TOWARDS A NEW TAXONOMY OF MANAGERIAL COMPETENCE: AN OPEN SYSTEMS PERSPECTIVE

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ABSTRACT

Although scholars have generated a substantial body of evidence on what managers do, theoretical models and explanations of managerial work are scarce. And the ones that exist do not identify what managers should do. In an attempt to fill this lacuna, this thesis distills a managerial brief from the first principles of systems theory. It is reasoned that just as cells are lower-level open systems embedded in higher-level biological organisms, occupational roles are lower-level open systems embedded in higher-level social systems. Understanding how open systems create value for the suprasystem in which they are embedded can enable one to understand how those occupying managerial roles might create value for their organisations. As per the systems view, adopted in this thesis, managers should strive for organisational survival if they are to be deemed effective. It follows that if one can discern what managers need to do to contribute towards organisational survival then one can make assertions about what managers should be competent at. This argument eventually leads to a new taxonomy of managerial competence.

The open systems view suggests that managers should be competent at managing interfaces, growth, and contingencies. Accordingly, the proposed taxonomy of managerial competence contains just three competency clusters. A clear line-of-sight is established between systemic properties and the managerial competencies contained in the three clusters. In the course of identifying what managers should do, the thesis amplifies why systems age and suggests a new way of describing the structure of systems. These contributions not only add conceptual clarity to management-related systems thinking, but also suggest a new definition of competency. In essence, this thesis presents a conceptual synthesis of managerial work that calls for reframing and re-categorising extant evidence. The theoretical reasoning, if embraced, has the potential to bring about a major change in how managers view their work and workforce.
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Jayantha Wickramasinghe, my ex-colleague, shared his observations when my thinking had not crystallised. His inputs helped me in more ways than he can possibly imagine.
DECLARATION

I certify that this thesis:

- Contains no material which has been accepted for the award of any other degree or diploma to me.

- To the best of my knowledge, contains no material previously published or written by another person except where due reference is made in the text of the thesis.

Sd/-
(Samir Shrivastava)
Melbourne
12 November 2007
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CHAPTER 1
EXPLAINING WHAT MANAGERS SHOULD DO: AN UNFINISHED AGENDA

Managerial work has been under scrutiny ever since Fayol (1916) enunciated the five basic functions – planning, organising, coordinating, commanding, and controlling – of management. In fact, there is some evidence that Fayol was extending similar works of economists dating as far back as the 1770s (Mintzberg, 1973). But this is not to say that managerial work is well understood. Lacking in particular are theory driven prescriptions that can enhance managerial effectiveness. It was over two decades ago that Hales (1986) pointed out the need to identify what managers should do. Not much headway has been made since then. The burgeoning demand for popular literature on managerial work indicates pervasive and continuing uncertainty about it (Squires, 2001). This thesis will attempt to partially alleviate the uncertainty by interpreting open systems theory in a bid to identify what managers should do. It will then make inferences about the competencies needed by managers to effectively do whatever it is that they are supposed to do. Finally, informed by the systems perspective, the thesis will parsimoniously capture the competencies identified under just three categories.

The inability on the part of scholars to reach normative conclusions about managerial work probably stems from the fact that there is no consensus over what makes managers effective. As Hales observes, “effectiveness denotes the extent to which what managers actually do matches what they are supposed to do” (1986; p. 88; emphasis in original). Since descriptions of what managers are supposed to do are singularly lacking, scholars have tended to cover all bases by listing several managerial roles and functions. Expressing disappointment with atheoretical lists, including his own list of ten managerial roles (see Mintzberg, 1973), Mintzberg observes that academics have been so preoccupied with studying isolated components of managerial jobs that they have failed to come to grips with the integrated whole and produce a satisfactory model of managerial work. He highlights the importance of developing a theory to help in the “hitherto intractable problem of delineating a useful list of competences that underlie the effective performance of managerial work” (1994; p. 24; emphasis in original). Because the area lacks a rich theory that can explain managerial work, it is not surprising that efforts to isolate generic managerial competencies have met...
with limited success. Academics and practitioners, as Barrett and Depinet (1991) imply, continue to generate never-ending competency wish-lists of suspect value.

Implicit in any quest for generic managerial competencies however, is the belief that managerial work has something in common. But how valid is this belief? An answer to the question is important because if managerial work were to not have much in common, then all efforts to isolate generic managerial competencies would either prove futile or be of limited value. Though managerial work varies substantially across levels, firms, industries, and nations, it also has a lot in common. Robbins, Bergman, and Stagg (1997) note that since the generic properties of management, at least in the free-market democracies, do not differ, managers tend to perform the same basic functions irrespective of the industry, organisational size, and levels that they are in. What varies, they note, is the emphasis and time spent on various functions. Similarly, Hales observes that “there are three broad aspects of managerial work which appear to be common to the work of most managers: first, certain generic managerial activities or processes; second, key substantive areas in which these activities are undertaken; and third, characteristic features of these activities” (1999a; p.338). He argues that the reluctance of scholars to explain the evidence on commonalities of managerial work has hindered theory development in the area.

Lacking well-informed, theory-driven prescriptions, managers perhaps interpret their own briefs in their own idiosyncratic way (see Stewart, 1976), but it would be reasonable to assume that most managers try to do what they think they should do. Further, given the spectacular productivity growths and amount of wealth generated in the past century, it is unlikely that managers in general have been doing, and continue to do, what they are not supposed to do. While there may be huge variations in managerial effectiveness and sub-optimal resource management in the corporate world, as a collective body, managers could justifiably claim partial credit for some of the prosperity around us. Therefore, before developing a theory about what managers should do, it is important to take stock of what managers in general are known to do and what their work looks like. Thus, at the outset, this thesis reviews the evidence on the commonalities of managerial work. From this point onwards, the discussion and arguments unfold in the order described below.
THESIS STRUCTURE

Chapter 2: Commonalities of Managerial Work

The findings on the commonalities of managerial work, behaviour, and roles are reviewed in this chapter. The “manager versus leader” debate is revisited to determine whether the literature on managerial leadership ought to be reviewed in the current context. The chapter also examines the tenuous link between management theories and studies of managerial work and underlines the need for a theoretical explanation of the commonalities of managerial work.

Chapter 3: Extant Explanations of Managerial Work

The focus in this chapter is on critiquing attempts that have been made to explain managerial work in its entirety. The theoretical explanations of individual facets of managerial work (e.g., negotiation, decision making, goal setting, and so forth) are considered beyond the scope of this chapter. It is argued that the extant theoretical explanations of managerial work as a whole are of limited value because they have not enabled scholars to arrive at normative conclusions. Unequivocal and generalisable assertions about what managers should do are lacking. A case is made for new ways of conceptualising and categorising managerial work to advance the area. And because open systems theory is subsequently used in this thesis to explain and categorise managerial work, it is considered essential to critique the extant management-related systems thinking in Chapter 3.

The chapter notes that the weaknesses in open systems thinking would have to be addressed if the thinking is to successfully isolate what managers should do to prove effective or competent. At the same time, it is acknowledged that the notion of managerial effectiveness is complex and has been a subject of much debate. The chapter therefore also discusses the various effectiveness criteria that have been used in empirical studies and points out that it may be particularly instructive to examine the criteria that are encapsulated in the notion of competence, an umbrella term that has become popular in the context of managerial work. Accordingly, the next chapter reviews the competency literature.

Chapter 4: Competency Modeling: A Critical Review

The chapter notes that the term competency has entered the lexicon of a large number of disciplines, ranging from law to clinical psychology. However, since the thesis pertains to what managers should do in their job roles, the various concepts of competency as found and
applied in the job analysis literature are reviewed in this chapter. It is argued that unless the drawbacks in the extant competency modeling approaches are addressed, questions regarding their validity will gather momentum. The chapter concludes by contending that the concept of competence is in dire need of a theoretical anchor if competency modeling is not to vanish as a fad that failed to deliver. The task of providing a theoretical anchor to the concept of competence and identifying what managers should be competent at is undertaken in the next chapter.

**Chapter 5: Explaining What Managers Should Do**

It is reasoned that just as cells are building blocks of higher-level living organisms, occupational roles, including managerial roles, are building blocks of higher-level social systems. Cells and higher-level organisms are also open systems in their own right. This means that occupational roles, being analogous to cells, may be conceptualised as open systems embedded in higher-level open systems. It follows that roles must possess all the properties of open systems. Further, just as cells work to ensure the survival of the higher-level organism in which they are embedded, managers while performing their roles must work to ensure the survival of their organisations.

“Ensuring survival” then is the unambiguous managerial brief as per the open systems perspective. A systemic interpretation of the brief also suggests a new definition of competence that places a premium on the process of value creation to ensure survival. Because one can infer from systemic properties as to what exactly lower-level systems should do to ensure the survival of the systems in which they are embedded, one can make assertions about what managers should do or should be competent at. It is argued that the systemic properties suggest that managers, to ensure the survival of the organisation, should manage interfaces (since energy transfer within systems takes place at an interface), growth (since systems must grow if they are to survive), and contingencies (since things seldom unfold as planned and because the need to simultaneously remain stable and grow inevitably brings about contingencies). One can thus contend that systemic properties suggest a normative basis for classifying managerial work and, by extension, managerial competence. The steps thereafter, as taken in Chapter 6, are relatively straightforward.

**Chapter 6: A New Taxonomy of Managerial Competence**

A line-of-sight between systemic properties and the generic and specific competencies that managers should possess is established in this chapter. It is argued that like their cellular
counterparts, managers while executing their roles must create value through transforming energy (mentally) via input-transformation-output (I-T-O) processes. Thus the chapter claims that they too should possess generic I-T-O competencies. Since the notion of generic I-T-O competencies pertains to information processing, it is compared to other notions that have similarly linked human capability and intellect to information processing abilities. Relating back to the systemic properties, the chapter argues that managers need to apply their generic competencies (i.e., information processing abilities) in the context of managing interfaces, growth, and contingencies. Therefore, the proposed taxonomy captures managerial competence under Interface Management, Growth Management, and Contingency Management Competency clusters. The specific competencies that may \textit{a priori} be said to belong to the three clusters are then identified.

Chapter 6 reiterates that while there may be gaps between what managers actually do and what they should do, it cannot be anyone’s case that managers in general have been doing things that they should never have been doing. It is argued that the three clusters in the proposed systems-based taxonomy can account for the extant evidence on the commonalities of managerial work discussed in Chapter 2. It is also claimed that the systems perspective can, to some extent, explain the variations in managerial work. The explanatory power, it is pointed out, adds to the generalisability of the systems perspective. This reference to generalisability leads to a discussion on the boundary condition of the systems perspective. Finally, with the area of applicability demarcated, the thesis proceeds to identify the implications of the systems perspective for the area in question.

\textbf{Chapter 7: Contributions, Implications, and Limitations}

The thesis seeks credit for making two theoretical contributions. It provides conceptual clarity to: (i) the structure of systems (by describing it as a fractal); and (ii) notions of value creation (by amplifying as to why organisations age during the process of value creation). The chapter also claims that the proposed definition of competency derived from an understanding of the notions of value creation and the structure of systems has the potential to reconcile the apparent incommensurability amongst the extant definitions of competency. It is argued that in addition to contributing to the competency literature, this thesis’s interpretation of systemic properties can inform theory building efforts in areas as diverse as managerial ethics, organisational slack, workforce reduction, and industrial ecology. The insights offered
are relevant to managerial competence because they place restrictions on how managers might manage interfaces, growth, and contingencies.

The chapter then proposes a research agenda that is driven by the need to better understand how systemic properties influence value creation and organisational longevity. Thereafter, the implications for practice are discussed. The fact that the proposed taxonomy contains just three categories – interface, growth, and contingency management – can have a bearing on how organisations might design and support managerial work and on how they might select, develop, and remunerate managers. The chapter draws attention to the refinements and limitations of the proposed systems perspective and concludes by briefly reiterating the salient aspects of the thesis.

**An Exercise in Synthesis**

Before readers take the plunge, they are cautioned about the apparent scope creep of this thesis. In systems thinking, understanding can be obtained only by expanding or synthesising the systems to be understood, not by reducing or analysing them (Ackoff, 1981). In order to gain an understanding of what managers should do in an organisation, it became necessary to fully understand the properties of the organisation as a whole. It was also considered logical to consider the boundary conditions of this thesis only after the nature of the containing system had been understood. Therefore, the boundary conditions are discussed at the end of Chapter 6 and not at the outset, as is often the case. Perhaps this reversal of order is another distinct feature of any synthetic exercise.

The synthesis that follows will highlight features of open systems theory that have hitherto been either ignored or underdeveloped by management scholars. What follows is based on an interpretation of systemic properties that has the potential to re-ignite the interest in open systems theory and offer a deeper insight into the factors that contribute to managerial competency and organisational longevity. At times, it may appear that the thesis is raising issues not germane to the topic on hand. But towards the end, the apparently peripheral strands of thought will converge to make a strong case for adopting a systems perspective to understand the nature of managerial work, identify what managers should do, and to classify managerial competence.
CHAPTER 2

COMMONALITIES OF MANAGERIAL WORK

Although the earliest studies on managerial work date back to the eighteenth century, research on the topic seems to have begun in earnest in the period following World War II. Over the years, scholars such as Carlson (1951), Sayles (1964), Stewart (1967a, 1976), Campbell, Dunette, Lawler, and Weick (1970), Mintzberg (1973), Kotter (1982a), Willmott (1984), Martinko and Gardner (1985), Hales (1986), and Watson (1994) have provided several insights into managerial work and comprehensively reviewed the literature in the area. By the 1990s, despite some ambiguity about what exactly had been studied – managerial work, jobs, behaviors, or all of them at once (Stewart, 1989) – scholars could legitimately claim that they knew what managers did (Fondas & Stewart, 1994; Mintzberg 1994). The legitimacy of the claim notwithstanding, taking stock of the current state of knowledge is by no means a simple task. In order to arrive at conclusions about the generic nature of managerial work, a reviewer must ideally include only those studies that subscribe to a common view of who a manager is. It turns out that scholars neither agree over the definition of manager nor over what constitutes managerial work.

According to Fletcher, “A manager is hired for what he knows other firms do, what he can find to do and what he can be told to do” (1973; p. 136). In similar vein, Pym (1975) describes managerial work as spurious work undertaken to absorb the time spent in employment. While some scholars concur with Pym and point out that managers have never had anything unique to do (e.g., Mant, 1977; Alvesson & Willmott, 1996), others (e.g., Heckscher, 1995; Grey 1999) believe that managerial work has started becoming redundant in recent times as companies seek to empower their non-managerial employees. If the boundaries between non-managerial and managerial work are indeed blurring, then one must question the relevance of looking at the latter in isolation. In fact, this thesis would serve no useful purpose if there were no distinction between the two types of work. That such a distinction exists will be argued later in this thesis. To commence reviewing the literature at this juncture, it is necessary to agree on a working definition of the term, manager.

As per one of the more straightforward definitions, a manager is someone who gets things done through other people (Appley, 1969) or someone who directs the activities of other people (Robbins, Bergman, & Stagg, 1997). To Stewart, a manager is “anyone above a
certain level, roughly above foreman whether in control of staff or not” (1976; p. 4). Note that while Stewart’s definition does not permit inclusion of foremen as managers, the other two definitions do. Rather than debate over the appropriateness of the various definitions and adjudicate on what qualifies as a study on managerial work and what does not, this chapter will review all studies that pertain to the work, behaviour, and jobs of those reported as being managers by the authors of the studies in question. In the current context though, ambiguities over the treatment of the three terms may be ignored because any explanation of managerial work must account for how managers are known to behave while executing their job in their work roles. As long as managerial behaviour, job, and work get explained, it matters little even if the scholars concerned have used these terms interchangeably.

Apart from distinguishing between managerial and non-managerial work, any thesis on managerial work must take a stance on whether managers are also leaders. This contentious issue (see Yukl, 1989) cannot be ignored because it determines whether a review of the literature on managerial work ought to take cognisance of the vast leadership literature. The leader versus manager debate has raged ever since Zaleznik (1977) observed that organisations were producing managers pre-occupied with maintaining stability as opposed to leaders prepared to challenge the status quo and grapple with the ensuing disorder. Consistent with Zaleznik’s view, Bennis (1989) held that while leaders mastered the context, managers were enslaved by it. He, for instance, emphasised that in contrast to managers who always had an eye on the bottom line, leaders eyed distant horizons. Similarly, Kotter (1990) noted that leadership and management were two distinctive and complementary systems of action. To him, management was essentially about coping with complexity, and leadership was mainly about coping with change.

If the scholars are right about the differences between managing and leading, then it is just as well that not all managers possess a propensity to lead. It is easy to picture how zealous managerial leaders, ever willing to challenge the status quo, could hurtle an organisation towards chaos. Nonetheless, calls exhorting managers of all ilks to become leaders are commonplace. Kanter (1997), for instance, urged managers to re-cast themselves as leaders in an era where hierarchical layers were disappearing and traditional power bases shrinking. It does however seem that much of the talk about employee empowerment and erosion of managerial authority is plain rhetoric (Willmott, 1993; Hales, 1999b).
Interestingly, employee empowerment is implicated by both viewpoints: the one that claims that managerial work is becoming redundant (e.g., Grey, 1999) and the one that believes that managerial work is more important than ever and should be expanded to include leadership roles (e.g., Kanter, 1997). The two viewpoints when combined and taken to their logical conclusion predict an oxymoronic situation—a situation in which organisations find themselves largely populated by leaders with no one to lead. In such a scenario, all “empowered” subordinates would have gone on to become their own boss. One can only conclude that the two viewpoints cannot at once be accurate. And there is some support for this conclusion. A recent survey of 135 firms in the UK found that the supervisory role of first-line managers, far from becoming weaker, had become stronger with firms having to either cope with growth in business or comply with a greater range of external regulations (Hales, 2005). Assertions about managerial work becoming redundant do not appear to be backed by evidence. But this does not necessarily imply that all managers could be expected to act as leaders in the current times, or that managerial roles across levels were expanding to include leadership roles.

The view that CEOs and senior managers often act as leaders (see Cannella & Monroe, 1997) by setting priorities and standards (Drucker, 1993), acting as visionaries (Hammer & Champy, 1993; Senge, 1990), and strategising (Knights & Morgan, 1991) appears more plausible (also see Grey, 1999). However, not everyone agrees. According to another influential view in the area, managers at all levels can, and do, act as leaders. In his widely cited book, Mintzberg (1973) included the leader role as one of the ten key managerial roles. Weick (1974) though did not concur and observed that Mintzberg had probably included a separate leader role because he wrongly believed that the other nine managerial roles could not explicitly account for attempts by managers to motivate their subordinates. Mintzberg, argued Weick, had failed to recognise that managers could potentially motivate their subordinates through whatever they did. He thus claimed that Mintzberg’s (1973) taxonomy could dispense with the leader role.

Defending his earlier work, Mintzberg (1994) insisted that managerial work could not be fully understood without the leadership dimension. He argued that while one could separate the components of the managerial job conceptually, it was impossible to separate the components behaviourally. Ironically, this was the same argument as the one used by Weick to criticise him. Mintzberg, in effect, was conceding that managers could be seen as
simultaneously fulfilling the leading role in the course of executing other managerial roles. This thesis concurs with the notion that one cannot tease apart the “leading” and “non-leading” *behavioural* dimensions that are inherent in a manager’s job. The inability to do so perhaps explains why some scholars insist that managerial behaviour could be equated with leader behaviour (e.g., Jaques & Clement, 1991), and others believe that managers could act as leaders and vice-versa (e.g., Kanter, 1997). On the contrary, as pointed out earlier, scholars such as Zaleznik (1977), Bennis (1989), and Kotter (1990) who concentrate on the *conceptual* dimensions of managerial work have no difficulty in declaring that managers are different from leaders. For example, Kotter (1990) asserts that one could be either a manager or a leader, but not a manager and a leader.

One can thus begin to appreciate why the *manager versus leader* debate is difficult to resolve. The proponents of conceptual-driven and behaviour-driven arguments are likely to continue talking past each other. A way out of the quagmire might be to regard leadership as being conceptually different from “managership” while conceding that managers may at times behave like leaders. The nature of difference between managers and leaders may be debatable, what is not is the fact that the leading role has received more attention than all the other managerial roles combined (Mintzberg, 1994). This fixation with the leading role in the context of managerial work appears illogical. Managing involves more than just leading others. The leading role, at least from the perspective of someone studying managerial work, is no different from say, the decision-making role. And in the current context, an in-depth discussion of the managerial leadership literature would be as much of a digression as would be an in-depth discussion of the decision-making literature.

To recapitulate, by way of establishing the scope of the literature review about to be undertaken, the following bounds have been set: (i) to commence reviewing the literature, it will be accepted that managerial work differs from non-managerial work; (ii) no distinction will be made amongst managers, first-line managers, foremen, and supervisors – all will be treated as managers; (iii) studies pertaining to managerial work, behaviour, and roles would all qualify for inclusion in the review; and finally (iv) since conceptually a leader’s role may be distinguished from that of a manager’s, the leadership literature, despite being largely based on managers in corporate settings, will not be reviewed unless it reveals something specific about managerial work.
Although researchers have concentrated on variations in and idiosyncrasies of managerial jobs, they have, without perhaps aiming to, generated substantial knowledge about the commonalities of managerial work (Hales, 1999a). The following literature review focuses on the generic nature of managerial work across industries, firms, and job levels. Though the literature reviewed is mainly from the US and UK, evidence suggests that the findings on the generic nature of managerial work are valid across nations as diverse as Senegal and Hungary (Lubatkin, Ndiaye, & Vengroff, 1997), and Brunei, Malaysia, Japan and Thailand (Pearson & Chatterjee, 2003).

Interestingly, the methods employed by researchers studying the nature of managerial work seem to have influenced their findings. For example, diary studies have provided evidence on managerial time allocation and contacts; structured questionnaires have uncovered managerial work elements or dimensions; and studies involving participant observation have shed light on the informal characteristics of managerial work (Hales, 1986). This fact makes one wonder whether the research methods of early scholars drove their research questions rather than vice versa. Irrespective of whether the research agenda was methods-driven or not, as Hales (1986; 1999a) notes, the extant literature certainly furthers our understanding of the common aspects of managerial work by providing an answer to the following questions:

- What is the content of managerial work (i.e., what do managers do)?
- What are the common characteristics of managerial work (i.e., what is managerial work like in terms of its communication patterns, pressures, and so forth)? And
- How and with whom do managers spend their time?

The next section takes stock of peer-reviewed published evidence as it pertains to the questions mentioned above.

THE EXTANT EVIDENCE

The Content of Managerial Work

Most of the early writings on managerial work are a product of perceptive practitioners (Koontz, 1980) who relied on their personal experiences to describe the functions of management. Their works, said to belong to the Classical School (Mintzberg, 1973), unproblematically deduced what managers did from commonsense conceptualisations. As stated in the previous chapter, Fayol (1916) identified five functions: planning, organising,
coordinating, commanding, and controlling or POC³. Gulick and Urwick (1937) later amplified Fayol’s POC³ functions and coined the acronym POSDCoRB, which stood for: planning, organising, staffing, directing, coordinating, reporting, and budgeting. The classical perspective seems to have been accepted unchallenged until Carlson (1951) remarked that the descriptions of management functions seemed speculative. Instead of accepting them at their face value, Carlson studied how managers actually behaved in the work place. Thus began the Behavioural School.

The behaviouralists asked managers to maintain diaries (e.g., Carlson, 1951; Burns, 1957). Though the diaries provided information about managerial communication patterns and time allocation, they understandably did not yield much information on the actual content of managerial jobs. After all, one must know in advance what people do if one wants them to keep track of the frequency with which they do what they do (Weick, 1974). Rather than design structured diaries in advance, Mintzberg attempted to find answers by shadowing five CEOs. He found that the status and formal authority vested in managers “give rise to interpersonal relations that lead to inputs (information), and these in turn lead to outputs (information and decisions) (1973; p.58).” Accordingly, Mintzberg concluded that the work of managers involved three basic roles: interpersonal, informational, and decisional. Each of these roles was divided by him into sub-roles as discussed below.

The interpersonal role included three sub-roles that entailed the manager: (i) acting as a figurehead while performing duties of a social or legal nature; (ii) behaving like a leader while motivating and training subordinates, and making staffing decisions; and (iii) carrying out liaison to maintain and develop a network of informers. In the informational role, the manager was said to act as a: (iv) monitor; (v) disseminator; and (vi) spokesman. Managers sought and received a wide variety of mostly current information that they transmitted (after interpreting and integrating it) to the people concerned within and outside their parent organisation. Finally, while performing the decisional role, the manager acted as (vii) an entrepreneur (when initiating, designing, and implementing change projects), (viii) a disturbance handler (when taking corrective action in the face of disturbances), (ix) a resource allocator (when making or approving decisions pertaining to resource utilisation), and (x) a negotiator (when representing one’s unit at major negotiations). On the basis of these ten sub-roles, some behaviouralists sounded the death knell of the Classical School and declared POSDCoRB functions to be folklore (see Mintzberg, 1975).
The stance of the behaviouralists was typified by Mintzberg’s quip, “If you ask a manager what he does, he will most likely tell you that he plans, organizes, coordinates and controls. Then watch what he does. Don’t be surprised if you can’t relate what you see to these four words” (1975; p. 11). But even as the behaviouralists were attempting to categorise managerial work through induction, Hemphill (1959) was administering structured questionnaires in a bid to extract factors underlying the classical management functions. His 575-item questionnaire identified, for the first time, dimensions such as Internal Business Control, Business Reputation, and Preservation of Assets. Other surveys that followed in Hemphill’s wake were also largely based on the categories of the Classical School and provided useful insights. As will be discussed shortly, the scepticism towards classicists was not entirely justified. The commonsense inferences from basic management functions were not necessarily incommensurable with what the behaviouralists had found.

The findings of the more influential studies from the Classical and the Behavioural School are summarised in Table 2.1. The summary takes into account the literature reviews of Campbell, et al. (1970), Prien and Ronan (1971), Mintzberg (1973), Wilmott (1984), Martinko and Gardner (1985), Hales (1986), Borman and Brush (1993), and Tett, Guterman, Bleier, and Murphy (2000). The vintage of the literature cited in Table 2.1 indicates that by the 1980s, scholars had come to grips with what managerial work entailed. In fact, one can safely assert that nothing new has been reported since Hales”(1986) comprehensive summary of the commonalities of managerial work. The relatively recent Tett, et al. (2000) taxonomy cited in Table 2.1 was not as much an attempt to unearth something new as it was an attempt to apply a data reduction technique to make better sense of the extant evidence.

As Hales (1999a) notes, evidence from decades of research on the content of managerial work suggests that managers in general: represent their organisations; network internally and externally; monitor, filter, and disseminate information; allocate and make decisions pertaining to utilisation of resources; resolve conflicts; design and maintain work flows; negotiate; plan; innovate products and processes; and motivate, control and direct subordinates. Indeed, the evidence on what managers do appears hardly striking, but a closer examination reveals that scholars might have missed opportunities to delve deeper into the evidence and make significant advances in the area. Two issues in particular merit a comment.
<table>
<thead>
<tr>
<th>Author</th>
<th>Methodology</th>
<th>Participants</th>
<th>Position Elements/Dimensions/Factors/Roles/Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flanagan (1951)</td>
<td>Critical Incidents Technique</td>
<td>US Air Force officers involved in over 3,000 incidents</td>
<td>Formulating problems and hypotheses; planning and designing the investigation; conducting the investigation; interpreting research results; preparing reports; administering research reports; accepting organisational responsibility; accepting personal responsibility.</td>
</tr>
<tr>
<td>Hemphill (1959)</td>
<td>Executive Position Description Questionnaire (EPDQ)</td>
<td>93 executives in 5 major US companies</td>
<td>Providing non operational staff service; work supervision; internal business control; technical aspects of products markets; human, community, and personal service; exercise of authority; business reputation; personal demands; preservation of assets.</td>
</tr>
<tr>
<td>Prien (1963)</td>
<td>Inverse factor analysis based on abbreviated EPDQ (Hemphill, 1959)</td>
<td>Refinery foremen in the US</td>
<td>Manufacturing process supervision; manufacturing process administration; employee supervision; manpower coordination and administration; employee contact ad communications; work organisation, planning, and preparation; union-management relations.</td>
</tr>
<tr>
<td>Sayles (1964)</td>
<td>Field observations</td>
<td>75 low and mid-level divisional managers in a US firm</td>
<td>Participation in external work-flows via relationships (work-flow, trading, servicing, advising, auditing, stabilising, innovating); Monitoring; Leadership.</td>
</tr>
<tr>
<td>Horne &amp; Lupton (1965)</td>
<td>Self-reported management activity record</td>
<td>66 “middle” managers across firms and technologies in the UK</td>
<td>Formulating (specifying long short-term objectives and resources needed); organising (deploying resources); unifying (facilitating); regulating (manipulating and shaping resources).</td>
</tr>
<tr>
<td>Mahoney, Jerdee &amp; Caroll (1965)</td>
<td>Questionnaire (self-reported activity including time spent on each activity).</td>
<td>425 managers across functions and departments in the US</td>
<td>Planning; representing; investigating; negotiating; coordinating; evaluating; supervising; staffing.</td>
</tr>
<tr>
<td>Author, (Year)</td>
<td>Methodology</td>
<td>Participants</td>
<td>Position Elements/Dimensions/Factors/Roles/Activities</td>
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<td>---------------</td>
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<tr>
<td>Baehr (1967)</td>
<td>Questionnaire</td>
<td>600 industrial managers in the US from nine occupational groups across levels and functions</td>
<td>Setting organisational objectives; improving work procedures; promoting safety; development &amp; technical idea; judgment &amp; decision making; developing group cooperation &amp; teamwork; coping with difficulties and emergencies; developing employee potential; supervisory practices; self development &amp; improvement; promoting community organisation relations; handling outside.</td>
</tr>
<tr>
<td>Stewart (1967 a &amp; b; 1976)</td>
<td>Self-record diaries, observation, interviews</td>
<td>180, 274, &amp; 16 managers across functions and levels in various companies in the UK</td>
<td>Liaison/contacts; maintenance of work; innovation/risk taking; setting job boundaries.</td>
</tr>
<tr>
<td>Katzell, Barett, Vann &amp; Hogan (1968)</td>
<td>Questionnaires: EPDQ (Hemphill, 1959); Performance Style Questionnaire (1961)</td>
<td>194 middle-management personnel in the US Army.</td>
<td>Long-range planning; staffing; technical consultation; budgeting; shared versus individual responsibility; operational versus professional concerns; technical versus administrative activity; controlling.</td>
</tr>
<tr>
<td>Phesey (1972)</td>
<td>Questionnaire (based on Hemphill, 1959)</td>
<td>96 managers on training in the UK.</td>
<td>Trouble shooting; forward planning; briefing subordinates; conducting meetings; reviewing subordinates” progress; interest in personal problems.</td>
</tr>
<tr>
<td>Mintzberg (1973)</td>
<td>Intensive observation (shadowing), diaries and analysis of managers” records</td>
<td>5 CEOs of US companies</td>
<td>Interpersonal (figurehead, leader, and liaison); informational (monitor, disseminator, spokesman); Decisional (entrepreneur, disturbance handler, resource allocator, negotiator).</td>
</tr>
<tr>
<td>Tonrow &amp; Pinto (1976)</td>
<td>Management Position Description Questionnaire (MPDQ)</td>
<td>433 managers in the US across six companies, 28 functions, and three broad levels (high, middle, and low)</td>
<td>Product, marketing, and financial strategy planning; coordinating organisational units and personnel; internal business control; products and service responsibility; public and consumer relations; advanced consulting; autonomy of action; approving financial commitments; staff service; supervision; complexity and stress; advanced financial responsibility; broad personnel responsibility.</td>
</tr>
</tbody>
</table>
Table 2.1(Continued)

<table>
<thead>
<tr>
<th>Author</th>
<th>Methodology</th>
<th>Participants</th>
<th>Position Elements/Dimensions/Factors/Roles/Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morse &amp; Wagner (1978)</td>
<td>Paper and pencil instrument based on Mintzberg’s (1973) managerial roles</td>
<td>A total of 941 managers (in three separate studies) across companies, functions and levels</td>
<td>Managing the organisation’s environment and resources; organising and coordinating; information handling; providing for growth and development; motivating and conflict handling; strategic problem solving.</td>
</tr>
<tr>
<td>Kotter (1982 a &amp; b)</td>
<td>Questionnaire, observation, appointment diary, interview, printed information</td>
<td>15 high-level general managers in various US firms</td>
<td>Setting agendas; network building; network using; implementing agendas</td>
</tr>
<tr>
<td>Yukl &amp; Lepsinger (1991)</td>
<td>Managerial Practices Survey developed and refined over 10 years</td>
<td>Over 2,000 managers across companies, levels, and functions</td>
<td>Planning and organising; problem solving and disturbance handling; monitoring; motivating; recognising and rewarding; informing; clarifying roles and objectives; supporting; consulting and delegating; conflict management and team building; networking.</td>
</tr>
<tr>
<td>Borman &amp; Brush (1993)</td>
<td>Content analysis of seven published and 18 unpublished studies</td>
<td>25 subject matter experts</td>
<td>Planning and organising; guiding, directing and motivating subordinates and providing feedback; training, coaching, &amp; developing subordinates; communicating effectively and keeping others informed; representing the organisation to customers and the public; technical proficiency; administration and paperwork; maintaining good working relationships; coordinating subordinates and resources to get the job done; decision making/problem solving; staffing; persisting to reach goals; handling crises and stress; organisational commitment; monitoring and controlling resources; delegating; selling/influencing; collecting/interpreting data.</td>
</tr>
<tr>
<td>Tett, Guterman, Bleier, &amp; Murphy (2000)</td>
<td>Content validation of a taxonomy by sorting behaviours into targeted competencies over a series of three studies</td>
<td>Between 110 and 118 subject matter experts</td>
<td>Traditional functions; task orientation; person orientation; dependability; open mindedness; emotional control; communication; developing self and others; occupational acumen and concerns (please see Annexure I for an elaboration of these nine “hyperdimensions”).</td>
</tr>
</tbody>
</table>
The first issue pertains to the failure of the two schools to isolate the drivers of managerial effectiveness. The methodology column of Table 2.1 indicates that all the studies cited could be classified as belonging to either the Behavioural or the Classical school, except for the one conducted by Flanagan (1951). Flanagan’s critical incident technique (CIT) was somewhat unique in the sense that Flanagan neither observed managerial behaviour nor made inferences about managerial activities from classical management functions. Instead, he recorded narrative accounts of incumbents and others close to the job about the things that people in the job in question did that made them either effective or ineffective. The dimensions of efficacy were distilled by analysing the narratives. Amongst the early scholars, Flanagan seems to have been the only one who concentrated on effectiveness. Unfortunately, the CIT’s focus on managerial effectiveness failed to enthuse Flanagan’s contemporaries.

The second issue pertains to the failure to integrate the findings of the Classical and Behavioural schools. A reconciliation of the evidence generated by the two schools would have helped the cause of theory-building in the area. Although the behaviouralist terminology in Table 2.1 may seem to have nothing in common with the classicist terminology, this is clearly not the case. As Hales (1986) argues, Kotter’s behavioural categories of Setting Agendas, Network Building, and Utilizing Networks, broadly translate into the classical tasks of Planning, Making Contacts, and Influencing respectively. Similarly, Mintzberg’s (1973) Figurehead, Leader, and Spokesman categories appear to be an amplification of Sayles’ (1964) Leadership category. Looked at in this light, the criticisms directed at the Classical School do not appear to have much merit.

As pointed out, Mintzberg (1973) had questioned the relevance of classical descriptions. He believed that the classical functions vaguely described the objectives of managerial work, and not what managers did. Somewhat surprisingly, Mintzberg’s assertions gained wide acceptance despite Mahoney, Jerdee, and Carroll (1963) having earlier shown that it was possible to integrate the classical and the behavioural perspectives by simply asking managers why they did what they did at any given point of time. For example, the empirical fact that managers spent a lot of time gathering and disseminating information could just as well have been interpreted as support for the classicist claim that managers coordinate and control. After all, it was possible that managers felt the need to gather and disseminate information in order to coordinate and control the work of subunits under their jurisdiction. For some reason, the potential of the Mahoney, Jerdee and Carroll study to
integrate the Classical and Behavioural School was generally ignored. It was left to Caroll and Gillen (1987) to bring the study back into circulation.

The Mahoney, Jerdee and Carroll (1963) study showed that the observable behaviours of managers (conversing, reflecting, inspecting, and so on) were directly related to eight classical functions: Planning, Representing, Investigating, Negotiating, Coordinating, Evaluating, Supervising, and Staffing (or PRINCESS). Carroll and Gillen (1987) pointed out that the PRINCESS study had been successfully replicated by Penfield (1975), and its results were congruent with those of Haas, Porat, and Vaughan’s (1969) study. While it had never gone entirely out of fashion to talk about managerial work in terms of classical functions, Caroll and Gillen’s (1987) reiteration gave the Classical School a fillip that was much needed following Mintzberg’s (1973) onslaught. In what signified a major revision of his position, Mintzberg (1994) conceded that managers do undertake classical functions like planning, organising, directing, and budgeting. He however insisted that the classical descriptions of managerial work, while not being wrong, were narrow.

Unless one subscribes to the view that managers have been doing what they should never have done, one would have to acknowledge that any theory which aims to explain and describe what managers should do must ultimately account for the evidence on the content of managerial work that has been generated by both the Classical and Behavioural Schools. The theory that will be developed in this thesis could later be gauged against its ability to do so. For the moment, the fact that the findings of the two schools of thought on managerial work do not appear to be incommensurable makes one optimistic about the prospects of developing such a theory. The focus can now shift to the evidence on the common characteristics of managerial work. Again, this evidence too will have to be accounted for by the theory developed in this thesis.

**Characteristics of Managerial Work**

A number of studies involving participant observation showed that managerial work was ad hoc, frenetic, and prone to frequent interruption. Much of what managers did was an unreflective response to circumstances; managers had to think on their feet while reacting to emergencies (Carlson, 1951; Copeman, Luijk, & Hanika, 1963; Horne & Lupton, 1965; Mintzberg, 1973; Kotter, 1982a). The studies also indicated that managers held brief face-to-face meetings, usually at the behest of others, in which a large amount of information got exchanged. Kotter (1982a) found that short disjointed conversations helped managers achieve
dual objectives. Firstly, they could attend to their agendas by quickly gathering large amounts of information from various sources. Secondly, the brief conversations also ensured that they could network more efficiently with a large number of people. Thus according to Kotter, one needed to dig beneath the surface to discern the “efficiency of the seemingly inefficient (managerial) behavior” (1982a; p.91).

Indeed, there is considerable evidence that managerial activities are incoherent and not readily discernable. While the collective evidence mentioned in Table 2.1 indicates that managerial jobs do share common elements, it would be prudent to pay heed to Hales who cautions that studies which seek to isolate individual elements, “may, in the process, lose the „living whole” in that managerial work is not the sequential execution of separate activities but is often an artful, simultaneous synthesis of inter-dependent activities or reconciliation of conflicting demands” (1986; p.102). Kotter (1982a) also found that managers commuted rapidly between multiple activities to keep things on track and a discrete activity that could provide the context, even the opportunity, for carrying out other activities.

As pointed out in the context of the manager versus leader debate, Mintzberg (1994) had observed that while it was possible to isolate job elements conceptually, in practice it was not feasible to do so because managerial activities were embedded in each other. Further, it should be noted that managerial jobs were seldom rigidly defined. Stewart (1976) found that managers often negotiated the boundaries of their work and tended to favour a particular style. For instance, a manager could prefer to delegate an entire task to her subordinate, while another in an identical situation could choose to delegate only partially and closely supervise the execution of the task in question. Additionally, managers not only negotiated the boundaries of their jobs but they also attempted to alter the content of their jobs so as to become less reliant upon others (Sayles, 1964), bring attractive functions under their control, and off-load more time consuming jobs (Dalton, 1959).

That managers tend to alter the content of their jobs in the manner described above suggests that their jobs also have a political character. In fact Dalton (1959) found that managers frequently engaged in power struggles to control resources for their respective cliques. Silverman and Jones (1976) discovered how middle managers resolved role conflicts created by the policy directives of their superiors and the pleas from their subordinates. Similarly, Nichols and Beynon (1977) found that managers needed to employ ideological tools to cope with the contradictions arising out of the need to simultaneously manage people
and technical systems. Fletcher (1973) and Stewart (1983) have also commented on the political aspects of managerial work. The political intrigues and competing demands that scholars have uncovered imply that managerial work is as much about making compromises as about anything else.

It is hardly possible to summarise the characteristics of managerial work more succinctly than does Hales (1999a). He notes that managerial work is characterised by fragmented activities prone to interruption; a need to react to events, problems, and requirements of others; a preoccupation with the immediate, ad hoc, and unforeseen; activities that are embedded in other activities; a high level of verbal interaction; conflict and pressure arising out of juggling competing demands; and a degree of choice and negotiation over the boundaries of managerial jobs and how they might be undertaken.

Thus far, the chapter has taken stock of the evidence that answers the questions pertaining to what do managers do and what is their work like. Now the focus shifts to the evidence related to the third question: How and with whom do managers spend their time? Research, particularly from the Behavioural School, has provided some answers to this question.

**Managerial Contacts and Time Allocation**

A number of studies found that managers spent a bulk of their time interacting verbally with others (Guest, 1956; Mintzberg, 1973; Kotter, 1982a). Whom managers interacted or networked (Kotter, 1982a) with varied with managerial position and function (Burns, 1957; Carlson, 1951; Stewart, 1967a); nonetheless it appeared that managers spent a greater amount of time communicating with their subordinates and peers than they did interacting with their superiors (Burns, 1957; Kelly, 1964; Horne & Lupton, 1965). When managers were not exchanging information with others, they were generally engaged in trouble shooting and assisting others (Phesey, 1972). Stewart’s (1976) study, which identified four work patterns in managerial jobs, each with its own time rhythm (system maintenance, systems administration, project, and mixed) confirmed that managers spent a lot of time in routine monitoring and maintenance of work processes.

In one of the more interesting findings on time allocation patterns, Luthans, Hodgetts, and Rosenkrantz (1988) reported significant differences between how effective and successful managers spent their time. The criteria used by the authors to gauge managerial success and
effectiveness will be discussed later; in the current context, it is worth noting that while effective managers were found to spend a bulk of their time (44%) communicating, successful managers reportedly spent a bulk of their time (48%) networking. Average managers (i.e., those neither very effective nor very successful) were found to spend a bulk of their time (32%) on traditional management functions. Early studies on managerial time allocation too had lent support to the importance of classical managerial functions. For instance, Mahoney, Jerdee, and Carroll (1963) reported that managers spent 19 percent of their time planning, 26 percent of their investigating, and 21 percent of their time coordinating. Some early studies had also investigated where managers spent their time (e.g., Stewart, 1967a). The results of these investigations varied greatly across functions and levels and were not very illuminating. In general, managers were found to spend about half their time out of their own offices.

