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Replication of innovation in professional service firms *options for leveraging knowledge*

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Abstract

In this conceptual paper we elaborate on the replication of innovation in professional service firms (PSFs). We do this by integrating literature streams on replication, knowledge sharing, productization of services and management of PSF's. First we discuss the object of replication in order to analyze what might be leveraged and replicated. Then we address the various levels of replication (individual, team, area, firm) and reflect on the limitations and managerial challenges in the process of replication. Then we discuss various replication strategies and tactics in PSF's. Finally we develop a framework for describing and analyzing replication and illustrate the framework with three recent case studies on different professional service firms.

Keywords

Professional service firms, replication strategies and tactics, innovation, knowledge leveraging

Introduction

Providers of professional services normally work on a variety of different problems and needs of their customers. These needs might differ between customers, business environments, and moments in time, due to which certain levels of flexibility and customization are required in service provision. Therefore, these firms typically have decentralized structures with high levels of autonomy for their professionals, who are able to use their own judgment when developing customer-specific solutions (Von Nordenflycht, 2010). This customization creates a challenge of learning from previous solutions: it can be costly to re-invent the solutions and offerings for every customer from scratch. Therefore one of the strategic challenges for professional service firms is to organize some level of replication and to capture the experience and the solutions created for customers. In many cases the value that is created in projects and solutions for customers is based on a combination of existing knowledge and new knowledge that is developed in the particular customer assignment (e.g., Fosstenlökken, Løwendahl, & Revang, 2003).

Replication of knowledge and solutions has been recognized as an important driver of firm growth (Winter & Szulanski, 2001). However, it is most often discussed in contexts that rely on clever and appealing business models that can be implemented with standardized skill-sets (Winter and Szulanski, 2001; Esser, 2009). In professional service firms (PSF's) the customer problems and knowledge base cannot be completely codified and standardized. Typically the most important asset for these firms is the complex expertise of their employees, who may resist attempts to codify their expertise (Brivot, 2011). Even though different forms of knowledge sharing in PSFs have been discussed extensively (Hansen et al, 1999; Løwendahl et al, 2001; Morris & Empson, 1998), there is not much knowledge concerning what exactly is being replicated in these firms and at what level.

In this conceptual paper, we aim to address these issues. We will start with Winter and Szulanski's concept of replication and evaluate it in the light of discourses of knowledge sharing and productisation of professional services. Particularly, we explore the relationship between the objective of replication, the level and object of replication, the connected managerial challenges and the tactics for replication. We illustrate various forms of replication and different replication tactics for PSFs with three empirical cases. The paper ends with evaluating the usefulness of our approach and suggestions for further research into replication in PSFs.

Theoretical perspective

Replication in professional services

According to Winter and Szulanski (2001) the essence of replication is the *discovering and refining of a business model by choosing the necessary components to replicate that model,by developing capabilities to routinize knowledge transfer, and by maintaining the model in operation once it has been replicated* (p.731). Instead of the term business model they also use the term 'formula' defined as a *complex set of interdependent routines*.

The replication of a formula or a business is not obvious. Replication includes more than repeatedly applying the same standard recipe. An important challenge of a strategy of replication is to explore and discover what drives the success of the formula and what can be repeated at another place or with another customer. Organizations do mostly have a limited understanding of the causes of the success of a formula or a practice. In order to be able to repeat their results they have to search for what Winter and Szulanski (2001) call the *Arrow core*. The Arrow core is the knowledge that a company has of which attributes of their formula or business model are replicable and valuable to replicate, and the knowledge of how the replication can be done (Winter and Szulanski, 2001, p.731).

In their research Winter and Szulanski (and their co-authors) refer to examples, case studies and empirical data that are mainly focused on service firms that offer rather standardized type of services, like retail banking or companies in the fast-food-sector or firms in retail chains (Winter & Szulanski, 2001; Szulanski & Jensen, 2006; Winter, Szulanski, Ringov & Jensen, 2012). Even in the case of relatively simple or standardized offerings replication is considered as a serious challenge because of the complexity of the business model and the causal ambiguity of its results.

In this paper we use the concept of replication of the *Arrow core* and apply this to professional service firms (PSF's). This type of firms is characterized by knowledge intensity – indicating that *a firm's output relies on a substantial body of knowledge* (Alvesson, 2004; Mors, 2010; Von Nordenflycht, 2010, p.159). This knowledge resides to a large extent in highly skilled employees. The employees are professionals with a particular knowledge base with a high level of self-regulation. Furthermore professionals have a preference for a high level of autonomy and take the responsibility to protect the interests of their clients or even society (Von Nordenflycht, 2010, p.164). Replication of a task, activity or formula of a PSF has to overcome additional limitations.

