

Managing Core Competence of the Organization

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Executive Summary

Past studies on 'core competence' have deliberated either on the theoretical concept of core competence or its usefulness as a strategic tool for firms. In spite of a large number of papers on the subject, to the author's knowledge, there has been no study which spells out an actionable framework for leveraging the concept of core competence in creating competitive advantage for organizations. This perceptible gap in strategy literature is the prime motivation for this study. In this paper, the author views core competence as a 'dynamic learned resource' which is subject to continuous metamorphosis with changes in internal and external environment. The proposed 'critical competence' framework integrates the various studies on core competence and puts forth an all-encompassing practicable methodology to be utilized by firms for sustained success. Critical competence is the ability of a firm to successfully identify, nurture, develop, upgrade, and deploy its hierarchy of competencies to attain sustainable competitive advantage. In the process of proposing and explaining the framework for critical competence, this paper makes four major contributions:

- First, it provides a consolidated and comprehensive literature review on the subject of core competence which can be used by academics for future studies on the subject.
- Second, the proposed framework for critical competence shows that the possession of meta/core competencies will in itself not result in competitive advantage; rather, it is important to understand how these competencies are utilized for adding value to the firm.
- Third, the proposed critical competence framework serves as a tool for analysing the past success/failure and also serves as a guide for charting out the future strategy of firms.
- Fourth, through the example of Indian Railways, the paper illustrates the 'descriptive capability' of the proposed critical competence framework.

The proposed framework helps us conclude that competencies in an organization need to be continuously nurtured, developed, and also abandoned. Critical competence emerges as a *universal competence* which is at the highest level in the hierarchy of competencies and is a pre-requisite for attaining sustainable competitive advantage. ♡

KEY WORDS

Critical/Core Competence

Resource-based View

Meta-competence

Capability

Ever since the seminal article of Prahalad and Hamel (1990), a lot has been said and written about the concept of 'core competence.' Most of the researchers on the subject agree that conceptualizing organizations as a set of 'core competencies' rather than as distinct 'strategic business units' (SBUs) helps in enhancing their competitiveness. SBUs should be treated only as potential reservoirs of core competencies. For sustainable competitive advantage, corporations have to devise ways to identify, cultivate, and exploit the core competencies that make growth possible (Prahalad and Hamel, 1990). Though 'core competence' has been universally recognized by scholars as a useful concept, there are very few studies (conceptual and empirical) which seek to explain the ways in which this concept can actually be used for the benefit of organizations. Though Prahalad and Hamel (1990) mentioned that management should develop a corporate-wide strategic architecture — a road map of the future that identifies which core competencies to build and their constituent technologies — they have not elaborated on how to go about charting this elusive 'strategic architecture.'

This perceptible gap in 'strategy literature' is the prime motivation for this study. This conceptual paper on the subject attempts to address this void in strategy literature in the following ways. From the theoretical origins of the resource-based view of the firm and its role in creating a sustainable competitive advantage, the concept of critical competence is developed which, simply speaking, is the ability of the firm to effectively manage its hierarchy of competencies. Further, by integrating the past developments in the literature on the subject, an actionable framework for critical competence is proposed. In doing so, this paper makes four important contributions. First, it provides a consolidated and comprehensive literature review on 'core competence' which we understand through the integrative theoretical framework of 'critical competence.' This detailed literature review on the subject can serve as a useful guide for scholars and academics researching on the subject. Second, the proposed framework for critical competence shows that the possession of core competencies itself will not result in competitive advantage; it is the successful identification, nurturing, development, and deployment of the core competencies that is important for adding value to the firm. Third, the framework serves as a tool for analysing the past success/failure of the firm and helps in charting out the future trajectory for firms by

understanding their competencies map. Fourth, the paper exhibits the 'descriptive capability' of the proposed framework through the example of Indian Railways' core competency in 'steam engine-based technology.'

LITERATURE REVIEW AND THEORETICAL DEVELOPMENT

Quest for Sustainable Competitive Advantage: Resource-based View

In the last three decades, increasing competition fuelled a substantial amount of strategic research on understanding the antecedents and processes governing firms' competitive advantage. Initially, traditional economic theory was at the base of all such thinking. Product market and industry structure were considered to be the determinants of performance (Chandler, 1990; Caves and Porter, 1977; Porter, 1985; Kogut, 1988; Rumelt, 1982, 1984; Williamson, 1985). Different explanations of corporate strategies were offered by the various researchers: be it minimization of transaction cost or achievement of economies of scale and scope. All these corporate strategies were directed towards the *external environment* and, according to this stream of thought, the firms which were able to match their strengths with the opportunities in the external environment were able to secure a competitive advantage (Porter, 1985; Barney, 1991).

Subsequently, researchers started viewing firms as a collection of resources and capabilities and started considering the *internal resources* as the source of competitive advantage. The resource-based view of the firm suggested that the differences in the resources of the firm (tangible or intangible) are accumulated and learnt over time and the heterogeneity of these resources is the source of competitive advantage (Barney, 1991; Dierickx and Cool, 1989; Dosi, 1988; Itami, 1987; Mahoney and Pandian, 1992; Nelson and Winter, 1982; Wernerfelt, 1984; Winter, 1987). This unique set of resources, capabilities, and skills, which accumulate over time, plays a significant role in providing a direction for the firm's future strategies. A firm's competitive advantage is thus derived from this unique knowledge (Spender, 1993). The causal ambiguity of this heterogeneous 'unique knowledge' makes it inimitable and the maintenance of its heterogeneity is essential for a sustained competitive advantage (Peteraf, 1993).

Barney (1991) included all the assets, capabilities, organizational processes, firm attributes, information,

knowledge, etc., within the ambit of firm resources. These firm resources can be further classified into three categories: physical capital, human capital, and organizational capital (Bogaert, Martens and Cauwenbergh, 1994). It was also highlighted by some scholars that not all these firm resources are strategically relevant. Hall (1992) made the distinction between assets (having resources) and skills or competencies (doing resources) which Amit and Schoemaker (1993) described as information-based capabilities. Itami (1987) described invisible assets as the information-based resources like consumer trust, brand image, etc., and considered them crucial for the long-term success of the firm. Most of the researchers on the subject have reiterated that invisible or intangible (doing) resources are critical to business success.

