

## **Measuring for learning – outlining the future of organizational metrics**

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### **Abstract**

It is widely agreed that nowadays knowledge and competencies are the key productive factors and organizational capability for continuous learning, development and renewal has become the main driver of competitiveness. Thus organizations increasingly aim to develop their capabilities for continuous learning. In this paper we explore the role of measurement in enabling continuous organizational learning. First, we argue that while traditionally, measurement has been mostly used for control purposes, recent changes in the nature of work have brought new challenges which can no longer be met with the old mindsets and measures. Then we focus on the novel approaches brought about by scholars working in the fields of intellectual capital and competence development, and examine the current state-of-the-art. Finally, we construct foundations for a knowledge-based view of organizational measurement and set some future directions in which these new branches should be developed in order to really enable continuous learning and renewal on the level of the whole organization. Specifically, we argue that such measures should be dynamic, collective, localized, based on the organizational strategy, oriented towards the future, and aimed at enabling reflexive learning.

### **1. Introduction**

It is widely agreed that nowadays knowledge and competencies are the key productive factors and organizational capability for continuous learning, development and renewal has become the main driver of competitiveness (Drucker, 1988; Prahalad & Hamel, 1990; Kogut & Zander, 1992; Grant, 1996; Teece et al., 1997). Thus organizations increasingly aim to develop their capabilities for continuous learning. In this paper we explore the role of measurement in enabling continuous organizational learning. We argue that while traditionally, measurement has been mostly used for control purposes, recent changes in

the nature of work have brought new challenges which can no longer be met with the old mindsets and measures.

“You can only manage what you can measure”, undoubtedly one of the oldest clichés of management science, embodies an assumption that once something can be measured, it can also be managed. This type of an assumption is based on the idea that optimal performance can be totally standardized. It is also connected with the view that the expertise about the nature of optimal performance is located at the top of organizational hierarchy. Thus management is reduced to giving orders and enforcing control, and the role of employees is that of obedient implementers.

While this may have been a justified view in the Fordist era of mass production, recent changes in the nature of work have brought new challenges. Knowledge work implies different performance criteria and a different type of management than other types of work (e.g. Blackler, 1995; Davenport, 2000; Snowden, 1999). This entails changes for measurement on two levels. First, the actual measures themselves have to change. For example, knowledge worker productivity is more related with the quality than quantity of output (Drucker, 1999), which makes most of traditional performance measures inadequate. Second, the whole goal of measurement has to be seen differently: not as to control but to enable continuous learning and renewal of the whole organization.

In this paper, we first examine the nature of knowledge work and knowledge-based organizing based on recent management science literature. We thereby construct foundations for a knowledge-based view of organizational measurement. Then we focus on the novel approaches brought about by scholars working in the fields of intellectual capital (e.g. Edvinsson & Malone, 1997; Sveiby, 1997; Roos et al., 1998; Stewart, 1997; Bontis, 1999) and competence development (e.g. (Snow & Hrebiniak, 1980; Henderson & Cockburn, 1994; McGrath et al, 1995; Riiter et al., 2002), and examine the current state-of-the-art. These two recent schools of thought are mindful of the special qualities of knowledge as opposed to other types resources. Interestingly, in these strands of thought there is also a different kind of twist as compared with the traditional measures:

while traditionally measurement was mostly aimed at controlling, these new approaches are, more or less explicitly, aiming to measure for learning. So, rather than to control the intangible resources and competencies, the novel metrics are meant to enable development and learning, even development of reflective capabilities and learning to learn.

However, even though these new branches of management have set to expand the measurement from command and control purposes towards enabling learning, there is still a lot improvement in the measurement frameworks as well as the specific indicators. Finally, based on the knowledge-based view of work and organizing, we set some future directions in which these new branches should be developed in order to really enable continuous learning and renewal on the level of the whole organization.

## **2. The rise of knowledge work**

There exists a widespread agreement that knowledge is the new fundamental basis of competition: it is the most important factor in the creation of economic value and competitive advantage (e.g., Drucker, 1993; Stewart, 1997). Nowadays organizations are routinely viewed as collections of knowledge assets, competences and capabilities (e.g. Kogut & Zander, 1992; Prahalad & Hamel, 1990), which are populated by knowledge workers (e.g. Drucker, 1999) and located in the wider context of information society (e.g. Castells & Himanen, 2002). Knowledge has replaced land, labor and physical capital as the most important factor of production (Drucker, 1988), and the ability to manage and create intellectual capital (IC) is recognized as the foundation of the productive capacity of all types of organizations (e.g. Edvinsson & Malone, 1997; Marr, 2005).

While knowledge has always been at the heart of organizations, it is during the past two decades that the significance of knowledge as the most important source of economic value has really been unleashed (Foray, 2004). Peter Drucker (1959) predicted the rise of knowledge workers already in the late 1950's. Recently, he stated that the main economic

challenge of the 21<sup>st</sup> century will be increasing the productivity of knowledge workers (Drucker, 1999). Knowledge workers are the fastest growing segment in the developed countries (Campion et al., 1996; Janz et al., 1997; Drucker, 1999; Foss, 2005; OECD, 2005), and they produce most of the value added in companies (Stewart, 1997).

