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Bente R. Løwendahl, Øivind Revang and Siw M. Fosstenløkken

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ABSTRACT

This article presents a comprehensive framework for the analysis of value creation and knowledge development in general and, in particular, for professional service firms (PSFs). The framework integrates the relationship between the domain choice and the resource (or knowledge) base, and argues that the bridge between the two is best explained as value creation processes (VCPs) with two inter-related dimensions: direct value creation for the clients, and indirect value creation in terms of enhancing the knowledge base.

KEYWORDS

knowledge development ■ knowledge management ■ learning ■ strategy

Introduction

This article discusses knowledge as a strategic resource within the context of professional service firms (PSFs), e.g. engineering, advertising, consulting, accounting, law firms, etc. It presents a comprehensive framework for the analysis of value creation and knowledge development in PSFs, based on a literature review as well as interviews with representatives from a number of PSFs. Since firms in other industries often see PSFs as role models, in particular as regards knowledge management, an understanding of PSF value creation may be of importance beyond the context of the PSFs themselves.

Three factors seem particularly important for the understanding of value creation in PSFs: (1) the domain choice, i.e. strategies concerning prioritization of clients and projects; (2) the resource base of the firm, with particular emphasis on knowledge; and (3) the value creation processes (VCPs). These three are combined in the proposed framework. In the PSF-context, domain choices are made possible, but also constrained, by the existing and potential resource base of the firm, hence 'inputs' and internal processes cannot be analysed separately from the strategic positioning vis-a-vis an external market. The framework therefore also includes the interactions between these factors or components.

This article comprises the following sections. First, we explain why PSFs are significant subjects for research. The following two subsections discuss the key contextual components of our framework: PSF strategies (in terms of domain choices) and resources (with a particular emphasis on knowledge). The next two subsections discuss how value is created in PSFs, first internally, in terms of knowledge development, and second in terms of service delivery, i.e. value creation for clients. Then, the combined framework is presented, before the final section discusses implications for further research.

Our framework builds on literature from several disciplines, including – but not exclusively limited to – strategic management, organization theory, social cognitive theory and pedagogy. However, given the space limitations of an article like this, our literature reviews are limited to a few key references relevant to our framework. The literature cited here is therefore not intended to represent an exhaustive list of relevant research and theory development.

Why study PSFs?

When attempting to understand the dynamics of knowledge development, insight is more likely to result from a study of extreme cases than from traditional firms (e.g. Starbuck, 1993). PSFs represent such extreme cases, as they employ a very high percentage of highly educated people, and they are extremely dependent on their ability to attract, mobilize, develop and transform the knowledge of these employees to create value for their clients. PSFs are significant subjects for research because they represent a growing part of both employment and value creation in western economies (e.g. Aharoni, 1993; Løwendahl, 1992, 1997). In addition, many PSFs, such as consulting firms, shape managerial thoughts and

actions through their advice to client firms. Some firms even see PSFs as role models, since these firms were among the first to develop systems for knowledge management and promoted these vis-a-vis their clients. These systems may not, however, be equally applicable for all firms. Hence, it is important to understand the characteristics of PSF value creation in order to assess the applicability of their knowledge management principles beyond the PSFs themselves.

What, then, are the key characteristics of PSFs? Based on the 1960s sociological literature on professions and professional organizations, more recent debates about professionals and interviews with a number of executives, Løwendahl (1997:20) suggests that the following are typical characteristics of professional services:

- Value creation is knowledge intensive and delivered by highly educated employees, who are frequently closely linked with research and scientific development within their area of expertise.
- Services are based on a professional assessment (diagnosis) by experts in the field.
- Services involve a high degree of personal judgment by the experts involved and, in some PSF industries, partners are personally held legally responsible for potential liability claims.
- Services are customized to each client's needs.
- Delivery involves a high degree of interaction with the client representatives, for diagnosis as well as delivery.
- Individuals are typically trained in a standardized body of knowledge which is common to all professionals in that sector and is certified by the relevant professional authority.
- Services are constrained by professional norms of conduct, including setting client needs higher than profits and respecting the limits of professional expertise.

This list defines 'ideal type' professional services, and not all PSFs deliver just these services. Some firms also try to develop standardized solutions in order to achieve economies of scale. However, unless the majority of the services delivered are of a professional, as opposed to a standardized nature, the firm is not a pure PSF.

PSFs deliver services within relatively constrained contexts. The following two subsections discuss two key contextual components that both constrain and enable service delivery: strategy or domain choice; and resources, i.e. primarily knowledge.