Core Competencies as the Most Important Resource

The concept of core competencies evolved from the resource-based view of the firm which emphasized the fact that competitive advantage rests on the firm's possession of unique difficult to imitate skills, knowledge, resources and competencies (Wernerfelt, 1984; Rumelt, 1984). These causally ambiguous inimitable core capabilities serve to provide sustainable competitive advantage to the firm. This view emerged as a counterpoint to market structure analysis of competitive strategy. A firm's core competencies are thus defined as a set of problem-defining and problem-solving insights that foster the development of idiosyncratic strategic growth alternatives (Lei, Hitt and Bettis, 1996). According to Hamel and Prahalad (1990), core competencies have three basic characteristics: they provide access to a wide variety of markets, contribute significantly to the end product benefits, and are difficult for the competitors to imitate. Though researchers in this stream have described the limits to the speed of accumulation of competencies (Dierickx and Cool, 1989), these tacit strategic capabilities are nonetheless subject to learning (Teece, Pisano and Shuen, 1990). These collective learning or coordination skills behind the firm's product lines are the source of its competitive advantage and enable the firm to introduce a new array of products and services. By focusing on their core competencies, firms stand to gain since they do those things at which they are the best. Core competencies when viewed as unique knowledge for problem definition and problem solving can form the basis of a firm's competi-

tive advantage and can also be leveraged in a wide variety of markets for future products.

Traditional literature on diversification strategy suggests core competencies as corporate characteristic. 'Related constrained strategy' in which each of the firm's business "draws on the same common core skill, strength or resource" is an indicator of the core competence as a corporate asset (Rumelt, 1972). As already discussed, competitive imitation of these core competencies is extremely difficult as the imitator will have to follow identical 'learning path' and make the same 'irreversible' investments (Barney, 1991). Moreover, time compression diseconomies also make the competencies inimitable (Dierickx and Cool, 1989).

The concept of core competencies is distinct from the traditional strategic thinking of competing for market share and also from Porter's (1985) low cost-differentiation strategy. The competition in the product/market arena is essentially for market share (Buzzell, Gale, Sultan, 1975). Strategists and researchers use the term 'market share' to refer exclusively to 'brand share' or 'end product share.' The concept of core competencies transcends the boundaries of the traditional market share. It is reflected in the firm's 'core products' which need not be end products of the firm and are usually the result of application of one or more core competencies of the firm (Hamel and Prahalad, 1990). Since the core products are usually not the end products and do not directly contribute to the competitive advantage of the firm, they may not be reflected by the traditional brand share (Hamel, 1994). For example, in the context of Indian Railways (IR), the core product of 'traction for transportation'¹ was dependent on the core competency of IR in handling 'steam engine-based technology' till the 1980s and is now dependent on the core competency of handling 'diesel engine and electric engine-based technology.' In this case, the end product, 'transportation for goods and passengers' and the core product, 'traction for transportation' remains the same though the 'core competency' enabling it has changed with time. Further, core competence talks of strategies that are beyond the low cost or differentiation for providing sustainable competitive advantage to the firm.

From Core Competencies to Critical Competence

Literature on the subject offers a wide array of explanations about the concept of core competencies and their

¹ Power required to haul trains or railroads.

role in enhancing the competitive advantage of the firm but it is largely silent on the issue of operationalizing it. Companies are likely to be different in terms of their abilities to select, build, deploy, and protect these core competencies. These differences are likely to yield differences in corporate performance (Hamel, 1994). The concept of core competence has implications at the strategic level; the firms should systematically work upon identifying their core competencies and developing them for sustainable competitive advantage.

Since the 1990 article of Prahalad and Hamel in the *Harvard Business Review*, the concept of core competence has been vividly discussed in literature. Most of these discussions have been theoretical explanations or extensions of the concept. Since core competencies are a bundle of collective learning, the problem has always been to understand and use the concept enabling firms to leverage it in framing their future strategies. There is no doubt about the fact that firms will certainly benefit if they know what their core competencies are and draw up plans for systematically developing and deploying these core competencies. The very mention of making the core competencies work brings forth the idea of successful firms having a better ability to leverage their core competencies. A resource, capability or skill which is untapped or unutilized will not result in any advantage.

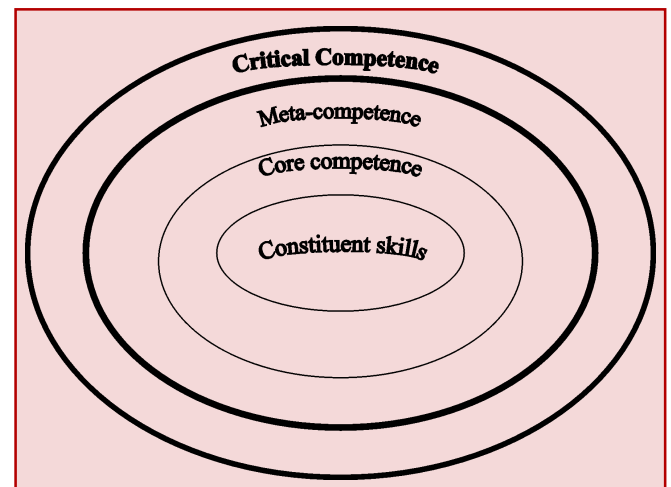
In other words, possession of core competencies is not an end in itself. The ability to leverage core competencies for the benefit of the firm is of greater importance. Literature on core competence talks about different types of competencies, the effect of learning on these competencies, and other related aspects, but the ability to manage the core competencies has not been studied explicitly by researchers. This critical competence is at the highest level of the abilities possessed by the firms and is evidently the most important ability. Through their concept of 'strategic architecture,' Prahalad and Hamel (1990) have stated in clear terms that for having a sustainable competitive advantage, it is essential for the firms to chart out a path for the future but they have not discussed the way a firm should go about charting this path. Bogaert, Martens and Cauwenbergh (1994) ask a very pertinent question with reference to the skills in an organization: "Who possesses the *skill* of managing the skills?" The answer to this question is no doubt important but more important is to know what this *skill* of managing skills is.

Critical competence seeks to identify the unique competencies of a firm through generic procedures. In this sense, though the core competencies of firms are diverse, their critical competence is universal. The pertinent question is to gauge whether firms possess this critical competence or not. The ability of a firm to develop its strategic architecture is its 'critical competence' and, from the discussion, this emerges as a prerequisite for achieving sustainable competitive advantage. Hamel (1994) has described the hierarchy and differences between meta-competencies, core competencies, and constituent skills (Figure 1). Any individual business may be having 40, 50 or more constituent skills, between 5 and 15 core competencies, and a couple of meta-competencies. "The distinction between the various levels of competencies is more a matter of convenience but understanding of hierarchy of competencies is essential — from meta-competencies (logistics in case of FedEx) to core competencies (package tracking) to constituent skills (bar-coding)" (Hamel, 1994). The competence which lies above all these competencies and which is all encompassing is the critical competence. 'Critical competence is the ability of a firm to successfully identify, nurture, develop, upgrade, and deploy its hierarchy of competencies to attain sustainable competitive advantage.

Hence, for sustainable competitive advantage, managers should invest time, effort, and resources in developing their critical competence. The first step towards developing critical competence is to understand that such a competence exists and realize that it makes a difference to the competitive advantage of the firm.