Knowledge workers are highly educated employees who apply theoretical and analytical knowledge to developing new products, services, processes or procedures (e.g. Janz et al., 1996). The essence of knowledge work lies in manipulation of symbols that convey data, information and ideas into new information and knowledge, in contrast to manipulation of concrete materials (Reich, 1992). Consequently, knowledge workers must master, for example, information processing, knowledge integration, knowledge creation, and abstract thinking (e.g. Tynjälä, 2003).

In addition to posing new demands for the individual employee, knowledge work also challenges the traditional conceptions of management. In fact, managing knowledge and knowledge work requires that most of the traditional assumptions about what effective management consists of must change. As Davenport (2001, 44) puts it, management in the knowledge economy is “a different game with different rules”.

Modern management was developed for the needs of Fordian mass production organizations. Ideally, this kind of an organization functions as a perfect machinery, which efficiently produces permanent quality and achieves pre-determined goals (see e.g. Burns & Stalker, XXXX; Grant, 1996; Spender, 1996b; Ståhle & Grönroos, 2000; Davenport, 2001). All the essential knowledge is seen to be located at the higher levels of the organization, and there is a strict separation into thinkers and doers. Hence the famous outburst of Henry Ford: “What I want is a good pair of hands; unfortunately I must take them with a person attached”. The managerially created knowledge is passed downwards in the form of rules and regulations, and the task of employees is obedient execution of the set criteria. Possibilities for new interpretations, elaborations and modifications by the employees are minimized, because these would merely disturb efficiency of the pre-

designed operating methods and hinder productivity. Hierarchical structure and centralized control ensure efficient steering of the organization. The role of measurement is to provide the management with information about whether the set goals are being met and the standardized operating methods being followed, and thereby to enable timely and just monitoring of execution. (The background assumption is that by gathering information about pre-determined and well-defined variables, the management controls what happens in the organization.)

In contrast, in knowledge-based organizations, the locus of knowledge is no longer solely at higher levels of the organization and in specialized functional units. Rather, knowledge is dispersed and distributed all around the organization (Brown & Duguid, 1991; Blackler, 1995; Tsoukas, 1996). Sometimes the relevant knowledge is in the customer interface or marketing and sales department, sometimes on the shop floor. Each member of the organization is likely to have some important knowledge that no one else in the firm possesses. Front-line employees are often perceived to be in a crucial position, as they directly interact with customers and production processes, and therefore they can continuously develop organizational functioning if empowered to make decisions.

As knowledge workers by definition are experts of their own jobs, much of the decision-making and job design has to be relocated where the expertise is (see e.g. Blomqvist & Pöyhönen, 2006). This signifies a shift toward a more organic view of management (Spender & Grant, 1996), where employees are seen as active, intentional and intelligent agents that are capable of learning and making decisions based on their specialized and local knowledge. Then the role of management is to provide the “context in which employees at every level become independent agents, take responsibility, experiment and make mistakes and learn as they strive for continuous improvement in every aspect of the firm’s total transformation process” (Spender, 1996b, 48). From this perspective, the role of organizational measurement is to enable knowledge workers to develop their own working methods and conditions, and to inform the management of how to better support employees in creating, sharing and integrating knowledge to productive ends.

### **3. Foundations of the knowledge-based view of the firm**

Along with the rise of knowledge work, a novel approach to organizations, the knowledge-based view of the firm, is emerging, that brings significant changes to the way in which organizations are understood. The KBV addresses the issues of the existence, the boundaries, and the internal organization of the multi-person firm (Foss, 1996, 460). The starting point is that organizations exist to create, transfer, and transform knowledge into competitive advantage (Kogut & Zander, 1992), and performance differences between firms derive from their differing stocks of knowledge and capabilities in using and developing knowledge (Grant, XXXX jne.). In this chapter we examine the essential characteristics of knowledge in organizations to ground our discussion of how knowledge and competence should be measured to enable learning and development.

The modern business sciences include a multitude of characterizations and classifications of knowledge. A common feature in all of them is that knowledge is understood differently from the traditional western epistemology where the most significant distinction lies between knowledge and mere beliefs or opinions whose truth value has not been proven. The Socratic/Platonic definition of knowledge as a “justified true belief” characterizes knowledge as information whose validity has been established through empirical proof. According to this view, the term knowledge should only be applied to information that is objective, universally applicable, and context-independent. It should be sharply separated from opinions, speculations, beliefs, or other types of unproven information (Liebeskind, 1996).

In contrast, in the modern management science, the term knowledge does not refer to the truth value of a statement. Here, the significant distinction concerns differences between data, information, and knowledge. Data is a sequence of signs, whereas information is data that is understood. While both knowledge and information bear some meaning to the individual, knowledge, unlike information, is anchored in the beliefs and commitment of its holder, and related to purposive action. Information is rather like raw material from

which individuals pick up elements that have relevance to them. Information becomes knowledge in the human mind when people combine it with their own unique space of associations. Therefore knowledge can be characterized as “a dynamic human process of justifying personal belief toward the ‘truth’” (Nonaka and Takeuchi, 1995, 58).