By and large, nothing very useful emerged from the body of research that concentrated solely on managerial time allocation. Perhaps this was because unlike Stewart (1976), who studied work rhythms over time, none of the other scholars recognised the need for longitudinal studies to better understand managerial work. For instance, how production or marketing managers spent their time could well have been a function of seasonal cycles, and product launch schedules. Scholars should have perhaps exercised greater caution before reaching conclusions about managerial time allocation patterns on the basis of a couple of weeks of diary entries or observations. Campbell, et al. (1970) rightly criticised such investigations noting that they yielded nothing more than descriptive tabulations and that no more fundamental dimensions could be developed from them.

In fact, two fundamental dimensions had emerged earlier, but from a different set of studies that, instead of scrutinising time allocation patterns, used questionnaires and checklists to obtain ratings and descriptions of managerial jobs. Ironically, the dimensions which emerged were wrongly appropriated as pertaining to leader behaviour. They probably pertained more to the generic domains in which managerial work takes place. A fresh interpretation of an existing body of evidence follows.

**Inferring Domains of Managerial Work**

In a series of studies that spanned over three decades, the Ohio State University (OSU) administered questionnaires to managers in business, the military, and labour unions that asked them to rate a large number of job-related statements. The responses were then factor analysed. The end result was LBDS – Leader Behavior Description Scales. The scale
started with over eighteen hundred statements. Subject matter experts culled all but 150 of these statements into nine categories, which were again factor analysed to yield two fundamental dimensions: consideration (primarily pertaining to integration, communication, representation, and fraternization) and initiating structure (involving primarily organization, domination, initiation, evaluation, and production emphasis). See Fleishman (1953) for a detailed description of how the LBDS was developed. Inexplicably, the findings of the OSU studies failed to impress scholars studying managerial work.

Although the respondents were almost without exception managers, the OSU studies have had a greater influence on the leadership than on the managerial work literature. The findings were interpreted to indicate that some leaders showed a lot of consideration towards their subordinates while getting a task accomplished whereas others emphasised the task itself and paid greater attention to other systems that could support the accomplishment of the task. In other words, the latter attached more importance to the initiating structure. Thus it was argued that leaders were either people- or task-oriented. Other leadership theories have since suggested that a leader’s concern for either the subordinates or the task is often contingent upon the situation. To discuss leadership theories further would be a digression. The point is that the OSU studies, as explained below, were revealing something about the generic nature of managerial work that appears to have been overlooked.

In their review, Campbell, et al. criticised the OSU studies for reducing the data to only two dimensions and in the process oversimplifying “the characteristics and full range of behaviors demanded by managerial jobs” (1970; p.85; emphasis added). But therein lay the problem. It is contended that the dimensions distilled by OSU studies were not behavioural dimensions per se. If one accepts that managers get work done through other people, then logically managerial work could be seen as taking place in two domains: the interpersonal and the technical or functional domain in which the task unfolds. This is precisely what the OSU studies had uncovered. Managers, in order to get a technical or functional task done through their subordinates, must at times show concern for them; and at other times they must put a premium on the technical or functional nature of the task. Thus the consideration and initiating structure dimensions could be interpreted as reflecting the interpersonal and technical-functional domains of managerial work.
Acts of Omission and Commission

The foregoing literature review has identified two acts of omission and one of commission that scholars in the area appear to be guilty of. Firstly, they ignored the potential of Flanagan’s (1951) CIT, which could have helped them learn more about managerial effectiveness. Secondly, the scholars failed to recognise that it was possible to integrate the findings of the Classical and the Behavioural School and thereby missed an opportunity to develop a comprehensive theory that could explain managerial work. And thirdly, the findings of OSU studies were misinterpreted, or incompletely interpreted by them. By treating the evidence from OSU studies as pertaining only to leader behaviour, scholars overlooked the implications of the OSU findings for managerial work. This thesis will address these oversights as it attempts to explain and describe what managers in general should do. To the extent managers have generally been doing what they should be doing, the theoretical explanation offered will have the potential to account for all the evidence on the commonalities of managerial work discussed thus far.

Scholarship in the area has been justifiably criticised for its atheoretical roots (Hales, 1999a). It will have been noticed that neither the Classical nor the Behavioural School can claim to have developed any theoretical framework on managerial work. In fact, with no coherent theory to guide data collection, the inductive approach of behaviouralists led to a somewhat arbitrary codification of managerial activities (Martinko & Gardner, 1985). Moreover, it appears that Mintzberg and the other behaviouralists failed to recognize that much of managerial work being mental, could not in any case be observed (see Carroll & Taylor, 1968). In so far as the classicists are concerned, as mentioned, the early practitioners had relied on commonsense principles and had never attempted to build any theory. Unfortunately, despite validating the musings of practitioners, academics failed to take the next logical step. They did not attempt to offer a theoretical explanation of the classical functions. In fact, the first theoretical explanation of managerial work that one comes across in the literature was offered not by an academic, but by Chester Barnard, a senior executive with New Jersey Bell Telephone.

Presenting a formal theory of the organisation, Barnard wrote that an organisation comes into being “when (1) there are persons able to communicate with each other (2) who are willing to contribute action (3) to accomplish a common purpose” ([1938], 1971; p.82). Analogously, he reasoned that the essential executive functions comprised of three roles:
providing a system of communication; promoting the securing of essential efforts; and formulating and defining purpose. Barnard implied that a business entity was first and foremost a social organisation wherein people did not always act rationally. According to him, one of the primary tasks of managers was to align the goals of individuals with those of the organisation. He recognised the potential for conflicts and the power of incentives to nip conflicts in the bud. As things stand today, Barnard’s thoughts may seem mundane; however, his thinking when first articulated was far ahead of its time. Barnard’s ideas were eventually embraced by sociologists, systems thinkers, and organisational theorists (see Williamson, 1990), but not by those studying managerial work.

The area continues to suffer to this day due to its atheoretical legacy. It is thus not surprising that holistic models on managerial work are scarce. The relatively recent attempts to integrate previous results with the help of subject matter experts are not theory-based (e.g., Borman and Brush, 1993; Tett, et al., 2000). Data reduction attempts, as shown in Table 2.1, have only succeeded in augmenting the number of atheoretical lists of managerial job elements. And as Mintzberg points out, “a list is not a model…and so the integrated work of managing still gets lost in the process of describing it” (1994; p. 11). It is argued in the next section that historically, whether by accident or otherwise, research on managerial work has failed to link with and draw from the prevailing wisdom about management.

MANAGEMENT THEORIES AND MANAGERIAL WORK: THE MISSING LINK

Since the 1930s, three different approaches to management have competed for precedence – the traditional approach often described as the Taylorist or the Scientific Management approach, the Human Relations approach, and the Systems approach (Kast & Rosenzweig, 1981). One can discern that the field has progressed through what the early 19th century German philosopher, Hegel would have described as a dialectical path. According to Hegel, “all logic and world history itself followed a dialectical path, in which internal contradictions were transcended, but gave rise to new contradictions that themselves required resolution” (as cited by Honderich, 1995; p. 198). Hegel’s *dialectic* is often explained with the help of the more familiar terms: thesis, antithesis, and synthesis.

A thesis may be described as a single dominant theme. The dominant theme invariably contains shortcomings that give rise to an antithesis, an idea almost diametrically opposite to the one espoused by the thesis. Another point of view, a synthesis, arises from the conflict
between thesis and antithesis. The synthesis reconciles the truths contained in the thesis and antithesis and in the process of doing so advances knowledge. The synthesis goes on to become a new thesis. Inevitably, it too generates an antithesis, and the cycle repeats itself as the quest for truth continues. Applying Hegel’s thinking, one would regard Taylorism as the prevailing thesis during the early part of the twentieth century. The excesses of Taylorism gave rise to its antithesis – the Human Relations movement of the 1930s and 40s. Finally, the 1960s saw the emergence of Systems thinking – a “synthesis” which attempted to reconcile the thinking found in Taylorism and humanism. Figure 2.1 depicts this journey.

**Figure 2.1**

**Management Thought: Evolution through a Dialectical Path**

Had the scholars studying managerial work been influenced by the dominant management theory of their times, their studies would have been informed to some extent by the themes found in Taylorism, humanism, and systems thinking. But this link between management theories and research on managerial work is more or less non-existent. And where a link does exist, it is either insufficiently developed or very tenuous in the sense that scholars have focused on a narrow aspect of managerial work while making the connection. For example, some scholars have focused exclusively on managers as decision makers and
accordingly borrowed from Simon’s (1976) theory of bounded rationality. Simon had theorised in the 1940s that managers must perforce satisfice while making decisions in a complex world. In fact, he was one of the first thinkers to question the belief in the “one best way” and the closed, rational model of organizations as propounded in the Scientific Management era (see Scott, 1991).

As is well known, Frederick Taylor’s principles of scientific management advocated standardisation of processes and division of labour to better exploit the potential of machines on the factory floor. The other influential work of the era, Max Weber’s theory of bureaucracy developed in the early 1920s shared the underlying preoccupation of its time: increased efficiency via adherence to hierarchy and spans on control. Although Henri Fayol wrote in the same era, his writings did not share much in common with the Tayloristic notions of organisational efficiency. He did recognise the importance of controlling and commanding, nonetheless, it should be noted that Fayol did not explicitly mention the need for managers to divide labour, determine spans of control, concentrate on efficiency, and design organisational hierarchy. The dominant logic of the Scientific Management era dictated that managers put a premium on these issues to make their organisations efficient. Fayol either failed to make this link or chose not to make inferences from Taylor’s treatise.

While Fayol might not have been greatly influenced by Taylorism, the same cannot be said of managers and factory owners. In their quest to optimise through “one best way,” they ended up dehumanizing and deskilling labour and subordinating it to machines. In protest as it were, the scholars swung the pendulum to the other extreme. Organisations, in the late 1930s, were advised to concentrate on fulfilling human needs before all else. The Human Relations era was dominated by theorists such as Mayo, Maslow, Herzberg, and McGregor. Their work did inform theories on leadership, individual motivation, and group behaviour. There is however no evidence to suggest that human relations thinking had a major influence on how managerial work was conceptualised. More importantly, despite numerous efforts, scholars failed to unearth a strong connection between good human relations and firm performance. This lack of empirical evidence perhaps persuaded scholars to look for answers elsewhere.

By the 1960s, “because of the weaknesses of traditional (i.e., Tayloristic) and human relations thinking and because of its own obvious superiority, the systems approach came to dominate management theory” (Jackson, 1991; p.41). While Taylorism and Weber’s
approach concentrated solely on the task and structure of organisations, the human relations approach focused only on people. The systems approach, as Jackson points out, was more holistic because it looked at organisations as systems made up of interrelated parts. Not only were tasks, structures, and people incorporated, but in systems thinking there was also place for external markets, technology, and competition.

It is perhaps fortuitous that Fayol and the other classical writers on managerial work did not get completely swayed by Taylorism; otherwise the resulting draconian prescriptions might have made an already bad situation worse. Similarly, it would appear that blind managerial adherence to human relations thinking could have done more harm than good to an organisation. But this is not to say that as things currently stand, managers would not benefit from theory-driven prescriptions. This time round, scholars studying managerial work might rue turning a blind eye to systems thinking. They ought to consider whether new ways of engaging with the extant evidence are needed to make headway. The atheoretical categories used by the Classical and Behavioral School have not helped identify the drivers of managerial effectiveness, as a result the area has stagnated. It will be later shown that the open systems perspective can potentially account for all the extant evidence under entirely new categories and offer fresh insights on managerial work in general and managerial efficacy or competency in particular.

It is not as if the systems perspective has been completely ignored by scholars of managerial work. Systems theory has spawned contingency theory. The former acknowledges that there might be a number of ways (as opposed to “one best way”) of doing things that are contingent upon the external and the internal environment (Jackson, 1991). Contingency theory, in turn, seems to have encouraged scholars to look at isolated aspects of managerial work and its variations. For example, Katz (1974) argued that all managers needed conceptual, interpersonal, and technical skills – only the amount of skills and the importance of the skills needed were contingent upon the type of organisation and managerial level. A number of scholars similarly claimed that managerial work was impacted by organisational structure and size; functional levels; national culture; and so forth (see Hales, 1986). While there is merit in understanding the isolated aspects of managerial jobs and its variations, this fixation with contingencies appears to have prevented scholars from understanding managerial work in its entirety (Mintzberg, 1994; Hales, 1999a).
As stated earlier, there is much to be gained by turning to systems theory to take a holistic view and account for all the evidence on commonalities, as opposed to only the variations, of managerial work. Without an explanatory theory on the general nature of managerial work, as Hales points out, “much of the evidence on what managers do is rather meaningless: a catalogue of disconnected actions, events, and encounters” (1999a; p.336). But before discussing how a systems perspective can inform the area, it is important to discuss the few attempts that have been made to explain managerial work. The next chapter critiques the extant theoretical explanations and establishes that the area needs to adopt a fresh approach if it is to arrive at firm conclusions about what managers in general should do.
CHAPTER 3
EXTANT EXPLANATIONS OF MANAGERIAL WORK

The variety in perspectives and methods that have been adopted to study what managers do makes the task of integrating and explaining the evidence on the commonalities of managerial work particularly difficult. This chapter begins by reviewing and critiquing, in chronological order, the four models that explicitly try to explain why managers do what they do. Although the extant explanations integrate the evidence on the commonalities of managerial work, they do not enable one to arrive at conclusions about what managers should do. It is contended that normative shortcomings will persist unless scholars successfully isolate valid criteria for gauging managerial effectiveness. The chapter then shifts its focus to partial explanations that can help one understand the important aspects of the generic nature of managerial work. Thereafter, since managerial work is seen in this thesis through a systems lens, the extant systemic conceptualisations of an organisation and their implications for managerial work are critiqued. An overview of the systemic conceptualisations is also considered important because this thesis later reinterprets systemic properties to arrive at a new way of conceptualising organisations. The aim is to enable comparisons between the extant systemic views and the one that is proposed in Chapter 5.

Before concluding, the chapter acknowledges that notions of managerial effectiveness need not necessarily be based on normative conclusions about managerial work. While it may make intuitive sense to conclude that managers who do what they should do may be deemed effective, it may not always be easy to isolate what managers should do. Scholars have used alternative approaches to understand managerial efficacy. Indeed, the drivers of managerial effectiveness are of great interest to management scholars across disciplines and may be described as the area’s Holy Grail. Accordingly, the effectiveness criteria that are to be found in the managerial work literature are briefly discussed. The chapter points out that since the effectiveness criterion implied by the systems view is amongst the most robust and valid, salvation will most likely come from a systemic view. It is asserted that systems theory appears to be ideally positioned to lead one to the grail.

In keeping with the outline discussed above, Chapter 3 contains four sections: (i) Integrative Models of Managerial Work, (ii) Partial Explanations of Managerial Work, (iii) Systemic Conceptualisations, and (iv) Alternative Approaches to the Grail. The chapter
begins with a review of the Carroll and Gillen (1987) model, which represents one of the first attempts to integrate and explain the evidence generated by the classical and behavioural perspectives.

**INTEGRATIVE MODELS OF MANAGERIAL WORK**

**Agenda Driven Model: Carroll & Gillen (1987)**

In the Carroll and Gillen (1987) model, managers are shown as having goal and task agendas – with the latter serving as a means to the former. The managerial agendas are said to be influenced by the following factors: organisational and unit plans, policies and procedures; problems and task assigned by others; managers’ own values, belief systems, and perceptions of the organisational environment; and job constraints, demands and choices. As work agendas crystallise (or change), managers, along with organisational and extra-organisational personnel, undertake activities – including unobservable mental activities – to carry out managerial functions (e.g., planning, organising, controlling) on- and off-site. Finally, Carroll and Gillen claim that the effectiveness with which the classical functions are carried out, the knowledge base, and the competencies of the managers collectively impact managerial performance. Managerial performance in turn is theorised to lead to agenda revision. And thus the cycle continues. Figure 3.1 depicts the Carroll and Gillen model.

As shown in Figure 3.1, Carroll and Gillen have integrated the classical and the behavioural perspectives by differentiating “activities” from the “purpose of activities.” According to their model, managers act in particular ways in order to accomplish their agendas or goals. As was discussed in the previous chapter, one could justifiably interpret the act of a sales manager disseminating news (an informational role as per the Behavioural School) to be a consequence of the need to co-ordinate (a classical function) the actions of a subordinate sales force in order to achieve a sales target (a goal). In other words, Carroll and Gillen argue that classical management functions can, and often do, underpin managerial behaviour. Tsoukas (1994) too has reached similar conclusions, albeit through a different route. He attributes the differences in perspectives on management and managerial work to scholars tapping into different ontological layers of the same phenomenon and arriving at narrow conclusions consistent with their limited worldview. Embracing a realist paradigm, Tsoukas integrates the different perspectives through a causal mechanism. An explanation follows.
Organizational and unit plans, policies, procedures

Unique tasks and problems assigned by others

Manager’s own observations of the organization and its environment

Manager’s personal concerns, values and implicit theories of management and behavior

Job constraints, demands, and choices

WORK AGENDA (goals and tasks)\(^b\)

ACTIVITIES (actions, interactions, thinking)\(^c\)

DEGREE OF PROGRESS ON PURPOSES OF ACTIVITIES (POC\(^3\) or PRINCESS functions)\(^d\)

KEY MANAGEMENT SKILLS OR COMPETENCIES\(^e\)

POC\(^3\): Planning, organizing, commanding, coordinating, & controlling.
PRINCESS: Planning, representing, investigating, negotiating, coordinating, evaluating, supervising, staffing.

Source: Caroll & Gillen (1987)

Though ostensibly pertaining to management, the Tsoukas (1994) model in fact tries to explain the evidence on managerial work. Tsoukas notes that while some scholars consider management to be a collective institutional process analogous to abstract concepts like class, bureaucracy, or market, others treat it as a product of actions taken by individual actors. The macro- and micro-orientations have expectedly produced very different perspectives on management. Tsoukas, with a view to later integrate them, identifies four main perspectives that are to be found in the extant literature: management functions, management task characteristics, management roles, and management control. Each of these perspectives is discussed briefly.

**Management Functions.** As stated earlier, the Classical School which dates back to early 20th century relied on work experiences of practitioners to suggest commonsense management functions such as $POC^3$ and $PODSCoRB$. Tsoukas observes that the atheoretical lists of classical functions have since been augmented by systems thinking and historical analyses. He notes that Beer (1981, 1985), a systems thinker whose work will be discussed separately, has argued that organisational survival entails management functions like coordination, the internal and now (i.e., the production function), the external and future (i.e., the innovation function), and the securing of organisational identity and legitimacy (i.e., the institutional function). In similar vein, Tsoukas reports that a historical analysis by Teulings (1986) reveals that management has progressed through stages and is currently expected to perform the ownership function (i.e., accumulate capital and preserve legitimacy); the administrative function (i.e., allocate investments); the innovative function (i.e., develop new products); and the production function (i.e., exercise control over the labour process). Thus the Classical School, systems thinking, and the historical approach all hold that the essence of management may be distilled to a set of functions that organisations must carry out.

**Management Task Characteristics.** While there may be a set of management functions that must be carried out, how they are carried out usually differs from one organisation to the next. Tsoukas concurs with Whitley (1987, 1989) that organisations, to justify their existence, must combine human and material resources in ways that their integration generates more value than otherwise. The need to generate value compels organisations to grant managers authority and discretion over resource allocation. The
organisational nature of management activities, and the discretion enjoyed by managers renders managerial tasks: highly interdependent and contextual; relatively unstandardised; developing and fluid; orientated towards both the maintenance and innovation of administrative structure; and difficult to gauge because it is seldom possible to directly link visible outputs to individual inputs. Tsoukas” characterization, despite being based solely on Whitley’s (1987) non-empirical work, enjoys support of the evidence generated by the Behavioural School. It should however be borne in mind that although managerial tasks are contextual, scholars, as discussed in the previous chapter, have unearthed a number of characteristics that are common to managerial work (e.g., fragmented activities; a need to react to events, cope with competing demands; and so forth) across industries.

**Management Roles.** As discussed in the previous chapter, the Behavioural School has generated substantial evidence on not only the common characteristics of managerial tasks, but also the general content of managerial work. Tsoukas captures the latter under the “management role” perspective. He refers in the main to the interpersonal, informational, and decisional roles identified by Mintzberg (1973) and to the roles identified by Steward (1976) and Kotter (1982a). Since the evidence on the content of managerial work has already been reviewed in depth, a further discussion is not considered necessary (refer back to Table 2.1 in Chapter 2). It is worth noting though that Tsoukas too is critical of the Behavioural School for failing to link observable managerial behaviours and activities to broader organisational objectives. Empiricists, he notes, would have learnt more had they explored why managers behave in the manner that they do.

**Management Control.** The neo-Marxists (e.g., Armstrong, 1989; Hales, 1989; Wilmott, 1984), who may be seen as subscribing to the management control perspective, prefer to focus on the structural and institutional basis of managerial power, and not on the superficial aspects of managerial behaviour. Tsoukas points out that the neo-Marxists consider managers as agents of capital, and believe that managers behave in the manner that they do, to sustain and reproduce this agency relationship. He observes that the management control perspective could be criticised for making “too great a conceptual leap from concrete managerial activities to abstract relations of production,” (1994; p. 294) and that it is debatable whether there is a direct link between capitalist production relations and managerial work. Tsoukas then goes on to explain how management, being embedded in an industrial
structure comprising of superiors, subordinates, the division of labour, capital owners, labour power, and the capitalist mode of production, derives its power from three sources: an ability to control the transformation of potential labour power to actual labour; an ability to offer symbolic and material rewards to elicit cooperation; and the fact that the drive towards efficiency and effectiveness is widely accepted as being a must for survival in the current socioeconomic context.

Meta-Theoretical Integration. Having summarised the four perspectives on management, Tsoukas makes an attempt to integrate them by arguing that:

For a particular set of management roles (i.e. what managers actually do) to be possible, management tasks (i.e. what managers have to do given the organisational nature of their activities) must possess certain characteristics. Similarly, for management tasks to have the features that they do, certain management functions (i.e. what has to happen for an organisation to be managed) need to be carried out. Finally, for management functions to be what they are, management must have a certain nature (described here as a set of causal powers) which endows management with a theoretically necessary way of acting. The causal powers of management derive their existence from management’s incorporation into the industrial structure (1994; p. 299; emphasis in original).

The above argument conceptualises management as having a four-layered structure corresponding with the four perspectives (or the four theoretical descriptions) of management as shown in Figure 3.2. The top two ontological layers are said to be populated by micro-level phenomena that unfold in the empirical domain. In other words, Tsoukas claims that one can physically observe managers enacting their roles and the characteristics of their tasks. In the third layer, lie the macro-level management functions whose existence can only be inferred. All the same, they actually exist in the sense that they generate observable events. Finally, at the bottom layer, in the real domain, is said to rest the causal mechanism (i.e., the mechanism that causes reality to actually unfold). The difference between the actual and real domain is that the former may be out of phase with the latter and even though the two may co-exist, they may not combine to trigger an event. It is up to the human agency (managers in this case) to ensure that the two come together. Otherwise, for practical purposes, the real would lie dormant and may never trigger events, at least not in the form desired, in the empirical domain. Thus the realists hold that the move from the real to the actual and thence to the empirical is a contingent accomplishment.
The causal mechanism that resides in the bottom layer or the *real domain* (TD 4: OL 4 in Figure 3.2) enables managers (or management if one prefers) to transform labour power into actual power. The questionable assumption seems to be that left to its own device, labour will seldom want to realise its full potential, hence the need to manage it. Tsoukas theorizes that managers have the power to realise the full potential of labour, but whether they can do so or not is contingent upon several factors including markets, technology, strategy, values, and so forth. Recollect that managerial power is said to emanate from (or caused by) the ability of managers to control labour through a rewards system, and the desire for effectiveness and efficiency. The causal mechanism proposed by Tsoukas will be critiqued later. His assertion that most management scholars have failed to link the macro- and micro-views, and as a consequence missed the big picture, has merit. It is in pursuit of just such a picture that Mintzberg (1994) puts forth a *rounded-out model* of managerial work.

**Rounded Out Model: Mintzberg (1994)**

In his model, Mintzberg (1994) describes the manager as an autonomous individual possessing a set of values, competences, knowledge and mental models that contribute to his or her preferred style of doing things. This manager’s job is embedded in a frame that has three dimensions: (i) purpose (what needs to be done); (ii) perspective (guiding principles...
about how things should be done); and (iii) positions (issues like location of the unit in its environment, nature of product, markets served, and so forth). Each manager conceives the frame differently depending upon how sharp or vague the three dimensions of the frame are and whether the frame is self-created or externally imposed. The conceptualised frame ultimately gets manifested as a set of current issues or agendas that managers tackle through planned allocation of time and effort (or scheduling). See Figure 3.3 for a pictorial depiction of Mintzberg’s model.

**Figure 3.3**

**Managerial Work Rounded Out**

Source: Mintzberg (1994)
The autonomous individual and the managerial agendas (generated by the conceptualisations of the frame) combine to form the core of managerial work. The activities of the core are said to occur in a three-layered context – inside the unit enabling formal exercise of authority, within the rest of the organisation, and outside the boundaries of the parent organisation. Mintzberg states that a manager manages the activities in the three contexts by managing information, managing people, and managing action.

Managing information entails the roles of communicating (gathering and disseminating useful information) and controlling (developing systems, designing structures and issuing directives). Managing people involves driving and encouraging individuals, building and managing teams, and creating and preserving unit culture (i.e., leading). It also includes the role of linking one’s unit with the external environment by acting as a filter that allows acceptable influences to pass through and blocks out the potentially harmful ones. Managing action entails execution of internal projects under one’s own direct supervision. It may also entail doing (i.e., personal involvement in deal closures and negotiations with external agencies). Mintzberg describes his rounded out model as a think-link-lead-do model and clarifies that whenever possible, managerial style determines which roles are favoured, how they are performed, and whether managers act deductively (think and then act) or inductively (act to think).

A Critique

The models discussed thus far do not explain managerial work in a manner that enables one to make predictions about managerial performance. One is unable to determine what managers should do to be deemed effective. As will be discussed, Tsoukas’ (1994) meta-theoretical model holds the faint promise of addressing this normative shortcoming since it attempts to explain how labour might realise its potential. The model is a refined neo-Marxist explanation of managerial work. Tsoukas argues that managers do what they do because they are the bearers (or agents) of class relations (the reference here is to the management-labour divide) who have causal powers to transform potential labour to realised labour. Managers are said to be capable of influencing labour because of the powers enjoyed by them, owing to their position in the industrial structure, to reward (or punish) labour. But how does one account for the fact that labour too can punish management (by taking
industrial action for instance)? Tsoukas, in keeping with his realist paradigm, accommodates this possibility by introducing a contingency framework.

As stated, contingencies in the Tsoukas model include the entire industrial structure, organisational reality, socioeconomic conditions, and the market forces. The model therefore implies that managerial ability to realise the full potential of labour could be contingent on, amongst other things, the quality of labour relations (the latter being a facet of organisational reality). Tsoukas seems to overlook the fact that managerial action itself has the potential to sour labour relations. His model in effect gives complete freedom to the managers to explain away any and every failure, and eulogises them for being the only ones who could be expected to show concern for organisational goals. The others, at best, are conceived as reluctant participants in need of motivation; or at worst, as active saboteurs. Further, it is not explained as to how exactly the forces in an industrial structure vest differential levels of power in managers and influence the nature of their work. Given the different dynamics in different industries, managerial work ought to vary greatly across industries. But, as pointed out, evidence on the commonalities of managerial work suggests otherwise. More importantly, as argued below, Tsoukas seems to have arrived at questionable conclusions while interpreting causality and identifying the ontological layers of his model.

It is debatable whether task characteristics can “cause” or give rise to managerial roles as envisaged by Tsoukas (1994). If anything, the reverse appears more plausible. Arguably, it is because managers must disseminate information to or negotiate with various stakeholders that their activities become highly contextual and fragmented. Thus it is because managers must perform certain roles or functions that their tasks acquire certain characteristics, and not vice versa. Perhaps it would have been more accurate of Tsoukas to include observable managerial activities and task characteristics in the topmost layer (i.e., the empirical domain). Similarly, Tsoukas needs to reconsider the location of classical functions and behavioural roles in his model. Functions and roles per se, being unobservable, do not belong to the empirical domain. They are in fact abstractions best located in the second layer (i.e., the actual domain). With respect to the fourth layer, given his ontological assumption, Tsoukas cannot be faulted. A causal mechanism, by definition, must lie at the bottom layer (i.e., the real domain). So to describe reality, Tsoukas could have used three, and not four, layers:
empirical, actual, and real. This would have aligned his conceptualisation more closely with the realist paradigm (see Bhaskar, 1978; Outhwaite, 1987).

The realists insist that causal mechanisms hold the key to making predictions. For instance, the mechanism theorised by Tsoukas (1994) does have normative implications, but confusingly, the implications appear to be at once very narrow and broad. So much so that they cannot inform practice. Tsoukas implies that managers need to primarily focus on eliciting the cooperation of labour. He then adds an all encompassing proviso: a raft of external contingencies must remain favourable if managers are to successfully realise labour’s full potential. Tsoukas thus appears to suggest that despite the power purportedly enjoyed by managers, managerial action can neither create nor influence its own reality. Beyond concluding that managers should motivate labour and be prepared for every conceivable contingency, one is unable to decipher other drivers of managerial effectiveness from the Tsoukas model. The same can be said of Carroll and Gillen’s (1987) model.

Though the Carroll and Gillen (1987) model explicitly mentions managerial performance, it fails to identify what drives performance. One is merely told that managers who are competent and knowledgeable perform well. By theorising that managerial performance depends upon the knowledge and competence level of the managers (see Figure 3.1), the authors appear to offer an unhelpful tautology. Moreover, while they identify the factors that influence managerial agendas, they do not explain as to why and how particular agendas arise. In his model, Minztberg (1994) tries to address this issue by theorising that agendas get generated through the way autonomous individuals conceive their frames i.e., the way they think through the purpose, perspective, and positions of their respective units. But Minztberg’s explanation is based on questionable assumptions. As per his model, the way managers conceive their frames depends upon the clarity or fuzziness of the frame and whether it has been invented by the managers themselves or imposed upon them. Implicit in the reasoning is the flawed assumption that managers are incapable of internalising a strategic vision that is imposed upon them by an external agency. Besides, seldom are “frames” a product of a single internal or external entity. The processes via which they are produced often foster a sense of joint ownership.

The model proposed by Minztberg (1994) also seems to ignore the fact that a frame which appears clear to one manager may appear fuzzy to another. It is therefore not difficult
to think of a situation where an identical set of circumstances (in terms of the three
dimensions of the frame) produces different conceptualisations of the frame and leads to
completely different sets of managerial agendas and action. Mintzberg’s model thus makes it
very difficult, if not impossible, to reach normative conclusions about managerial work.
Managers, conceived as being totally autonomous, appear to have the license to do what they
want. Contrary to what Mintzberg suggests, in reality managers insist that it would be a
mistake to think that they enjoy a lot of power and authority. They complain that they have to
frequently float trial balloons that are routinely rejected by key subordinates (Carroll &
Gillen, 1987). Hales too is critical of Mintzberg’s notion of an organisation being the
“manager’s adventure playground” (1999a; p. 342). He has suggested an alternative model of
managerial work that is discussed next.

Structuralist Model: Hales (1999a)

According to Hales (1999a), a manager may be seen as someone responsible for a
well-defined area of work and for those who work in the area. For example, a marketing
manager could be seen as someone responsible for marketing related activities and for those
who work with her in the marketing unit. Managerial responsibility is theorised by Hales as
being both enabled and constrained by the resources (facilities made available and denied),
cognitive rules (what is managerial and what is not), and moral rules (what is legitimate and
what is not) of the social systems that managers find themselves in. Managers, owing to the
precarious nature of their work (precarious because they are held individually responsible for
what is a collective effort), are forced to draw upon and reproduce the resources of a system,
and its cognitive and moral rules to affirm themselves and their position in that system.

All managers, in the process of affirming themselves, are said to engage in the kinds of
generic activities that they have been found to engage in by the behaviouralists. One can,
for instance, imagine the marketing manager in the example cited above, having to act as her
unit’s point of contact and also negotiate priorities and duties in her area of responsibility.
Additionally, one can visualise her feeling the need to draw upon information (a resource)
and disseminate the same to her subordinates as per existing norms and in the process
recreate the very webs of information on which she is reliant. Hales argues that his model can
similarly account for all the evidence on the commonalities of managerial work discussed in
the previous chapter. For instance, he reasons that the generic activities pertaining to
managing human resources, handling disturbances, and designing work processes could be seen as stemming from managers being made responsible for the labor process.

The attempt by Hales (1999a) to explain why managers do what they do is admirable in that it cogently connects ideas from Giddens” (1984) structuration theory that provides the link between structural properties (in the form resources and norms) and managerial activities, Foucault”s (1982) notion of how institutional practices simultaneously bestow freedom and responsibility, and Whittington”s (1994) work on institutional systems within which a managerial agency is embedded. A closer examination nonetheless reveals that this explanation raises more questions than it answers. Managerial responsibility as a point of departure is particularly problematic. Given the increasing emphasis on cross-functional teams and collaboration, it is not always possible to delineate clear lines of responsibility. Besides, who is to decide what exactly should managers try to achieve in their areas of responsibility? “Managers themselves” is the response. The picture painted is that of an inward looking managerial cadre that justifies its own existence by turning to self-created social rules and norms. Managers do what they deem themselves to be responsible for doing. This prevents Hales, just as it does Mintzberg (1994) in his case, from reaching normative conclusions about managerial work.

The Elusive Grail

The theoretical models reviewed above may not permit one to make normative conclusions, but they certainly show that it is possible to integrate the evidence generated by the Classical and Behavioural School. By integrating the evidence, the authors of the extant models have also shown that the classical and the behavioural accounts may not be as atheoretical as they are made out to be. However, establishing that there might be reasons for managers to plan, coordinate, control, disseminate information, make decisions, network, and so forth is not the same as identifying the Holy Grail – the drivers of managerial effectiveness. True, one could insist that because all managers must perform certain classical functions and behavioural roles, to be effective they should be proficient in executing them. Seen thus, the managerial functions and roles do have a normative ring to them and the foregoing critique may be dismissed. But such a dismissal would betray a continuing pre-occupation with current categorisations of managerial functions and roles and will most likely condemn the area to forever remain in pursuit of the elusive grail.
Despite decades of research, scholars continue to be unsure of what causes effective managerial performance. Lists of managerial functions and roles have proven singularly unhelpful (Hales, 1999a; Mintzberg, 1994). This is because asserting that managers must plan or share information is not enough. One must then go on to show what needs to be planned, what and how information needs to be shared. Such a line of inquiry would no doubt produce highly contextual answers and probably prove unavailing if one’s aim is to develop a general theory of managerial work. For example, what information needs to be shared, with who, and how is likely to vary across situations. Indeed, it is debatable if the descriptions of managerial action in terms of planning, sharing information, coordinating, and so forth can ever be generalised. A theory that captures managerial work from a new perspective may be needed if the area is to offer prescriptions that can inform managerial action (Stewart, 1989).

Commenting on the process of theory building, Christensen and Raynor (2003) observe that it has three stages: thorough description of the phenomenon; classification of the phenomenon into categories; and an articulation of what causes the phenomenon to occur, and why. The authors assert that amongst the three stages, “The middle stage – getting the categories right – is the key to developing useful theory” (2003; p. 13). They note that the entire theory building process tends to be iterative as researchers must keep cycling through the stages and refining their ability to make predictions. In the current context, the theoretical models reviewed above do engage with the extant evidence, but fail to make general predictions about managerial effectiveness. The models, without exception, invoke Classical and Behavioural School categories to classify evidence. Could the problem lie with the classification categories? It is perhaps time to iterate by taking a step back, considering new categories to capture the evidence, and making an attempt to understand the phenomenon from a new perspective.

The area continues to be saddled with taxonomies that have not enabled scholars to make predictions. Despite the stagnation, scholars have tended to shy away from proposing new categories to capture the general elements of managerial work. To move away from the specificities that must inevitably be factored in when conceptualising managerial work in terms of classical functions and behavioural roles, scholars should consider using higher-level abstractions. Raising the level of abstraction of theories may suggest new ways of capturing the evidence and offer a better understanding of the phenomenon in question. Although
Tsoukas (1994) and Hales (1999a) incorporate higher-level abstractions in their model, as pointed out, they do so only in order to justify the existence of classical functions and behavioural roles. It is almost as if the scholars in the area have attempted to justify and explain the extant *categorisations* of the evidence rather than the evidence *per se*.

While few explicit attempts have been made to explain managerial work in its entirety, there is no dearth of partial explanations (i.e., explanations of particular facets of managerial work). For example, Butcher and Clarke (2003) expound on the need for managers to be political, Wall and Callister (1995) discuss conflict resolution in the managerial context, Walsh (1995) focuses on managerial cognition, and so forth. This body of literature, just like the body of literature on managerial leadership, is considered beyond the scope of this thesis and will not be reviewed. However, the partial explanations offered by Stewart (1982) and Watson (1994) are relevant in the current context. Their explanations are partial only in the sense that Watson’s work is based on a single organisation; and Stewart’s work avowedly concentrates on the source of variations in managerial jobs. Though both authors highlight the central role of organisational context and local influences, their explanations add to body of knowledge on the generic nature of managerial work as well. A review follows.

**PARTIAL EXPLANATIONS OF MANAGERIAL WORK**

**Demands, Constraints, and Choice Model: Stewart (1982)**

In part, Stewart (1982) developed her model to explain why managers holding similar jobs had widely differing perceptions about their work. After interviewing and observing several managers, Stewart proposed three new categories to describe aspects of managerial jobs: demands, constraints, and choices. In her framework, *demands* were what someone in a job had to do; *constraints* were internal and external factors that limited what a job holder could do; and *choices* were what a jobholder could do, but did not have to. The three dimensions were conceptualised as changing across situations and over time. Additionally, managers too were said to bring to a job their own demands (what they thought had to be done), constraints (their beliefs and fears), and perceptions of their choices (their own judgment about how much discretion they enjoyed). Stewart theorised that the interplay between the job characteristics and the characteristics of the job holder (in terms of the three dimensions) could account for the variations in managerial jobs. She also went on to caution
against making generalisations about managerial work, without first understanding its variations.

In what appears to be a change of stance, Stewart has in recent times implied that the three dimensions of her model potentially capture almost everything that is of consequence to all managerial jobs. She and her colleague claim that demands, constraints, and choices comprise the rules of the game and that empirical knowledge of these rules could help create effective managers. They therefore suggest that effectiveness could mean “being effective in playing the game of management and not in meeting management ideals” (Noordegraaf & Stewart, 2000; p. 431), and propose that those who satisfy the demands of their jobs, work within their job constraints, and make appropriate choices are likely to be effective. One suspects that Noordegraaf and Stewart are confusing success with effectiveness (see Luthans, 1988). Managers who “play the game” could well end up being successful (i.e., getting promotions), but they need not always prove effective (i.e., create something of value for their organisation). While the claim about the three dimensions comprising “the rules of the game” may be an over generalisation, the dimensions appear to have the potential to explain unethical, if not effective, behaviour. One could, for instance, hypothesise that managers who attempt to work around the constraints of their jobs are more susceptible to behaving unethically.

Despite its strengths, as is true of the behavioural perspective in general, Stewart’s (1982) model does not reveal what drives managerial behaviour. Her model does identify some important drivers of the variations in managerial jobs, but it does not explain how and why particular managerial demands and choices crystallise. Further, Noordegraaf and Stewart (2000) are silent on how one might determine whether the choices made are appropriate. By claiming that an appropriate choice is one that is effective, they appear to have fallen into the trap of infinite regress. Stewart’s model, like the other models that have been discussed, does not satisfactorily isolate unambiguous criteria for gauging managerial effectiveness. And as will be discussed later, scholars will struggle to isolate the drivers of managerial effectiveness unless they isolate such criteria. In one particular instance though, there was no ambiguity about what the senior managers of a company thought they were supposed to do to prove effective. Watson’s (1994) ethnographic study of the company in question spanned over 12
months and culminated in him reluctantly differentiating between “good” and “bad” managerial behaviour. His insightful work merits closer scrutiny.

**Strategic Exchange Perspective: Watson (1994)**

In a bid to understand the meaning of management, Watson immersed himself in the world of managers and played close attention to their verbal interactions. He concluded that management was essentially a human social craft that required “the ability to interpret the thoughts and wants of others – be these employees, customers, competitors, or whatever – and the facility to shape meanings, values and human commitments” ([1994] 2001; p. 223). On first reading, Watson’s conclusion may not appear striking. But as his exposition demonstrates, human motivations and emotions can be extremely complex. It is no mean task to understand, leave alone shape, them. In his treatise, Watson interprets the events as lived and experienced by the middle managers at ZTC Ryland, a struggling telecommunication equipment manufacturing plant in Britain. His narrative offers insights on how the most well-meaning of initiatives can go awry. The ZTC board had tried to do all the right things. Paying heed to management gurus, it had articulated an unambiguous strategic intent, expressed a desire to create a winning culture, and empowered change agents to implement what was a well-considered strategy in a rapidly changing environment. Yet things deteriorated.

Several factors contributed to the manufacturing plant’s woes. This review discusses only those germane to the generic nature of managerial work. Although organisational history is a factor that all managers must live with, scholars have ignored its influence on managerial work. Watson’s analysis implies that ZTC suffered greatly due to its legacy. The company had been formed by merging two businesses that had once been bitter rivals. The emergent schizophrenic culture ultimately engendered two discourses – one of empowerment, and the other of control. Consequently, the middle managers had to straddle two competing worldviews. This impinged on their effectiveness. Apart from implicating a confusing discourse and a dysfunctional organisational culture, Watson held the tendency at ZTC Ryland to let “means become ends” culpable. He observed that managerial committees at the plant tended to create bureaucratic work processes for their own sake. And managers tried to manage through “remote control” (e.g., through metrics) at the expense of “getting out and about and talking to customers, talking to people in the factory and in the offices” (2001; p. 135). In the current context, it would be pertinent to ask why the managers at ZTC Ryland
acted in the manner that they did and whether the ZTC case allows one to make generalisations about managerial work and effectiveness.