From the above discussion it is clear that the presence of meta competencies or core competencies is not

Figure 1: Competence Hierarchy



the complete recipe for competitive advantage. Even if a firm possesses certain meta or core competencies which provide competitive advantage at a point in time, it is possible that these competencies may not provide 'sustainable competitive advantage.' The relevant question that arises is — how do firms go about charting a path for sustainable competitive advantage? Is there some universal competence which is required by the firms for achieving sustainable competitive advantage? The resource-based view attributes competitive advantage of the firm to its resource heterogeneity. It further considers the 'maintenance of resource heterogeneity as the source of sustainable competitive advantage' (Peteraf, 1993). This approach is a *post facto* approach and relies on the *ex-ante* benefits acquired by the firm. It does not really provide a planned path for sustaining competitive advantage. It can only provide us with a validation of historical success stories.

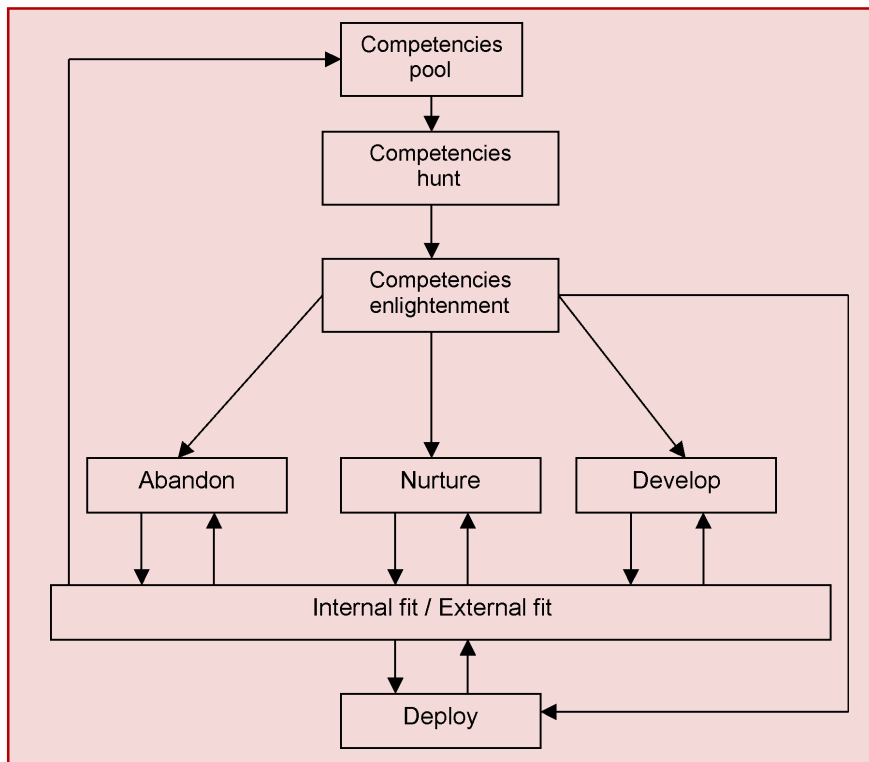
The sustainable competitive advantage of a firm lies in its ability to manage its hierarchy of competencies of which meta and core competencies are of utmost importance and in this paper this ability is referred to as critical competence. As already mentioned, though the firms may have different competencies, their critical competence is universal. This study is an attempt to develop

a theoretical framework for critical competence which can serve as a guide for practitioners and managers helping them apply the concept of core competencies for gaining competitive advantage.

CRITICAL COMPETENCE FRAMEWORK

The critical competence framework seeks to make the concept of 'core competence' work to the benefit of organizations. The underlying assumption behind this framework is the fact that something which can be regarded as a skill can be explicated and learnt to be used. Critical competence can be equated to a skill for operationalizing and managing the competencies for the benefit of the firm. The critical competence framework comprehensively covers all the aspects related to competencies and skills in a firm. It provides a holistic, intuitive framework for designing the enterprise-wide strategic architecture of the firm and provides answers to the reasons for differences in performance of firms that seemingly possess identical resources. It also exhorts the practitioners to focus not only on developing or acquiring core competencies but continuously work upon upgrading, nurturing or abandoning them in relation to internal and external environment. The proposed framework for critical competence is given in Figure 2.

Figure 2: Critical Competence Framework



Let us analyse each component of the critical competence framework which will help us in understanding the applicability of the concept of core competence.

Competencies Pool

Every organization has its own set of 'doing' resources. These intangible assets are skills which help the firm in performing its activities. Hamel (1994) uses the terms competencies and capabilities interchangeably. These competencies may or may not be strategic. Dierickx and Cool (1988) mention that these competencies are learnt and accumulated over time. This competencies pool at any given point in time enumerates the capabilities of the firm (useful as well as not so useful). The constituent competencies in this pool undergo metamorphosis in multifarious ways. The pool may be replenished with competencies which continue to provide competitive advantage; some new competencies may be added to the existing pool or some of the old, redundant competencies may be spilled out of the pool. Also, the pool may have some dormant competencies which may be utilized as and when the need arises. The critical competence framework seeks to empower managers and practitioners with the requisite knowledge so that the competencies pool of the organization is managed in a way that enhances the firm's performance. The management of competencies pool, which is critical to the firm's sustained success, should be a conscious effort on the part of the firm rather than something to be left to chance. Hence, managers must view their organizations as bundles of competencies which have to be continuously managed for gaining a competitive advantage.

Competencies Hunt

Barney (1991) mentions that not all the resources in a firm are strategically relevant. Strategic assets are 'the firm resources that hold the potential for sustainable competitive advantage' (Amit and Schoemaker, 1993; Barney, 1991). They have the following four attributes: (1) they are valuable (exploit opportunities and/or neutralize threats in the firm's environment); (2) they are rare among the firm's current and potential competitors; (3) they are imperfectly imitable, and (4) no strategically equivalent substitutes exist (Barney, 1991). This implies that these are a set of difficult to trade and imitate scarce resources and capabilities. Some of the examples are technological capability, favourable cost structure, and a firm's service organization (Amit and Schoemaker,

1993). As mentioned by Hamel (1994), a firm may have around 10-15 core competencies and a couple of meta-competencies as shown in our hierarchy of competencies in Figure 1. These distinctive competencies set apart the organization from its competitors (Hall, 1992). The firm should identify its key business processes, manage them centrally, and invest in them heavily looking for a long-term payback. Identification of this hierarchy of competencies from the pool of competencies is not an easy task. Causal ambiguity makes it extremely difficult to attribute competitive advantage to particular competency. Meta-competencies and core competencies are themselves an intricate mix of a number of constituent skills. To proceed further in developing its 'critical competence,' a firm should be able to identify its 'elusive' higher level competencies (meta and core).

