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A STUDY OF ORGANIZATIONAL CAPABILITY MANAGEMENT AS A MEDIATOR OF SUCCESSFUL INNOVATION IMPLEMENTATION AND INNOVATION PROBLEMS

DISSERTATION

Presented in Partial Fulfillment of the Requirements for the Degree Doctor of Philosophy in the Graduate School of the Ohio State University

By

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* * * * *

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1999
ABSTRACT

Previous HRM models of organizational competitiveness have focused on identifying the correct combination of HR practices that fit firm level strategies. Since these models often focus on technical HR practices, which are not considered strategic, researchers have argued for models that take a capability-based approach to management (Ulrich, 1998). The present paper empirically examines and presents a new capability-based model designed to explain the variability in innovation implementation success and division performance.

Fifty-six general managers from a fortune 20 firm participated in this project by completing a questionnaire on organizational capability management (OCM) and implementation success of managerial innovations. Results showed that OCM mediated the relationship between innovation problems (resource management, collaborative structures and process, and organizational climate) and innovation implementation success. However, OCM did not have a direct, positive impact on firm performance. In addition, it was found that innovation implementation success had a significant, positive impact on firm performance.

Several potential limitations of this research were identified and steps taken to improve the internal validity are discussed. Finally future research, in order to better
explain the relationship between OCM, implementation success, and firm performance were discussed.
This project is dedicated to my husband, Everestus Ifeanyi Nwakamma, and my mother, Bobbie Ann Stockdale.
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CHAPTER 1

INTRODUCTION

Previous models of organizational competitiveness (from a strategic human resource management perspective) have focused on the correct combination of human resource management (HRM) practices in firms such that they fit or match business level unit or firm level strategies (Huselid, 1994). Although popular, this approach uses models where the combination of factors often represents "technical human resource management" practices. Technical HRM practices represent the commonly recognized areas of HRM (Youndt, Snell, Dean, & Lepak, 1996): staffing, training, performance appraisal and compensation. These practices are problematic because they are exposed to institutional pressures such as governmental regulations, and industry and societal pressures, which reduce their strategic effects and makes them -- at best -- sources of competitive parity (Huselid, Jackson, & Schuler, 1997). Further, this approach has been shown to be limited in its ability to predict performance of firms which have to make strategic changes quickly. Thus, Welbourne and Andrews (1996) argue that it seems implausible that HRM practices can or should make frequent changes to assist in the implementation of major transformations.

Therefore, in order to expand the empirical and theoretical work in the strategic human resource management (SHRM) field, hypotheses based on a new
perspective were tested to assess the impact of SHRM on organizational changes and firm performance. This research is designed to redirect the focus of SHRM from a "function-based focus" to a capability-based focus. That is, this paper addresses the concerns of SHRM by focusing on the firm’s organizational capability management potential (OCM, which, in short represents the ability to manage knowledge in the organization) – the outcomes and processes derived from HR practices (Ulrich, 1998). Further this research addresses the ability of SHRM to predict performance of firms engaged in change strategies by focusing on the importance of innovation implementation success.

The relationship between OCM and innovation implementation success has received very little attention in the SHRM literature. In fact, the conceptual literatures of these two constructs have been developed separately. An examination of both literatures indicates that many of those who have written about the management of organizational capability and innovation implementation success have admonished managers to use these constructs as sources of competitive advantage. For example, OCM has been viewed as a source of value creation or what Hamel and Prahalad (1994) termed "numerator management". Further, research indicates that the importance of innovation implementation success (which represents the ability to fit the innovation with organizational goals and values) lay in its ability to make employees more productive (Amabile, Conti, Coon, Lazenby & Herron, 1996); and the firm more effective (Dougherty & Hardy, 1996; Lawless & Anderson, 1996;

---

1 Chapter 2 provides a more detailed description.
2 Chapter 2 provides a more detailed description.
Norhia & Gulati, 1996). The problem is that no research directly studies the relationship between these two constructs. A few descriptive studies have indicated that OCM has an impact on successful innovation implementation as indicated by Dougherty and Hardy 1996:

"The challenge of connecting innovations with routine operations has long been noted (Burns & Stalker, 1961; Kanter, 1983). Structures and strategies in mature organizations reinforce existing practices and, according to Hlavacek and Thompson (1973), are "hostile to creativity: (Burgleman, 1983; Dougherty, 1990; Meyer, 1982). The inertia of current practice can overwhelm concerted efforts to change (Hannan & Freeman, 1984; Johnson, 1988) (italics added).

Thus, OCM can have an impact on successful innovation implementation. However, because there has been no direct, empirical study of this relationship, it is still unclear whether OCM has a direct impact on successful innovation implementation and whether the impact is positive or negative. This research is important because it can influence how supervisors manage employees and develop firm processes for doing business. In order for firms to be successful, they must know what variables are relevant for gaining and sustaining a competitive advantage. Researchers and managers should be able to use this research to assist in making decisions regarding which factors are most relevant for organizational capability management, innovations and innovation implementation effectiveness, and firm performance.

In light of the expressed importance of this research, the fundamental goal of this dissertation is to assess the impact of organizational capability management on innovation implementation success. This research uses the theoretical foundation adopted by many researchers in the quest for understanding the strategic role of organizational constructs (Barney & Wright, 1998; Becker and Gerhart, 1996;
Huselid, 1995; Lado & Wilson, 1994; Wright & McMahan, 1992). That is, this research applies the resource-based view (RBV) of the firm to understand the impact of the management of firm-specific resources (specifically, OCM) on innovation implementation effectiveness.

Another problem, which impacts the clarity of the OCM—innovation implementation success relationship, is the inclusion of other variables. Very little research has provided key variables that may impact the success of OCM or successful innovation implementation. Dougherty and Hardy (1996) indicated that successful innovation implementation depends on organizational factors or what these researchers termed "innovation problems." These factors (discussed in detail later) include resource availability, collaborative structures and processes, and organizational climate. Given that previous research has indicated that both innovation problems and OCM have an impact on innovation implementation success, it is probable that innovation problems and OCM share a relationship as well. Thus, as explained in more detail later, this research argues that OCM mediates the relationship between innovation problems and successful innovation implementation.

Based on the issues detailed above, this dissertation will attempt to answer three basic research questions:

a. Does organization capability management mediate the relationship between innovation problems and innovation implementation success?

b. Does innovation implementation success partially mediate the relationship between OCM and firm performance? Does OCM have a direct effect on firm performance?
c. Will innovation implementation have a direct and positive effect on firm performance?

The first question examines the premise explicated by Dougherty and Hardy (1996) that "innovation problems" (such as resources, structures and processes, and organizational climate) have a direct impact on innovation effectiveness. That is, this question assesses whether this relationship is a direct link, or if it is mediated by some factor not previously studied. This paper argues that innovation problems have a negative impact on innovation implementation effectiveness because firms fail to manage their capabilities in a fashion that will eliminate innovation problems.

The purpose of the second research question is to provide support to the SHRM literature that HRM is strategic. However, the present study provides a nontraditional assessment of HRM's source of competitive advantage. Thus, this research will focus on HRM outcomes instead of practices, and will demonstrate that the outcomes of HRM's practices (i.e., organizational capability) impact firm performance.

Findings to the second question are extremely important to managers and researchers. These results could provide further support for the SHRM argument that the management of human resources has a direct impact on firm performance. Further, the answer to this research question will provide an indication of the need to discover intervening variables that may influence SHRM - firm performance relationship.

The third question focuses on the importance of innovation. As a result, it provides an area of study traditionally ignored by HR researchers. An answer to
whether innovation implementation has a direct and positive effect on firm performance is of considerable value to researchers and practitioners. The findings from this paper can address specific reasons behind the failure of firms to gain a competitive advantage.

It is expected that the findings from this research will provide a strong argument for the need to focus less on technical HRM practices, (which have little strategic effect) and more on the management of organizational capability.
CHAPTER 2

LITERATURE REVIEW

The basic premise of this research is that OCM mediates the relationship between innovation problems and successful innovation implementation. Therefore, this paper asserts that OCM is a critical factor in the use of innovations in the workplace. The rationale for this contention is found in the theoretical explanations of OCM. Thus, before a study of the proposed premise ensures, it is important to first provide background on organizational capability management and understand its roots.

This chapter will begin by exploring OCM. Since OCM is tied to SHRM, it is critical that a discussion of this field occurs. First, a discussion on SHRM will provide a clear definition, perceptions of the construct; including the benefits of such beliefs, and a demonstration of the need to move HR forward. This paper next suggests that the basic premise of SHRM must be expanded to the study of OCM. This expansion is made possible with the help of the strategic management literature. The resource-based view of the firm (a theory utilized by both SHRM and strategic management literatures) provides the theoretical support for OCM and its importance to innovation implementation success.
2.1 FROM SHRM TO OCM

Strategic Human Resource Management.

It has only been in the last ten years that companies have viewed the HRM function as a means to enhance the operations of other functions in the organization and contribute directly to the firm's profitability. This has occurred because researchers in the area of strategy as well as human resource management and chief executive officers, line managers, and human resource managers increasingly recognize that a strategic human resource management function plays a key role in determining company success and in gaining a competitive advantage.

Wright and McMahan (1992) described strategic human resource management as "the pattern of planned human resource deployments and activities intended to enable an organization to achieve its goals (p. 298)." That is, the role of human resources (HR) in organizations is understood by addressing the issue of fit of HR practices to the strategic need of the organization in order to respond to a variety of strategic requirements. Typically the strategic human resource management literature asserts that the impact of HR practices on firm performance is conditioned by an organization's strategic posture (Youndt, et. al., 1996). Wright and Snell (1998) argued that this approach had an impact on strategy implementation only. Thus, they expanded the model to suggest that SHRM impact strategy development. As a result, they argued that the purpose of SHRM is to promote organizational flexibility in order to enable a firm to achieve a dynamic fit with changing environmental circumstances. This is strategic in the sense that a competitive advantage can be acquired through successful promotion of fit and flexibility by HR management.
Most research in the SHRM literature focuses on demonstrating the influence of HRM on firm performance, and the impact of the internal fit of HR practices and the external fit of HR practices and business strategy on firm performance. For example, Delaney and Huselid (1996) discussed the firm-level impact of progressive HRM practices. Their findings suggest that progressive HRM practices including selectivity in staffing, training, and incentive compensations are positively related to perceptual measures of organizational performance. Youndt, et al. (1996) studied the effect of fit of manufacturing strategy with HRM practices. They found that when firms link human capital enhancing HR systems with quality manufacturing strategy, there is a strong main effect on productivity. Youndt and his colleagues (1996) also found that employee productivity, and also works in conjunction with delivering flexibility in strategy can improve customer alignment. These findings suggest that administrative systems are still very appropriate in strategic contexts that emphasize reducing costs and eliminating uncontrollable behavior. Snell and Youndt (1995) examined the relationship between human resource management and controls used by executives and their impact on changes in financial performance. Their results indicated that when the approach to HR was based on behavior control, firm performance was higher when executives had complete knowledge of cause and effect relationships. Thus Snell and Youndt (1995) suggested that executives should be cognizant of several contingencies that might guide their choice among various approaches to HRM as well as the effects these choices have on the performance of their firms.
The benefit of research on strategic HR is that it provides strong evidence that human resource management can be strategic and have a profound effect on organizational effectiveness and firm performance. Unfortunately, the current state of the research (while still in its infancy stages) has quickly fallen into "rut" as it focuses on theoretical factors which seemingly have relatively little concern for management. This "rut" is explained by the fact that much of the research on the strategic role of human resources has focused on two types of studies: 1) what HRM does and 2) whether HRM should follow universalistic practices or contingency or fit focus. In the first instance, this research continues to use the "textbook" model for studying human resources. Titles and content may differ, but nearly all of the chapter headings focus on what HR people do: staffing, training and development, compensation, benefits, communication, employee relationship management, high performance teams. Such research reflects the paradigms that have dominated HR research for decades: making sure that HR is done in elegant ways. Huselid and his colleagues (1997) make the argument that this focus on technical HR variables do not represent strategic value. The lack of strategic value is due to "institutional pressures" which include governmental regulations, industry and societal pressures. In short, the authors argue that HR practices "have been increasingly regulated through stakeholder expectations (p. 172)." As a result, these technical HRM practices represent factors that influence competitive parity and represent the area in which there is very little variance between firms.

Thus, literature that focuses on human resource practices as a strategic function falls short, in that it fails to address what HR delivers. By focusing on the
deliverables, one gains a quick and clear understanding of the areas and activities that make HR strategic. It is the argument of this research that the appropriate way to address HR's deliverables is through the study of organizational capability management.

The second reason why research on strategic human resource management issues have stagnated in the last few years is due to the debate over whether the approach to HRM should be universalistic or contingent. Human resource management, if it is to continue to demonstrate its value must move beyond the issue of fit and characteristics to focus on results of human resource deliverables. This research suggests that this first step involves expanding the focus of human resource management to include the management of organizational capability. Organizational capability represents managers' proficiency in understanding principles and applying processes consistent with principles for managing people (Ulrich & Lake, 1991). These principles represent the key concepts that underlie human resource practices.

Organizational capability management is based on the premise that organizations and their various functions do not think, make decisions or allocate resources, people do (Ulrich & Lake, 1990). It represents managers' proficiency in understanding principles and applying processes consistent with such principles for managing people for competitive advantage. OCM also focuses on management. Thus, there is a great deal of emphasis on results or outcomes of practices; and in

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1 Researchers maintain the duty to explore all possible questions. However, since many managers employ our paradigms to structure their processes and workplace initiatives, we also have a duty to address research questions that may improve the overall effectiveness of the organization.
short, what is delivered. The focus on deliverables removes the focal point from functions and places it on important capability factors which are critical to organizational success (Ulrich, 1998). The present research discusses "what SHRM delivers" by focusing on the results of HR work. Ulrich (1998) agrees that this is a critical way to address what HR delivers. For example, factors such as customer service delivery and innovative behavior are considered key deliverables of HRM practices (Ulrich, 1998). Such factors are important because they explain why HRM practices are effective.

Despite the fact that SHRM has been slow in addressing the practical needs of the HR manager, recent theoretical work in business strategy has given a boost to the prominence of HR in generating sustained competitive advantage. According to the resource-based view of the firm (Barney, 1986; 1991; Barney & Wright, 1998), firms can develop sustained competitive advantage only by creating value in a way that is rare and difficult for competitors to imitate. Although traditional sources of competitive advantage such as natural resources, technology, and financial capital can create value, the resource-based argument is that these sources are increasingly easy to imitate especially in comparison to a complex social structure such as an employment system. This logic has led many researchers and managers from a variety of fields and industries to conclude that human resource strategies may be especially important sources of sustained competitive advantage (Lado & Wilson, 1994; Wright & McMahan, 1992). A critical drawback to this conclusion is that the knowledge of the valuable, rare, imperfectly imitated practices of human resources are a function of institutionalized practices. Fundamental to the strategic HRM literature...
perspective is an assumption that firm performance is influenced by the set of HRM practices firms have in place (Arthur, 1994; Huselid, 1995). Huselid, and colleagues (1997) argued that this research, which established a relationship between HRM policies and practices and firm performance, made little distinction between policies and practices that reflect the more traditional personnel perspective and those that reflect a more strategic nature. Technical HRM practices and policies represent those factors that are increasingly regulated through stakeholder expectations and include recruiting, selection, performance measurement, training and the administration of compensation and benefits. Such activities have been standardized because of the pressures by institutions (stakeholders, government regulations, and competition) to conform. It is the argument of this paper that the policies and practices, themselves, (because of their standardization) do not serve as a source of competitive advantage. Rather, it is the management of the organization's capability, the outcomes of these management practices and policies that are critical.

2.2 A CAPABILITY - BASED VIEW

A capability-based view of the organization is concerned with the process and related behavior efforts to attain a competitive advantage (Kamoche, 1996). Inherent in these processes are networks by which knowledge and information are dispersed. Thus, the management of organizational capability concerns the ability to manage knowledge (Henderson & Clark, 1990). This paper adopts a previously used

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1 Due to the amount of research in this area, it has become less difficult to see the difference between organizational capability and organizational competence. Organizational capability is broad-based and focuses on the entire value chain of the organization, and focuses on internal attributes that enable a firm to exploit its
definition of OCM as the potential to diffuse knowledge throughout the organization, through the use of information-based, firm-specific, socially complex, organizational processes that determine the efficiency with which firms transform knowledge into outputs; or invisible assets (Amit and Shoemaker, 1993; Collis, 1994). This notion goes beyond traditional research in SHRM to suggest that the components (HR practices and policies) are just part of the framework that leads to organizational success. Organizational capability management focuses on the ability to understand and manage the organizational knowledge and the processes that facilitate knowledge management. In short, organizational capability management uses HR practices and polices, but also considers the outcomes of these and other processes within the organization in order to maintain and develop organizational capabilities.

Henderson and Cockburn (1994), in their article on measuring organizational capabilities of pharmaceutical firms distinguished between two broad classes of capabilities. This categorization serves as a viable method for distinguishing between SHRM and organizational capability management. The first class, component competence, refers to abilities, knowledge, and skills in the organization. This concept is analogous to SHRM's discussion of "technical HRM capabilities"; those capabilities which can be bought or sold in the labor market. Component competence resources. Organizational competence is restricted and focuses on attributes that enable a firm to implement organizational strategies (Prahalad & Hamel, 1990).

Since this study will focus on organizational capability management, it is important to distinguish between resources and capabilities. Resources represent the fundamental building blocks of competitive advantage, or the "stocks of available factors that are owned or controlled by the firm (Amit and Shoemaker, 1993, p. 35)."
is important and may serve as a source of competitive advantage. For example, Barney and Wright (1998) argued that generic technical HRM capabilities are important since these are capabilities employees sell in the labor market. If firms do not carefully manage this "technical knowledge", they may lose them to other companies. Such turnover can have negative effects on firm and team synergy, employee morale, and productivity. SHRM practices are often seen as instrumental in reinforcing policies such that ideas concerning skills, pay criteria, and other practices may become embedded within the culture.

The second class, architectural competence, of an organization includes "architectural knowledge," (Henderson & Clark, 1990), which are the communication channels, problem-solving strategies, the control systems, and dominant values of the organization. Architectural competence "allows [the organization] to make use of its component competence to integrate them together in new and flexible ways to develop new architectural competencies as they are required (p. 66)". Thus, the management of a firm's capabilities is dependent upon the successful ability to exchange and utilize information and knowledge needed to achieve desired organizational outcomes (Lado & Wilson, 1994). This requires the use of the firm's component competencies or human resource practices to assist in the management of architectural competence (Amit & Schoemaker, 1993).

Researchers often suggest that organizational capabilities, with regard to business strategy, often requires the CEO or senior managers to discover, develop, and

Capabilities represent capacity or potential that must be realized in order to achieve improved performance.
deploy these capabilities for organizational success. For example, Stalk, Evans, and Schulman (1992) argued that "managers [must] undergo the fundamental shift in perception that allows them to see their business in terms of strategic capabilities. ...(p. 61)." The authors further argued that it is the senior manager's duty to link essential business processes to serve customer needs, and reshape organizational roles and responsibilities to encourage new kinds of behaviors necessary to make capabilities-based competition work. These activities can certainly be applied to the SHRM role (where it is the job of the strategic human resource manager to develop HR practices designed to develop and reward behaviors consistent with organizational needs and strategies). However, because organizational capabilities are associated with business processes, they are not seen as an important, expanded role of SHRM. Unfortunately, most researchers view the HR manager's role in managing organization capabilities as "the matchmaker", where the strategic human resource manager assures that HR policies and practices are matched to the strategies and existing organizational capabilities. However, as mentioned earlier, organizational capability management focuses on the ability to incorporate policies and practices (i.e. components) into management of processes in the organization, and therefore expands the strategic capability of human resource management.

With the exception of a few researchers, such as Kamoche (1996), many researchers have not tried to address the role of HR in organizational capability management. Kamoche (1996) argued that human resource competence is achieved by the constant renewal and sustainability of a firm's stock in knowledge. Since all asset stocks are subject to decay in the absence of assessments and development
activities, Kamoche argues that it is important that SHRM include the management of continuous knowledge and learning. Further, research by Huselid et. al. (1997) concluded that the success of strategic HRM on firm performance depends on both traditional HR capabilities (e.g. a broad knowledge of many HR functions) and business capabilities (e.g., experience in business areas).