While ethnographic studies do not permit empirical generalisations, generalisable insights can be drawn from them “at the level of process and of theory” (Watson, 2001; p. xiv; emphasis in original). Watson’s account highlights the managerial need to make sense of the complexity that dealing with people usually entails. The account also draws attention to the fact that managers generally believe that they can help shape their organisations and in the process of doing so make sense of their own identities. Furthermore, Watson confirms that managers have a desire to remain in control at all times. But he clarifies that this managerial desire for control does not render accurate the neo-Marxist descriptions of managers being agents of capital who must control labour to ensure optimal production. Watson emphasises that managers express a desire to control their own circumstances and not their subordinates per se. The managers “wanted control over events so that they could fulfill their employment contract in a way which would allow them to meet their personal requirements for satisfaction, at the same time as enabling the organisation to continue in business” (2001; p. 85). Drawing from the broad themes that emerged from his ethnographic analysis, Watson adopted a “strategic exchange perspective” to explain managerial behaviour.

By pointing out that individuals (and organisations) shape their world, and in turn, are shaped by it, the strategic exchange perspective underlines the two-sidedness of every social interaction. Watson (1994), like Hales (1999a), draws from Giddens’ (1984) notion of structuration, which holds that human initiative is not merely constrained by the circumstances or structures in which it occurs, it can also be enabled by them. He theorises that managers continually exchange symbolic and material things while interacting with other individuals, groups, or their external environment and that these exchanges are not random. The exchanges in fact, pertain to the interests, purposes, and projects of the parties involved. And since the exchanges are shaped in ways that help individuals and groups cope with the challenges of their external environment, and also help organisations survive into the future, they may be deemed strategic. Watson’s explanation implies that the parties involved in an exchange know beforehand as to what is in their self-interest. But this may not always be the case. Besides, the strategic exchange perspective fails to identify the mechanisms which can
potentially ensure that the exchanges made by individuals and groups (albeit out of self-interest) contribute to organisational survival.

Notwithstanding the weaknesses discussed above, Watson’s explanation addresses the challenge of isolating an unambiguous criterion for gauging managerial effectiveness. By making organisational survival an imperative, the strategic exchange perspective in effect suggests what managers should strive for. For reasons that are not entirely clear, Watson ignores organisational survival as a criterion while developing his managerial competency framework for ZTC Ryland. Given his theorising, one would have expected him to link to organisational survival, competencies such as the ability to deconstruct organisational discourse, understand historical forces, align individual self-interests with organisational interest, and so forth. Instead, using a technique similar to Flanagan’s (1951) CIT, Watson merely chose to isolate good and bad managerial behaviours by asking ZTC managers to recount examples from their personal experience.

The ZTC scheme finally developed by Watson captured managerial competencies under three broad categories: personal orientation (what a person currently is); cognitive style (how a person thinks); and interpersonal style (how a person relates). See Appendix 1 for more details. The list in the appendix is no different from other atheoretical competency lists that are in abundant supply and it does seem that Watson missed an opportunity to inform his competency framework by invoking the strategic exchange perspective. Indeed, Watson admits to having had reservations about the whole competency framework development exercise. He asserts that “every manager is effective or ineffective in their own way” implying that it may be unrealistic to expect all managers to buy-in to universal notions of what would make them competent (2001; p. 222; emphasis in original). Watson also reveals that that he had cautioned the ZTC management against using his competency framework mechanistically. Thus despite having arrived at an unambiguous criterion to gauge managerial effectiveness, Watson perhaps did not believe that a generalisable competency framework could be, or ought to be, developed.

In contrast to Watson, Quinn (1988) readily recommends generic competencies for managers across levels and industries. As if to cover all bases, he incorporates four competing criterion of managerial effectiveness (or values) in his framework’s point of departure. Quinn’s “Competing Values Framework” was not reviewed earlier because it neither
integrates the extant evidence on the commonalities of managerial work nor purports to explain why managers do what they do. As such, the framework is not an “integrative theoretical model.” Nonetheless, it partially explains why managers might have emphasised different values in different eras. More importantly, Quinn’s framework makes conclusions about what managers should do and logically proceeds to delineate the competencies that they should possess. This is something that cannot be said of any of the theoretical models that have been critiqued in this chapter. The competing values framework is reviewed below.

**Competing Values Framework: Quinn (1988)**

Tracing the stages through which management thought has evolved, Quinn (1988) described four management models that he claimed reflected the dominant viewpoint of their respective eras. The four management models were said to have the following characteristics (also see Quinn, Faerman, Thompson, & McGrath, 2003):

- **The Rational Goal Model (1900-1925):** Managerial behaviour during this period was informed by Tayloristic principles. The means-end assumption was that clear direction led to productive outcomes. The emphasis was on goal clarification, rational analysis, and action taking and the criteria of managerial effectiveness were increased productivity and profits. Accordingly, the managerial role was that of a “director and producer.”

- **The Internal Process Model (1900-1925):** The model flourished around the same time as the rational goal model and complemented the latter. Managerial thinking was influenced by the writings of Weber and Fayol on “professional bureaucracies.” The means-end assumption was that routinisation led to stability. The emphasis was on defining responsibility, measurement, and documentation and the criteria of managerial effectiveness were stability and continuity. Accordingly, the managerial role was that of a “monitor and coordinator.”

- **The Human Relations Model (1926-1950):** In this era, despite the stock market crash and World War II, the workforce generally became more prosperous and showed a concern for the first time with recreational matters. The famous Hawthorne experiments conducted during the 1920s ostensibly demonstrated the need to focus on interpersonal relationships and informal processes to enhance human performance. The means-end assumption was that involvement led to
commitment. The emphasis was on participation, conflict resolution, and consensus building and the criteria of managerial effectiveness were commitment, cohesion, and morale. Accordingly, the managerial role was that of a “mentor and facilitator.”

- **The Open Systems Model (1951-1975):** A more educated workforce, technological advancement, and an unpredictable environment as typified by the oil crisis of the 1970s paved the way for more dynamic thinking about management. A number of scholars adopted the organismic analogy to conceptualise organisations during this period. Quinn and colleagues believe that the means-end assumption in the open systems model was that continual adaptation and innovation led to acquiring and maintaining external resources. The emphasis was on political adaptation, creative problem solving, innovation, and change management and the criteria of managerial effectiveness were adaptability and external support. Accordingly, the managerial role was that of an “innovator and broker.”

Note that Quinn (1988) claims that by the mid 1970s, the open systems model had lost its relevance. He argues that the rapid rate of change and increasing complexity since the 1970s has meant that the open systems model alone cannot provide all the answers. Quinn contends that the values espoused by the four models in his framework are competing and while managers in previous eras could afford to subscribe to the prevailing wisdom, in the current environment they need to draw from all the models if they are to help their organisations successfully cope with the contradictions. For example, organisations need to be stable and yet retain the ability to adapt. Similarly they need to focus on productivity, but not at the expense of employee morale. The Competing Values Framework (CVF) depicts the relationships amongst the four models along two axes (see Figure 3.4).

The vertical axis in Figure 3.4 ranges from *flexibility to control*; and the horizontal axis from *internal* to *external* focus. Each quadrant in the figure contains one of the four models. The models diagonally opposite each other, unlike those adjacent to each other, are said not to have much in common. Quinn implies that organisations need to acquire the ability to move to any quadrant as needed, or simultaneously exist in all four. Therefore, he holds that managers in the current era should be competent in all the eight roles as dictated by the four management models.
Each of the eight leadership roles in the competing values framework contains three competencies. They, like the values, both complement the ones next to them and contrast with those opposite to them.

Source: Quinn, Faerman, Thompson, & McGrath (2003)
The CVF distills eight managerial roles from the different effectiveness criteria that are implicit in the four models. The roles are then analysed to derive 24 managerial competencies as shown in Figure 3.4. In essence, the technique used in the framework is similar to what will be used later in this thesis. While the rationale to use effectiveness criteria to derive competencies is sound and the framework could be used to justify the need for identifying contradictory managerial roles, the roles themselves seem to have been arbitrarily chosen and labeled in the Quinn framework. And to the extent that the roles are invalid, the competencies derived from them too would be invalid. For example, it is not clear as to why fostering a productive environment is considered a critical competency in the Rational Model, and not so in the Human Relations model. The very idea behind the human relations movement was that better human relations foster productivity. Similar objections could be raised about other managerial competencies and roles. For instance, the coordinator role is just as critical in the Open Systems model as it is in the Internal Process model. After all, systems thinking rests on the premise that subsystems must work together, even sub-optimally if they have to, towards attaining a super-ordinate goal. Thus Quinn’s (1988) managerial roles, much like Mintzberg’s (1973), appear to be essentially atheoretical.

The Open Systems model in particular seems to have been misinterpreted, or rather partially interpreted, by Quinn (1988). The conclusion that adaptability and external support are the criteria for managerial effectiveness is contentious. Open systems must adapt and obtain external support in order to survive. Thus the effectiveness criterion is organisational survival. According to the open systems perspective, managers must aim to make the internal structures robust and complex so that they can match the complexity of the external environment and survive. Further, they must use control mechanisms to help systems adapt. Thus control is not necessarily inimical to flexibility in the systemic context. Since open systems are bifocal (i.e., they have an internal and an external focus) and incorporate control mechanisms that confer flexibility, they extend across the extremities of the horizontal and vertical axes in Figure 3.4. From a theoretical perspective, the Open System model could be shown as occupying all the four quadrants. And this would be entirely consistent with the notion that systems thinking synthesises the thinking that was prevalent in the Scientific Management and Human Relations era. Why then did scholars such as Quinn (1988) find open systems thinking inadequate?
It appears that the systems perspective did not get as much traction amongst those studying managerial work as it could have for two reasons. Firstly, the properties of open systems had been either incorrectly or incompletely interpreted – Quinn (1988) is a case in point. The issues around interpretation will become clearer in Chapter 6 when the properties of open systems are discussed in depth. Secondly, the way systems scholars had conceptualised organisations did not permit unambiguous conceptualisations about managerial work. Since a reinterpretation of systemic properties in this thesis leads to an entirely new way of conceptualising an organisation (with implications for how one might describe the nature of managerial work and derive managerial competencies), it is considered essential to briefly review the extant systemic conceptualisations.

**SYSTEMIC CONCEPTUALISATIONS**

There are several strands of systems thinking including hard, soft, and critical systems thinking; as also thinking pertaining to the related area of cybernetic systems. But not all types of thinking make allowances for the idiosyncrasies of human nature. The focus in this section is on soft systems thinking. That is on systemic strands which acknowledge that human behaviour does not lend itself to being accurately modeled through quantitative techniques. The section summarises the more influential systemic conceptualisations of organisations and briefly discusses their implications for management in general and managerial work in particular. The summaries that follow draw heavily from Jackson’s (1991) review of the “organisations-as-systems” literature (pp. 41-72) and include perspectives informed by three theories, namely General Systems Theory, Contingency Theory, and Sociotechnical Systems Theory.

**General Systems Theory: 1930s to 1960s**

General systems theory was formulated by the biologist von Bertalanffy, orally in the 1930s, and in various publications after World War II (see Bertalanffy, 1972). His focus was on *open systems*, that is, on systems which exchange matter with the external environment. Bertalanffy’s theory was supplemented by Ashby’s (1956) work on cybernetic systems (i.e., systems with an in-built automatic control mechanism). The other oft-cited early works on systems theory include the works of Parsons (1956a, 1956b) who believed that formal organisations, unlike other social systems, were primarily oriented towards attaining a specific goal; Boulding (1956) who suggested a hierarchy of systems based on levels of complexity; and Miller (1965, and 1972) who devised a set of criteria that a system had to
meet to qualify as a living system. But the credit for introducing the open systems concept to a wider management audience should perhaps go to Katz and Kahn (1966). Like other systems scholars, they visualised organisations as comprising different subsystems.

The five organisational subsystems identified in general systems theory are: (i) the production subsystems, which transform inputs to outputs; (ii) the supportive subsystems, which obtain fresh inputs and dispose outputs; (iii) the maintenance subsystems, which play the role of ensuring that employees perform their respective roles through selection, socialisation, rewards, and sanctions; (iv) the adaptive subsystems, which have an external focus and ensure that the organisation can survive by responding to changes in the environment; and (v) the managerial subsystems, which comprise of activities that control, coordinate, and direct the other four subsystems of the organisation. The managerial subsystem is thus visualised by Katz and Kahn (1966) as performing the important role of aligning subsystem-level goals with suprasystem-level goals.

**Contingency Theory: 1960s to 1970s**

Several scholars based their empirical work on the general systems perspective to further challenge traditional (i.e., Tayloristic) and human relations thinking. Their collective work has been labeled Contingency Theory. The theory views organisations as a series of interdependent subsystems, each of which has a specific function that it must perform to ensure organisational survival. The four significant subsystems upon which organisational performance is said to be contingent are: the goal, human, technical, and managerial subsystems (Jackson, 1991). The goal system is concerned with overall purpose and objectives. The human subsystem concerns itself with people, leadership, and motivational issues. The technical system transforms inputs (e.g., matter, energy, information) into useful outputs (e.g., products, services, information). And the managerial subsystem is expected to coordinate the subsystems, monitor the organisation’s relationship with the external environment, and determine the best structure for the organisation. The key is to make subsystems congruent with each other and at the same time meet the demands of the external environment. Although contingency theorists viewed organisations and their environment as being in a state of mutual influence and dependence, they seldom studied how managerial action could, and did, influence an organisation’s external environment (see Stern & Barley, 1996)
Sociotechnical Systems Theory: 1940s to 1980s

Sociotechnical systems theory is associated with the work done in the Tavistock Institute of Human Relations. Jackson (1991) identifies seven inter-related ideas that were put forth during the early stages of theory development by scholars such Emery, Rice and Trist. The most important idea was that organisations comprised of interdependent social, economic, and technical subsystems. The second idea was about joint optimisation. There was recognition that at times the social and technical systems had to be sub-optimised to ensure optimal economic outcomes. The third notion was that managers could exercise a degree of choice while jointly optimising the subsystems. The next idea identified survival as an organisation’s primary task and emphasised that subsystems had to be jointly optimised to ensure organisational survival. The fifth concept embraced the input-transformation-output model to understand production systems. The sixth insight pertained to the importance of permitting workers to form semi-autonomous groups for increased efficacy and satisfaction. Finally, as the importance of working in semi-autonomous work groups came to the fore, the seventh idea suggested itself. Boundary management was declared to be critically important. Rather than waste time policing motivated work groups, managers were advised to concentrate on obtaining necessary inputs and profitably marketing outputs.

The above ideas did not emerge at once, but by the 1960s had crystallised well-enough to inspire a large number of studies over the next decade. By the 1980s, at least six new ideas, as listed below, were added to sociotechnical thinking:

- Sociotechnical theory came to be seen as a means of promoting industrial democracy.
- The importance of appropriate job design was underlined.
- Technological redesign issues that could permit and facilitate group work came under consideration.
- There was greater appreciation of organisation-environment relations.
- Organisational goals were recognised as an important subsystem.
- A step-by-step methodology was devised to implement the thinking (Jackson, 1991; p. 63).

Sociotechnical systems theory has had a major impact on industry and is credited for inspiring the quality circles concept and the quality of working life movement. Nonetheless, the organisations-as-systems perspective as a whole is justly criticised for downplaying purposeful action in organisations; reifying organisations; being unable to properly explain conflict and change; exhibiting a managerial bias; and offering vague and ill-founded
prescriptions for improving managerial performance (Jackson, 1991). Each of these criticisms is elaborated in turn and will have to be addressed if the systems perspective is to be successfully invoked to explain managerial work and offer valid prescriptions to managers.

**Weaknesses in the Organisations-as-Systems Perspective**

Since the organisations-as-systems perspective considers survival rather than goal attainment as the primary task of organisations, it is criticised for ignoring the fact that modern organisations often undertake purposeful, goal-driven activities. Though contingency and sociotechnical systems theory incorporate goals as subsystems, the theories do not properly locate command and control centres that may help organisations realise their goals. As a consequence, the systems perspective fails to explain how one might measure whether an enterprise is achieving its goals or not. Jackson (1991) observes that there is also a tendency in the organisations-as-systems perspective to reify organisations (i.e., to consider organisations capable of independent thought and action). Systems thinkers tend to explain organisational activities as functional imperatives undertaken to ensure survival and adapt to the external environment. They consider individuals in organisations incapable of controlling and comprehending the larger forces at work. Conscious explanations provided by individual employees in justification of their own actions are summarily dismissed as being invalid if they run contrary to the functional logic inherent in the organisations-as-systems view.

Consistent with viewing individuals as entities incapable of conscious action, the organisations-as-systems perspective is unable to accommodate conflict and instability. The organismic analogy pictures all parts of an organisation as functioning in cooperation to serve the whole. Unity and interdependence are stressed at the expense of acknowledging that it is quite possible for individuals and groups within organisations to pursue their own interests based on competing social and economic interests. Furthermore, the need for organisations to adapt in response to environmental pressures and disturbances is said to be the sole driver of organisational change. Organisations are therefore theorised as having a tendency to maintain status quo by preserving their structures. Why organisations should wish to preserve their structures, unless disturbed, is not explained (Jackson, 1991). Again, the systemic view ignores the fact that purposeful individuals can initiate change in the absence of external stimuli. Thus the notion that elements in social systems could be in conflict or that organisations could choose to change their structures for reasons other than the need to adapt is not entertained.
As stated earlier, the organisations-as-systems perspective fails in two more important areas: it shows a managerial bias and offers vague and untested remedies for improving managerial performance. Jackson observes that in the systemic view, managers are seen as “…acting paternistically, for the good of all, by using their expert knowledge to adjust the organization in ways that will ensure its survival. Sociotechnical theory even gets the workers to control themselves, relieving managers of one onerous chore, by convincing employees that they are getting a form of genuine control over their working lives” (1991; p. 69). It is not clear as to why managers would automatically act in the larger interest of the organisation and not pursue their own agendas. Alternatively, one could wonder why non-managerial employees are considered incapable of displaying the same degree of conscientiousness. There is no evidence to support the flattering view of managers as envisaged in the organisations-as-systems perspective. Further, since the extant systemic conceptualisations do not necessarily suggest specific courses of managerial action, they are criticised for offering vague and ill-founded prescriptions. For example, what exactly do managers need to do to help organisations adapt is not prescribed.

As Jackson (1991) notes, the weaknesses discussed above are inter-related and appear to stem from the fact that the organisations-as-systems perspective primarily subscribes to a biological analogy. Citing various critics, Jackson argues that while organisations may be systems, they are not necessarily natural systems. Unlike other biological systems, organisations are populated by purposeful individuals capable of independent thought and action and this is not taken into account by the organisations-as-systems perspective. Jackson believes that the way forward may be to retain the virtues of the perspective while ridding it of its glaring weaknesses. He sees promise in the “organisational-cybernetic” perspective which emphasises dynamic processes and information flows within an organisation. The Viable Systems Model proposed by Beer (1981, 1984, 1985) typifies the organisational-cybernetic perspective and is reviewed next. The model, as was acknowledge by Tsoukas (1994) in his meta-theoretical model, has major implications for managerial work.


Cybernetics is considered an interdisciplinary science because it deals with general laws that govern control processes irrespective of the nature of the system to be controlled. It thus does not carry the heavy baggage of a biological analogy. Stafford Beer is reputed to be amongst the first to have applied cybernetic principles in the late 1950s to study
organisations. But almost three decades were to pass before he published a fully developed cybernetic account of an organisation. The input-transformation-output model so popular in the systems tradition was augmented in the cybernetic account by a command and control element. Introduction of this element enabled management to be studied as a phenomenon in its own right (Jackson, 1991). The management task was said to be determined by the nature of the system being controlled and by the nature of environment within which the system operated. The cybernetic view emphasised the need for management to control systems through feedback loops (i.e., through information about what it is that the controlled system should do more or less of). It was also accepted that to ensure organisational survival, management had to match, at all times, the variety present in the external environment.

To aid management in its task, Beer (1981; 1984) proposed a Viable Systems Model (hereafter VSM). He argued that to understand the principles of viability one must ideally use a known-to-be-viable system as an exemplar. Accordingly, he based his VSM on the human brain. To Beer, “a system is viable if it is capable of responding to environmental changes even if those changes could not have been foreseen at the time the system was designed” (Jackson, 1991; p. 105). VSM conceptualises an organisation as comprising five interacting subsystems. Systems 1-3 are concerned with the “here and now” of the organisation’s operations, System 4 is concerned with the “there and then,” the strategic responses to the effects of environmental and future demands on the organisation. System 5 gives policy directives and is concerned with balancing the “here and now” and the “there and then” (Viable Systems Model, 2006). The role of each system is explained further:

- **System 1** consists of elements that directly carry out the tasks that the organisation is supposed to be doing. Each part of System 1 (or the subsidiary of the firm) is autonomous in its own right so that it can absorb some of the environmental variety that would otherwise inundate the higher management.

- **System 2** is a coordination function and contains information channels which ensure that the various parts in System 1 act in harmony. One could imagine instances when autonomous subsidiaries acting in their own best local interest end up jeopardising the entire organisation. If necessary, System 2 can call upon the resources available with System 3.
• System 3 is a control function. It does not initiate policy but interprets it based on its own direct audit of System 1 and information received from System 2 and System 4. It oversees the implementation of policy, monitors performance, and distributes resources to System 1. The three lower systems (Systems 1, 2 and 3) could together be seen as autonomously carrying out the production function without having the overall view of the organisation. The responsibility to acquire such a view falls on the higher-level Systems 4 and 5.

• System 4 has two major responsibilities. It acts as a bridge between System 5 and the other systems, and it monitors the environment to determine how the organisation needs to adapt in order to remain viable. Beer calls System 4 the biggest “switch” in the organisation. The system switches instructions downward from the thinking chamber (i.e., System 5) of the organisation to the lower-level systems and it switches upward information collected from Systems 1 to 3. Information switched upward needs to be filtered for there is a constant danger of overloading System 5 with too much information. With regards to helping the organisation adapt, System 4 attempts to model the future and make predictions so that the organisation can respond in time and innovate.

• System 5 is responsible for the direction of the whole organisation and gives it a distinct identity. Based on information provided by System 4, it makes policy decisions to balance demands from different parts of the organisation. (Jackson, 1991, excerpted from pp. 106-111).

Three issues about VSM merit emphasis. Firstly, VSM has a recursive structure. This means that the structure of the whole model is replicated in each of its parts. Thus each subsidiary of an organisation could be treated as a viable system in its own right with its own Systems 1 to 5 (Jackson, 1991). Secondly, although VSM clearly has organisational design implications, Beer should not be seen as prescribing a particular organisational structure in
the traditional sense of the term. His model is not about hierarchical lines of authority; it is
about nested centres of control based on how information is shared and distributed within
systems. And thirdly, one ought to appreciate that it is possible for individual managers to
find themselves simultaneously belonging to two or more systems. In fact, the chances of a
manager wearing multiple hats are likely to be higher in the case of those politically
connected or perceived to be competent. Beer’s model does not fully consider the
consequences of such a possibility. And as discussed in the next paragraph, while VSM is
immune to most of the criticisms leveled against the organisations-as-systems perspective, it
too is guilty of ignoring the impact that purposeful humans can have.

By recognising that subsidiaries of an organisation could work at cross purposes,
VSM makes allowances for conflicts – albeit only at a subunit level. Further, by incorporating
mechanisms to scan the external environment and monitor feedback loops, VSM explicitly
accommodates the need for organisations to change. Nonetheless, Beer ignores the very real
possibility of purposeful conduits of information (e.g., interested individuals who happen to
be well-connected) manipulating information for their own ends. He implies that generating,
sharing, and consuming information comes naturally to humans. But one need play the game,
“Chinese Whispers” for only a few minutes to realise otherwise. Also, while VSM does not
reify organisations, by conceptualising an ideal organisation as a reservoir of information, it
errs in assuming that information alone is enough to ensure timely action and organisational
survival. Insofar as offering managerial prescriptions is concerned, VSM does make specific
suggestions on how performance, particularly irresponsible cost cutting and prospects of
future returns (Jackson, 1991), might be monitored and how managers could hope to match
the complexity levels (or variety) of the external environment without getting overwhelmed
by it. Suggestions to engineer variety include delegating, restructuring, hiring consultants,
relying on technology, and so forth.

This concludes the review of the relevant systems literature as it pertains to the nature
of organisations, management, and managerial work. Because the open systems approach
subscribes to an unambiguous criterion for gauging managerial effectiveness (i.e.,
organisational survival), it appears to be in a better position than other approaches to
delineate the competencies that managers should possess. However, one ought to
acknowledge that despite the immense promise – in the late 1960s systems thinkers were
optimistic about developing a unified theory of organisations – systems theory has failed to
deliver (Thayer, 1972). What went, and what continues to go, wrong? It appears that academia, and not open systems theory, is to blame. Ashmos and Huber’s (1987) lament about scholars missing opportunities to use the open systems paradigm remains valid to this day. They had complained that most scholars tended to use the term open systems for studies that were merely shaped by the commonsense idea that external environment affected organisations; seldom were studies purposefully designed around systemic properties. This study, unlike others, will derive all its arguments directly from systemic properties.

As has been indicated, an effort will be made to distill the principles that underpin managerial work and identify the drivers of managerial effectiveness by raising the level of abstraction of systems theory and suggesting new categories to capture managerial work. Not much has changed since Stewart (1989) observed that one needs to better understand managerial jobs before attempting to link specific managerial behaviour to a measure of effectiveness. The hope is that open systems theory, when interpreted differently, would reveal what purposeful individuals (like managers) embedded in large social systems (like formal organisations) should do to help their parent systems survive. As stated earlier, knowledge of what managers should do is essential since managerial effectiveness may be gauged by matching what managers actually do against what they should do (Hales, 1986). Unfortunately, as the foregoing review asserts, extant models on managerial work have failed to generate knowledge about what managers should do. It would however be remiss of this thesis to not point out that managerial effectiveness may be gauged in ways that do not require one to reach normative conclusions. What might be the other routes to gauge effectiveness?

**ALTERNATIVE ROUTES TO THE GRAIL**

The area tends to gauge managerial effectiveness through either internal or external criteria. Most scholars who have studied managerial behaviour have tended to subscribe to an internal criterion of effectiveness. For example, Noordegraaf and Stewart (2000) have culled a number of internal criteria from various behavioural studies and point out that managers may be considered effective if they: understand the nature of their work and act accordingly, cope with work pressures and perform the roles as demanded by the circumstances, satisfy the demands and constraints of their jobs, and make the right choices, formulate agendas, and create networks. With regards to external criteria, one comes across the following measures: speed of promotion; job satisfaction, and commitment levels of subordinates; quantity, and
quality of tasks performed by subordinates; and performance based rankings based on global impressions by superiors (see Luthans 1988; and Martinko & Gardner, 1990). The literature also alludes to broad organisational goals like industry leadership, long-term organisational growth, profit maximisation, internal organisational stability, organisational efficiency, selection and development of effective subordinates, and maintenance of high employee morale. But Campbell and colleagues (1970) are rightly dismissive, claiming that such criteria cannot be defined and measured precisely.

The problem of isolating the criteria for managerial effectiveness then is anything but simple. Even the so called “hard” external criteria like speed of promotion may ultimately be based on “soft” subjective (and often invalid) human judgments (Noordegraaf & Stewart, 2000). Though made more than three decades ago, one cannot to this day dispute the comment that quantifying “job effectiveness has been industrial psychology’s major bugaboo since its inception” (Campbell et al., 1970; p. 101). Perhaps job analysts have erred in choosing to focus on either external or internal efficacy criteria. It may not be tenable for job analysts to insist that they know what managerial jobs entail without knowing what objectives managers are expected to achieve in their jobs. In other words, knowledge claims about internal criteria without reference to external criteria might not hold much substance in the context of managerial jobs. The area needs to adopt an effectiveness criterion that is at once internal and external. It is argued that organisational survival meets this stipulation – it is a robust criterion that is “timeless” in more ways than one.

It will subsequently become clear that the systems perspective implies that organisations cannot survive unless managers are proficient in certain key areas. Support for organisational survival as a criterion is found in Watson’s (1994) strategic exchange perspective and the early empirical works of other scholars as well. After carrying out a factor analyses of a set of performance indicators of 75 insurance companies over a ten-year period, Seashore and Yuchtman defined organisational effectiveness as “the ability of an organization to exploit its environments in the acquisition of scarce and valued resources to sustain its functioning” (1967; p. 393). Drawing from Seashore and Yuchtman’s notion of organisational effectiveness and after extensively reviewing all the evidence on managerial work, Campbell and colleagues zeroed in on exactly the kind of effectiveness criterion that open systems theory suggests. They defined effective managerial job behavior as “any set of managerial actions believed to be optimal for identifying, assimilating, and utilizing both internal and
external resources toward *sustaining, over the long term*, the functioning of the organizational unit for which a manager has some degree of responsibility” (1970; p. 105; emphasis added).

Surprisingly, the works of Seashore and Yuchtman (1967), and Campbell and colleagues (1970) failed to inspire others to focus on managerial effectiveness. Or perhaps progress could not be made because scholars, owing to their predilection with the classical and behavioural categories, failed in their attempts to isolate the drivers of managerial effectiveness. As was noted in Chapter 2, studies on and predictions about managerial effectiveness are conspicuous by their absence. The area also stands guilty of having ignored Flanagan’s (1951) CIT – one of the few techniques that had the potential to isolate the drivers of managerial efficacy. It was left to the Harvard Business School psychologist, McClelland to later modify Flanagan’s CIT and approach the problem of isolating the predictors of effective performance through an alternative route. Rather than study the nature of the job to identify what an incumbent should do, or examine what job outputs an incumbent was expected to achieve, McClelland chose to study the personal characteristics of incumbents who were effective or *competent* in their jobs. Until this point, the terms competent, competence, and competency have been used in this thesis in a commonsensical (but hopefully intelligible) way. At this stage, it would be pertinent to take a more technical look at the concept of competence.

In the 1970s, disenchanted with the failure of traditional academic and aptitude tests to predict job effectiveness or success in life, McClelland (1973) recommended using criterion samples to predict desirable life outcomes. His idea involved identifying characteristics (or competencies) associated with success by comparing people who were effective in their actual jobs with those who were less so. This whole area has come to be known as competency modeling and enjoys wide currency amongst the practitioner community. Competency models appear to have the potential to address questions about managerial effectiveness. Note that McClelland’s technique of comparing the characteristics of effective and less effective incumbents relies on an external agency to determine who is effective and what constitutes effective behaviour.

Although McClelland’s approach is popular, it is not the only approach that has been undertaken to identify what makes incumbents effective or competent. Interestingly, different competency modeling techniques subscribe to different notions of effectiveness. Recognising that the area of competency modeling deserves greater attention than what has been hitherto
paid to them by those theorising about managerial work, the next chapter scrutinises the existing concepts of competence and competency modeling techniques. The extant conceptualisations of competency are germane to this thesis for another important reason: in the process of developing a new taxonomy of managerial competence, the thesis will propose a new way of conceptualising individual-level competence. It would be instructive to critique the extant competency-related literature, for one will later need to determine if the proposed systems-based concept of competence has the potential to advance the area.
CHAPTER 4

COMPETENCY MODELING: A CRITICAL REVIEW

The different definitions of competency and the competency modeling approaches that the definitions have spawned are critiqued in this chapter. The notions of managerial effectiveness and managerial competence are inextricably linked. One could reason that managers who are competent at doing whatever it is that they are supposed to do may be deemed effective. At face value, this line of reasoning appears logical. To illustrate, chauffeuring entails driving automobiles – therefore, chauffeurs who drive competently may be deemed effective. But things may not be as straightforward. Consider a scenario wherein skilled drivers are unavailable for hiring. One’s best option then would be to recruit candidates likely to become competent drivers. The challenge would revolve around making predictions on the basis of characteristics and traits of prospective chauffeurs. Since trainability would be an issue, some job analysts could choose to observe the process of chauffeuring and isolate elements like listening skills, politeness, navigation skills, knowledge of traffic conditions, and so forth. Yet others could insist that to be deemed superior to an average performer, a chauffeur must display automotive trouble shooting skills. Thus there is potential for disagreement over what might constitute effectiveness even in a relatively uncomplicated job like chauffeuring.

This chauffeur example, albeit at the expense of being somewhat simplistic, captures the essence of the person-process-product (3Ps) model proposed by Campbell et al. (1970). In general, the person in the 3Ps model refers to characteristics, traits, and knowledge of the individual performing the work in question. The product pertains to an outcome (such as increase in profitability, or transportation from place A to place B), and the process refers to on-the-job behavior and activities. The 3Ps model could be used to study the effectiveness of an incumbent in any job. Analysing the complex job of managing though is likely to prove more challenging than armchair theorising about chauffeuring. To begin with, there may be no unanimity over the product that managers are expected to produce. For instance, should one expect managers to produce quarterly profits? Or should managers be told to concentrate on long-term objectives? These questions get to the heart of the effectiveness criterion problem discussed in the previous chapter. Moreover, since managers get their work done through others, one could legitimately ask if it is possible, or even fair, to hold managers
solely accountable for outcomes that are essentially a product of joint effort. Rather than get embroiled in intractable product related issues, some scholars prefer to use either the process or person as their point of departure to reach conclusions about the competence levels needed by incumbents.

The different points of departure have led not only to different definitions of the term “competency,” but also to different competency modeling techniques. Although competency modelers do not use the 3Ps language, it will be explained that they too essentially attempt to isolate the product (i.e., effective or superior performance), identify the process (i.e., behavior displayed by superior performers), and make inferences about the person concerned (i.e., the characteristics or competencies possessed by superior performers). This chapter will examine whether their inferences are based on a sound rationale. To the extent that the notions of competence and competency modeling are underpinned by valid reasoning, they can inform theory building efforts on managerial work.

FOUR DISTINCT APPROACHES

In 1998, impressed by the magnitude and pace of growth of competency modeling, the Society for Industrial and Organizational Psychology (SIOP) commissioned a task force to study the phenomenon. Unsurprisingly, the ten-member taskforce could not find a consensus definition of competency. It attributed the confusion to the fact that the terms competence and competency were used with different connotations in domains such as law, clinical psychology, concept of multiple intelligence, vocational counseling, leadership research and assessment centers, job analysis, and so forth (Schippmann, et al., 2000). The following review, in keeping with the aim of this thesis, will mainly be confined to the job analysis literature.

Categories of Competency Definitions

Like job analysts, competency modelers choose to either concentrate on the nature of the work or on the characteristics of the worker (Sandberg, 2000). Those modelers who concentrate on the nature of work are said to adopt a work-oriented approach. They start by identifying the activities that need to be undertaken and then make inferences about the attributes needed by the incumbents to successfully accomplish the task on hand. Thus the work-oriented approach is output-based – the preoccupation in this approach is with what comes “out” of the job (i.e., the focus is on the product). In contrast, the main concern of
modelers who adopt a worker-oriented approach is with the skill sets that the workers bring “in” to the job. Thus their approach is input-based (i.e., the focus is on the person). They start by identifying and studying individuals who are regarded as successful (by an external agency) and then make inferences about what makes them successful in their particular jobs.

The definitions of competency in the UK, unlike those in the US, tend to be output-based (Garavan & McGuire, 2001; Horton, 2000; Stuart & Lindsay, 1997). Candidates in the UK are expected to meet laid down standards or competences. The attributes of the job holder are assumed to exist if the output standards are met. The Employment Department’s Standard Programme in the UK defines competence as, “a description of something which a person who works in a given occupational area should be able to do. It is a description of an action, behavior, or outcome which a person should be able to demonstrate” (as cited by Holmes & Joyce, 1993; p. 38). In the US, consistent with the input-based view, competency definitions generally focus on what individuals bring “in” to the job. For example, the US Federal Government’s Office of Personnel Management (OPM) defines competency as “a measurable pattern of knowledge, skill, abilities, behaviors, and other characteristics that an individual needs to perform work roles or occupational functions successfully” (as reported by Rodriguez, Patel, Bright, Gregory, & Gowing, 2002; p. 310). The input-based versus output-based dichotomy in the competency literature will be discussed later in the chapter. For the moment, the focus is on two other distinct conceptualisations of competency: hybrid and constructionist.

Worker-oriented approaches are criticised for generating competency-lists that are too general. There are a host of generic personal skills that tend to be applicable across occupations. For instance, chauffeurs and managers could both be well-served by listening skills. Conversely, work-oriented approaches are criticised for producing highly specific descriptions of work activities that do not always permit inferences about the competencies needed to perform the activities effectively (Sandberg, 2000). To persist with the chauffeur example, it may not be that simple to infer what makes a particular chauffeur good at navigating. To circumvent these criticisms, some competency modelers incorporate features of both the work- and the worker-oriented approaches. Proponents of this method are likely to subscribe to what may be called a hybrid definition of competency. For instance, Parry (1996; p. 48) defines competency as “a cluster of related knowledge, skills and attitudes (KSA) that affects a major part of one’s job (or role or responsibility), that correlates with performance
on the job, that can be measured against well-accepted standards and that can be improved via training and development.” Note how a hybrid definition tries to cover all bases by simultaneously referring to an individual’s attributes (i.e. inputs) as also to specific measurable standards that must be achieved (i.e. outputs).

See Table 4.1 for examples of some other definitions of competency that could be captured under the categories as discussed. It may prove useful to understand why different categories of definitions are popular in different parts of the globe. The reasons for the differences may reside at the meta-theoretical level. An examination of the philosophical assumptions made by job analysts across nations is beyond the scope of this thesis. Nonetheless, the reference to meta-theory leads one to the constructionist definition of competency included in Table 4.1 that is yet to be discussed. Criticising work- and worker-oriented approaches on ontological grounds, Sandberg (2000) notes that the objectivist assumptions of these approaches encourage the use of predefined quantitative measures of competency. As a result, competency modelers are said to capture their own notions of competency as opposed to the levels of competency of the workers. Sandberg adds that traditional methods merely identify attributes and fall short of identifying how, if at all, workers use their attributes. Focusing on how attributes are used is important because it draws our attention to work processes.

Arguing for a reality which acknowledges that workers cannot be separated from their work, Sandberg (2000; p. 12) emphasises that “people’s ways of experiencing work are more fundamental to their competence than the attributes themselves.” Sandberg’s concept of competency is underpinned by a constructionist ontology in that he believes that individuals construct their own meanings about their own competence as they go about doing their work and interacting with their environment (see Crotty, 1998). The constructionist definition proposed by Sandberg (see Table 4.1) questions the practice of superimposing competency models that use either work or a worker’s attributes as their point of departure. He recommends that competency models be developed using workers” conception of their own work as a point of departure. The aim, according to Sandberg, should be to develop competencies by altering workers” conceptions about their own work.
Table 4.1
Classifying Extant Definitions of Competency: Some Examples

<table>
<thead>
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<th>Definitions</th>
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<tr>
<td><strong>UK: An Output-based Definition</strong>&lt;br&gt;Competence is a description of an action, behavior or outcome which a person should be able to demonstrate (Holmes &amp; Joyce, 1993).&lt;br&gt;Occupational competence (is) …the ability to perform the activities within an occupation or function to the level of performance expected in employment (Management Charter Initiative, 1990).</td>
</tr>
<tr>
<td><strong>USA: An Input-based Definition</strong>&lt;br&gt;A competency is an underlying characteristic of an individual that is causally related to criterion referenced effective and/or superior performance in a job or situation (Spencer &amp; Spencer, 1993).</td>
</tr>
<tr>
<td><strong>South Africa: A Hybrid Definition</strong>&lt;br&gt;Competency comprises of the skills, knowledge and understanding, qualities and attributes, sets of values, beliefs and attitudes which lead to effective managerial performance in a given context, situation, or role (Woodall &amp; Winstanley, 1998).</td>
</tr>
<tr>
<td><strong>Europe: A Constructionist Definition</strong>&lt;br&gt;Workers” lived experience of work determines what meaning work takes on for a particular worker and this in turn gives rise to the meaning of “competence” for that individual worker in a given context (Sandberg, 2000).</td>
</tr>
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</table>

**Bibliography**

For more on definitions see Brown (1993); Garavan and McGuire (2001); Hoffman (1999); Holms (1995); Lindsay and Stuart (1997); Martin and Staines (1994); Schippmann, et al. (2000); Winterton and Winterton (1999); and Woodruffe (1993).
This concludes the discussion of the four main categories of competency definitions found in the job analysis literature. The next section highlights validity-related issues and argues that competency modelers should consider revising their definitions and rethinking their points of departure, if they are to silence their critics. The input-based approach, being the most influential (Dale & Iles, 1992), is analysed in-depth. Thereafter, the section critiques the other approaches.

VALIDITY CONCERNS

Input-based Approach

The seminal article in the area – Testing for competence rather than for “intelligence” – does not contain a definition of competency. One can only infer that to its author, McClelland (1973) the term meant general characteristics of successful people. One wonders whether the competency movement would have witnessed such a major conceptual crisis had the article contained a precise definition of the term. In McClelland’s own words, his article was supposed to be an exercise in brainstorming. He was alive to the possibility of some of his suggestions being as “open to criticism on other grounds” as the traditional procedures he was criticising (1973; p. 7). But this is not to suggest that as things stand, McClelland might be amenable to reconsidering his opinion. He has since vigorously defended his tentative ideas (McClelland, 1994). But it will shortly become clear that his defence has failed to put fears about the validity of the input-based approaches to rest.

As was pointed out in the previous chapter, McClelland (1973) suggested identifying characteristics associated with success by comparing effective people with those who were less effective. Further, McClelland held that the best predictor of what a person can and will do is what he or she spontaneously thinks and does in an unstructured situation – or has done in similar past situations. Since it is usually not feasible to continually observe superior and average people at work, Behavioral Event Interview (BEI) is recommended as a compromise (see the introduction by McClelland in Spencer & Spencer, 1993). BEI is based on Flanagan’s (1951) CIT and involves eliciting information from superior and average employees about their best successes and worst failures in the form of a narration. This narration of critical incidents is then subjected to a technique called CAVE (content analysis of verbal expression) that enables investigators to estimate whether the differences in competencies of superior and average performers are statistically significant. Owing to the complexity of managerial jobs
however, it is moot whether BEIs can identify all the characteristics displayed by successful managers.

