CREATION OF MANAGERIAL CAPABILITIES THROUGH MANAGERIAL KNOWLEDGE INTEGRATION: A COMPETENCE-BASED PERSPECTIVE

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ERIM REPORT SERIES *RESEARCH IN MANAGEMENT*	
ERIM Report Series reference number	ERS-2000-19-STR
Publication status / version	draft / version February 2000
Number of pages	28
Email address first author	fbosch@fbk.eur.nl
Address	Erasmus Research Institute of Management (ERIM) Rotterdam School of Management / Faculteit Bedrijfskunde Erasmus Universiteit Rotterdam PoBox 1738 3000 DR Rotterdam, The Netherlands Phone: # 31-(0) 10-408 1182 Fax: # 31-(0) 10-408 9020 Email: info@erim.eur.nl Internet: www.erim.eur.nl

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REPORT SERIES
RESEARCH IN MANAGEMENT

BIBLIOGRAPHIC DATA AND CLASSIFICATIONS		
Abstract	The purpose of this paper is to develop a conceptual framework of managerial knowledge integration and to illustrate the framework for three levels of management: front-line, middle, and top management. Based on the framework, propositions will be derived relating managerial knowledge integration with the creation of managerial capabilities and a firm's managerial competences.	
Library of Congress Classification (LCC)	5001-6182	Business
	5546-5548.6	Office Organization and Management
	30.2	Office Organization and Management
Journal of Economic Literature (JEL)	M	Business Administration and Business Economics
	L 20	Firm Objectives, Organization and Behavior: general
	M 19	Business Administration: Other
European Business Schools Library Group (EBSLG)	85 A	Business General
	270 A 100 G	Strategic Management Organizational Growth
	240 B	Information Systems Management
Gemeenschappelijke Onderwerpsontsluiting (GOO)		
Classification GOO	85.00	Bedrijfskunde, Organisatiekunde: algemeen
	85.10	Strategisch beleid
	85.20	Bestuurlijke informatie, Informatieverzorging
Keywords GOO	Bedrijfskunde / Bedrijfseconomie	
	Strategisch management, organisatievernieuwing	
	Kennismanagement, Vaardigheden, Organisatieontwikkeling	
Free keywords	Managerial knowledge integration; Managerial capabilities and competences; Levels of management	
Other information		

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February 2000; Version 2.1

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ABSTRACT

The purpose of this paper is to develop a conceptual framework of managerial knowledge integration and to illustrate the framework for three levels of management: front-line, middle, and top management. Based on the framework, propositions will be derived relating managerial knowledge integration with the creation of managerial capabilities and a firm's managerial competences.

KEYWORDS

Managerial knowledge integration; Managerial capabilities and competences; Levels of management.

INTRODUCTION

During the last few decades the field of strategic management has lost its emphasis on management. Although different scholars (e.g., Coff, 1997; Pennings, Lee & Van Witteloostuijn, 1998; Pfeffer, 1998) recently have emphasized human assets and capital as strategic variables of importance to firm behavior and performance, the field has largely failed to recognize management as a more specific human asset (Bartlett and Ghoshal, 1993). Notwithstanding its aptitude, the resource-based view of the firm (e.g., Grant, 1991; Wernerfelt, 1984) has also neglected to redress thoroughly the role of managers in the competitive equation. In addition to the neglect to acknowledge the direct role of management in competition, the loss of emphasis on management has also brought on 'a silent, ongoing battle between weak signals from the realm of management practice and strong, well-developed paradigms in established fields of scholarly inquiry' (Prahalad, 1995: iii). As Mahoney and Sanchez (1997) have provided some leeway into this issue by an interactive, reciprocating process model to reconnect the dissociative theories of practice and research, in the competence-based view the managerial shortcoming appertains particularly to the role of management itself.

Since Edith Penrose (1959) already pointed at the key role of managers forty years ago in her seminal work on the resource-based view, this may be considered a remarkable development. From her argument it can be construed that management's role is effected as (1) the management *of* resources and, grounded in the view that managers carry and employ *managerial resources* and *capabilities*, (2) management *as* a resource. Both constructions are in constant touch with each other in that managers as resources render services for the management of other resources, as also for the prosecution of their job in general. In addition, the conspicuity is reinforced by the fact that 'of all various kinds of productive services, managerial services are the only type which every firm, because of its very nature as an administrative organization, must make use of' (Penrose, 1959: 48).

The theory of competence-based competition builds on this indispensability of management in so far as it has provided an onset to resuscitate the role of managers by viewing firms as open systems, guided by a strategic logic derived from *managerial cognitions* and governed by *management processes*, to coordinate asset stocks and flows (Hall, 1997; Sanchez and Heene, 1996). Intellectual inquiries building on Penrose's growth theory (e.g., Ghoshal, Hahn and Moran, 1997; Mahoney, 1995), and studies arguing for a 'managerial action perspective' in resource-based

theories (Martens, Vandenbempt and Bogaert, 1997) serve similar bases to expand understanding of the management *of* resources. But, apart from the few noteworthy disquisitions claiming managers to be a key class of resources (e.g., Barney, 1994; Castanias and Helfat, 1991), insights into managers *as* resources, and the *managerial* resources and capabilities they carry, remain sparse and inchoate. Rather, thus far the competence-based view has preoccupied itself thus far largely with the importance of *organizational* resources and capabilities, particularly organizational knowledge (Conner and Prahalad, 1996; Hall, 1997; Sanchez, 1997).