According to the recent management science understanding, the integral characteristic of knowledge is its human nature. Knowledge does not exist apart from the knowing subject – as universal abstractions floating somewhere out there, but is always tied to a particular viewpoint and practical application. In other words, knowledge is a fundamentally human issue: it is a product and vehicle of human activity, bounded by the limitations of human cognitive and other psychological capacities, and by the social and cultural environment of activity. Information technology systems and other related mediating tools can act as vehicles for transferring knowledge, or as repositories for storing knowledge, but in knowledge-based management the role of these is secondary compared with knowledgeable human actors.

Also, humans are seen as active constructors of knowledge, who use knowledge for achieving certain goals – rather than naïve recipients of externally created knowledge or “garbage cans” into whose minds information is inserted and where it exerts a stable and predictable influence. Learning is a situated process of knowledge construction based on action (Berger & Luckmann, XXXX; Kolb, XXXX; Schön, 1987). In fact, to learn is to be able to make use of the newly acquired knowledge in one’s behaviour.

Furthermore, humans always are located in a social context, or as Marx put it, human beings are “social animals” (Eskola, 1982). The particular socio-historical context sets the boundaries for individual understanding and behaviour, while at the same time individuals regenerate and modify the context by enacting it (e.g. Giddens, 1984). Even when we are alone our culture and communities influence us both from the outside and inside, as internalized conceptions, mental models, attitudes, and values. This is not to say that knowledge would not exist on the personal level, but that even individually held



knowledge has a fundamentally inter-subjective quality to it. Individuals neither think nor take action in a vacuum; knowledge is embedded and constructed in shared practices by interacting individuals that combine their efforts while striving towards more or less common goals (e.g., Berger & Luckmann, 1966; Crossan et al., 1999). As Spender (1996a, 64) argues, “knowledge is less about truth and reason and more about the practice of intervening knowledgeably and purposefully in the world.” And to intervene in the world one has to be able to communicate with others and understand the particular context of activity. In this sense, knowledge exists essentially between and not within individuals.

To summarize, knowledge from a management perspective knowledge is not something objective, free-floating, abstract, and universal as portrayed by the traditional western epistemology; but neither is it only subjective, residing solely in the minds of individuals as their personal experience. Rather, knowledge is something that is constructed in the social practices of actors embedded in a particular social context. Knowledge emerges from the social interactions between various parties within and across the organizational borders. It is continuously re-interpreted and modified, and continuously changes and develops (e.g. Blackler, 1995; Drucker, 1997; Tsoukas & Chia, XXXX; Orlikowski, 2002). In other words, knowledge is fundamentally dynamic in nature: it is the subject of constant negotiations, modifications, and alterations. It also is related with to the issues of power and control (Blackler, 1995).

The recent management science literature boasts many typologies for different types of knowledge. The most influential of these classifications is the division of knowledge into two dimensions: explicit and tacit (Polanyi, 1966). Explicit knowledge stands for that part of knowledge which can be expressed and codified relatively unproblematically, for example, in the form of verbal accounts, numbers, formulas, and theoretical models. This type of knowledge is rational, formal and systematic in nature, and can be easily transferred from one person to another, and stored in libraries, databases, and other non-human repositories of knowledge.

However, most of human knowledge is in tacit form; we know more than we possibly can ever articulate. Tacit knowledge stands for that part of knowledge that is personal, context-dependent and based on practice and experience. This knowledge is very hard to formalize and communicate. Some knowledge can be externalized into explicit form, while some knowledge will always remain tacit (Polanyi, 1966; Nonaka, 1991). Most of tacit knowledge remains subconscious even for the individuals themselves: it is impossible to explain fully what one knows, and even more impossible to articulate how the act of knowing happens (Snowden, XXXX).

Tacit knowledge is demonstrated in skilled action and unconscious judgments, and it is very hard to separate it from the activity in which it is demonstrated. Cognition and action go hand in hand: knowledge is both acquired by and demonstrated in action (Dougherty, 1992; Spender, 1996a; Crossan et al., XXXX; Orlikowski, 2002). While knowledge is demonstrated in many forms (e.g. explicit and tacit) and located at many levels (e.g. individual and social), the most valuable kind of knowledge is what is demonstrated in process of “knowing” and the formation of skillful behavior, rather than that which is stored in, for example, databases and patents. Competitive advantage, in fact, flows not from resources themselves but from the firm capabilities to use these resources for productive purposes (e.g., Penrose, 1959; Kogut & Zander, 1992; Grant & Spender, 1996; Grant, 1996b).

