees)

☐ Yes
☐ No (Thank you for your time)

Did the SME use a rigorous vendor selection process when selecting the cloud service provider/providers?

☐ Yes
☐ No (Thank you for your time)

Did you play a decision-making role in any of those projects?

☐ Yes
☐ No (Thank you for your time)

Is the SME you are referring to/recalling located in Australia?

☐ Yes
☐ No (Thank you for your time)

Is the firm you are referring to/recalling a for-profit firm?

☐ Yes
☐ No (Thank you for your time)

Section 2

Directions:

Please recall your experience in any successful paid cloud computing solution adoption project in an SME when answering the questionnaire.

Please read each question carefully and respond by choosing the most appropriate response.

Please ensure you answer all questions. Failing to respond to all questions could make the questionnaire invalid. There are no right or wrong answer.

This questionnaire is divided into four parts.

Section A consists of a set of statements related to *internal and external coordination processes* of the SME you are recalling.

Section B consists of a set of statements related to *organisational learning processes* of the SME you are recalling.

Section C consists of a set of statements related to *organisational transformational processes* of the SME you are recalling.

Section D consists of a set of statements related to innovations taking place within the SME you are recalling.

Section A

When answering questions in this section, think of the *internal and external coordination processes* of the SME that successfully adopted paid cloud computing solution/solutions. Even though you are not currently working in that firm, please assume that you are working in that firm and answer the questions.

Section A consists of items under three factors that explain internal and external coordination processes of a firm, namely, integrated market orientation, intrapreneurship and effective human resource practices.

Rate each item in this section on the scale of *1 = Strongly Disagree to 5 = Strongly Agree.*

	Integrated Market Orientation	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
1	My company encourages customer comments and complaints because they help us do a better job					
2	My company's marketing team regularly discusses customer needs with other teams					
3	This company does a good job in integrating the activities of all teams					
4	My company periodically circulates documents (e.g., reports, newsletters) that provide information on its customers					
5	When something important happens to a major customer or market, all the teams know about it in a short period					
	Intrapreneurship	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
6	My company is willing to spend on new product/service development activities					
7	Employees are supposed to get the job done with minimum supervision					
8	In my company uncertainty is treated as a challenge					
9	In my company employees are encouraged to venture into unexplored territories					
10	My company constantly seek new opportunities related to the present operations					
11	My company constantly seek opportunities to improve our business performance					
	Effective human resource practices	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree

12	My company treats employees as the most valuable resource within the company					
13	My company emphasises the importance of having satisfied employees					
14	In my company employees receive benefits linked to their performance					
15	All employees receive effective feedback on their performance					

Section B

When answering questions in this section, think of the *organisational learning processes* of the SME that successfully adopted paid cloud computing solution/solutions. Even though you are not currently working in that firm, please assume that you are working in that firm and answer the questions.

Section B consists of items under four factors that explain the organisational learning processes of a firm, namely, individual level learning, group level learning, absorptive capacity and learning orientation.

Rate each item in this section on the scale of *1 = Strongly Disagree to 5 = Strongly Agree.*

	Individual Level Learning	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
16	In my company individuals are able to break out of traditional mind-sets to see things in new and different ways					
17	In my company individuals are aware of the critical issues that affect their work					
18	In my company individuals generate many new insights					
	Group Level Learning	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
19	In my company different point of views are encouraged in group work					
20	In my company teams are prepared to rethink decisions when presented with new information					
21	Teams have the right people involved in addressing the issues					
	Absorptive Capacity	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
22	The management team motivates the employees to use information sources within our industry					
23	The management team expects the employees to deal with information beyond our industry					
24	In my company there is a quick information flow					
25	In my company employees successfully link existing knowledge with new insights					
26	My company regularly reconsiders technologies and adapts them accordant to new knowledge					
	Learning Orientation	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
27	The management team expects the employees to deal with information beyond our industry					

28	In my company there is a quick information flow					
29	In my company employees have the ability to structure and to use collected knowledge					

Section C

When answering questions in this section, think of the *organisational transformational processes* of the SME that successfully adopted paid cloud computing solution/solutions. Even though you are not currently working in that firm, please assume that you are working in that firm and answer the questions.