Thus, the management of organizational capabilities incorporates SHRM (including the programs, policies, philosophies, and practices) such that it enables fit between business strategies and human resources. Similar to SHRM, the management of organizational capabilities also aligns business strategies and human resources. But, the management of organizational capabilities also determines the types of user-based innovations that are beneficial for the firm because it focuses more on knowledge and information - based processes and outcomes. This notion is supported in research by Leonard-Barton (1992), who argued that organizational capability components such as managerial knowledge and skills are instrumental in sustaining current practices and developing new practices that help the firm to respond to changes in the environment.

Since firms respond to changes to their environment through innovation (Kanter, 1983) it is argued in this paper that the management of organizational capabilities also enables innovation implementation strategies. That is, in order for new practices designed to help firms respond to environmental changes are effective, OCM must have a positive impact on the implementation of those innovative practices.
2.3 THEORECTICAL EXPLANATION OF OCM: RBV LOGIC

The Resource-Based View of the Firm.

Since OCM, as used in this paper takes its roots from SHRM and strategic management literatures, this paper adopts the theoretical foundation often used by researchers to understand sources of competitive advantage (Barney & Wright, 1998; Becker and Gerhart, 1996; Huselid, 1995; Lado & Wilson, 1994; Wright & McMahan, 1992). That is, this research uses the resource-based view (RBV) of the firm to understand the impact of firm-specific resources on innovation implementation effectiveness. RBV logic argues that in order for firm resources to have the potential of sustained competitive advantage, they must have four attributes (Barney, 1991):

a. They must be valuable, in the sense that they exploit opportunities and neutralizes threats in the firm's environment. Firm resources can only be a source of competitive advantage or sustained competitive advantage when they are valuable.

b. They must be rare among a firm's current and potential competition. Valuable resources possessed by large numbers of competing or potentially competing firms cannot be sources of either a competitive advantage or a sustained competitive advantage. A firm enjoys a competitive advantage when it is implementing a value-creating strategy not simultaneously being implemented by other firms.

c. They must be imperfectly imitable. Valuable and rare organizational resources can only be sources of sustained competitive advantage if
firms that do not possess these resources cannot obtain them. Firms can be imperfectly imitable for one or a combination of three reasons: a) the ability of a firm to obtain a resource is dependent upon unique historical conditions, b) the link between the resources possessed by a firm and a firm’s sustained competitive advantage is causally ambiguous or c) the resource generating a firm’s advantages socially complex (Dierickx & Cool, 1989).

d. There can be no substitution. There must be no strategically equivalent valuable resources that are themselves either not rare or imitable. Two bundles of firm resources are equivalent when they each can be exploited separately to implement the same strategies.

Implicit in the model is the assumption that managers are limited in their ability to manipulate all possible attributes and characteristics of their firms. It is this limitation that makes some firm resources imperfectly imitable and thus potentially sources of sustained competitive advantage. Thus, the study of sustained competitive advantage, depends on the resources controlled by the firm.

Human resource management plays a great role in determining the types of resources controlled by the firm. However, researchers and practitioners have only recently become proactive in discussing HR’s role in this function. As a result, HR continues to maintain its focus on internal practices (staffing, training and development, motivation and maintenance). This research adopts Ulrich’s (1998) argument that in order to meet future challenges HRM must take a broader perspective and focus on managing capabilities associated with the value chain. Thus, HRM
should be viewed as a function that creates value through organizational capability
management.

The resource-based view (RBV) of the firm examines resources and
capabilities of firms that enable them to generate economic rents and a sustainable
competitive advantage (Barney, 1986; Barney, 1991; Oliver, 1997). Resource
selection and accumulation are a function of both within-firm decision-making and
external strategic factors. Within-firm managerial choices are guided by an
economic rationality and by motives of efficiency, effectiveness and profitability
(Conner & Rumelt, 1991). Competitive advantage stems from the unique bundles of
resources that the competition cannot imitate. Thus factors such as “physical
technology, whether it takes the form of machine tools... or complex information
systems is by itself typically imitable (Barney, 1991, pg. 110).” A key determinant of
whether resource selection and deployment result in enduring variation across firms is
imitation. Organizational resources can only be a source of competitive advantage to
the extent that these firm-specific resources are imperfectly imitable. An important
firm-specific resource that serves as an important source of competitive advantage in
RBV logic is the human resource (Barney, 1991). The human resource is an
important resource for firms due to the difficulties in imitation by other firms.

Coff (1997) in his article on human assets and management dilemmas discuss
three attributes of human resource that impacts their imitability: asset specificity,

social complexity, and causal ambiguity. These factors are the isolating mechanisms
(Rumelt, 1984) which protect individuals from imitation and preserves their ability
to generate economic rents (Peteraf, 1993). Thus, when considering the strategic factors
for strategy change, RBV logic argues that the firm must consider these isolating mechanisms. As a result, it is expected that a firm's reason for enhancing organizational capability will be impacted by firms increased concern for its level of asset specificity, the causal ambiguity of its resource, and the firm's social complexity.

Asset Specificity. As firms continue to downsize, they become more increasingly concerned with their specific assets. An asset is specific if it makes a necessary contribution to the production of a good or service and has little value in alternate uses (Globerman & Vining, 1996). There are various kinds of specificity (e.g., physical assets, site specificity, dedicated assets, and temporal specificity). In considering various strategic factors, RBV logic attests that firms are especially concerned with human assets embedded in firm-specific routines, language, and skills that are critical to the performance of the firm (Coff, 1997). Firm specific human assets are tailored for use in one context, and a firm that relies on such knowledge may attain high returns because there is no competitive market to bid up wages.

Research on asset specificity argues that firms internally source what they do well and outsource that which others do well (Argyres, 1996), and recent studies have found that increased asset specificity enhances the efficiency of integration. For example, Conner and Prahalad (1996) conceptually argued that internalizing assets "economizes on cognitive limitations through specialization and (how knowledge is applied to an activity) – knowledge substitution; p. 486, text in parentheses added)." Comparative efficiency arises throughout the formation of firm-specific language and routines that both enhance the performance of an activity itself and aid in ensuring
its efficient governance. As an activity becomes more specific to the firm, it increasingly accesses and develops a “common organizational communication mode” (Conner & Prahalad, 1996) which both codifies knowledge and facilitates its efficient dissemination and protection. Thus, firms simply possess advantages in generating firm-specific language and routines that efficiently yield valuable capabilities. The more firm-specific an activity, the greater use it makes of firm-specific language routines. This research suggests that the use of organizational capability decreases to the extent that the explanation of its routines, language and other tacit knowledge become difficult. However, it is important to note that a firm will consider using an organizational capability or outsourcing it based on which mode provides the greater net value (Conner & Prahalad, 1996). Either can be the better option depending on the knowledge-related advantages of each balanced against the costs associated with each. This is based on the costs associated with time lost due to timely explanations, and the costs associated with such knowledge in the market.

Causal Ambiguity. The resource-based view of the firm holds that most effective barriers to imitation are achieved when competitors do not comprehend the capabilities on which the advantage is based (Barney, 1991; Reed & DeFillippi, 1990). That is, the relationship between firm processes, practices, (e.g., innovation implementation practices) organizational capability management, and competitive advantage may be causally ambiguous. Thus, causally ambiguous assets are hard to imitate because the link between the resource and performance is not understood (Coff, 1997, Lippman & Rumelt, 1982). Human resources are often causally ambiguous because many social and cognitive processes are not well understood by
managers, employees, or competitors. As a result, ambiguity may not only block rivals, but may also block intrafirm mobility (Coff, 1997). Barney (1997) suggests that this may occur for three reasons. First, it may be that the capabilities that generate competitive advantage are embedded in day-to-day operational activities, and managers are unaware of them. These may be organizational capabilities such as teamwork among team members or customer relationships with clients. Second, managers may be unable to evaluate the relationship of capabilities and their ability to create a competitive advantage. Finally, it may be that multiple capabilities, bundled together generate a competitive advantage for the firm.

Social Complexity. Socially complex capabilities are important for consideration because they are hard to imitate since they are embedded in complex social systems and capabilities (Coff, 1997, Barney, 1991). A wide variety of capabilities may be socially complex including interpersonal relationships, firm culture, (Barney, 1991) and firm relationships with customers (Ulrich, 1998). Complexity can arise from a number of organizational routines and individual or team-based experiences (Reed & DeFillippi, 1990).

2.4 RBV LOGIC – THEORECTICAL SUPPORT FOR OCM.

The strategic management literature has begun to place increased emphasis on idiosyncratic firm resources and capabilities as predictors of performance. Three kinds of resources, in particular, are often distinguished: a) physical resources, such as assets and technologies, b) organizational resources, such as reporting structures and cultures; and c) human resources, representing the know-how and skills of individuals working in the organization (Barney, 1991). Firms differ in the ways they
utilize and combine these resources, thus yielding outputs whose "services" cannot be predicted. This idiosyncrasy yields superior performance for those firms that are able to create more efficient or attractive outputs as a result of the way in which they use resources. Hence firms with superior human resource utilization are likely to experience superior performance.

A resource—based approach to strategy, presents interrelationships between capabilities and firm strategy. Capabilities are processes to both deploy present resources to implement current strategy, and because of their value, to create future opportunities that influences the formulation of future strategies. A firm's managers identify the capabilities that they view to be important to the product markets in which they wish to compete, given their strategic intent (Hamel & Prahalad, 1989) and determine the optimal time and process paths for developing, maintaining, and deploying those capabilities. Viewed this way, decisions about capabilities are intertwined with both strategy formulation and implementation.

Much of the research on capabilities has been conceptual. Empirical studies have been slow to follow primarily because of difficulties with operationalizing the constructs (Wernerfelt, 1995). Because capabilities are latent constructs, they can not be directly measured and proxies are required. Outcomes of applying capabilities have typically been used as proxies (Conner & Rumelt, 1991).

Despite the lack of a large empirical research base used to establish direction of research, some researchers (relying on the conceptual literature) have forged ahead and conducted empirical studies on a wide range of questions relating to the use and development of capabilities. Among the empirical papers published are studies that
examine the role of capabilities in vertical integration decisions (Argyres, 1996),
capability - based relatedness in diversification, firm - specificity of R & D
capabilities and diffusion of knowledge (Helfat, 1994), and the relationships between
capabilities, environment, and performance (Miller & Shamsie, 1996). These studies
all examine the role of capabilities or the consequences of using them.

Other studies have examined various aspects of capability development or
acquisition. Zander and Kugot (1995) argued that replication of capabilities within a
firm and imitation of capabilities by competitors serve as mechanisms for diffusion of
innovation. Levinthal and Myatt (1994) addressed the effect of feedback from the
market on capability formation and link the evolution of capabilities to industry
evolution. Henderson and Cockburn (1994) examined the relationship between
capabilities (which they label competence) and resource productivity in
pharmaceutical firms, which itself is a capability, providing insight into capabilities
that create capabilities.

While these articles raise important issues relevant to the management of
organizational capabilities, they do not provide a concrete model or any direct
indication of the impact of OCM on successful innovation implementation. Thus,
these studies do not explicate how managing capabilities within the firm impacts the
effects of these innovation problems on innovation implementation success and
ultimately improve firm performance. This paper argues that organizational capability
management impacts firm performance by impacting the success of innovation
implementation.
CHAPTER 3

MODEL DEVELOPMENT AND RESEARCH APPROACH

No research to date has developed a model to help us understand the relationship between OCM and innovation implementation success. Thus, using research on organizational capability management, and innovation implementation, this chapter will present a model here in order to introduce the proposed relationships and their theoretical underpinnings. This dissertation will also test the proposed model. This model is based on the belief that each organization must contend with "innovation problems" when implementing a new innovation. However, those firms that can manage their capabilities well will have better success in their implementation.

This chapter begins with a discussion of key definition terms used throughout this discussion. Following these definitions, a brief discussion of the entire model is presented. Each construct is discussed in detail. During this discussion, hypotheses for study are presented. Finally research approaches used in previous studies to assess each construct is discussed in detail. This discussion provides an explanation for the paper's research methodology, discussed in the next chapter.
3.1 KEY DEFINITIONS

Organizational Capability Management.

Organizational capability management is the ability to diffuse knowledge in the organization. More specifically, OCM is the potential to manage knowledge – based, firm – specific, socially complex, organizational processes or routines that determine the efficiency with which firms transform inputs into outputs; or invisible assets (Amit and Shoemaker, 1993; Collis, 1994). It is the management of organizational potential believed to facilitate innovation, create learning and transfer of existing intellect within the organization.

Management innovation

In its simplest form, the term innovation refers to the idea, practice or material artifact that is regarded as novel or that has been invented, independent of its adoption or use. The emphasis is on the fact that the innovation is new to those using it. Essentially it reflects any idea, practice or material artifact perceived to be new by the relevant unit of adoption. However, the paper uses this concept but adopts a more specific definition of innovation. This research focuses specifically on what is termed “management innovations.” Management innovation represents new managerial techniques for organizational management. Thus, it does not include new products to be sold. It includes (but is not limited to) new organizational processes, outsourcing, partnering with other companies, organizational changes in practices including the use of virtual teams, and remote work. The empirical research
performed in this study will focus on management innovations. (See chapter four for more details.)

**Innovation Problems**

Dougherty and Hardy (1996) argue that “innovation problems” are practices, policies, and processes, which have the ability to negatively impact innovation success. There are three types of innovation problems: resource management, collaborative structures and processes, and organizational climate. The first type, resource management can be problematic because it is concerned with a firm’s ability to manage its resources successfully enough to ensure that new organizational activities can be managed effectively. A resource management system represents a system that has the ability to channel money, equipment, and human resources to all factors associated with the innovation.

The second type, collaborative structures and processes can be problematic because it represents the ability to manage relationships within the organization. As RBV logic suggests, relationships may be so complex that it is difficult to understand the impact. Innovation implementation projects rely on administrative structures and processes that fit the innovation’s development stage and access to decision making across the organization.

The third type, organizational climate can be problematic because social norms and mores may impact a firm’s ability to develop and implement new innovations. Dougherty and Heller (1994) found that the activities of innovation were frequently
illegitimate in large firms, either because they violated prevailing norms, or there was no shared understanding of the innovation to make them meaningful.

Implementation Effectiveness

Innovation implementation effectiveness represents the successful implementation of an innovation. Very little research has defined implementation effectiveness. Klein and Sorra (1996) suggest a contingency approach. That is, the effectiveness of the innovation achieves a fit with values and objectives. This research adopts this approach.

3.2 OCM AND IMPLEMENTATION SUCCESS: THE MODEL

Figure 3.1 illustrates the proposed relationships among innovation problems, OCM and successful innovation implementation. Factors on the far left side of the model are the antecedents – the “innovation problems.” As indicated by previous research, there are three critical “innovation problems” which have a direct impact on innovation implementation success (Dougherty & Hardy, 1996). Availability of resources, collaborative structures and processes, and organizational climate have been shown to have a direct and negative effect on innovation. However, past research has not discussed the impact of intervening variables. This paper argues that organizational capability management mediates the relationship between innovation problems and innovation implementation success. That is, “innovation problems” are, indeed named so because they have the ability to negatively impact a firm’s ability to implement new innovations successfully.

Organizational capability management represents the most critical piece of this model since it mediates the relationship between innovation problems and innovation
implementation success. OCM represents the capacity or the potential that must be managed in order to achieve the desired result. Using Baron and Kenny's (1986) definition of a mediator variable OCM explains how the relationship between innovation problems and successful innovation implementation is possible. As Figure 3.1 illustrates, and I suggest, OCM drives this relationship, making the casual relationship between innovation problems and innovation implementation success essentially null.

As past research has indicated (e.g., Damonpour, 1991; Dougherty & Hardy, 1996; Kanter, 1984; Kanter, 1988; Nohria & Gulati, 1996), innovation has been shown to have an impact on firm performance. The present research agrees with this perception and argues that innovation implementation success, that is the success of implementing management innovations has a direct impact on firm performance. Diffusion of innovation and ambiguity are not critical components of this research. However, these factors are traditional components of the conceptual innovation literature and therefore are also included in this model. Traditionally, diffusion of innovation and ambiguity are thought to have a direct effect on innovation implementation success. This research argues that both diffusion of innovation and ambiguity influence successful innovation implementation, but organizational capability management mediates this relationship. Organizational capability management should influence both factors through its ability to prepare employees for changes associated with doing business.
3.3 KEY MODEL COMPONENTS

Organizational Capability Management

Organizational capability management is an important source of competitive advantage for the firm (Henderson & Mitchell, 1997). The most well documented case to illustrate this notion is the case study by Stalk and colleagues (1992), which discussed the differences between Wal-Mart and K-Mart. The authors’ analyses demonstrated that Wal-Mart’s success is due to the firm’s ability to compete based on its capabilities. That is, Wal-Mart’s strategic capabilities in distribution, marketing and information systems provide important competitive advantages for the firm. Empirical research has also supported the importance of organizational capability. Tripsas (1997) argued that capabilities developed in the past might still have a direct impact on present firm performance.

The research model used in this paper also argues that OCM has a direct impact on innovation implementation success and division performance. This research also purports that OCM provides the link between key relationships discussed in past research. That is, this paper suggests that OCM mediates the relationship between innovation problems and innovation implementation success.

Hypothesis 1: Successful management of organizational capabilities is significantly and positively related to innovation implementation success.

Hypothesis 2: Successful management of organizational capabilities is significantly and positively related to division performance.
Innovations can take several forms: innovation in 1) a product or service; 2) a production process; 3) organizational structure; 4) people; and 5) policy (Fidler & Johnson, 1984). Thus, there have been many definitions used to explain innovation. For example, it has been described as an entity such as a new technology, idea, product or program that is introduced to potential users in the organization (Lewis & Seibold, 1993). Tabak (1997) refers to innovation as a dysfunctional or functional entity based on its potential to contribute to organizational performance. In this research, an innovation is described as a process or practice "being used for the first time by members of an organization, whether or not other organizations have used it previously (Nord & Tucker, 1984, p. 6)." Unlike most of the innovation literature, this article focuses on what I have termed "management innovations". Management innovations represent new managerial techniques and include new organizational processes, outsourcing, partnering with other companies, organizational changes in practices including the use of virtual teams and remote work, organizational total quality management, computer-aid design, or manufacturing systems.

Since firms must continuously adapt to changing environments, innovation implementation is crucial to organizational effectiveness (Fidler & Johnson, 1984). Innovation is intensely adaptive, and it is undertaken typically in response to unfamiliar, unexpected, or non-routine problems. It embodies a new idea that is not consistent with the current concept of the organization’s business (Galbraith, 1982) and relies on the management of organizational capabilities to ensure that implementation is successful (Mezias & Glynn, 1993).
There is no one universal and smooth sequence of steps from initial vision, idea generation, development, and final implementation (Amabile, 1988). Although multi-stage approaches offer a detailed examination of the innovation process, which is useful for tracking and managing innovative projects in a firm, creators of most stage models acknowledge the dual components of initiation and implementation/adoptions. Researchers (Van de Ven, 1986; Staw, 1990) support the following two - stage model a) an initiation stage which consists of all activities pertinent to problem perception, information gathering, attitude formation and evaluation, and resource attainment leading to the top decision to adopt, and, b) an implementation stage, which consists of all events and actions pertaining to modifications in both an innovation and an organization initial utilization (Glynn, 1996). The two - stage model is useful because it breaks down innovation process into two tasks, each associated with a particular set of skills or roles, which, it is proposed, relates to a particular set of demands.

While understanding the stages of the innovation process is important, research indicates that innovation effectiveness is based on the implementation process. For example, Nutt (1986) based on the profiles of 91 case studies found that the implementation process had profound effects on the success of the innovation. He found that those firms that used implementation by intervention had a 100% success rate. Those using implementation by edict had the worst success rate – forty – three percent. This deals with structured implementation activities designed and enacted by internal or external change agents to specify usage of innovations and influence users' innovation - role - involvement, their formal and emergent patterns of interactions.
with and concerning the innovation. The roles of users may be created and defined by
the innovation or some individuals may be interdependent or sequentially dependent
on the operation and functioning of the innovation.