At one point in time, the database of McBer and Company, a consulting firm co-founded by McClelland and David Berlew, had 286 competency models that contained a total of 760 distinct behavioural indicators (Spencer & Spencer, 1993). While it is not clear as to how many of these models pertained specifically to managerial jobs, it does appear that it may not be practical for organisations to conduct BEIs in sufficient depth and breadth to enable the development of valid managerial competency models. The sheer number of “critical managerial incidents” might preclude this possibility. While input-based competency models may claim concurrent validity – the problem is their lack of predictive validity. In fact, Barrett and Depinet have raised serious concerns over this issue. They point out that McClelland and his associates have failed “to produce any professionally acceptable empirical evidence that their concept of competencies is related to occupational success” (1991; p. 1021). In what appears to be a weak rejoinder, McClelland attributes this state of affairs in part to data being proprietary, and in part to the fact that psychologists engaged in competency modeling “must spend their time earning their salaries rather than writing papers for publication” (1994; p. 69).

More than a decade has gone by since the debate between McClelland and his detractors took place (also see Barrett, 1994; Cowan, 1994). One cannot but notice that peer-reviewed empirical evidence supporting the predictive validity of input-based approaches is yet to be furnished. The problems probably stem from the manner in which competency has been defined. A formal definition of the term appeared in the literature for the first time in 1980, a full seven years after the publication of McClelland’s seminal article. One of the reports prepared by McBer and Company defined competency as “an underlying characteristic of a person which results in effective and/or superior performance in a job” (Klemp, 1980; p.21). In his book, Boyatzis, who was then the CEO of McBer and Company, subscribed to Klemp’s definition and insisted that in order to define competency, one must first “determine what the actions were and their place in a system and sequence of behavior and what the results or effects were and what the intent or meaning of the actions and results were” (1982; p. 22). Boyatzis’s elaboration seems to have further complicated matters.

In the current context, Boyatzis’s (1982) insistence would mean that competency modelers must not only profess complete knowledge of cause and effect relationships
involved in a work setting, but they should also claim to know what is going on inside the minds of the workers, and the consequences of workers’ actions. This appears to be a very tall order indeed. Consequences of employee action are not always immediately apparent. Besides, uncertainty often means that employees themselves have incomplete knowledge of cause and effect. It is not surprising that the definition in McBer and Company’s report failed to forge a consensus amongst scholars; prompting Zemke (1982) to remark that competency was a term that had no meaning apart from the one given by the person with whom one was talking.

Perhaps in response to all the criticism, the associates of McBer and Company, made another attempt to offer a more precise definition. They defined competency as “an underlying characteristic of an individual that is causally related to criterion-referenced effective and/or superior performance in a job or situation” (Spencer & Spencer, 1993; p. 9; emphasis in original). According to Spencer and Spencer, the term underlying characteristics implies that a competency is a fairly deep and enduring part of a person’s make-up. They state that there are five types of underlying competency characteristics: i) motives – the things a person consistently thinks about or wants that cause action; ii) traits – physical characteristics and consistent responses to situations or information; iii) self-concept – a person’s attitudes, values or self-image; iv) knowledge – information a person has in specific content areas; and v) skills – the ability to perform a certain physical or mental task. Spencer and Spencer further note that knowledge and skill competencies tend to be on the “surface” and people can be trained to acquire these visible competencies; but the core motives, self-concepts, and traits are “deeper” and it is more cost effective to select for these competencies (see Figure 4.1).

A deconstruction of Spencer and Spencer’s (1993) definition reveals some major deficiencies with the input-based conceptualisations of competence. The first term, underlying characteristics used in the definition is an umbrella term that sanctions the inclusion of just about any individual characteristic remotely linked with performance. Not surprisingly, input-based approaches tend to generate competency wish-lists that show no signs of exhaustion. Given the breadth of managerial jobs, it is not difficult to “discover” previously unidentified competencies that an incumbent should possess. Several consulting companies appear to be engaged in just such an exercise, as evidenced by the mushrooming of competency dictionaries (e.g., Lucia & Lepsinger, 1999; Cooper & Cooper, 2000). See
Appendix 2 for examples of wish-lists that have been isolated by the practitioner community. Evidently, the input-based approach has failed to parsimoniously delineate managerial competencies. In particular, Spencer and Spencer’s comprehensive definition, as discussed below, raises validity and causality-related issues that need a satisfactory resolution.

**Figure 4.1**

**Central and Surface Competencies: The Iceberg Model**

By incorporating motives and self-concept as underlying characteristics of competency, Spencer and Spencer (1993) appear to overlook the fact that two people having dissimilar motives or self-concept may display identical behaviors. An employee with a political agenda and an employee desirous of climbing the corporate ladder may both put in long hours. The former may do so to advertise the “poor time management skills” of his immediate boss, while the latter may do so to get into the good books of her boss by the quality of her work. Conversely, it is also possible for two managers with identical motives to display dissimilar behavior. Consider the case of two colleagues who are equally eager to climb the corporate ladder – one of them may choose to work hard while the other, being politically savvy, may choose to ingratiate himself with his boss.

The *causally related* component of Spencer and Spencer’s (1993) definition refers to personal characteristics that predict behaviors, which in turn predict job performance. This
component rests on generally accepted principles of causation. Without discussing the
epistemological assumptions about causality, suffice it to note that if Spencer and Spencer are
right, then going by the logic inherent in input-based definitions, “effect could precede cause”
in some cases. Barrett and Depinet (1991) point out that though self-confidence is identified
as a characteristic of successful employees, whether this competency is a cause or effect of
success cannot be determined. They ask if a measure of self-confidence taken early in an
employee’s career, before the employee had experienced successes or failures, will be same
as the one taken later in his or her career. Does success result in self-confidence or is it vice
versa? Since there may be a question mark over the temporal dimension, the causally related
component of the definition could get undermined.

The final component of Spencer and Spencer’s definition of competency contains the
notion of superior and/or effective performance. While conceptually it may make sense to
isolate effective performance in order to build a competency model around it, doing so in
practice proves difficult. Input-based competency models rely on the ability of firms to
identify “effective” performers. But there is evidence that companies confuse “being
successful” with “being effective”. As mentioned in another context, Luthans (1988) found
significant differences in behavior between successful managers (i.e. those who climbed the
corporate ladder faster than did others) and effective managers (i.e. those who produced
superior quality and quantity of performance, and had more satisfied subordinates).
Successful managers spent the bulk of their time networking, while effective managers
concentrated on communicating. The implication is that either the firms are not good at
gauging performance or that other considerations override objective performance-measures
come promotion time. Perhaps, there is an element of truth in both these observations.

It is probable that in practice, input-based competency models are based on successful
as opposed to effective employees. These flawed models can have serious consequences.
Severe problems may arise when a contaminated corporate environment starts rewarding
behavior that had been responsible for contaminating it in the first place. One can only
speculate about the kind of competencies that a competency modeler interviewing top-rated
Enron executives would have isolated. Perhaps the modeler would have failed to uncover
anything untoward. Arguably, face-to-face interviews (i.e., BEIs) conducted in a
contaminated environment would most likely elicit self-serving and socially desirable
information. As evident from the Enron example, modelers who subscribe to input-based
competency definitions rely on external criteria for gauging effectiveness and such reliance can prove problematic. Applying the joint probabilities logic, one could assert that the validity of input-based competency models can never be greater than the validity of the external criteria on which the models themselves are based.

The challenges involved in obtaining uncontaminated performance appraisals based on external criteria have been extensively documented in the HR literature (see Longenecker, Sims, & Gioia, 1987). More often than not, managers who satisfy suspect external criteria (e.g., quarterly profits) are deemed effective. To make matters worse, input-based competency modelers urge other managers to treat these “top-rated” managers as role models. This makes input-based competency modeling a bit like benchmarking at an individual level. But as Raelin & Coolidge (1995) observe, just because some competencies can be measured and observed does not indicate that these alone cause effectiveness wherever they are found. At times, spurious correlations could lead one to “benchmark” against the wrong thing. Further, even if one copies the right thing, it may not result in increased effectiveness if the thing copied is applied out of context.

Suspect external criteria for gauging effectiveness and the other drawbacks discussed above have the potential to impinge upon the validity of input-based competency models. However, this is not to say that other approaches to developing competency models are necessarily valid. The assumptions about effectiveness criteria made by constructionist and out-based competency modelers introduce other kinds of challenges and are discussed next.

Efficacy Assumptions in Other Approaches

Although not explicitly mentioned by Sandberg (2000), the notion of self-efficacy (Bandura, 1977; 1994) seems central to the constructionist perspective. Perceived self-efficacy is defined as people’s beliefs about their capabilities to produce designated levels of performance. While one can intuitively appreciate the role self-efficacy might play in determining one’s own competence levels, the problem with Sandberg’s conceptualisation is that when taken to its logical conclusion, it entails applying highly specific competency models at a micro-level. Individuals are bound to have their own opinions about the nature of their work and what drives their efficiency. The constructionist approach would have each opinion individually addressed to ensure that workers feel well-supported. Fostering efficacy in this manner could prove very time-consuming and expensive. Thus the constructionist
approach has its own problems as do the approaches informed by the output-based and hybrid definitions of competency. These problems are discussed next.

As far as competency modelers who subscribe to the output-based definitions are concerned, they rely on internal criteria – a notion of effectiveness encapsulated within the job itself (Noordegraaf & Stewart, 2000). Internal criteria, by definition, are self-referential. As a result, output-based definitions of competency are sometimes criticised for being tautological (see Raelin & Coolidge, 1995). Output-based models apparently imply that competency is what is displayed by competent employees. For example, Woodruffe (1991) holds that competency refers to that which underpins competent performance. The temptation to dismiss the output-based definitions as being circular is understandable, but a deeper analysis reveals that the apparent tautology is an artifact of the method used to gauge effectiveness.

Using internal criteria ensures that only those incumbents who are able to do specific things as dictated by the job in question are deemed effective. Thus an output-based definition of competence embraces Hales’s (1986) notion of effectiveness. The definition implies that effectiveness may be modeled as a gap between what employees actually do and what they should do – smaller the gap, greater the effectiveness. The reasoning is not circular. Hence, it may be unjust to criticise output-based competency models on tautological grounds. Nonetheless, this does not mean that such models are unproblematic. Two issues potentially detract from the utility of output-based competency models. Each is discussed in turn.

The first issue relates to the difficulty in understanding complex jobs. The internal criteria used for gauging effectiveness make it imperative for output-based competency modelers to reach valid normative conclusions about a job. Unlike in the case of chauffeurs, it is not easy to delineate what managers should be competent at. As Hales (1986) laments, and as the literature review in the previous chapter reveals, normative assertions about complex managerial jobs are hard to find. The level of complexity prevents modelers from asserting what incumbents in complex jobs should do. The workplace though hankers for prescriptions on the more complex jobs. Unfortunately, it appears that output-based competency models may be found wanting precisely in areas where they are most needed.

The second issue pertains to the fact that output-based competency models ignore that incumbents can redefine their own jobs and often enjoy choices that present “opportunities for one jobholder to do different work from another and to do it in different ways” (Stewart,
1982; p. 9). Examples of jobs in the workplace suddenly becoming high-profile or obscure are commonplace and can usually be linked to particular individuals moving in or out of the jobs in question. It is impossible to anticipate how dynamic incumbents might interpret their jobs. For instance, a creative carpenter might take it upon herself to redesign the assembly line using ergonomic principles. Output-based competency models tend to put a premium on demonstrated experience at the expense of an incumbent’s potential to learn and contribute in ways unforeseeable (also see Athey & Orth, 1999). Having said this, such competency models are likely to prove more practicable than constructionist models and more tenable, in terms of validity, than input-based models.

In an attempt to get the best out of input- and output-based approaches, hybrid competency models attempt to incorporate internal as well as external effectiveness criteria. Drawing from distinct approaches has obvious advantages. But it is often impossible to import only the strengths of an approach while rejecting its weaknesses — strengths and weaknesses tend to be inextricably interwoven. Thus merely combining the two approaches is unlikely to address the shortcoming inherent in them. Having criticised the extant conceptualisations of competency and discussed the problems associated with different notions of effectiveness, the onus is now on this thesis to offer an alternative conceptualisation. Theory based assertions about what managers should do can logically lead one to arrive at conclusions about what managers should be competent at. But as this chapter has implied, the concept of competence itself will need rescuing if any taxonomy of managerial competence is to lay claims to face validity. The foregoing analysis has identified concepts that a definition of competency cannot (or should not) include. In addition, some indications have been given as to the features that the proposed competency concept ought to incorporate. This has paved the way forward.

THE WAY FORWARD

To recapitulate, it was argued that in the interest of parsimony and owing to their limited predictive validity, underlying characteristics like motives and self-concept should not be included in the concept of competency. Further, because of the complexities involved, conceptualisations of competency cannot profess knowledge of cause and effect relationships. The dangers of confusing “success” for “effectiveness,” and the susceptibility of BEIs to elicit self-serving responses were also alluded to. The thesis concurred with Sandberg (2000) on the need to focus not only on the work and the worker, but also the processes involved in
accomplishing work. Finally, it was suggested that owing to causal ambiguity, external criteria alone could not be relied upon to gauge efficacy. If one must choose between external and internal criteria then one is better-advised to opt for the latter. Nonetheless, it was recognised that it may be particularly difficult to isolate internal criteria for gauging efficacy in complex jobs.

Given all its drawbacks, it is not surprising that the competency movement, despite being so popular amongst practitioners, is still given a fad status by some academics who predict that the movement will fade away (see Schippmann, 2000 et al.). The next chapter adopts an open systems perspective to provide a valid theoretical anchor to the concept of competence. The chapter also begins to develop an explanation of why managers do what they do. More importantly, by incorporating an unambiguous effectiveness criterion that is at once internal and external, the systems perspective takes the area forward and eventually enables one to reach conclusions about what managers should be competent at.
CHAPTER 5

EXPLAINING WHAT MANAGERS SHOULD DO

Recognising that the way forward may be to “free the mind from existing categories,” (Stewart, 1989; p. 7) various theoretical perspectives were explored to understand the nature of managerial work. Finally, open systems theory was zeroed in on. If one wants managers to embrace systems thinking then there is merit in adopting a systems perspective to understand and classify their work. Conscious of this argument, this chapter puts forth a systems-based framework to synthesise, as opposed to analyse, managerial work. As was pointed out in Chapter 1, the key to systems thinking is synthesis (Ackoff, 1981). Rather than decompose managerial work, understand each component, and then aggregate one’s understanding of the components to understand the whole, this chapter does the reverse. While synthesising, as Ackoff explains, one must identify the containing system (i.e., the system which contains the thing to be explained); understand the properties of the containing system; and then focus on the behavior of the thing to be explained in terms of its role within the containing whole.

One could regard managers as being embedded or contained in organisations. Since organisations may be considered open systems, the properties of open systems are discussed at the outset. The systemic properties as interpreted in this chapter suggest an entirely new way of conceptualising organisations and discerning the role of the embedded managerial entity. The conclusions drawn are normative as the open systems view unequivocally asserts that managers should strive for organisational survival if they are to be deemed effective. It follows that if one can discern what managers need to do to contribute towards organisational survival then one can make assertions about what managers should be competent at. The arguments that eventually lead to a new taxonomy of managerial competence unfold in four sections as follows: (i) Systemic Properties; (ii) Conceptualising Organisations and Occupational Roles as Fractals; (iii) Competence Defined; and (iv) Discerning Managerial Work.

SYSTEMIC PROPERTIES

That managers ought to abandon their functional silos and embrace systems thinking is a common refrain (see Detrick, 2002). The abundance of advice on the systemic view notwithstanding (see Beer, 1985; Gharajedaghi, 1999; Jackson, 2003; Senge, 1990), what the view holds for managerial work and competencies has not yet been clearly enunciated. The
competing values framework (Quinn, Faerman, Thompson & McGrath, 2003) contains references to open systems but as has been argued, the authors of the framework offer no justification as to why an open systems perspective dictates the inclusion of certain managerial competencies and exclusion of others. Similarly, Morgan (1998), in his famous work on organisational images, claims that the systems perspective emphasises the need for certain specific managerial competencies. But by treating systems as mere metaphors, he absolves himself of making any ontological commitment to the properties of open systems. A metaphorical treatment gives Morgan the license to highlight some aspects of open systems and disregard others.

Adhering to Ackoff’s (1981) advice on synthesising, this thesis will study the properties of open systems to discern what the properties might hold for the nature of managerial work. Discussed below are the basic properties of open systems, namely: permeable boundary, energy transformation, negentropy, equifinality, homeostasis, requisite variety, autonomous adaptability, and fractal structure. The property of negentropy is examined in detail since management scholars have overlooked a major aspect of the property. It will be subsequently argued that the oversight has exposed the organisations-as-systems perspective to the criticism that it downplays purposeful action and ignores conflict in organisations. In addition to offering a more complete interpretation of the property of negentropy, the following discussion introduces autonomous adaptability and fractal structure as separate properties in their own right for the first time in the organisations-as-systems literature. The property labeled autonomous adaptability is derived from recent advances in the area of complexity and the work done in the 1970s by two Chilean biologists, Humberto Maturana and Francisco Varela. With regards to fractal structure, though the extant management literature has discussed fractals in passing, the term has not been used in the context as proposed by this thesis.

**Permeable Boundary**

An open system is distinguished from its environment by an arbitrary boundary. These boundaries are permeable, indistinct, and “dynamic rather than spatial” (Bertalanffy, 1972; p. 422). Even if boundaries are only a mental construct, they must be delineated if an open systems perspective is to be applied; for without boundaries, the distinction between a focal system and its environment would disappear (Scott, 1992).
Energy Transformation

Open systems receive inputs from the environment and transform them into outputs. Further, they exchange their outputs for new inputs so as to ensure their own survival. This exchange cycle implies that if the outputs of systems are not valued by the external environment, the inputs would eventually cease. In the case of a business organisation, one can visualise how organisations transform raw materials (forms of inputs) into finished goods/services (outputs), which are exchanged for a fresh round of inputs. The input-transformation-output (I-T-O) cycle may be described as a dynamic process that involves conversion of energy from one form into another. Open systems thus create value through transforming energy via I-T-O processes.

Negentropy

According to the Second Law of Thermodynamics, entropy (i.e., measure of disorder or randomness in energy) in any closed part of the universe tends to increase with the passage of time. Zukav (1979) asks us to picture depositing a drop of black ink into a glass of clear water. Initially, the drop of ink can be clearly viewed since the molecules of ink continue to retain their order, but as time passes, the molecules of ink steadily disperse and intermingle with the molecules of water until a point of maximal entropy is reached – at that point all one sees is a murky homogeneous liquid with absolutely no structure or order. Thus entropy increases with the passage of time. This however, is not true in the case of open systems. When in existence, open systems appear to defy the Second Law of Thermodynamics. Since open systems do not show an increase in entropy, they are said to have negative entropy or negentropy. It is important to understand how open systems sustain their negentropic state.

The organisations-as-systems perspective (refer back to Chapter 3 for a criticism of the perspective by Jackson (1991)) maintains that organisations exhibit negentropy because of their ability to acquire fresh inputs in exchange for their outputs. For example, Hendrickson (1992) states that firms counteract entropy through an I-T-O cycle. Similarly, Katz and Kahn (1978; p. 25) describe the I-T-O cycle as a “cycle of negative entropy.” But this explanation is ambiguous and only partially correct. The physicist, Erwin Schrödinger had observed that internal entropy in living organisms instead of increasing remained constant because organisms arrest or reverse the entropic process by pumping disorder (i.e., entropy) out of their bodies in the form of excreta and radiation (Schrödinger, 1944). The management
literature has overlooked this aspect and is generally silent on what constitutes entropy, how it accumulates, and what can be done to arrest or minimise it in the organisational context.\footnote{Entropy in cybernetics, the science of control and communication in machine and animals, is taken to mean uncertainty or “ignorance”; conversely, it is held that information fights entropy.}

It is one of the fundamental laws of nature that energy can neither be created nor destroyed – it can only be made to change its form. Whenever energy is converted by a system from one form into another, there is “wastage” or some loss of energy. That is, hundred percent energy conversions are seldom possible. Some energy invariably escapes during energy conversion processes. More damagingly, not all of the unusable energy escapes to the external environment, some of it remains within the system itself – this unusable energy that the parent system retains may be termed, “accumulated entropy.” In well designed systems, minimal amount of energy escapes as waste, and accumulation of unusable energy (entropy) is miniscule. This concept is explained further with the help of an example.

An automobile’s engine converts chemical energy of the petrol (input) into kinetic energy of the wheels (output), but in the process of doing so it wastes some energy as the system heats internal objects, emits fumes, makes some sound, and so on. Of course, the more efficient engines emit less heat, give better mileage, and are quieter. But even in the best of engines, efficiency, which is defined as the ratio of output to input, is always less than one. Only perfect systems have an efficiency of one and such systems do not exist. In this sense, inputs always exceed outputs irrespective of whether a system is closed or open. As discussed, some wastage and production of disorder (or “entropy accumulation”) is unavoidable during energy transformation. If all systems accumulate entropy, then this brings us back to the question of how open and closed systems differ from each other. Why are open systems said to be negentropic while the closed ones are not?

To become negentropic, the automobile engine in the above example must, without intervention from an external source, exchange its kinetic energy (motion) for chemical energy (petrol) for its next I-T-O cycle, as also periodically clean the soot that accumulates inside it in the wake of its operation. This it cannot do, hence it is a closed system. Open systems, unlike closed systems, have the ability to ensure that the total amount of order exceeds the amount of disorder in them at any point of time. They do this by continually obtaining fresh inputs from the external environment \textit{and} by periodically expelling entropy that accumulates inside them as a result of energy transformation processes. These two
abilities combine to make systems negentropic for an appreciable length of time. Eventually however, the second law of thermodynamics catches up with all systems and they lose their negentropic state. Even if an automobile engine were to automatically clean itself and become capable of independently obtaining fresh inputs, it would be virtually impossible for it to prevent the wear and tear of its individual parts due to internal heating. Ageing thus is an entropic process. It should however be noted that social systems, if managed well, can far outlive closed systems like automobile engines or other open systems like living organisms.

“Managing well” however, is anything but easy as evidenced by the number of businesses that collapse in their infancy. The task before management is to continually transform energy and create value through I-T-O processes while ensuring minimal entropy accumulation. The concept of entropy accumulation is explained further with the help of some simple equations. If $X = \text{inputs}$; $Y = \text{outputs}$; and $X' = \text{inputs for the next cycle}$, then in energetic terms it is impossible for $Y$ to be greater than $X$ (since efficiency is always less than one). See Figure 5.1 for amplification.

**Figure 5.1**

**Entropy Accumulation in Systems**

\[ Y/X = \text{Efficiency}; \text{also } X > Y \text{ since perfect energy conversions are impossible} \]

If $X - Y = Z$; then $Z = Z_1 + Z_2$. That is, $X = Y + Z_1 + Z_2$
If the difference in energetic terms between X and Y is Z, then Z is wastage. Further, as discussed earlier, wastage takes two forms: while some energy (Z₁) escapes from the parent system into the external environment (e.g., fumes and sound in the case of an automobile), the balance (Z₂) gets accumulated or dissipated within the system (e.g., soot in an automobile’s engine or heating of internal parts through friction). The energy that does not escape has more serious consequences for the long-term health of any system.

It should also be noted that the fact that Y is always smaller than X by amount Z does not mean that businesses are forever doomed to exist in a state of “decreasing energy returns.” To attain a state of sustainable negentropy, a firm must be capable of exchanging its outputs (Y) for fresh inputs (X’). And more challengingly, its outputs (Y) in real dollar terms should be consistently valued greater than its inputs (X) by the external environment (despite Y being lower than X in energetic terms). Clearly, if a system is to survive, the external environment should be willing to pay “economic rent” for the real or perceived value created by the system in question. In an era of hyper competition, many organisations discover to their chagrin that the external environment is not always so “benevolent.” All things being equal, the dice is loaded in favour of the more efficient value creator. Looked at another way, the property of negentropy ensures that an open system remains energy efficient while creating value, failing which it is perpetually under pressure to obtain more and more inputs in the face of declining outputs. In the long-term, wasteful systems cannot withstand negentropic pressures. The term “wasteful” in the current context includes not only obvious examples like unacceptable wear-and-tear of machinery, but also negative affect experienced by the workforce during the value creation process. Demoralising one’s employees in the wake of one’s I-T-O cycle is an example of entropy accumulation.

**Equifinality**

The property of equifinality enables a system to “reach the same final state from different initial conditions and by a variety of different paths” (Katz & Kahn, 1978; p.30). The I-T-O cycle may be indispensable for value creation, but organisations can choose to execute their cycle in different ways. Simply put, this property reminds us that “there are many ways to skin a cat.”

**Homeostasis**

Open systems rely on feedback to remain stable and maintain an equilibrium with an ever-changing external environment. In every feedback loop, as the name suggests,
information about the result of a transformation or an action is sent back to the system in the form of input data. If these new data facilitate and accelerate the transformation in the same direction as the preceding results, they are positive feedback – their effects are cumulative. If the new data produce a result in the opposite direction to previous results, they are negative feedback – their effects stabilize the system. Positive feedback loops left alone can lead only to the destruction of the system, through explosion (e.g., hyperinflation) or through implosion (e.g., economic depression). The wild behavior of positive loops – a veritable death wish – must be controlled by negative loops. This control is essential for a system to maintain itself over time.

In a negative loop, every variation towards a plus triggers a correction towards the minus, and vice versa. There is tight control; the system oscillates around an ideal equilibrium that it never attains (deRosnay, 1997). A thermostat uses negative feedback to attain its goal of maintaining room temperature within an acceptable range. Humans too, maintain their body temperatures and blood sugar content levels through a similar mechanism. Such self-regulating goal-seeking behavior induced by negative feedback ensures survival of a system even as the system in question continues to grow. This property which maintains equilibrium and allows for stable expansion of the system is called homeostasis.

**Requisite Variety**

Systems evolve to become more complex. The highly complex sense organs and the nervous system of higher organisms have evolved from primitive nervous tissues. Over four decades ago, Katz and Kahn (1966) had observed that the number of medical specialists in the US outnumbered general practitioners. Since then, not only has the number of specialists mushroomed, but so has the number of medical specialties. In business organisations too, the trend is towards a greater degree of specialisation within functions. For instance, one comes across all sorts of pay and compensation experts in the HR function – experts in benefits and wellness, variable pay, base pay, and incentive pay to name but a few. This inexorable movement towards increasing differentiation or complexity can be explained by Ashby’s (1956) law of requisite variety.

Variety is the number of states in which a system can exist. An electric switch can occupy two states (on and off) and therefore has a variety of two; a consumer in today’s market who is spoilt for choice has a variety which is enormous. Just as entropy is a measure of disorder, variety is a measure of complexity. A complicated system has more variety,
meaning it can occupy a number of states. Ashby’s law essentially claims that a system needs variety to combat variety. Consider the example of a computer taking on a chess grandmaster. The winner in this case is the system that negates every move of the other system and manages to come up with a variation to which the other system has no answer.

Now consider the case of a system that must cope with an ever changing environment. Disturbances or perturbations in the external environment would, according to Ashby’s law, require of this system to make commensurate internal variations if it is to survive. But making variations can potentially affect the system’s internal stability. Recollect that the property of homeostasis keeps systems as close as possible to a stable state. By definition, a stable system exhibits low variety since it continues to occupy the state it is in. If the aim of controlling a system through feedback mechanisms is to help a system remain stable, then the purpose of control may be described as variety reduction. Controlling a system essentially means foreclosing the system’s option to occupy other states.

Notice that the law of requisite variety in effect requires systems to be flexible enough to occupy other states should the external environment change. The law tells us that a system can insulate itself from the complexity of the external environment by making itself complex (only variety can kill variety, as seen in the computer versus chess grandmaster example). In this sense requisite variety and homeostasis confer on systems the ability to cope with a paradox. That systems must and can embrace complexity to combat complexity is counterintuitive and not always understood by organisations (see Heylighen & Joslyn, 2001).

Unless operating as a monopoly, an organisation is an important part of its competitors’ external environment. No sooner an organisation becomes more complex in order to cope with its external environment than it succeeds in making the external environment more complex for its competitors. The competition too must respond in kind if it is to survive. Thus begins a “complex” cycle that feeds on itself. To play with an old Chinese proverb, whether we currently live in interesting times or not may be moot; but it certainly is our curse to live in a world of ever increasing complexity.

Firms often make futile attempts to reduce complexity. As mentioned in Chapter 3, Beer (1981) recommends variety engineering as a viable option. If management is treated as a subsystem that controls operations of other subsystems within an organisation, then management may either increase its own variety or reduce the variety of the subsystems it controls in a number of ways. For instance, Beer suggests that management could increase its
own variety by employing external consultants or commissioning sophisticated management information systems. Alternatively, managers could choose to reduce the variety that they must deal with by delegating the responsibility of responding to the external environment to self-managed teams. There may be some merit in alleviating the burden of managers in the manner suggested by Beer (1981); but as far as the organisation as a whole is concerned, variety cannot be engineered away. Organisations usually discover that they have to continually raise more specialised subsystems and form ad hoc cross-functional teams and committees to cope with increasing complexity.

**Autonomous Adaptability**

As stated above, the properties of homeostasis and requisite variety highlight a paradox that organisations, being open systems, must live with. Homeostasis places a premium on stability, while the property of requisite variety requires organisations to evolve. To survive, open systems must maintain their stability with the help of their feedback mechanisms even as they grow and adapt to a changing external environment. Recent works in the field of complex systems offer new insights into the process of growth and how systems adapt. The relevant aspects of these advances in systems thinking are highlighted below.

Increasing complexity drives organisations towards a new state of equilibrium. Historically, “change” has been viewed as moving from one equilibrium state to another (e.g., from water to ice). Newtonian physics could not cope with the messiness of the actual transition between the two states of equilibrium. As a result, what happened during transitions was not well understood. But the relatively inexpensive computational power of modern computers has changed all that and we can now better understand the “messiness” that accompanies change or growth (Pascale, 1999). Modern modeling techniques reveal that when a system starts growing, it is continually confronted with choices (or “bifurcation points” in the parlance of chaos theory) and must decide which direction to take. Eventually, a stage comes when further growth, irrespective of the decisions made at bifurcation points, is not possible and the system becomes completely unstable.

There is however a small region between the two points – the point beyond which further growth is impossible and the point at which the system becomes completely unstable – that has generated immense excitement amongst the scientific community. The scientists call this area the “edge of chaos.” At the edge of chaos, systems behave in a completely
unpredictable or “chaotic” manner despite repeating a discernable pattern. In other words, a complex system at the edge of chaos simultaneously displays characteristics of stability and instability. Additionally, an analysis of growth patterns suggests that such a system’s destiny is extremely sensitive to its initial condition. Under certain circumstances, a very small change in the initial condition of a system can lead to major changes in its behavior. In fact, it is this sensitivity to initial condition that makes it impossible to make predictions about the future states of non-linear systems. The problem is that as humans we are incapable of measuring the initial condition of complex systems to the minute levels needed to make accurate predictions.

Weather systems are a good example of systems that behave in a chaotic manner. One can predict broad stable seasonal patterns as they recur year after year, but despite the availability of vast amounts of data, one cannot accurately forecast local weather conditions beyond a week or so. It is impossible to make accurate predictions about complex local weather systems because their initial condition cannot be measured accurately enough. To use the famous “butterfly-effect” example, one cannot possibly measure the minute changes triggered by the flap of a butterfly’s wing in the Amazon that might ultimately be responsible for a tornado in the US. The implication is clear: one must learn to cope with uncertainty since the future state of a system cannot be predicted. But an inability to accurately ascertain the initial position of a system should not prevent one from trying to generate as many future scenarios as possible so as to be better prepared for uncertain times. Moreover, in certain situations, an early warning of just a couple of hours can make the difference between life and death as someone escaping from a tornado hit area would readily testify.

Perhaps, of greater interest to management scholars is the fact that some systems at the edge of chaos tend to evolve (or “self-organise”) into higher-level structures; thus order can emerge from chaos. Computer simulations at the Santa Fe Institute in New Mexico have shown how simple rules of individual behaviour generate replications of the flocking of birds, the trail-laying of ants, the dynamics of organism-parasite systems, and so on. But as Rosenhead (1998) cautions, it is debatable whether such computer simulations constitute evidence in the organisational context. Given the current state of knowledge, a final verdict on the applicability of all the findings emanating from the study of complex systems must be held in abeyance (for more on complex systems, see Kauffman 1993; Macintosh & Maclean, 1999; Stacey, 1995). Management scholars however ought to acknowledge that: (a) the
unpredictable nature of growth trajectories makes “long term planning and visioning” suspect; and (b) during turbulent times (or at the edge of chaos) feedback mechanisms tend to breakdown; only those organisations that have the capacity to adapt to a new reality by “re-educating” their feedback mechanisms can avoid extinction.

While systems, as discussed, remain stable through homeostasis, they avoid extinction through adaptation. This brings one to the concept of autopoiesis. Adaptation can be understood by looking at how autopoietic systems get “structurally coupled” with their external environment. The term autopoiesis, which literally means “self-producing,” was coined by Maturana and Varela to explain the nature of living systems. Their work has generated a great deal of interest across disciplines; so much so that Mingers (1995; p.4) believes that their contribution “will stand as an example, if not the example, of outstanding work in the field of systems per se” (emphasis in original). The central idea of autopoiesis is that “a living system is one organized in such a way that all its components and processes jointly produce those self-same components and processes, thus establishing an autonomous, self-producing entity” (Mingers, 1995; p. 13). A living cell, as explained below, is considered a perfect example of an autopoietic system.

A cell produces many complex and simple substances that are retained inside a membrane. These substances, along with some others that enter the cell through its membrane, participate in the very same processes that had produced the substances in the first place. The cell thus continually keeps producing its own constituents (Mingers, 1995). A living cell, like all other autonomous open systems, is geared towards maintaining its own identity.² According to Maturana and Varela (1992), an identity of an autonomous system is “structure determined.” That is to say, a system changes in some way only if the internal structure of the system changes. Some structural changes (such as increase in height) leave the identity of a system unchanged (i.e., equilibrium of the system is more or less maintained), but other structural changes (e.g., an egg turning into a chicken) lead to a new identity of the system (i.e., they lead to a new state of equilibrium in what is a totally “new” system).

² While there is general agreement that social systems are autonomous, not everyone agrees that they are autopoietic. See Mingers (1995; 2002) for an evaluation of the different viewpoints (also see Kay, 2001). The point of contention is over what, if anything, social systems reproduce. In this instance, since the thesis has merely relied on the fact that social systems are autonomous its position is not very difficult to defend.
It is important to note that while the external environment may trigger a change in the internal structure, it does not determine how a system changes. How, if at all, a system reacts to the external environment depends upon the state of the internal structure of a system. For example, the fact that we humans cannot hear a dog whistle is attributable to our internal structure. The sound is there in the external environment alright, but our ears are not equipped to register sounds that have a frequency of over 20,000 hertz. Similarly, what is poisonous to us humans (owing to our internal structure) may be food to other animals – there is nothing inherently “poisonous” about any substance (Mingers, 1995). The timing of a signal from the external environment is also important. Whether our body can fight off hostile bacteria or not depends upon the state of our internal structure at the particular moment our body is invaded by the bacteria. If our internal structure is “strong” we fight off the bacteria, but if it is “weak,” we develop infection.

Continuing with the bacteria example, if the external environment continually invades the human body with similar bacteria (i.e., the same signal is sent by the environment) then the human system, if strong, becomes “structurally coupled” to the external environment and almost reflexively makes the changes needed to ward off the threat (this is how immune systems develop). As long as a system continues getting energy and remains structurally coupled to the external environment, it survives. The property of homeostasis ensures its stability. But as discussed, complexity forces systems to move away from their state of equilibrium and a stage comes when they become unstable and “uncoupled.” At this edge of chaos they need to recreate themselves or else they face oblivion. Some living organisms mutate; but what about social systems? Can business organisations emerge from the edge of chaos by re-stabilising in and re-coupling with the new environment?

The example of a thermostat is usually cited to highlight the inability of cybernetic systems to adapt and recreate themselves. Consider what would happen if rising energy costs and pressure from environmental groups were to make it incumbent upon all electrical systems to consume 40 percent less energy. The thermostat is equipped to react only to temperature changes in the external environment. As a lower-level closed system, it only has the capacity for “single-loop learning” which can at best ensure static stability and maintain the temperature inside a room at desired levels. A thermostat being incapable of questioning the assumptions that drive its control mechanism would have no answer to the changed parameters that require of it to become more efficient. It would not, for instance, be able to
analyse that it is not the room temperature *per se* but the comfort level of the occupants that is important. If the thermostat were capable of doing this, it could well discover that the type of clothing worn by the occupants and their moods had a bearing on their comfort level. Such knowledge could lead to energy savings – in fact, the thermostat could go a step further and encourage the occupants to undertake a physical regimen to improve their thresholds for tolerating discomfort.

“Assumption questioning” thermostats do not exist, but other higher level open systems that can do so do. Since business organisations are populated by humans, they confer on them the capacity to question assumptions, carry out self-reflection, and display what Argyris (1977) calls “double-loop learning.” Social systems can act in a purposeful manner irrespective of the external circumstances. According to Ackoff (1999), a purposeful entity can select what it wants to achieve (i.e., the ends) and how it wants to achieve (i.e., the means) what it desires in two or more environments. Being autonomous and populated by humans, social systems, in theory, have the capacity to initiate change on their own and adapt. It is a different matter that this capacity is not always utilised and many businesses fail to recreate themselves primarily because they let their “internal structure” decay. In essence, autonomy as envisaged by autopoiesis implies that organisations cannot explain away their failure to adapt by blaming external causes.

**Fractal Structure**

Entities may be visualised as hierarchically nested systems. This visualisation implies that at any unit of analysis, an entity may be treated as a system containing lower-level systems. And each of these lower level systems, in turn could be seen as containing a system of finer components (Simon, 1962 as cited by Schilling, 2000). The identity of any unit as a “system” is therefore context dependent. As Schilling points out, an organisation is a system within the context of an industry; an industry is a system within the context of an economy; and so forth. If one moves in the other direction, one could regard the marketing unit as a system in the context of an organisation. Further, systems of any class possess properties of their component, lower-level systems.³ Thus an organisation (a higher-level system) has

³ In his seminal article, Boulding (1956) presented a hierarchy of classifying systems based on increasing complexity that extended across nine levels. The first three levels, labeled frameworks, clockworks, thermostats, comprised of closed systems. The next six – cells, plants, animals, human beings, social systems, and transcendental systems – were said to be open systems. Transcendental systems represented the unknowable and were included by Boulding to cater for future advances.
organisational properties plus all the properties of lower level systems (e.g., properties of a marketing system, an HR system, and so forth) that reside within it.

It appears that irrespective of whether one zooms in or out, one always finds open systems within open systems. The thesis therefore suggests that open systems have a “fractal” structure (i.e., similar structures, albeit of different sizes, are embedded in one another). Though the term fractal has not been used in the systems literature in this context, it seems to accurately describe the structure of systems. The concept of fractals is elaborated since it will later prove central to the visualisation of an occupational role and the process of value creation. “How long is the coast of Britain?” is the question with which Mandelbrot (1982) begins his treatise on fractal geometry. He demonstrates that the question is not simple and that Euclidean geometry cannot provide an answer. The problem is that one’s answer to this question depends on the length of the ruler one uses. The shorter the ruler, the longer the length measured, since the short ruler fits more snugly into the nooks and crannies of the irregular coastline. This paradox is known as the Coastline Paradox. Mandelbrot used the term “fractal” to describe the coastline’s irregular and self-similar shape (i.e., a shape which repeats its own self). Fractals can be easily generated. See Figure 5.2 for an example of how one might generate a fractal called the “Koch Curve.”

**Figure 5.2**

*Generating the “Koch Curve” Fractal*

As can be seen, the curve is built starting with an equilateral triangle, removing the central third of each side, building another equilateral triangle at the location where the side was removed, and then repeating the process indefinitely. What is the length of the curve? Clearly, the Koch curve has infinite length even though it covers a finite area. The curve drives home the dilemma that Mandelbrot must have faced while trying to measure Britain’s coastline. One can zoom in and zoom out of a Koch curve, or any other fractal, to no avail. A
fractal therefore displays self-similarity on all scales. It need not exhibit exactly the same structure at all scales, but the same “type” of structures must appear on all scales (Weisstein, 1999).

Nature is replete with fractals. Mountains, rivers, clouds, trees, lungs, and vascular systems for example have a fractal nature in that they replicate a dominant pattern at several smaller levels of scale. Manmade objects like the Internet also have a fractal nature. No matter where one zooms in or zooms out on the Internet, one sees similar patterns of random connectivity amongst computers. Fractal geometry has been used to graphically show change and evolution in technology, sociology, economics, psychotherapy, medicine, psychology, astronomy, and evolutionary theory; its metaphorical application is spreading to art, humanities, philosophy, and theology (Scott, 1991). This study will add to the growing list. The fractal metaphor will shortly be applied to understand human competence.

CONCEPTUALISING ORGANISATIONS AND OCCUPATIONAL ROLES AS FRACTALS

Business organisations, being open systems, have a fractal structure. That is, in them lower-level systems are nested within similarly structured higher-level systems. Though Beer (1984) does not use the term fractal to describe the organisational structure as envisaged in his VSM, the recursive design that is said to make organisations viable (see Chapter 4) has a fractal element. Fractals, in effect, act like genetic algorithms enabling systems to efficiently replicate essential functions through lower-level systems that reside within them (Pascale 1999). The whole notion of “internal marketing” for example, implies that there is similarity between lower-level systemic functions and those performed by the suprasystem. The central idea of internal marketing is that a lower-level system (e.g., HR system), like a higher-level system (e.g., strategic business unit), is a producer with its own internal suppliers and customers. In fact, this thinking could be applied right down to the level of individual employees. Expounding his thinking on social systems, Boulding states:

…it is convenient for some purposes to distinguish the individual human as a system from the social systems that surround him, and in this sense social organizations may be said to constitute another level of organization. The unit of such systems is not perhaps the person – the individual human as such – but the “role” – that part of the person which is concerned with the organization or situation in question, and it is tempting
to define social organizations, or almost any social system, as a set of roles tied together with channels of communication (1956; p. 205).

While Katz and Kahn stop short of visualising an occupational role as an open system, they too regard the concept of role as a “major means for linking the individual and organizational levels of research and theory” (1978; p. 219). If one agrees that an organisation is an open system that has a fractal structure, then taking Boulding’s (1956) observation to its logical conclusion, one could conceptualise an occupational role (including managerial role) as a lower-level open system residing within an organisation. Just as cells are building blocks of living organisms, roles are building blocks of an organisation. It is thus argued that employees while enacting their roles should be capable of doing what open systems do. Put differently, a role needs the competencies that an open system needs. Given this argument, competence lends itself to being defined from an open systems perspective.