Section C consists of items under four factors that explain the organisational transformational processes of a firm, namely, trustworthy leadership, capable champions, innovative culture and effective communication.

Rate each item in this section on the scale of *1 = Strongly Disagree to 5 = Strongly Agree.*

	Trustworthy Leaders	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
30	The management team of my company protects the core values while encouraging change					
31	The management team of my company demonstrates humility while fiercely pursuing the vision					
32	The management team and the team leads talk in a way that makes employees believe they can succeed					
33	The management team and the team leads challenge employees to think about problems in new ways					
34	The management team and the team leads show performers how to look at difficulties from a new angle					
	Capable Champions	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
35	In my company, there are several individuals who are well informed about the issues, opportunities and how to get things done					
36	In my company, there are several individuals who have the capability of networking and getting the right people together					
37	In my company, there are several individuals who have the capability of planning and managing the change process					
38	In my company, there are several individuals who have the capability of keeping people focused and motivated					
39	In my company, there are several individuals who have the capability of persevering until the change succeeds					
	Innovative Culture	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
40	In my company, people are not penalised for new ideas that do not work					
41	Managers/team leads in my company promote and support innovative ideas, experimentation and creative processes					
42	My company is willing to reorganise teams to increase innovative outputs					

	Effective Communication	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
43	Employees in my company experience consequences for outcomes of their actions					
44	Employees in my company often discuss their work with the managers/team leads					
45	Managers/team leads communicate with the employees about work to agree upon the best actions possible					
46	In my company, communication flows both from the managers/team leads to and from the team members to the managers/team leads					

Section D

When answering questions in this section, think of the *innovations* of the SME that successfully adopted paid cloud computing solution/solutions. Even though you are not currently working in that firm, please assume that you are working in that firm and answer the questions.

Rate each item in this section on the scale of *1 = Strongly Disagree to 5 = Strongly Agree.*

	Innovation	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
47	My company constantly benchmark its operating systems to world class standards					
48	In my company work practices are constantly updated to increase productivity					
49	My company constantly use technology to enhance service quality					
50	My company invests heavily in developing new operating systems					
51	My company continuously train people in emerging industry technologies					
52	My company has introduced many new services to the market					
53	My company has introduced many modifications to the existing services					
54	My company constantly seeks find new services					
55	My company has introduced more new services than our competitors					
56	The new services my company introduced have caused significant changes in the industry					
57	My company constantly introduce new ways of managing our business					
58	My company invests in updating administrative procedures					
59	In my company management constantly seeks new ways to improve administrative systems					
60	My company empowers employees to take initiatives					
61	My company's competitors use our administrative systems as a benchmark					

Section 3 – Background Information

Please tick the most appropriate answer.

1. Gender

☐ Male
☐ Female
☐ Other
☐ Prefer not to mention

2. How many years of work experience do you have?

☐ Less than 1 year
☐ Between 1 and 5 years
☐ More than 5 years

3. Where is your organisation (the one that did successful cloud adoption) located?

☐ Victoria
☐ New South Wales
☐ Western Australia
☐ South Australia
☐ Northern Territory
☐ Queensland
☐ Capital Territory
☐ Tasmania

4. What is the level of your current position?

☐ Operational level
☐ Mid-level
☐ Strategic level

5. What is your highest education qualification?

☐ Doctoral Degree
☐ Master's Degree
☐ Bachelor's Degree
☐ Other

6. What is the size of the SME you are working for/provided advises to adopt paid cloud computing services?

☐ Between 1-4 Employees
☐ Between 5-19 Employees
☐ Between 20-50 Employees
☐ Between 50-100 Employees
☐ Between 100-199 Employees