**Antecedents of Innovation Implementation**

Organizational factors can have profound effects on the success of innovation
process (Dougherty & Hardy, 1996). Structures and strategies in organizations
reinforce existing practices, and according to Hlavacek and Thompson (1973) are
hostile to creativity (Burgleman, 1983; Dougherty, 1990.) Dougherty and Hardy
(1996) argue that for a mature organization to develop the capacity for sustained
innovation, it must successfully make these innovation – to – organization connections
in three key areas: 1) make resources available, 2) provide collaborative structures
and processes to solve problems creatively and connect innovations with existing
businesses, and 3) incorporate innovation as a meaningful component of the
organization’s strategy. Previous research suggests that these factors represent
innovation problems since they present problems in connecting innovation
implementation with organizational processes. As a result, these innovation problems
have a direct and negative impact on innovation effectiveness. However, previous
research has not addressed the issue of organizational capability management. This
research suggests that OCM completely mediates the relationship between innovation
problems and innovation implementation success. That is the direct relationship
between innovation problems and innovation implementation is not significant when
OCM is added to the relationship.
Resources for Innovation Implementation. A key ingredient for the success of any innovation is the necessary resources to carry it out (Kanter, 1984). Research has focused on the importance of different types of resources (capital, human, time, physical, organizational, etc.) for innovation success. For example, Kanter (1984) discussed the importance of financial capital and methods by which companies obtain it for new innovations. Her qualitative analysis suggested that methods for obtaining financial resources often included "bootlegged funds," "budgetary ambiguities," "innovative banks", and investments by internal venture capitalist. The premise of Kanter's research is that "manpower flows" have a positive impact on innovation outcomes (Ettlie, 1985). The assessment of slack within the organization provides another example of the impact organizational capability has on the resource problem. Slack includes resources that are excess inputs such as redundant employees, unused capacity, unnecessary capital expenditures, uneven performances, or responses to environmental changes (Meyer, 1982; Nohria & Gulati, 1996). Slack is beneficial only to the extent that such resources are appropriately allocated to the innovation effort. If managed well, slack can be beneficial. Since innovation processes drain resources, the search for slack becomes instrumental (Cheng & Kesner 1997). Finding and appropriately allocating slack indicates recognition of the potential of those resources elsewhere in the firm. Well managed slack allows the firm to mediate the flow of information resources (Ettlie, 1985), and provides opportunities to explore new strategies (Moses, 1982) or products (Mokyr, 1990). Successful movement of people across organizational boundaries to support innovation processes has a positive impact on innovation decision-making. Empirically, Dougherty and Hardy (1996) showed
how failures in resource management systems negatively impacted innovation. For example, these researchers found that in many cases failures associated with innovations were a result of poor management of resources. Resource gain was primarily a result of successful networking by management, where more savvy managers were more successful than less tactful managers at gaining support and resources for ideas. The authors concluded that business unit wide innovations require business unit management and support. Research by Collis (1991) on the ball bearings industry demonstrated that firms must have organizational capability to effectively implement new strategies and innovations and regenerate core competencies. The development of these strategies requires that the necessary resources be available at the appropriate times for implementation processes.

The above research points to the need for organizations to have efficient organizational capability to support innovative ideas. Thus, organizational capability management can reduce the impact of the resource problem by providing units ways in which to communicate new ideas and practices to the organization. For example, the management of organizational capability includes the ability to select capable persons to oversee the innovation project. Kessler and Chakrabarti (1996) argued that the selection of a highly qualified innovation champion (one who is charged with the duty of managing overall issues and concerns of the new product or practice) is beneficial to the innovation process because he or she is able to "get resources, sell the project, coordinate activity and facilitate communication, and motivate key participants" (p. 1167)."
Structural Context — Structure and Policy Issues. A potential innovation problem lies in the structural context of the organization. The structural context includes the diverse organizational and administrative (practices and policies) elements, whose manipulation is likely to affect the innovation implementation process (Burgleman, 1984). Previous research indicates that the structural context of the organization should facilitate organization wide collaboration (Dougherty & Hardy, 1996). Research regarding the importance of the structural context argues that it can enable employees to work creatively (Kanter, 1988). Further, it enables employees to connect to departmental "thought worlds so they can combine unique insights (Dougherty & Corse, 1997, pg. 160)."

Lawler and Ledford (1996) argue that organizational capabilities tend to rest in the design, or structural context of the organization. Thus, it is no surprise that the management of organizational capability impacts the relationship between structural context and innovation implementation process. This notion is supported by Ashkenas (1995), who argued that many companies such as GE capital are successful because they focus on organizational capabilities. This focus enables GE to be more innovative since OCM allows the firm to spot hierarchical structures that inhibit the company from being successful, and permits those structures to be broken down to allow more permeability. Successful implementation of innovations such as total quality management (TQM) and virtual teams requires a focus on organizational capabilities that impact the information processes of the organization (Lawler III & Ledford, Jr. 1996).
The Issue of Organizational Climate. Schneider (1990) defined organizational climate as “the employees perceptions of events, practices, and procedures and the kinds of behaviors that are rewarded, supported and expected in a setting (p. 384).” The focus of organizational climate extends to the shared perceptions of employees’ specific to outcomes of interests (Klein & Sorra, 1996), such as the implementation of a new innovation (e.g., development of a virtual team, or virtual organizational partnerships). Climate impacts implementation of innovation to the extent that it impacts employees’ perception of rewards to use the innovation and to the extent that the climate cultivates use. Organizational capability management impacts the potential negative effects of climate on innovation implementation effectiveness by ensuring employees have the right competencies to engage in activities associated with the innovation, providing valuable incentives and benefits, and removing obstacles that may impact the willingness to use the innovation. That is, implementation is useless and difficult if the knowledge, skills, concerns, complaints and perceptions are not managed. Further, innovation implementation is successful to the extent that OCM provides the necessary training for innovation use, ample time is provided to allow employees ability to learn about the innovation and innovation use is monitored and praised by managers (Klein & Sorra, 1996). In short:

Hypothesis 3: OCM mediates the relationship between Innovation Problems (as defined by resource management, collaborative structure and processes, and climate) and innovation implementation success.
Diffusion of Innovation and Ambiguity

**Diffusion of Innovation.** A major issue in the success of innovation implementation is the diffusion of innovation. Especially in firms that operate in hypercompetitive markets, quick adoption of an innovation can serve as a source of competitive advantage. (Kessler and Chakrabarti, 1996). Early adopters, however adopt the innovation before the bandwagon effect emerges. (Bandwagon effects occur when an increasing number of firms adopt an innovation.) Gaining the first mover advantage, a firm can reap the rewards from the risks associated with early adoption. At this early point, the presence of uncertainty implies risk and therefore increases the expected returns a firm might require before adopting an innovation. However, early adopters can be inefficient, that is they may incorrectly calculate the expected returns from an innovation or may not have enough information to make an accurate assessment. If early adopters of the innovation fail to obtain some form of permanent advantage, their initial returns will begin to dissipate in the presence of the increased competition, which leads to a downward spiral in performance (Levintahal & Myatt, 1994).

A key determinant of the success of innovation adoption is organizational capability management. Rai (1998) argues that understanding the capabilities for individuals, groups, processes and organizations; and how these may impact innovation is a key determinant of successful adoption. As a result, this research argues that those firms that have valid information regarding their organizational capabilities and use that information to decide to adopt an innovation will be more successful. Hence:
Hypothesis 4: Organizational capability management mediates the relationship between diffusion of innovation and innovation implementation effectiveness.

Ambiguity. Ambiguity is the opaqueness or lack of clarity surrounding an organization’s assessment of an innovation’s efficiency. There are two types of ambiguity which are of concern in this research: a) ambiguity of goals of the innovation, and b) ambiguity of means – ends relations or the lack of clarity regarding both the range of possible outcomes of actions and the probability of each outcomes’ occurrence. Ambiguity matters in the stages of implementation and after implementation have already occurred. When decisions to adopt the innovation are unclear late in the process, it is usually because economic considerations such as return on investments can not be accurately measured or can be measured and they lead to negative results (Abrahamson & Rosenkopf, 1993). This is often the case with management innovations comprised of organizational processes, whose outputs and inputs are primarily tangible (e.g., a virtual team that builds synergy from members with extremely diverse skill – sets). Effectiveness of such innovations can not be accurately measured in a quantitative fashion. As a result, social factors play a major role in the process. Thus, employees use proxies to determine the effectiveness of the innovation. For example, individuals may rate the success of the virtual team innovation based on conversations with team members, and others in different departments, who have undergone a similar innovation process. Due to the lack of tangible measures to assess effectiveness, OCM becomes extremely important. In general, OCM provides communication regarding the expectations, values and goals of the innovation. Thus, social cues obtained from social networks about an
innovation can effect the level of ambiguity in the ultimate decision to use an innovation. Thus:

_Hypothesis 5: Organizational capability management mediates the relationship between ambiguity concerning the innovation and innovation implementation effectiveness._

**Organizational Effectiveness/Division performance**

Successful innovative products and services are critical for organizational effectiveness (Doughtery & Hardy, 1996). Research has indicated that successful implementation of innovative organizational technologies and practices are important for organizational success (Klein & Sorra, 1996), and may serve as a source of competitive advantage. Given the important impact of innovation on division performance, a large body of research has focused on this relationship. Key research in this area includes the assessment of organizational characteristics thought to impact product and organizational innovation. However, this past research tends to focus on one or two organizational characteristics and does not address the strategic nature of the innovation implementation process and its impact on division performance.

Prior to the 1980s, most researchers who studied the determinants of innovation adoption did not study its aftermath: implementation effectiveness (Tornatzky & Klein, 1992). Although research on implementation is now more prevalent, research on its aftermath is, primarily nonexistent. Klein and Sorra (1996) argue that innovation implementation may result in one of three outcomes:
a) When innovation implementation is successful and enhances organizational performance, support of innovation implementation increases, yielding likely improvements in implementation policies and practices.

b) When implementation succeeds but does not enhance an organization's performance, support is weakened.

c) When implementation does not succeed, support is weakened.

Given the importance of innovation implementation on firm performance, this research uses innovation implementation success as an indicator of effectiveness and argues that it has a direct impact on division performance. Therefore:

Hypothesis 6: Innovation implementation will have a direct and positive effect on division performance

This paper addresses this concern by asking the question *What is the relationship between innovation problems, OCM, and innovation implementation effectiveness?* This research suggests that OCM is an intervening variable of innovation problems and innovation implementation success. The argument here is that innovation problems are reduced when a firm successfully manages organizational knowledge. That is, innovation problems are reduced when firms realize and manage their capability successfully. Figure 3.2 provides a summary of the essential question at hand.

### 3.4 RESEARCH APPROACH

The relationship between organizational capability and innovation implementation success is complicated since it is intertwined with various factors thought to have a negative impact on innovation. These factors include resource
issues, structure and collaborative issues, and organizational climate issues. However, successful management of organizational capabilities is expected to mediate the impact these factors have on innovation. Before testing this premise, this chapter first develops the research methodology used to measure the impact of organizational capability management on innovation problems. This section of the research presents previous research used to measure intangible factors such as OCM and "innovation problems". The hypotheses represent the hypothesized relationship between organizational capability management and innovation implementation. The hypotheses are based on these factors:

**Organizational Capability Management**
- Customer Service Orientation
- Time to market
- Organizational Development
- Innovative Behavior Development
- Cost Effectiveness

**Innovation Implementation Success**

**Division performance**

**Innovation Problems**
- Resource Problems
- Collaborative Structure
- Climate

In order to articulate how each variable was operationalized, it is important to discuss previous methods used. This information provides a better understanding regarding the reasons why various methods were chosen for this study.

**Organizational Capability Management**

Very little empirical work has focused on the measurement of capabilities. Most research has used case study analysis to understand it. A good example is
Collis's (1991) work on global competition in the ball bearings industry. His methodology focused on the identification of history and complex social phenomena to better understand the firm-specific capabilities that enable the three firms studied to enter global markets. He used observational techniques and interviews to gather information on organizational capabilities. There is a major problem with this technique; his methodology is not very clear and it is indeterminate as to whether he had postulated firm capabilities prior to analysis or whether they are a result of his analysis of global competition (Collis, 1991). Another method, from the human resource management literature, uses existing data to factor analyze an existing scale into a measure of business capabilities and human resource capabilities. Huselid and colleagues (1997) used data from Towers – Perrin to develop a scale of capabilities. Fifteen items were found to be related to human resource capabilities. Three items were found to be related to business capabilities. The advantage of this measure is that it provides a quantitative assessment of capability. The disadvantage, however, is that there is no indication that this measure represents a valid measure of capability. Further, because the data did not include firm-specific information, it is doubtful whether these capabilities are true sources of competitive advantage. There was no determination of whether these capabilities were considered valuable, rare, or imperfectly imitable by firms. At best, Huselid and his colleagues are measuring sources of competitive parity. A better research method comes from Henderson and Cockburn (1994) who first used qualitative data drawn from interviews and secondary sources (national press, reference sources, academic textbooks, medical journal articles, and reports) to better understand the pharmaceutical industry. Using semi –
structure interviews, the goal was to develop a narrative history of cardiovascular drug
development (an innovation) as the informant experienced it. Interviews were
supplemented with internal firm documents or academic articles that documented the
history that the respondents were describing, and with interviews from industry
experts. These "in-depth" field interviews were used to construct measures of
competence. While a major problem with this method is that the measures were
filtered through the eyes of the investigators' preconceptions and beliefs, this method
does have some benefits. First, it permits the construction of detailed measures that
are rooted in the experience of multiple informants. The questions are better linked to
structure, process, and to particular events. This may also increase the accuracy of the
measures. By exploring the pattern of problem-solving around particular scientific
discoveries in detail, the authors were able to gain a better understanding of the ways
in which cross-disciplinary communication was managed in the firm. The authors
also used proxies to measure architectural capabilities. For example, to test the third
hypothesis: "firms with the ability to encourage and maintain an intensive flow of
information across boundaries of the firm will have significantly more productive drug
discovery efforts, all other things equal" the authors constructed a 5-point Likert
scale where the firm was coded 5 if standing in the larger scientific community was a
dominant criterion for the promotion of scientific personnel and 1 if an individual's
publication record and reputation in the wider community were not significant factors
in promotion decisions. Other researchers support this method. For example, in his
article on the development of consensus on firm competencies and capabilities,
Marino (1996) presents a model by which to identify capabilities, where the major
questions asked were: What are we selling to whom and how are we doing?, Why do our customers choose our products instead of our competitors?, What is it about our organization that gives us cost advantage, superior quality or reliability?, After -- sale support?, or Whatever it is that our customers value? Which of our strengths and capabilities are most important for building the future of the organization, can we agree on our organization's core capabilities? Maritan (1997) also agrees with the importance of history collection and interviews and adopted this technique in her study. Using this method, she quantitatively assessed the process of investing in capabilities. Given the overwhelming support for this technique, this research adopted this method and followed the techniques used by Maritan (1997) and Henderson and Cockburn (1994).

Similar to prior research (e.g. Henderson & Cockburn, 1994), this study used both literature reviews and in-depth interviews, to develop five categories of firm-specific capabilities. Since this research focuses on one organization, corporate-wide capabilities are used. Human resource practices (items typically found in SHRM literature) were not addressed in this study, since there is very little variability in the practices used by the respondents in this study (see chapter 4 for more details). It is argued that the management of organizational capabilities at the business-level varies, explaining variability in performance. To obtain measures of OCM, a qualitative approach, similar to Henderson and Cockburn (1994) was used. Findings from this qualitative approach to data collection, (that is, based on literature reviews on Hewlett-Packard and in-depth interviews,) produced five conceptually
different, *firm specific*, corporate - wide capabilities that were used to obtain quantitative data.

**Customer Service Orientation.** One important organizational capability is customer service orientation. This essentially involves a keen focus on the needs and expectations of firm current and potential customers. It requires that firms create processes and train people to connect quickly and easily with customers' needs. At Hewlett – Packard, four critical characteristics were found to best illustrate customer service orientation for the firm.

**a. Knowledgeable about customer needs.** A firm that possesses this capability does not spend a great deal of time “selling” new products and services to customers. This firm provides those services that are of extreme importance to the customer. Further, it helps the customer articulate and determine its needs. The firm can clearly articulate who its customers are, what their goals are, and how it can help its customers achieve their goals. Thus, it encourages its employees to help customers to be successful.

**b. Ability to address customer needs in a timely manner.** Firms that are knowledgeable about customer needs react to those needs immediately. These firms recognize that most of their customers face difficult challenges and constant change in the market place. Thus, time is extremely important. Firms that have the ability to address their customers' needs are not only reactive, but also
proactive. That is, they predict future needs of their customers and help them make decisions about future needs.

c. Ability to establish close relationships with customers. The firm with strong customer service orientation is viewed as a trusting partner to their customers. Thus, the customers believe the firm has a genuine interest in their success and takes a win–win approach to customer service.

d. Customer focus. The mission and vision of the firm is based on the goals and needs of its customers. The activities, structure, processes, and goals associated with the mission and vision are designed to achieve customer satisfaction.

Time to market. A second important organizational capability is time to market. This capability focuses on the ability to meet new performance requirements based on market demands. At Hewlett–Packard, four characteristics of time to market are considered critical.

a. Ability to lead the market. At the corporate level, HP's goal is to be considered number one or number two in each market in which it competes. Thus, this goal requires that the firm provide innovative products and services that essentially drive the direction of the market.

b. Ability to maintain an efficient product generation process. Product life cycles, especially in hypercompetitive markets are short. As a result, a continuous flow of new and improved products is essential. Thus, it is important that innovative thinking, risk–taking
individuals are provided the flexibility and freedom to develop new products.

c. **Ability to reduce time to market.** Since the life cycle of a product is extremely short in the electronics industry, reducing the time it takes to get new products to market is extremely important. This requires the swift organization of people, skills, and projects to meet market demands immediately.

d. **Ability to increase production speed.** To meet the demands of the market place, firms must increase their productivity. This requires increasing the efficiencies associated with input (employees having the proper, firm-specific capabilities to do the job) and output (inexpensive output due to little or no defects in product).

**Organizational Development.** A third important organizational capability is organizational development. This capability requires methods to help the organization and the employees maintain a continuous learning objective in order to adapt to both organizational and environmental changes. As demands on employees change, skills to cope with those demands must change to meet changing needs. Six characteristics of organizational development are considered critical.

a. **Ability to manage objectives and engage in strategic planning.**

A major component of this characteristic is the assessment of objectives and strategies. These criteria help firms understand what changes are occurring in the firm (turnover, employees with skills not currently in use, and training needs) as well as
changes that are occurring externally (competitive advantage, characteristics of competition, and changing market demands).

b. Team—building and collaboration ability. Firms with these characteristics recognize that success springs from leveraging individual skill—sets to obtain the best possible solution for the customer. These firms recognize that when faced with high demands, teams often find better way to satisfy demands than do individuals working in isolation. Thus, teams and collaboration in groups is absolutely critical to the success of the firm.

c. Leadership ability. This ability recognizes the value placed on participative forms of leadership. That is, as with team—building, firms recognize the importance of gathering information from members of the firm and using such information to make informed decisions. Even from a leadership perspective, consensus is still extremely important.

d. Total quality improvement. Firms with this capability recognize the importance of quality. In fact, this quality improvement is a never—ending process by which managers and employees are in constant search for ways to improve the quality of its products and services.

e. Communication capability. This factor places high value on information—sharing. In order for the firm and individuals
within the firm to develop, information on best practices, ideas, market demands, firm culture, and skill-sets must be shared.

**f. Employee commitment.** Employee commitment focuses on employee personal commitment to the firm, project, and work. It is an indication that the goals, values, mission, and vision of the organization are the same or similar to those of the employee.

**Individual risk-taking.** The fourth organizational capability focuses on the ability and willingness of the organization to be innovative. In order to operate in an ever-changing market, innovative behavior is extremely important since it provides the creativity needed to push the firm to its highest level of performance. Further, it helps the firm visualize new opportunities and customer needs. At Hewlett-Packard, six characteristics of this capability are considered critical.

**a. Willingness to take risks.** This characteristic represents the willingness to be vulnerable by taking a chance in focusing on a new idea, product or service. This concept is important since it requires that firms and employees work “outside of the box” and concentrate on areas that may not currently represent their area of expertise.