Meta-competencies of a firm can be equated to the personality of an individual. The personality of every individual is different; so are the meta-competencies of every firm. Hence, identification of meta-competencies and consequently the core competencies of a firm is almost as difficult as assessing the personality of an individual. Even though the personality of each individual is uniquely different from the other, still the literature on personality seeks to identify some 'broad generic personality traits,' e.g., Myers Briggs (MBTI) personality types. Classification of personality types into broad groups gives a starting point to the practising psychologist. Drawing an analogy from this example, as a first step, we seek to classify meta-competencies into generic groups. The term generic group of competencies can be misleading as the meta-competencies of a firm are the unique collection of all the learned experiences within the particular organization. Nonetheless, since meta-competencies are at a higher level of competencies than core competencies, an effort can be made to classify them into generic groups based on past literature of the subject. The generic group of meta-competencies indicates the most dominant common element among the group of competencies. The criterion for the formation of the generic group of competencies is based on the commonality in the various competencies. Figuratively, it can be said to be the highest common factor of all the competencies in that group.

Identification of generic meta-competencies: Mascarenhas, Baveja and Jamil (1998) classified competencies into three basic groups: *superior technological know-how*, *reliable processes*, and *close relationships with external parties*.

A *superior technological competence* involves a deep understanding of a subject area. This deep understanding arises from an early, substantial, and continuous involvement in that area. It includes knowledge of the scientific properties, inter-relationships, and latest developments in a subject area. This knowledge is useful if the competitors do not have a similar knowledge and it contributes substantially to customer value (Mascarenhas, Baveja and Jamil, 1998). A *reliable process* delivers an expected result quickly, consistently, and efficiently with least inconvenience and disruptions to the customers. A reliable process can involve almost anything, e.g., transfer of skills, ability to combine various inputs to customize a product, etc. Reliability is important because customers increasingly consider the total cost of a product over its life and not just its initial purchase price (Mascarenhas, Baveja and Jamil, 1998). A *close external relationship* with suppliers, regulators and professional organizations, distributors, and customers yields several benefits. The firm and the partner can identify opportunities for mutual benefit. Suppliers can suggest ideas for new product development, professional organizations can offer superior talent, distributors can provide market access and information, and customers can provide guidance about the new competencies the firm should develop (Mascarenhas, Baveja and Jamil, 1998).

Higgins (1996) brings out an altogether different factor which he calls as the core competence (or in our case, meta-competence). He mentions that 'innovation' is *the* core competence because it makes competitive advantage by any other strategy possible. Creating new products and product enhancements provides differentiation. Process innovation can lead to lower costs and increased customer satisfaction (Higgins, 1996). Innovation is an important ability of a firm which helps the firm in coming up with new ways for fulfilling the needs of the consumers.

Further, Hamel (1994) has classified competencies (at the highest level) into three broad types: *market access competencies* (management of brand development, sales and marketing, distribution and logistics, technical support, etc. — all those skills which help to put a firm in close proximity to its customers), *integrity-related competencies* (competencies like quality, cycle time management, just-in-time inventory management and so on which allow a company to do things more quickly, flexibly or with a higher degree of reliability than com-

petitors), and *functionality-related competencies* (skills which enable the company to invest its products or services with unique functionality which invest the product with distinctive customer benefits rather than making it incrementally better). These three meta-competencies explain all kinds of competencies in the organizations and organizations have one or more than one of these meta-competencies.

Leo (1994) points out that time is a dimension of strategy which does not find a place in the traditional strategy frame. There is little concern in the competitive frame about the pace of change as a key aspect of competition (Williams, 1991). There is no doubt about the fact that time drives strategy and affects the sustainability of competitive advantage. With the increasing use of information technology for business and the nature of business becoming global, *agility* is a factor which is becoming of increasing importance and can be considered as a generic meta-competency.

From the above discussion on the subject, we see that different ways of classifying competencies by different authors reflect the diversified customer needs which each of these generic meta-competency addresses. *The underlying criterion is that the meta and hence the core competence should result in superior customer value.* Summing up the discussion on generic competencies, we see that meta-competencies of firms can be classified into five generic groups:

- cost efficiency
- reliable systems
- innovation
- close external relationships
- agility.

Cost efficiency: The ability of a firm to be cost-efficient is dependent on developing its systems into a low cost structure. This philosophy must be reflected in every action of the firm to be classified as a meta-competence. It will be a bundle of constituent skills having undercurrents of cost efficiency. For such a firm, all its operations will be directed towards achieving low cost. The much fabled 'Every Day Low Price' (EDLP) policy of Wal-Mart is an actualization of such a meta-competence. **Reliable systems:** A reliable system aims at delivering an expected result quickly, consistently, and efficiently with least inconvenience and disruptions to the customers. The primary focus here is the reliability of processes rather than cost or any other criteria. It may happen that having a reliable system may result in an overall cost

reduction because of lesser wastages. Reliable systems assure the customer of lesser variability thereby minimizing his/her risk. This may be affected by state-of-the-art technology or trained manpower but the effort is to make systems reliable. A reliable process is valuable when conducting business in a global context so that the customer is assured about the level of quality he expects to get throughout the world. Being able to offer a reliable process is valued by customers since international transactions are subject to great uncertainties and disruptions because of transportation, communication, customs delays, red tapism, and cultural differences. Merck has a reliable process competence in the development of new drugs (Mascarenhas, Baveja and Jamil, 1998). McDonalds has the capability of delivering a consistent (reliable) taste through its McBurger all over the world.

Innovation: Firms having this meta-competence have well-developed systems through which they are able to understand emerging customer needs, the thrust being on 'intelligent innovation.' Intelligent innovation implies that these firms are able to innovate products (or services) which add superior customer value. The means for achieving this meta-competence may be diverse ranging from a technological superiority to a pool of market-savvy managers. 3M is one firm which constantly strives to do something new for its customers.

Close external relationships: Close relationships with suppliers, regulators, professional organizations, and customers yield multifarious benefits. These relationships are particularly useful in the global environment to penetrate new markets. Close relationship with customers enhances the firm's ability of understanding its customers better. Firms can leverage this competence to customize their products (or services) for providing the appropriate value to the customers. Managing relationships is also a competence which accumulates with time. Siemens produces and sells its large capital goods items like power generation, telecommunications, and transportation equipments to its customers in over 120 countries. Siemens' close relationship with Deutsche Bank provides it with ample low cost financing for its customers enabling it to make its sales to many countries (Mascarenhas, Baveja and Jamil, 1998). Dell is another firm which is constantly working on its systems to manage relationships with its suppliers and customers.