Unlike traditional physical goods that are consumed when they are used, knowledge is subject to increasing returns: the more knowledge is used, the more valuable it becomes (Grant, 1996b; Zack, 1999). In fact, latent knowledge that is not used does not create value. For example, no matter how many patents the organization possesses or how novel ICT systems have been put in place or how high competencies the staff has, these will not help the firm to prosper unless they really are used in the everyday practice of the firm. This means that even though knowledge can also be codified in databases, book, patents, formulae etc., without individuals to activate the knowledge into knowledgeable activity, the knowledge stays latent and without any value.

Furthermore, because knowledge is always based on human action, it cannot be managed in the same way as inhuman resource stocks and flows. Knowledge is intangible, invisible and to a large extent unconscious even to those in whose minds and bodies it is embedded. Tacit knowledge can never be fully externalized and brought to be the subject of rational management control. Thus, the most important way to manage knowledge is by creating contexts where knowledge can grow and flourish. Higher-order organizing principles (Kogut & Zander, 1992) and collective knowledge (Spender, 1996a; 1996b) create the context where organizational activities take place, and therefore have a crucial role in steering any knowledge-based organization.

Humans are bounded by cognitive limitations as to how much and what they can know, and therefore they have to specialize (Simon, XXXX). Especially in complex issues which cannot be understood by any single individual, there is a need for integration and coordination of knowledge (Grant, 1996b). Producing a good or service typically requires the application of many types of knowledge resources (Kogut & Zander, 1992; Grant, 1996b; Grant & Baden-Fuller, 2004). This means that the organization also has to be able to manage, integrate, and coordinate the knowledge of its employees (Penrose, 1959; Kogut & Zander, 1992; Grant, 1996b). For a firm to be knowledgeable, it is not enough that its individual employees are skilled and educated. The scattered, uncoordinated insights of individual organizational members are not enough to produce competitive advantage; in order to produce sustainable value, they must be combined into a synergistic whole. This does not mean a mechanistic aggregation or synthesis of what the individual members of the organization know. The pattern and mechanisms of integration of knowledge cannot be reduced to the level of individual actions, but have to be analyzed in their own right, on the level of shared practices. The crucial issue is how the employees work together, how their tasks interrelate and how their individual knowledge is integrated to produce value for the company (Grant, 1996a; 1996b). This entails that from a knowledge-based view, organizations are above all social entities “specializing in the creation and transfer of knowledge” (Kogut & Zander, 1996, 503).

#### **4. New approaches to organizational measurement: intellectual capital and competence development**

As knowledge has become the primary driver of competitive advantage in the contemporary economy, new approaches for measuring organizations are needed which recognize the knowledge-based aspects of value creation. Especially two relatively novel strands of research, intellectual capital and competence development, have set out to understand the productive capacity of knowledge-based organizations through developing measurement frameworks. Both schools of thought are mindful of the special qualities of knowledge and competence as opposed to other types resources, and the measurement frameworks created within them aim, more or less explicitly, to enable development and learning. While both traditions are interested in knowledge in organizations, there is a difference in their preferred analytical level: the intellectual capital literature addresses the whole organization as a single unit, and competence development literature typically focuses on the individual employee.

##### **4.1 Intellectual capital**

Research on intellectual capital is explicitly based on the conviction that the logic of doing business and creating value has changed fundamentally and knowledge has taken the place of land, labor and economic capital as the main source of corporate wealth creation. The success of modern organizations is seen to depend on their ability to gather and create knowledge, to share it and integrate it into existing organizational knowledge base and to apply it in a profitable manner. While financial capital and other resources can also be important, the primary resources are intangible.

The intellectual capital “school” attempts to overcome the limitations of conventional indicators that are used to explain, measure and manage organizational performance, and to provide classifications for intangibles that enable examining intellectual wealth from a comprehensive perspective. Research in this tradition focuses on constructing methods

for identifying, describing, measuring, reporting and valuating intangibles in organizations, regions, networks and nations. Specifically, its critique is aimed mainly at three intertwined issues in traditional performance measurement and management of organizations: 1) the extensive reliance on traditional accounting-based indicators, 2) the orientation towards the past instead of the future, and 3) the neglect of the need for non-financial information. The most famous measures are the Skandia Navigator (Edvinsson & Malone, 1997) and the Intangible Assets Monitor (Sveiby, 1997).

The field of IC is multidisciplinary, and the views of the nature and composition of intellectual capital tend to vary from one author to another. One definition of intellectual capital is that it is knowledge that can be converted into value (Sullivan, 1999). According to another definition, intellectual capital consists of an organization's capability to transform its intangible assets, expertise and renewal ability into economic value (Ståhle & Grönroos, 1999, 50). Attempts to understand and conceptualize intellectual capital have yielded many intellectual frameworks (e.g. Kaplan & Norton, 1992; Edvinsson & Malone, 1997; Sveiby, 1997; Stewart, 1997; Roos et al., 1998; Sullivan, 1998; OECD, 2000) all of which divide IC into several components. However, there is no general agreement as to what these components are (Bontis et al., 1999). The most commonly shared view is that IC is constructed of three parts: human capital (skills and know-how of the people in the organization), structural capital (organizational infrastructures and processes) and relational capital (relationships with clients, suppliers and other significant stakeholders, image, brand) (e.g. Dawson, 2000; Bontis, 1999).