**b. Ability to operate in areas of uncertainty.** This requires the ability to work in an environment where there is significant doubt as to whether success lay in the future. However, it is also the recognition that uncertainty creates opportunities, even
if operating in this kind of environment is perceived as uncomfortable.

c. **Promotion of long-term research.** Individual risk-taking also recognizes that providing new ideas, products, and services requires a great deal of investment in research and development. Thus, those firms with this capability will engage in research activities that focus on meeting current needs, but also meeting future customer needs.

d. **Management of change.** Firms that possess the individual risk-taking capability also recognize that with new ideas comes a need to change existing business activities to meet new ones. Thus, the management of change is taken seriously and handled carefully in order to ensure that the success of an innovation is not marred by an inability to transform to meet those changes.

e. **Engagement in participatory management.** Participatory management recognizes that success is not an individual victory, but a victory won through the use of many ideas, services, and skill-sets. Thus, this characteristics focuses on the value placed on obtaining input from many sources prior to implementing vast changes in the firm, or in products or services.

f. **Promotion of innovative behavior.** Firms that engage in this activity recognize the importance of actions. That is, they not
only recognize and articulate the value placed on innovative behavior, but they promote such behavior via the importance placed on innovative projects, rewards given for such behavior, and recognition of new ideas, products and/or services.

Cost Effectiveness. Firms do exist to increase profitability. Firms that are not profitable, in the absence of a sustained monopolistic position will fail. A key component of profitability is decreased costs. Thus, the fifth organizational capability is cost effectiveness. It requires that firms provide the products and services needed by their customers but in an efficient manner such that waste and slack are reduced. Three characteristics of cost effectiveness are considered critical.

a. Management of costs. The cost of doing business can be extremely high if the firm does not actively find and implement cost effective measures of doing business. Thus, the management of costs focuses on cost controls associated with the overall business operations from costs associated with meeting customer needs and obtaining sales, to costs associated with processes used to create product and services.

b. Ability to reduce costs to customers. The ability to reduce costs to customers focuses on providing quality products and services at a cost that reflects the true value of the products and services.

c. Ability to reduce costs of internal operation. Firms with this ability provide products and services without large overhead
costs, or using unnecessary processes and hierarchical structures.

**Innovation Implementation Effectiveness**

Innovation implementation within an organization is the process of gaining targeted employees' appropriate and committed use of an innovation. DeBrandt (1995) argues that the measure of socio-economic factors have been the most prominent measure of innovation and innovation implementation success. The evaluation of socio-economic factors requires an analysis of the positive and negative effects resulting from the use and dissemination of the innovation implementation. The consequences examined often included all the consequences involved at least within a certain time horizon and include economic variables (growth competitiveness, income, employment, and costs) and social variables (communications and distributions). As a result, analysis must represent a keen understanding of the organizational context. Birchall, Chanaron & Soderquist (1996) used an example of this technique. Their study looked at the success of innovation within small and medium-sized enterprises. Evaluation of innovation was measured by three factors: satisfaction with current level of innovative behavior, the importance of the innovation in product or service impact on current work processes and procedures, and satisfaction with innovative actions in the business. Factors used to discuss these questions were: a) actions for continuous improvement, b) technology management, c) internal management systems, and d) pressures for cost cutting. Table 3.1 presents a detailed summary of variables used to measure these factors.
More recent research has attempted to tie innovation implementation effectiveness to organization-level factors and strategy. Klein and Sorra (1996) argued that implementation effectiveness refers to the consistency and quality of targeted organizational members' use of a specific innovation. Thus, innovation effectiveness essentially means three things. First, it is a homogeneous construct (Klein, Dansereau & Hall, 1994) describing the quality and consistency of the use of a specific innovation within an organization as a whole. It also represents the goals and objectives that are initially developed for the innovation as well as fit the values of the organization. Finally, Klein and Sorra (1996) further argue that when implementation effectiveness enhances organizational performance, organizational values, strategies and goals are affected. This is the argument that is adopted in this research.

Research also focuses on two important factors to affect innovation implementation: diffusion of innovation and ambiguity. Such factors have been shown to impact successful innovation.

Diffusion of innovation.

Diffusion of innovation has been an important aspect of innovation success. Most of the research in this area focuses on the rate at which innovations are adopted (Cool, Dierickx & Szulanski, 1997). This construct is often measured by (a regression): \[ R(t) = b \times n(t) \times [N - n(t)] \]. Where \( R(t) \) is the rate of diffusion at time \( t \), \( n \) is the number of adopters at time \( t \), \( N \) is the total number of potential adopters, and \( b \) is the constant. Abrahamson and Rosenkopf (1993) argue that the problem with this
method is that it fails to include other factors which members consider before adopting an innovation such as the ambiguity of the innovation.

The Bandwagon effect is another method of measuring diffusion whereby: \( B(i, k) = I(i) + (A(i) \cdot n(k - 1)) \) where \( B(i, k) \) is a composite of organization i's, the bandwagon assessment of the innovation, in bandwagon cycle k. \( I(i) \) and \( A(i) \) denote, respectively, the individual's assessment of the organization and the ambiguity about the innovation, \( n \) is the total number of adopters (Abrahamson & Rosenkopf, 1993). The benefit of this method is that it not only considers the ambiguity of the situation but provides a measure of the extent of diffusion and individuals consider the level of ambiguity. This information is important since it provides more detailed information regarding the factors employees and managers considered when deciding to implement an innovation. As a result, it provides additional information regarding the success or failure of the innovation. In short, it will provide more detailed information regarding the relationship between the role OCM plays in the relationship between diffusion and innovation implementation success. Thus, this method is adopted in this research.

Ambiguity.

Ambiguity has an important impact on innovation implementation. However, most research (e.g. Abrahamson & Rosenkopf, 1993, 1997) discusses this notion with respect to diffusion of innovation as opposed to innovation implementation, and suggests that ambiguity in goals and processes creates a sense of uncertainty that frees the organization to search and experiment to find better techniques. A high level of rigidity in defining a company's goals and processes negatively impacts innovation
because it reduces the number of options to be considered. However, it is the argument of this research that high levels of ambiguity in the innovation implementation process will reduce its effectiveness. The opaqueness of the innovation’s goals as well as a lack of understanding about its purpose may create confusion and uncertainty. As a result, individuals may fail to adopt the management innovation and choose to use previous methods for performing and achieving objectives. Unfortunately, conceptual work represents most of the work done on ambiguity. In light of this fact, this research adopted an ad hoc measure of ambiguity. This measure was developed based on research from the innovation implementation literature. Klein and Sorra (1996) argue that successful innovation implementation requires a clear understanding of the goals of the innovation and expected outcomes from it. If the value and goals of the innovation are not made clear, implementation may not be successful. Based on this research, the measure of ambiguity focused on the extent to which the goals of the management innovation where clearly defined and measurable and the extent to which the expected returns from the management innovation were clearly defined and measurable. This measure is supported by Abrahamson and Rosenkopf (1993), who argue that measures of ambiguity which focus on clarity of goals and outcomes have an impact on innovation.

Division performance.

A major problem with assessing the impact of human resource management in firms is the diversity of performance measures used. These differences make it more difficult to cumulate findings (Becker & Gerhart, 1996). Huselid (1995) and Arthur (1994) represent examples of two different measurement techniques. Huselid used the
proportion of the workforce covered by profit sharing, gainsharing and merit pay, whereas Arthur asked what percentage of employment costs was accounted for by bonus or incentive payments. These approaches both have merit, but makes it difficult to compare findings accurately and completely.

The empirical literature that explicitly attempts to estimate the relationship between a firm’s strategic human resource management practice and its performance remains quite limited. What does exist, varies considerably by level of analysis and measures of both HRM system and firm performance. Since much research in SHRM literature focuses on interorganizational differences, corporate financial performance is often used. For example, Cascio and Serapio (1991) argued that the financial returns associated with investments in progressive HRM practices are generally substantial. Further, since most research on innovation deals with tangible products, measures often deal with the economic growth of the firm as a result of the technology. The most popular way of measuring a firm’s performance is through the use of accounting measures (Fisher & McGowan, 1983). Accounting measures of performance are beneficial since they are publicly available for many firms, and they provide a great deal of information about a firm’s operations. Specifically, profitability ratios (e.g., gross profit margin and return on total assets) are beneficial because they measure management’s overall effectiveness as shown by the returns generated on sales and investment are important measures. However, researchers argue that in interorganizational research, accounting measures may fail to capture intangible innovations such as the development of a virtual team or new communication network system. This is due to the fact that accounting measures
typically, are not strong indicators of intangible factors. However, most problems occur at the interorganizational level. Since this study focuses on business – unit effects, it is expected that differences between accounting measures will be limited. Further this paper argues that, accounting data are important because they do provide additional relevant innovation. Moreover, accounting data are often the focus of human resource managers, who must allocate scarce resources. To further reduce the negative affects of accounting data, multiple measures of firm performance are used. Bining and Barret (1989) argue that performance is a multidimensional construct. That is, performance in any firm represents a cluster of interlocked and covariant activities, and this cluster represents a subset of all possible activities necessary for the firm to accomplish its goals and objectives. Thus, the measurement of performance must include multiple measures to ensure an explicit assessment of division performance. As a result, this research uses several measures of division performance. Measures included the firm’s net profit margin, return on assets and increase in net revenue. This study adopted the technique used by Huselid (1995) and included economic measures of performance as well to enhance the validity of the findings. Thus, change in market share and firm market value were also used.5

Resources, Collaborative Structures and Process.

An organization with multiple innovative projects will have a resource system that channels money, equipment, expertise, and information to all these activities

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5 These measures were thought by Subject Matter Experts to be available by the respondents.
simultaneously. This resource system should also nurture new ideas and continuously raise and solve problems and should not rely solely on slack.

Each innovation project needs administrative structures and processes appropriate to its development stage and access to decision-making across the organization. These structures include multifunctional teams to work through technical problems faced by multiple projects. Reward systems also impact collaborative structures and processes. Shared perceptions of employees specific to strategic outcomes of interest are also important. These climatic factors include the extent to which it impacts perceptions of rewards provided to use the innovation and to the extent that the climate cultivates use. Positive climates provide incentives, ensures employee skills and innovation use and removes obstacles for use.

Dougherty and Hardy (1996) examined detailed case studies of these factors. In order to understand the resource flows, in-depth interviews were used to understand how resources flowed to innovation projects, whether and how structures connected the innovations to ongoing work in other functions, divisions and managerial levels, and whether and how innovation projects become embodied in the organization's strategies. Interviews focused on people's understanding of new product's development, including its connection with the organization's resources, structures, and processes, and strategy. Individuals were asked to tell a story about a particular innovation and discuss what they knew about the market and technology, and how they got necessary resources, how they worked with other departments and divisions and whether the firm climate had helped or hindered the innovation. Due to environmental and time constraints, this paper used survey data to obtain this
information. However, this research adopts the argument used by Delaney and Huselid (1996). Namely, that measures of perceived organizational effectiveness have been found to correlate positively (with moderate to strong associations) with objective measures.
Figure 3.1 OCM Model
Hypothesis 1: Successful management of organizational capabilities is significantly and positively related to innovation implementation success.

Hypothesis 2: Successful management of organizational capabilities is significantly and positively related to division performance.

Hypothesis 3: OCM mediates the relationship between Innovation Problems (as defined by resource management, collaborative structure and processes, and climate) and innovation implementation success.

Hypothesis 4: Organizational capability management mediates the relationship between diffusion of innovation and innovation implementation effectiveness.

Hypothesis 5: Organizational capability management mediates the relationship between ambiguity concerning the innovation and innovation implementation effectiveness.

Hypothesis 6: Innovation implementation will have a direct and positive effect on division performance.

Figure 3.2 List of Hypotheses.
<table>
<thead>
<tr>
<th>Actions for Continuous Improvement</th>
<th>Technology Management</th>
<th>Internal Management Systems</th>
<th>Pressures for Cost Cutting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continuous improvement</td>
<td>Designed to meet market need</td>
<td>Appraisal systems</td>
<td>Importance of waste reduction</td>
</tr>
<tr>
<td>Improved staff competence</td>
<td>Record of internally generated innovation</td>
<td>Performance measurement for managers</td>
<td>Reduction in staff numbers</td>
</tr>
<tr>
<td>Cross – functional working</td>
<td>High innovation profile</td>
<td>Targets for performance improvement</td>
<td></td>
</tr>
<tr>
<td>Team approach</td>
<td>R &amp; D involved marketing</td>
<td>Targets for performance improvement</td>
<td></td>
</tr>
<tr>
<td>Learning organization</td>
<td>Innovation strategy</td>
<td>Job definition</td>
<td></td>
</tr>
<tr>
<td>Internal networking</td>
<td>Designed for manufacturing/ Delivery</td>
<td>Performance monitoring</td>
<td></td>
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<tr>
<td>Capability to manage change</td>
<td>Innovation targets</td>
<td>Support for creative people</td>
<td></td>
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<tr>
<td>Improve quality of product/service</td>
<td>Manager responsible for innovation</td>
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<td>Shared vision</td>
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<td>External networking</td>
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<td>Performance measurement</td>
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<td>Focused marketing/sales</td>
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<td>New product/services</td>
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<td>Adoption of technology</td>
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<tr>
<td>Improve quality of management</td>
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</tbody>
</table>

Table 3.1 Factors used to Evaluate Innovation.
CHAPTER 4

METHOD

4.1 THE STUDY POPULATION

Since this study was performed at one firm, criteria were needed to determine whether a business entity could be included in the study. Entities were included if they engaged in management innovations in the last 12 to 18 months and if they were responsible for profit and loss. These criteria would provide management innovations that were, by HP’s standards, considered new, would increase the subject pool and would provide data on the direct link between innovations and division performance. At the time of this study there were 112 separate businesses with general managers (GM’s) responsible for profit and loss of each business. All 112 GM’s were asked to participate in this study. General managers were asked to participate since it was believed that they would have the most knowledge on entity strategy and performance. From this population 33 respondents provided complete data (that is, they completed the division performance data). However, after a suggestion from the Principal

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6 This number is as of September, 1998. However, during the course of this research, the company restructured its businesses three times. Reorganizations were a result of attrition, strategic, and financial concerns. The latter was of major concern at the time of this study. HP underwent major expense controls and several jobs worldwide were downsized as a result.
Investigator that surveys could be completed without this data 23 additional respondents participated for a total of 56 respondents (50% of the population).

**Company Researched.**

This research was performed at Hewlett – Packard -- a Fortune 20, highly diversified technology company – at the corporate site in Palo Alto, California. Hewlett – Packard is one of the world’s largest computer companies and the foremost producer of test and measurement instruments. The company employs more than 130,000 people (including contractors, interns and temporary workers). The company’s more than 29,000 products are used by people for personal use and in industry, business, engineering, science, medicine, and education. In addition, the company makes networking products, medical electronic equipment and systems for chemical analysis, handheld calculators and electronic components. Table 4.1 presents a summary of the ten major groups in which businesses at HP are divided.  

The 43 billion-dollar company is a global company, since more than 56% of its business comes from outside the United States (more than two – thirds of that is from Europe).

**Company Strategy.**

While HP is a large company, its strategic focus is based on empowering general managers to make decisions that best support their respective businesses. Thus, HP is a highly decentralized company. Collaboration with other companies and technology alliances allow HP to extend leading computing, instrument and

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* Table 1 lists a few of the products and services in which HP is number one or number two in the market.

66
communications solutions to many industries. The company's management practices are based on a belief that people are committed to doing a good job and are capable of making sound decisions. The "HP Way" — the articulation of HP's culture — is one of openness and informality. Employees share in HP's success through regular cash profit — sharing and stock purchase programs.

Hewlett - Packard is divided into two organizations. The first, and oldest organization is the Measurement Organization, consisting of medical, analytical and component products. HP's medical equipment, including cardiac ultrasound — imaging and patient — monitoring systems, is used in hospitals and clinics around the world, and HP computer systems are used in both clinical and administrative areas. The company's expertise helps health — care organizations improve patient care and reduce costs.

Hewlett - Packard's analytical instruments analyze the chemical components of liquids and gases. They are used in the chemical, energy, pharmaceutical and food industries, and in environmental monitoring, medicine, bioscience and university research. HP's more than 9,000 component products are used in areas such as the fiber — optic, wireless, and visual communications industry. They are designed to help people communicate quickly, reliably and cost effectively.

The newer and faster growing part of the company is the Computer Organization. Today, most of HP's revenue comes from computers — ranging in size from palmtops to supercomputers — plus peripherals and services. HP is the fastest
growing personal computer company in the world. In addition, HP manufactures and services networking products to help customers connect HP computers as well as those of other manufacturers.

HP introduced its first computer in 1966 to gather and analyze data coming from HP electronic instruments. The company branched into business computing in the 1970s with the HP 3000 midrange computer, launching a new era of distributed data processing, taking computers out of computer rooms and making them accessible to people throughout an organization. HP is the leader in both UNIX® system and Windows NT® platforms and in successfully integrating them in today’s businesses. HP helps customers maximize the productivity of their computing resources while reducing their overall costs. In 1997, HP acquired VeriFone, a firm in the electronic-commerce solutions. Now HP has the pre-eminent technology for payment systems on the Internet, where it is already a leader in security, enterprise computing solutions and service and support. Hewlett – Packard Company is one of the top computer service and support companies, with 35 response centers and support offices in more than 120 countries. HP also offers a broad range of consulting, management and finance services to give customers cost-effective, timely and easy access to information.

Company HR practices.

While business management practices at HP are high decentralized, management of technical HR practices are highly centralized. Qualitative indicators provide evidence that the technical HR practices within HP are constant autonomous entities.
and could not explain the variance in innovation implementation success and firm performance.

Prior to 1990 the HR department, like HP’s businesses was very decentralized. Virtually all of Hewlett-Packard’s 50 divisions and 120 sales offices had their own on-site personnel staff, which took care of all their HR needs both technical and strategic. Pete Peterson, the Vice-President of HR at the time made major changes to improve the HR function. His strategy was to consolidate HR operations, keeping only those activities that require local attention at the site level. HR has consolidated disability claims management into a disability service center, medical transactions into a medical response center and relocations into a relocations center (Personnel Journal, 1993). One of the major consolidations, which is also most important for this paper is a major consolidation of the of HR functions at the regional level. The HR department has incorporated most HR functions into one regionalized center, which is where more than 80% of the respondents from this study obtain their HR services called the Bay Area Personnel Services (BAPS) Regional Center. The regionalized HR services includes technical activities such as records, benefits and staffing (including recruitment and selection processes), and organizational activities such as employee relations issues and organizational design projects. This center is also responsible for providing personnel forms, training and education schedules of training programs coordinated primarily at the corporate level. HR managers and specialists at the regional level are responsible for these technical activities at all of HP’s business sites and HR managers and specialists at the site level provide more strategic and customized HR services to their business managers and divisions.
Since HP businesses are increasingly located across multiple geographies within the US, and many have global operations, HR organizations are responding to business needs with both systems and process solutions that span multiple geographies. The internal capability of the HR organization to leverage major systems is based, in part, on the technology in place (i.e., the PeopleSoft platform). However, it is also based on the ability to use the technology to effectively provide quality information to business managers that facilitates a global perspective, strategy development/execution and enhances organizational capability by managers. HP's Human Resource Management Systems called PeopleBase integrates several people–management processes (e.g., staffing the organization, managing total compensation, developing the workforce, managing the work environment) (Gresham, 1998; Yeung & Brockbank, 1994). For example, prior to the integration of the staffing function, to apply for a job at Hewlett – Packard, applicants had to send their resumes to 46 different mailing addresses in the US. Each of HP's business units collected resumes individually. Few if any shared resumes with each other. Today the staffing system is completely automated. This system is also able to assist managers with redeployment. The integrated system can match people with jobs rather than jobs with people.

Today, Hewlett – Packard's HR function is a service organization designed to help HP's businesses become more successful. The strategic intent of HR is to ensure profitable, global growth of HP's various businesses using HP's culture, the HP Way, as the foundation for policies, practices, and actions. The key role for HR
as expressed by Susan Bowick, Vice President of Human Resource Management at HP (1997):

provides leadership in the worldwide development and communication of the philosophies, frameworks and systems that provide competitive advantage to the businesses. More and more, for example, our role is to provide access to global data. But instead of corporate creating all the reports and sending them out, corporate must make sure the geographies and businesses can use the data to create their own reports. Corporate is also responsible for product and program design and development, as well as a strategy for delivery enterprise-wide (www.persweb.hp.com).

4.2 RESEARCH STRATEGY.

Since this study focused on a single, large, multidivisional firm this research used a case study approach to determine organizational capability management practices. It also consists of a quantitative assessment of those organizational capability management practices for each division of the firm. A case study method approach was selected for several reasons. First, the question asked by this research is not only if, but also how, the relationship between innovation problems and innovation implementation effectiveness is affected by organizational capability management. Yin, (1994) argues that case studies are particularly appropriate for “how” questions because such questions deal with operational links needed to be traced over time, rather than with frequencies or incidence.