Contextual components

Strategy or domain choice

The most important strategic decisions of a firm concern the firm's 'domain' (Levine & White, 1961): 'what' is delivered, 'to whom', 'where', and 'how'. This is particularly important for PSFs, because their key strategic resource – knowledge – is 'information based' and therefore enhanced primarily through 'daily operations' (Itami, 1987). Professionals learn from the clients they work for and the projects they engage in, and hence the projects determine both what they learn and how much. A strategically targeted portfolio of clients and projects allows for additive improvements of the knowledge base whereas, without such a focus, projects, knowledge development and recruiting are likely to be ad hoc. Hence, it is absolutely crucial for a PSF to target and win the right kinds of projects and clients (Løwendahl, 1992, 1997).

The choice of domain is also valid at a more general level: the choice of industrial context. For PSFs, this choice is typically limited by the professional context; for example, law firms compete in the 'law industry' and accounting firms in the accounting business. However, PSFs also face choices within these professional contexts; for instance, law firms can provide services within different segments such as contract law, criminal law, tax law, labour legislation, and so on. In addition, the firm may target different client types within these segments; some may serve the largest and most demanding business clients, whereas others target small businesses or individuals.

Domain choices affect both the type of professionals the firm can hire and the type of learning that takes place within the firm. In fact, PSF domain choices and strategies for knowledge development are so tightly interconnected that they constitute a 'chicken-and-egg' problem: a given combination of employees, processes and knowledge will support specific types of value creation in terms of what can profitably be delivered to whom and how, and certain kinds of clients, problems and processes attract particularly competent and interested professionals. The next section discusses the critical role of the resource base of PSFs, with particular emphasis on knowledge.

Resources

A PSF cannot choose its domain from an unlimited set of opportunities, as there are clear limits to both what the firm can do, what its members want to do, and what the environment (especially the potential clients) accepts that

the firm can deliver. This is not different from manufacturing firms but more extreme, since the knowledge workers can be redeployed more flexibly than most machines. Yet they can also refuse to do what they personally do not see fit. The resource base therefore constitutes an important contextual component for PSF value creation and is here broadly defined as the combination of the *tangibles*, e.g. finances, buildings, production machinery, and the *intangibles*, e.g. professional expertise, reputation, client loyalty, corporate culture and management skills, which may be usefully applied to generate value for the firm and its stakeholders (see e.g. Løwendahl, 1992, 1997 or Haanes, 1997 for a detailed discussion of these terms).

In strategic management, the resource based view (RBV) of the firm (e.g. Amit & Schoemaker, 1993; Barney, 1991; Rumelt, 1984; Wernerfelt, 1984) emerged in the mid-1980s, and generated substantial interest in the role of firm resources in the development of a firm's competitive advantage. For the PSF, resources play a key role in the development of superior value creating processes for clients as well as for owners – frequently the senior professionals of the firm (Greenwood et al., 1990). The RBV can offer interesting insights on strategy and firm development, particularly if we look back to the classic work of Penrose (1959), where it is clearly stated that resources have no intrinsic value per se; resources are valuable only to the extent that they can deliver valuable services. Resources can generate different types of services and hence: 'exactly the same resource when used for different purposes or in different ways and in combination with different types or amounts of other resources provides a different service or set of services' (p. 25). These different sets of services also have different potentials for generating competitive advantage.

Within the RBV, we find at least two different main streams of research:¹

- (a) Research which emphasizes the stock of knowledge as a potential source of sustained competitive advantage. Knowledge is often unique, difficult to imitate, difficult to substitute and difficult to transfer (e.g. Barney, 1991), and hence, access to superior stocks of knowledge is crucial for competitive positioning. Since other types of resources are more easily tradable in markets, they are less likely to constitute sources of sustainable advantage (Amit & Schoemaker, 1993).
- (b) Research which emphasizes knowledge as a potential source of innovation and value creation (e.g. Leonard & Sensiper, 1998; Leonard-Barton, 1995; Teece, 1998). Here it is not the stock of knowledge that may give the firm a competitive advantage, but rather the way the knowledge is applied in VCPs. When knowledge is combined into

unique processes at the firm level, core competences may be developed, thereby indicating a knowledge-based sustainable competitive advantage (Prahalad & Hamel, 1990).

Whereas the first stream of research focuses on knowledge as a resource in itself, which, if it is superior to that of competitors, will give a competitive advantage, the second focuses on knowledge as one of many input factors in innovation and value creation. Here, even firms which lack a unique or distinctive knowledge base may, with luck and appropriate processes, generate services that are superior from the clients' perspective.

One important debate among researchers focusing on knowledge in firms has to do with the role of individuals in knowledge creation as well as application (Grant, 1996; Nordhaug, 1994), whereas another key debate has to do with the role of tacit knowledge. The following subsection discusses different dimensions of knowledge before we turn to the dynamic aspects of knowledge application, flows and systematic transfer.