Intellectual capital is intimately linked with strategy. Roos et al. (1998) suggest that the theoretical roots of IC lie in two streams of thought: the strategic school, which studied the creation and use of knowledge for enhancing the value of the organization and the measurement school, which aimed at constructing reporting mechanisms that enable non-financial, qualitative items to be used along with traditional financial data. Sullivan (1998) states that in order to extract value from IC, it has to be strongly linked with the strategic objectives of the company. IC should be internally aligned with the company's vision and strategy to ensure that the organization's IC is focused on achieving the right

goal. Also, the choice of IC indicators should be guided by the long-term strategy of the company; one should measure what is strategically important (e.g. Stewart, 1997; Bontis et al., 1999). Moreover, IC reports and statements function as communication tools for presenting and maintaining the corporate vision and strategy (Bukh et al., 1999).

## **4.2 Competence measurement and development**

We have reviewed the emergence of the knowledge-based view due to the rapidly changing business environment and the demand from the market the new type of worker in so-called knowledge intensive organizations and society. Within the knowledge and competence management field, this view is also in transition. Ahonen et al (2000) indicate a major transition in knowledge management theories. The first generation knowledge management theories took the knowledge-carrying individual as the unit of analysis and defined knowledge and competence in terms of discrete skills that could be codified and measured. The second generation theories focused more on networking, communication and collective practices rather than the things people apparently know and the information they possess. The key idea behind these theories is that knowledge is embedded in and becomes constructed in collective practices. This transition in knowledge and competence thinking have been noted by a number of other authors (Snowden, 2002; Tuomi, 2002; von Krogh, 1999).

More specifically in competence management literature, Hong and Ståhle (2005) have clarified three conceptually evolving approaches to understanding competence measurement and development in organizations as follows: 1) competence as resources, 2) competence as integration capabilities, and 3) competence as innovative learning processes. Similar classifications similar to the three generation competence approaches can be seen also in others' work (e.g., Collis, 1994; Fujimoto, 2001; Whitley, 2003).

As reviewed in this paper, competence is being increasingly understood in the organizational and business literature as the firm's most valuable resource for successful

business. The basic assumption behind the first-generation competence approach is that organizational competence is equal to resources or configurations of resources affecting workplace activities. The key issue in competence management and development is *to obtain* the resources or competences that are needed. This approach or understanding is therefore termed *competence as resources*.

The second-generation approach assumes that competence is the ability of an organization to use and manage its resources. It is by virtue of this ability that it can gain sustainable competitive advantage, particularly in unstable and evolving business environments. The key issue turns to “*applying*” rather than “*obtaining*” the resources in organizational routines and practices. This could be called *competence as integration capabilities*), and differs from the first approach in its emphasis on “what you know and are capable of” rather than “what you have.” It also indicates a transition from the individual perspective of the first-generation approach to a more social, collective and organizational perspective.

The trend is to move towards the third-generation approach, in which competence is seen not as a set of pre-existing resources but rather as being created and renewed through the firm’s practices, activities and innovations. Thus, the key issue is *to create and recreate* resources or new competences. This approach could be termed *competence as innovative learning processes*. In this case, knowledge about competence itself and the acquisition process, as well as knowing “how to produce resources and capabilities”, constitute the potential for facilitating organizational and strategic change. The emphasis is on continuous and more dramatic types of renewal and innovation, particularly in unpredictable and turbulent business environments.

The following we review the major lines of competence measurement and development, whenever it appears appropriate, also examine the different measurement approaches with the lens of two generation knowledge management theories and the basic ideas and assumptions of three competence approaches.

### *Competence matrix*

Competence mapping is sometime also called competence mapping or competence analysis. It is a most common tool used in work organizations for competence measurement and development. It focuses entirely on the personal and cognitive traits of so-called competent managers or employees in relation to their job performance (e.g., Boyatzis, 1982; Klemp, 1980; McClelland, 1973; Morgan, 1988; Spencer & Spencer, 1993). Those skills and competences include, for instance, technical/professional skills, human competence (e.g., interpersonal communication skills), and business know-how. In this connection, common competence-management practices discussed in the literature include: 1) making individual competence profiles visible via the company's intranet or data systems, so that people's talents and expertise can easily be traced when needed; and 2) identifying the gaps between current and required competences through development meetings and discussion between managers and subordinates, and setting up training and development programs for building up employee competences.

Competence matrix practice represents the mainstream of competence measurement and development in organizations. In most cases, such practices are initiated in a top-down manner and developed by the HR department of an organization. Organizations put more and more efforts in integrating HR functioning into business and strategic development in order to conduct a more profound and effective development program. However, the integration of the development of individual or employee competence with the organization's business and strategic development demands competence measurement and development at a different level, in which organizations rather than individuals become the focus of the analysis.