In elucidating a proper context for the management of organizational knowledge creation processes, the literature on new organizational forms on the other hand has had an explicit focus on management processes, and implicitly on managerial resources at different managerial levels (see, e.g., Bartlett and Ghoshal, 1993; 1997; Hedlund, 1994 Van Wijk and van den Bosch, 1999). Deducible from Bartlett and Ghoshal's (1997) work on management competencies is that *managerial knowledge* is a pivotal managerial resource. Although the concept of managerial knowledge has been heeded by some ancestral management scholars, such as Fayol (1949) and Mintzberg (1973; 1994), it has further been unexplored. By integrating and applying managerial knowledge, however, managers form managerial capability (*cf*. Grant, 1996a; Sanchez and Boisot, 1999) and render services (Penrose, 1959) for their functioning in general and, more fundamental to the competence-based view, for the managerial roles required for creating and developing other kinds of—organizat-ional—knowledge and capabilities. As knowledge creation processes and new organizational forms constitute dynamic organizational capabilities (Hedlund, 1994) and are driven by the services of management, it can be argued imperative to put '*managerial* knowledge at the forefront of competitive advantage' (Floyd and Wooldridge, 1996: 23; emphasis added).

As it is rather unexplored yet in the competence-based view of management, this paper focuses upon the moot point what managerial knowledge and managerial capabilities are, what services are rendered by them, how it complements organizational knowledge creation processes, and how front-line, middle and top management contribute to a firm's managerial capabilities. With this end in view, the agenda of the paper is as follows. The next section addresses the process of organizational knowledge creation and urges the necessity of *managerial knowledge creation*. In the third section, the antecedents of and categories of managerial knowledge are broached. In the fourth section, the paper explores how managerial knowledge is embedded in managerial capabilities by means of integrating individual managerial knowledge. Furthermore, a conceptual framework of

managerial knowledge integration will be developed, to be expanded in the fifth section by an application of this framework to three levels of management and by suggesting a few propositions. The final section concludes the paper with a discussion and provides directions for future research.

ORGANIZATIONAL KNOWLEDGE AND ITS CREATION

In search to explain the competitive successes of firms, scholars have paid a vast amount of attention to knowledge and knowledge creation processes as primary sources of competitive advantage. Because it serves as the basis upon which capability is formed, because it may create barriers to imitation by rivals, and, therefore, may account for the larger part of value added, knowledge has been endowed as 'the most strategically-significant resource of the firm' (Grant, 1996a: 375). In dynamic environments knowledge creation processes may be conceived of as even more crucial, since they endow firms with the capability to develop knowledge in congruence with the demands imposed by the environment over time (Nonaka and Takeuchi, 1995). Inquiries into knowledge and knowledge creation have highlighted, however, some cynosures. First, a categorical fixation on the role and use of tacit versus explicit knowledge in firms has emerged. Second, most academic—and managerial—work has focused on knowledge related to the creation of products and services. Owing to this emphasis placed upon knowledge by both these foci, third, less emphasis has emerged on higher order capabilities. Furthermore, although knowledge has been emphasized to reside at the individual and organizational level (Spender, 1996a), most higher order capabilities are argued essentially organizational (e.g., Kogut and Zander, 1992; Teece, Pisano and Shuen, 1997). Higher order capabilities may, however, also reside at the individual level, in particular with the administrative personnel of the firm, that is, managers.

Tacit versus explicit knowledge

Tracing its origins back to Penrose (1959) and Polanyi (1958), a commonplace distinction appearing across recent contributions is between explicit and tacit knowledge. Although arguments have been adduced for the strategic importance of both explicit and tacit knowledge, a comparison of some illustrative work (e.g., Nonaka and Takeuchi, 1995; Ramirez, 1999; Sanchez, 1997; Spender, 1996b; Winter, 1987) reveals that the advantage of the one is the disadvantage of the other. Contrary to explicit knowledge, tacit knowledge is difficult to articulate, codify and teach since

it emanates from context-specific personal experience and learning-by-doing. In turn, it is highly immobile and subject to issues of appropriability and causal ambiguity. Tacit knowledge inhibits, therefore, imitation by rivals, but it also impinges upon internal transfer and replication. With respect to explicit knowledge, a similar, but reversed argument can be posited. That is, because it is articulated, codified and teachable, explicit knowledge is easier to transfer internally than tacit knowledge, but it is also susceptible to easier imitation by rival firms.