Dimensions of knowledge

Knowledge is a term with many and partly conflicting definitions. A number of dimensions have been proposed, such as explicit versus tacit knowledge (Polanyi, 1958, 1966), embodied versus embedded knowledge (Granovetter, 1985) and knowledge as intrinsically versus instrumentally valuable (Degenhardt, 1982). Grant (1996) provides a comprehensive list in his reference to Machlup's (1980) identification of 13 'elements of knowing': 'being acquainted with, being familiar with, being aware of, remembering, recollecting, recognizing, distinguishing, understanding, interpreting, being able to explain, being able to demonstrate, being able to talk about, and being able to perform' (p. 110). We view knowledge as a very broad term and include both tacit and explicit knowledge, and both knowledge at the individual and at the collective levels.

As suggested by a number of authors (see e.g. Bonora & Revang, 1993; Hedlund & Nonaka, 1993; Løwendahl, 1992, 1997; Nonaka & Konno, 1998; Spender, 1996), we separate between the characteristics of knowledge and the level of analysis.

At the *individual* level, three types of knowledge seem important to value creation:

- Information-based, objective, task-related knowledge, so-called 'know-what'.
- Experience-based, tacit, subjective knowledge, so-called 'know-how',

including skills as well as deeper understanding: e.g. the skills of 'reflective practitioners' (Schön, 1983).

- Personal knowledge, including talent, aptitudes, artistic abilities, creativity, intuition, etc. This type of knowledge has also been described as 'dispositional knowledge' (Ryle [1954: 109, note 6] in Brown & Duguid, 1998).

At the *collective* level, we view knowledge as the combination of skills, routines, norms and values developed and shared by at least two employees working together, each employee's individual knowledge, and the information available to them. A firm's collective knowledge base is strongly influenced by the cultural systems through which people achieve their knowing (Blackler, 1995), the socialization processes and other socially situated activities (Alvesson, 1993; Lave & Wenger, 1991). Hence, firm-level knowledge also includes a firm's formal reporting structure and its formal and informal planning, controlling and coordinating systems. It also frequently involves the development of a unique language or code, as well as shared norms and values guiding individual behaviour. Here, the collective knowledge of a firm rests heavily on the organizing principles by which relationships among individuals, within and between groups, and among organizations are structured (Kogut & Zander, 1992).

A transition from individual to collective knowledge is not trivial, and is widely debated in the literature. Spender (1996) provides an in-depth discussion of the difficulties involved when extending the concept of knowledge to the collective level, and points out that there is a fundamental difference between theorists such as Nonaka and Takeuchi (1995), who define collective knowledge as 'the knowledge shared by the individuals', and those who claim that 'the firm has an ability to know independently of its employees' (p. 51). We find it difficult to accept that a firm can know or think independently of its employees, but as stated by Hedlund and Nonaka (1993): 'the organization clearly has knowledge filed in its cabinets. Whether it, rather than its members, learns becomes a more problematic question' (p. 120). As a result, we choose 'knowledge development' as the general term, and only refer to learning when it relates to individuals.

Many PSFs maintain a strong link both to the educational institutions certifying employee knowledge and to professional organizations that offer additional training and information about new developments in their respective areas of knowledge. Such professional organizations represent particularly well-defined 'communities of practice', i.e. groups with a shared body of know-how (knowledge base) and a common 'world view' (Brown & Duguid, 1991). To the extent that these knowledge bases are inter-organizational or

'cosmopolitan' (Gouldner, 1957, 1958), they contribute both to the development of industry level 'recipes' (Spender, 1989), and to individual expertise which is easily transferable from one firm to another. Inter-organizational knowledge bases facilitate both recruiting and the legitimation of firm knowledge, but they also make it difficult to develop unique firm-level core competences (Prahalad & Hamel, 1990). Firms which recruit knowledge workers without any professional affiliation or which employ experts from a number of professions, such as management consulting firms, have to develop their shared knowledge bases internally. Hence, an important dimension to assess before knowledge management practices are transferred from one context to another is the extent to which knowledge bases are imported from external 'communities of practice' or developed within the firm.

Table 1 summarizes the two dimensions of knowledge characteristics, namely knowledge types and level of analysis. For simplification, this table takes the static perspective of knowledge stocks, whereas the following section deals explicitly with the dynamic aspects of knowledge transfer and value creation.