But before defining competence, an important issue needs to be addressed. The fractal structure as visualised suggests that all occupational roles within an organisation possess the properties of open systems. This equates managerial role with other generic roles. One can however talk about managerial competence only if the managerial role is in some way different from a non-managerial one. It is argued that although viewing organisational structures as fractals equates roles at one level, the fractal view does not imply that the specific activities performed during the enactment of all roles are identical. The fractal view is different from the traditional systems view of an organisation and has specific implications for a managerial role as explained below.

Manager: First Amongst Equals

As discussed in Chapter 3, systems scholars have traditionally visualised organisations as containing different subsystems, with managerial subsystems performing the important function of aligning subsystem-level goals with suprasystem-level goals (refer back to the sub-section titled, “General System Theory: 1930s to 1960s”). In contrast to the traditional organisations-as-systems view, the fractal view proposed in this thesis does not consider the managerial subsystem to be a standalone system. In fact, in the fractal view there is no place for isolated subsystems. Visualising systems as standalone systems amounts to subscribing to a reductionist view, which is, or should be, anathema to any systemic view. Figure 5.3 depicts the traditional and the fractal visualisation of an organisation.
In the fractal view, every embedded subsystem, be it a strategic business unit (SBU) or a functional unit within an SBU, is visualised as creating value through its own I-T-O processes. Therefore, all subsystems in the fractal view do, albeit at a smaller scale, what production and supportive subsystems are said to do in the traditional systems view. In so far as “control” and “adaptation” are concerned, these functions are not seen as being performed by any external subsystem. The management and the adaptation subsystems of the traditional view are rendered redundant by the fractal view. In the latter, the locus of control and adaptation is visualised as residing within each subsystem in the form of LAMSS (Learning, Adaptation, and Management Support System) as discussed below.

Each subsystem in the fractal view is considered purposeful and capable of analysing feedback loops and questioning assumptions. Nonetheless, the fractal view recognises that this pervasive double-loop learning ability, which makes adaptation and learning possible, cannot be allowed to run amuck lest it pull an organisation in different directions. Therefore, included in this view of organisations is LAMSS – a type of control system designed by Ackoff (1996). In Figure 5.3, every major subsystem is shown as having its own LAMSS. This is perhaps the only aspect of the fractal view that does not necessarily correspond with current organisational reality. Though one could insist that all organisations do have a “natural” LAMSS that is accessible at all levels (the reference here is to the human brain that all employees possess). It is another matter that in reality LAMSSs remain dormant, almost atrophying due to lack of formal organisational mechanisms to tap them.

A large number of organisations institute centralised management control systems to, as the name suggests, “control” their employees. The conventional control systems are seldom successful in converting their employee’s tacit or implicit knowledge of into an explicit asset (see Nonaka & Takeuchi, 1995) that is readily available for organisation wide use. Ackoff’s (1996) LAMSS aims to address this drawback. His system is designed to monitor feedback loops, formalise assumption questioning and testing within an organisation, and store learning outcomes in a corporate memory bank. As shown in Figure 5.3, the subsystem or system in which managers are embedded as “first among equals” as it were, could be the entire organisation in the case of CEOs; an SBU in the case of general managers; or a functional/technical unit of some kind in the case of other managers. Note that in the fractal view, all occupational roles are akin to open systems that are engaged in value creation. The difference is that managers in their roles, unlike non-managers, also create value
Figure 5.3
Organisational Structure: Two Different Views

The Traditional Organisations-as-Systems View

The Fractal View
through others (with substantial help from their LAMSS if it happens to be well designed). The fractal view thus implies the following definition of a manager: A manager is someone who as a formal head of a purposeful system gets work done through others. The “others” in the above definition may or may not be a part of the system in which the manager concerned is embedded. In fact, as shown in Figure 5.3, ever increasing complexity forces managers to frequently work with and through ad hoc cross-functional and cross-unit teams and committees comprising of people not under their direct control. These ad hoc committees, teams, SBUs, LAMSSs, and functional units of organisations are built “role-by-role” by employees performing specific activities that fall within their domains. This thesis will subsequently interpret systemic properties to show that a managerial role entails actions peculiar to that role. Thus despite treating all roles as lower-level open systems, the fractal view does not necessarily make it impossible to discriminate between managerial and non-managerial roles.

Once managerial roles have been captured under categories as suggested by systems theory, one could proceed to delineate the competencies needed by managers to execute the roles. But before an attempt is made to interpret systemic properties and develop a new taxonomy of managerial competence, it is imperative, that there be some agreement over what “competence” is. As was discussed in the previous chapter, different points of departure that stem from different notions of managerial effectiveness have led to very different ways of conceptualising competence. Since the extant definitions have major weaknesses, a new systems-based definition is offered in the following section that takes into account how systems create value for the external environment. Rather than concentrate on either inputs or outputs, the definition concentrates on both and focuses on the value creation process. Moreover, the effectiveness criterion implicit in the systemic view is at once internal and external. These features enable derivation of a simple, but a holistic definition of competency. The holism inherent in the new definition is consistent with systems theory.

**COMPETENCE DEFINED**

Since an occupational role could be considered an open system, it follows that the focal person while performing his or her role should be able to productively transform energy or create value through an I-T-O cycle. It is therefore argued that competence of any system should be defined in terms of its value creating ability. Accordingly, competence of a system is defined as *the ability of a system to create value in an optimal manner*. “Optimal” because,
as discussed, the property of negentropy implies that a system must not only strive to conserve as much energy as possible, but also ensure that its subsystems do not suffer undue wear-and-tear (i.e., accumulate large amounts of entropy) while the suprasystem is engaged in value creation. Note that optimal is followed by the word “manner” thereby highlighting the value creation process and not the amount of value created. It should also be borne in mind that value creation in the systemic context has a specific connotation. In the long run, the sole objective measure of value creation is survival. Only systems that can continually, and almost reflexively, exchange their outputs for inputs (while remaining negentropic) can claim to be competent as per the proposed definition.

To reiterate, remaining negentropic (or optimal) entails raising efficiency levels by trying to attain higher levels of output for the same amount of inputs. In addition to increasing the size of the numerator in the efficiency equation, being negentropic requires that systems try to: (a) ensure that minimal amount of unusable energy gets stored or dissipated within the parent system; and (b) the amount that does accumulate in the system (as some amount invariably will) is rapidly ejected. That is, being negentropic also entails keeping the value of $Z_2$ low (refer back to Figure 5.1). Unfortunately, the need to increase output and keep the value of $Z_2$ low can place conflicting demands on organisations and managers. It is a difficult balancing act that systems must execute if they are to sustain their negentropic state. Lacking formal mechanisms to either detect or eject $Z_2$, most organisations try to plug the visible but less damaging form of wastage (i.e., $Z_1$ in Figure 5.1) and focus primarily on readily measurable inputs (X) and outputs (Y).

From a systems perspective, an output of a process becomes an input of some other process. Thus inputs and outputs are essentially the same but are labeled differently depending on one’s frame of reference. A farmer’s orange crop, an output to the farmer, is an input to the marmalade manufacturer who buys the crop. Though inputs and outputs are easily identifiable at the boundary (or interface) between two systems (as in the orange grower-marmalade producer example), these are also continually produced and transferred within a system since a system being a fractal potentially contains several subsystems, each engaged in its own value creation process. Because the thesis has set out to identify individual-level managerial competencies, the focus is on value creation within a system. That is, the thesis is interested in how individual managers perform their role to create value.
The value creation process can be visualised as a chain or spiral consisting of almost an infinite number of I-T-O processes. Consider an example of a manager needing to study various industry reports before recommending a course of action. The findings of the various reports in this instance would be inputs that are later transformed through further analysis and weighing of options into an output (a final recommendation). One could zoom in on inputs to discover that the act of studying industry reports may be further broken down into input, transformation, and output processes. For example, while studying a report, the manager might feel the need to interview suppliers (inputs), and collate the findings of the interviews (transformation) before discerning a particular trend (output). This breaking down of competences into their I-T-O processes can continue almost ad infinitum. Thus the value creation process may be viewed as a fractal. See Figure 5.4 for a visual representation of the fractal structure of competence.

**Figure 5.4**

*Competency as a Fractal*

The fractal view of competence has similarities with how psychologists view personality. Ones and Viswesvaran (1996; p. 611) state that there is widespread consensus that “...the description of personality can be undertaken in a hierarchy of levels with specific descriptions at the lower levels of the hierarchy. As one goes up the hierarchy, broader traits are encountered.” Along similar lines, it is theorised that competence too is a hierarchy. Everything that resides in individuals and confers on them the ability to create value is linked
to their competence. As shown in Figure 5.5, the upper echelons of the value creation spiral contain broad competencies like general mental ability, while the lower echelons comprise narrow competencies like the power to memorise that can, in fact, be traced right down to the genetic makeup of an individual. Further, it is theorised that attempts to gauge aptitude and general mental ability (GMA), measure knowledge and skills, and examine deeper underlying personality traits are all attempts at probing the competence of an individual at different hierarchical levels of the same value creation spiral.

**Figure 5.5**

**Multi-level Probing of Competency**

Movement along the vertical axis in Figure 5.5 towards the base of the value creation spiral implies a shift in focus to a narrower competence. Probing at levels deeper and narrower than personality traits in the spiral is beyond the scope of social scientists. The scientist who studies memory processes at the neurological level to understand Alzheimer’s disease in effect concentrates on narrow memory-related competencies. Similarly, geneticists who attempt to isolate the genes responsible for say “memory for facts” (as opposed to “memory for procedures”) focus on still narrower memory-related competencies that perhaps
lie at the base of the value creation spiral. The horizontal axis in Figure 5.5 indicates that measurement accuracy (but not necessarily ease of measurement) improves as one travels towards the base of the spiral. This makes intuitive sense; as one narrows one’s focus, by definition, it becomes sharper.

To borrow from Ones & Viswesaran’s (1996) analogy, traversing from the upper to the lower echelons of the value creation spiral would entail discarding a pair of binoculars for a microscope. For social scientists, the choice then is between probing broad (or less accurately measurable) and narrow (or more accurately measurable) competencies. The notion, again, parallels the “bandwidth-fidelity trade-off” concept found in the literature on personality measurement for personnel selection. Researchers in the personnel selection area claim that they often have to choose between careful measurement of a single narrowly defined variable and a cursory exploration of multiple variables (see Cronbach, 1960; Hogan & Roberts, 1996; Ones & Viswesvaran, 1996). As is the case with personality traits, it is postulated that broad competencies will be valid predictors of broad criteria. Conversely, narrow competencies will be valid predictors of narrow criteria. This concludes the discussion on the systems-based competency definition.

The proposed definition of competency is based on the systemic property of energy transformation, which, as has been discussed, is indispensable for value creation. The definition is also tempered by two other systemic properties. It reflects the pervasiveness of the fractal structure of systems by deeming competence itself to be a fractal. The reference to optimisation in the definition is a reflection of the limitation imposed by the property of negentropy, which stipulates that in order to survive over an appreciable length of time, a system must be energy efficient and it should try to minimise disorder that accumulates within it.

Having conceptualised occupational role as an open system and defined competence as the ability to create value in an optimal manner, the thesis can finally shift its focus to identifying what managers should do to create value. Managerial role is embedded in social systems, which must create value for the external environment in order to survive; hence, managers to ensure the survival of their own roles must create value for their respective external environments. In abstract terms, as has been explained, value can only be created through manipulation or transformation of energy. The next section begins to develop an argument that can help discern what managers should do if they are to successfully
manipulate or transform energy. “Successfully”, in the systemic context means contributing to organisational survival and longevity

**DISCERNING THE NATURE OF MANAGERIAL WORK**

Shorn of all jargon, this is the picture painted by systemic properties: Business organisations can survive in the long run only by creating value for their external environment. It is possible to create value in a number of ways; the only imperative is that organisations create value as efficiently as possible without compromising their ability to undertake value creation processes in the future. In order to create value for the external environment, organisations need to match its complexity. They are thus compelled to form committees, ad hoc cross-functional teams, and introduce specialised subsystems. These teams and subsystems have other subsystems embedded within them; therefore, the number of interfaces within an organisation tends to increase exponentially as complexity increases. The purpose of subsystems, which are generally “headed” by managers, is to contribute to the overall value creation effort of an organisation. During value creation processes, subsystems exchange their outputs and inputs at their respective boundaries or interfaces. Thus managers at all levels should be able to manage interfaces while creating value. Further, managers also need to understand at all times as to what is valued by their respective external environments.

In an ever changing external environment, the nature of competition changes as do value preferences. Accordingly, an organisation too must grow either in terms of its size or in terms of altering its value proposition; or both. As an organisation grows, it is confronted with choices and must periodically exercise its options. Thus managers should be able to manage growth by continually exercising options and learning through their feedback mechanisms whether their offerings are valued by the external environment. However, irrespective of the choices an organisation makes, a stage comes when growth stagnates and the organisation becomes unstable and teeters on the edge of extinction. The response of the managers to this contingency determines an organisation’s destiny: the organisation can cease to exist, survive to live another day, or emerge triumphant by recreating itself (until the next cycle of stability-growth-possible demise). Thus managers should also be able to manage contingencies when their feedback loops breakdown. It could be argued that since growth gives rise to contingencies, growth management and contingency management are one and the same. But as explained below, there is an important difference between the two.
The difference between growth and contingency management may be understood in terms of differences in the purpose of a system. Attempting to define an epistemology of process as a basis for the development of expressive and creative action, Cooper (1976; pp. 999-1000) identifies three forms that humans and their environments can assume. His exposition of the three forms is reproduced below:

(1) The Structural Form: Its main features are preservation of itself at the expense of the environment and subordination of its parts to the whole. Men’s energies, therefore are directed to the maintenance of the system more or less as it is, and also of themselves as they occupy the functional roles of the system. It is the world of Classical Rationalism.

(2) The Process Form. Through flux and chance events coincide to make novel forms. In the extreme, there is no guiding purpose; things merely happen. The precondition for process is the abnegation of control; men have to deny their existing structure in order to lay themselves open to the creative possibilities of chance. It is questionable whether men can assume the process form for long periods without dissipating themselves into chronic nonstructure, e.g., madness and chaos. The paradigm for the process is Surrealism.

(3) The Structure – Process Balance. Structure and process complement each other in a state of “regenerative equilibrium” (Koestler, 1964). The relationship is cyclic: the disintegration of structure → a temporary immersion in process → the attainment of a new, more creative structure. In this form, men continually have to disapprove the adequacy of their own structures without having detailed preconceptions of what should take their place. The relevant paradigm is Creative Evolution (Bergson, 1944).

Cooper (1976) goes on to explain that the key to understanding the structure-process relationship lies in the concept of purpose. He claims that purpose binds together a system and gives it direction; and it does so at the expense of process. Therefore, fixed and specific purposes are said to lead to fixed and specific structures. Since process is all about flux and change, Cooper asserts that process is inversely related to the degree of fixity and specificity of purpose and that given a fixed and specific purpose, everything else adjusts to that purpose. Delving deeper, he suggests that one could classify systems by their purpose as being either instrumental or expressive. Instrumental systems use themselves as a means for attaining objectives that are external to themselves (e.g., production units). Such systems thus display organisational forms that stress structure over process and their purposes are relatively specific. In contrast, expressive systems, explore their external environments to realise various possibilities (e.g., creative artists). The organisational form of expressive systems is of “structure-process balance” and accordingly their purposes are diffuse.
Interestingly, the instrumental and expressive systems are described by Cooper (1976) as following different principles of development: linear and contingent. Linear development is the path taken by instrumental systems from the known to the known. That is, instrumental systems attempt to grow by maintaining stability and imposing their own image on the environment. The growth of such systems entails sharpening of instrumentality and/or increase in size. Unlike linear development, contingent development of expressive systems eschews restrictions implied by specific purposes and fixed structures. Cooper states that every contingency is valued as a potential source of growth by expressive systems and that an expressive system is “ viewed as a mosaic of possibilities whose actualization depends upon chance factors; its growth is multiform, dependent on adventure and discovery” (1976; p. 1000).

Systems theory has advanced substantially since Cooper wrote about the different paths to development. It is now known how stable systems through “chance and discovery” can reinvent themselves at the edge of chaos. It is not a question of being either instrumental or expressive. Purposeful systems populated by humans can, and do, possess qualities of being both instrumental and expressive. This thesis has in effect argued that only those “instrumental” systems that have the capacity to “express” themselves can re-emerge from the precipice that linear development inevitably takes an organisation towards. The notions of linear and contingent development have striking parallels with the notions of growth and contingency management. During times of stability, managers need to put a premium on growth (i.e., linear development). At other times, when an organisation teeters at the edge of chaos, contingency management (i.e., contingent development) skills of managers must come to the fore if the organisation is to survive. Cooper’s “disintegration of structure → a temporary immersion in process → the attainment of a new, more creative structure” cycle has similarities with the “stability-growth-possible demise” cycle implied by systemic properties. But this does not imply that managers need to manage contingencies only once in a while when their systems face extinction.

The fractal structure of systems ensures that contingencies are perpetually being faced by systems at different levels. Any of these contingencies, if not nipped in the bud, have the potential to destabilize a system and hurtle it towards a precipice. Depending on the ability of managers, the lower level systems are forever recreating and redefining themselves in order to preserve the stability of their larger parent system. The challenge for lower-level systems is to
redefine themselves as seamlessly as possible. From the perspective of the suprasystem such changes may seem incremental, but at the lower levels the changes could have major ramifications -- a redefinition of anything, howsoever small, can hardly be incremental.

The contours of the activities that managers need to undertake to ensure organisational survival are beginning to emerge and will be brought into sharper relief in the next chapter. As per the picture painted by the systemic view, an organisation is an entity with many interfaces that must have the ability to grow in a complex environment if it is to survive. Further, an organisation should be prepared to face contingencies that growth, even successful growth, inevitably brings about. To use systemic terms, managers should be adept, in the general sense, at transforming “energy” (i.e., executing I-T-O processes to create value). More specifically, they should be able to create value while they manage interfaces, growth, and contingencies. Accordingly, the next chapter identifies the generic competencies needed for value creation and the specific competencies needed for managing interfaces, growth, and contingencies.
CHAPTER 6

A NEW TAXONOMY OF MANAGERIAL COMPETENCE

Systemic properties are interpreted in this chapter to arrive at conclusions about what managers should be competent at to be deemed effective. An attempt is made to establish a line-of-sight between systemic properties and managerial competencies. The chapter begins by deconstructing the value creation process in a bid to identify generic competencies (i.e., competencies which all open systems must possess for value creation). It emerges that the generic competencies in the current context pertain primarily to information processing. Therefore, to further explore the notion of generic competence, the chapter discusses other bodies of literature that have similarly linked individual ability to information processing ability. The discussion underscores the fresh insights offered by the open systems perspective on human competence in general and managerial competence in particular. As mentioned in the previous chapter, if managers are to ensure the survival of the system in which they are embedded, they should be competent at managing interfaces, growth, and contingencies. Accordingly, the chapter proceeds to identify the specific competencies needed to manage interfaces, growth, and contingencies and classifies them as such.

It is claimed that the proposed taxonomy, despite containing just three competency clusters, is valid across cultures, industries, organisational functions, and job levels. Prima facie, the generalisability claim appears overly ambitious, but is defensible because the proposed taxonomy is based on widely applicable systemic properties. Nonetheless, the thesis recognises that the context in which managerial work takes place does have a bearing on the competencies needed by managers; therefore, the context-driven variations in managerial work are discussed next. Finally, the chapter concludes by identifying the circumstances under which the proposed taxonomy may prove invalid.

In effect, the final section of the chapter discusses the boundary conditions of the proposed taxonomy. As mentioned in Chapter 1, it is unusual to delimit a thesis towards its concluding stages and not at the very outset. It is however argued that while synthesising, one may, per force, have to postpone delimiting the object of one’s study. In this case, it was only after gaining an understanding of the context in which managers operate that it became possible to crystallise the amorphous nature of managerial role. Recollect that the synthesis undertaken in the previous chapter led to managerial roles being visualised as building blocks.
of higher-level systems. The focus then shifted to the properties of higher-level systems. This expansion in scope brought to the fore the fractal property of systems. The fractal property in turn made it possible to once again narrow the scope and infer the generic and specific roles that the building blocks themselves should play if they are to ensure the survival of the higher-level system in which they are embedded.

In general terms, the thesis has argued that the building blocks (i.e., occupational roles) of a system must strive to create value if the system in question is to survive. Put in this manner, the argument seems hardly remarkable. But importantly, the systems perspective offers insights on how value is created. The following section claims that focusing on value creating processes can help one delineate generic competencies that are indispensable to managers across situations.

**GENERIC COMPETENCIES**

**I-T-O Competencies**

The fractal view of organisations suggests that managers as formal heads should be capable of creating value in the technical-functional and interpersonal domains in the subsystems in which they are embedded. While outcomes in the technical-functional domain are generally more visible and relatively easy to measure, no less important are outcomes in the interpersonal domain. In the process of getting work done through others, managers should be sensitive to negative affect associated with their work processes. As discussed, generating negative affect during value creation is analogous to accumulating entropy and tantamount to suboptimal value creation. Thus far, it has been emphasised that value can only be created by a system through I-T-O processes. Since an occupational role is an open system in its own right, all occupational roles entail effective execution of I-T-O processes. Analogously, individuals executing occupational roles should possess input, transformation, and output competencies if they are to create value. The three generic competencies may be defined as follows:

- **Input competence**: The ability to bring to bear the resources needed for a given task.
- **Transformation competence**: The ability to convert available resources into desirable outputs.
• **Output competence**: The ability to retain and/or add value while delivering a finished product to the external environment.

As conceptualised, the generic I-T-O competencies are the life-blood of any value creation process. A deficiency in any of the three generic competencies would greatly impede value creation, irrespective of the domain in which I-T-O cycles are executed. Admittedly, academics will need to first operationalise the generic I-T-O competencies if such competencies are to be of any use to practitioners. As Green (1999) points out, an operational definition of a competence should help one observe a competence. That is, on witnessing competent behaviour one should be able to recognise it as such. Discerning managerial competence can be particularly challenging since most managerial activities, being mental, are not directly observable.

In the case of managers, one of the manifestations of input competency arguably would be the ability of managers to cope with cognitive complexity. A manager cannot garner the necessary resources to complete a task or solve a problem unless she can sift through a maze of information and isolate that which is of essence. Similarly, a manager cannot be said to possess transformation competency if he lacks the ability to analyse and synthesise complex problems, recommend a viable course of action, and when applicable, ensure that the recommended course of action is executed. With regards to output competency, it is held that this competency would be lacking in managers who are unable to get themselves understood by others while delivering their final product; thus the ability to communicate clearly is an important manifestation of output competency. One could thus operationalise and measure generic competencies of managers in terms of their ability to cope with complexity, process information, and communicate; and then proceed to make predictions about their efficacy. But as pointed out, generating negative affect during value creation detracts from a manager’s competency. Efficacy predictions therefore, would also need to take into account whether the concerned manager’s style had the potential to increase the levels of entropy accumulated during value creation.

Executing I-T-O processes with minimal entropy accumulation is not all that there is to managerial work. As has been emphasised, to ensure the long-term survival of their organisations (i.e., to be deemed effective), managers should be able to create optimal value (through their generic I-T-O competencies) in the domains in which they work (functional-technical and interpersonal) by managing interfaces, growth, and contingencies. Therefore,
the proposed systems-based taxonomy of managerial competency contains three clusters: Interface, Growth, and Contingency Management Competency clusters (see Figure 6.1). The clusters in Figure 6.1 are also shown to contain specific competencies that suggest themselves a priori. The systemic rationale behind the inclusion of specific competencies is discussed later in this chapter. For the moment, it should be noted that all the specific competencies in the three clusters are underpinned by generic I-T-O competencies. Generic competencies, being the life-blood of the value creation process, are to be found in every sinew of individual-, group-, and organisational-level competencies.

By defining competency as an ability to create value in an optimal manner, the thesis takes into account how systems must create value for the external environment to ensure their own survival. The open systems view may therefore be described as a process-based view of competency. As has been emphasised, open systems cannot execute value creation processes unless they possess I-T-O competencies. Since input competency, being a “competency,” must itself comprise of I-T-O competencies, a competency is said to have a fractal structure. Though the proposed systemic view, which is based on value creation through mental processes, is very different from extant conceptualisations of competence discussed in Chapter 4, a somewhat similar view of how individuals process information is found in the human intelligence and human capability literature. Given the fact that managerial work mainly involves information processing, it may be pertinent to discuss parallel notions from these bodies of literature. In future, scholars interested in the area could consider linking human competence, capability, and intelligence. Intuitively, one could hypothesise a relationship amongst these constructs.

OTHER COMPARABLE NOTIONS

Structure of Intellect (Guilford, 1977)

Joy Paul Guilford, a US psychologist, rejected the prevailing “Spearmanian” view that measured intelligence through a single numeric parameter (for a summary of Spearman’s view, see Williams, Zimmerman, Zumbo, & Ross, 2003). He, instead, proposed a model that viewed intellectual abilities as comprising three dimensions: operations, contents, and products (Guilford, 1977). The operations dimension in his model refers to major kinds of intellectual activities or processes, that is, things that the organism does with raw materials of information; and information is defined as that which the organism discriminates, that is, each item of information is different from every other item so that the organism can distinguish
Figure 6.1
Taxonomy of Managerial Competence

I-T-O = Generic input-transformation-output competencies
IMC = Interface management competency
GMC = Growth management competency
CMC = Contingency management competency
one item from another. The products dimension pertains to forms that information takes in
the organism’s processing of it. Finally, the contents dimension refers to broad classes or
types of information discriminable by the organism.

As Fleishman and Quaintance, (1984) note, one could use Guilford’s structure of
intellect (SOI) model to describe tasks that involve information processing. Interestingly,
they point out that in an information-processing context, the Contents dimension in the
SOI model represents inputs, the Operations dimension reflects the processing of or acting
upon the inputs (i.e. transformations), and the Products dimension represents the outputs.
Indeed, there are striking similarities between Guilford’s description of the structure of
intellect and this thesis’s description of the structure of competence. Albeit developed
from different vantage points, both views link their respective objects of study (i.e.,
“intellect” and “competence”) to how individuals process information. Further, both views
in their own language implicate I-T-O processes. The SOI model isolates five kinds of
contents/inputs (visual, auditory, symbolic, semantic, behavioural), five kinds of
operations(transformations (cognition, memory, divergent production, convergent
production, evaluation), and six kinds of products/outputs (units, classes, relations,
systems, transformations, and implications). See Table 6.1 for definitions of various
Contents (or Inputs), Operations (or Transformations), and Products (or Outputs).

Table 6.1

Category Definitions for Guilford’s Parameters in the Structure-of-Intellect
Model

<table>
<thead>
<tr>
<th>Contents (or Inputs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Types or broad classes of information discriminable by the organism.</td>
</tr>
</tbody>
</table>

Auditory

Information instigated directly from stimulation of the inner ear in the form of sensations, or indirectly in the form of images.

Visual

Information instigated directly from stimulation of the eye in the form of sensations, or indirectly in the form of images.

Symbolic

Pertaining to information in the form of denotative signs having no significance in and of themselves, such as letters, numbers, musical notations, codes and words (as ordered letter combinations).

Semantic

Pertaining to information in the form of conceptions or mental constructs to which words are often applied. Most notable in verbal thinking and verbal communication, but not necessarily dependent upon words. Meaningful pictures also convey semantic information.
Table 6.1 (continued)

*Behavioral*

Pertaining to information, essentially non-figural and nonverbal, involved in human interactions, in which the attitudes, needs, desires, moods, intentions, and thoughts of others and of ourselves are involved.

### Operations (or Transformation):

Things that an organism does with raw materials of information.

*Cognition*

Immediate discovery, awareness, rediscovery, or recognition of information in its various forms; comprehension or understanding.

*Memory*

Fixation of newly gained information in storage. The operation of memory is to be distinguished from memory store.

*Divergent Production*

Generation of logical alternatives from given information, where the emphasis is upon variety, quantity, and relevance of output from the same source. Likely to involve transfer recall (instigated by new cues).

*Convergent Production*

Generation of logical conclusions from given information, where the emphasis is upon achieving unique or conventionally best outcomes. Likely that given information fully determines the outcome.

*Evaluation*

Comparison of items of information in terms of variables and making judgments concerning criterion satisfaction (correctness, identity, consistency).

### Products (or Outputs)

Forms that information takes in the organism’s processing of it.

*Units*

Relatively segregated or circumscribed items or “chunks” of information having the character of a “thing”. May be close to Gestalt psychology’s “figure on a ground”.

*Classes*

Conceptions underlying sets of items of information grouped by virtue of their common properties.

*Relations*

Connections between items of information based upon variables or points of contact that apply to them. Relational connections are more definable than implicational connections.

*Systems*

Organized or structured aggregates of items of information; complexes of interrelated or interacting parts.

*Transformations*

Changes of various kinds (redefinitions, shifts, transitions, or modifications) in existing information.

*Implications*

Circumstantial connections between items of information, as by virtue of contiguity or any condition that promotes “belongingness”

\[ \Psi \]

May not be applicable to managerial work

Excerpted from Guilford & Hoepfner (1971)
Since inputs, transformations and outputs are independent dimensions, as per SOI, there are 150 different cells or components (5 Transformations x 6 Outputs x 5 Inputs) of intelligence (see Figure 6.2). Each cell in Guilford’s model represents a hypothetical factor (or ability) related to intelligence. There exist one or more tests designed to measure each of the demonstrated factors. The factorial descriptions provide concise definitions of specific abilities and the cells in Figure 6.2 could be viewed as succinct descriptors of behaviours. Moreover, each behavioural cell could be regarded as a composite of an operation or activity performed upon some content or type of information to obtain a product (Fleishman & Quaintance, 1984).

**Figure 6.2**

**Guilford’s Structure of Intellect Model**

Since managerial work involves information processing, one could use Guilford’s model to identify and describe managerial competencies. In one study, for example, tasks designated as problem solving in nature did not reveal a one-dimensional problem solving factor, but rather loaded on already established factors, such as Verbal Comprehension, Conceptual Foresight, Originality, and Semantic Elaboration (Merrifield, Guilford, Christensen, & Frick, 1962). The point is that problem solving did not represent a unitary behaviour distinct from all other behaviours; rather, it could be analysed in terms of less complex, component behaviours. Thus the component behaviours of problem solving (or any other competency involving mental processing of information for that matter) contain
elements analogous to input, output and transformation competencies as suggested by open systems theory.

The SOI model continues to be one of the most complete taxonomic systems ever developed for describing intellectual abilities (Fleishman & Quaintance, 1984). As stated earlier, in effect, the model considers each mental process as comprising I-T-O processes and links intellectual ability with information processing ability. In particular, the operations of convergent and divergent production as described by Guilford (1977) can help one better understand generic problem solving abilities. While convergent production involves deductive generation of a single solution to a problem, divergent production involves creative generation of multiple responses to a given problem.

In recent times, scholars studying student performance have tended to attribute resourcefulness and the ability to solve open-ended problems to divergent thinking (see Yorke, 2003). In similar vein, the Canadian psychologist, Elliot Jaques has linked human capability to the ability to process complex information and generate multiple responses to a given problem. His research is consistent with the systemic conceptualisation of competence developed in this thesis and is discussed next. Jaques’s theory on human capability cannot be explained in a piecemeal fashion and needs to be discussed in its entirety. The discussion that follows may strike one as being a somewhat complex and long digression, but it will later become evident that Jaques’s (2002) view on human capability shares much in common with the systems perspective on human competence put forth in this thesis. In fact, the two views inform each other and when combined, paint a more complete picture of the nature of managerial competence.

Human Capability (Jaques & Cason, 1994; Jaques 2002)

On being approached by a group of union representatives who were dissatisfied with traditional approaches to job evaluation and who wanted incumbents to be paid equitably on the basis of the size of their jobs, Jaques set out to formally define work and determine how “big” or “small” a job really was. His study spanned over four decades and, somewhat unexpectedly, led to the development of a theory of not only human capability, but also of life and behaviour of living organisms in general. Explained below are the features of his theory that are germane to this thesis:
Work is central to the very being of living organisms because all living organisms must work to survive, adapt, reproduce, and communicate. Just as mechanical work \( W \) is defined as exertion of force \( (F) \) to move an object to a given distance \( (S) \) (i.e., \( W_{\text{mech}} = F \times S \)), Jaques defines organical work as exercise of judgment \( (J) \) through time \( (T) \) (i.e., \( W_{\text{org}} = J \times T \)). Organical work thus is not about expending physical effort. It is about using one’s judgment and making choices and decisions on the way to achieving a goal within a given time frame (see Figure 6.3). Consider the case of a worker who is required to carry bricks to a mason. At first glance, carrying bricks appears to be a purely mechanical activity, but this is not the case. Carrying bricks, as Jaques points out, requires one to use one’s brain for balancing the load carefully and not dropping anything going up the ladder, and for “judging how to work quickly enough but not so quickly as to be dangerous” (2002; p. 19). Thus even the most mundane of human work contains a mental (or organical) element.

**Figure 6.3**

Goal-directed and Time-bound Work

In general, humans experience work and feel that they are expending effort when they exercise discretion and mentally loosen (or bifurcate) myriad choices to make decisions in pursuit of their goals. The wavy path in Figure 6.3
indicates that goal attainment is seldom straightforward. There is often a vast multiplicity of choices potentially available to individuals as they try to achieve their goals. Jaques states that it is impossible to explain why exactly an individual exercises a particular choice. He insists that how choices are made cannot be fathomed and that the decision making process defies description. He links this “ineffability” of the decision making process to “free will” that all organisms seem to enjoy (2002; p. 11). To illustrate his notion of free will, Jaques turns to the nesting pattern amongst birds. He explains that while genetic evolution can account for the nesting behaviour of a species, the gene-driven influences cannot explain the specific choices and judgments that an individual bird makes around “where to put a nest, which of the available material to gather, how to carry out the best weave with those particular materials” (2002; p. 11; emphasis in original). Jaques implies that even if the bird in question were capable of speech, it would be unable to rationally explain all its decisions.

- This chapter will later discuss how the open systems perspective can clear some of the haze around the decision making processes that are integral to organical work. In the current context, it should be noted that on the one hand Jaques suggests that organisms enjoy free will, on the other he draws attention to factors that impose a limit on the number of choices that organisms can generate while making decisions. Notice that in Figure 6.3, the wavy path towards a goal has been “boxed in” or limited by some factors. The limiting factors merit a discussion since, by definition, they restrict productivity.

- Humans, notes Jaques (2002), have created a world governed by rules, policies, and laws that tend to impose limits on the number of choices that may be generated during an organical work process. For example, legal stipulations often impose limits on how researchers may conduct their experiments. Interestingly, Jaques found that employees felt no sense of effort or work when staying within the limits imposed by rules and regulations – unless they happened to be operating just at the boundary. So while carrying bricks, most workers would not feel that they had to do extra work on being instructed to wear gloves and helmets. Ordinarily, workers would not need to make any
judgments while following the safety instructions in this instance. But for those operating at the boundary or “living on the edge” (e.g., fire fighters or stem-cell researchers), Jaques suggests that rules and regulations, which must per force be somewhat ambiguous, could increase the need to exercise judgment. It is not hard to imagine how the work of fire fighters (or stem-cell researchers) might entail frequent weighing of risks. The need to constantly assess risks and exercise choices could lead to mental fatigue and increases in the level of “felt work.”

- This is not to say however, that Jaques considers the number of choices generated during organical work to be solely a function of the rules and regulations imposed by external agencies. On the contrary, he places greater emphasis on internal factors. Apart from rules and regulations, as indicated in Figure 6.3, the number of choices generated also gets limited by the availability of resources, methods used, and the capability of the employee doing organical work. For instance, by analysing multiple variables within seconds and generating myriad options, a computer could prove to be a useful decision-making resource. Similarly, people trained in conducting brainstorming sessions may be able to generate more choices than those not trained in the method. One can thus appreciate as to how lack of access to resources and methods within an organisation might limit the number of choices that get generated by employees. But what about employee capability? How does an individual’s capability, the most important internal factor identified by Jaques, impose limits on the number of choices generated?

- Jaques hypothesises that “greater the level of capability of the individual, greater is the loosening and bifurcation process, in the sense that greater is the number of associations that become possible, and hence greater the complexity of the problems for which solutions (decisions) can be created” (2002; p. 22). Note the parallels with Guilford’s (1977) concept of divergent production. Jaques too links problem-solving abilities with the manner in which individuals process information. Jaques and Cason (1994) furnish robust evidence to establish that the capability of an individual (i.e., the ability to work effectively in a corporate hierarchy) can be accounted for by ascertaining: (a) the order of
complexity of information that an individual can process; and (b) the style in which the individual processes the information in question. Given the central role that *Orders of Information Complexity* and *Information Processing Styles* play in making predictions about individual capability, these notions merit closer scrutiny.

- **Orders of Information Complexity.** Based on increasing levels of abstraction, Jaques identifies six levels of *information complexity* from First Order to Sixth Order as follows (see Table 6.2 for more details):
  - First Order: Here-and-now tangible entities.
  - Second Order: Intangible entities and collections of tangible entities.
  - Third Order: Categories of intangible entities.
  - Fourth Order: Categories of categories of intangible entities: conceptual abstractions.
  - Fifth Order: General principles: categories of categories of categories of intangible entities.
  - Sixth Order: Universals (2002; p. 34).

- Those capable of processing higher orders of information complexity are said to be more capable. Nonetheless, Jaques clarifies that the mere use of high-sounding abstractions by an individual does not make the individual concerned capable of processing higher order complexity. To be deemed thus, the individual had to demonstrate an ability to generate solutions using abstractions. For instance, Guilford would be considered by Jaques as someone capable of processing Fourth Order complexity since the highly abstract categorisations (Contents, Operations, and Products) in Guilford’s SOI model are not hollow – they have the potential to offer solutions to practical problems.

- That a two-year old cannot process any information beyond the here-and-now (i.e., the First Order complexity) and that a 20-something finance graduate can grapple with abstract concepts like stock options and derivatives (i.e., Third Order complexity) are assertions hardly likely to raise eyebrows. What often causes consternation, Jaques confesses, is his assertion that an individual’s ability to process complex information is innate and that it matures at varying rates. In effect, the assertion implies that some humans are genetically better
<table>
<thead>
<tr>
<th>Order</th>
<th>Description</th>
<th>Illustrations</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Order</td>
<td>Here-and-now tangible entities</td>
<td>Information is confined to things present in the sensible environment (e.g., “I want that doll”). Used by human infants and the rest of the animal world through sign language.</td>
</tr>
<tr>
<td>Second Order</td>
<td>Intangible entities and collections of tangible entities</td>
<td>Information is no longer limited to the thing on hand; it moves on to things that might happen (e.g., “a cat may sit upon the mat”); and it may refer to a collection (as opposed to an abstract categorisation) of specific entities (e.g., “toys in a child’s room”; but not “educational” toys). Used by human children.</td>
</tr>
<tr>
<td>Third Order</td>
<td>Categories of intangible entities</td>
<td>Information becomes less connected with what is at hand and pertains to difficult to define intangible entities (e.g., “rent” which in turn contains first order tangible money). Everyday adult communications that may refer to activities in the past, present and future (e.g., “investment”).</td>
</tr>
<tr>
<td>Fourth Order</td>
<td>Categories of categories of intangible entities: conceptual abstractions</td>
<td>The information is well-removed from the world of sensible reality. The conceptualisation may incorporate within it a number of third order tangibles. Highly sophisticated or “exceptional mortals” may use the categorisation to relate several such abstractions to make a point of practical significance (e.g., Guilford’s SOI model).</td>
</tr>
<tr>
<td>Fifth Order</td>
<td>General principles: categories of categories of intangible entities</td>
<td>The information contains at least two layers of abstract conceptualisations and may be eventually broken down into thousands and millions of specific entities. This is the level of information used by extraordinary mortals to build general laws that can help make sense of the massively complex world we live in (e.g., Newton’s laws of physics).</td>
</tr>
<tr>
<td>Sixth Order</td>
<td>Universals</td>
<td>Information contained in works of geniuses that have stood the test of time and transcended cultures (e.g., the works of Confucius, Aristotle).</td>
</tr>
</tbody>
</table>

Adapted from Jaques (2002)
equipped than are others to process complex information and that those born with “lower” abilities matured at a rate that did not permit them to ever catch up with those with greater innate ability. Hence, no longer could one back one”s effort and ambition to take one wherever wanted to go – one”s innate capability imposed limits. Some dreams, simply put, were unattainable. Seen in this light, the consternation appears understandable. But is it justifiable? The objections to accepting the fact that human capability might be unevenly distributed due to natural causes seem misplaced when otherwise there appears to be a ready acceptance of “normal distributions” across a broad spectrum of human characteristics and endeavours. Moreover, Jaques and Cason (1994) provide strong evidence in support of fixed maturation rates of information processing capabilities. Their data indicate that individuals not only become progressively capable of processing higher orders of information complexity, but they also display a progressively sophisticated style of information processing that evolves at a pre-determined rate. Different information processing styles and their evolution are discussed next.

- **Information Processing Styles:** Jaques and Cason (1994) insist that individuals process information in four, and only four, ways: declarative, cumulative, serial, and parallel. The information processing styles are analogous to four logic types: or-or; and-and; if-then-then; if-and-only-if. Table 6.3 contains detailed descriptions of the four styles.

- As individuals age, unless hampered physiologically, they display greater levels of sophistication in their information processing styles. To begin with, a human child is capable of declarative processing with First Order information. As the child grows, it progressively develops cumulative, serial, and parallel information processing capabilities. It then graduates to processing with Second Order information. Again, initially, the young adult can subject Second Order information complexity only to declarative processing. Thereafter, gradually the adult begins to display the ability to subject Second Order information complexity to cumulative, serial, and parallel processing in the sequence mentioned. The same pattern is repeated as individuals graduate to processing higher orders of information complexity.
Table 6.3
Information Processing Styles

Declarative (or-or):
A person supports a position by putting forth a number of separate reasons for it. “I think that so and so could be true because of this, or this, or this other reason.”

Cumulative (and-and):
A number ideas, none of them sufficient on their own, are brought together to make a case. “I think that so and so is true because of this, and this, and this other reason taken together.”

Serial (if-then-then):
A person explains his or her position by reasoning sequentially and linking a chain of reasons. “I think that so and so is true because if we do it, it will lead to X, and that will then lead to Y, and that will then cause Z.”

Parallel (if-and-only-if):
A number of alternative positions, each arrived at through serial processing, are simultaneously examined and linked together. “I know that if we do X it will lead to Y, and then to Z but we have to consider that if we do not do X but rather do A, that will lead to B, and then to C. So we have to consider both possibilities and relate them.”