### *Competence measurement at an organizational level*

We found with interest several attempts in developing competence measurement at a more organizational or collective level (Henderson and Cockburn, 1994; McGrath et al, 1995; Ritter et al, 2002; Snow and Hrebiniak, 1980 ), trying to understand, identify and measure the core or distinctive competence of an organization.



Snow and Hrebiniak's research (1980) is perhaps one of those earliest attempts. They focused on the measurement of *distinctive competence* of an organization, which refers to those things an organization does especially well in comparison to its competitors. The interesting and significant point of their research lies on their exploration into the relationship among strategy, distinctive competence and organizational performance was studied already in 1980s. For some reason, this has been neglected for decades, and there seems to be a recurrent interest in the issue in recent time.

McGrath et al (1995) identified two processes which are central to the emergence of competence and its measurement: the emergence of *comprehension* (the "comprehension" of the management team working on developing competence) and *deftness* ("deftness" of their task execution). In the treatment of both comprehension and deftness, they consider and measure the relative impact of content and process upon the emergence of competence, where the comprehension score is a measure of content understanding (what do we know and how well do we know it?), and the deftness score is a measure for how well group processes are operating. Further, both content and process are moderated by the inclusion of contextual variables.

Several important contributions of McGrath et al's work are worthy mentioning. Firstly, this paradigm draws an attention to the comprehensive/holistic nature of competence development. Secondly, it emphasizes the collective nature of competence formation. "... Individuals are poor processors of complexity" (55). Thirdly, it lays a stress on the dynamic nature of competence and process, and a process-centered paradigm is accentuated. And finally, objectives / strategic process are emphasized in defining and measuring competence content and process.

Henderson and Cockburn (1994) elaborate further the concept of core competence or distinctive competence as heterogeneous organizational "competence" in competition, which constitutes two critical elements to be measured: component and architectural competence. "Component competence" on the local abilities and knowledge that are fundamental to day-to-day problem solving, and "architectural competence" or the ability

to use these component competencies – to integrate them effectively and to develop fresh component competencies as they are required.

Interestingly, the two dimensions of organizational competence identified by Henderson and Cockburn resemble the first two competence approach as elements identified by Hong and Ståhle (2005): component competence is equal in nature to competence as resources, and architectural competence to competence as integration capabilities. The authors emphasized particularly on the second competence construct, and their results of the study suggests that a focus on architectural or integrative or combinative capabilities as a source of enduring competitive advantage may provide useful insights into the sources of enduring differences in firm performance. It also supports the view that the ability to integrate knowledge both across the boundaries of the firm and across disciplines and product areas within the firm is an important source of strategic advantage. Then, as we see it, what is missing for the measurement here is the element in terms of competence as innovative learning processes.

Another research attempt is on measuring network competence (Ritter et al, 2002). For them, the distinctive competence or core competence is on the ability of a firm to develop and manage relations with key suppliers, customers and other organizations and to deal effectively with the interactions among these relations. The measurement they developed focuses on two dimensions: task implementation/execution and the qualifications ... network management. The work of measuring and developing collaborative capabilities emphasize more on the element of meta-capabilities which are not concerned in Ritter et al's work (Levy J. & Levy A-M, forthcoming; Miles et al, 2000). Today, as claimed by Miles et al (2000), collaboration is the meta-capability.

In the business context, meta-competences constitute a potential for facilitating organizational and strategic change (e.g., learning ability, mastering of uncertainty, ability to tolerate change). Moreover, meta-competence is crucial not exclusively to managers but also for subordinate employees at all levels in firms that have to accomplish organizational change (Nordhaug, 1998). The importance of developing meta-learning

and competence practice has been heavily stressed in competence management literature (Morgan, 1988; Nordhaug, 1998; Weinert, 2001).

## **5. Future directions**

Even though intellectual capital and competence development research traditions have set out to expand organizational measurement from command and control purposes towards enabling learning, there is still a lot improvement to do if they are to deliver their full potential. Based on the development of intellectual capital and competence development literatures, as well as the qualities of knowledge as a productive resource reviewed in chapters 2 and 3, we outline implications for a knowledge-based view of organizational measurement.

### *Dynamic perspective*

For knowledge work, it is hard to craft set of performance measures following the traditional logic of performance assessment. Defining the precise goals and criteria of good performance for knowledge work is problematic. In knowledge work, the tasks are likely to be non-repetitive, and cannot be standardized. Furthermore, performance criteria concern mostly quality rather than quantity of output (Drucker, 1999). As is well known, quality is hard to define in general terms, and even harder, if not impossible, to measure. The main way to evaluate the output quality is probably customer satisfaction or peer review, rather than some objective criteria. The dynamic nature of knowledge makes it even harder to pin down: as knowledge is altered, re-interpreted and modified as it is used, it is quite impossible to define stable content-based yardsticks for judging knowledge worker performance.

So rather than outcomes of knowledge work, a more viable option would be to examine its processes. In fact, according to the knowledge-based view of strategy (e.g. Penrose, 1959; Kogut & Zander, 1992; Grant & Spender, 1996; Grant, 1996b), value creation depends not so much on the knowledge resources per se but rather on how they are used.