Value creating processes

Successful PSFs generate value in two distinct ways: they provide value to their clients and they provide value to owners and (other) firm members. Owners gain both from financial returns and knowledge development, as the

Table 1 Knowledge of different types and at different levels

	<i>Individual knowledge</i>	<i>Collective knowledge</i>
Fact-based knowledge, 'know-what'	Facts, expertise.	'Codified knowledge' (Hansen et al., 1999), databases, information about who knows what.
Experience-based knowledge, 'know-how'	'Grey hair' (Maister, 1993); 'personalized knowledge' (Hansen et al., 1999), skills.	Norms, routines, best practices, shared 'ways of doing things', 'organizational skills' (Nelson & Winter, 1982).
Dispositional knowledge, identity	Aptitudes, talents, intelligence, etc.	Shared culture, mechanisms of socialization, unique language or code, corporate identity.

Source. Builds on and extends Kogut and Zander (1992: 388) and Lowendahl (1992: 527)

latter, to the extent that new knowledge is retained within the firm, is in many ways similar to retained earnings. Both increase the value of the firm, as they enable more revenue enhancing VCPs. Hence, a comparison of PSF results in terms of return on equity, or other traditional stockholder measures, does not always make sense since earnings deliberately retained or forsaken for the purpose of undertaking projects with a higher learning potential can easily be confused with lower profits as a result of lack of success in the market-place.

We therefore start with the internal processes of knowledge development and learning, before we turn to VCPs for clients.

Knowledge development

Discussions of knowledge development seem to emphasize one of two perspectives: the first focuses on the firm, its owners, its managerial processes and its profits, thus defining employees and their personal contributions as input factors to the value creation. The other focuses on the individuals and their learning processes as interesting in and of themselves, in the extreme defining the organization as a support for the employees. By combining two theoretical views of knowledge and knowledge development, namely strategic management and social cognitive learning theory, perspectives of firm-driven and individually driven knowledge development can be bridged.

Social cognitive theorists (e.g. Bandura, 1986; Mischel, 1976) focus on the processes of interaction between the human being and the environment. The theory emphasizes the social origins of behaviour and the importance of cognitive thought processes in all aspects of human functioning – motivation, emotion and action. By adopting such a frame of reference, we acquire a broader and more dynamic analytical framework than those that have traditionally been applied to issues in the field of knowledge management. A study of learning processes is particularly important in order to understand the interplay between current knowledge and future developments. According to Vygotsky (1978), knowledge development should be based on the connection between the learner's current knowledge and the next step of development. A good learning situation occurs when the distance between the learner's current knowledge and the efforts made to enhance knowledge corresponds to the learner's 'zone of proximal development'. It is therefore important to be familiar with each employee's zone of proximal development, so that the learning becomes individually adjusted. As a result, general knowledge management programmes often work only for a minority of the employees involved in them.

In addition to considerations about the individual learner, different types of knowledge require different types of knowledge transfer mechanisms. Nonaka and his colleagues (Hedlund & Nonaka, 1993; Nonaka & Konno, 1998; Nonaka & Takeuchi, 1995) discuss four different knowledge conversion processes, depending on the type of knowledge *ex ante* as well as *ex post* (tacit versus explicit). These processes involve both knowledge creation and knowledge sharing, both of which are processes that enhance the total knowledge base of the firm. First, when knowledge is tacit, it can either be transferred as tacit, through interpersonal mechanisms such as socialization and training, or second, it can be made explicit before it is transferred. The latter process is referred to as 'externalization'. Third, explicit knowledge can be transferred as explicit, or converted to new knowledge through the combination of different categories of explicit knowledge. Fourth, knowledge can be transformed from explicit to tacit, so-called 'internalization'. These are critical dimensions of knowledge development but for PSFs, two additional aspects need to be included: knowledge creation through reflection, inspiration, or creative 'kicks' (not conversion); and learning or knowledge transfer from external sources such as the profession, universities, consultants, journals and books, etc. Interestingly, the inter-organizational level was present in Hedlund and Nonaka (1993), but seems to have been left out in more recent publications.

In terms of the three categories of knowledge presented in Table 1, information-based knowledge can be shared, stored and transferred, e.g. through IT systems. This knowledge transfer strategy has been referred to as 'codification' (Hansen et al., 1999; Morris & Empson, 1998). Experience-based, tacit knowledge and skills, if they cannot be made explicit, can only be transferred or shared through interpersonal interaction, such as apprenticeships, mentoring or working together with more qualified colleagues. Personal or dispositional knowledge cannot be transferred or shared, except maybe symbolically – e.g. when people learn by mimicking the behaviour of their professional 'heroes'. A knowledge development strategy that emphasizes the development of individual, personal knowledge has been referred to as 'personalization' (Hansen et al., 1999). At the collective level, knowledge can be enhanced both through the improvement of individual knowledge and skills, through the diffusion of knowledge to more individuals and through the development of databases, routines, norms of best practice, unique shared language and culture, etc. Firm-level knowledge can even be enhanced through recruiting new knowledgeable members, as additions or as replacements for less competent individuals.