Second, Yin (1994) suggests using the case study method, when the boundaries between the phenomenon (being studied) and the context are not clearly evident. This description clearly applies to studies of organizational processes in general, and thus applies to this study as well. Studying the process of managing organizational capability in its organizational context provides the rich descriptions
that are necessary to address the research question. Therefore, a method that deals with both phenomenon and context are desirable.

Third, case study inquiry readily accommodates the inclusion of both qualitative and quantitative data (Yin, 1994). This research deals with complex organizational processes. Quantitative data can not necessarily define what those capabilities are. The richness and holism of qualitative data are necessary to understand and articulate the firm's view of organizational capability management.

The conceptual literature on innovation and organizational capability are fairly well developed. Therefore it was possible to develop a set of literature – based propositions to guide the data collection and analysis as suggested by Yin (1994). These preliminary propositions were used to identify potentially important constructs (Eisenhardt, 1989) and help structure this research in a way that its findings can be positioned in the context of the body of work that preceded it.

Although propositions were developed a priori, an important feature of this research strategy is that the relationships identified by these propositions may or may not be part of the conceptual model of organizational capability management. The benefit of using a case method is that it provides rich descriptions that are possible to obtain when a phenomena is studied in context.

However, to gather data from multiple individuals across multiple groups within an organization requires the use of quantitative data. Klein and Sorra (1996) argue that the use of quantitative measures is beneficial, since it allows researchers to conduct needed statistical tests of within – and between group variability in implementation effectiveness. Thus, in this study survey data were also used to assess
the relationship between innovation problems, organizational capability management, and innovation implementation effectiveness across entities within a single organization.

**Historical Data to Develop Measures For Quantitative Assessment.**

For the present study, historical analysis provided a thorough understanding of firm-specific organizational capabilities that are pertinent to each business unit. Hewlett-Packard is organized around two competencies: Measurement and Computers. Thus, analyses of historical data included capabilities related to both of these competencies. The historical analysis not only provided information regarding capabilities, but also management innovation processes. This information was used to develop a list of firm-specific organizational capabilities (focusing on knowledge management and communication network management), and a general mapping of acceptable management innovations. Top managers within HP confirmed the validity of this information. From this information a survey was developed to assess the perceived success of the management of organizational capabilities. Further, information regarding problems that may inhibit the success of an innovation implementation process (e.g., resource factors, collaborative structures, and climate) was also examined using the survey and archival data. Perceived success of a recent innovations and the implementation process was also assessed.

**Development of HP’s Organizational Capability.**

To determine the organizational capabilities a review of the literature on Hewlett-Packard was conducted. This review focused on research that discussed Hewlett-Packard’s success and explanations behind its success in recent years. At
the request of various members from the company, this research covered a three-year
time—span. Given the speed with which changes occur within the company, it was
argued that past measures of success might be irrelevant. These qualitative data were
sorted based on article content. A first draft of the list and description of HP
capabilities were given to two employees, who combined have over forty years of
experience in areas and positions ranging from information technology and human
resources, to specialists and general manager. These individuals held a “focus group”
meeting with four other individuals with similar experience. Based on this meeting
and additional meetings with the two representatives, the capabilities were revised.
Table 4.2 provides a list of those capabilities. These capabilities were translated into
23 characteristics describing capabilities in the areas of 1) customer service
orientation, 2) time to market, 3) organizational development, 4) cost effectiveness,
and 5) individual risk—taking. For example in relation to the issue of innovative
behavior, the scale asked the respondents to comment on their business’s ability to
support 1) risk—taking behavior, 2) creative technology development, 3) research
capability, 4) operation in areas of uncertainty, 5) employee acceptance of change, 6)
promotion of long—term and short—term research, 7) participatory management, 8)
entrepreneurial behavior, and 9) investment in methodology. This list resultant was
added to the survey. This subscale of organizational capabilities utilized a seven—point Likert scale.
Development of the Survey.

A questionnaire was developed to gather data on OCM, division performance, innovation implementation success, innovation problems (resource management and collaborative structure and processes), ambiguity and diffusion of innovation. Historical data was used to obtain additional information on collaborative structures and processes and information regarding organizational climate. Initial versions of the instrument were reviewed and edited by staff in the Corporate Human Resources, Information Technology, and Quality Management Departments. A version of the questionnaire was field-tested using a panel of seven anonymous Human Resource professionals within Hewlett – Packard. The benefit of using these individuals was that they provided support for the different businesses within Hewlett – Packard. Thus, these individuals had an excellent understanding of the amount of time General Managers would be willing to spend on the survey, the content of the questions, and the marketability of the questions. Each reviewer received a brief verbal introduction to the study and was then asked to complete the questionnaire, reacting to its construct and face validity and to its general format, length, and clarity. Specific feedback on individual items was also solicited when the researcher met individually with each reviewer.

Without exception, the reviewers reacted negatively to the length of the questionnaire and suggested possible areas for shortening. The time for completion varied from 30 to 45 minutes. Reviewers felt that thirty minutes maximum was the most amount of time a General Manager would spend on any survey. Several reviewers reacted negatively to measures of human and financial resource
management. This was due to the fact that Hewlett – Packard, at the time of data collection, was going through expense controls. Because the survey was distributed by Corporate Offices, the reviewers felt that the purpose of the survey may be misconstrued and thus, motivate individuals to engage in impression management while completing the survey. As a result, these questions were revised. Thus, in order to facilitate the gathering of responses, scales were altered.

Reviewer suggestions on the clarity and redundancy of specific items were incorporated into the final version of the questionnaire shown in Appendix B. Comments on the Organization Capability Management scale were particularly useful since this subscale was newly developed by the author.

The final version of the instrument shown in Appendix B consisted of six sections with 70 questions as follows:

Section I: Demographic Questions (7 questions)
Section II: Structure/Processes Questions (2 questions)
Section III: Resource Management (2 questions)
Section IV: Innovation and Innovation Implementation Effectiveness (7 questions)
Section V: Organizational Capability Management (46 questions)
Section VI: Division performance (6 questions)
4.3 DEPENDENT MEASURES.

Innovation Implementation Effectiveness.

There is not a great deal of research to indicate how to assess innovation implementation success. Klein and Sorra (1996) argue that this construct can be measured by assessing the fit of the innovation with the goals of the firm. Following Klein and Sorra’s (1996) suggestion, this paper uses a two-item measure of innovation implementation effectiveness: a) *To what extent does the management innovation serve its purpose to date?* and b) *To what extent does the use of the management innovation fit the goals of the entity?*

Division performance. The primary distinction to be made among many measures of division performance is between measures of accounting and economic profits (Huselid, 1995). Economic profits represent the net cash flows that accrue to shareholders. Account profits differ from economic profits as a result of timing issues and choice of accounting method. Economic profits are forward-looking and reflect the market’s perception of both potential and current profitability but accounting data reflect a historical perspective. Economic measures of performance, today are often preferred to accounting measures at the corporate level. However, at the business level, obtaining such data can be quite difficult (Becker & Gerhart, 1996). Because error in obtaining these measures is smaller at the business level and because they are more readily available to general managers, these measures were used in this study. Such measures are beneficial since, from a human resource perspective, they are used

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9 Twenty-three questions concerning organizational capability management were questions about OCM that were specific to the innovation. Thus, it was not expected that all items listed would apply.
to allocate resources, and do provide relevant information needed by business
managers.

Three accounting measures of division performance were asked in this study:

a) What was the entity’s net profit margin from your key, primary products for FY
97?, b) What was your ROA for FY 97, c) What was your percentage increase in net
revenue for FY97?

Economic measures were also used. Three questions were asked:  a) What was
the expected market share for your key, primary products at the beginning of FY 97? ,
b) What was your realized market share for your key, primary products at the end of
FY 97?, and c) What would be the market value of this entity if it were sold today?
The difference between questions a and b for the economic measures was used to
provide a change in market value.

4.4 INDEPENDENT MEASURES.

Organizational Capability Management as a Mediator.

As mentioned earlier, subjects were asked to indicate how effective their
entity is at managing the five (customer service orientation, time to market,
organizational development, cost effectiveness, and individual risk -- taking)
organizational capabilities. Respondents were also asked to indicate the capabilities
which were important for the implementation of management innovations and
indicate the impact those capabilities had on the implementation of stated management
innovations.
Resource Management.

To assess this innovation problem two measures of slack were used. The first measure focused on human resource slack and asked respondents: "Assume that due to some sudden development, 10% of the time of all people working in your entity has to be spent on work unconnected with the tasks and responsibilities of your entity. How seriously will this affect your entity's ability to meet its business goals and commitments over the next year?" Respondents were asked to choose one option from a four point Likert scale, which ranged from: 1) It would make it impossible to 4) We're pretty flexible, we could probably absorb this.

The second measure focused on financial slack and asked respondents to: "Assume that due to some similar development, your entity's annual budget is reduced by 10%. How seriously will this affect your entity's ability to meet its business goals and commitments over the next year?" Respondents were asked to choose one option from a four point Likert scale, which ranged from 1) It would make it impossible to 4) We're pretty flexible, we could probably absorb this.

The third measure focused on the impact of the reporting relationship of HR Managers and its effectiveness on a general manager’s business. Respondents were asked to choose one option from the following: positive, negative, no impact, or other.

Structure and Collaborative Processes.

To measure concerns related to structure, subjects were asked if "The HR management support function reports directly to you?" and to indicate "What impact do you think this reporting structure has on the effectiveness of the business?" This
response required participants to choose from choices including positive, negative, no impact, and other.

Collaborative processes were assessed using archival data from HP’s employee survey. An aggregate measure of the entity’s relationship management was assessed using four items: 
a) The communication processes at my entity are working well, b) Relationships between individuals of different races or ethnic backgrounds are usually good at my entity, c) There is good cooperation between my department and other departments in my entity, and d) My work group functions effectively as a team. 
These items were assessed on a 5 - point Likert scale ranging from 1) disagree to 5) agree.

Climate.

Organizational climate was assessed using archival data from HP’s employee survey. An aggregate measure of the entity’s perceptions of the HP way was used. Six questions were used to assess climate issues: 
a) Management in my entity creates an environment where we have trust and respect for individuals, b) Management in my entity creates an environment where we focus on a high level of achievement and contribution, c) Management in my entity creates an environment where we conduct our business with uncompromising integrity, d) Management in my entity creates an environment where we achieve our common objectives through teamwork, e) Management in my entity creates an environment where we encourage flexibility and innovation, f) The HP way is working as intended in my entity. These items were assessed on a 5 - point Likert scale ranging from 1) disagree to 5) agree.
Ambiguity.

To measure ambiguity, three ad hoc measures were added to the study. These include: a) To what extent are the goals of the management innovation clearly defined and measurable, b) To what extent are the expected returns from the management innovation clearly defined and measurable, and c) To what extent are the expected reactions from the market concerning the management innovation clearly defined and measurable? These items were assessed using a 5-point Likert scale with measures ranging from 1) to a great extent to 5) to no extent. Low scores indicate greater levels of ambiguity.

These items were used to reflect the level of ambiguity regarding the expectations of the management innovation, the perceived outcomes of the management innovation, and the perceived value of the innovation by customers.

Diffusion of Innovation.

To measure the diffusion of innovation, this study adopted the method used by Abrahamson and Rosenkopf (1993). That is, diffusion is measured by \( B(i,k) + I(i) + A(i)*n(k-1) \), where \( B \) is a composite of the firm's bandwagon assessment of the innovation. \( I(i) \) and \( A(i) \) denote the individual's assessment and the ambiguity about the innovation respectively, and \( n \) is the total number of adopters.

4.5 CONTROL VARIABLES

Firm Size.

Firm size may effect innovation implementation success. Smaller entities may have less structure and process, and have smaller "innovation problems" than larger entities. As a result, there may be a difference regarding the ability to implement new
innovations. Since firm size has a major impact on processes and structure, it is included in the regression. Firm size is measured using number of employees.

Years as General Manager.

Some general managers may be more successful because they have had more experience in managing the entity. As a result, years as GM in the entity in question was used.

Industry.

Industry could also impact findings. The entities in the computer organization operate in a market that is more volatile than the measurement organization. Further, entities in the computer organization have a shorter history in this industry, and greater competition. Those entities in the measurement organization operate in industries that tend to be more stable, and where HP's name as a quality provider of goods and services is well recognized. Industry is measured by whether entities are located in the measurement or computer organization.
4.6 PROCEDURES FOR ADMINISTRATION OF THE QUESTIONNAIRE IN THE CURRENT STUDY.

The Executive Compensation department at the Corporate Headquarters in Palo Alto generated a list of General Managers and Human Resource Managers within the business unit. A letter, requesting the participation of each General Manager, signed by the Principal Investigator, and Hewlett-Packard sponsors; as well as the survey were sent via interoffice mail. The cover letter shown in Appendix A was personally addressed and hand carried along with questionnaire. Individuals were requested to fax or return the survey via interoffice mail. Respondents used both methods. Two weeks prior to the due date, a general message was sent via voicemail to all General Managers in order to increase the number of participants. Human Resource Managers were contacted and asked to “assist” General Managers in their endeavor to complete the survey. Throughout the entire procedure, confidentiality of response was stressed.

4.7 USE OF ARCHIVAL DATA.

The use of archival data is an unobtrusive data collection technique. The review of available documents and records can provide insight into the behavior of an organizational system. These “traces” of a system’s behavior can lead to modifications in previous understandings of the system, or they can introduce completely new topics and processes for consideration. One disadvantage of archival data is that it often contains a great deal of information not directly related to the constructs of interest. Despite this disadvantage, Webb and Weick (1979) recommend that unobtrusive measures, such as archival data, be regularly incorporated into the research of
organizational questions. Archival data assist in triangulation by providing documentation of the history and maturation of organizational systems. Archival data allow cross-sectional data collected by other methods to be placed in a longitudinal context. Additionally, archival data can corroborate or refute subjective data collected through interviews and questionnaires. They allow one to see data that may have been missed by using cross-sectional data alone.

Employees from each business unit completed an employee survey every year. These data have several factors: 1) entity management, 2) supervision, 3) communications, 4) relationships, 5) work environment, 6) performance, 7) development, 8) promotions, 9) recognition, 10) job, 11) corporate management, 12) pay, 13) benefits, 14) quality 15) diversity, and 16) HP way. These data were collected for each business unit for the past two years, and were used to measure the innovation problems mentioned in chapter one.

4.8 STATISTICAL PROCEDURES.

The archival data and data from the survey were coded, and entered into Systat computer program for analysis. Despite the fact that this research focus is new, stringent criteria were set for all hypotheses. Thus, coefficient alphas for each hypothesis were tested at the .05 level.

To reduce interpretational confounding, a confirmatory factor analysis (CFA) to determine item factor structure was performed. The measurement model assessed whether all proposed items for each subscale correspond to the same latent factor - OCM. Items that reflected a common construct were aggregated. Thus, factor analysis was performed and the reliability coefficient was calculated for each factor of
the OCM scale. Raw score means, standard deviations and Pearson product–moment correlations will constitute the descriptive statistics.

A key question is to determine whether dimensionality of OCM obtained via the factor analysis represents a useful way to understand OCM or if a simpler model is necessary. Even if the CFA produced the five factor model via qualitative analyses (explained in chapter 3), it is possible that not all factors are indicators of implementation success. Thus using stepwise regression, the factors obtained in the CFA and a summated OCM scale will be regressed against innovation implementation success.

Covariance Structure Modeling (RAMONA) using ordinary least squares (OLS) was used to test the hypothesized model. OLS is beneficial because it is used to test models with small samples. To measure the fit of the model, the root–mean–square error of approximation (RMSEA) will be used, and RMSEA will be set at .05 for a statistically acceptable measure of fit. Some authors have expressed concerns over using Covariance Structure Modeling with small sample sizes. When small samples sizes are accompanied by departures from multivariate normality, it leads to underestimates of fit statistics. In such situations, a model that fits the data well can fit the data better only if a larger sample size is used. This concern does not seem to be relevant when a model that is based on a small sample size fits the data well. Bentler and Chou (1987) argue that the minimum sample size depends on model complexity. Likewise, MacCallum (1997) argues that the way to test the power of CSM analyses with small samples is to compare this model with alternative models using a cross-validation index such as ECVI for model comparison. This is especially useful under
small N conditions, because it provides information on the degree to which solutions for different models will generalize to the population. Thus, power will be assessed via comparison analysis with other models.
<table>
<thead>
<tr>
<th>GROUP</th>
<th>PRODUCTS/SERVICES</th>
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<tr>
<td>Chemical Analysis Group</td>
<td>Gas – Chromatography Systems</td>
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<td>Liquid – Chromatography Systems</td>
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<td>Benchtop Mass – Spectometry Systems</td>
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<tr>
<td>Components Group</td>
<td>LED lamps and displays</td>
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<td>LEDs for Automotive Exterior Lighting</td>
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<td></td>
<td>Fiber Optic Communications Transceiver Modules</td>
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<td>Consumer Products Group</td>
<td>Inkjet/Color/ Printers</td>
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<td>Home Photo Scanners</td>
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<td>Photo Quality Printers</td>
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<td>Enterprise Systems Group</td>
<td>Commerical RISC/UNIX Systems</td>
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<td>Laserjet Solutions Group</td>
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<td>Desktop and Network Scanners</td>
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<td>Network Printer – Management Software</td>
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<td>Medical Products</td>
<td>Acute Patient – Care Monitoring Systems</td>
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<td>Cardiovascular Ultrasound Imaging Systems</td>
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<td>Clinical Information Systems</td>
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<td>Desktop Personal Computers</td>
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<td>Notebooks</td>
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<td>Software and Services Group</td>
<td>Intel – Based Server and Network Hardware Support</td>
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<td>External Consulting Services</td>
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<tr>
<td>Test and Measurement Group</td>
<td>Spectrum Analyzers</td>
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<tr>
<td></td>
<td>Cesium (Atomic) Clocks</td>
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<tr>
<td></td>
<td>Semiconductor Process – Control Test Equipment</td>
</tr>
</tbody>
</table>

TABLE 4.1: Hewlett – Packard Company Group and Their Products and Services

10 HP has over 29,000 products.
<table>
<thead>
<tr>
<th>Customer Service Orientation</th>
<th>Time to market</th>
<th>Organizational Development</th>
<th>Cost Effectiveness</th>
<th>Individual risk - taking</th>
</tr>
</thead>
</table>
| • Knowledgeable about customer needs | • Constant reevaluation of market demands  
• Adaptable to market fluctuations  
• Maintenance of an efficient product generation process  
• Capability to Reduce/maintain time to market/Increase speed  
• Management of acquisitions/Interorganizational relationships | • Strategic planning/management of objectives  
• Team building/employee collaboration  
• Leadership development  
• Total quality improvement  
• Trust enhancement  
• Information-sharing/communication  
• Employee commitment | • Effective management of costs to customers  
• Effective management of costs of internal operations | • Willingness to take risks  
• Capable operation in areas of uncertainty  
• Employee acceptance of change  
• Promotion of long-term, short-term research.  
• Participatory Management |

Table 4.2 Organizational Capability Management Variables
CHAPTER 5

RESULTS

5.1 DESCRIPTIVE STATISTICS

Descriptive statistics for company characteristics are presented in Table 5.1. The average number of employees for a division at HP was approximately 749 employees. Although the range of general manager experience ranged from 2 months to 11 years, the average general manager had 4 years experience. The average business studied had been in operation for 9 years.

Table 5.2 lists the industry characteristics in which each business operates. The majority of businesses surveyed operated in the United States (82%). Other business operation locations included the United Kingdom, Singapore, Germany, Italy, Spain, Australia, and Mexico. Most businesses (62.5%) belonged to the HP’s Computer organization as opposed to the Measurement Organization (35.7%) or Corporate (1.9%). Table 5.2 also lists the specific businesses in which the respondents operated. Table 5.3 lists the various management innovations implemented by each respondent. There was no distinct type of management innovation used by an organization, industry or business size. However, examples of innovation ranged from use of work teams to organizational restructuring.
5.2 FACTOR ANALYSIS

Confirmatory factor analysis (CFA) using the principal components method with oblique rotation was performed on the OCM scale. The analyses produced five subscales. Those subscales and their factor loadings are listed in Table 5.4. Eigenvalues are listed in Table 5.5. Using a 30% proportion criterion, the analysis showed that the items loaded on just one factor per subscale.\(^{11}\) The results of the factor analysis support a five-factor model. However, the five factor model was different than expected (see chapter 3 for list of expected relationships). Table 5.4 shows five factors and item loadings.