Therefore, if the core rationale of organizational measurement is to improve value creation capabilities of a firm, they should be focused on how the organizational practices where resources are used, rather than on the resources or assets per se, no matter how intangible and knowledge-related these may be.

However, the existing measures in both IC and competence development traditions tend to examine knowledge and competencies as static possessions of the organization, rather than as activities conducted by the actors or brought about by the act of organizing itself (cf. Blackler, 1995; Tsoukas, 1996; Orlikowski, 2002;). For example, most of the literature on intellectual capital conceptualizes intellectual capital as a static asset or a 'stock' (Bontis, 1999) and assumes that it is something that can be relatively easily identified, located, moved and traded, much like some sort of a "package", be it an intangible one. Alternatively, knowledge could be understood to emerge from ongoing social interactions, and the focus could be not on the knowledge resources as static assets or outcomes per se but on the capabilities to leverage, develop and change them. There are some recently constructed measures which address this dynamic dimension of knowledge (Stähle et al., 2003; Pöyhönen, 2004; Blomqvist & Pöyhönen, 2006; Pöyhönen, forthcoming).

#### *Emic approach*

Knowledge is situated in specific local contexts, and distributed across the organization among individual knowledge workers and communities of practice (e.g. Lave & Wenger, 1990; Brown & Duguid, 1990; Blackler, 1995; Tsoukas, 1996). The locus of expertise is viewed fundamentally differently in knowledge work versus traditional work: in the latter it is located on the top of the hierarchy, while in the first it is seen to be in the hands of knowledge workers themselves, i.e. distributed across the organization. To improve reflexivity and learning, what gets measured and how it is measured should make sense to those who are meant to be the ones learning. In knowledge work, the core rationality is that it is the employees themselves who are the best experts and developers of their work, so they are the ones who should have a say in deciding the measures. This implies an emic rather than etic approach towards measurement: the measurement should not aim to

serve the gaze of an external evaluator or supervisor looking at the system from above and outside the system, but the contextualized self-understanding of the local actors themselves.

### *Particular practices*

Tacit knowledge is demonstrated in skilled action, and it is very hard to separate it from the activity in which it is demonstrated (Dougherty, 1992; Spender, 1996a; Crossan et al., XXXX; Orlikowski, 2002). The most valuable kind of knowledge is that which is demonstrated in “knowing” and skillful performance. There is no “pure” or “stand-alone” performance; to understand how proficient a performance is, one needs to understand the context in which it takes place. This implies a focus on particular practices rather than universal abstractions and generalized criteria.

Based on the knowledge-based view of the firm, Spender and Marr (2006) argue that human capital is demonstrated in skilled performance and that it can only be addressed by looking in detail into the particular work practice. Performance “needs to be understood in the context of its being integrated into, and as a constituting part of, the production function. Hence, performance measurement and human capital must be based on the specific system of practices internal to the firm” (p. 265). Spender and Marr offer activity-based accounting as a possible solution, but note that this strand of research is in its infancy and does not yet offer developed tools. Anyhow, as identification of tacit knowledge is difficult if not impossible, its measurement promises to be even more so.

### *Strategy-based indicators*

According to the resource-based view of strategy (an outgrowth of which the knowledge-based view is), performance differences among firms are due to differences in intra-firm characteristics rather than market positioning. Consequently, the most important information for strategic decision-making is provided by understanding the firm’s resources and capabilities, rather than external market-based evaluations.

This implies that to enable learning and development, indicators should be chosen based on organizational strategy, rather than external needs and demands. The organizational strategy should function as a frame of reference that determines what factors to measure. In the intellectual capital literature there is a strong conviction that the measures should be derived from the organizational strategy and be connected with the value-creation logic of the firm. Organizations are emphasized as strategic, goal-oriented entities rather than a free-floating collection of stocks and flows. The drawback of this is that intellectual capital measurement systems and reports tend to be so idiosyncratic that it is hard to make cross-comparisons between several organizations and to interpret whether a given measurement results indicates a positive or a negative tendency.

Concerning competence development, in his early article, Snow (XXXX) already emphasized the importance of identifying and assessing the distinctive competencies of the firm. This, of course, is the main thrust of the RBV of the firm: creation of supranormal returns is based on the heterogenous and inimitable resources. However, looking at the competence development literature and assessment systems in the literature and in use, it seems that this lesson has been lost on the way. It should be clear that it makes little sense to map competencies in general; what is measured should be related with the value-creation logic of the firm. In sum, indicators should be drawn from strategy and distinctive competencies of the firm, i.e. be chosen on internal grounds.