Adapted from Jaques and Cason (1994)

- The four information processing styles keep recurring in the life of individuals. The difference is that on every recurrence, the information processing style gets applied to a higher order of information complexity. With advancing age, as per this view, individuals become capable of processing increasingly complex (or more abstract) information in an increasingly sophisticated style that matures at a set pace. No amount of training or incentives can “fast track” individuals along what may be described as pre-ordained paths of maturation.

- In his lifetime, Einstein had perhaps graduated to processing Sixth Order information – the zenith of human capability. But as Jaques (2002) discovered, most ordinary mortals can do no better than parallel process Third Order information complexity by the time they are 70 years old. But maturation rates of individuals, depending on their innate abilities, do vary substantially. For example, individuals capable of declarative processing with Third Order information complexity at the age of 30 years, graduate to declarative processing with Fourth Order information complexity at 60. In contrast, those capable of parallel processing Third Order information complexity at 30
become capable of serial processing Fourth Order information complexity at the age of 60. See Figure 6.4 for examples of how 20-year olds with different innate abilities progress along what are fixed capability maturation paths.

- Jaques contends that 20-year olds who cannot process Third Order information complexity are incapable of working in the corporate sector. At the other end of the spectrum, extraordinary mortals capable of parallel processing Fourth Order information complexity are said to feel under-challenged in a corporate environment. Jaques cites examples of visionaries such as Konosuke Matsushita and Alfred Sloan who, owing to the maturation of their capabilities, outgrew their CEO roles and went on to grapple with problems much bigger than those posed by the corporate world.

- To recapitulate, Jaques defines organical work as exertion of judgment through time (i.e., $W_{org} = J \times T$). The discussion until this point has remained confined to the “J” in the equation. It has been pointed out that while working, employees need to make sound judgments after adequately processing information and generating choices. One will readily agree that the order of information complexity that machine operators need to process in the shop floor before exercising their judgment is likely to be lower than the order of complexity that, say, a Manager (Inventory Control) must process. But where does “time” come into the picture?

- Jaques argues that different roles have different time-spans. A machine operator’s role in the shop floor would have a much shorter time-span of discretion than that of the Manager (Inventory Control) in the above example. The time-span of discretion of a role may be objectively measured by “ascertaining the longest periods that employees were required to continuously exercise judgment in completing assignments without their managers being in a position to know whether they were very slowly getting behind or creating very marginally substandard output quality” (Jaques, 2002; p. 24; emphasis added).

- To clarify, in most cases, a machine operator’s time-span of discretion would seldom be in excess of “one day”. Put differently, an error of judgment made on the shop floor would be noticed within hours, if not minutes, and most certainly
Figure 6.4

Capability Maturation Paths: Some Examples

<table>
<thead>
<tr>
<th>Information Complexity</th>
<th>Processing Style</th>
<th>Time (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fourth Order</td>
<td>Parallel</td>
<td>70 yrs</td>
</tr>
<tr>
<td></td>
<td>Serial</td>
<td>52 yrs</td>
</tr>
<tr>
<td></td>
<td>Cumulative</td>
<td>39 yrs</td>
</tr>
<tr>
<td></td>
<td>Declarative</td>
<td>27 yrs</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Third Order</td>
<td>Parallel</td>
<td>70 yrs</td>
</tr>
<tr>
<td></td>
<td>Serial</td>
<td>42 yrs</td>
</tr>
<tr>
<td></td>
<td>Cumulative</td>
<td>20 yrs</td>
</tr>
<tr>
<td></td>
<td>Declarative</td>
<td>20 yrs</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Capabilities beyond this point are generally not needed by managers in the corporate world.

Adapted from Jaques (2002)
within one day. In the case of Manager (Inventory Control), mistakes in procurement would perhaps become apparent only in the next production cycle (i.e., within the next quarter). So the time-span of discretion of someone in the position of Manager (Inventory Control), a section level manager, is considered by Jaques to be around three months. Similarly, one may realise only years later that a CEO had made an error in judgment while allocating strategic resources. Thus the time-span of discretion of the CEO role in large corporations could extend to decades. Not surprisingly, incumbents in roles with longer time-spans of discretion in the corporate world tended to report greater levels of “felt work.”

- As stated earlier, Jaques found that in most corporate environments, managers were required to process either Third or Fourth Order information complexity. Additionally, he found that managerial hierarchies displayed a “universal underlying pattern of stratification” (Jaques and Cason, 1994; p. 14). In other words, managerial hierarchies had naturally occurring discontinuities or boundaries. The discontinuities consistently occurred at the following time-spans of discretion: one day, three months, one year, two years, five years, 10 years, and 20 years. Reportedly, managers who were capable of occupying roles with these “default” time-spans of discretion showed a preference for being made solely responsible for their respective roles. Further, all of them had an inclination to be supervised by someone with a capability to work in a role at the next higher discontinuity.

- Generally, all subordinates tended to resent situations wherein they had to report to someone with an identical time-span of discretion. So, as per Jaques, it would be untenable to expect a manager with a 10-year time-horizon to report to a superior with a similar time-horizon. Also, one could not have a situation in which a manager with a 10-year time-horizon directly supervised someone with a two-year time-horizon. The latter would want to be supervised by someone with a five-year time-horizon (i.e., by someone capable of working at the next higher discontinuity). Jaques reports that any insertion or elimination of

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4 Jaques defines time-horizon as, “the longest time-spans in work that an organism could cope with” (2002; p. 26).
managerial roles at levels other than those at naturally occurring discontinuities resulted in managers complaining of either too many or too few hierarchical layers. Intriguingly, this phenomenon was consistently observed across organisations and industries in the US, Canada, and Australia; hence the assertion that managerial hierarchies appear to have a universal pattern of stratification.

- Even more intriguingly, the ability to execute a role with a particular time-span of discretion was found to be strongly linked with the ability to process complexity of a given order. For example, roles with a one-day time-span of discretion were found to require declarative processing of Third Order information complexity. Similarly, roles with a time-span of discretion of 10 years were found to require cumulative processing of Fourth Order information complexity. Table 6.4 shows the level of information processing capability needed to cope with the complexity of roles with different time-spans of discretion. The findings reported in the table have obvious implications for organisational design in terms of the optimum number of managerial layers (see Jaques, 1990).

- While organisational design issues may not be pertinent in the current context, the issue pertaining to matching human capability with managerial jobs certainly is. As will become apparent, Jaques’’s concept of human capability can be used to make predictions about managerial competence, which is the focus of this thesis. For example, the findings in Table 6.4 imply that managers capable of declarative processing with Fourth Order information complexity would feel frustrated if occupying roles with a one-year time-span of discretion. In other words, such managers being “over-capable” would prove incompetent. By the same token, they would feel overwhelmed if required to process the levels of complexity in roles with a 20-year time-span of discretion.

- It is clear from the above discussion that if Jaques’’s findings are valid then to accurately predict an individual’s potential capability to work in a corporate environment, one needs three pieces of information at a moment in time: (i) the individual’s biological age; (ii) the order of information complexity that the individual can process; and (iii) the style with which the individual processes
the particular order of information complexity.\(^5\) For instance, as Figure 6.4 indicates, the capability to parallel process Third Order information complexity at the age of 30 would definitely mature to the ability to serial process Fourth Order information complexity at 60. Note that the maturity path predictions pertain to potential capability and not capability that manifests itself in the workplace.

Table 6.4
Matching Capability with Work Complexity

<table>
<thead>
<tr>
<th>Time Span of Role</th>
<th>Nature of Information Used</th>
<th>Information Processing Style</th>
<th>Order of Information Complexity</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 years plus</td>
<td>Generally not applicable in the corporate world</td>
<td>Serial</td>
<td>Fourth</td>
</tr>
<tr>
<td>10-20 years</td>
<td>Complex conceptual abstract information necessary for corporate control and future plans.</td>
<td>Cumulative</td>
<td></td>
</tr>
<tr>
<td>5-10 years</td>
<td>Conceptual data necessary for managing a strategic business unit.</td>
<td>Declarative</td>
<td></td>
</tr>
<tr>
<td>2-5 years</td>
<td>Critical path analysis to coordinate a number of serial processes to arrive at final control</td>
<td>Parallel</td>
<td>Third</td>
</tr>
<tr>
<td>1-2 years</td>
<td>Alternative plans for getting from A to goal B via L or M via P and Q, and choose the best one</td>
<td>Serial</td>
<td></td>
</tr>
<tr>
<td>Three months to One year</td>
<td>Diagnostics – if not A then later B, then later C; conclude problem X-might arise, and take action to prevent it.</td>
<td>Cumulative</td>
<td></td>
</tr>
<tr>
<td>One day to Three months</td>
<td>Concretely specified output and method layout. If trouble –A1, do A2; if trouble –B1, do B2. If no success, see manager.</td>
<td>Declarative</td>
<td></td>
</tr>
</tbody>
</table>

Adapted from Jaques and Cason (1994); Jaques (2002)

- The challenge before organisations then is twofold. It is: (i) to place managers at the right level in the hierarchy commensurate with their capability to process complexity; and (ii) to remove obstacles that can prevent managers from applying their current potential capability (hereafter referred to as CPC).

\(^5\) In their book, Jaques and Cason (1994) discuss a validated method of identifying the order of information complexity and deciphering an individual’s information processing style at a moment in time.
Jaques explains that CPC is a measure of the “maximum level of work that we would be potentially capable of doing, if we had the necessary skilled knowledge for whatever it was that we were trying to do” (2002; p. 38; emphasis in original). He points out that individuals could realise their full potential only if they faced zero impediments in the workplace. Whether individuals can fully apply their potential capability in the workplace is another matter and is discussed next.

- Since Utopian workplaces with zero impediments do not exist, Jaques argues that it is not possible for individuals to ever realise their full CPC. He therefore introduces the notion of applied capability (AC) and claims that the AC of an individual in a given assignment is always below the individual’s CPC. This is another way of saying that output can never equal input; individuals can never work to their maximum possible level, since 100 percent energy conversions exist only in the realms of fantasy. As explained during the discussion on negentropy, some energy invariably escapes during transformation processes and, to make matters worse, some of it gets accumulated as entropy within the system. Jaques partially captures this phenomenon by theorising that the AC of employees at a given level in corporate hierarchy is a function \( f \) of their CPC; skilled knowledge (K/S); commitment (C) to a job; and the ability to display required behaviour (RB) in what is a socio-legal environment. That is, \( AC = fCPC \cdot C \cdot K/S \cdot RB \).

- The AC equation is self-explanatory. It implies that despite having the ability to process complex information (i.e., despite having the level of CPC needed for a particular position in a hierarchy), a manager’s AC could be low if the manager were to lack commitment. Similarly, high CPC and C would not necessarily translate into high AC if a manager were to lack skilled knowledge. For example, marketing managers would flounder without specialised product and market knowledge. In this instance, high levels of CPC and commitment would not be able to fully compensate for their lack of skilled knowledge about their organisation’s product and market. By required behaviour, Jaques means behaviour acceptable to others. High levels of CPC, C, and K/S would not lead high levels of AC, if a manager were to consistently demoralise his or her
subordinates through rude behaviour. In the long run, the AC of a manager incapable of displaying RB would prove to be low.

- Interestingly, Jaques asserts that personality traits are irrelevant to the CPC of an individual and could be ignored unless the individual suffered from “seriously dysfunctional qualities such as apathy, lack of integrity, gross abrasiveness, or other things” that could come in the way of the individual displaying required ordinary everyday behaviours when doing work (2002; p. 39). So Jaques implies that RB in the AC equation could have either a value of one (in which case RB would have no impact on AC) or a value of less than one (in which case RB would have a negative impact on AC). The notion of RB impacting AC, as conceptualised by Jaques, has similarities with the open systems perspective recognising that entropy accumulation (e.g., demoralisation) could impact value creation. In fact, the parallels between Jaques’s (2002) thinking and the open systems perspective as developed in this thesis are not merely confined to notions of RB and entropy accumulation. The discussion in the next section establishes that it is possible to explain all the variables in Jaques’s AC equation by systemic properties.

**Generic Competence and Human Capability: The Parallels**

As stated earlier, Jaques’s work is a bold attempt to explain the nature of capability across all living organisms – from amoebas to humans. Given their biological roots, the similarities in Jaques’s theory and the open systems perspective are hardly surprising. Some of the more important points of convergence, as they pertain to the generic nature of human competence in an organisational context, are discussed below:

- The generic I-T-O competencies that form part of the value creating spiral have been conceptualised in this thesis as having a genetic base (refer back to Figure 5.5 in Chapter 5). There is thus recognition that the generic I-T-O competencies, much like the CPC of individuals, are innate. Beyond a certain point, training may not be able to improve an individual's I-T-O competence (i.e., the ability to sift, analyse, and communicate complex information). Ability to communicate in the systemic context (i.e., the output competency context) is not to be confused with good oratory and writing skills. Managers with high levels of output competency are able to clearly decipher and
communicate the connections amongst apparently disparate abstract variables. The persuasiveness in their communication stems from the strength of their logic.

- Fusing Jaques’s parlance with open systems language, one could, for example, insist that entry-level managers, at a minimum, possess output competency that enables them to communicate to their audience the results of serial processing Third Order information complexity. But does the open systems perspective provide theoretical reasons as to why I-T-O competencies should improve as managers ascend the corporate ladder?

- As discussed earlier, Jaques provides strong empirical evidence that managers need to display a qualitative improvement in information processing abilities at naturally occurring discontinuities if they are to progressively prove effective at higher echelons. While it is true that there is nothing in the systems view that identifies discontinuities in managerial hierarchies, the systemic properties do offer pointers as to why such discontinuities might arise. Additionally, as explained below, requisite variety implies that managers at senior levels need superior information processing abilities since they must match or cope with higher levels of complexity that exist in their external environment.

- It has been argued that because systems have a fractal structure, the number of interfaces that managers must manage rises exponentially in the higher echelons of managerial hierarchy. An increase in the number of interfaces naturally leads to an increase in complexity or variety, making it incumbent upon managers to have the ability to factor in inputs from various sources that interact with each other in a manner that is not readily decipherable. It is possible that thresholds of orders of information complexity, as identified by Jaques, are linked to the number of critical interfaces that need to be managed within a system. As the number of critical interfaces increases, the system perhaps moves to a tipping point beyond which managers need a qualitatively different and more sophisticated style of information processing in order to make sense of their world. Thus as is true of CPC, higher levels of I-T-O competencies are needed at higher levels of a corporate hierarchy. But this convergence over something relatively inane is hardly surprising; perhaps more
interesting is the fact that the systems perspective also offers a plausible explanation as to why an individual’s ability to cope with complexity might, as suggested by Jaques, steadily improve with age.

- To the extent that complexity in the environment increases during an organism’s lifetime, the organism must at birth be genetically equipped to increase its own internal complexity (refer back to the discussion on *requisite variety* in Chapter 5). In their lifetime, humans experience a frightening pace of change in their external environment (see Toffler, 1970). Could well-defined maturation paths be nature’s way of equipping humans to cope with ever increasing complexity in one lifetime? The human brain has evolved, and continues to evolve, at an impressive pace (Balter, 2005). Whether this evolution has also conferred on humans the genetic ability to process information in an increasingly sophisticated style as they mature is a question that medical science can answer. Within the social science domain however, *requisite variety* supports Jaques’s contention. Matching external complexity in the managerial context entails processing complex information and unravelling knotty feedback loops (see the discussion on *homeostasis* in Chapter 5) on an ongoing basis. Only systems that can, in the face of increasing complexity, decipher feedback loops and generate sophisticated internal processes so as to enable transformation of inputs into valuable outputs display the property of *requisite variety*. The need to generate internal processes to match external complexity could be framed in Jaques’s language as the need to do organisational work by generating multiple choices and options, and arriving at sound decisions.

- Although the open systems view cannot fully explain as to why managers make the decisions that they do, when combined with Jaques’s work, the view can eliminate some of the “ineffability” associated with decision making processes. In systemic terms, a decision making point may be described as the point at which individuals terminate their I-T-O processes. Jaques claims that the termination point is often arbitrarily chosen by individuals and is a manifestation of “free will” enjoyed by living beings (2002; p. 11). But interpreted differently, Jaques’s own theory suggests that the point at which
individuals terminate their I-T-O processes could be a function of their capability to process complex information. The mental processes take place at lightening speeds and one could hypothesise that given the same amount of time, all other things being equal, individuals with superior information processing abilities produce “better” considered decisions.

- *Better* in this context would imply that a greater number of variables get factored in by the time the I-T-O processes are terminated. It is possible that evolutionary struggle has genetically encoded, in the DNA of species, all the cost-benefit analysis outcomes that are critical for survival. Thus, to return to Jaques’’s example, a bird when it terminates its I-T-O processes while selecting a twig to build its nest may not be exercising its free-will *per se*; one must instead consider the possibility whether evolution has genetically primed it to do so. The bird is perhaps hard-wired to realise that no further benefit may be gained through endlessly analysing the tensile strength of various twigs.

- Again, whether genes can account for an individual’s ability to factor in more variables while making decisions is an empirical question best left to medical science. In the organisational context however, one could hypothesise that those with superior information processing ability may not necessarily make “better” considered decisions unless confronted with a problem that adequately engages their faculties. Lack of commensurate complexity could result in complacency or sheer boredom amongst managers. Whichever way one looks at it, the need for matching I-T-O competency levels (or CPC) of incumbents with their roles cannot be overemphasised.

- As noted earlier, despite being a psychologist, Jaques does not recommend taking personality traits into account while matching individual capability with corporate roles. But he concedes that personality variables could play a role in preventing individuals from displaying *required behaviours* in their roles. Interpreted from an open systems perspective, Jaques seems to indirectly acknowledge that socially dysfunctional managers (i.e., managers incapable of displaying RB) could demoralise their subordinates and this could lead to suboptimal value creation (or entropy accumulation). Taken to its logical conclusion, the AC equation implies that low RB in a manager has the potential
to also lower the AC of the manager’s subordinates by reducing the commitment (C) levels of the latter. Indeed, lack of RB amongst managers can have a cascading effect in an organisation.

- At first glance, it may appear that the open systems view has no parallels for the “commitment” variable in the AC equation. On reflection though, it becomes apparent that the open systems perspective assumes that the building blocks of a system are committed to the survival of the parent system. This is generally true of all living organisms, unless the building blocks themselves happen to turn cancerous. In an organisational context, the scenario becomes akin to a cancer when subunits are led by managers who pursue their own agenda at the expense of organisational longevity. Such malignancy, if not nipped in the bud, can have dire consequences. In the systems view, competent managers are not only committed to organisational survival, but they are also successful in eliciting similar levels of commitment from their subordinates. According to the open systems view therefore, in addition to I-T-O competencies (which are analogous to information processing abilities that determine CPC levels), managers need other specific skill sets as well. For example, it has just been implied that managers need to be skilled at motivating their subordinates and ensuring that the interests of their subordinates are aligned with those of the parent system and vice versa.

- As discussed in Chapter 5, systemic properties suggest that managers should be able to manage interfaces, growth, and contingencies if they are to ensure organisational survival. Thus the thesis holds that the specific managerial competencies essentially pertain to these three areas. One could argue that CPC as conceptualised by Jaques manifests itself in the form of AC when managers attempt to apply their K/S while doing organical work (i.e., while generating choices and options in a bid to manage interfaces, growth, and contingencies in the interpersonal and technical-functional domains). Parallels may therefore be drawn between K/S in the AC equation and the specific competencies needed to manage interfaces, growth, and contingencies.

The foregoing discussion has drawn parallels between all the variables in the AC equation and open systems thinking. Though it was not the aim of this thesis to provide a
theoretical anchor to Jaques”s equation, it does appear that the open systems perspective can do so. The next section identifies the specific competencies that are needed by managers to ensure organisational survival and in a way amplifies the K/S variable in the AC equation in the context of managerial work.

**SPECIFIC COMPETENCY CLUSTERS**

**Interface Management Competency Cluster**

In the course of their work, managers may find themselves simultaneously playing roles in multiple subsystems that lie nested within their complex organisations such as project teams, temporary taskforces, long standing committees, and so forth. Managers may also have to interact and negotiate with other work units and be differentially responsive to them. They may “need to scout one context, coordinate with a second, and be diplomatic toward a third” (Denison, Hart, & Kahn, 1996; p. 1008). All work units that managers interact with may be considered as systems with their own permeable boundaries.

Though organisational-level boundaries have been conceptualised in a number of ways in the literature (see Scott, 1992), there has not been much research on work units as open systems and on associated boundary issues (Yan & Louis, 1999). The concept most relevant in the current context is that of boundary as an interface. Brown defines organisational interfaces as “the meeting grounds where social units come face to face and parties interact (1983; p. 1).” To Friedlander “interfaces provide the means of communication and information flow across work groups (1987; p. 305).” It is in designing and managing interfaces that one gains the greatest leverage and faces the greatest risks (Harrington, Carr, & Reid, 1999), and it is at interfaces that inputs are received and outputs delivered.

The fractal structure of systems and the need for maintaining requisite variety introduce a very large number of interfaces that must be managed during and for value creation. In the systems view, the emphasis is on managing interactions as opposed to managing actions. Accordingly, Interface Management Competency (IMC) cluster is visualised as containing competencies needed by managers to ensure transfer of resources between and amongst systems in as seamless and frictionless a manner as possible.
It is theorised that managers should know how to *design work processes* for efficient transfer of resources. *Conflict resolution and negotiation skills* are also included in the IMC cluster as these are bound to be needed by managers to placate ruffled feathers in the wake of resource allocation and to reach an agreement over jurisdiction issues where boundaries or interfaces are ill-defined. Managers should also possess *team building skills* as cohesiveness in teams is required not only to better deal with complexity but also to facilitate transfer of resources. Additionally, given the fact that modern managers must deal with an ever increasing number of interfaces, *time management skills* are also considered indispensable.

Finally, since the interfaces also pertain to the interpersonal domain, the IMC cluster includes some important people management skills. Managing interfaces could involve activities like boundary buffering and spanning (see Yan & Louis, 1999) and what Mintzberg (1994) describes as “linking” (i.e. protecting one’s unit from the external environment by acting as a filter, which allows acceptable influences to pass through and blocks out the potentially harmful ones). These activities call for diplomacy, tact, and courage of conviction, and could entail standing up to one’s superior. The ability to empathise with others is also likely to be particularly important for managing interfaces. Understanding emotional turmoil arising due to reallocation of resources is perhaps as important as redesigning a subunit’s value chain for better exploitation of resources. There is thus a case for including *emotional intelligence* in the IMC cluster (see Figure 6.1 for an overview of the cluster).

**Growth Management Competency Cluster**

The need for *requisite variety* makes it incumbent upon organisations to continually grow in response to ever increasing complexity. Growth is considered essential for survival in the systemic view. Ordinarily, growth entails an increase in size. But limitless growth in the ordinary sense is not possible – this conclusion has also been supported by a number of empirical studies on the growth rates of businesses (see Mackey & Valikängas, 2004). Negative feedback loops, as many organisations have discovered, tend to stabilise runaway growth. This is how the property of *homoeostasis* ensures stable expansion of systems. Thus to maintain stability, organisations need “single-loop learning” ability as displayed by a thermostat.
In practical terms, an organisation, like a thermostat, needs a good understanding of its external environment. Further, an organisation must know its current position vis-à-vis where its current position ought to be. It is this gap between the actual current state and the ideal current state which motivates value creation. Senge (1990; p. 150) calls the gap between the ideal and the current state “creative tension.” To return to the thermostat example, once switched on, the thermostat functions only when the temperature falls above or below the desired level. It automatically switches off when the “ideal” is temporarily attained. In similar vein, there would be nothing for an organisation to do if it were to start believing that the ideal had been attained. Fortunately, ever increasing complexity ensures that organisations can never afford to believe that there is nothing left to attain.

As per the systemic view then, managers need the ability to maintain creative tension. But creative tension facilitated by single-loop learning can only help in improving current standards incrementally. Moreover, growth reliant on single-loop learning has limits. A time comes when such loops breakdown. It had been pointed out while discussing the property of autonomous adaptability that humans, unlike thermostats, also have double-loop learning ability – this assumption-questioning ability can be leveraged to ensure limitless growth of a different kind. Managers can inspire organisations to chase ever-distant horizons by continually recreating their organisations. Being populated by humans, organisations have the potential to initiate changes to their product portfolios without any apparent signal from the external environment and even educate elements of the external environment about the value created by their offerings.

Growth Management Competency (GMC) cluster is thus visualised as containing competencies that enable a manager to continually gauge the quality of value created so as to make changes when necessary and take the system in question to a higher plane by offering superior value.

Managers can maintain creative tension only if they have a good understanding of where their subsystem is and where it ought to be (given the preferred general direction of growth of the parent system). Therefore, it is imperative that managers possess sound industry and organisational knowledge. Such knowledge can also help managers recognise an opportunity (or a bifurcation point) for future growth. However, having knowledge
about one’s current state and future possibilities is not enough; managers should also be able to produce a plan of action to reduce the gap between the actual current state and the ideal current state (see Ackoff, 1981 for a discussion of how systems might attain an idealised state). Thus it is theorised that managers should possess goal setting skills. The goals set could be based on previous performance or they could be completely new ones that are arrived at after questioning and testing previously held assumptions. Additionally, managers should be able to monitor feedback loops. They should therefore possess performance assessment skills so as to be able to ascertain whether the goals set, given the generally agreed upon growth trajectory, are being met or not.

In so far as the interpersonal domain is concerned, as was implied earlier in the context of discussing the commitment variable in Jaques’s (2002) AC equation, managers need the ability to align their subordinates’ goals with those of the larger systems in which they find themselves embedded. To ensure growth, managers, as argued, must make their subordinates alive to the gap between the current and the ideal state and egg them on to narrow the gap. Thus managers need motivational skills if they are to foster creative tension. Lastly, it is theorised that competencies in the GMC cluster also encompass personal growth. As a system grows and becomes more complex, the roles within it naturally become more complex and require incumbents to possess greater expertise. Thus the GMC cluster in Figure 6.1 also includes competencies pertaining to self- and subordinate-development. Managers can create substantial value by continually upgrading their own skills, and those of their subordinates.

Contingency Management Competency Cluster

It has been discussed that as complex systems grow, a stage comes when any movement away from the state of equilibrium results in a breakdown of feedback mechanisms. Certain complex physical and biological systems, under specific conditions, are capable of “self-organising” and metamorphosing into new entities. Some scholars (e.g., Brown & Eisenhardt, 1998) believe that managers can and should consciously take their organisations to the edge of chaos in order to hasten their evolution. This thesis however, concurs with Stacey, Griffin, & Shaw who argue that any talk of deliberately creating self-organising processes ignores the point that such processes are innate in a system and cannot be externally introduced. They point out that, “When managers are advised to change the dynamic of their organisations to the edge, the insight is lost that the
system’s own internal dynamic and its connections with other systems determines the dynamic” (2000; p.206). The argument put forth by Stacey, et al., is in fact consistent with how autonomous systems get structurally coupled. While it may neither be possible, nor indeed, desirable to artificially hasten growth through “steroids;” it is argued that since one cannot be certain about the ability of social systems to self-organise, it might be risky to take organisations to the brink and then leave things entirely to chance.

As it is, organisations are at risk because the simultaneous need for stability and growth has the potential to pull them in different directions and send confusing signals to their managers. Despite best efforts to manage interfaces and growth, managers may discover growth projections going awry and interfaces getting out of sync. It is when things do not go to script that managers need the flexibility and composure to manage contingencies. At the CEO-level, contingencies can threaten the very survival of an organisation, while those at the lower-levels, if not managed well, can escalate and detract top management. In this context, Senge (1990) observes that when the burden of resolving contingencies is shifted from the line to corporate headquarters, it prevents managers from developing their own interpersonal skills. As short-term solutions are used to redress problems with seemingly satisfactory immediate results, organisations succumb to using them frequently and avoid instituting fundamental long-term corrective measures. Even in instances where institutional mechanisms to discern early signals and anticipate problems are in place, managers are bound to find themselves confronting unforeseen challenges. They therefore need contingency management competencies.

The Contingency Management Competency (CMC) cluster is visualised as containing competencies that enable a manager to stabilise a system during a crisis and, if needed, turn it around so that the system in question can attain a new state of equilibrium in a different environment.

To cope with contingencies, managers would need problem solving skills to tackle the urgent and temporarily stabilise a system before undertaking any major surgery. Even as the situation stabilises, managers would need to envision the future and chart a new course of action for their organisation. Thus managers would also need visioning skills. Turning around an organisation amounts to almost recreating it. During major contingencies, managers enjoy the freedom to partially redefine their external environment.
(for example, they may have the freedom to choose the markets for which to create value). Since managers usually have multiple options before them during a contingency, it is theorised that they should be capable of weighing all the options and deciding on a viable course of action. Thus to successfully respond to a contingency, managers should also possess sound decision making skills.

Contingencies that occur during day-to-day functioning are essentially conflicts associated with transfer of resources and are better captured by the IMC cluster of the taxonomy. It is clarified that while the competencies in the IMC cluster equip managers to address minor contingencies, the competencies of the CMC cluster are theorised as pertaining to major “chance events” that threaten to destabilise a system. Thus the competencies of the CMC cluster are likely to be more relevant for senior-level managers. One could however, argue that decision making and problem solving skills are needed by managers at all levels – a contingency, howsoever minor, cannot be addressed by a manager who lacks these skills. Decision making skills are also likely to be needed by managers not only during a contingency but also during periods of ordinary growth when they have to make informed choices at bifurcation points to exploit opportunities. Note that Figure 6.1 shows overlap amongst the three competency clusters. The overlap amongst clusters will shortly be discussed in greater detail.

With regards to managing contingencies in the interpersonal domain, managers might encounter two types of contingencies. At times, managers may have to deal with difficult subordinates who may need disciplining. At other more difficult times, they may have to tackle a widespread morale crisis as the system they are embedded in gets destabilised and its very survival is called into question. The thesis posits that managers who are emotionally stable will be better able to handle both these types of contingencies. Though the thesis by and large concurs with Jaques’s view that personality traits could be ignored while determining generic competency (or CPC) levels, this is not the case when one considers specific competencies (or K/S) as applicable to managerial work. The need for managing contingencies suggests that emotional stability – one of the Big Five personality traits (see Barrick & Mount, 1991) – be included in the CMC cluster (see Figure 6.1). In fact, a case could be made that reasonable levels of emotional stability are necessary if managers are to display, what Jaques (2002) terms, required behaviours.
At first glance, it appears implausible that managerial work can be captured by just three competency clusters. But an open systems perspective makes such parsimony possible. If for a moment managerial work can be compared to doing embroidery on a piece of fabric, then according to the taxonomy depicted in Figure 6.1, “interpersonal” and “functional-technical” domain constitute the fabric on which managers embroider; the thread with which managers embroider their designs is “generic I-T-O competencies.” And the designs that managers embroider are the IMC, GMC, and CMC clusters.

The thesis is finally in a position to make two legitimate claims. Firstly, it can claim that the activities corresponding to the three competency clusters – managing interfaces, growth, and contingencies – are truly “managerial” in the sense that managers need do little else. It is conceded that other non-managerial employees, in the course of creating value in their respective domains, could find themselves managing interfaces, growth, and contingencies, but these activities would seldom constitute the sole purpose of their jobs. Further, the scope and scale of these activities in non-managerial jobs would be much smaller. Secondly, it is claimed that the proposed taxonomy has the potential to account for all the evidence on commonalities of managerial work.

While it is true that evidence suggests that managers tend to be preoccupied with the immediate, it cannot be anybody’s case that managers across the board have been doing things – deliberately or otherwise – that do not contribute to organisational longevity. Thus the evidence on what managers do should, to a large degree, be consistent with the open systems perspective. While managers may adopt different strategies and subscribe to their own notions of managerial work, it is reasonable to assume that their work, particularly when executed competently, would contribute to organisational survival. If nothing else, self-preservation instincts must make most managers subconsciously realise that they would have no role to play if their organisations were to wither away. It should therefore come as no surprise that all the extant evidence on managerial work can be parsimoniously captured by the three categories as suggested by the systemic interpretation of managerial work.

As stated earlier, in the time that has elapsed since Hales (1986) presented his summary of the extant evidence on the commonalities of managerial work, scholars have proposed new competency labels and taxonomies, but not necessarily added to the list of
managerial activities or discovered some new characteristic of managerial work. Table 6.5 includes Hales’s summary and indicates that all the activities which managers are known to undertake and the characteristics of managerial work can be accounted for by the open systems perspective. One could reasonably argue that managers plan, coordinate, network, share information, and so forth in order to manage interfaces, growth, and contingencies. Notice that in Table 6.5, different competency clusters are shown as capturing identical managerial activities. For example, the need to monitor and disseminate information has been accounted for by the IMC as well as the GMC cluster. This overlap amongst competency clusters is explained next.

**Overlap Amongst Competency Clusters**

As shown in Figure 6.1, the individual specific competencies belonging to the IMC, GMC, and CMC clusters are all underpinned by generic I-T-O competencies. To clarify, a manager may have to communicate clearly (a generic output competency) in the context of resolving a conflict (an IMC). In another instance, the same manager may need the same ability (i.e. the ability to communicate clearly) in the context of motivating a subordinate (a GMC). And yet another manager may need to keep subordinates motivated (a GMC) while solving problems (a CMC) during a contingency. Similarly, work process redesigning skills (an IMC) may be needed not only for efficient transfer of resources, but also for making performance assessment (a GMC) easier and more accurate. Continuing in the same vein, one could think of several other examples where managers might need problem solving and decision making skills (both CMCs) to manage growth and interfaces. Thus the taxonomy depicted in Figure 6.1 contains overlapping clusters.

Consistent with the overlapping of clusters in Figure 6.1, the IMC and the GMC clusters in Table 6.5 are both shown as accounting for the “monitor and disseminate information” activity. Managers would need to monitor and disseminate information about the external environment so as to maintain creative tension in their systems, but they would also need to monitor and disseminate information, albeit of a different kind, to facilitate transfer of resources amongst interfaces. Conflict may arise as interfaces compete for the same resources. Conflict may also arise during a major contingency when systems
### Table 6.5

**Accounting for Extant Evidence on the Commonalities of Managerial Work**

<table>
<thead>
<tr>
<th>Common Managerial Activities (see Hales, 1986)</th>
<th>Common Characteristics of Managerial Work (see Hales, 1986)</th>
<th>Accounted by</th>
</tr>
</thead>
<tbody>
<tr>
<td>Act as point of contact for their work units; monitor and disseminate information; network internally and externally; allocate resources; negotiate inside and outside the firm; handle disturbances to work flow; innovate processes; manage human resources, control subordinates; plan and schedule work</td>
<td>Fragmented activities prone to interruption; a need to react to events, problems, and requirements of others; a preoccupation with the immediate, and ad hoc; activities that are embedded in other activities; a high level of verbal interaction; conflict and pressure arising out of juggling competing demands; and a degree of choice and negotiation over the boundaries of managerial jobs and how they might be undertaken.</td>
<td>IMC cluster</td>
</tr>
<tr>
<td>Innovate products; network internally and externally; monitor and disseminate information</td>
<td>A preoccupation with the immediate and the unforeseen; a high level of verbal interaction.</td>
<td>GMC cluster</td>
</tr>
<tr>
<td>Solve problems; handle disturbances to work flow</td>
<td>A need to react to events and problems; a preoccupation with the unforeseen; a high level of verbal interaction; conflict and pressure arising out of juggling competing demands.</td>
<td>CMC cluster</td>
</tr>
<tr>
<td>Perform work related to their function/specialty</td>
<td>A degree of choice and negotiation over the boundaries of managerial jobs and how they might be undertaken.</td>
<td>Specific functional and technical knowledge as applied while managing interfaces, growth, and contingencies</td>
</tr>
</tbody>
</table>
become unstable and managers can no longer make sense of and respond to feedback signals. Thus conflict as a characteristic of managerial work is shown as being accounted for by the IMC as well as the CMC clusters. Other overlaps in Table 6.5 may be similarly explained.

It appears that managerial activities corresponding to two or more competency clusters may take place simultaneously and cannot really be teased apart. As noted in Chapter 2, Mintzberg (1994) too had reached a similar conclusion. He had observed that while it was possible (and even desirable for practical reasons) to conceptually separate the components of a manager’s job, behaviourally the components could not be separated. He had also asserted that managers could not practice their jobs as a set of independent parts. The holism in the proposed taxonomy, as reflected by overlapping clusters, makes it a poor taxonomy by conventional yardsticks since the categories in it are not mutually exclusive, but this lack of mutual exclusivity is entirely in consonance with the open systems perspective and Mintzberg”s conclusions. It would be reasonable to assert that the holistic taxonomy derived from open systems theory can capture all the commonalities in managerial work. Nonetheless, any theory that purports to explain managerial work should be able to account for the variations in managerial work as well. The thesis contends that the open systems perspective has the potential to do so. Arguments to support this contention are presented in the following section.

EXPLAINING CONTEXT-DRIVEN VARIATIONS

The nature of managerial work has generally been found to vary with level, function, organisation (type, structure, and size), and the environment in which the work takes place (Hales, 1986). Despite insisting that all managers need to manage interfaces, growth, and contingencies, the open systems view has the sophistication to engage with the evidence on the variations in managerial work. In fact, the discussion on the fractal nature of systems and the need for requisite variety has already indicated how changes in managerial level might impact managerial work. The number of interfaces within a system drives complexity levels, which in turn, influence the nature of challenges associated with managing interfaces, growth, and contingencies. Thus one could claim that it is the scope of managerial work, and not managerial work per se, that varies across levels as managers find themselves trying to match the complexity levels of their respective external environments. By extension, one could argue that though all managers need competencies from the IMC, GMC, and CMC clusters,
what varies across levels is the scope of the competencies needed by managers. The depth and breadth of knowledge needed, for example, by an R&D manager of a small laboratory would be very different from that needed by a research scientist in charge of a dozen laboratories of a conglomerate.

Given the complex nature of interfaces that one must manage at higher levels, it appears logical that there be a greater premium on cross-functional knowledge of senior managers. Managing interfaces at the level of, say, General Manager (Marketing) could involve influencing the CEO to approve major investments in a new production line. At the level of a Territory Manager (Sales), it could entail influencing subordinates to assign their best salespeople to rescue a newly introduced product. Just as in the case of managing interfaces, managing growth and contingencies could have different connotations at different levels, with emphasis being greater on cross-functional competencies at higher levels. Growth to a Manager (Inventory Control) could mean coping with procurement of additional items, whereas to a Vice President (Production), it could mean commissioning a new state-of-the-art production facility. As regards contingencies, to a CIO, a contingency might come in the form of the need to integrate 20 different IT systems within an unrealistic timeframe; to a Database Manager it could take urgent revival of a crashed database. As apparent from these examples, variations in levels impact the nature of managerial work by altering, in effect, its scope or complexity.

In addition to altering the scope of managerial work, variations in levels can amplify or dampen the ramifications of managerial decisions. Consider the decision to outsource the payroll function. Despite it being a relatively minor cost-saving initiative at the CEO level, the decision could trigger a major contingency at the subunit level. In the wake of lay-offs, the HR manager concerned could dread managing a situation wherein subordinates felt demoralised. Or the manager could look forward to implementing the decision to outsource in hopes that it could help the HR unit better manage its interfaces by making more time available for its internal clients. Thus managers can, and do, shape their reality by autonomously interpreting their own work (Stewart, 1976; Watson & Harris, 1999). As has been discussed, the nature of interpretations in the case of an autopoeitic system depends on the “internal structure” of the system at a given moment. In the current context, “internal structure” would be governed by the belief systems of the managers as they choose to implement a decision. It therefore appears that the level at which a managerial decision gets
implemented can impact the nature of work in myriad, and at times unpredictable, ways. In contrast, the likely impact of the function in which managerial work gets done, as discussed below, is somewhat easier to discern.

It is not hard to imagine that the specifics of technical knowledge (or elements of K/S in the AC equation) needed to manage interfaces, growth, and contingencies would vary substantially across functions. Knowledge of debt-to-equity ratios is hardly likely to prove directly relevant to an accountant tasked to manage an IT unit. A technical contingency in the accounting function (e.g., failure to disclose vital financial information to shareholders) may not have much in common with a contingency in the IT function (e.g., failure of a database to scale). As in the case of the variations in function and level, it could be theorised that the variations in the wider environment (e.g., national culture; industry), and in organisational size, structure, and type (e.g., public versus private) influence managerial work by ultimately influencing the nature of interfaces, growth, and contingencies. Managing interfaces comprising blue-collar workers in an automotive production line would probably be very different from managing interfaces comprising doctors and nurses in a hospital. Managers in the two situations would not only need different sets of specific technical knowledge, but they may also need to adopt different behaviours.

Since interfaces are ubiquitous, the open systems perspective has the potential to explain variations in managerial work across a range of circumstances. But as Christensen and Raynor point out, “applying theory to industry after industry cannot prove its applicability because it will always leave managers wondering if there is something different about their current circumstances that renders the theory untrustworthy (2003; p. 29).” They add that while academic researchers often take pains to clarify the boundary conditions within which their theories are valid, this is seldom enough. They argue that it would be very useful to practitioners if academics were to also identify the circumstances under which their theories break down. Taking cognisance, the next section discusses what lies within and without the boundaries of the systems perspective.

**DELIMITING THE PROPOSED TAXONOMY**

It should be noted that the proposed systems-based taxonomy has identified specific competencies that while being necessary for value creation may not always prove sufficient. In one sense, the taxonomy is a “default taxonomy” that may have to be suitably augmented
depending upon the nature of interfaces, growth, and contingencies that need to be managed. For example, expatriate managers lacking cultural sensitivity may be unable to create value irrespective of their proficiency levels in other competencies. Similarly, managing growth in underdeveloped economies may require of managers to develop competencies such as networking to develop distribution channels or liaising with government agencies to ensure supply from local utilities. Thus managers in these examples would need competencies over and above those identified in the IMC and GMC clusters in Figure 6.1. In particular, competencies in the CMC cluster may prove “insufficient” because contingencies, by their very nature, cannot be predicted. In fact, one could argue that organisations tend to hire external consultants during major contingencies because the top management often concludes that the internal competency-sets alone might not prove sufficient to ensure organisational survival.

The open systems perspective on managerial work rests on the basic premise that all managers should aim to ensure the longevity of the parent system in which they are embedded. It follows that if this basic premise were called into question, the perspective would get undermined. For instance, managers tasked to divest the holdings of a government owned enterprise, having no concern for organisational survival, could legitimately disregard systemic notions on sustainable growth. But divestments are a special circumstance. Under normal circumstances, one would be hard-pressed to fault the longevity premise; yet, managers continue to be fixated with short-term results. Perhaps executive compensation packages that link incentives to quarterly results are to blame for this phenomenon (see Bolton, Scheinkman, & Xiong, 2006). Or perhaps, managers focus on short-term goals because they find it difficult to make long-term projections about a complex world. Whatever the reason, the point is that in environments where long-term survival is not the focus, one could question the need for making trade-offs between growth and entropy accumulation. This would be especially true when market forces get subverted and managers do not experience negentropic pressures.