Agility: Speed is a factor which is fast becoming a competence in the world of today. The only way to increase this resource is by shortening the processing

times. The QB barber shops in Singapore offer a ten-minute hair cut to its customers. FedEx offers next day delivery to any destination in the world. Dell also promises to deliver your computer in a very short time. E-business has particularly revolutionized the very concept of agility. Internet helps the firms deliver even customized products in a very short period to its niche segments. Agility is a competence which is particularly of relevance to the service industry.

All the generic meta-competencies are aimed at satisfying some need of the customer in a better and efficient way. Firms in the same industry may have different generic meta-competencies according to the target customer segment they aim to serve. The core competencies of the organization emerge from the meta-competencies it has. They are aimed at providing an 'enhanced customer value.' The systems in the organization have to be consciously built around the underlying meta-competencies to maximize the benefit for the organization.

Competencies Enlightenment

The identification of five generic groups of meta-competencies makes the task of understanding the dynamics of 'critical competence' easier. These generic groups of meta-competencies cover all the possible kinds of competencies possessed by the firms at the highest level of hierarchy. Our task now is to find out which generic group(s) of meta-competency describes a particular firm. Once we identify the meta-competencies of an organization, managing them becomes easier. This 'competencies enlightenment' paves the way for future strategy to be followed by the organization. Normally, successful firms will possess not more than a couple of these generic meta-competencies as they may have conflicting objectives (Hamel, 1994). This helps them focus their resources in a directed way and they do not spread their resources 'too thin.' The identification of these 'elusive' meta-competencies and core competencies helps the organization in spending its resources judiciously so that these efforts serve as 'performance enhancers' rather than 'resource drainers.'

Based on the above discussion and the nature of meta-competencies, the following two propositions emerge:

Proposition I: Successful firms have some identifiable meta and core competencies.

Proposition II: The number of meta-competencies of successful firms is very less, may be one or two.

The task of identifying the generic meta-competencies in a firm is not an easy task. Higgins (1996) uses the McKinsey's 7-S framework for designing the Innovation Quotient Inventory. It is proposed that the 7-S framework comprising of strategy, structure, systems, style, staff, shared values, and skills comprehensively covers all aspects of an organization and can also be used for identifying the meta-competencies of organizations.

Meta-competence is also an all pervading phenomenon in an organization and is at the highest level of competence hierarchy. It is embedded in all the components of an organization. For a 'generic competence' to be termed as 'meta-competence,' it should be present to a reasonable extent in all the 7-S of an organization. Using this argument as the point of departure, we propose a methodology for identifying the core competence of an organization. As explained, these generic competencies can be mapped on the 7-S framework as shown in Figure 3. From this mapping we can conclude that a competency is a meta-competency if it is embedded to a reasonable extent in all the 7-S.

Different methodologies for mapping the above matrix can be adopted. One such methodology can be following a case study approach. In this approach, the researcher studies the various elements of the 7-S of selected firm(s) by observation. Subsequently he/she moderates it by interviewing firms' executives and employees, reading firms' procedures, manuals, circulars, and other corporate communication literature. Based on all these, the researcher can allocate points on a scale of 0-10 on each of the 7-Ss of the firm where 0 signifies *no reflection* and 10 signifies *complete reflection* of the particular 'generic competence' in that 'S' of the organization. From the scores allocated to the various generic competencies on all the 7-S, the researcher can conclude

which competence(s) are core. Another method can be designing an inventory which is required to be answered by the company executives. The results from this instrument can be used by the researcher to interpret which meta-competencies are present in the firm.

After identification of the meta-competencies, the managers have to identify the core competencies in their firm. This can be done in a way similar to that demonstrated by Prahalad and Hamel (1990). In terms of our framework, let us assume that we know that Canon has a meta-competency of 'reliable systems;' now, for unravelling core competencies, the next level of competencies which lead to the 'core products' are listed. If the listed competencies are pervading in their core-products, then they are their core competencies. For instance, in terms of Prahalad and Hamel's (1990) example, from the competence map it emerges that three competencies are pervading all the Canon products — precision mechanics, fine optics, and micro-electronics — and all belong to the generic group of 'reliable systems.' Hence, these are the core competencies of the organization which have to be managed effectively for sustaining a competitive advantage.

Firms which possess critical competence have their own methodologies for identifying their meta and core competencies on almost a continuous basis. These methodologies may not be dependent only on the formal systems but may draw heavily on the informal systems and organizational culture. Hence, it is imperative to develop a 'competence consciousness' in organizations in addition to the formal systems for charting out meta and core competencies.

Dynamics of Core Competencies

Deploy

The process of identification of meta and core competencies is just the beginning. These identified or known

Figure 3: Meta Competencies Identification Map

	Cost Efficiency	Reliable Systems	Innovation	Close External Relationship	Agility
Strategy					
Structure					
Systems					
Style					
Staff					
Shared values					
Skills					

competencies should ideally be deployed in diverse businesses of the firms. Successful firms not only know what their meta and core competencies are but they leverage them by deploying them to their business. Before deploying, the only concern is to see that they mesh with the internal and external environment and that there is no anticipated 'unmanageable dissonance.'

Successful firms (firms which have critical competence) not only know how to deploy their core competencies but are also aware of the dynamic nature of this resource. The valuable core competencies in a firm need to be 'nurtured' and the not so valuable competencies in a firm need to be 'abandoned.' Firms should also be on the look-out for new competencies which can be acquired and focus on their 'development.' Let us discuss each of these elements in the critical competence.

Nurture

Meta and core competencies reflect the specialized expertise of an organization resulting from its collective learning (Prahalad and Hamel, 1990). The existence of core competencies in an organization is a necessary but not a sufficient condition for the success of an organization. For the success of the organization, its core competencies have to be nurtured. This implies that the core competencies of an organization should manifest in multifarious systems of the organization so that they are actually used. To quote Prahalad and Hamel (1990):

Core competence does not diminish with use. Unlike physical assets, which do deteriorate over time, competencies are enhanced as they are applied and shared.

If these capabilities and competencies are not nurtured, they will erode with time (Eaton and Lipsey, 1980). Dierickx and Cool (1989) mention that strategic stocks are subject to stock erosion and, therefore, need to be constantly monitored. Constant monitoring does not necessarily only mean the upgradation of core competencies. It means that the decision and control systems in the organization must be so developed that they are able to leverage the core competencies to the fullest. Organizations should nurture core competencies and not squander its resources in nurturing its non-core competencies.

As already discussed, a firm has a pool of competencies but the ones which are supported by its organizational architecture are the nurtured competencies. Firms will be able to leverage its core competencies to the maximum if these competencies are supported by

its organizational architecture or are nurtured. The three elements of organizational architecture (Brickley, Smith and Zimmerman, 1995) are:

- assignment of decision rights within the firm
- structure of systems to evaluate the performance of both individuals and business units
- methods of rewarding individuals.