#### *Potential skills*

In the intellectual capital literature, authors often note that an important drawback of the traditional performance measures is that they are past-oriented - they show changes in performance only when it is too late to influence the situation (e.g. Sveiby, 1997; Edvinsson & Malone, 1997). In contrast, monitoring the intellectual qualities and properties of a firm should enable the rapid re-steering and more realistic evaluation of the available alternatives. Furthermore, as knowledge-intensive businesses are increasingly characterized by rapid changes and nonlinearity, it is impossible to predict which specific competencies and resources are the ones that will emerge to rule in a given business area. Therefore the success factors have to relate to organizations'

dynamic capabilities for mastering change and adaptation and continuous renewal (Teece et al., 1997; Eisenhardt & Martin, 2000; Pöyhönen, 2004).

In addition to examining the actualized, existing skills, it would be important also to address potential knowledge and competencies. Knowledge is not only related with action and already made decisions and sought for possibilities, but also with the emergent future possibilities and potential, the not-yet embodied or the self-transcendent (Scharmer, XXXX). Spender and Marr (2006) underline that in measuring human capital, understanding what constitutes skilled performance in the context of current circumstances is only the first step. What would also be needed is understanding the potential for skilled performance under circumstances which have not yet come to be. That is, while it is important to understand what is known at the present, it is also important to understand what is in the “zone of proximal development” (Engeström, XXXX) / Vygotsky) or in the space of potential possibilities, what kinds of paths or real options (Kogut, XXXX) there are open for the actor/firm in the (near) future. Grasping the potential capabilities is more important to the extent that the environment is non-predictable and rapidly changing.

#### *The collective dimension*

Knowledge is fundamentally inter-subjective: it is embedded and crafted in continuous social interactions among the members of the organization. Rather than residing in the minds of individuals or in databases, the most important type of knowledge is that which is located between people (e.g., Spender, 1996b). This means that its measurement should also emphasise inter-subjective factors and social interaction, instead of individual propensities. The problem with current competence development metrics is that they are exceedingly individualistic and fail to examine knowledge and capabilities on the collective level. The same applies to the human capital measures of the intellectual capital measurement frameworks. for example, the human capital measures (in both IC and comp dev frameworks) focus on such factors as age, educational background etc.

The problem is two-fold. First, it is well reported that the social environment significantly influences the extent to which individuals actually put invest their time and effort to reach organizational goals. Measures depicting individual propensities only tell what the individual potential is – and even this defined in quite a narrow manner. They do not address whether or how much of these latent capacities the individual really directs to performing a given task. By assessing the features of the socio-psychological environment, a more valid analysis could be provided, that would also help in determining how the situation could be improved so as to better enable and encourage enactment of individual skills and competencies.

Second, collective knowledge, or shared tacit knowledge is the strategically most important type of knowledge (e.g. Spender, 1996a; Bollinger & Smith, 2001), and should therefore be measured in itself. Collective knowledge consists of the knowledge that is embedded in the forms of social and organizational practice, residing in the tacit experiences and enactment of the collective, such as routines (Nelson & Winter, 1982). Individual actors may be unconscious of such knowledge, even though it is accessible and sustained through their interaction. (Spender, 1996a; 1996b.) Consequently, the manner in which it can be studied is by examining the relational patterns among the organizational actors and the coordination principles by which they collaborate (Kogut & Zander, 1992; Grant, 1996). Shared operating methods are inimitable across firms, and therefore they are the main source of sustained competitive advantage. For example, innovations can be copied by competitors, while innovativeness as an organizational characteristic embedded in the organizing principles and patterns of social interaction cannot. However, there are very few measures that have been created for collective knowledge, and indeed it seems like a very demanding issue to quantify.

## **6. Conclusion**

The crucial importance of knowledge as a factor of production means that the basis of competition has shifted from striving to achieve maximal efficiency in mass production



towards generating an organization-wide capability for continuous learning and self-directed development. To assist in this new strategic focus, also the underpinning logic of organizational measurement has to change accordingly. In this paper, we argued that seeing the purpose of measurement as enabling learning rather than as enabling control implies changes on several features.

Table 1 presents our key arguments about the differences between control-oriented and learning-oriented measurement logics.

	<b>Traditional view of measurement</b>	<b>Knowledge-based view of measurement</b>
<b>Goal of measurement</b>	Enabling control by management	Enabling learning and development by employees
<b>Knowledge understood as</b>	Static asset, stock	Emergent and socially constructed process
<b>Essential form of knowledge</b>	Explicit, know-that	Tacit, potential, know-how
<b>Epistemological assumption</b>	Positivist view of knowledge	Constructivist view of knowledge
<b>Locus of expertise in the organization</b>	Expertise located at the top of the organizational hierarchy	Knowledge workers are more knowledgeable than managers. Knowledge is dispersed and contextual.
<b>View of employees</b>	Naive recipients and implementors of managerially crafted knowledge	Active, intentional and intelligent agents
<b>Main interest</b>	Identifying and leveraging existing knowledge and competencies according to the set plan	Improving existing knowledge and competencies, creating new ones
<b>Measurement focus on</b>	Existing statistical data of individuals, possessions and outcomes	Particular activities, social processes and organizational characteristics
<b>Quantification of objects of measurement</b>	Easy	Difficult

Table 1. Contrasting traditional view of measurement with knowledge-based view of measurement

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