In monopolistic environments, assured of captive markets, organisations can perhaps survive despite destroying value. Government policies that either inadvertently or deliberately insulate organisations from negentropic pressures take away the incentive for managers to concentrate on efficient value creation. For example, until the 1990s, in an era when India’s economy was closed and “Licence Raj” flourished, more than any other competency, Indian
managers needed political acumen, networking, and lobbying skills to curry favours from government bureaucrats (see DeLong, 2003). The situation in other economies that continue to be closed may be somewhat similar. Unsurprisingly, even in developed economies, the sectors and companies that enjoy protection tend to lose their competitiveness (Porter, 1990). The history of problems associated with tobacco production in the US (see Watkins, 1990) or the recent travails of the European aircraft manufacturer, Airbus can be traced back to well-meaning protectionist policies that back-fired.

Admittedly, the discussion on the boundaries of the open systems perspective is beginning to read like an ode to free markets, but it is worth noting that the conclusions have been arrived at through an interpretation of systemic properties and without reference to any of the assumptions made by economists. More importantly, the systems perspective has an irreconcilable difference with the free-market Friedman mantra that places wealth generation for shareholders above all else (see Ghoshal, 2005). A strict interpretation of open systems theory would suggest that shareholders should be treated no differently from other input providers. The mantra of the systems perspective – at the expense of being repetitive – is simply this: managers should concentrate on creating value for the external environment so that the parent system in which they are embedded may survive. The boundaries within which the open systems perspective on managerial work is valid may then be summarised in one sentence: the perspective is valid in free markets where organisations aim for long-term survival. But the boundary condition just identified raises the question as to why should managers and other employees choose to concentrate on organisational survival.

Systems thinking, to account for how social systems grow, must acknowledge that humans are purposeful beings who have their own intentions. Given this acknowledgement, the systems perspective cannot ignore the fact that managers could choose to ignore the organisational need to maintain negentropy and instead pursue their own agenda. In other words, managers could sabotage their own systems, thereby completely undermining the basic longevity premise.6 Such a possibility, of course, cannot be ruled out. But again,

6 It could be pointed out that at times there may be valid reasons to undermine the longevity of an organisation. For instance, managers of a factory that exploits its workers may legitimately choose to work towards their factory’s closure. One cannot possibly call such managers saboteurs. One could, however, argue that an exploitative factory invites the wrath of its workforce because exploitation leads to high entropy levels. Managerial backlash, in this instance, could be described as a manifestation of extremely high levels of accumulated entropy. Thus the proposed theoretical perspective may have some explanatory power even under circumstances that call for organisational demise.
organisations could turn to open systems thinking and Jaques”s (2002) work on human capability for answers.

One could hypothesise that if managerial capability were suitably matched with complexity levels, managers would most likely feel fulfilled. Further, having the ability to cope with negentropic pressures, they would probably seek challenges rather than look for ways to grow at the expense of their organisation. Nonetheless, it is conceded that placing managers at appropriate hierarchical levels may not be enough. Organisations would also have to take pains to align the interests of individual managers with those of the parent system. And this may not prove simple. Discussing the alignment issue further would amount to discussing the implications, not the boundary conditions, of systems theory. This chapter terminates here so as to avoid encroaching into the territory of Chapter 7.
CHAPTER 7

CONTRIBUTIONS, IMPLICATIONS, AND LIMITATIONS

The thesis had set out to identify what managers should do, and, by extension, what they should be competent at. It has been argued that if one accepts that organisations may be conceptualised as higher order open systems, then an interpretation of systemic properties can help one identify what managers should do to ensure organisational longevity. To the extent that the interpretation of systemic properties has been internally consistent, the thesis can claim to have made a contribution by distilling an unambiguous managerial brief from the first principles of systems theory. A purely conceptual interpretation of managerial work has led to this thesis identifying what managers should do, and proposing an entirely new way of classifying extant evidence.

One cannot validate the proposed taxonomy in the conventional sense since its categories are not mutually exclusive. But again, as has been pointed out, this lack of exclusivity is entirely consistent with the holism inherent in the open systems perspective. The thesis has implied that organisations would most likely live longer if employee roles were conceptualised as building blocks as suggested by the fractal view of the organisation. Since roles are currently not considered analogous to building blocks, efforts to empirically test the fractal view in the workplace would probably prove futile. Nonetheless, as this chapter argues, a mere change in perception can lead to outcomes that may later validate the proposed view. In effect, an appeal is made to the scholarship in the area to consider reframing managerial work on theoretical grounds. Since this thesis has added conceptual clarity to the first principles of open systems theory, as applied in the managerial context, its main contribution is in the realm of theory development.

The thesis has not merely used a systemic lens to better understand an existing phenomenon; arguably, it has contributed to the quality of the lens itself by enunciating systemic properties that had hitherto been either ignored or incompletely understood by scholars subscribing to the organisations-as-systems perspective. The final chapter begins by identifying the theoretical contributions made by this thesis and surfaces the ontology of the newly introduced concepts. Thereafter, the chapter discusses how theory-building efforts in diverse areas related to managerial work and competence might be informed by the proposed notion of value creation. Then a research agenda is put forth, the implications for practice
discussed, and it is pointed out that the fractal view developed in this thesis can address the weaknesses of the traditional organisations-as-systems thinking. Lastly, the chapter identifies the limitations of the fractal view and concludes with a summary of the salient aspects of this thesis.

THEORETICAL CONTRIBUTIONS

In the course of identifying what managers should do, the thesis has made two theoretical contributions. It has: (i) introduced the concept of negentropic pressure to the organisations-as-systems literature; and (ii) offered a new systemic view, which may be described as the fractal view, of conceptualising organisations. A discussion on the contributions follows.

Negentropic Pressure as a Theoretical Construct

As pointed out in Chapter 5, the claim that organisations remain negentropic through continually executing I-T-O cycles (e.g., Katz & Kahn, 1978; Hendrickson, 1992) is only partially true. The failure of scholars to recognise that open systems also pump out entropy has meant that the management discipline lacks a theory about how entropy accumulates, and about how, if at all, do social systems discharge entropy. By conceptualising entropy in the social context as negative affect, this thesis suggests that there are sound theoretical reasons to pay heed to employee morale. This concern for employee well-being is not couched in naïve humanistic language as was perhaps done during the Human Relations era. According to the proposed open systems perspective, demoralising one’s employees in the wake of an I-T-O cycle is tantamount to suboptimal value creation. Processes that lead to employee burnout could be held culpable for increasing the levels of accumulated entropy (i.e., Z₂ in Figure 5.1 in Chapter 5) and thereby reducing the longevity of an organisation.

The danger of increasing levels of Z₂ in pursuit of higher levels of outputs is only a part of the problem. The other problem is that Z₂ could also rise as systems attempt to lower the levels of leakages (i.e., Z₁). As explained, leakages from a system are unavoidable during the process of transforming inputs (i.e., X) to outputs (i.e., Y). But this does not mean that systems can do nothing about leakages. However, unless systems are extremely inefficient, attempts to plug leakages would involve trade-offs. On being prevented from escaping during a value creation process, the entrapped energy, Z₁ could tend to dissipate in the form of outputs (i.e., some energy could desirably manifest as Y in Figure 5.1) and in the form of
accumulated entropy (i.e., the balance would undesirably manifest itself as \(Z_2\)). Beyond a certain point, efforts to lower \(Z_1\) could contribute more towards increasing the levels of \(Z_2\) than of \(Y\). This implies that leakages do not necessarily run counter to efficiency in the long run. The challenge then is to determine acceptable levels of leakages. Acceptable levels, in practice, would vary with context. In theory, these would be reached when efforts to prevent leakages start contributing more to entropy accumulation than to an increase in outputs.

Paradoxically, the very act of creating value leads to entropy accumulation, and systems cannot survive without creating value. Thus the assertion by physicists that eventually the Second Law of Thermodynamics\(^7\) must prevail. But as implied in Chapter 5, the law can be kept at bay by systems that retain the ability to withstand negentropic pressure. In the current context, negentropic pressure may be formally defined as the pressure experienced by systems as they try to extract the maximum possible economic rent for their outputs, \(Y\) while simultaneously trying to strike a balance between \(Z_1\) and \(Z_2\) (refer back to Figure 5.1). The implications of the organisational and managerial need to cope with negentropic pressure will be discussed later. For now, the chapter turns to the fractal view of organisations, the second major theoretical contribution made by this thesis.

The Fractal View of Organisations

In the proposed fractal view of organisations (see Figure 5.3 in Chapter 5), it is a given that every subsystem nested in a higher-level system plays a value creating role. Such a view is not about the higher-level system (i.e., the whole) being greater than the sum of its parts; it is about every single building block in the system reflecting the whole system. This is precisely what the Eastern mystics imply when they observe that the macrocosm may be found in the microcosm (see Capra, 1975) or when social scientists from the West use the imagery of holograms to explain organisational characteristics (e.g., Morgan, 1998) and emphasise the importance of individuals buying into a common vision (e.g., Senge, 1990). In effect, the fractal view of organisations, which is very different from the extant systemic conceptualisations of organisations, makes a contribution by providing a theoretical framework that can help scholars bridge the macro-micro divide.

Although several scholars have bemoaned the macro-micro divide in organisational studies and extolled the virtues of theorising across levels (e.g., Cappelli & Sherer, 1991; Capra, 1975; Morgan, 1998; Senge, 1990), the fractal view of organisations may offer a fresh perspective.

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\(^7\) The law, as mentioned in Chapter 5, states that randomness or disorder (i.e., entropy) in any closed part of the universe increases with the passage of time.
House, Rousseau & Thomas-Hunt, 1995; Klein & Kozlowski, 2000), multilevel theories continue to be rare. Indicting the training imparted in doctoral programmes as one of the more “insidious barriers” to multilevel theory-building, Klein, Tosi, and Cannella state:

The training that researchers receive as doctoral students seldom is multilevel in nature. Hence, individual-level behaviors and attributes may seem of little interest and import to the macrotrained theorist. Conversely, organizational behaviors and outcomes may appear intractable and uninteresting to the micro-trained scholar. The statement that “organizations don’t behave; people do” may be a truism for the micro theorist but a misguided cliche for the macro scholar. The micro scholar may be unable or simply disinclined to see the forest for the trees, whereas the macro scholar may be unable or disinclined to see the trees that make up the forest (1999; p. 244).

It would seem that even those who attempt to theorise across levels are unable to completely shed off the influence of their training. For instance, Klein, Tosi, and Cannella (1999) appear to betray this influence when they claim that multilevel theories can link previously unlinked constructs by identifying how individual-level characteristics shape organisation-level outcomes and vice versa. While the claim may be true, it should be noted that Klein, et al. themselves choose to treat the individual and the organisation as distinct entities. They apparently believe that because these two entities influence each other, it is worthwhile to theorise about such “across levels” influences. Reflecting a similar belief, Crossan, Lane and White (1999) consider it necessary to invoke the differences amongst individual-, group-, and organisational-level processes while proposing a multilevel theoretical framework on organisational learning. Undoubtedly, differentiating across levels can aid in theory-building and comprehension, but scholars will do well to recognise that there is nothing sacrosanct about levels, which are only a creation of the human mind. Multilevel theories could also be developed to offer an integrated view – a view that does not differentiate amongst levels within the object of its focus.

Open systems theory, in some contexts, has the potential to offer a truly integrated view. The theory asserts that systemic boundaries are mental constructs. This assertion can enable scholars to not only span boundaries, but also redraw them should they so desire. Moreover, as stated in Chapter 5, the identity of a system is context dependant – the systems themselves are neither macro nor micro. A business organisation that is treated as a micro-level system in the context of a pan-national economy, could acquire the status of a macro-level system in the context of a local industry. This thesis goes a step further and claims that
the macro-micro divide could be ignored in the context of value creation because value creation processes are identical across all open systems – from individual cells to social systems. Irrespective of whether one zooms in or zooms out, one encounters a pervasive need for open systems to execute I-T-O processes and remain negentropic. This is as true for regional economies, as it is for employees executing job roles in their individual capacity. Thus the I-T-O fractal presents a theoretical view that obviates the need to differentiate across levels in so far as the basic value creation processes are concerned.

Whether the two concepts introduced to organisations-as-systems thinking – the fractal view of organisations, and recognition of the need to withstand negentropic pressure to survive – have any practical significance will be discussed shortly. At this stage, it may be pertinent to surface the ontology of the systemic notion of value creation. The discussion on the nature of reality will later help in highlighting how the proposed definition of competency might be able to reconcile the apparent incommensurability amongst extant competency definitions.

SURFACING ONTOLOGICAL ASSUMPTIONS

By theorising that the value creation spiral has a genetic base, the thesis seems to have embraced a realist position. The proposed systemic notion implies that the ability to create value (or the competency of a system) is “real” in the sense that its existence may be linked to the presence or absence of certain molecules. Such a real existence makes it possible for geneticists to physically and objectively measure the competency of an individual. But as discussed below, competency’s true nature, in the context of social systems may be slightly different.

The ontology implicit in the systemic notion of competency is not immediately apparent. By factoring in human intention and highlighting the importance of internal structures at a given moment in time (refer back to the discussion on autonomous adaptability in Chapter 5), the systems perspective recognises the fact that social systems can be unpredictable. According to the perspective, whether intentional beings are able and willing to apply their competence in the workplace depends upon how the beings in question perceive, interpret, and choose to respond to their own reality. In other words, reality as it pertains to competency in the workplace is socially constructed. Interestingly, some
Philosophers have argued that social constructionism is commensurate with realism. The philosopher Stanley Fish for example, points out that “balls” and “strikes” might be socially constructed rules of baseball, but one cannot deny that they are real. Players, he reminds us, are paid millions of dollars to produce them or prevent their production (as cited by Crotty, 1998). Akin to “balls” and “strikes,” competency has an ontology that includes elements of constructionism and realism. This dual nature is amplified below.

Although the systemic view holds that competency is innate (or a genetically determined objective reality), it also holds that as individuals embedded in social systems begin to apply their “objective” ability, they introduce a “subjective” element to it. Thus in the notion of competency, as in other socially constructed notions, objectivity and subjectivity get “indissolubly bound up with each other” (Crotty, 1998; p. 48). Since competency has been defined as the ability to create value in an optimal manner, it encapsulates the notions of: (a) efficiency as reflected in the need to execute I-T-O cycles to create as much value as possible from available inputs; and (b) negentropy, which draws attention to the need for minimising wear and tear (or for being optimal) during value creation. While one could develop objective measures for elements of efficiency (i.e., the ratio of outputs to inputs), one’s negentropy measure (i.e., a measure of emotional turmoil in the wake of value creation) would per force have to make room for subjectivity. This duality in the ontology of competency appears to be responsible for engendering diverse, and apparently irreconcilable, epistemologies in the area.

The failure on the part of scholars to closely examine and surface their ontological assumptions has caused much confusion in the competency literature (Garavan & McGuire, 2001). While multiple research approaches can inform an area in different ways, in this instance, the approaches may be proving to be a hindrance since they appear to be further entrenching scholars in their respective ontological positions. The thesis concurs with Doppelt (1978) who observes that since rival paradigms speak to the same empirical situation, they need not necessarily be insular and imprisoned within their own language. The next section claims that the duality in the ontology of competency that has just been surfaced perhaps offers a more complete view of reality.

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8 See Shrivastava & Kale (2003) for more on the topic.

9 Jaques’s (2002) notion of Human Capability also seems to have a dual nature. According to him, Current Potential Capability (CPC) is innate (i.e., its roots are genetic) and may be objectively measured. But Applied Capability (AC) is a function of, among other things, an individual’s “commitment.” Thus one must make allowances for a subjective reality while measuring AC, which is analogous to competency that manifests itself in the workplace.
IMPLICATIONS FOR THEORY

Competency Definitions: Reconciling the Apparent Incommensurability

Chapter 5 has already used the fractal view of value creation and a more complete understanding of negentropy to suggest a definition of competency that, as has been claimed, is applicable across macro- and micro-levels. But the thesis has not yet discussed the implications of the proposed definition. It could well be that the proposed definition merely adds to the theoretical confusion by conceptualising competence in a way that is different, but not necessarily more valid. Why should competency modelers interested in studying individual-level competence embrace the systemic notion of competency? As has been pointed out, the lack of unanimity over the definition of competency is, in large measure, attributable to scholars choosing different points of departure and, as a result, subscribing to different effectiveness criteria. Recollect from Chapter 4 that worker- and work-oriented approaches to defining competency have respectively spawned input- and output-based competency modeling techniques.

On the one hand, input-based models rely on suspect external effectiveness criteria that undermine their validity; on the other, output-based models subscribe to internal effectiveness criteria that make them more defensible in terms of validity, but do nothing to help identify what incumbents in complex jobs should do. Hybrid competency definitions do make an attempt to combine the strengths of the work- and worker-based approaches, but lacking a theoretical anchor, they imply that one could build competency models by simply compiling input- and output-based competencies. Not surprisingly, the models based on hybrid definitions tend to contain long atheoretical wish-lists (see Tett, et al., 2000). In contrast, the proposed systems-based competency definition, as argued below, integrates the strengths of the extant approaches while simultaneously addressing their inherent weaknesses.

Since only those who create valuable outputs as dictated by their work roles are deemed effective in the systemic view, the view can be said to use internal criteria to gauge effectiveness. The conclusion that managers in their work roles should manage interfaces, growth, and contingencies is based on an understanding of the internal properties of

\[\text{\textsuperscript{10}}\text{Input-based modelers from the US tend to prefer the term competency, whereas output-based modelers in the UK favour the term competence (see Garavan & McGuire, 2001). Recognising that such pedantry could create confusion, the thesis has used the terms interchangeably. In any case, none of the widely-used English dictionaries differentiate between competence and competency. Every-day language issues aside, the systems perspective, as will become clear, enables one to merge the input- and output-based competence/competency conceptualisations.}\]
organisations. However, as per open systems theory, it is only the external environment that can determine whether value is being continually created. The systemic view therefore also subscribes to external criteria. The *internal* properties that systems possess are geared towards ensuring survival by creating value for the *external* environment. Because the systemic view of managerial competence subscribes to an effectiveness criterion that is at once internal and external, it may be in a position to reconcile the apparent incommensurability in the work-and worker-oriented approaches. In addition, the systems-based concept of value creation may have the potential to help competency modelers develop parsimonious models even for complex jobs.

As illustrated in the value creation spiral (refer back to Figure 5.5 in Chapter 5), GMA, a plethora of KSAOs, and innumerable personality traits can be theorised to contribute to an individual’s value creating ability. Given such a wide menu, competency modelers can invariably identify a “new” competency should they be intent upon doing so. But the competencies they identify essentially emerge from different levels of the *same* spiral. Thus most competency lists tend to contain redundancies. However, the notion of the value creation spiral is not inimical to the principle of parsimony *per se*. The art of competency modeling lies in probing the spiral at the appropriate echelons. If the probing is backed by sound theory, competency modelers may safely infer that the requisite underlying traits that populate the lower echelons of the spiral exist in the person concerned.

In the context of managerial work, presence of competencies in the IMC, GMC, and CMC clusters would provide competency modelers sound theoretical reasons to infer that the person concerned possesses the other requisite underlying personality traits needed to become an effective manager. Such an inference should help modelers eliminate redundancies in their competency lists. As per the proposed view, unless there is a need to predict something very specific about a manager, narrow personality traits at lower echelons need not be probed. Note that the two personality traits – emotional intelligence and emotional stability – that all managers are required to possess as per the proposed taxonomy (see Figure 6.1) are relatively broad traits. It was postulated in Chapter 5 that broad competencies are valid predictors of broad criteria. Since the proposed taxonomy in general contains very broad multi-dimensional competencies, one can assume that the “longevity” or the survival-related effectiveness criterion subscribed to by the open systems perspective must be a broad criterion. The chapter will later scrutinise if this is the case.
Thus far, the chapter has argued that the systems perspective can meet the challenge of reconciling work- and worker oriented approaches or input- and output-based notions of developing competency models. But what about the constructionist view of competency? The issue whether the systems-based competency definition is consistent with the constructionist notions of competency is examined next.

Just as Sandberg’s (2000) constructionist competency definition attaches importance to how workers experience and conceive their own competency levels, the systems-based definition emphasises how value is created. Thus both definitions are process-centric. As discussed earlier, the systemic view incorporates elements of constructionism because it acknowledges that the internal state (e.g., notions of self-efficacy, mental models, belief systems, commitment, motivation levels, and so forth) of individuals ultimately determines how the I-T-O processes are applied in the workplace. On fundamental issues therefore, the systems-based approach converges with the constructionist approach. And although the former stops short of embracing a position that recommends a custom-made competency model for each individual, it does recommend that organisations should carefully match each individual’s generic competency levels with the complexity levels that the individual would be expected to cope with while trying to create value in a given job role.

From the foregoing discussion, it is clear that the proposed competency definition has elements that are consistent with the constructionist, work-, and worker-based competency conceptualisations. The definition is anchored by a holistic theoretical view that focuses on the value creation process and eschews dichotomous thinking by simultaneously including external and internal criteria. More importantly, the systems-based competency definition draws attention to the need for remaining negentropic while creating value. The chapter now turns to discussing the theoretical implications of the term negentropic pressure introduced in this thesis.

As pointed out earlier, organisations, being higher-order open systems, can, in theory, remain negentropic almost interminably. However, in practice, organisational life-spans tend to be short. By understanding how firms respond to negentropic pressure, scholars can gain theoretical insights on several diverse areas that can help managers contribute to organisational longevity. In the current context, the thesis has identified the areas of managerial ethics, organisational slack, workforce reduction, and industrial ecology as being particularly relevant. The discussion below will try to establish that the negentropy-related
theoretical insights pertain to sustainable value creation that restrict managerial choices and have a bearing on how managers might apply their competence in the workplace.

Managerial Ethics

The open systems view implies that to remain negentropic, an organisation must strive to obtain inputs as competitively as possible from the environment and try to extract high economic rent for its outputs. Thus forging relationships with suppliers would be considered a legitimate attempt to improve organisational efficiency as the move could lower the value of the denominator in the efficiency ratio. Similarly, launching an advertising campaign to get a premium for outputs would be deemed an acceptable way of trying to increase the value of the numerator. Additionally, the open systems perspective accepts that organisations could try to create demand for a product or service that the external environment might not have even envisaged. As discussed, social systems, unlike biological systems, have the ability to foresee what might be of value, produce it, and then educate the external environment about the product’s value proposition. This unique ability may be attributed to the fact that social systems are populated by purposeful humans; that is, by humans who have intentions (see Ackoff, 1996).

If systems thinking must invoke human intention, then it must also acknowledge that some managers could just as well intend to make things easier for themselves by denying others fair access to the external environment. As organisations reach a point where cost cutting measures start proving counterproductive, and the demand for their output starts stagnating (i.e., when neither the denominator nor the numerator of the efficiency ratio can be influenced), the situation becomes untenable. Some organisations cease to exist; some fade away into oblivion, merely delaying the inevitable through borrowing; and some, as discussed in Chapter 5, successfully redefine themselves. Negentropic pressures however, could lead to outcomes that have not been mentioned thus far. A few organisations could try to survive by influencing the external environment in an unethical manner. Every once in a while, one comes across reports of organisations making false claims in consumer, labour, or financial markets, pressuring governments to preserve or grant monopoly rights, or colluding to form cartels. Such unfair acts aim to either extract higher economic rent or obtain superior inputs.

Unethical acts may thus be defined as acts that are undertaken by the perpetrators to subvert market forces in a bid to cope with negentropic pressure. Unethical acts have the potential to limit the legitimate choices of the competition. Adoption of corrupt practices can
greatly add to the complexity and unpredictability in the external environment (see Rodriguez, Uhlenbruck, & Eden, 2005) thereby posing challenges for the competition that it ordinarily would not have faced. With their choices reduced, the managers in the competing companies must work that much harder to maintain requisite variety in their organisations. Alternatively, they too could choose to take the easier route and adopt unethical practices. Thus dishonourable managerial intentions have the potential to trigger a chain reaction and shift the focus from ensuring longevity by value creation to ensuring longevity through subverting market forces. The circumstances created by unethical acts approximate what tends to happen in closed economies. When market forces get subverted, organisatons, as mentioned in the previous chapter, can survive despite being inefficient value creators.

The above discussion delineates the boundaries within which it is permissible for managers to influence the external environment in order to create value and seek growth as per the open systems view. Pursuit of growth at the expense of limiting the legitimate options of one”s competition is not permissible. Thus negentropic pressure as a concept informs theory-building efforts in the area of managerial ethics and delineates some limits within which managers might exercise and manage growth options. The concept, as pointed out below, also underscores the need for managers to pay heed to organisational slack while creating value.

Organisational Slack

It is true that some businesses manage to survive despite being unable to exchange their outputs for enough inputs. They do so by raising debt from the financial markets or by persuading their owners to lend them resources with promises of future returns. Leveraged buyouts are a case in point. But to survive in the long run, only sustainable negentropic value creating processes can save organisations from the wrath of the Second Law of Thermodynamics. It is also true that organisations, on occasions, find the external environment temporarily incapable of providing fresh inputs. For instance, during a tight labor market, organisations without deep pockets could find it difficult to hire talent. The need to continually withstand negentropic pressures suggests that there are theoretical reasons for firms to stockpile reserves for a crisis. It is stocks of reserves (coupled with inactivity) that help cold-blooded organisms survive winters.

Organisations, of course, cannot hibernate or remain inactive. During tough times, unable to sustain their I-T-O cycles in the face of declining demand, firms often try to become
negentropic by lowering their operating costs, which are analogous to energy that escapes from a system during value creation processes. Thus cost-cutting attempts may be modeled as attempts to lower the value of $Z_1$ (see Figure 5.1 in Chapter 5). But as stated earlier, while the organisations that succeed in completely eliminating leakages might be able to claim higher input-output ratios in the short-term, in the long run they could suffer. By not making allowances for failures and experiments, zero-error cultures could tend to increase stress levels amongst employees. A high tolerance for failures and leakages therefore could be described as form of slack that does not run counter to efficiency in the long-term. In other words, the need to maintain a balance between $Z_1$ and $Z_2$ suggests the need for organisations to have slack.

Further, in environments that lack slack and do not tolerate failures, managers, under pressure to produce immediate results, could become more susceptible to cutting corners. As discussed earlier, the pressure to remain negentropic has the potential to inadvertently drive unethical behaviours. Since organisational slack lowers negentropic pressure, it could contribute to an environment that facilitates ethical behaviour. One may thus hypothesise that it is easier for managers to remain scrupulous in times of munificence. Their real test comes during survival-threatening “winters.” Alternatively, one could, with equal conviction, hypothesise that reserves and slack could tempt managers to undertake unethical “pet” projects that do not necessarily further organisational interests. Managers who pursue personal aggrandisement and short-term gains at the expense of their workforce could be considered incompetent because they squander away organisational slack and erode their organisation’s ability to survive.

The thesis has implied that to be deemed competent, managers cannot be unethical and fiscally imprudent while creating value. Interestingly, the proposed notion of value creation also precludes managers from considering layoffs as a viable option to cope with negentropic pressure. The argument developed below frames layoffs as untenable attempts to manage contingencies, and, consistent with the fractal view, makes a case for regarding employees as the building blocks of an organisation rather than as “inputs” that need to be paid for. The change in weltanschauung (or worldview) that the employees-as-building blocks thinking can

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11 The literature defines organisational slack as a cushion of actual or potential resources that can help organisations adapt to internal and external pressures. Sharfman, Wolf, Chase, and Tansik (1988) point out the need to differentiate between slack over which managers enjoy discretion and over which they do not. In this context, the reference is to the former.
bring about has implications for how organisations might define their own role and gauge managerial competence.

**Workforce Reduction**

While efforts directed at eliminating non value-added work to cope with negentropic pressure are commendable, the organisational tendency to take the easier route by temporarily becoming negentropic through laying-off workers is not. Layoffs often appear attractive to struggling firms because following layoffs, the pressure on firms to extract high economic rents from the external environment reduces (see Greenhalgh, Lawrence, & Sutton, 1988). Having lowered their wage bill, firms expect their subsequent rounds of I-T-O cycles to cost less. But such productivity gains can be short-lived if the firms do not address the root causes of the failure to remain negentropic. In fact, there is ample evidence to suggest that layoffs are seldom successful at turning around a firm’s fortunes (Cascio, 1998). On the contrary, layoffs are perceived by demoralised survivors as breaches of psychological contracts (Brockner, Grover, Reed, DeWitt, & O’Malley, 1987). They can thus increase levels of accumulated entropy (i.e., $Z_2$ in Figure 5.1). So while layoffs as a response to a contingency may make intuitive sense, they have the potential to engender other more serious contingencies.

Despite layoffs producing mixed results at best, a majority of senior managers when experiencing negentropic pressure seem to have no hesitation in recommending downsizing. They probably do so because they view labour as just another factor of production. Classical economics would suggest that, all other things being equal, competent managers can cope with negentropic pressure by successfully lowering the costs of obtaining inputs or factors of production. In fact, the strategic human resources management literature and the extant systemic conceptualisations of organisation too model “labour” as “inputs.” But as argued below, a more complete interpretation of negentropy and the fractal view of organisations suggest a new way of modeling employee inputs that questions the traditional organisations-as-systems thinking that seems to have uncritically embraced conventional economic wisdom.

Drawing from Katz and Kahn’s (1966; 1978) conceptualisation of organisations as open systems, Wright and Snell (1991) describe HR systems as open systems that execute...

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12 As discussed in Chapter 3, Katz and Kahn (1966; 1978) conceptualise organisations as containing five subsystems. Wright and Snell (1991) however, do not conceptualise the HR system as a subsystem embedded in a suprasystem. Instead, they treat HR as a generic system that spans across all other subsystems that rely on people to execute I-T-O processes. The authors imply that the HR system’s boundary is identical to that of the parent system’s. The strategic HR system in the Wright and Snell model performs the roles that Katz and Kahn reserve for *maintenance* and *supportive* subsystems in their model.
throughput control processes to convert inputs into outputs. Inputs, in the Wright and Snell model, comprise competencies (i.e. knowledge, skills and abilities) of employees; throughputs comprise employee behaviors; and outputs consist of performance outcomes (e.g., tangible product, service quality) and affective outcomes (e.g., job satisfaction, group cohesiveness). The widely-cited Wright and Snell open systems HR model equates employee competencies with other forms of raw materials or inputs that need processing. Therefore, the systems-based HR model could be termed as the “employees-as-inputs” model. Although it seems reasonable to model employees’ competencies as inputs obtained by an organisation from the external environment, the implications of doing so appear to have not been fully appreciated.

Just as the conventional organisations-as-systems view suggests that employees could be modeled as inputs, the proposed organisations-as-fractals view suggests that employees, or more accurately, employee roles may be modeled as the building blocks of an organisation. It is argued that individuals become an integral part of the organisation the moment they join an organisation’s workforce and get engaged in processing inputs to produce outputs through applying their competencies. Seen in this light, employee competencies cannot be equated with raw materials or inputs. Since only the external environment, as per the open systems view, can provide inputs, the HR system (or any other embedded system), being internal to the parent organisation cannot, at least in the technical sense, be modeled as providing inputs to the parent system.13

It logically follows that internal systems cannot be modeled as seeking compensation from their parent systems for creating value for them. Consider what would happen if every cell in the human body were to demand from the body its pound of flesh for creating value. Building blocks create value as much for themselves as for the parent system in which they reside. This reasoning naturally raises the question of how one might capture and explain employee compensation in open systems thinking as represented by the fractal view.

The employees-as-inputs thinking would capture employee compensation as costs of obtaining inputs (i.e., as a portion of X in Figure 5.1), whereas the employees-as-building-blocks thinking would capture the said expense as unavoidable costs of energy conversion

13 It is certainly possible to model subsystems within a parent system as providing inputs to each other. For instance, one may model a firm’s HR system as providing inputs (e.g., conducting training) to say, the firm’s marketing system, and seeking compensation for its outputs from the latter. But technically, one cannot model an HR system as providing inputs to a system within which it is embedded.
(i.e., as a portion of $Z_1$). This divergence of opinion is not an instance of academics wrangling over a trivial technicality. The two ways of modeling employee contributions have major implications for how firms might treat their workforce. Extending the employees-as-inputs model, Snell (1992) proposes a control theory of strategic HRM that prescribes a combination of HR practices to control inputs, outputs, and throughputs. Snell theorises that inputs (i.e., competencies) on being processed or manipulated could produce behaviours (i.e., throughputs) which, in turn, could lead to desirable outputs. Implicit in the control theory of strategic HRM is the assumption that those whose behaviour cannot be controlled are undesirable elements best got rid of. Perhaps it is unfair to imply that employees-as-inputs thinking could lead to organisations dismissing employees on frivolous grounds and adopting manipulative behaviour-control mechanisms. Nonetheless, as explained below, the thinking is open to criticisms on other grounds as well.

One can imagine that when confronted with rising levels of negentropic pressure, companies would try to negotiate better terms with those who supply inputs. If unsuccessful, they would look for cheaper inputs from other sources. But before doing all of this, companies would probably try to reduce their consumption of inputs by becoming more efficient. These courses of action would make perfect sense, but the point is that companies which subscribe to the employees-as-inputs thinking could show an inclination to substitute the word “inputs” with “labour” in the last two sentences. One can now being to understand, at least partially, why big businesses might abhor employee unions, find outsourcing attractive, and consider layoffs a cost-effective solution. With respect to layoffs, firms tend to optimistically expect a smaller labour force to produce pre-layoff levels of outputs. As pointed out earlier, productivity gains under such circumstances, if realised, tend to be temporary. Compare these possible outcomes with what would most likely happen in the case of firms that subscribe to the employees-as-building-blocks thinking.

Firms amenable to treating employees as building blocks would, at least in theory, generally aim to keep all employees as “healthy” as possible at all times without, of course, jeopardising the firm’s ability to remain negentropic. Thus acquiring the capacity to pay high wages to every employee would be an ideal that firms would aspire to. True, negentropic pressures would still require managers to keep operating costs low, but this requirement would have to be offset against the need to keep levels of accumulated entropy in check. The point that $Z_1$ and $Z_2$ in Figure 5.1 could have a curvilinear relationship has already been made.
When faced with negentropic pressures and the unavoidable need to urgently bring down their wage bill, the firms would probably subject all employees to an equitable salary-cut. Layoffs in such firms would be treated like amputations – last resort options to be undertaken only in the face of grave consequences. Thus the employees-as-building-blocks thinking has the potential to prompt courses of action very different from the ones likely to be prompted by the employees-as-inputs thinking.

As per open systems thinking, input providers from the external environment (e.g., suppliers of raw materials) need to be compensated for the value they provide to the system. Since employees are an integral part of the firm, it was earlier argued that the compensation paid to employees could not be modeled as payment for inputs. Instead, it was suggested that one could model employee compensation as unavoidable energy leakages that occur during the value creation process. But the question as to why it is necessary for social systems to compensate their own building blocks that do not, at least in the technical sense, provide inputs has not yet been satisfactorily answered. Clearly, someone needs to pay the employees. Who should pay them as per open systems thinking? And why must they be paid if they are internal building blocks? Are there conceptual flaws in the fractal view of organisations and the related employees-as-building-blocks model?

One could answer the above questions by modeling the human mind and the internal building blocks as distinct entities. When individuals choose to join an organisation they become an integral part of a social system by virtue of agreeing to play a particular role for the system, but their minds, as per the fractal view, continue to be their own personal property. It is argued that the individual mind could be treated as something present outside the permeable boundary of the organisation. And when employees as building blocks commence working in their job roles, they, to varying degrees, obtain inputs from their minds. Every time an I-T-O process is executed, work gets done and individuals suffer wear-and-tear (i.e., they accumulate entropy) as they create value for their organisation. This view is very different from the one that treats hiring employees as akin to obtaining raw materials as a one-off at the beginning of an I-T-O cycle. It is for continually making mental inputs available and suffering wear-and-tear (i.e., accumulating entropy, howsoever miniscule) that employees must be compensated.

Conceptually, organisations do not compensate the building blocks. They pay a “price” for causing wear-and-tear to a resource that does not belong to them. The price, to re-iterate,
could be modeled as a leakage (i.e., as $Z_1$ in Figure 5.1). Interestingly, Jaques (2002) too implies something similar. As mentioned, Jaques’s study began with a request from union employees to determine levels of fair compensation in the workplace (see Jaques and Cason, 1994). His work on human capability not only linked information processing abilities with time horizons of jobs, but also logically linked time horizons of jobs with the notions of comparative worth. Jaques reasoned that employees occupying jobs with larger time-horizons deserved higher levels of compensation because they provided more (or “superior”) mental inputs to the organisation. Since the thesis has just conceded that Jaques’s work and the employees-as-building-blocks thinking both propose that employees provide mental inputs, one might wonder how these views are substantially different from the employees-as-inputs view put forth by Snell and Wright (1991). It is emphasised that there is a subtle, but important, difference.

By treating competencies as raw materials that could be transformed into outputs through behavioural control, Snell and Wright (1991) imply that the mental faculties of employees belong to the parent organisation and that these acquired inputs could be used for creating value in ways as deemed fit by the organisation (also see Lado, Boyd, & Wright, 1992; Snell, 1992). Notice that according to the fractal view, firms may claim ownership of the products created by the mental efforts of their employees, but they cannot lay claims to owning the mind of their employees.\(^\text{14}\) How and in what way employees choose to exploit their own mental resources in the course of executing their job roles and creating value is largely determined by the employees themselves. This resonates with Sandberg’s (2002) constructionist notion of competency.

As per the proposed systems perspective, organisational practices and structures may play an active role in facilitating the value creation processes, but not in exercising “control” over employees’ competencies. Organisations that subscribe to the employees-as-building-blocks model would be entitled to explaining away the expenditure incurred on employees as incentives offered to encourage employees to use their mind”s full potential. The model implies that managers should value and acknowledge the contributions made by each individual in the course of managing interfaces. “Enabling individuals to exploit their full potential so as to retain the organisational capacity to create value,” could well emerge as the

\(^{14}\) Thus the drive by some scholars to reflect employee competencies (i.e., intellectual or human capital) as assets in corporate balance sheets (see Roos & Roos, 1997) would appear untenable as per the systems view.
raison d’être for companies that subscribe to the employees-as-building-blocks thinking. And the competence levels of a company’s managers could be gauged by how well the company pays its employees without jeopardising its ability to withstand negentropic pressure and stock reserves for future growth.

The reference to growth underlines another important implication of negentropy. Since the organisations-as-fractals view depicts embedded systems as creating value for their parent systems, zooming out from one suprasystem to the next would lead one to conclude that growth at the expense of another system might amount to increasing entropy at the suprasystem level and rendering the economy unsustainable. It is thus not a matter of choice or value judgment, open systems thinking as developed in this thesis issues a call to adopt a balanced approach to growth and value creation. An imbalanced approach that ensures growth at the expense of exploiting others would eventually prove unsustainable according to the fractal view.

Traditionally, firms tend to enter the businesses of their suppliers and buyers and get vertically integrated in order to safeguard against “exploitation” or to capture for themselves the margins enjoyed by others. Some firms also try to get horizontally integrated through expanding across market segments and geographical areas. Horizontal and vertical integration growth strategies are underpinned by a spirit of competition. The fractal view implies a new kind of integration that is driven by the need to minimise waste. This notion of integration, labeled “ecocentric integration” suggests new avenues of legitimate growth, and is discussed next.

**Ecocentric Integration**

Thus far, only Y in Figure 5.1 has been described as “output.” But in energic terms, $Z_1$ and $Z_2$ are also byproducts of the value creation process. From the perspective of the external environment, $Z_1$ adds to entropy levels in the suprasystem unless it gets utilised in some other value creation process. Organisations, should they so desire, can convert $Z_1$ into a new source of revenue. Although several companies have tapped into this source, they remain a miniscule minority. Industrial ecosystems that are based on the idea of companies utilising $Z_1$ have failed to enthuse governments and the corporate world. Shrivastava defines an industrial
ecosystem, as a “network of organizations that jointly seek to minimize environmental degradation by using each other’s waste and by-products and by sharing and minimizing the use of natural resources” (1995; p. 128). He explains how a power plant, an enzyme plant, a refinery, a chemical plant, a cement plant, a wallboard plant, and some farms in Kalundborg, Denmark use each other’s wastes and by-products as raw materials and coordinate amongst themselves the use of energy, water, and waste-management practices. The industrial ecosystem concept suggests a new form of integration that could prove commercially lucrative to corporate conglomerates.

The ability to utilise $Z_1$ in Figure 5.1, as in the example of Danish companies cited above, can make firms more efficient by increasing the value of the numerator in the efficiency equation. With $Z_1$ converted into a revenue stream, a firm’s efficiency would equal $(Y + Z_1)/X$. The firm in question would then have an incentive to arrive at a product portfolio comprising $Y$ and $Z_1$ in commercially viable and environmentally sustainable proportions. In the case of firms that choose to recycle $Z_1$ for their own consumption (i.e., for their next cycle of I-T-O processes), the value of the denominator, $X$ would get lowered. These direct benefits that might accrue to firms hardly need elucidation, what may not be obvious is that the ability to utilise $Z_1$ could also reduce $Z_2$ levels. One could hypothesise that organisations which recognise the value creating potential of $Z_1$ would be unlikely to drive their workforce to lower $Z_1$ levels at the expense of accumulating $Z_2$. It is therefore theoretically possible for companies to increase their ability to withstand negentropic pressures without impinging on their own ability to remain efficient.

The thesis has argued that in the absence of negentropic pressure (e.g., in closed economies), firms might lose their incentive to remain efficient. In systemic terms, however, an ideal state is that in which firms experience minimal negentropic pressure and yet remain efficient value creators. As long as systems can remain in this ideal state they need have no fear of mortality. Industrial ecosystems, which encourage mutual cooperation, can take firms closer towards attaining this state. Informed by the open systems perspective, corporations could consider taking the logic behind industrial ecosystems to the next step, and consider becoming “ecocentrically integrated” entities. Conglomerates could choose to operate in industries where the synergies come from the ability of their different businesses to utilise each other’s by-products.
Ecocentric integration would, no doubt, require a complete re-orientation in the corporate mindset. It may entail a new language. For example, the core competence of an organisation could revolve around the ability to cause minimal environmental impact through the use of recycled materials. Mutual advantage may displace competitive advantage in the lexicon, and it could accrue to industrial landscapes with undetectable carbon footprints. Self-contained corporate eco-spheres may seem a distant dream, but could one day prove critical to humankind’s survival. The notion of ecocentric integration, if embraced, can play a crucial role in radically changing the way firms exercise their growth options.