The three legs of the organizational architecture stool should balance and support meta and core competencies at the top. Brickley, Smith and Zimmerman (1995) mention that the organizational architecture for an organization must be designed and created. This has profound implications for the present study. If the organizational architecture of a firm is not in tandem with its core competencies, then it must be suitably designed and created to support the desired core competencies.

Besides organizational architecture, the organizational culture of the firm should also support its core competencies. Organizational culture is the underlying philosophy which guides the organization in all its activities. The core competencies of a firm are nurtured through its organizational architecture and organizational culture.

The 7-S framework gives details of the current inventory of affairs in the firm; the organizational architecture framework gives formal working procedures and organizational culture gives the informal working procedures of the firm. In this sense, the former gives a 'static snap shot' in time whereas the latter two represent the 'dynamics of business conduct.'

Develop

Organizations are always trying to imitate the actions of other successful organizations (Lippman and Rumelt, 1982). For sustaining a competitive advantage, organizations must continually learn and enhance their core competencies. If constant renewal does not take place, other organizations will imitate and make the competencies which led to competitive advantage obsolete. A core competency must be continually invested in and upgraded if it is to serve as a source of sustained competitive advantage (Helleloid and Simon, 1994). Other organizations attempt to imitate a successful firm, but, due to imperfect imitation, other organizations may create mutations which provide even greater value to customers (Hill and Helleloid, 1992).

Competencies may be upgraded or new competencies may be acquired through internal development,

market procurement, inter-firm collaboration or mergers and acquisition. Firms which have 'critical competence' have well-developed methods of continuously improving and upgrading their competencies. This signifies the dynamic nature of critical competence. The framework in Figure 2 shows that critical competence is a 'continuous iterative loop' and the competencies are modified, maintained or abandoned depending on the dissonance between the current competencies and the internal/external environment.

Abandon

The dynamic nature of competencies suggests that some competencies may become obsolete with time. They may cease to deliver 'sufficient value' because of drastic 'technological leap' or other reasons. Competencies development takes a lot of time and is a result of accumulated shared learning within the organization (Prahalad and Hamel, 1990). It is important for managers to be conscious of the fact that it is very easy for core competencies to become 'core rigidities' (Leonard-Barton, 1992). Firms should be sensitive to the internal and external factors and avoid getting into a 'competence trap' (O'Driscoll, Carson and Gilmore, 2001). It will be opportune to mention here that the higher a competency in the hierarchy (Figure 1), the more rigid it will be for the organization to abandon. This implies that organizations will have greater difficulty to shed their meta-competencies than their core competencies.

Though managers must instil flexibility in their competencies management, they must exercise caution so as not to abandon a core competency without giving sufficient thought. No doubt, it is imprudent to nurture an unutilized core competency because nurturing a competency demands substantial resources. But, managers must remember that building a core competency again from scratch will not only be a very costly proposition but the feat may be next to impossible to achieve. Hamel (1994) gives the example of Motorola which sold off its television plants in the 1970s to Matsushita and got out of consumer electronics business. Though Motorola's decision of exiting from the highly competitive consumer electronic business had a lot of foresight at that point in time, in retrospect, it felt that it would have been better if it had preserved some of its competencies buried in the former consumer electronics business to help the company in its present business.

However, this example should not really deter managers from abandoning unutilized competencies (or

competencies that will be unutilized in future). One of the core competencies of Indian Railways (IR) was maintaining and operating steam locomotives. However, this painful decision of abandoning its core competency is now proving to be beneficial for the organization. Hence, abandonment of a competency including a core competency can be done but it must be done only after a lot of careful thought and deliberation. The managers must take into account the perspective view of the internal and external fit as mentioned in the critical competence framework (Figure 2). While abandonment of a core competency may be imperative for the continued success of a firm, it is an exercise which cannot and should not be done in haste.

APPLICABILITY OF THE FRAMEWORK: AN ILLUSTRATION

The proposed theoretically derived framework for critical competence suggests a plausible method for identifying and using the core competencies for creating a sustainable competitive advantage for the firm. This framework can be used not only for analysing if a firm is on the right path of developing its critical competence but also for charting out its future strategic trajectory. This indicates that the framework has descriptive as well as prescriptive ability which means that the framework can not only be used, *post-facto*, for understanding the success/failure of an organization but also for charting out the future competence framework for the organization. In this section, we illustrate the applicability of the framework for understanding the success of an organization, i.e., its descriptive ability.

In the discussion about the framework (and also in the previous literature on the subject), a large number of examples from Western countries have been used (Wal-Mart, 3M, McDonalds, etc.). In contrast to this, we illustrate the universal applicability of this framework through an Indian example and that too a government organization — the Indian Railways (IR) — which as indicated earlier, abandoned its core competence and switched over to 'traction technology.' Another reason for the choice of IR as an example for illustrating the concept of critical competence is that most of the Indians are aware of and have used the Railways at some point of their life as a means of transportation.

Before we present the applicability of the framework in analysing the critical competence of IR, it is imperative to provide some of its important contextual

details. IR is the principal mode of passenger and freight transportation in India. It has played an important role in the nation building process of Indian history after its inception in the British India in the year 1853. It has one of the biggest infrastructure and network compared to other railroad systems across the world. Currently, it has 63,140 route kms of rail track, around 8,000 locomotives, over 45,000 coaching vehicles (including passenger coaches), and over 220,000 freight carrying wagons (*IR Year Book*, 2004). Last year, IR moved over 550 million tonnes of freight and, at the same time, carried around 5.5 billion passengers. IR's network has around 7,000 railway stations and employs around 1.6 million people — making it the largest single employer in India. IR, a socio-commercial government organization under the Ministry of Railways, is known for its professional approach. The conflicting objectives of being a commercial organization and at the same time fulfilling social obligations makes it imperative for it to adopt innovative efficiency enhancing systems. The 'end product' which IR offers is 'transportation for goods and passengers.' The 'core product' which leads to this end product is 'traction for transportation' which hauls the passenger and freight trains. Till 1980s, the 'core competency' responsible for this 'core product' was 'steam engine-based technology.' The rapid proliferation of diesel and electrical engine-based technology in the external environment led to a dilemma about abandoning its core competency in steam engine-based technology. The problem was even more complex because around 0.3 million of the 1.6 million total employees of IR had

expertise in skills related to the core competency. However, it was forced to adopt the newer and more efficient modes of traction. IR, which had nurtured and developed its competency in 'steam locomotives technology' for over a hundred years, abandoned it and developed and deployed a new core competency in 'diesel and electric engines technology.' Though the abandonment of this developed and nurtured competency was painful for IR, as of now, this decision has helped improve its efficiency manifold. We also observe that the meta-competencies of IR guiding this transition of core competencies (reliable systems and innovation) remained the same even after the transition. In fact, the core product as well as the end product delivered by IR is also the same in description though there is an improvement in quality.