The paradox regarding the strategic value of either explicit or tacit knowledge is redressed though by the dependence of both types of knowledge on the content, process, and context in which each must be utilized (e.g., Liebeskind, 1996). In addition, the knowledge creation processes of firms center on the social interaction between *both* tacit *and* explicit knowledge. Nonaka and Takeuchi (1995) argue that the knowledge creation process of firms is manifested in a four-phase process model in which tacit knowledge is converted into explicit knowledge, and *vice versa*. Similarly, Boisot (1995; 1998) points out that the knowledge creation process of a firm may be seen as a 'social learning cycle' (SLC) in which knowledge moves back and forth across three dimensions which make up the 'information space' of firms, and indicate the degree of abstraction, diffusion and codification of knowledge. Two additional ways serving the creation of knowledge at the organizational level are the replication of knowledge among organizational members without alternation of its content (Kogut and Zander, 1992; Nelson and Winter, 1982) and the integration of different kinds of knowledge into a new body of knowledge (Grant, 1996a). Similar to socialization and combination processes (Nonaka and Takeuchi, 1995), these two modes of knowledge creation do not necessarily involve a conversion. With regard to integration, it is argued individuals' specialized knowledge serves as the basis to forming single-task capabilities. Similarly, specialized capabilities, activity-related capabilities, functional capabilities and cross-functional capabilities serve as the basis upon which its consecutive capability is formed, and eventually culminate in *organizational* capabilities (Grant, 1996a). Nevertheless, the basic thrust behind knowledge creation, as well as of integration and replication, is that it most commonly involves both tacit and explicit knowledge. Furthermore, as Tsoukas postulates it eloquently, since '[t]acit knowledge is the necessary component of *all* knowledge ... to split up tacit and explicit knowledge is to miss the point - the two are inseparably related' (1996: 14; original emphasis). In cases where knowledge is used for action, tacit knowledge, in the shape of rules and routines (see also Nelson and Winter, 1982), and explicit knowledge are grounded on a tacitly shared knowledge background.

Organizational level knowledge: products and services knowledge

While the distinction between explicit and tacit knowledge is important to the argument developed here, an equally prevalent observation is that the bulk of the literature on knowledge and knowledge creation processes focuses on *organizational* features. In so doing, knowledge and knowledge creation are primarily related to the most obvious way in which profits and rents are earned, that is through its deployment and application to products and services. For example, Grant (1996a) illustrates his point that knowledge needs to be integrated to form *organizational* capability (see above) by a manufacturer of private-branch telephone exchanges (PBXs). Somewhat similar to Grant's notion of integration, Henderson and Clark (1990: 10) set forth that organizational 'innovations that change the way in which the components of a product are linked together, while leaving the core design concepts ... untouched' establish significant competitive implications and require the application and creation of 'architectural' product knowledge. Centering on changes in component knowledge rather than on changes in architectural linkages between components, Sanchez (1999) and Sanchez and Mahoney (1996) take an opposite stance and propound that by virtue of modularity in product design percussions in knowledge creation processes, and flexibility and modularity in organizational design can be achieved. From yet another perspective, Grant and Baden-Fuller (1995) argue that knowledge is most likely to be created through interorganizational collaborations in case knowledge domains and *product* domains are not confluent. Identical to the other examples—which are abound (e.g., Grant, 1996a; Leonard-Barton, 1995; Nelson and Winter, 1982; Nonaka and Takeuchi, 1995; Schumpeter, 1934; Spender, 1996)—that fixate on products and services knowledge, the competence-based and resource-based views have also concentrated mainly on *organizational* knowledge and knowledge creation.

Higher-order capabilities

With its emphasis on knowledge creation processes to create organizational, product and services related knowledge, the theory of competence-based competition has focused primarily on the inside of the orange, squeezing out the profitable juice while separating it from the flesh. In the course of its inquiry into rare, valuable, imperfectly imitable and imperfectly substitutable organizational capabilities and knowledge, however, the competence-based view has largely downplayed the necessity of the peel as a higher order organizing principle (Kogut and Zander, 1992). The peel is necessary in that it governs the orange's growth and, in the meanwhile, prevents

the orange from desiccating, falling apart, and loosing juice. Consequently, the peel establishes a long term dynamic perspective.

Since knowledge creation is based upon a tacitly shared background (Tsoukas, 1996), codification processes in knowledge creation processes, for instance, must be governed by 'a coding repertoire ..., as well as a body of accumulated experience guiding the use of that repertoire - i.e. a coding convention' (Boisot, 1995: 168), which serves as this background. Based upon the same premise, socialization, externalization, internalization, integration and replication processes require similar governing principles. Since organizational knowledge creation processes are coordinated, led and organized by the administrative personnel of a firm -i.e. managers- (Hedlund, 1994; Nonaka and Takeuchi, 1995; Penrose, 1959), it can be argued the peel is constituted by management, and management processes.