A key question is whether the proposed five factors model of OCM (customer orientation, time to market, individual risk-taking, organizational development, cost effectiveness) is more useful for understanding the success of innovation implementation success than simpler measures. To test this question, the five factors were regressed against innovation implementation success.

Two separate multivariate regressions were performed for innovation implementation success. In the first regression, OCM is unidimensional; it consists of an equal-weighted sum of all the 23 items. In the second regression, the five factors were regressed against innovation implementation success using stepwise regression. Table 5.6 presents the results of the regression coefficient for the unidimensional model. The tests for the unidimensional OCM factor is positive (\(\beta = .57, t = 5.05, p<\)

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\(^{11}\) One of the items in the organizational development factor loaded on both the Time to market and the Cost effectiveness factor. As a result, this item was eliminated from the model.
and significant. It can be concluded that OCM is a significant contributor to innovation implementation success ($R^2 = .32$).

However, a multidimensional framework provided a more detailed view of the OCM's relationship on innovation implementation success. The stepwise regression in Table 5.6 indicates three factors of OCM (Customer: $\beta = .69$, $t = 30.80$, $p < .0001$; Cost effectiveness: $\beta = .25$, $t = 3.30$, $p < .05$; Time to Market: $\beta = .21$, $t = 2.21$, $p < .07$) influenced innovation implementation success. This model better explains the variation in innovation implementation success than the unidimensional model ($R^2 = .53$) and provides more detail regarding the factors which define OCM. As a result of these findings, the Organizational Development and Risk-taking factors were eliminated from the model.

### 5.3 THE MODEL

Means, standard deviations, and person zero-order correlations of the manifest variables of the model are presented in Table 5.7. Reliability coefficients for the 3 subscales are placed in parentheses. The Cronbach alpha reliability coefficient for the Customer orientation factor was .90. The coefficient for the Cost effectiveness factor was .91 and the Time-to-Market reliability coefficient was .86. These coefficients were adequate and high in most cases.

Figure 5.1 illustrates the results of the causal model tested. To conduct a causal analysis, RAMONA (Browne & Cudeck, 1993) was used. The model was run

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12 Ambiguity and Diffusion of Innovation, insignificant were excluded from the model. There was a significant improvement in the more parsimonious model, and will be discussed throughout the rest of the model.
on correlational matrices of variables, and depicts OCM as a mediator of the relationship between Innovation Problems and Innovation Implementation Success.

Recall that OCM is also depicted as having an impact on firm performance. The fit indexes for this model depicted in Figure 5.1 indicate this model fits the data quite well (RMSEA = .03; (CI = .00, .07)). It is important to note that while the lower boundary of the confidence interval indicates excellent fit, the upper boundary indicates fair fit (MacCallum, , 1997). Thus, the null hypothesis of no fit can be rejected.

Following the suggestions made by Macallum (1997), alternative models were tested. The first alternative model was the simplest model, which excluded the OCM factor as a mediator between Innovation Problems and Innovation Implementation success. The result of the model indicated a poorer fit (RMSEA = .06). The expected cross-validation index (ECVI) was used to compare the primary model to the alternative model. ECVI is useful, especially when N is small, as it is in the present case. Smaller ECVI scores indicates a better fit. The ECVI for the primary model (ECVI = 3.27) indicates that it represents a marginally superior fit to the model than a model which excludes OCM (ECVI = 3.53).

The second alternative model also excludes OCM, and uses ambiguity and diffusion of innovation as mediators of the innovation problem—innovation implementation success relationship. Analysis of the model resulted in fair fit of the model to the data (RMSEA = .07). As with the first comparison, ECVI was used to assess the superior fit. The primary model resulted in a better fit compared to the
alternative (ECVI = .3.72). It is important to note that both alternative models provide poorer fits, but only marginally so.

5.4 PARAMETERS

Slack

Resource management was regressed on three facets used to measure organizational slack, in order to determine how the specific items contributed to the latent variable. The results reveal that resource management was significantly related to one of the variables. The measure of HR impact on business support served as an indication of overall HR management function. This revealed the strongest relationship ($\beta = .451$, $t = 3.21$, $p < .05$). Both measures of manpower ($\beta = .081$, $t = .68$, $p > .05$) and financial slack ($\beta = .008$, $t = .06$, $p > .05$) were not found to be significant indicators of resource management. Interestingly, this finding is contrary to research by Nohria and Gulati (1996) who found manpower and financial slack to be valid indicators of resource management.

Innovation Problems

The latent variable “innovation problems” was regressed on resource management, collaborative resources and processes, and climate to determine how the specific items contributed to the latent variable. The results reveal that innovation problems was significantly related to each of the three facets of problems: resource management ($\beta = .95$, $t = 2.02$, $p < .05$), collaboration and processes ($\beta = .21$, $t = 1.97$, $p < .05$), climate ($\beta = .26$, $t = 2.04$, $p < .05$). Thus, the global measure of innovation
problems appears to reflect the three problem dimension with resource management revealing the strongest relationship.

**Organizational Capability Management**

The contribution of the 3 specific OCM scales was also examined. The analyses show that all three scales correspond to OCM: (Customer orientation: $\beta = .98, t = 9.86, p<.05$; Cost effectiveness: $\beta = .90, t = 4.20, p<.05$; Time to market: $\beta = .53, t = 1.98, p<.05$). Thus, the global measure of OCM appears to reflect the three knowledge management dimension with all three factors having a strong relationship.

The results provide support for the following conclusions: Resource management reflects the importance of human resource management.

a) The latent variable, Innovation Problems, reflects three sets of innovation problem facets which are resource management, climate, and collaboration and structure.

b) OCM reflects three facets, which are customer orientation, cost effectiveness, and time to market.

**5.5 HYPOTHESES**

**Hypothesis 1**

It was hypothesized that the successful management of OCM would be significantly and positively related to innovation implementation success. Finding from the analysis of the model supported this hypothesis ($\beta = .30, t = 12.30, p< .05$).

Variance could be explained by exogenous demographic variables. Thus, several variables were tested as controls in the event that they might confound the
results. These variables were chosen, in part, because they have been shown to impact performance measures.

An alternative model was used to test the effects of these control variables. The model was similar to the primary model, however innovation implementation success was regressed on the control variables industry, number of employees, and years as general manager which were entered simultaneously into the model. Compared to the primary model, the model with control variables produced a poorer fit to the data (RMSEA = .11, CI (.0001, .145). Further, comparison of the ECVI's for the primary model (ECVI = 3.27) and the control variable model (ECVI 5.70) indicates that the primary model is a significantly better model.

An assessment of the parameters provides more details concerning the causal relationships than an overall analysis of the model. In the control variable model OCM still has a direct and positive effect on innovation implementation success ($\beta = 3.1, t = 24.38, p<.01$). However, industry ($\beta = -.004, t = .008, p>.05$) years as general manager ($\beta = -.01, t=.37, p>.05$), and number of employees ($\beta = .003, t = .08, p>.05$) had no significant impact on innovation implementation success. Thus, according to the primary model OCM is an extremely important contributor to innovation implementation success and accounts for 51% of the variance in innovation implementation success. 13

Hypothesis 2

It was hypothesized that successful OCM is significantly and positively related to firm performance. To test this hypothesis net revenue (the most complete data
available – 28 respondents) was used in the primary model as an indicator of firm performance. Findings from the model did not support this hypothesis (.11, t = .90, p > .05). OCM did not have a direct impact on firm performance. Since OCM does have a strong effect on innovation implementation success, it is uncertain at this point whether it represents at best a mediator between innovation implementation success.

A key problem with this finding is that the data are incomplete. That is, due to concerns regarding confidentiality, only 28 of the respondents provided data on firm performance. As a result, more research is needed to determine the relationship between OCM and firm performance.

Another possible explanation for this relationship is that exogenous variables impact the relationship. Thus, several variables were tested as controls (industry, years as general manager, and number of employees) in the event that they might confound the results. These variables were chosen, in part, because they have been shown to impact performance measures. The alternative model discussed in hypothesis 1 was used to test the effects of these control variables. The model was similar to the primary model; net revenue was regressed on the control variables which were entered simultaneously into the control variable model.

In the control variable model, OCM did not have any effect on firm performance (β = .06, t = .43, p > .05). The impact of industry (β = -.13, t = .61, p > .05) and number of employees (β = -.21, t = .95, p > .05) on firm performance was also found to be insignificant. However, years as general manager did have an impact on net revenue (β = .69, t = 2.61, p < .05). Essentially, as the years of general manager...
experience increased, net revenue also increased. One might conclude that there should be a relationship between OCM and years as general manager. Specifically, those individuals with greater tenure may have more experience with managing OCM, which may explain their financial success. However, an assessment of the correlational matrix for the alternative model indicates years as general manager had no significant relationship with the factors of OCM tested in this model (Customer orientation: \( r = .03 \), Time to market: \( r = .07 \), Cost effectiveness: \( r = -.05 \)). These findings indicate that other factors may contribute to net revenue and that the dimensions of OCM studied in this paper have no significant relationship with firm performance. However, it is important to recall that the data were not complete and additional analyses will be needed to support this finding.

**Hypothesis 3**

The third hypothesis suggests that OCM mediates the relationship between innovation problems (as defined by resource management, collaborative structure and processes, and climate). In order to determine whether OCM mediates the proposed relationship it must be the case that (Baron & Kenny, 1986):

1. The regression of OCM (mediator) on Innovation problems (antecedent) must be significant.
2. The regression of innovation implementation success on OCM must be significant.
3. The relationship between innovation problems and innovation implementation success must not be significant.

The results confirm the first requirement. That is the relationship between innovation problems and OCM is significant (\( \beta = .98, t = 21.03, p < .05 \)). Results also
confirm the second requirement as mentioned earlier, OCM has a direct and positive impact on innovation implementation success ($\beta = .30, t = 12.30, p < .05$). Finally, the relationship between innovation problems and innovation implementation success was found to be insignificant ($\beta = -.34, t = .90, p > .05$). The findings from this study indicate that the effects of innovation problems on innovation implementation success are most likely due to a division's ability to manage its organizational capability.

**Hypothesis 4 and 5.**

Hypothesis four and five were less critical tests, but were added to the original model (see chapter 4) since prior research on innovation found them to be important factors to influence innovation success. Thus, these two hypotheses represent additional tests of control variables. Hypothesis four indicates that OCM mediates the relationship between diffusion of innovation and innovation implementation success. In order for this to occur, the three case scenario described in the previous analyses must hold true. This was not found to be the case in this study since no relationship was found between diffusion of innovation and OCM ($\beta = .12, t = .90, p > .05$). Further, there was no relationship found between ambiguity and OCM ($\beta = .19, t = .68, p > .05$). Thus, there was no indication that OCM mediated the relationship between diffusion of innovation (or ambiguity) and innovation implementation success.

The direct relationship between diffusion and ambiguity on innovation implementation success were also examined since it is part of the three-premise case.
for mediation. These relationships were also found to be insignificant (diffusion of
innovation: $\beta = .02, t = .10, p > .05$; ambiguity: $\beta = .01, t = .06, p > .05$).

**Hypothesis 6**

The final hypothesis suggests that innovation implementation success will have
a direct and positive effect on firm performance. Net revenue was regressed on
innovation implementation success. The findings from the primary model indicate
that this hypothesis can be accepted ($\beta = .85, t = 24.64, p < .05$). However, the findings
indicate that innovation implementation success explained only 10% of the variance in
firm performance. A contributing factor to the low variance explained may be the
number of respondents who reported firm performance data.
<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Employees</td>
<td>60</td>
<td>4000</td>
<td>749</td>
<td>792</td>
</tr>
<tr>
<td>Years as General Manager</td>
<td>2 months</td>
<td>11 years</td>
<td>4.19</td>
<td>3.00</td>
</tr>
<tr>
<td>Entity in Operation</td>
<td>6 months</td>
<td>35 years</td>
<td>8.08</td>
<td>8.81</td>
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Table 5.1 Descriptive Statistics for Demographic Variables
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<tr>
<th>Characteristics</th>
<th># Subjects</th>
<th>%</th>
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</thead>
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<td><strong>ORGANIZATION</strong></td>
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<td></td>
</tr>
<tr>
<td>Computer</td>
<td>35</td>
<td>62.50</td>
</tr>
<tr>
<td>Measurement</td>
<td>20</td>
<td>35.71</td>
</tr>
<tr>
<td>Corporate</td>
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<td>1.79</td>
</tr>
<tr>
<td><strong>GENERAL LOCATION</strong></td>
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<td></td>
</tr>
<tr>
<td>United States</td>
<td>46</td>
<td>82.14</td>
</tr>
<tr>
<td>Other</td>
<td>10</td>
<td>17.86</td>
</tr>
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<td><strong>BUSINESS TYPE</strong></td>
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<td></td>
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<tr>
<td>Test and Measurement</td>
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<td>21.43</td>
</tr>
<tr>
<td>Computer Peripherals</td>
<td>3</td>
<td>5.36</td>
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<tr>
<td>Software Services</td>
<td>13</td>
<td>23.21</td>
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<tr>
<td>Enterprise Systems</td>
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<td>14.28</td>
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<tr>
<td>Product Support</td>
<td>4</td>
<td>7.14</td>
</tr>
<tr>
<td>Measurement Services</td>
<td>4</td>
<td>7.14</td>
</tr>
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<td>Automotive Testing</td>
<td>2</td>
<td>3.56</td>
</tr>
<tr>
<td>Hardware products</td>
<td>1</td>
<td>1.78</td>
</tr>
<tr>
<td>Laserjet Supplies</td>
<td>7</td>
<td>12.50</td>
</tr>
<tr>
<td>Computer Sales and Distribution</td>
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<td>1.78</td>
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<tr>
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<td>1.78</td>
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Table 5.2 Industry Characteristics

N = 56
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<tr>
<th>LOCATION</th>
<th>ORG.</th>
<th>MANAGEMENT INNOVATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>US</td>
<td>MO</td>
<td>Conversion form a 100% custom product to standard product focus</td>
</tr>
<tr>
<td>ITALY</td>
<td>CO</td>
<td>Divestiture of the formatter factory</td>
</tr>
<tr>
<td>AUSTRALIA</td>
<td>MO</td>
<td>Adoption of a centralized and coordinated product planning function including portfolio mapping</td>
</tr>
<tr>
<td>WEST LOTHIAN, UK</td>
<td>MO</td>
<td>Customer care program building customer relationship with installed customers</td>
</tr>
<tr>
<td>US</td>
<td>CO</td>
<td>Distributed work teams/virtual teams</td>
</tr>
<tr>
<td>US</td>
<td>CO</td>
<td>A reorganization to a very strong matrix organization. This includes double solid reporting relationships and leveraged resources.</td>
</tr>
<tr>
<td>SINGAPORE</td>
<td>MO</td>
<td>Partnering with two external companies</td>
</tr>
<tr>
<td>US</td>
<td>CO</td>
<td>Comprehensive dashboard matched to a unique org. Structure</td>
</tr>
<tr>
<td>US</td>
<td>CO</td>
<td>Autonomous teams</td>
</tr>
<tr>
<td>US</td>
<td>MO</td>
<td>Downsized, restructured department</td>
</tr>
<tr>
<td>US</td>
<td>CO</td>
<td>Introduction of program management structure</td>
</tr>
<tr>
<td>US</td>
<td>CO</td>
<td>Launching newly trained sales force for the business</td>
</tr>
<tr>
<td>US</td>
<td>CO</td>
<td>Ability to address new business with a reasonably high degree of independent freedom</td>
</tr>
<tr>
<td>US</td>
<td>CO</td>
<td>Platform development</td>
</tr>
<tr>
<td>US</td>
<td>MO</td>
<td>Processed oriented organization established</td>
</tr>
<tr>
<td>US</td>
<td>MO</td>
<td>New HR reporting device</td>
</tr>
<tr>
<td>US</td>
<td>MO</td>
<td>Developed partnership with another department</td>
</tr>
<tr>
<td>US</td>
<td>CO</td>
<td>Service delivery</td>
</tr>
<tr>
<td>US</td>
<td>MO</td>
<td>New partnership with outside vendor</td>
</tr>
</tbody>
</table>

Table 5.3 Management Innovations Continued
<table>
<thead>
<tr>
<th>LOCATION</th>
<th>ORGANIZATION</th>
<th>MANAGEMENT INNOVATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>US</td>
<td>MO</td>
<td>Dialog training to build strong management team</td>
</tr>
<tr>
<td>US</td>
<td>CO</td>
<td>Continuous inventory replenishment for top distributors</td>
</tr>
<tr>
<td>GUADALAJARA, MEXICO</td>
<td>CO</td>
<td>Opened new business, closed two others</td>
</tr>
<tr>
<td>WALDBRONN, GERMANY</td>
<td>MO</td>
<td>Partnering with two external companies</td>
</tr>
<tr>
<td>US</td>
<td>CO</td>
<td>Comprehensive dashboard matched to a unique org. Structure</td>
</tr>
<tr>
<td>US</td>
<td>CO</td>
<td>Autonomous teams</td>
</tr>
<tr>
<td>US</td>
<td>MO</td>
<td>Sold LMO’S business to Lucent Technology</td>
</tr>
<tr>
<td>US</td>
<td>CORP</td>
<td>Introduction of program management structure</td>
</tr>
<tr>
<td>US</td>
<td>CO</td>
<td>Launching and deploying a dedicated sales force for the business</td>
</tr>
<tr>
<td>US</td>
<td>CO</td>
<td>Ability to address new business with a reasonably high degree of independent freedom</td>
</tr>
<tr>
<td>US</td>
<td>CO</td>
<td>Platform development process</td>
</tr>
<tr>
<td>KOREA</td>
<td>MO</td>
<td>Processed oriented organization established</td>
</tr>
<tr>
<td>US</td>
<td>MO</td>
<td>Sap implementation guide</td>
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<tr>
<td>US</td>
<td>MO</td>
<td>Joint development of a product with another division</td>
</tr>
<tr>
<td>US</td>
<td>CO</td>
<td>Service delivery Unix management</td>
</tr>
<tr>
<td>KOBE, JAPAN</td>
<td>MO</td>
<td>Partnership with US vendors</td>
</tr>
<tr>
<td>US</td>
<td>MO</td>
<td>Alignment of business teams with rest of division</td>
</tr>
<tr>
<td>US</td>
<td>MO</td>
<td>Alignment of target customers, customer road maps, goals and priorities for next 12 months.</td>
</tr>
<tr>
<td>US</td>
<td>MO</td>
<td>Consolidation of service delivery operation from 7 to 1 in the US &amp; 11 to 4 in Europe</td>
</tr>
<tr>
<td>US</td>
<td>CO</td>
<td>Distributed work teams</td>
</tr>
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</table>

Continued
Table 5.3 Management Innovations. Continued.