Thus, IR, which at one point in time was focusing only on steam-based technology, not only abandoned it but is now consciously developing and nurturing the diesel and the electric engine-based technology. The critical competence of IR helped it rediscover its lost agenda and focus on something which generates greater customer value. Table 1 shows the applicability of the framework through the example of IR. Though this framework does not show the intricate details of the framework, still it does give an idea about how this framework can be broadly used to understand the success/failure of an organization. Apart from the descriptive capability, the framework also has a prescriptive capability which can be used to systematically identify and develop the organization's core competencies for

Table 1: Applicability of Critical Competence Framework for IR

Critical Competence Framework	IR
Competencies pool	Maintenance and operation of steam, diesel, and electric locomotives.
Core competencies hunt	Initially, its core competency was in steam locomotives. With the phasing out of steam locomotives, it started looking out for options and functions which would create superior customer value with diesel and electric locomotives.
Core competencies enlightenment	It realized that operation and maintenance of diesel and electric locomotives would create greater customer value. By reorganizing its skills, it could redefine its core competency.
Abandon	Due to technological development, it had to do away with steam engine technology which was its core competency at one point in time.
Nurture	Though it was nurturing the steam engine technology till the 1980s, now it is nurturing diesel and electric engine technology.
Develop	Competencies in diesel and electric engine technology were reorganized and upgraded for the officers and staff. Many of the staff who had skills in steam locomotives were retrained and deployed for diesel and electric locomotives.
Internal and external fit	Diesel and electric locomotive operations create superior customer as well as organizational value. Hence, an external change in technological climate resulted in IR changing its competencies for survival, growth, and sustaining competitive advantage.
Deploy	Currently, it has changed its agenda competently and now its traction-related core competency is in diesel and electric engine technology.

gaining a competitive advantage.

CONTRIBUTIONS AND CONCLUSIONS

Firms are continuously striving for ways to attain a sustainable competitive advantage. Literature on strategic research is replete with examples offering explanations for various success stories in business. One stream of research suggests core competencies to be at the base of all competitive advantage. Researchers in the field of core competence have been so intrigued by the concept that a substantial portion of the literature is devoted to the understanding of the concept of core competence itself. While some researchers have explored the effect of organizational learning on core competence, others have studied the effect of external influence on the development of new competencies, but very few researchers have studied how the concept can be used by organizations for attaining competitive advantage. Prahalad and Hamel (1990) touched upon the concept of strategic architecture but did not discuss the vivid details of this roadmap for the future. The aim of this paper is to address this perceptible gap in strategy literature by suggesting a framework which makes this concept work. In doing so, this study offers four important contributions which have implications for academics as well as practitioners.

First, we provide a consolidated and comprehensive literature review on the subject of core competence and develop a hierarchy of competencies for a better appreciation. We understand how core competencies work through the integrative concept of critical competence for which we propose a theoretical framework. This comprehensive and current literature review will serve as a useful starting point for scholars undertaking future research on the subject. It also serves to put the concepts related to core competence in an organized fashion for the benefit of academics.

Second, the proposed framework for critical competence shows that the possession of core competencies will not result in a competitive advantage by itself. It is the successful identification, nurturing, development, and deployment of the core competencies that is important for adding value to the firm. The suggested critical competence framework is arrived at by integrating the various streams of research in the field of core competence with a view towards providing a comprehensive and actionable framework for making the concept of core competencies work. The concept of critical competence

is introduced as the most important resource a firm should possess for sustainable competitive advantage. Critical competence framework lays down a systematic intuitive actionable strategic direction which can be used by the firms in multifarious ways for tapping, building, and utilizing their core competencies. This paper not only elucidates a critical competence framework but also gives a hierarchy of competencies with meta-competencies at a higher level than core competencies. It further puts forth the view about the universal applicability of competencies which is reflected at the highest level of hierarchy by critical competence. Thus, critical competence not only seeks to explain the sustainable competitive advantage of firms but also reiterates the importance of viewing organizations as a hierarchy of competencies.

Third, the proposed critical competence framework serves as a tool for analysing the success/failure of firms and also serves as a guide for charting out the future trajectory for firms by understanding their competencies map which identifies the generic meta-competencies and helps in identifying core competencies. This can serve as a useful tool for the practitioners for organizing their thinking about using core competencies to gain competitive advantage. The paper not only suggests ways of identifying the elusive meta and core competencies but also deploying them to the benefit of the firm. The suggested holistic framework integrates the learning and nurturing of core competencies to provide a better understanding of the dynamic nature of core competencies. The critical competence framework suggests that the competencies pool may get replenished with time by adding nurtured and upgraded competencies with newly developed and learned competencies, and may spill off the abandoned competencies. Hence, the framework incorporates the 'forever evolving' dynamic nature of core competencies and suggests that for sustainable competitive advantage, organizations have to continuously nurture, develop, and abandon their core competencies. The deployment of the competencies is also a logical part of this framework because possession of an unused competence is a source of wastage for the firm.

Fourth, through the example of Indian Railways, the paper exhibits the descriptive capability of the proposed framework. The choice of a government department in the Indian context shows the universal applicability of the framework. This article not only talks of nurturing

and upgrading the existing core competencies but also of developing new core competencies in line with the trends and technological shifts taking place in the external environment. It is also imperative for the firms to continuously assess its redundant competencies and draw out an action plan for abandoning such competencies which might provide to be 'resource drainers' for the firm. Abandoning of core competencies should be done with utmost care after weighing the pros and cons in relation to future plans of the company *vis-à-vis* its external environment. The critical competence framework views competencies of a firm as a dynamic learned resource which needs to be continuously managed for the firm to have a sustainable competitive advantage. Thus, having core competencies is not a guarantee to success; firms have to learn the right ways of deploying them to their advantage. The critical competence framework offers comprehensive guidelines to the practitioners and managers about the various issues they should focus on to leverage their core competencies for attaining a sustainable competitive advantage.

Most of the past studies in strategy literature offer a *post-facto* approach, i.e., they study organizations and then analyse the reasons for their success or failure. This traditional approach no doubt offers points of learning for the managers but what the practitioners really need

is a forward looking strategic framework which provides them suggestions for business conduct. The critical competence framework is a universal model and in addition to *post-facto* analysis, it can also be used to formulate the competence strategy for an organization. In other words, it has both *descriptive* as well as *prescriptive* capability. The dynamic nature of critical competence framework takes into account the upgradation, learning, development, and abandonment of core competencies in relation to internal/external fit making it more realistic, practical, and holistic.