There is sometimes a conflict between the learning desired by individual professionals and what is most appropriate for the firm. Professionals want

to safeguard their own individual knowledge bases, whereas managers want to develop the knowledge required for competitive advantage and minimize dependence on specific individuals. A major challenge involves the ability of the firm to both extract as much explicit knowledge as possible into knowledge structures or databases and, at the same time, encourage the sharing of tacit knowledge. However, what is rational at the collective level (contributing to the shared knowledge) may not be rational at the individual level (protecting individual expertise, or earning more money by moving on immediately to the next project and new 'billable hours'). In some cases, the firm requires the development of unique and firm specific knowledge (Nordhaug, 1994) that 'locks in' the employees. In other cases, flexibility in terms of general knowledge and skills is important both to the employer and the employee. The existence of inter-organizational knowledge bases enhances such flexibility. Engineering design offers a good example of knowledge development with a predominant emphasis on general knowledge, which facilitates the hiring of external engineers or collaborating with other firms when projects are large. Management consulting firms, on the other hand, often emphasize the development of unique models and approaches that cannot easily be applied in other firms.

Knowledge development must clearly be linked to the strategy of the firm and the areas in which the firm may offer superior value creation relative to competitors, and often takes place as a by-product of the firm's value creation for the clients. The following section therefore discusses the core VCPs of delivering services to clients.

Service delivery

With reference to management consulting, Hansen et al. (1999) suggest that two fundamentally different value creation logics apply in PSFs: 'reuse economics' and 'expert economics' (p. 109). The first is typically linked to a low degree of customization and involves frequent reuse of knowledge assets, large teams with a high ratio of associates to partners, and emphasis on scale and large overall revenues. Expert economics, on the other hand, involves high fees for highly customized solutions to unique problems, small teams with a low ratio of associates to partners and emphasis on high profit margins. Hansen et al. found differences between the two categories, not only in terms of the firms' underlying 'economic models', but also in terms of their competitive strategies, their HR recruiting policies, their use of IT and their knowledge management strategies. In particular, knowledge management in a reuse economics context is said to be primarily focused on 'codification' and knowledge management systems, whereas knowledge management in an

expert economics context primarily emphasizes ‘personalization’, i.e. the development and support of the individual consultant. The two categories are very similar to Maister’s (1993) three categories of PSFs: routine-based, expertise-based and ‘grey hair-’ based, except that ‘expert economics’ includes both expertise and ‘grey hair’.

However, such a dichotomy may be too crude for an analysis of professional services. In Table 2 we suggest a classification of different types of services on a continuum from low to high degrees of customization. The degree of customization is closely linked to the type of interaction with the client, from a rather hands-off type where industry information, market data, or expert answers are provided, to a deep involvement of both client and PSF representatives in a joint team implementing a strategic change process. Such interactive team efforts involve complex interdependencies and are difficult to coordinate. The services presented in the final two categories in Table 2 also involve a very high degree of customization, but typically only one PSF representative is involved with each client firm. As a result, in this context, coordination needs within the PSF are easier to handle.

While Hansen et al. (1999) distinguish between firm-level strategies, we suggest that PSFs can successfully operate in ‘mixed modes’. Therefore, Table 2 categorizes the services, as opposed to entire firms. However, the extreme cases of expert economics on the one hand and reuse economics on the other, are important categories at the service level, because they lead to different characteristics of the VCPs.

Tasks, interdependencies, and coordination

Different types of services (Table 2) involve different task characteristics, lead to different interdependencies and coordination needs, and require different

Table 2 A broad mapping of the customization of professional services

<i>Degree of customization</i>	<i>Professional services</i>
Lower	Information, market analyses, reports Certification, quality assurance, audits Expertise, advice Training Solutions to problems Innovation, new ideas, creative design Assistance in implementation Mediation, negotiator, ‘middle man role’ Stand in, management for hire, spokesperson ‘on behalf of’...
Higher	

types of knowledge bases. Thompson (1967) provided a theory of how different interdependencies between tasks lead to different coordination requirements, thereby constituting different types of organizational technologies. This theory now needs to be extended in terms of the context of knowledge-based value creation. Thompson made a distinction between ad hoc or 'synthetic' organizations and organizations which may maximize both efficiency and effectiveness at the same time through standardization, planning and mutual adjustment. Synthetic organizations are effective but not efficient, because they cannot calculate in advance the extent of the problem to be solved or the full array of resources available to them (p. 53). Many tasks carried out by PSFs, especially those that require a high degree of customization and team-based interaction with client representatives, take on the characteristics of synthetic organizations: the activities to be carried out, the interdependencies between them and the resources required both in terms of knowledge and number of 'man-hours', are unknown at project startup.