<table>
<thead>
<tr>
<th>LOCATION</th>
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<th>MANAGEMENT INNOVATIONS</th>
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<tbody>
<tr>
<td>US</td>
<td>CO</td>
<td>Alignment of business teams with rest of division</td>
</tr>
<tr>
<td>US</td>
<td>CO</td>
<td>Alignment of customers, and goals.</td>
</tr>
<tr>
<td>US</td>
<td>CO</td>
<td>Consolidation of service delivery</td>
</tr>
<tr>
<td>US</td>
<td>CO</td>
<td>Distributed work teams</td>
</tr>
<tr>
<td>US</td>
<td>CO</td>
<td>Adoption of a centralized product planning function</td>
</tr>
<tr>
<td>US</td>
<td>CO</td>
<td>Joint development of a product with another division</td>
</tr>
<tr>
<td>US</td>
<td>CO</td>
<td>Service delivery Unix management</td>
</tr>
<tr>
<td>US</td>
<td>CO</td>
<td>Partnership with US and European vendors</td>
</tr>
<tr>
<td>US</td>
<td>CO</td>
<td>Alignment of business teams</td>
</tr>
<tr>
<td>US</td>
<td>CO</td>
<td>Improving customer service</td>
</tr>
<tr>
<td>Adjectives</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>------------------------------------------------</td>
<td>----</td>
<td>-----</td>
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<tr>
<td>CUSTOMER ORIENTATION</td>
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<tr>
<td>Knowledgeable about customer needs</td>
<td>5.21</td>
<td>1.30</td>
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<tr>
<td>Ability to address customer needs in a timely manner</td>
<td>4.86</td>
<td>1.22</td>
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<tr>
<td>Ability to establish close relationships with customers</td>
<td>5.09</td>
<td>1.40</td>
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<td>Customer focus</td>
<td>4.96</td>
<td>0.14</td>
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<tr>
<td>TIME TO MARKET</td>
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<td></td>
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<tr>
<td>Ability to lead market</td>
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<tr>
<td>Ability to maintain an efficient product generation process</td>
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<td>Ability to reduce time to market</td>
<td>4.60</td>
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<td>Ability to increase production speed</td>
<td>4.23</td>
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<td>ORGANIZATION DEVELOPMENT</td>
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<tr>
<td>Ability to manage objectives and engage in strategic planning</td>
<td>4.68</td>
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<tr>
<td>Team – building and collaboration ability</td>
<td>4.89</td>
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<tr>
<td>Leadership ability</td>
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<td>Total quality improvement</td>
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<tr>
<td>Communication capability</td>
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<td>1.37</td>
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<tr>
<td>RISK – TAKING BEHAVIOR</td>
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<tr>
<td>Willingness to take risks</td>
<td>4.71</td>
<td>1.50</td>
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Table 5.4 Organizational Capability Scale Analyses
### Table 5.4 Organizational Capability Scale Analyses. Continued

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<th>Adjectives</th>
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<th>SD</th>
<th>Factor Loading 1</th>
<th>Factor Loading 2</th>
<th>Factor Loading 3</th>
<th>Factor Loading 4</th>
<th>Factor Loading 5</th>
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</thead>
<tbody>
<tr>
<td>Ability to operate in areas of uncertainty</td>
<td>4.61</td>
<td>1.38</td>
<td>.031</td>
<td>300</td>
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<td>.847</td>
<td>.093</td>
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<td>Promotion of long-term research</td>
<td>4.39</td>
<td>1.49</td>
<td>211</td>
<td>.085</td>
<td>.175</td>
<td>.579</td>
<td>.282</td>
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<td>Engagement in participatory management</td>
<td>4.94</td>
<td>1.42</td>
<td>.264</td>
<td>.081</td>
<td>.241</td>
<td>.544</td>
<td>.229</td>
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<td>Management of change</td>
<td>4.62</td>
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<td>252</td>
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<td>.255</td>
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<td>Promotion of innovative behavior</td>
<td>4.91</td>
<td>1.54</td>
<td>.069</td>
<td>293</td>
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<td>.146</td>
<td>.791</td>
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<tr>
<td>Management of costs</td>
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<td>248</td>
<td>.115</td>
<td>.177</td>
<td>.278</td>
<td>.597</td>
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<td>Ability to reduce costs to customers</td>
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<td>.294</td>
<td>.184</td>
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<tr>
<td>Ability to reduce costs of internal operation</td>
<td>4.70</td>
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Table 5.5 Eigenvalues for Organizational Capability Management Subscales

\[ N = 56 \]
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<thead>
<tr>
<th>Variable</th>
<th>Unidimensionality Results</th>
<th>Multidimensionality Results</th>
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<td>Unidimensionality</td>
<td>.57***</td>
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<tr>
<td>Customer Effectiveness</td>
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<td>30.80***</td>
</tr>
<tr>
<td>Cost Effectiveness</td>
<td></td>
<td>3.3 *</td>
</tr>
<tr>
<td>Time to Market</td>
<td></td>
<td>2.21 (a)</td>
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<tr>
<td>$R^2$</td>
<td>.32</td>
<td>.53</td>
</tr>
<tr>
<td>F-test</td>
<td>25.49 (.000)</td>
<td>19.30***</td>
</tr>
</tbody>
</table>

Table 5.6 Results of Regression Analyses for Dimensionality Tests.
N = 56 for both tests
* Marginally significant (p < .07)
* p < .05
*** p < .0001
<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>SD</th>
<th>1.00</th>
<th>2.00</th>
<th>3.00</th>
<th>4.00</th>
<th>5.00</th>
<th>6.00</th>
<th>7.00</th>
<th>8.00</th>
<th>9.00</th>
<th>10.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. HR Impact</td>
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<td></td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>2. Manpower</td>
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<td>0.73</td>
<td>-0.17</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>3. Financial Slack</td>
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<td>0.7</td>
<td>-0.15</td>
<td>0.81**</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>4. Implementation success</td>
<td>4.1</td>
<td>1.16</td>
<td>0.10</td>
<td>-0.04</td>
<td>0.02</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>5. Customer</td>
<td>5.03</td>
<td>1.17</td>
<td>0.28</td>
<td>0.00</td>
<td>0.06</td>
<td>0.70**</td>
<td>(.90)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Time to Market</td>
<td>4.6</td>
<td>1.25</td>
<td>0.23</td>
<td>0.15</td>
<td>0.04</td>
<td>0.38</td>
<td>0.61**</td>
<td>(.84)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Cost</td>
<td>4.75</td>
<td>1.41</td>
<td>0.24</td>
<td>-0.07</td>
<td>0.02</td>
<td>0.49**</td>
<td>0.57**</td>
<td>0.69**</td>
<td>(.91)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Collaboration</td>
<td>2.99</td>
<td>0.56</td>
<td>0.03</td>
<td>0.08</td>
<td>-0.01</td>
<td>0.03</td>
<td>0.16</td>
<td>0.21</td>
<td>-0.10</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Climate</td>
<td>2.95</td>
<td>0.54</td>
<td>-0.04</td>
<td>0.16</td>
<td>-0.02</td>
<td>-0.18</td>
<td>-0.07</td>
<td>0.03</td>
<td>-0.14</td>
<td>0.32</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>10. Net Revenue</td>
<td>0.35</td>
<td>0.57</td>
<td>0.23</td>
<td>-0.07</td>
<td>-0.22</td>
<td>-0.22</td>
<td>-0.15</td>
<td>-0.23</td>
<td>-0.23</td>
<td>0.02</td>
<td>0.21</td>
<td>1.00</td>
</tr>
</tbody>
</table>

Note: Reliability estimates, in parentheses, are coefficient alphas. N = 56 for all variables. ** p < .001 Table 5.7 Means Standard Deviations, Reliabilities, and Correlations
Figure 5.1 Primary Model: OCM as a mediator

*p < .05  * insignificant,  *b* moderately significant, p < .07, ** excluded form tested model
Previous human resource management models of organizational competitiveness have focused on finding the correct combination of HR practices such that they fit firm level strategies (Huselid, 1994). These models more often than not represent "technical human resource management" (Huselid et al., 1997; Welbourne & Andrews, 1996). However these technical HR practices represent the results of institutional pressures, and therefore are not strategic since they do not account for much variance in organizational effectiveness indices such as innovation implementation success and firm performance. In order for the human resource management function to serve as a strategic function, it must improve efficiency or contribute to revenue growth (Becker & Gerhart, 1996). In light of this, researchers have argued for new models of competitiveness that focus on organizational capabilities that enable firms to serve customers better and to differentiate themselves from competitors (Ulrich, 1998).

The present paper has argued for a new model designed to explain the variability in division performance, and in innovation implementation success. More specifically, the model focuses on the management of organizational capability and its impact on innovation implementation success and firm performance. In addition this research wanted to examine empirically whether conceptual research by Ulrich (1998)
and Ulrich and Lake (1990) support the argument that an OCM focused organization leads to superior performance.

6.1 SUMMARY OF FINDINGS

It was hypothesized that organizational capability management would positively and significantly impact innovation implementation success. Results indicate that OCM does have a positive, significant impact on innovation implementation success as measured in this study. That is, it was found that divisions who manage their OCM well have innovations, which serve their purpose effectively and achieve their intended goals. Further, this research demonstrated that successful management of OCM required strong management of organizational capability in the areas of customer knowledge, cost management, and product/service development cycle (time to market). It is not suggested that OCM is the sole determinate of innovation implementation success. Rather, it appears that OCM does explain a significant amount of variance in innovation implementation success. Thus, business units who are able to manage their capability well are more successful at implementing new managerial innovations than those who manage their capability poorly. This finding supports the work by Kanter (1983) who argued that:

The acts of myriad individuals drive the innovating organization. There would be no innovation without someone, somewhere deciding to shape and push an idea until it takes usable form as a new product or management system or work method. And that process of pushing and shaping requires power sources and power skill (p. 209).

Her anecdotal evidence from companies such as Polaroid, General Electric, Hewlett-Packard and Honeywell found that companies who did not manage their capabilities well were not as innovative as other companies and often lost customers. More
innovating companies have knowledge management structures that are horizontal, allow information to flow freely, and, operate in team – oriented environments.

As suggested in chapter one of this paper, the data support the assertion by researchers and practitioners that managers must maintain a capability – based focus. The value of OCM is further realized when one examines the control variables studied in this paper. The size of the organization (that is, the number of employees), general manager experience (tenure as general manager), and industry were examined in this paper. These factors had no impact on the relationship between OCM and managerial innovations.

The implications of these findings is that (regardless of company size, tenure and industry) organizations, who do not specifically use their knowledge of the divisions' customers, organizational costs, and product/service cycle management (time – to – market) effectively will not be successful at implementing managerial innovations. Thus, managers are admonished to use their knowledge of organizational capability to ensure that the implementation of managerial innovations is successful.

The second hypothesis posited that OCM had a positive and significant impact on firm performance. To test this hypothesis net revenue was regressed on OCM. The model tested did not support this hypothesis. A possible reason for the insignificant relationship between OCM and firm performance is that general manager tenure may account for the variance in firm performance. The analysis of the control model indicated that the tenure of the general manager had a direct and positive impact on firm performance. Essentially, more experienced general managers were more effective. This finding is interesting since managerial tenure is often associated
with rigidity in strategy, and thus, lack of strategic change (Boeker, 1997). Previous research suggests that long-tenured managers are less likely to implement innovations. Further, Boeker (1997) argues that organizations with shorter-tenured chief executives may generally be more likely to change strategy, especially when performance of these firms has been poor. Perhaps OCM allows for innovation, but tenure maintains consistency in strategic changes. That is, it is possible that tenure impacts the types of innovations implemented in the organization. Incremental innovations may be more likely in organizations with long-tenured managers, while radical innovations may be more likely in short-tenured managers. Since there was no relationship between the dimensions of OCM and tenure, it is suggested that perhaps other managerial factors such as other dimensions of OCM not tested in this paper may share a relationship between tenure and firm performance.

It was also hypothesized that OCM mediates the relationship between innovation problems and innovation implementation success. This third hypothesis was the principle focus of this paper. Results supported this hypothesis. Innovation problems associated with resource management, collaboration structure and processes, and organizational climate do not have a direct effect on innovation implementation success. That is, these innovation problems are "problematic" when employers fail to manage employee knowledge regarding customers; organizational cost management, and the product/services development cycle. The inability of the division to manage this knowledge results in implementation processes that are not effective for implementing managerial innovations into the division. Work by Dougherty and Hardy (1996) also supports this finding. They propose organizations take a more
last approach to developing an organization wide capability for sustained
innovation by changing the underlying configuration of power, from a personal
network base to an organizational system — base. The present model suggests that all
of the effects of innovation problems on success are caused by OCM, since the direct
relationship between innovation problems and success was found to be insignificant.
However, more research is needed to confirm this finding.

Hypotheses four and five were less critical premises studied in the paper, but
add strong support to OCM as an important predictor of success. Previous research
suggests that diffusion of innovation and ambiguity are critical factors to consider in
innovation implementation. Especially in firms that operate in hypercompetitive
markets, quick adoption of an innovation can serve as a source of competitive
advantage (Kessler and Chakrabarti, 1996). Further, research suggests that ambiguity
matter in the stages of implementation and after implementation has already occurred.
When decisions to adopt the innovation are unclear late in the process it is usually
because economic considerations such as return on investments can not be accurately
measured or can be measured and the lead to negative results (Abrahamson &
Rosenkopf, 1993).

While diffusion of innovation and ambiguity have previously been shown to be
valid predictors of success, this research shows that when OCM is added to the model,
the effects of diffusion of innovation and ambiguity are reduced significantly. Thus, it
is interesting that when OCM is added to the model the influence of ambiguity and
diffusion of innovation decrease significantly.
Finally, the last hypothesis, that innovation implementation success positively and significantly impacts firm performance was supported. This finding supports previous research that suggests that innovations make employees more productive (Amabile, Conti, Coon, Lazenby, & Herron, 1996) and the firm more effective (Dougherty & Hardy, 1996; Lawless & Anderson, 1996; Norhia & Gulati, 1996). Kanter (1995) explains that implementation success leads to high performance because these firms have successfully reacted to changes in the market place. Further, these firms understand where the market is headed, which products and services are going to be desirable, and which geographic territories are the best. Thompson (1995) argues that implementation success leads to better firm performance not only because it increases revenues, profits, and economic value, but because it results in smarter employees and managers, who can use these innovations to improve operating efficiencies, and create more value for customers.

6.2 BENEFITS OF THE RESEARCH

This paper is beneficial to the research on organizational capability and innovation for three important reasons. First, it represents an analysis of two important constructs often studied separately. While many researchers and practitioners have admonished managers of the importance of these factors, their relationship has not been studied in the past. This research assesses the causal relationship between OCM and innovation implementation success.

Second, this research adds to the growing literature in SHRM, that organizational capabilities impact organizational effectiveness. Both conceptual (Ulrich, 1998) and empirical (Huselid et. al., 1997) research suggests that “technical
HRM activities" are not considered strategic and do not have an impact on firm performance, since they are functions of institutional pressures -- governmental regulations, the need to at least maintain competitive parity in the workplace, and professional organizations. Such activities have been standardized because of the pressures by institutions (stakeholders, government regulations, and competition) to conform.

Ulrich (1998), who has done a significant amount of work with HP on capability management, argues that organizational capabilities focus on "processes and practices within a company that enable a company to add value for customers in unique ways" (p. 65). From a human resource standpoint he argues that capabilities should reflect "outcomes" of human resource activities. Instead of focusing on the technical aspects of HR; that is, what human resource does, we should focus on what it delivers. I argue in this paper that the policies and practices, themselves, (because of their standardization) do not serve as a source of competitive advantage. Rather, it is the management of the organization's capability, that is, the outcome of these management practices that is critical. The present paper shows that on particular outcome, OCM is important. This paper argues that the current strategic HR literature still falls short since it continues to focus on HR practices. That is, the literature focuses on what HR does and not what it delivers (Ulrich, 1998).

Third, this research is beneficial because it discusses the "black box" between innovation -- problems and innovation implementation success. Becker and Gerhart (1996) support the relevance of this approach:
Future work on the strategic perspective must elaborate on the black box between a firm's HR system and a firm's bottom line. Unless and until researchers are able to elaborate and test more complete structural models — for example, models including key intervening variables — it will be difficult to rule out causal models that explain observed associations between HR systems and firm performance.... Without intervening variables, one is hard pressed both to explain how HR influences firm performance and to rule out an alternative explanation for an observed HR firm performance link such as reverse causation. (793).

This research addresses the "black box" issue by focusing on the mediation of OCM — management of knowledge — on the relationship between innovation problems and innovation implementation success.

6.3 LIMITATIONS

As in any research, the present work has a number of limitations. First, this is a field study limited to an assessment of one firm. In spite of the fact that this firm uses a decentralized structure and its various businesses compete in many different industries, widespread conclusions can not be proposed. Capabilities used in this study are firm-specific and thus their application as sources of competitive advantage in other firms may be problematic. Extrapolation of the population under study to include other firms and their capabilities and innovations increases the generalizability of the findings. Validation on many different firms in many different industries would be desirable.

Researchers such as Larson (1993) argued that this can be accomplished via empirical analysis of multiple case studies. He suggests that the case survey method is a valid method for identifying and statistically testing patterns across studies. This method is particularly useful when case studies dominate a particular area of research.
(as in the case of organizational capability), when the unit of analysis is the organization or when a broad range of conditions is of interests, and when experimental design is impossible and factors to capture situations relevant to managerial practice. To study OCM in multiple firms, this method can be applied. It requires a group of case studies that are relevant, and a meticulous coding scheme for converting qualitative data into quantitative data. This approach is beneficial since it enables researcher to study more complex phenomenon. In addition, this approach facilitates replication since coding schemes are available to researchers.

Second, the large number of possible variables that could have been included in this study was narrowed by previous research, the exploratory nature of the study, and the sample size. The subset of the variables included represent the initial "best" set for study rather than as the final or exhaustive list. Thus, it is recognized that to fully realize the power of OCM, additional research that includes additional variables is needed. (See section 6.4 "Future Research" for explication of those variables).

Third, this study focuses primarily on key variables at one given point in time. The best way to determine the impact of OCM is to study its effects over time. This will determine not only OCM's power in time of change, as when an innovation is being implemented, but it also determines its power in more stable times. It is possible that OCM is insignificant during more stable periods in the business cycle because it is not needed. That is, OCM may not be needed because "innovation problems" are not problematic. Recall that innovation problems (resource management, collaborative resources and processes, and organizational climate) are often problematic in times of change because they reinforce the status quo. However
in more stable times, reinforcement of current goals and values may be desired. Thus, OCM, as defined in this paper may not account for variability in firm performance during times when change is not prominent.

Fourth, the study relied on self-report data, and thus relied on the recall of general managers and human resource managers to gather data. Research suggests this may have an impact on reliability. Further common method variance is an obvious result of using self-report data only. To reduce the effects of common method variance factor analysis was used to discriminate between the subscales of OCM. Using a minimum eigenvalue criteria five factors emerged. Factor loadings for the most part were matched with the hypothesized factors. However, this may not resolve the problem entirely. Multiple informants, and more objective measures concerning innovation implementation success and firm performance would help further reduce the effects of common method variance.

Fifth, restriction in range may have occurred for several reasons. First, only 56 general managers participated of the entire organization. This may have influenced the analysis, those who participated may have been predisposed to respond. Further, more supportive results would have been found if a larger sample containing multiple organizations was used. If restriction of range occurred it would tend to reduce the variance found. This possibility infers that a sample more representative of the population might have produced stronger results. Restriction in range is also a possible explanation for the lack of significance of the results found for hypothesis 2.

Sixth, while the discrepancy function and the ECVI for model comparison did support the primary model, the findings were not indubitably strong to negate the
possibility of other models. Future research is needed to determine if the primary model better explains the relationship between innovation problems, OCM, implementation success and firm performance than other models that exclude OCM.

Seventh, the fact that OCM did not explain the variance in firm performance is a major limitation of the study. This finding may be a function of the firm performance measure used, the sample size, or an indication that the relationship is more complicated than originally suspected. In addition to using a larger sample size, two important factors should be considered in order to provide a stronger indication of the relationship between OCM and firm performance. First, multiple measures of performance would provide a more thorough knowledge of OCM’s impact of firm performance. Bining and Barret (1989) argue that multiple measures of performance enhance the validity of the relationship. That is, the “performance... in any organization is a cluster of interlocked and covariant behaviors, and this cluster consists of a subset of all possible behaviors necessary for the organization to accomplish its broader goals and objectives (p. 480).” Thus, the measurement of performance can not rest solely on subjective measures. The measures of performance can be clustered into two types: subjective and objective measures of performance. In this method, both tangible and intangible factors of performance are included in the measurement. Further, this method is beneficial from a OCM perspective (which is multidimensional in nature), since it provides a measurement of differences regarding the factors that a measure of OCM impacts. Becker and Gerhart (1996) suggest that since capital market measures of performance are not available at the business unit level, measures such as growth, market share and profits are available and should be
used. Unfortunately, because of the sample size and thus the need to study a parsimonious model, one measure of firm performance was measured – net revenue. In order to determine whether OCM does impact firm performance better, more complete measures of firm performance must be used.

Second, the insignificant relationship between OCM and firm performance may indicate that the relationship between OCM and firm performance is more complicated than originally realized. That is, the OCM – firm performance relationship may be moderated by another factor. Dougherty and Hardy (1996) excluded the assessment of OCM in their study of innovation problems. However, their study consisted of mature firms operating in a variety of industries (e.g. chemical, packaged goods, paper, machinery, and office equipment to name a few). For the most part, the industry suggests environments that are stable. Given this environment, it is uncertain whether OCM is a necessary predictor of firm performance. Perhaps the value of OCM as described here is necessary in turbulent environments. In short, the impact of OCM on firm performance may depend on the turbulence of the environment in which the firm operates. OCM may be more effective in more turbulent environments (those participants in the computer organization at HP) and may not be effective in more stable environments (those participants in the measurement organization).