7. Which paid cloud computing technologies are used by your organisation?

☐ Software-as-a-Service
☐ Platform-as-a-Service

☐ Infrastructure-as-a-Service

8. What industry sector does your organisation operate in?

☐ Agriculture, Forestry and Fishing
☐ Mining
☐ Manufacturing
☐ Electricity, Gas, Water and Waste Services
☐ Construction
☐ Wholesale Trade
☐ Retail Trade
☐ Accommodation and Food Services
☐ Transport, Postal and Warehousing
☐ Information Media and Telecommunications
☐ Financial and Insurance Services
☐ Rental, Hiring and Real Estate Services
☐ Professional, Scientific and Technical Services
☐ Administrative and Support Services
☐ Health Care and Social Assistance
☐ Arts and Recreation Services
☐ Other Services

What is the name of your organisation? _____

Appendix G - Summary of the demographic profiles of the respondents

Table G.1: Demographic profile of the respondents based on the industry sector

Industry Sector of the SME	Number of Respondents	Respondent Percentage
Information Media and Telecommunications	39	18.66%
Mining	29	13.88%
Health Care and Social Assistance	23	11.00%
Retail Trade	20	9.57%
Rental, Hiring and Real Estate Services	19	9.09%
Wholesale Trade	17	8.13%
Manufacturing	16	7.66%
Electricity, Gas, Water and Waste Services	12	5.74%
Transport, Postal and Warehousing	8	3.83%
Agriculture, Forestry and Fishing	6	2.87%
Construction	4	1.91%
Accommodation and Food Services	4	1.91%
Professional, Scientific and Technical Services	4	1.91%
Other Services	3	1.44%
Financial and Insurance Services	3	1.44%
Administrative and Support Services	2	0.96%
Arts and Recreation Services	0	0.00%

Table G.2: Demographic profile of the respondents based on the state which the SME is operating in

State Which the SME is Operating In	Number of Respondents	Respondent Percentage
Victoria	104	49.76%
New South Wales	78	37.32%
Western Australia	15	7.18%
South Australia	5	2.39%
Northern Territory	0	0.00%
Queensland	6	2.87%
Capital Territory	1	0.48%
Tasmania	0	0.00%

Table G.3: Demographic profile of the respondents based on the working experience of the respondents

Working Experience	Number of Respondents	Respondent Percentage
Less than 1 year	85	40.67%
Between 1 and 5 years	94	44.98%
More than 5 years	30	14.35%

Table G.4: Demographic profile of the respondents based on the level of the current position

Level of the Current Position	Number of Respondents	Respondent Percentage
Operational level	152	72.73%
Mid-level	53	25.36%
Strategic level	4	1.91%

Table G.5: Demographic profile of the respondents based on the highest education qualification of the respondents

Highest Education Qualification	Number of Respondents	Respondent Percentage
Doctoral Degree	3	1.44%
Master's Degree	71	33.97%

Appendix H – Ethics clearance letter

Swinburne University of Technology Human Research Ethics Committee

Approval certificate

The ethics application for your project 'Development of a Multiple-Item Scale for Measuring Effectiveness of Resource Integration Processes within Paid Cloud Computing Service Environments' has been approved.

Chief Investigator: Professor Lester Johnson

Ref: R/2019/203

Approved Duration: 20 August 2019 to 1 April 2022

I refer to the ethical review of the above project protocol by Swinburne's Human Research Ethics Committee (SUHREC) or its sub-committees.

I am pleased to advise that, as submitted to date, the project may proceed in line with standard on-going ethics clearance conditions outlined below.

- The approved duration is as shown above unless an extension request is subsequently approved.
- 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 (2018)* 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, and addition or removal of other personnel/students from the project, 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 from SUHREC for approval. 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.

The following investigators have been approved to work on the project:

Chief Investigator

Lester Johnson

Associate Investigators

Chandana Hewege, Chamila Perera

Student Investigators

Shan Anjana Jayasinghe

The delegate advises, though, that the misspelling of 'completed' on the questionnaire should be corrected.

Please contact the Swinburne Research Ethics Office if you have any queries.

Regards,

Ms Sally Fried

on behalf of Swinburne Human Ethics Sub-Committee 3

Research Ethics Office

Swinburne University of Technology

P: 9214 8145 | E: resethics@swin.edu.au