Because the competence-based view of competition views firms as open systems in which asset stocks and flows, and thus knowledge and knowledge creation processes, are coordinated and governed by *management processes* and a strategic logic derived from *managerial cognitions* (Sanchez and Heene, 1996), it would be pejorative to maintain that it has completely neglected to acknowledge the importance of the peel. However, as it incites a dynamic, systemic, cognitive and holistic view of the management process, it remains somewhat remarkable. As these management processes may be considered as one of the most important of 'the firm's abilit[ies] to integrate, build, and reconfigure internal and external competences to address rapidly changing environments', they constitute a firm's dynamic capability (Teece, Pisano and Shuen, 1997: 516). It therefore is more appropriate to shift the focus from the management *of* resources, in terms of management processes, to *managerial resources* and management *as* a resource (*cf*. Penrose, 1959). Since it can be conjectured that dynamic capabilities are also based upon the integration of knowledge (Grant, 1996a), and as they are valuable to management processes as well, and therefore to organizational knowledge creation processes, likewise, *managerial knowledge* as 'a different kind of knowledge' (Sanchez, 1997: 177) induces a dynamic capability through which a firm is able to integrate, build and renew knowledge and knowledge creation processes in congruence with the contingencies posed by the changing environment. In this connection, at a higher order, managerial knowledge *creation* processes as part of the strategic logic of a firm (Sanchez, Heene and Thomas, 1996) may even be considered capabilities to create dynamic capabilities, and, therefore, be taken for as metacapabilities (Collis, 1994).[1]

MANAGERIAL KNOWLEDGE: ANTECEDENTS AND CATEGORIES

Despite the reasonable interest into the efforts of predecessor Penrose (1959), the resource-based and competence-based views have thusfar overlooked managerial knowledge as a specific managerial resource. Rather, the exceptional disquisitions purporting the competitive role of managers are limited to managerial resources in general, and almost exclusively address knowledge-related resources carried by managers. For example, building on Penrose (1959), many (e.g., Ghoshal, Moran and Hahn, 1997; Mahoney, 1995; Martens, Bogaert and Vandenbempt, 1997; Spender, 1994) have propounded that in order to advance theory building in resource-based views, other disciplines and streams of intellectual inquiry should be united with it. In search to synthesize the resource-based view of the firm, organizational learning theories and the dynamic capabilities approach into a resource-learning theory, Mahoney (1995) argued that besides '... competition between heterogeneous "bundles of resources" ... competition between heterogenous "mental models"' needs to be considered in order to understand competitive advantage'. Most closely related to the notion of managerial knowledge is Barney's (1994) work, which adduces at a more general level that managers' experiences, intelligence, and cognitive style may stand the tests of value, rareness, imperfect imitability, and imperfect substitutability, so characteristic of analyses ensuing the resource-based view of the firm. Although curtailed to the top management level, another noteworthy exception is the work of Castanias and Helfat (1991), who postulate that management may constitute a resource in terms of managerial skills from which differential managerial rents accrue, and therefore may conduce sustainable competitive advantage. Upon this score, both Barney and Castanias and Helfat more or less acknowledge that managers, and in particular the knowledge related aspects they carry do matter in the competitive equation. Nevertheless, the competence-based view is still short of a recognition of managerial knowledge, which, in this paper, is elaborated as the driving force behind organizational knowledge creation processes.

Foregoing studies in the plethora of work on management roles, functions, and tasks emanating from organizational behavior and theory (e.g. Drucker, 1973; Mintzberg, 1973; 1994) have, relative to the other insights gained, also only scantly addressed the role of managerial knowledge. Following Koontz's (1964) definition of managing, it can be adduced that managerial knowledge may be defined as knowledge regarding 'the art of getting things done through and with

people' (p. 15). Nevertheless, this definition and similar observations remain conspicuous and incongruent considering the fact that Fayol (1949: 7) already implicitly referred to managerial knowledge as comprising general education 'not belonging exclusively to the function performed', special knowledge 'peculiar to the function', and experience 'arising from the work proper'. As one of the few exceptions to the rule, Mintzberg (1994) poses regarding 'the person on the job' that

> '*values* ... [together with] a body of *experience* that, one the one hand, has forged a set of skills or *competences*, perhaps honed by training, and, on the other, has provided a base of *knowledge* ... [which] is, of course, used directly, but ... also converted into a set of *mental models* ... determine ... his or her *style* of managing' (p. 12; original emphasis).

As does Ewing (1964) in its inquiry into the knowledge of the executive, experience, skills and competences, and knowledge are taken separately by Mintzberg (1994). Following the arguments of Grant (1996a) and Nonaka and Takeuchi (1995) on knowledge creation and integration, however, it can be maintained that all are essentially intermingled and built upon each other. Stock should also be taken of the difference between a skill and knowledge, in that 'skill' refers to something one 'does', and 'knowledge' to something one 'does' but also may 'have' (*cf.* Hall, 1997). Thus, knowledge can be interpreted as knowledge as an asset or resource ('having'), or knowledge as a capability, skill, or competence ('doing').

MANAGERIAL KNOWLEDGE INTEGRATION

Grant's (1996a) logic with regard to organizational capabilities can be followed to analyze managerial knowledge and to relate managerial knowledge to managerial capabilities and competences. As depicted in Figure 1, at the most basic level, managerial knowledge components serve as the basis of managerial knowledge domains related to a specific aspect of managing. In turn, the integration of these knowledge domains leads to the integrated managerial knowledge an individual manager carries, entailing all knowledge to prosecute his or her job properly, which integrated collectively culminates in a firm's managerial capabilities.