Thompson classified technologies by increasing complexity and cost of coordination, based on the interdependence between tasks to be carried out. In the simplest technology, tasks are only interdependent in the sense that they all affect overall performance, and such tasks are coordinated by standardization. A good example may be auditors working in parallel with multiple clients, where their performance is guided by strict standards of which documents need to be checked, how many samples are required at warehouses, etc. A more complex technology involves a sequence of subtasks, planned so that the next cannot be carried out before the previous task is completed. For large audits, multiple assistants may collect data from several warehouses, and all of this information is required before the partner in charge can sign the audit. In addition to common standards, the firm then coordinates through plans and deadlines. The third and most complex type of technology involves 'reciprocal interdependence', where those carrying out the tasks need to coordinate by mutual adjustment. In the auditing case, information about missing units in a warehouse may prompt the partner in charge to require additional samples, so that both assistants and partners have to adjust their schedules. As complexity increases, the cost of coordination goes up and in these examples, costs increase both in terms of total hours used and in terms of the involvement of the senior professionals. Van de Ven et al. (1976) added a fourth category, namely team efforts requiring simultaneous interaction.

As a result of the degree of customization (Table 2), services differ in terms of the degree to which tasks can be predefined at project start-up or may emerge as new problems are discovered or new solutions are invented. Thompson's framework was explicitly limited to tasks that can be predefined.

Can we assume that for firms which deliver highly customized services, only the most costly form of coordination is applicable? Do the firms need to remain inefficient and costly to run, or can they develop modes of coordination and collaboration that reduce costs without reducing client responsiveness? In PSFs, three factors contribute to the complexity of the VCPs, and therefore also to the costs of coordination: first, the domain choice is critical, in terms of the types of clients the firm targets, the types of services to be delivered, and in how many places. Second, the resource base is important, and in particular the type of knowledge base the firm develops, and the extent to which individual professionals can carry out their tasks more or less independently of other professionals, either based on their individual expertise or supported by sophisticated knowledge management systems. Third, the types of VCPs carried out by the firm determine coordination needs and the costs thereof, in particular in terms of the degree of customization of services and interaction with client representatives, the number of subtasks and therefore the number of professionals involved, and finally the degree of interdependence between subtasks and professionals. Coordination requirements are given by the tasks carried out by the firm, but since these tasks largely result from strategic decisions, coordination needs and costs can also be managed, at least indirectly. If tasks can be subdivided and coordinated by standardization, maybe combined with plans and milestones, coordination costs can be relatively moderate. However, when tasks require substantial customization and interaction with the client, maybe even in innovative teams with simultaneous presence, tasks cannot be preplanned and the costs of mutual adjustment are unavoidable. In this situation, only mechanisms that facilitate mutual adjustment are feasible, such as mobile PC and telephone systems, voice-mail systems, frequent meetings and social gatherings, and excellent support staff.

The ability of an organization to predefine tasks in the VCPs may vary according to experience, as a firm with experience from similar projects may be more efficient than one without such experience. Hence, there is a clear path dependency, where previous projects may enhance both the knowledge base and the reputation of the firm, thereby allowing the firm to target and win the most appropriate projects in terms of learning as well as profitability. On the other hand, previous projects may constrain the strategic development of the firm, as previous experience limits both the types of projects the firm has adequate knowledge to compete for, and the reputation of the firm allowing it to sell a 'credible promise' (Løwendahl, 1997). The following section presents our proposed framework, thereby bringing together our previous discussions.

The framework

The 'VCPs of PSFs-framework' consists of two contextual components, namely the domain choice and the resource base, which both constrain and enable the VCPs of a PSF for each specific project. The third and central component of the framework is service delivery. These components illustrate a 'snap-shot' taken at a given point in time. In addition, the framework highlights the importance of dynamic VCPs, illustrated by the arrows in Figure 1 below. The two core, broad arrows illustrate the processes by which domain choices and resource mobilization combine to determine the value created for and delivered to the client(s). As a by-product of these service deliveries, value