This thesis, perhaps at the expense of spreading itself too thin, has exploited the potential of open systems thinking to inform several facets of managerial work – ranging from the need to be ethical to the need for maintaining levels of organisational slack, and from precluding workforce reduction as a viable response to contingencies to eschewing growth opportunities that can damage the suprasystem. Although the implications of the fractal view and the need to cope with negentropic pressure pertain to diverse areas, they have a common thread in that they all impose limits on how managers might apply their competence or value creating abilities. The theoretical implications, as must have been noticed, range seamlessly across individual-level competencies to regional-level bio-spheres. The challenge before researchers is to build what Shrivastava (1995; p. 134) labels “green organizational/management theories.” Since the payoff – sustainable development – is as attractive as the task is challenging, researchers should not hesitate in picking up the gauntlet.

A RESEARCH AGENDA

This section identifies an agenda that researchers could consider concentrating on. If theory-building is to inform the various areas as discussed above, negentropic pressure and organisational longevity, the two constructs central to open systems thinking will need to be operationalised with great care. It is noteworthy that academics have started warming up to the systemic property of equifinality (see Gresov & Drazin, 1997; Jennings, Rajaratnam, & Lawrence, 2003), but the same cannot be said of negentropy. However, it is only when entropy reduction and organisational longevity get accepted as valid managerial goals that researchers may be in a position to isolate significant differences between competency-sets of managers in companies that wish to live long and in companies that concentrate on short-term goals. Given the nature of the constructs involved, researchers may have to undertake a large number of longitudinal projects to better understand the factors that enable organisations to
withstand negentropic pressure and the drivers of organisational longevity. A discussion on operationalising the two constructs follows.

**Operationalising Negentropic Pressure**

The fact that the Second Law of Thermodynamics states that every entity inexorably moves towards disorder does not mean that one cannot do anything about entropy accumulation. If anything, the law’s universal applicability and consequences provide additional reasons for researchers to identify mechanisms that can help firms cope with and discharge entropy. As mentioned, accumulation of entropy is a gradual process and, like ageing, it is easy to overlook. Moreover, to some extent, entropy gets discharged through a self-correcting mechanism as disgruntled and emotionally scarred employees resign. Self-(de)selection amongst employees combined with lack of readily detectable symptoms could partially explain why managers in the workplace are often blind to entropy accumulation. But management academics, unlike managers, cannot point to mitigating circumstances to explain away their oversight. The literature is generally silent on how entropy manifests itself in business organisations and what, if anything, can organisations do about it.

The thesis has argued that the open systems perspective makes it imperative that value be created in an optimal manner if an organisation is to remain negentropic. Measuring “optimal” however might prove to be particularly challenging. The property of equifinality suggests that there is no “best” way to create value. It appears that whether managerial behaviour is optimal or not could be determined by measuring the ratio of outputs to inputs (i.e., efficiency), but the ratio would have to factor in “negative output” (i.e., negative affect generated during value creation). The amount of time taken by prospective managers to create value could also be factored in as one of the inputs. Higher the efficiency ratio, higher would be the managerial ability to withstand negentropic pressure.

Ordinarily, negentropic pressure would tend to rise with either the revenues stagnating or the profit margins falling. Under such circumstances, some managers could drive their subordinates to work harder to the extent of demoralising them. Even during normal times, socially dysfunctional managers could cause disaffection and raise the levels of entropy in an organisation. Negative affect is, but one symptom of accumulated entropy that the thesis has identified. Employee turnover rates, work-related stress, absenteeism, and lack of organisational citizenship behaviour are other possible symptoms. But due care will have to be exercised while measuring these symptoms since they could all get confounded by
extraneous factors. For example, employee turnover could be an artifact of the conditions in the labour market and not of suboptimal value creation processes adopted by an incompetent manager. Moreover, symptoms, by definition, are lagging indicators. The damage is likely to have been done by the time symptoms surface. Researchers should therefore also consider identifying leading indicators of entropy accumulation to help organisations become more proactive.

Recent advances in measuring emotional intelligence (see Cherniss & Goleman, 2001) may help in predicting the effectiveness of managers in the interpersonal domain. The ability of managers to empathise could lead to lower levels of entropy accumulation. A composite score of managerial emotional stability in an organisation could prove to be negatively related to negative affect experienced by its workforce. Jaques and Cason’s (1994) work suggests that matching potential capabilities with expected complexity-levels in job roles could lower entropy accumulation. One could hypothesise that fully engaged employees will feel fulfilled and display a positive attitude towards their organisations. Conversely, those promoted beyond their capability will feel stressed and put their subordinates under pressure through their “incompetence.” Several organisations have instituted employee-wellness programmes to combat work-related stress. Such initiatives may be described as efforts undertaken to discharge entropy. Researchers may find it worthwhile to identify other effective entropy discharging mechanisms. Efforts to discharge entropy are analogous to servicing an engine to ensure its long life. This brings one to the organisational longevity construct, which is discussed next.

**Operationalising Organisational Longevity**

This thesis has made a case for incorporating organisational longevity as an external criterion to gauge managerial competence. On the face of it, measuring organisational longevity should prove to be straightforward. Since social systems can be expected to outlive humans – and some have managed to keep their corporate identities intact for over a couple of centuries\(^\text{15}\) – one could arbitrarily choose a figure beyond 100 years to benchmark organisational longevity. Nonetheless, agreeing on which organisations have lived long is not the same as identifying what contributes to their longevity. One cannot, in the current context, make predictions based on past record. Just because an organisation has survived for 125

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\(^\text{15}\) Geus (1999) cites the example of the publicly-listed Swedish company, Stora, a paper, pulp, and chemical manufacturer that traces its origins to as far back as 700 years.
years would not indicate an ability to last another 125 years. The open systems perspective requires of researchers to identify characteristics that would increase the statistical probability of organisations to live long.

In theory, features that enable organisations to cope with negentropic pressures can also help them live longer. As identified, reserves and tolerance for failure, both a form of slack, are a pre-requisite for organisations that hope to survive difficult economic times. Further, one could argue that when employees identify themselves with their organisations, an external agency is not needed to drive efficiency levels. With the drive to cope with negentropic pressure coming from within, entropy accumulation would be minimal. Thus according to the open systems perspective, organisations cannot live long unless they are committed to their workforce and vice versa. The systemic properties also suggest that actions which enhance the ability of organisations to acquire superior inputs, and increase the demand for their outputs, ought to contribute towards their longevity. Therefore, a solid reputation amongst suppliers, distribution channels, customers, and in the labour market would probably prove to be a good predictor of organisational longevity. Interestingly, whatever limited empirical work that there is on the subject supports this conclusion.

An internal study conducted by the petroleum giant Royal Dutch/Shell found that long-lived companies were: (i) sensitive to the societal concerns and the environment around them; (ii) cohesive with a strong sense of identity – their employees, and at times even their suppliers, felt that they were part of a single entity; (iii) tolerant, particularly of experiments, eccentricities, and outliers which helped them understand what was possible; (iv) financially conservative and “knew the usefulness of having spare cash in the kitty” (Geus, 1999; p. 14). Admittedly, the Royal Dutch/Shell study did not establish what “caused” longevity. The 30 publicly-listed companies that were studied were all over hundred years old. The lack of variability in the sample meant that there was no way of knowing how the companies in the sample were different from the short-lived companies. Nonetheless, the study provided some evidence that the features, as identified by open systems theory, could be associated with longevity. Also noteworthy about the study was what was not found to be associated with longevity.

None of the long-lived companies in the sample showed great concern for generating returns for the shareholders. As Geus (1999) argues, profits are symptoms, not predictors or
determinants of organisational health. While ignoring the ability to create shareholder wealth might make the job of predicting longevity simpler, the need to account for the paradox that good health in the corporate context does not always lead to long life could make things awkward. Researchers will need to recognise that good organisational health could attract corporate raiders. Factoring in the possibility of mergers and acquisitions has the potential to raise complex questions about corporate identity and longevity. Moreover, researchers would also have to account for the fact that some serial entrepreneurs start their own businesses with the sole aim of harvesting returns by selling their creation (Wright, Robbie, & Ennew, 1997). Although there appear to be no theoretical reasons to identify different health-checks for privately-held and publicly-listed companies, researchers may need to reconsider what longevity and retention of corporate identity might mean in different contexts.

A publicly-listed company that succumbs to a hostile take-over bid and undergoes complete restructuring, including a change in name, culture, and values would represent a classic case of corporate mortality. But such extreme losses of identity are probably rare. Research on how corporate legacies survive and disappear is almost non-existent. Consider the case of short-lived companies which spin-off entities that go on to live for decades or the case of two negentropic companies that choose to merge with each other for better prospects. It may be incorrect to regard such companies as “failures” merely because they had been unable to retain their original corporate identity. Whether firms that lose their corporate identity are necessarily unsuccessful or not may be debatable, what is certain is the fact that mergers and acquisitions that result in large scale downsizing or layoffs usually signify failure on the part of one or both the entities involved.

Even at the risk of stretching the biological analogy too far, it would seem that organisations that manage to spread their “genes,” in whatever form, are the ones that may be deemed successful. One could argue that organisations spread their genes primarily through their employees. In the industrial ecosphere, organisations could be seen as “cross pollinating” each other with their “healthy genes” through a mobile workforce. It seems that

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16 Another study by Collins and Porras (1994) that asked over 700 CEOs in the US to identify their most admired companies reached similar conclusions. In general, the admired companies did not see shareholder wealth creation as being all-important. Interestingly, with the exception of Sony and Wal-Mart, all the companies identified had been established in the 1930s or earlier. The characteristics of these most admired, “built to last” companies, as distilled by the authors, however seem too general (e.g., don’t be afraid to evolve; look inside your top management; constantly innovate) to inform future research.
the number of healthy genes contributed to an economy, and the net gain in the number of jobs as a direct result of an organisation’s action over its lifespan, could also be factored in while gauging organisational success or failure. Arguably, the ability to withstand negentropic pressure should translate into an ability to create new jobs in the long run.

The longevity construct merits much greater attention than it has been given. Researchers may not be able to do much better than aim to identify likely predictors of longevity. They will also need to tackle the multicollinearity problem between longevity and negentropic pressure. Indeed, conceptually the two constructs might be different, but for practical purposes researchers may have to opt for either one of them. The thesis implies that managers who are competent at managing interfaces, growth, and contingencies will confer on their organisations the ability to live longer or withstand negentropic pressure.

One, of course, cannot wait to observe whether organisations would live long or not. Open systems theory suggests that managerial competence should manifest itself in the form of: a culture that affords slack and tolerates failure, a solid reputation amongst external stakeholders, strong organisational commitment towards employees, and hierarchies in which employees are engaged as per their potential to match the complexity in the external environment. Additionally, managerial competence could manifest itself as a healthy attrition rate wherein employees leave voluntarily and confidently for better prospects owing to the developmental opportunities afforded to them. Furthermore, irrespective of whether they maintain their corporate identity in its purest form or not, organisations that possess the characteristics listed above would most likely, over a period of time, generate a net gain in the number of jobs for an economy.

One could question the rationale behind equating organisational success with organisational longevity and job creation. Merely because open systems theory places a premium on longevity does not mean that society too should value the concept. But Geus makes a valid point when he observes that “work lives, communities and economies are all affected, even devastated, by premature corporate deaths.” He goes on to add that “companies die because their managers focus on the economic activity of producing goods and services, and they forget that their organization’s true nature is that of a community of humans. The legal establishment, business educators, and the financial community all join them in this mistake.” (1999; p. 9). The open systems view concurs. And in recognition of the need for research on corporate longevity, the view draws attention to other research agendas that could
generate knowledge to help managers create value more efficiently and enable organisations to live longer.

Apart from the need to operationalise negentropic pressure and organisational longevity, the systemic properties point to the need for studying interfaces from a management perspective, exploring the nature of organisational growth and contingencies, measuring “fractality,” scrutinising the competencies included in the proposed taxonomy, and replicating Jaques’s work on human capability. A discussion on each of these issues follows.

**Other Research Agendas**

*Interface Design.* Open systems thinking attaches great importance to interfaces because systems are said to exchange inputs and outputs at interfaces. The interface design problem however, has mainly been approached from an engineering perspective (e.g., Vicente & Rasmussen 1992). This thesis makes a case for studying interfaces from an organisational behaviour perspective. Research on features that facilitate resource transfer could provide useful insights to managers. More importantly, the complexity levels of information that managers need to process are a function of the number of interfaces that must be dealt with. As discussed, Jaques and Cason (1994) link fair salary levels to the time horizons of managerial jobs and the complexity of information that needs to be processed at given hierarchical level. Further research could refine their notion of comparative worth by ascertaining the number of important interfaces that managers occupying roles with differing time horizons must manage. The degree of importance of interfaces could be combined with the levels of information complexity processed to arrive at a more robust measure of comparative worth. Not all interfaces are equally important and organisations could benefit from identifying “high leverage” interfaces.17

*Exploring Organisational Growth and Contingencies.* In his seminal article on systems thinking, Boulding (1956) had mused on the possibility of developing a general theory on systemic growth. Unbeknownst to him perhaps, Penrose was already working on such a theory. Although Penrose rejected using biological analogies, her theory of the growth of the firm was not necessarily inconsistent with open systems theory. Penrose held that biological

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17 One could argue that competitive advantage accrues to those who exploit interfaces. Japan’s automotive industry, in large measure, owes its success to leveraging the interface with its suppliers. In recent times, firms like Amazon.com have demonstrated how the interface with customers can be used for value creation. Content generation by and feedback from customers are being taken to a new level in cyberspace.
analyses wrongly implied that “human decision and conscious human motivation had no place in the process of growth” (1995 [1959]; p.2). But open systems thinking too, as has been emphasised, must incorporate the human mind if it is to explain how social systems grow. The open systems perspective underlines the need for research on how firms might cope with the need to simultaneously grow and remain stable. The potential for conflict between the two needs also suggests that researchers ought to identify the types of contingencies that might arise when managers are unable to manage the tension.

Measuring “Fractality.” A case could be made for developing a measure of “fractality” to predict an organisation’s competitiveness. The concept implies a notion of strategic fit that is slightly different to the one espoused by Porter (1996). Fit in the fractal context is more about the ability of embedded subsystems to function in an efficient internal market than it is about the ability of organisational functions and subsystems to reinforce each other. The fractal view implies that just as the parent system creates value for the external environment, the embedded subsystems should create value for their internal clients. It would be interesting to learn how internal customers and suppliers differ from the external ones, and whether there are significant differences in the value propositions in the internal and external context. This is an area ripe for research.

Refining Competency Clusters. Although the proposed taxonomy does not contain “new” managerial competencies, the systemic view has specific connotations for the competencies in the IMC, GMC, and CMC clusters. Goal-setting skills for instance pertain mainly to a manager’s ability to keep long term goals in mind while articulating short-term goals and maintaining creative tension in an organisation. Similarly, performance assessment skills in the systemic context entail being aware of the difficulties involved in discerning feedback signals and of likely time lags before effects are felt. In this regard, Senge’s (1990) description of systems archetypes could inform future research on performance assessment skills. Further, the need for problem solving skills in the systemic context makes it incumbent upon managers to have an intimate knowledge of how and why subsystems interact with each other while creating value. It may also prove worthwhile for researchers to explore how the nature of challenges associated with managing interfaces, growth, and contingencies might change during times of stability, rapid expansion, and “at the edge of chaos.” Different circumstances, as mentioned earlier, could call for the taxonomy to be appropriately augmented or modified.
Replicating Human Capability Research. Given the striking parallels between the concept of human capability and the proposed systems view of competency, replications of Jaques and Cason’s (1994) study on human capability would amount to gathering evidence for the proposed view. For reasons that are not entirely clear, the mainstream competency literature does not draw upon the work on human capability. But Jaques’s work can clearly inform competency notions. It can help organisations realise the full potential of their employees. Few things can be as important as this lofty ideal. If academics are sceptical about Jaques and Cason’s (1994) work, then the onus is on them to provide evidence that debunks the notion of human capability. But if the notion is found valid, then successful replications could produce a nomological network amongst constructs such as current potential capability (CPC or I-T-O levels), job satisfaction, work complexity (measured in terms of the number of important interfaces managed and order of information complexity processed), time horizons of job roles, felt fair pay levels, organisational citizenship behaviour, alignment (between individual and organisational goals), job performance, negentropy index (or longevity potential), fractality, and so forth.

IMPLICATIONS FOR PRACTICE

Without empirical evidence, it may be premature to offer prescriptions to practitioners. Nevertheless, this thesis can cite in its support Guilford’s (1977) view on the structure of intellect and Jaques’s view on human capability that he painstakingly developed over four decades (Jaques & Cason, 1994). The open systems perspective can also draw some support from studies that have gathered data on long-lived companies (e.g., studies by Collins & Porras, 1994; Geus, 1999). It is believed that the new categories of classifying managerial work and the fractal view of organisations can engender substantial changes in the way organisations select, develop, support, and remunerate managers, and design managerial work. A discussion follows.

Managerial Selection and Development

The notion that I-T-O competencies are indispensable for value creation has major implications for managerial selection. It has already been suggested that the abilities to cope with cognitive complexity, synthesise and analyse, and communicate can be used to operationalise generic I-T-O competencies. It would be cost-effective for organisations to incorporate tests of these abilities as an initial hurdle in the managerial selection process. Managerial training and development could be geared towards exposing managers to different
types of growth situations and unfamiliar interfaces. In unfamiliar circumstances, one could expect managers to learn from contingencies. In this context, McCall’s (1998) “school-of-experience” view is highly relevant. The view holds that a manager’s potential should not be measured by the attributes possessed by the manager, but rather by the manager’s ability to acquire new skills and abilities from his or her experiences. In their work on growth through innovation, Raynor and Christensen (2003) use the school-of-experience view to argue that different managerial skill-sets are needed for managing different types of growth.

The authors argue that managers who had previously been successful in achieving growth through sustaining innovations were unlikely to prove proficient at managing growth through disruptive innovations. They theorise that organisations may develop managers capable of managing disruptive growth by putting them in positions where they could learn from failures. Often, the authors note, senior managers are unable to balance the tension between deploying qualified managers for immediate results and providing learning opportunities to managers to become capable of delivering better results in the future. Christensen and Raynor (2003) observe that subsequent efforts on the part of organisations to poach managers from the competition to fill the managerial skills-gap seldom bear fruits. The need to develop managers in-house is consistent with the open systems perspective that requires individual and organisational goals to be closely aligned with each other.

Managerial goals may be aligned with organisational goals through placing managers in roles with time horizons that are commensurate with their ability to process complex information. By placing managers according to their capability, organisations can maintain requisite variety and ensure that their managerial responses are sophisticated enough to match the external environment’s complexity. An error in placing managers could lead to frustration, with managers feeling either under-challenged or overwhelmed (Jaques & Cason, 1994). The alignment of capability with roles, if achieved, would prevent managers from getting promoted beyond their level of competence or capability, thus providing an antidote to the Peter Principle. But, despite enjoying the weight of evidence, as Jaques and Cason

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18 Growth through sustaining innovations entails improving existing products that are sold for more money to attractive customers. In contrast, growth through disruptive innovation involves commercialising a simpler, more convenient product that sells for less money and initially appeals to a new or an unattractive customer set (Christensen & Raynor, 2003).

19 The Peter Principle states that in a hierarchy every employee tends to rise to his or her level of incompetence (Peter, & Hull, 1969). The principle implies that employees stop getting promoted only when they start causing damage. In an ideal scenario, people should “stagnate” in roles that fully engage their competence.
point out, the notion of carefully matching capability with time horizons of jobs is often
criticised because, in effect, the notion implies that someone might have the potential
capability to work “only” at, say, the shop-floor level, or at the level of “merely” a junior
supervisor, and so on. Definitive conclusions about someone having limited capability are
held to be derogatory or degrading by the critics. In self-defence, Jaques and Cason state:

This type of criticism is based upon covert arrogance. It assumes that no one
at a lower level of innate potential than oneself could possibly be satisfied to be
there. Those people who hold such an outlook seem to be unaware that it would
imply that others of still higher capability than themselves must in turn have such a
derogatory attitude toward them. This attitude is further reinforced by the view,
particularly prevalent in the United States, that no self-respecting person could
possibly be satisfied with anything less than a continuous aspiration to get to the
very top, whatever that might be, and is driven by dissatisfaction with anything less.

This view of human nature is seriously incorrect. As our study clearly
confirms, people seek, in the very deepest sense to be recognized and appreciated
for what they really are – neither more nor less. That is the real meaning of valuing
the individual (1994; p. xii).

Firms can help managers realise their CPC by affording them an opportunity to apply
their innate potential to manage interfaces, growth, and contingencies under various
circumstances (i.e., by providing opportunities to managers to hone their K/S – refer back to
the AC equation in Chapter 6). In this context as well, the need for slack gains important. One
could postulate that organisations with slack would be more willing to risk “failure” by
exposing their managers to uncharted territories as suggested by Christensen and Raynor
(2003). Moreover, since organisations possess the property of autonomous adaptability, they
do not have the luxury of blaming the external environment for their travails. They should
thus consider utilising the stable times to develop their managers and strengthen their internal
structures. The fact that all firms, without exception, owing to negentropic pressures, move
inexorably “towards the edge of chaos” suggests that firms may need a portfolio of
managerial competencies that complement each other. Research on the nature of interfaces,
types of growth, and contingencies may also point to the need for a different set of
competencies during the start up phase, rapid expansion, times of stability, and at the edge of
chaos.

Supporting Managerial Work

The open systems perspective has implications for how organisations might support
managerial work. Organisational cultures that encourage delegation and tolerate mistakes can
make it easier for managers to manage interfaces. Similarly, formal succession plans linked with school-of-experience driven training, and a well-designed LAMSS can facilitate growth management (refer back to Figure 5.3 in Chapter 5). With regards to contingency management, organisations can generate plausible future scenarios to try to ensure that their managers are not caught off-guard by the unexpected. Scenario planning can strengthen an organisation”s internal structure and better prepare its managers to respond to a chance event. The story of how the oil giant Royal Dutch/Shell prepared its managers to respond to the oil crisis of the 1970s is often recounted in the systems literature (see Senge, 1990; also see Wack, 1985). In the end, managerial work could become much easier if subordinates at all levels were to occupy roles commensurate with their competency levels or their ability to cope with complexity. Again, in this context, organisations could benefit from Jaques and Cason”s (1994) work on human capability. Further, as discussed below, organisations could also benefit from instituting internal markets.

**Internal Markets**

Organisations ought to appreciate that managers whose subunits enjoy subsidy and a captive market are unlikely to feel the pressure to remain negentropic. Therefore, even internal service departments should be made to compete with external service providers for internal clients” business. How organisations capture their costs and make budgetary allocations could influence the levels of negentropic pressure experienced by managers. As Ackoff (1993) points out, an internal market in its purest form would most likely force managers and their subsystems to become and remain competent. Thus according to open systems thinking, organisations should consider replicating market conditions within their boundaries because managers operating in competitive environments are likely to better appreciate the nuances of optimal value creation.

The thesis could be criticised for implicating several apparently unrelated micro- and macro-level variables (e.g., individual-level I-T-O competencies, organisational culture, firm-wide accounting policies that foster internal competition, and so forth) in its bid to offer prescriptions to managers. To some extent, the vast range of implications may be attributed to the complex nature of managerial work. It is however noteworthy that despite managerial work being so broad, the taxonomy of managerial competence, as suggested by the fractal view, contains just three categories. And what is perhaps even more noteworthy is the fact that the fractal view which is derived from open systems theory has the potential to address
the weaknesses of the traditional organisations-as-systems thinking. This claim is scrutinised in the next section.

**ADDRESSING THE WEAKNESSES OF ORGANISATIONS-AS-SYSTEMS THINKING**

The refinements introduced in the fractal view are consistent with the much maligned organismic analogy. Recollect from Chapter 3 that the organismic analogy is often blamed for the weaknesses of the organisations-as-systems thinking. But if one accepts that organisations are higher level social systems, then going by Boulding’s (1956) hierarchy of classifying systems, social systems must possess all the properties of the systems that are embedded in them. In other words, if social systems contain biological organisms, then social systems, in addition to possessing properties unique to themselves, must continue possessing the properties of their component biological systems. The challenge, in the organisational context, is to understand how and why the embedded biological organisms interact in and with social systems in the manner that they do. Ashmos and Huber (1987) perhaps have a point when they hold management scholars – and not any shortcoming in open systems theory per se – responsible for the failure of open systems theory to deliver on its early promise to take the area forward.

The early researchers who subscribed to organisations-as-systems thinking (e.g., Katz & Kahn, 1966; Miller, 1965; Parsons, 1956a, 1956b), might have erred in that by concentrating on the organismic analogy, they failed to consider the emergent properties of social systems. Biological organisms embedded in social systems (i.e., humans in organisations) are capable of conscious action because they have a “mind/brain” of their own. This fact confers peculiar properties to social systems. The insight that an occupational role executed by a purposeful human may be visualised as not only the unit of social systems, but also as an open system in its own right has enabled this thesis to conceptualise organisations (and individual-level competencies) as value creating fractals. The refinements proposed in the fractal view suggest that it might be possible to revitalise organisations-as-systems thinking.

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20 Refer back to footnote 3 in Chapter 5 (page 90).
21 Refer back to Boulding’s (1956; p. 205) quote cited in Chapter 5, page 92 of this thesis.
Although one could describe the fractal view of organisations as a refined version of the organisations-as-systems view, it is reiterated that the former is very different from the latter (refer back to Figure 5.3 in Chapter 5). As stated earlier in Chapter 3, organisations-as-systems thinking has been criticised over the years for downplaying purposeful action, reifying organisations, being unable to explain change and conflict, exhibiting managerial bias, and offering ill-founded and vague prescriptions for improving managerial performance (Jackson, 1991; 2000). A brief discussion on how the fractal view proposed in this thesis can address each of these inter-related criticisms follows.

- **Downplaying purposeful action:** The fractal view recognises that the occupational roles are executed by purposeful individuals. Consistent with Ackoff’s (1999) assertion, individuals are considered capable of selecting not only their own ends, but also the means to their chosen ends. As has been stated, a social system may take legitimate actions to influence and educate its external environment, and identify latent demand for its products or services. Moreover, the concept of autopoiesis when applied to social systems suggests that whether the internal structures of systems can get coupled with the external environment or not depends largely on the actions taken by purposeful humans. According to the fractal view, the internal structures would be strong only if the LAMSSs – the command and control systems embedded at various levels – were capable of successfully obtaining timely inputs from the “brains” of the building blocks (refer back to the discussion on Figure 5.3 in Chapter 5). Thus purposeful action is not downplayed in the fractal view.

- **Reifying organisations:** Organisations in the fractal view are conceptualised as acting and thinking through their building blocks; that is, through individuals capable of conscious action. By recognising that individuals are capable of displaying double loop learning as suggested by Argyris (1977), the fractal view in effect insulates itself against the charge of reifying organisations. Additionally, complexity theory, which the thesis subscribes to, implies that conscious choices must continually be exercised at bifurcation points if organisations are to continue growing during stable times. Complexity theory also holds that the desire to maintain stability and equilibrium becomes untenable at the “edge of chaos.” The initiative to reinvent organisations at this critical juncture must necessarily come
from humans capable of double loop learning. The fractal view therefore puts individual, and not organisational, action at the forefront.

- **Inability to explain change and conflict**: Individuals capable of double-loop learning, by definition, are capable of initiating change. Further, by pointing out that organisations which create value at the expense of employee well-being could lose their negentropic state, the thesis identifies the need for managers to actively manage conflicts during value creation. It is implied that suppression of conflict could lead to higher levels of entropy accumulation. The property of negentropy therefore makes it essential to align individual and organisational interests, but deems that this cannot be done through coercion. In addition, the fractal view explicitly recognises the possibility of conflicts arising at an interface as subsystems interact with each other to exchange or deliver outputs and inputs. Notice that the proposed taxonomy of managerial competence includes negotiation and conflict resolution skills as a key competency of the IMC cluster. It would be pertinent to point out in this context that aligning individual interests with organisational interests ought not to be confused with consensus building. Lack of conflict, as the literature on the subject reveals, is seldom in the interest of organisations. The fractal view and the need for remaining negentropic both require managers to have the sagacity to learn from conflicts (see Delquie, 2003) and recognise the value in inviting contrary viewpoints.

- **Exhibiting Managerial Bias**: One could, with some justification, argue that the proposed fractal view continues to display managerial bias. However, it is reiterated that the thesis views managers as “first amongst equals.” While the traditional organisations-as-systems view regards managers as acting paternalistically for the good of all, the fractal view recognises that managers are entirely fallible. It theorises that managers may not be able to cope unless they have the capability or the competence to, at the very least, match the external environment’s variety. Further, even when capable of coping with complexity, managers, in the fractal view, are expected to do no more than manage interfaces, growth, and contingencies. The view does not privilege the managerial cadre to unilaterally decide as to what an organisation should do in order to survive.

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22 Foster and Kaplan’s (2001) article on creative destruction discusses this issue in detail.
Instead, the view requires of managers, as formal heads of systems, to engage employees at all levels and continually invite inputs from various stakeholders before making decisions. As argued earlier, one could hypothesise that entropy accumulation would be minimal in environments where people feel engaged, valued, and are afforded opportunities to explore their full potential.

- *Ill-founded and Vague Prescriptions.* This thesis, through faithfully interpreting the properties of open systems, has offered specific prescriptions on managerial selection, development, and support. The proposed view has also offered insights on how managers create value and why organisations should try to replicate market forces within their boundaries. A better understanding of value creation processes can help managers improve their own performance across a wide range of areas in a competitive environment. The taxonomy derived from the fractal view draws attention to the specific competencies that managers should try to develop if they are to become adept at managing interfaces, contingencies, and growth.

It is clear from the above discussion that the fractal view recognises that social systems possess properties which can enable them to make conscious decisions at bifurcation points, redefine themselves through double-loop learning when needed, and cope with ever increasing complexity. The view also acknowledges that conflicts and negative affect may arise within social systems during value creation. Importantly, as mentioned earlier, the recognition that social systems possess these characteristics does not make the fractal view internally inconsistent. Boulding’s (1956) interpretation of general systems theory implies that as one moves up the hierarchy of systems, it should be possible to add layers to one’s theory to progressively explain the nature of higher-level systems without sacrificing the ability to account for the nature of embedded lower-level systems. But this is not to say that an internally consistent fractal view is without its limitations. The thesis now turns to identifying the limitations in the proposed view.

**LIMITATIONS**

The fractal view has led to the derivation of a new taxonomy of managerial competence that, according to the thesis, should prove valid across organisations and industries. *Prima facie,* claims of such wide applicability appear to run contrary to open systems theory, which, as mentioned in Chapter 2, is credited with spawning contingency
theory. It was open systems thinking that provided sound theoretical reasons to factor in the external environment in organisational studies for the first time (see Jackson, 1991). One could criticise the proposed fractal view for trying to turn the clock back and pushing for a universalistic agenda that currently stands discredited. The contradiction-in-terms notwithstanding, it is pointed out that this thesis has proposed a “partly” universal view. The thesis has, in fact, argued that the nature of managerial work is universally contingent on the interfaces, growth, and contingencies that managers are required to manage. As has been emphasised, the competencies included in the proposed taxonomy are considered essential for value creation, but they may not always prove sufficient. The fractal view thus takes into account the circumstances under which managers try to create value.

Despite placing value creation for the external environment at the centre, the fractal view is silent on what constitutes value. The proposed view is also limited in the sense that it is essentially a process-based view. It emphasises how value might be created in a sustainable manner once a system discovers whether or not the external environment is willing to pay economic rent for a system’s output. It would, no doubt, be useful if one could predict whether or not the external environment would willingly accept an output. But unlike, say, the resource based view (Barney, 1991) the open systems view offers no clue to managers as to the characteristics of an output that might be valued by the external environment. So how can a system learn what is valued by the environment? “It can learn by trial-and-error through feedback mechanisms,” is the best that open systems thinking offers. Nonetheless, learning by doing may not be such a bad option. As the experience of several innovative companies reveals, it is very difficult to second-guess the size of the market for new products or technologies (see Christensen, 1997). But this does not imply that organisations are at the mercy of the external environment.

The ability of organisations to influence the external environment has already been acknowledged. It has also been conceded that organisations, being populated by purposeful individuals, have the ability to educate the external environment and create a demand for products and services that potential customers had never envisaged. Additionally, the thesis recognises that while lower-level open systems do not have the ability to change the type of inputs obtained and outputs produced (e.g., humans cannot decide that they would start inhaling carbon dioxide and start exhaling oxygen), higher order social systems have this ability (e.g., a garment manufacturer could choose to buy polyester instead of cotton, and start
producing skirts instead of trousers). But recognising that organisations have the ability to influence the external environment, and to consciously obtain and produce different types of inputs and outputs (i.e., select ends and means) is not inconsistent with open systems theory.

The fact that organisations might feel the need to change their inputs/outputs or feel the need to influence the external environment merely reinforces the point that an open system, even a higher-order social system, can survive only if the external environment attaches value to the system’s output. This again underlines the inability of open systems theory to predict what the external environment might value. As Ackoff (1996) implies, having the ability to identify what might be of value to the external environment, and what ought to be valued in the years ahead, requires wisdom.

Alas, humankind is yet to discover a silver bullet that makes people wise. But there is some hope. Jaques’s impressive work on human capability holds great promise. His work, which is consistent with systemic properties as interpreted in this thesis, suggests that organisations could increase the statistical probability of finding effective or “wise” solutions if they were to match managerial capability with the complexity levels that their managers might be expected to cope with. The vital need to place managers at appropriate levels in a corporate hierarchy and rely on their intention to use their capability wisely could expose the fractal view to another criticism.

Notice that whenever the fractal view runs out of explanation, it invokes the human mind – whether it is to explain the need for organisations to re-invent themselves through assumption questioning at “the edge of chaos,” or it is to explain the need for organisations to compensate their own building blocks (i.e., their own employees). While one could defend invoking the human mind to explain the behaviour of higher-order social systems, the problem is that such invocation raises questions about the ability of soft systems thinking to make predictions. The human mind, being what it is, can spring surprises by doing the unexpected. Thus predictions, right or wrong, could always be explained away in hindsight by the fractal view, or any other strand of systems thinking that chooses to invoke the human mind. Hence, it is with utmost caution that one must factor in the human mind. When unavoidable, it ought to be done in as objective a manner as possible as demonstrated by Jaques’s (2002) treatise on human capability.
CONCLUSION

The holistic view of managerial work offered by the systems perspective makes a strong case for sustainable growth strategies. The thesis began by pointing out that the differing perspectives on managerial work and competency had made it difficult for scholars to integrate the extant literature on the subjects and offer informed prescriptions. In particular, normative theories about managerial work were conspicuous by their absence. Recognising the potential of open systems theory to provide fresh insights into the area, the thesis synthesised the properties of open systems and presented a new fractal view of organisations. The fractal view, in turn, helped define the role of a manager. It was argued that just as cells are lower-level open systems embedded in higher-level biological organisms, occupational roles are lower-level open systems embedded in higher-level social systems. In other words, it became possible to conceptualise an occupational role as an open system. Based on an understanding of how open systems transform energy while creating value, the notion of value creating spiral was proposed, and competency was defined as the ability of a system to create value in an optimal manner.

Thereafter, the systemic properties were interpreted to assert that managers should be competent at managing interfaces, growth, and contingencies to ensure organisational survival. Accordingly, the thesis proposed a new taxonomy of managerial competence which included three corresponding competency clusters. The specific competencies in the three clusters were then derived from an understanding of how one might manage interfaces, growth, and contingencies in social systems, given the properties of higher-order open systems. It was argued that the proposed taxonomy could account for all the evidence on the commonalities of managerial work. The focus then shifted to the implications for theory, research, and practice. Finally, the thesis claimed that the fractal view could address the weaknesses of the traditional organisations-as-systems thinking, but conceded that the proposed view had limitations of its own.

The limitations notwithstanding, it is hoped that the fractal view constitutes a legitimate attempt to reinterpret and refine aspects of open systems theory in the context of social systems. To quote Mintzberg, “…the manager’s effectiveness is significantly influenced by his insight into his own work” (1975; p.60). The theory-driven taxonomy that has been developed in this thesis has the potential to offer precisely the kind of insights that can influence the effectiveness of managers. The proposed fractal view, if adopted, can create
long-lived organisations that exist in harmony with nature and afford opportunities to employees to realise their full potential. The thesis has issued a clarion call to researchers to help realise this attainable Utopian dream.
References


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A SCHEME OF MANAGEMENT COMPETENCIES DEvised FOR ZTC RYLAND
(excerpted from Watson, 1994; pp. 225-228)

A: PERSONAL ORIENTATION (WHAT A PERSON CURRENTLY IS)

1. Achievement and results orientation
   Good managers set high but realistic standards for themselves and others and monitor progress against targets.
   Bad managers muddle through without clear objectives, are happy with adequate performance and see success as the avoidance of trouble.

2. Initiative
   Good managers want to be ahead of the game and are proactive.
   Bad managers passively follow the initiatives of others.

3. Decisiveness and self-confidence
   Good managers believe in their own judgement and accept that they could at times be mistaken.
   Bad managers are risk averse; they procrastinate and are afraid of making mistakes.

4. Commercial orientation
   Good managers are cost conscious but aware of the need to invest productively.
   Bad managers either (i) pay little attention to costs – and as a result overspend, or (ii) keep down costs regardless of the impact of present expenditure on future returns.

5. Adaptability and capacity to learn
   Good managers are flexible; they do not panic in the face of crises, and are constantly learning from their own experiences and external sources.
   Bad managers continue to do the things that they always have; they retreat when faced with changes and believe that they know all that they need to know.

B: COGNITIVE STYLE (HOW A PERSON THINKS)

1. Vision and strategic thinking
   Good managers understand the link between everyday activities and long-term business success. They have a global perspective.
   Bad managers have a short-term perspective and are inward looking. There is little awareness of or interest in the international setting of the business.

2. Information search
   Good managers are constantly collecting and sifting information of a formal and informal nature from a variety of sources and their networks.
   Bad managers either (i) limit themselves to a few formal sources so that they do not get a feel of their surroundings, or (ii) get swamped with indiscriminately received information and quickly become dazed and out of touch.
3. **Use of concepts**
Good managers can discern trends, cause-effect relationships, and develop testable hypotheses.
Bad managers lack conceptual frameworks; they cannot see the wood for the trees and have little idea of what causes a phenomenon. There is little basis for trying new ideas.

4. **Creativity**
Good managers are both imaginative and innovative and devise new things and processes.
Bad managers, at best follow the lead of others; at worst, they are negatively conservative and resist new ideas.

5. **Judgement and decision-making**
Good managers rely on evidence to make decisions, but are willing to take risks and balance it when needed with their own intuition.
Bad managers’ judgement are subject to bias; and their reasoning may be either (i) coldly based on raw data lacking flair or(ii) based on guesses, ill-informed hunches, bind self-interest or malice.

**B: INTERPERSONAL STYLE (HOW A PERSON RELATES)**

1. **Sensitivity and listening**
Good managers are sensitive to others; they listen carefully and work actively to elicit contributions from others.
Bad managers have little regard for others and concentrate on their own feelings and objectives.

2. **Impact and persuasiveness**
Good managers have personal presence and gain compliance and support through setting examples.
Bad managers are seldom noticed and even when given attention are unable to influence others.

3. **Planning and organisation**
Good managers set agendas and time bound objectives for their teams and work to support and provide resources for their teams.
Bad managers leave objectives vague and provide haphazard access to resources.

4. **Presentation and communication**
Good managers communicate unambiguously.
Bad managers have little appreciation of when to use which means of communication; they fail to check if they have been understood.

5. **Leadership, team building and maintenance**
Good managers work with teams to build a positive climate, even when not leading they contribute positively and constructively.
Bad managers work on their own and maintain power by keeping information from others; when not leading they participate only when they perceive an opportunity to defend or further a sectional interest.
### Appendix 2
(Chapter 4; p. 72 refers)

**COMPETENCY WISH-LISTS: EXAMPLES FROM PRACTITIONERS**
(Source: Tett, Guterman, Bleier, & Murphy, 2000; pp.250-251)

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<tr>
<td>1. Think Strategically</td>
<td>1. Technical Knowledge</td>
<td>1. Action Oriented</td>
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<tr>
<td>17. Build Relationships</td>
<td>17. Listening</td>
<td>17. Decision Quality</td>
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<tr>
<td>23. Foster Open</td>
<td>23. Integrity</td>
<td>23. Fairness to Direct Reports</td>
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<tr>
<td>Communication</td>
<td></td>
<td>24. Functional/Technical Skills</td>
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<tr>
<td>27. Show Work Commitment</td>
<td>27. Organizational Commitment</td>
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203
Personnel Decisions Inc. (contd.)

28. Act with Integrity

29. Demonstrate Adaptability

30. Develop Oneself

31. Use Financial and Quantitative Data

32. Use Technical/Functional Expertise

33. Know the Business

34. Manage Profitability

35. Commit to Quality

36. Focus on Customer Needs

37. Promote Corporate Citizenship

38. Recognize Global Implications

Lominger Limited (contd.)

28. Innovation

Management

29. Integrity and Trust

30. Intellectual Horsepower

31. Interpersonal Savvy

32. Learning on the Fly

33. Listening

34. Managerial Courage

35. Managing and Measuring Work

36. Motivating Others

37. Negotiating

38. Organizational Agility

39. Organizing

40. Dealing with Paradox

41. Patience

42. Peer Relationships

43. Perseverance

44. Personal Disclosure

45. Personal Learning

46. Perspective

47. Planning

48. Political Savvy

49. Presentation Skills

50. Priority Setting

51. Problem Solving

52. Process Management

53. Drive for Results

54. Self-Development

55. Self-Knowledge

56. Sizing Up People

57. Standing Alone

58. Strategic Agility

59. Management Through Systems

60. Building Effective Teams

61. Technical Learning

62. Time Management

63. TQM/Re-engineering

64. Understanding Others

65. Managing Vision and Purpose
A “HYPERDIMENSIONAL” TAXONOMY OF MANAGERIAL COMPETENCE  
(Source: Tett, Guterman, Bleier, & Murphy, 2000; pp. 232-236)

<table>
<thead>
<tr>
<th>Traditional Functions</th>
<th>Emotional Control</th>
<th>Communication</th>
<th>Developing Self and Others</th>
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<td>7. Coordinating</td>
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