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Figure 1 about here
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Knowledge components

The premise that to manage knowledge and knowledge creation effectively within an organization, 'managers need to understand not just the stocks of knowledge within the firm ..., but also how to manage the actual and potential transfers and diffusions (flows) of knowledge within and across the boundaries of the organization' requires recognition of the basic differences in the contents of knowledge (Sanchez, 1997: 174). Based on this premise, Sanchez (1997) discerns know-how, know-why, and know-what as related to state, process, and purpose forms of knowledge in a system respectively. In explaining this, Sanchez uses the example of a product as a system extensively, but, as will be expounded below, it can also be conceived as a technical method, a function, a firm, or the environment. Then, according to Sanchez (1997), know-how is knowledge about 'how elements of a system are interrelated in the current state of the system' (p. 176), whereas know-why is knowledge about why these parts are interrelated to produce its overall function. Finally, Sanchez (1996) describes know-what as knowledge about 'what courses of action are available to a firm' (p. 177) and what its outcomes are likely to be.

Building on this classification we propose that *know-what* is knowledge about what the elements of a system are, and resembles declarative or component knowledge (Henderson and Clark, 1990). *Know-how* is knowledge about how the elements of a system are related to each other, and therefore resembles procedural or architectural knowledge (Henderson and Clark, 1990). *Know-why*, then, is not only knowledge about why the elements of a system function together, but also why a firm operates in the way it does.

As management also involves managing through and with other people (Koontz, 1964) and knowing who governs or possesses certain elements of a system, however, *know-who* must be included as one of the basic building blocks. For example, know-who might refer to knowing an R&D manager, or knowing an employee who has knowledge about a particular process. Similarly, as managing also concerns different parts of the firm and different geographical locations, *know-where* is another fundamental building block upon which eventually managerial knowledge is built. Building on the previous example, know-where entails where the R&D manager or the employee

reside. In the context of European Management, Boone and Van den Bosch (1996) discuss the importance of the geographical dimension in Europe as regards know-where. Finally, since management is also prosecuted at different times, *know-when* constitutes the final basic building block. In the example used, know-when is knowledge about when to consult the R&D manager or the employee. From a broader perspective, know-when is also related to the time dimension of strategy and strategic decision-making (Van den Bosch and De Man, 1997).

To summarize, as depicted in Figure 1, the knowledge components of managerial knowledge are constituted by know-what, know-how, know-why, know-who, know-where, and know-when. Therefore, in the context of organizational knowledge creation processes, it can be argued that managers must know when and why to activate and govern the know-how and know-what of knowledge processes knowledgeably by knowing who needs to be involved, and knowing where to find these people.

Knowledge domains

As basic building blocks, these knowledge components are employed integratively in certain knowledge domains, which specify the nature of managerial knowledge at a higher level, and relate to the broader activities a manager must perform to maintain the competitive stance of the firm (see Figure 1).

In explaining the rent generating capacity of top management as necessary to the emergence of cultural resources and organizational capabilties, skills and abilities, Castanias and Helfat (1991) employ Katz's (1955) classification to discern the different skills of a manager. Katz distinguishes technical skills implying 'an understanding of, and proficiency in, a specific kind of activity, particularly one involving methods, processes, procedures, or techniques' (p. 34), human skills as the 'ability to work effectively as a group member and to build cooperative effort within the team he leads' (p. 34), and conceptual skills as 'the ability to see the enterprise as a whole' (p.36). However, because this classification does 'not distinguish between different organizations and environments in which the skills are employed' (Castanias and Helfat, 1991: 159), they propound an alternative classification configured around 'generic skills', 'type of business or industry-related skills', and 'firm-specific skills'. Grounded in the premise that skills and capabilities are formed by integrating knowledge, one might also speak of technical, human, and conceptual managerial knowledge, as also of generic, industry-related, and firm-specific managerial knowledge.[2,3]

For the purpose of this paper, Castanias and Helfat's (1991) classification, however, may be too broad and drawing on a different perspective, in the sense that the knowledge a manager possesses about, for example, his function may be the result of integrating generic knowledge, industry-related knowledge, and firm-specific knowledge at the same time. This is reflected in Simon's (1985) conjecture that

> 'managerial knowledge falls into two main categories: on the one hand, knowledge about human behavior in organization and about how organizations operate, and, on the other, knowledge about the content of the organization's work - knowledge that may be largely specific to an industry or even to a particular company or plant' (p. 17).

As the classification of Simon (1985), who takes a similar stand as Katz (1955), is too limited in that it does take into account organizational aspects only narrowly and no environmental aspects, the classification of *knowledge domains* needs to be rearranged.

As illustrated in Figure 1, the knowledge domains upon which managerial knowledge builds can be arranged in four domains, which are (1) managerial functional knowledge, (2) managerial technical knowledge, (3) managerial company knowledge, and (4) managerial environmental knowledge. In this classification, Fayol's (1949: 7) notion of functional knowledge is adopted to address knowledge 'peculiar to the function' of the manager. For instance, this knowledge can be conceived in terms of knowledge how and why to prosecute properly what roles the manager needs to prosecute, in terms of scheduling, leading, controlling, and communicating to other people (for a review of managerial roles see, e.g., Drucker, 1973; Mintzberg, 1973; 1994), and in terms of knowledge how to operate in the functional areas making up a firm, such as R&D, manufacturing, HRM, marketing and finance. By technical knowledge Katz's (1955) and Simon's (1985) terminologies are adopted, and reference is made to knowledge about methods, processes, procedures, and techniques related to particular kinds of activity.