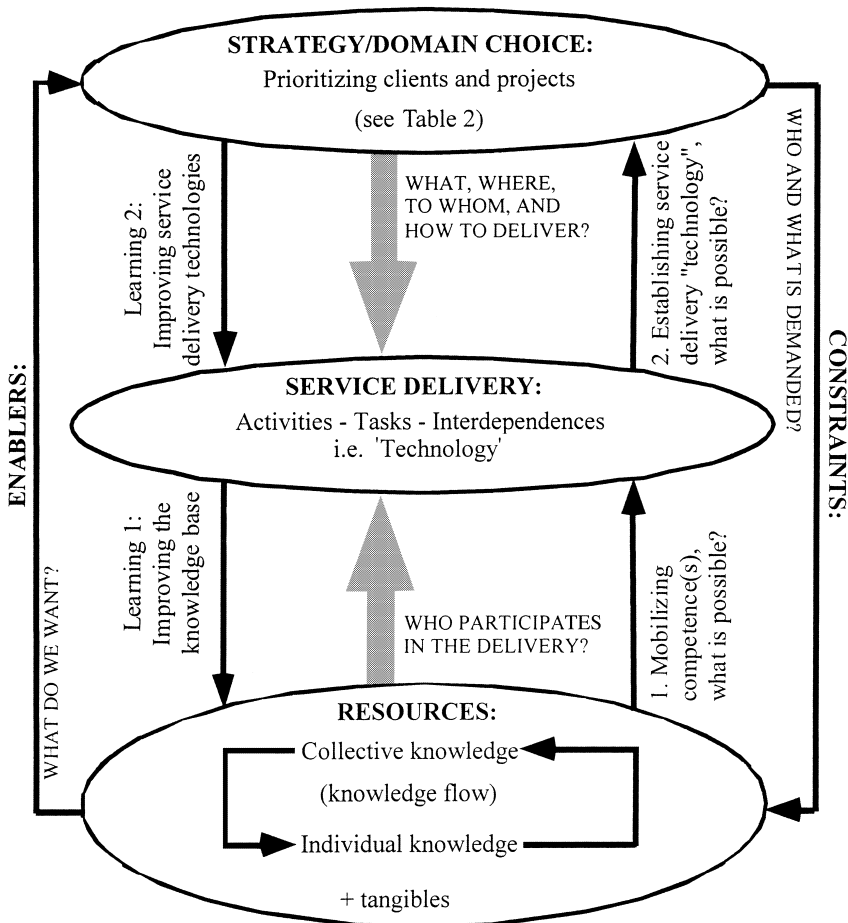


Figure 1 The VCPs of PSFs-framework

is created both in terms of options for domain enhancement (vertical arrows pointing up, via service delivery, to strategy and domain choice) and in terms of learning (vertical arrows pointing down, via service delivery, to the resource base). Value can also be created in terms of investments in knowledge development, as illustrated by the arrows within the resource base component.

As the outer arrows indicate, there is a close interconnection between the resource base, which determines what the firm is able to do, and the strategy/domain choice, since (potential) client opinions constrain the types of projects the firm can win. Similarly, the firm's resource base, including previous experiences, determines what the professionals want to do and what they are confident that they can do, and hence sets limits for the kind of projects and processes they are willing to engage in.

The most fundamental component of this framework is the knowledge base, since this is costly, difficult and time-consuming to change. Here, our framework is very much in line with that proposed by Morris and Empson (1998) that highlights the importance of knowledge management strategies for bridging the market for professionals and the market for the firm's services. However, our framework expands on the previous model by focusing on the VCPs as the key bridge to client markets. Clients buy *services* that require specific combinations of knowledge, and some services involve knowledge development whereas others do not. Hence, knowledge development is critical to clients, but mainly indirectly through the services delivered. On the other hand, for the professionals involved, knowledge development adds value directly, in terms of both firm-level knowledge and individual learning.

This framework has implications for practice as well as research, but as this article has a theoretical focus, the final section will focus primarily on research implications.

Contributions and implications

To understand value creation in PSFs, we suggest that the components of the framework must be studied 'holistically', i.e. how the three components are linked, as well as how they develop over time. A fundamental research question is: to what extent can these linkages be managed or do they result from natural development? Are domains consciously chosen, or do they emerge as a result of previous projects? Within this framework, we want to highlight five areas which clearly merit further research:

First, it is important to link knowledge development to strategy. Most

of the literature on knowledge management discusses an internally focused process involving training, development of IT systems etc., whereas the critical link to strategic knowledge development for enhanced value creation is left out.

Second, market-related analyses and professional concerns must be combined (Løwendahl & Revang, 1998; Morris & Empson, 1998). The existing literature seems biased in terms of emphasizing *either* the positioning of the firm relative to the external market ('domain choice') *or* dealing with the intra-firm complications of employing professionals. Our framework links the external dimension with the internal, through VCPs. Of particular importance are VCPs involving non-predefinable activities, as these are under-researched. The general challenge is how to develop processes that bridge requirements from customers with the relevant professional knowledge (Løwendahl & Revang, 1998, 2000) when coordination by standardization and planning is of limited value.