Finally, sample size had a major impact on this study. The sample size was obviously too small. A larger sample would help provide more conclusive information regarding the (lack of) support for the model and the individual parameters.
As with many studies, methodological limitations ensue. However, it is the argument of this paper that even in this early attempt to focus on the relationships described above, attempts to analyze these important relationships lead to better understanding, suggestions of improved methodologies, and future attempts to address the influence of organizational capability management.

6.4 FUTURE RESEARCH

The results from this paper support the argument that a capability approach to management has a positive impact on innovation implementation success. Nevertheless, scholars have little understanding of the processes required to realize this potential or conditions under which the potential is realized. These issues are important for future research to address.

Future research should address the data collection problems by focusing on longitudinal data of OCM, innovation implementation success, and firm performance. This technique would help correct biases described here and develop plausible estimates of the impact of organizational capability management. Discussions of OCM often focus its role in times of change (e.g., Ulrich & Wiersema, 1989). Thus, an important topic for future research is the function of OCM in times of change and throughout an organization’s entire business cycle. Punctuated equilibrium models (Gersick, 1991) dominate current thinking about environmental change, suggesting that revolutionary transformations interrupt eras of incremental change. Future research should address the role of OCM during times of radical change and more stable times. Key questions should address when OCM is most effective and if there are times when a “technical HRM policy focus” is sufficient. An example of the
importance of this research comes from the most recent and dramatic separation of HP's computer organization and measurement organization (where HP will maintain control of the computer organization, but the measurement organization will become a new organization.) This represents a major revolutionary transformation. Longitudinal data could support one of two possible explanations for the role of OCM in this transformation. The first explanation suggests that OCM represents higher order capabilities. Collis (1994) refers to these as “meta – capabilities and describes these capabilities as follows”:

The capability that wins tomorrow is the capability to develop the capability to develop the capability that innovates faster (or better), and so on. These capabilities might include the flexibility to shift between capabilities more efficiently or faster than competitors… or the ability to respond to or initiate radical change… Or perhaps it is just the capability to innovate the innovation that innovates the innovation that innovates … and so on ad infinitum. (p. 148.)

Collis (1994) argues that these higher – order capabilities allow firms to overcome the path dependence that led to the inimitability of the lower – order capabilities. In HP's case, OCM explains the split – up of the organization. That is, it was OCM that eliminated the normal methods by which HP often handled competition and developed a new (and approved method by stockholders (Orshal, 1999)) strategy for enhancing organizational performance.

The second possible explanation for the role of OCM is that the capabilities defined in this study become obsolete, having no impact on organizational effectiveness. Collis (1994) admonishes managers and researchers of an interesting concept regarding organizational capabilities. Specifically, OCM that generates a
competitive advantage today may not be sustained (even if that OCM is inimitable). Erosion of OCM as firms adapt to external competition, replacement by different OCM's, and being surpassed by a different capability makes the current OCM obsolete over time:

Even if every one of those capabilities is itself inimitable, the risk to a market leader is that a competitor will invalidate its current source of competitiveness by pursuing a substitute capability. Organization capabilities are peculiarly vulnerable to this threat because their variety is almost infinite.

In short, HP's split may be explained by the fact that current managerial approach to the organization's capabilities was unsuccessful and new capabilities developed by the split of the organization were needed. Thus, the key to sustainability was limited in duration.

The elimination of OCM's power in HP may also be explained by the fact that it inhibited the firm's ability to adapt to environmental changes. OCM may have been so causally ambiguous that no one, except possibly the firm itself tacitly, understood the causes of its capability. Thus, no one really understood or could articulate what specific factors make OCM the key to sustainability.

As a result, any explanation of competitive advantage can not be assessed within the present time only. Therefore, the current emphasis of OCM is not the end of the search for sources of sustained competitive advantage. In short, longitudinal study of the effects of OCM overtime would provide detailed answers to questions associated with the power of OCM.
To better understand the impact of OCM on innovation implementation success and firm performance, future research should include technical HRM practices in the model equation. It has been the argument of this paper that technical HRM practices do not explain the variation in organizational performance. This is explained by the fact that institutional pressures have regulated technical HRM practices to an extent where there has been very little variability in such practices. This is most evident at the business unit level, as demonstrated in the anecdotal evidence provided by this paper. Pete Peterson, the Vice-President of HR at the time made major changes to improve the HR function, consolidated HR operations. The HR department has incorporated most HR functions into one regionalized center, which is where more than 80% of the respondents from this study obtain their HR services called the Bay Area Personnel Services (BAPS) Regional Center. The regionalized HR services includes technical activities such as records, benefits and staffing (including recruitment and selection processes), and organizational activities such as employee relations issues and organizational design projects.

However, while the anecdotal evidence provides support for minimal variability in technical HRM practices, empirical data are needed to substantiate this premise. The HRM role on organizational effectiveness is a result of four factors: technical HRM practices, OCM, the interaction of technical HRM practices, and the interaction of technical HRM practices and OCM. Most research in SHRM focuses on technical HRM practices and their interaction. However, when assessing the influence of these factors on effectiveness using VRIO framework (Barney, 1991), one realizes that a technical HRM-based approach to SHRM simply addresses the issue of
value (or competitive parity) and fails to serve as a source of competitive advantage or sustained competitive advantage because they are not rare and can be imitated by other firms.¹⁴

When the VRIO framework is used to assess OCM as a source of competitive advantage, one notices that OCM is the factor that truly explains the variance in organizational effectiveness. It can serve as a source of value because it can enable the firm to use firm-specific know-how to effectively react to and create change in the organization. OCM also has the potential to be rare because it represents the firm’s ability to establish internal structures and processes that create firm-specific competencies (Ulrich and Wiersema, 1989). Finally, because OCM represents capabilities that are accumulated over time, it lends itself to imperfect imitation by other firms. Its inimitability is also explained by the fact that OCM is often causally ambiguous, since it resides in the network of employee relations, is embedded in internal processes, and is a complement to other types of capabilities such as physical capabilities. Thus, future research should empirically examine the impact of technical HRM practices and OCM on performance indices such as innovation implementation success and firm performance. Such an analysis could include a comparison of the primary model discussed in this paper and an alternative model, which includes a direct impact of technical HRM practices on performance.

Additional variables should also be considered in this study. For example, some researchers have suggested that OCM is a function of organizational learning.

¹¹ There may be some variability in the method of technical HRM capabilities used, but by and large the many practices we teach in our classes are taught because these are common HR practices in the work
and communication network management (Marino, 1996; Stalk et. al., 1992). By definition, OCM is the ability to manage knowledge in the organization. I have discussed knowledge management from a practical sense, focusing on key capability areas of one organization. However, researchers have argued that a key component of OCM is organizational learning. Many firms realize that if they are going to be successful in the long term, they need to find effective ways of developing or unlocking the intellectual capabilities of their employees. Organizational capability management requires the constant update of capabilities, or constant organizational learning. Organizational learning is the capacity within an organization to maintain or improve performance based on experience (DiBella, Nevis, & Gould, 1996). It is so important that it has been suggested that the rate at which individuals in organizations learn may be the only source of competitive advantage, especially for knowledge intensive industries (Stata, 1989). Without the constant assessment of capabilities, the value of existing knowledge may decay (Diecrix & Cool, 1989), negatively impacting the ability of firms, not only to develop new innovations, but to complement existing innovations as well. Further, research indicates that organizational learning impacts the ability to evaluate technological and commercial potential knowledge in a particular domain, assimilate it, and apply it to commercial ends (Cohen & Levinthal, 1994).

Much of the research in the organizational science literature divides organizational learning into two types. The first is single-loop learning, which Argyris
and Schon (1978) labeled an adaptive learning or exploitation. The second type of learning is double-loop learning, which involves learning to innovate. That is, it requires that learning challenge deep-rooted assumptions and norms within an organization. Stein and Vandenbosch (1996) argue that the former is most likely to occur in organizations because it implies that basic routines remain apt. Double-loop learning is more riskier, since the benefits from this type of learning are more uncertain. An organization that promotes double-loop learning provides opportunities for different solutions to problems, but new ideas, new markets, practices, and products have greater uncertainty in their outcomes than single-loop learning. Research suggests that this type of learning is beneficial because it promotes innovative thinking (Stein & Vandenbosch, 1996). Therefore, it is suggested that organizational learning through a double-loop process will facilitate the innovative process, since individuals will be more willing to engage in new ideas (DiBella, et. al., 1996). Thus, OCM may lead to a double-loop learning process essential for developing new ideas, while "technical HRM practices and policies, designed to address the status quo may support a single-loop learning processes. This concept would suggest that OCM and "technical HRM practices and policies" can operate simultaneously, with OCM having more power when change is needed and technical HRM practices being beneficial during more stable times.

The communication process is key to innovation implementation success because it is based on the interaction of individuals involved in the process. (Burkhardt & Brass, 1990; Roberston, Swan, & Newell, 1996). Communication networks require the management of interpersonal interactions, since organizations
engage in the exchange of knowledge, expertise, and information. That is, it requires an understanding of areas where communication is weak and need increased interpersonal action for successful innovation implementation. In research by Dougherty and Hardy (1996), it was found that communication processes that did not promote participation, problem-solving, and the kinds of decisions necessary for innovation impacted the success of innovation. In cases where there was no working way to manage the "white space", that is bring different groups together, people had difficulty collaborating and this negatively impacted the diffusion of innovative ideas within the organization. The ability of the communication process to facilitate the implementation of an innovation requires the management of organizational capabilities. This requires an understanding of which groups, divisions, and units are sharing information. If there is a lack of information sharing, an understanding of how this may affect the communication networks within the organization is needed.

Managing the communication networks requires the understanding of how innovation is currently communicated throughout the organization, what current situations will negatively affect new implementation processes, and what can be done to remedy these problems. Further, it requires the development of formalized processes to clearly convey to employees the norms, values and integrity of the organization. Future research should examine the communication networks of firms that manage OC well and poorly. Research questions should address whether firms with strong OCM promote participation and problem-solving (as suggested by Dougherty and Hardy, 1996). Further, researchers should examine the communication network management techniques used. Do successful firms rely on GroupWare or do these firms have
selection practices and motivation practices that support information sharing, such as a team mental model? Future research should determine the benefits and disadvantages of these techniques from a capability based focus.

Another important variable that should be considered for study in conjunction with OCM is the effectiveness of the leader. The leadership literature provides evidence that some leaders are more effective for more change oriented environments than others. Strong leaders articulate direction and save the organization from change via drift (Kanter, 1983). They create a vision of a possible future that allows themselves and others to see more clearly the steps to take, and the need to build on present capabilities and strengths. Kanter (1983) argues that if leaders of an organization are not able to build on a set of innovations, then it is likely that the innovations will drift away. Or that so many kinds of innovations will float by that none of them will even gain the momentum and force to take hold.

The present research also provided support for the role of the leader. Essentially, tenure or years as general manager had a greater impact on firm performance than did OCM. Further, tenure was not correlated with the manifest variables of OCM suggesting that the role of the leader and his or her influence over OCM may be an important aspect that future research should consider. Given the importance of leadership to organizational effectiveness, future SHRM research should address the role of leaders from a capability based approach. Ulrich and Lake (1991) argue that organizational capability represents the manager's proficiency in understanding principles and applying processes consistent with principles for managing people for competitive advantage (p. 81). The importance placed on
managers suggests that effectiveness may be explained by the interaction of leadership and OCM.

An important question is what type of leader is capable of managing change through OCM. Research suggests that transformational leaders, who are also charismatic, may serve as strong managers of change since they have a high degree of self-confidence, are risk-seeking, persistent, intellectually stimulating, and visionary (Bass, 1985). These leaders are beneficial because they use these traits and behaviors to influence and motivate followers by inspiring a shared vision, and building subordinate confidence and trust (Yammarino & Bass, 1990). In addition, Howell and Aviolo (1993) found that transformational leaders impacted unit performance to the extent that leaders supported innovative behavior. Thus, future research should consider the characteristics of the leader as a key moderator between the relationship between OCM and innovation implementation success.

6.5 CONCLUSION

In conclusion, this research calls attention to the importance and the benefit of an organizational capability management focus in organizations. This research is designed to redirect the focus of SHRM from a “function-based focus” to a capability-based focus. That is, this research addressed the concerns of SHRM by focusing on the firm’s organizational capability management potential (OCM, which, in short represents the ability to manage knowledge in the organization) – the outcomes and processes derived from HR practices (Ulrich, 1998). Further this research addressed the ability of SHRM to predict performance of firms engaged in
change strategies by focusing on the importance of innovation implementation success.

This study indicates that OCM mediates the relationship between innovation problems and innovation implementation success, but consideration needs to be given to its impact on firm performance. If OCM is as important to the success of the organization its positive effect on firm performance is critical. However, this research does suggest that a capability – based approach to knowledge management is critical for managing organizational change through managerial innovations.
LIST OF REFERENCES


MacCallum, R. (1997). Covariance structure modeling. The Ohio State University, Columbus, Ohio 43210.


Maritan, C. A. (in press). The process of investing in capabilities. Purdue University, Lafayette, IN.


APPENDIX A

LETTER TO GENERAL MANAGERS
August 4, 1998

Dear HP General Manager,-

The Ohio State University, sponsored by representatives of the HR, IT and Quality functions within HP, is conducting a study to determine the impact of organizational capability management on the successful implementation of management innovations. Please assist in this endeavor by spending 30 minutes of your valuable time to provide input into a research project which we believe will help FT understand the factors that contribute to (or hinder) successful management innovation. Please note that all information kept confidential. Participants will receive a management summary of the findings, as well as the opportunity to discuss the results in detail with the Principal Investigator. Please complete the survey and forward it via interoffice mail to Maria Gresham, MS 20AF or fax the completed survey to telnet 852 - 8469. If you have any questions regarding the details of this project, please feel free to contact Maria Gresham at telnet 236 - 5178 or by email.

Thank you very much for your assistance. It is greatly appreciated.

Sincerely,

Maria T. Gresham
Principal Investigator
The Ohio State University
Global Human Resources Reporting
Hewlett - Packard Co.

Internal sponsors:
Sally Dudley
Human Resources
Chuck Sieloff
Information Technology
Michael Ward
Quality
Total Compensation and Knowledge Management
Systems,
US HR Function Service Delivery

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Name: ____________________________________________

Entity/Organization Name: ____________________________________________

Of Which Organization are you a Member (e.g. CO, MO)? ____________

# Of Employees: ______________#

# Of Years as General Manager: ______________#

# Of Years that your Entity has been in operation: ______________#

1. Does the HR management support person (or people), who support your business report directly to you?
Yes __________
No __________ If not, where do they report?

2. What impact do you think this reporting relationship has on the effectiveness of your business? Check one.
Positive __________
Negative __________
No Impact __________
Other __________ please explain:

3. Assume that due to some sudden development, 10% of the time of all people working in your entity has to be spent on work unconnected with the tasks and responsibilities of your entity. How seriously will this affect your ability to meet your business goals and commitments over the next year? (Choose one).

It would make it impossible __________
We could only meet the top priority goals and commitments __________
We could probably meet most of
4. Assume that due to a similar development your entity's annual operating budget is reduced by 10%; how seriously will this affect your ability to meet your business goals and commitments over the next year? (Choose one).

- It would make it impossible
- We could only meet the top priority goals and commitments
- We could probably meet most of them
- We're pretty flexible; we could probably absorb this

A management innovation is one being used for the first time by members of an Entity (whether or not other Entities or other firms have used it previously), and affects how the Entity runs its business internally. Management innovations include (BUT ARE NOT LIMITED TO) new organizational processes, outsourcing, partnering with other companies, organizational changes in practices including the use of virtual teams, changes in organizational structures and processes, distributed work teams, hoteling, and remote work. It also includes the use of new communication technologies designed to facilitate new processes, networks, and information/knowledge flows such as desktop video conferencing, teleconferencing, computer based training, and intranets/internets/extranets/web.

5. A) What was the most important management innovation you have made in the last 12 – 18 months?
When was it implemented?

5. B) How many individuals in your entity adopted this management innovation (estimate)?

Based on your answers in question 5A, use the following scale to answer questions 6 – 10. Please place in bold your choice (or circle your choice if returning by interoffice mail or fax).

5 = to a great extent
4 = to a moderate extent
3 = to some extent
2 = to a small extent
1 = to no extent

6. To what extent does the management innovation serve its purpose to date?  5  4  3  2  1
7. To what extent does the use of the management innovation fit the goals of the entity?  5  4  3  2  1
8. To what extent are the goals of the management innovation clearly defined and measurable?  5  4  3  2  1
9. To what extent are the expected returns from the management innovation clearly defined and measurable?  5  4  3  2  1
10. To what extent are the expected reactions from the market (if any) concerning the management innovation clearly defined and measurable?  5  4  3  2  1
Below is a list of organizational capabilities known to have some impact on organizational effectiveness. Indicate how effective your entity is (in general) at managing these capabilities (please complete all items). **Place in bold your choice** (or circle your choice if returning by interoffice mail or fax). Next, place a check mark by those capabilities important for the management innovation mentioned in question 5A (Check only those that apply). Of those that you have checked, indicate the impact these capabilities had on the implementation of the management innovation.

<table>
<thead>
<tr>
<th>General Effectiveness</th>
<th>Impact on Implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Knowledge about customer needs</td>
<td>7 6 5 4 3 2 1</td>
</tr>
<tr>
<td>b) Ability to address customer needs in a timely manner</td>
<td>7 6 5 4 3 2 1</td>
</tr>
<tr>
<td>c) Ability to establish close relationships with customers</td>
<td>7 6 5 4 3 2 1</td>
</tr>
<tr>
<td>d) Customer focus</td>
<td>7 6 5 4 3 2 1</td>
</tr>
<tr>
<td>e) Ability to lead the market</td>
<td>7 6 5 4 3 2 1</td>
</tr>
<tr>
<td>f) Ability to maintain an efficient product generation process</td>
<td>7 6 5 4 3 2 1</td>
</tr>
<tr>
<td>g) Ability to reduce time to market</td>
<td>7 6 5 4 3 2 1</td>
</tr>
<tr>
<td>h) Ability to increase production speed</td>
<td>7 6 5 4 3 2 1</td>
</tr>
</tbody>
</table>

**Note:** Place in bold your choice (or circle your choice if returning by interoffice mail or fax).
| i) Ability to manage objectives/engage in strategic planning | 7 6 5 4 3 2 1 | 7 6 5 4 3 2 1 |
| j) Team-building/employee collaboration ability | 7 6 5 4 3 2 1 | 7 6 5 4 3 2 1 |
| k) Leadership ability | 7 6 5 4 3 2 1 | 7 6 5 4 3 2 1 |
| l) Total quality improvement | 7 6 5 4 3 2 1 | 7 6 5 4 3 2 1 |
| m) Communication capability | 7 6 5 4 3 2 1 | 7 6 5 4 3 2 1 |
| n) Entity's employee commitment | 7 6 5 4 3 2 1 | 7 6 5 4 3 2 1 |
| o) Willingness to take risks | 7 6 5 4 3 2 1 | 7 6 5 4 3 2 1 |
| p) Ability to operate in areas of uncertainty | 7 6 5 4 3 2 1 | 7 6 5 4 3 2 1 |
| q) Promotion of long-term research | 7 6 5 4 3 2 1 | 7 6 5 4 3 2 1 |
| r) Management of change | 7 6 5 4 3 2 1 | 7 6 5 4 3 2 1 |
| s) Engagement in participatory management | 7 6 5 4 3 2 1 | 7 6 5 4 3 2 1 |
| t) Entity's promotion of innovative behavior | 7 6 5 4 3 2 1 | 7 6 5 4 3 2 1 |
| u) Management of costs | 7 6 5 4 3 2 1 | 7 6 5 4 3 2 1 |
| v) Ability to reduce costs to customers | 7 6 5 4 3 2 1 | 7 6 5 4 3 2 1 |
| w) Ability to reduce cost of internal operation | 7 6 5 4 3 2 1 | 7 6 5 4 3 2 1 |

12. What was the expected market share for your key, primary product(s) at the beginning of FY 97? (Note: If there are many products and the market share ranges widely, please note that and indicate the share of the few largest revenue products).
13. What was your realized market share for your key, primary product(s) at the end of FY 97? (Note: If there are many products and the market share ranges widely, please note that and indicate the share of the few largest revenue products).

14. What was the entity’s net profit margin from your key, primary products for FY 97?
15. What was your ROA for FY97?
16. What would be the market value of this entity if it were sold today?
17. What was your percentage increase in net revenue for FY97