By company knowledge reference is also made to Katz (1955) and Simon (1985) in that it entails knowledge about how the organization operates. Expanding this terminology, however, it also entails knowledge about what the organization stands for, or what individuals and groups are present within the firm. To compensate for the lack of recognition of the environment, environmental knowledge constitutes the final knowledge domain a manager draws his or her knowledge on. In that connection, environmental knowledge is constituted by, for example, market knowledge of what

customers' preferences are, knowledge about macroenvironmental developments, or knowledge about competitors and other key external stakeholders.

Managerial knowledge

At the highest individual level, management knowledge domains are integrated to form individual managerial knowledge. This knowledge is mostly tacit because managers over time gain experience in managing and form a routine in managing (Nelson and Winter, 1982). Moreover, although they use documents or written formats to get acknowledged with aspects of importance to the organization, they normally do not use them while 'doing' their job. Therefore, managerial knowledge is mainly tacit, but the interrelatedness of explicit and tacit knowledge still upholds (Tsoukas, 1996), since managers act in a largely tacit context.

In performing his or her job, the manager integrates the four knowledge domains in a coherent but idiosyncratic set of knowledge specified to a particular context. For example, a manager applies his or her technical knowledge in his or her function as an R&D manager trying to lead a team of engineers, in a particular organizational context under certain environmental circumstances which he or she must reconcile. In the context of organizational knowledge creation, individual managers leading the organizational knowledge creation process apply knowledge '... [where] a personal element, to some extent incommunicable, remains with us to become a source of individuation and differentiation in the skill with which the code is applied' (Boisot, 1995: 170). As managers learn to apply and integrate these knowledge domains over time, 'this increase in knowledge not only causes the productive opportunity of a firm to change in ways unrelated to changes in the environment, but also contributes to the 'uniqueness' of the opportunity of each individual firm' (Penrose, 1959: 52-53).

Managerial capabilities

Integrating the managerial knowledge of individuals, a firm achieves its managerial capabilities. Integrating individual managerial knowledge in, for example, a constellation of people such as a team, can provide additional services as the ones rendered by individual managers, because working with each other 'enables them to provide services that are uniquely valuable for the operations of the particular group with which they are associated' (Penrose, 1959: 46). Consequently, 'they become individually and as a group more valuable to the firm in that the services

they can render are enhanced by their knowledge of their fellow-workers, of the methods of the firm, and the best way of doing things in the particular set of circumstances in which they are working' (Penrose, 1959: 52). In a collective setting, managers are able to complement and leverage each other's individual knowledge, both at the level of the knowledge components and at the level of the knowledge domains.

When the collective is a more or less permanent one, managers are able to specialize, and to build and build upon the competences available to a firm (Sanchez and Heene, 1996). Since knowledge and mental models are heterogeneous (Mahoney, 1995), temporal constellations of different managers may also provide enormous benefits in that reconfiguring and reintegrating their managerial knowledge gives rises to new combinations and therefore new managerial capabilities at the firm level. Stemming from the analysis conducted above, the following proposition can be suggested:

Proposition 1 *Managerial knowledge integration is a prerequisite for managerial capabilities creation.*

Proposition 2 *Both the composition and the durability of a managerial collectivity (e.g., a management team) determine the nature of the managerial capabilities created.*

MANAGEMENT LEVELS AND MANAGERIAL KNOWLEDGE INTEGRATION

Having developed a conceptual framework of managerial knowledge integration, in this section we will apply this framework to the different levels of management extant within a firm. Following Bartlett and Ghoshal (1993), three levels of management can be discerned: front-line management, middle management and top management. Although within these different levels of management basically the same set of roles and tasks are performed by managers, the relative importance of each is different. This view goes back to Fayol (1949) who stated all activities within firms can divided into six groups. Five of these groups of activities relate to the now well-known functional areas of management. Management activities are discerned as the sixth group of activities. Fayol clearly stated that most of these activities will be present in most jobs, be it to varying degrees.

Fayol stressed that the managerial activities are the most important in senior jobs and least or absent in direct production jobs. However, with the emergence of new organizational forms and the current decentralization practices in organizations, management jobs are completely reconfigured (Bartlett and Ghoshal, 1993; Hedlund, 1994; Van Wijk and Van den Bosch, 1998; 1999). Notwithstanding this development, Bartlett and Ghoshal (1993) seem to be build on Fayol's approach as they claim that different levels of management more or less perform the same basic managerial activities, but that their relative importance changes by level. Although front-line, middle and top management are discerned, as an example, Figure 2 tentatively illustrates the relative importance knowledge components and knowledge domains bear at the front-line management level.

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Front-line management

Front-line managers occupy themselves mostly with production (Fayol, 1949), the creation of new (managerial) knowledge (Bartlett and Ghoshal, 1993) within particular functional areas or organizational units. Although they need to possess some organizational knowledge with regard to other people in their departments and their senior managers, and some environmental knowledge in order to develop the appropriate competences and knowledge, as illustrated in Figure 2, their managerial knowledge is particularly based on the technical and functional knowledge domains. By corollary, the managerial knowledge components upon which these managerial knowledge domains are build pertain particularly to know-what, and know-how, in terms of knowing what to do within the particular function and how to do it. The components know-who, know-where, and know-when are limited to knowing who and where particular persons within the functional department or organizational unit reside, and when to approach them for consultation.