Third, our framework suggests that the three components are linked by two types of processes: enablers and constraints. Both cover relations between the strategy and the resource base, mediated by the VCPs. On the enabling side, reputation affects the demand and the projects the firm can choose. The strategic focus, i.e. which projects the professionals want to undertake, determines the priorities among projects. Experience from former projects affects the firm through two learning processes: first, the resource base improves through experience (Itami, 1987); and second, experience can be used to improve the design and management of the VCPs. Will successful firms move from expert economics to reuse economics over time? Or will they remain devoted to exploration? On the constraining side, we find demand for specific knowledge, often in terms of named individuals who have a reputation based on customer legitimacy (Lowendahl, 1992; Løwendahl & Revang, 2000). The capacity of the resource base restricts the possibility to add more value, but existing knowledge about how to 'design' appropriate VCPs may also restrict the will to accept new projects. These constraints may be countered by internal processes: systematic knowledge transfer within the knowledge base may increase capacity, while domain choices may be made explicitly such as to improve knowledge about specific VCPs.

Fourth, in terms of the knowledge base itself, we suggest that in order to understand knowledge development, it is important to look at the relationship between the knowledge of the firm and the knowledge residing in individual experts. The combination of these types of knowledge available as well as required by the present and target clients determines which kinds of knowledge management strategies are viable, and the number of combinations in

use is likely to exceed the two (codification and personalization) suggested by Hansen et al. (1999). It is important for firms to look at the knowledge base and knowledge requirements in relationship to key tasks in the VCPs. Since firms may carry out many types of tasks both simultaneously and over time, this implies that the analysis of knowledge development needs to be undertaken at the micro-level of key experts, key value creating processes and desired present and future domains. Rather than look for more specific categorizations of knowledge types, the entire learning environment must be analysed, thereby emphasizing not only codification and storage of collective knowledge, but also collaboration and sharing of individual knowledge, as well as collective ways of handling and learning from client relationships. Research into micro-level knowledge development is likely to be most influential if it studies in depth the actual knowledge development and VCPs of extreme cases – ideally both successful and less successful VCPs. In this area, theory development lags behind practice. Research will also need to look at knowledge development from a broad perspective, including but not limited to organization structure, formal and informal communication, organization culture, interpersonal networking and the role of communities of practice. Multidisciplinary studies with a broad theoretical base are likely to yield most insight.

Finally, as regards the generalizability of our framework, empirical research is needed. Since many firms in various industries are willing to adopt the knowledge management practices developed and sold by PSFs, it is important to learn more about how knowledge management is linked to: (a) different kinds of task characteristics (in particular the extent to which they are predefinable or not) and resulting coordination requirements; and (b) different types of knowledge bases, including but not limited to the impact of inter-organizational versus intra-firm knowledge bases and the degree of codification of knowledge, as opposed to unique and non-substitutable individual experts. There may be many different combinations of components leading to superiority, and hence good reasons to caution against a premature adoption of so-called 'best practices' from other firms.

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Note

- 1 Consistent with its origins in the economics literature, the resource-based perspective typically adopts a positivist view of knowledge, viewing it as an objectively definable commodity that can be traded between individuals. However, some resource-based theorists (e.g. Spender, 1996; Tsoukas, 1996) have attempted to accommodate greater complexity into this approach by recognizing the social processes by which knowledge is constructed and legitimated within organizations.

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Bente R. Løwendahl is Associate Professor of Strategy at the Norwegian School of Management BI. Her research interests include knowledge intensive firms, professional service firms, knowledge as a strategic resource, and post-industrial value creation. Her publications have included articles in *Strategic Management Journal*, *Scandinavian Journal of Management*, and *Global Focus*. She is an active member of the Academy of Management (BPS Executive Committee) and the Strategic Management Society, and teaches primarily in the MBA, MSc, PhD and executive programmes.

[E-mail: Bente.Lowendahl@bi.no]

Øivind Revang is Professor of Change Management at the Norwegian School of Management BI. His research interests are primarily strategies of organizational change, new organizational forms and management of professionals. He teaches extensively in graduate and executive programmes, and has published articles in a number of journals including *Strategic Management Journal*, *Global Focus*, and *International Journal of Information Management*.

[E-mail: Oivind.Revang@bi.no]

Siw M. Fosstenløkken is a doctoral candidate in strategy at the Norwegian School of Management BI. Her research interests are primarily in individual and organizational learning processes, with particular emphasis on professional service firms. She is in her third year of studies and is currently collecting data for her dissertation through interviews and observations in four case firms.

[E-mail: Siw.Fosstenlokken@bi.no]