This paper leads us to the conclusion that for achieving sustainable competitive advantage, firms need to have a critical competence. The various elements of critical competence framework discussed so far bring out their importance and meaning. We have demonstrated the *descriptive* ability of the framework through the example of IR. Future research can study and test the usefulness of the suggested theoretically synthesized framework with reference to its *prescriptive* ability. This can be done by analysing the ways in which firms are actually deploying, nurturing, developing, and abandoning core competencies. Such studies can offer concrete methodologies on how firms can develop their systems for actualizing their critical competence framework. ♡

REFERENCES

- Amit, R and Schoemaker, P J H (1993). "Strategic Assets and Organizational Rent," *Strategic Management Journal*, 14(1), 33-46.
- Barney, J (1991). "Firm Resources and Sustained Competitive Advantage," *Journal of Management*, 17(1), 99-121.
- Bogaert, I; Martens, R and Cauwenbergh, A V (1994). "Strategy as a Situational Puzzle: The Fit of Components," in Hamel, G and Heene, A (eds.), *Competence-Based Competition*, The Strategic Management Society, Sussex: John Wiley and Sons, 57-74.
- Brickley, J; Smith, C and Zimmerman, J (1995). "The Economics of Organizational Architecture," *Journal of Applied Corporate Finance*, 8(2), 19-31.
- Buzzell, R D; Gale, B T and Sultan, R (1975). "Market Share: A Key to Profitability," *Harvard Business Review*, 53(1), 97-106.
- Caves, R E and Porter, M (1977). "From Entry Barriers to Mobility Barriers: Conjectural Decisions and Contrived Deterrence to New Competition," *Quarterly Journal of Economics*, 91(2), 241-261.
- Chandler, A (1990). *Scale and Scope*, Cambridge, MA: Harvard University Press.
- Dierickx, I and Cool, K (1989). "Asset Stock Accumulation and Sustainability of Competitive Advantage," *Management Science*, 35(12), 1504-1511.
- Dosi, G (1988). "Sources, Procedures and Microeconomic Effects of Innovation," *Journal of Economic Literature*, 26(3), 1120-1172.
- Eaton, B and Lipsey, R (1980). "Exit Barriers are Entry Barriers: The Durability of Capital as a Barrier to Entry," *Bell Journal of Economics*, 11(2), 721-729.
- Hall, R (1992). "The Strategic Analysis of Intangible Resources," *Strategic Management Journal*, 13(2), 135-144.
- Hamel, G (1994). "The Concept of Core Competence," in Hamel, G and Heene, A (eds.), *Competence-Based Competition*, The Strategic Management Society, Sussex: John Wiley and Sons, 11-33.
- Helleloid, D and Simonin, B (1994). "Organizational Learning and a Firm's Core Competence," in Hamel, G and Heene, A (eds.), *Competence-Based Competition*, The Strategic Management Society, Sussex: John Wiley and Sons, 213-238.
- Higgins, J M (1996). "Achieving the Core Competence: It's as Easy as 1,2,3...47,48,49," *Business Horizons*, 39(2), 27-32.
- Hill, C W L and Helleloid, D (1992). "A Resource-based Theory of the Multinational Enterprise," Proceedings of the European International Business Association Annual Meeting, Reading, UK.
- Indian Railways Year Book* (2003-04). Ministry of Railways, New Delhi: Government of India.
- Itami, H (1987). *Mobilizing Invisible Assets*, Cambridge, MA:

- Harvard University Press.
- Kogut, B (1988). "Joint Ventures: Theoretical and Empirical Perspectives," *Strategic Management Journal*, 9(4), 319-332.
- Lei, D; Hitt, M A and Bettis, R (1996). "Dynamic Core Competences through Meta-Learning and Strategic Context," *Journal of Management*, 22(4), 549-569.
- Leo, F D (1994). "Understanding the Roots of Your Competitive Advantage: From Product/Market Competition to Competition as a Multiple Layer Game," in Hamel, G and Heene, A (eds.), *Competence-Based Competition*, The Strategic Management Society, Sussex: John Wiley and Sons, 36-55.
- Leonard-Barton, D (1992). "Core Capabilities and Core Rigidities: A Paradox in Managing New Product Development," *Strategic Management Journal*, 13(5), 111-125.
- Lippman, S and Rumelt, R (1982). "Uncertain Imitability: An Analysis of Interfirm Differences in Efficiency under Competition," *Bell Journal of Economics*, 13(2), 418-438.
- Mahoney, J T and Pandian, J R (1992). "The Resource-based View within the Conversation of Strategic Management," *Strategic Management Journal*, 13(5), 363-380.
- Mascarenhas, B; Baveja, A and Jamil, M (1998). "Dynamics of Core Competencies in Leading Multinational Companies," *California Management Review*, 40(4), 117-132.
- Nelson, R R and Winter, S G (1982). *An Evolutionary Theory of Economic Change*, Cambridge, MA: Belkap Press.
- Peteraf, M A (1993). "The Cornerstones of Competitive Advantage: A Resource Based-View," *Strategic Management Journal*, 14(3), 179-188.
- O'Driscoll, A; Carson, D and Gilmore, A (2001). "The Competence Trap: Exploring Issues in Winning and Sustaining Core Competence," *Irish Journal of Management*, 22(1), 73-90.
- Porter, M E (1985). *Competitive Advantage*, New York: Free Press.
- Prahalad, C K and Hamel, G (1990). "The Core Competence of the Corporation," *Harvard Business Review*, 68(3), 79-93.
- Rumelt, R (1972). *Strategy, Structure and Economic Performance*, Boston: Harvard University Press.
- Rumelt, R (1982). "Diversification Strategy and Profitability," *Strategic Management Journal*, 3(4), 359-369.
- Rumelt, R (1984). "Towards a Strategic Theory of the Firm," in Lamb, R (ed.), *Competitive Strategic Management*, Englewood Cliffs, NJ: Prentice Hall, 556-570.
- Spender, J C (1993). "Competitive Advantage from Tacit Knowledge? Unpacking the Concept and Its Strategic Implications," *Academy of Management Best Papers Proceedings*, Atlanta, GA.
- Teece, D J; Pisano, G and Shuen, A (1990). "Firm Capabilities, Resources, and the Concept of Strategy," CCC Working Paper no. 90-8, University of California at Berkeley.
- Wernerfelt, B (1984). "A Resource-based View of the Firm," *Strategic Management Journal*, 5(2), 171-180.
- Williamson, O E (1985). *The Economic Institutions of Capitalism*, New York: Free Press.
- Winter, S G (1987). "Knowledge and Competence as Strategic Assets," in Teece, D J (ed.), *The Competitive Challenge*, Cambridge, MA: Ballinger, 159-184. ♡

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No human pursuit achieves dignity unless it can be called work, and when you can experience a physical loneliness for the tools of your trade, you see that the other things—the experiments, the irrelevant vocations, the vanities you used to hold—were false to you.

Beryl Markham