Middle management

In traditional organizations, middle managers are the implementors of resource allocation decisions made at the top, whereas in more contemporary organizational forms, middle managers constitute the pivotal management level, the boosting level (Vila and Syvertsen, 1999), in linking the

firm's resources, skills, and knowledge (Bartlett and Ghoshal, 1993; Mintzberg, 1994). On both accounts, it can be argued that the middle manager's individual knowledge is mostly build upon the knowledge domains of company knowledge and environmental knowledge, and less on the functional and technical knowledge domains. Although the middle manager requires a certain amount of specialist technical and functional knowledge to allow for the linking of different resources and knowledge as a generalist (Leonard-Barton, 1995), environmental and company knowledge regarding the knowledge components of why to link what resources and knowledge, when to do as such, and whom to approach and where to find him or her is more important.

Top management

Top management's function in organizations is mainly to set forth the vision with regard to the firm's future, and the strategies and strategic logics that must bring the firm to its intended future (Bartlett and Ghoshal, 1993; Mintzberg, 1994). Since the strategies of firms are preferably build on the alignment of organization to environment, the knowledge domains of company and environmental knowledge are by far the most important of the four domains discerned. As strategies move beyond functional compartementalizations and the scopes of organizational units, relative to middle management, the importance of functional and technical knowledge is even more decreased. In order to get acknowledged with the requirements of the most appropriate strategies and strategic logics to be build, they still require certain amounts of know-who, know-where, and know-when. The most important knowledge component upon which their individual managerial knowledge is build, however, is know-why as knowledge regarding why it is necessitated that a firm moves in the direction it goes, or must go in the future.

Managerial competences

As 'knowledge is fundamental to organizational competence' (Sanchez and Heene, 1997: 5), so is managerial knowledge fundamental to managerial competence. From a competence perspective, *managerial competence* can be defined as an ability to sustain the coordinated deployment of managerial resources, managerial knowledge and managerial capabilties in a way that helps a firm achieve its goal. From this perspective, a firm's managerial competences can be considered as the final piece of the abovementioned conceptual framework of managerial knowledge integration, by applying and integrating the managerial capabilities to a wider goal, as is depicted in

Figure 3. The combination of Figures 2 and 3 depict systemic interdependencies among knowledge components, knowledge domains, individuals' managerial knowledge, and managerial capabilities. These systemic interdependencies, including the path dependencies and managerial mental models and cognitions, create highly firm-specific managerial capabilities, and thus firm-specific managerial competences, although generic, industry-specific and firm-specific knowledge may be involved (Castanias and Helfat, 1991). This suggests the following proposition:

Proposition 3 *Due to its systemic interdependencies built up over time, a firm's managerial competence is highly firm-specific, difficult to imitate, and therefore a key determinant of sustainable competitive advantage*.

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Figure 3 about here

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CONCLUSION

It appears that managerial knowledge thus far has been an unrecognized concept conducive to sustainable competitive advantage. This paper tried to contribute to this topic by elaborating the concept of managerial knowledge, which in integrated form serves as the basis upon which managerial capabilities and consecutively managerial competences are build. Competence-based management stressing the necessity of a dynamic, systemic, cognitive and holistic view of the management process clearly needs a thorough understanding of how and what managers learn to answer the intriguing question 'What is managerial knowledge ?' This paper contributed to this understanding by proposing a conceptual framework of managerial knowledge integration. It showed how managerial capabilities and managerial competences fit into this framework, and may serve as the ultimate basis upon which sustainable competitive advantage is built.

ACKNOWLEDGEMENTS

An earlier version of this paper was presented at the Fourth International Conference on Competence-based Management, held June 18-20, 1998, Oslo, Norway. We gratefully acknowledge the comments and suggestions of Aimé Heene, Ron Sanchez and the participants.

ENDNOTES

[1] Here the principle of infinite regress apparently can be applied as well, which is the capability to develop the capability to create managerial knowledge, and so forth. Nevertheless, as Collis (1994: 150) propounds, 'although the source of sustainable competitive advantage can be found in any one of the—very large—number of levels, valuable capabilities are dependent on the context of industry and time'. The same stand is taken here in that the necessity to create new knowledge is dependent on time and context, and therefore as also the application and creation of managerial knowledge.

[2] As they inquire the potential of rent generation of managerial skills, it should be noted that Castanias and Helfat's (1991) classification is an improper one. As will be adapted to later in the paper, they argue that, in respective order, generic skills, industry-related skills, and firm-specific skills bear an increasing propensity to generate managerial rents.

[3] An additional classification is provided by Sternberg (1997), who discerns analytical, practical and creative intelligence to show that IQ is only one part of managerial intelligence. Although mentioned by Barney (1994) and therefore applicable to the argument developed in this paper, this classification moves beyond the purpose of this paper and is therefore omitted for consideration.

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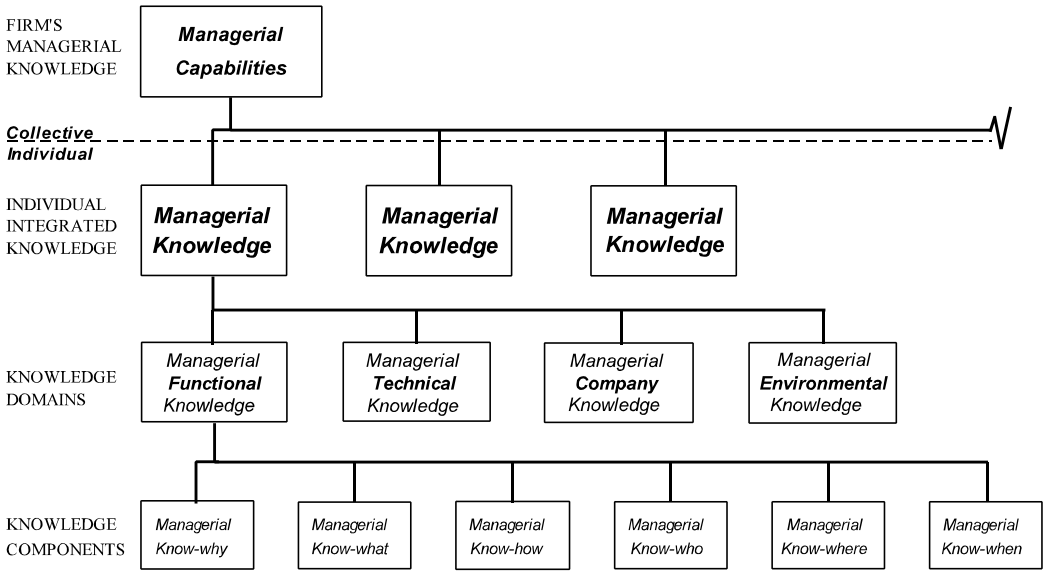
FIGURE 1:

A Conceptual Framework of Managerial Knowledge Integration

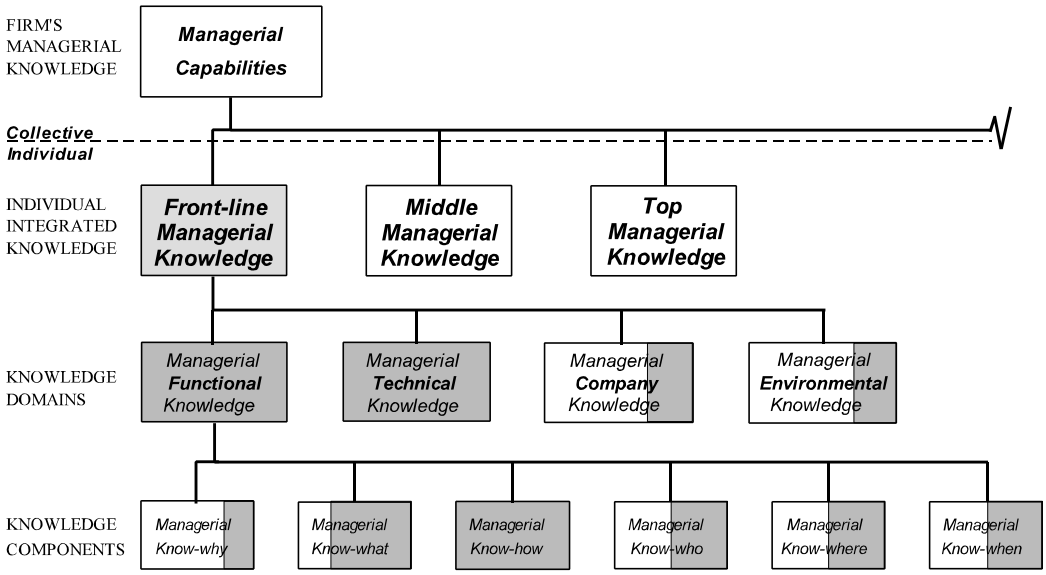


Note: adapted from Grant (1996a)

FIGURE 2:

A Conceptual Framework of Managerial Knowledge Integration:

The case of Front-line Management

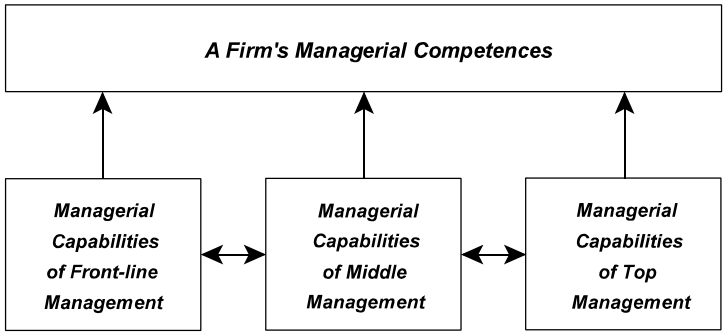


adapted from Grant (1996a)

Note: shaded area indicates relative importance of knowledge domains and knowledge components for a specific level of management.

FIGURE 3:

Managerial Competence Building



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