According to Winter & Szulanski (2001) the *Arrow core* refers to the attributes of a template or a business model. In this paper we take *multi-level approach*. That means that replication in a PSF can take place at various levels in the organization: professionals share and replicate their knowledge at the individual level, at the department or team level and at the firm level. At the organization or firm level replication often refers to an operating routine, a format, or a business model. At the level of the team or the department terms like routines, standards or procedures are used. Replicating an

individual task or routine is supposed to be less challenging than replicating a business model. However, in a PSF additional complexity may loom at the operational (front office) levels, due to the idiosyncratic nature of customer assignments, required competences, and solutions. Therefore, we need to include this level of analysis in order to understand the drivers and barriers of replication in this type of firm.

The arrow core in PSFs

We suggest that two features of PSFs are important to consider to identify the arrow core. Firstly, idiosyncrasy in this context calls for understanding replication at different levels. Secondly, whereas Winter and Szulanski (2001) suggest that information can be leveraged and replicated 'infinitely' because it does not deteriorate in use, a PSF may base its strategy in creativity and complex problem-solving, which prevents it from replicating similar solutions in customer projects (Løwendahl, 2001; Maister, 1982). Some professionals base their success in identifying knowledge that loses its value when widely recognized (Willman et al, 2001). In these situations, the arrow core cannot describe the customer-specific output of the service.

However, even though the end result would be unique, the solution may include replicable elements: the challenge is to identify these elements (Toivonen & Tuominen, 2009). To reach a balance between replication and uniqueness, PSFs may modularize their service offerings and use some *elements* as the replicable 'core', whereas others are tailored to individual customers (Sundbo, 2002). Replication may also emphasize some *dimensions* of a service. Based on these notions, we suggest that replication can take place at different levels of the firm's offering, including a business model, a service, or a service module, and that it can focus on specific dimensions of a service, whereas other dimensions may remain susceptible to context- and customer-specific improvisation. Compared to standardized services, in PSFs larger part of the required knowledge may be tied to local situations and customers, whereas other parts are described in the arrow core. This situation creates specific challenges for capturing and transferring knowledge, which we discuss next as the key activity in managing replication.

Replication limitations and challenges

Although the basic idea of replication might seem relatively simple, the implementation can be difficult. Winter and Szulanski (2001) discuss a variety of limiting factors for organizations not being able to replicate their successes from one place or project to the other. These factors can be grouped in two broad categories: cognitive limitations and motivational limitations (Hinds & Pfeffer, 2001).

Cognitive limitations refer to the understanding of what are good practices and what are good sources of new knowledge (Haas and Hansen, 2007) and to causal ambiguity, the limited understanding of the causes of certain results (Winter & Szulanski, 2001). Also tacit knowledge and expertise based on experience will limit the opportunities for knowledge sharing and replication. Instead of 'cognitive limitations' Hansen (2009) uses the term 'ability problems' and makes a distinction between search problems – people are not able to find information and people easily – and transfer problems – people are not able to transfer complicated knowledge from one unit or team to the other.

According to Hinds & Pfeffer (2001) *motivational limitations* come to a large extent from the structure of most organizations which are designed to set people and units against each other (p. 11). Internal competition limits knowledge sharing and collaboration. Hansen (2009) distinguishes between two subcategories of motivational problems: not-invented-here – people are not willing to seek input from others and hoarding – people are not willing to provide information and help others.

In PSF's a replicator faces some specific challenges. First, a characteristic of PSF's is the continuously developing knowledge base. Employees may learn in every customer project and, in best cases, are able to combine their learnings to reach improved solutions in the next projects (Fosstenlökken et al., 2003; Werr & Stjernberg, 2003). When employees engage in explorative and exploitative activities simultaneously 'freezing' the arrow core can be a challenging task.

Second, in PSF's the professional autonomy is considered as an important prerequisite for the quality of the solutions provided. Professionals defend their autonomy and might be reluctant to share their expertise, as their reputation is often based on their unique expertise and client relationships (Morris & Empson, 1998). Third, learnings from customer projects are often largely tacit and difficult to separate from individual persons. Knowledge in PSFs is viewed as '*information* which professionals acquire through experience and training, together with the *judgement* which they develop over time which enables them to deploy that information effectively in order to deliver client service' (Morris & Empson, 1998, p. 613, emphasis added). Difficulties arise especially when the aim is to replicate interpersonal knowledge, i.e. know-how related to how to interact with customers, as well as knowledge concerning customer's value creation processes (Løwendahl et al., 2001).

Overcoming the cognitive (or ability) limitations and the motivational limitations generate challenges for the organization and its management. Various types of solutions and tactics can reduce these limitations. A number of those tactics will be discussed and illustrated in our case studies.

Replication strategy and tactics for knowledge transfer in PSFs

Winter and Szulanski (2001) suggest that in replicating firms exploration and exploitation, that is, knowledge creation and transfer, are separated from one another temporally and spatially. The successful solutions are identified first in a central organisation, which may require explorative activities and piloting. Once identified, the arrow core needs to be captured and transferred in a format that enables close imitation. Several tactics for knowledge transfer are used, including spreading knowledge in codified format, such as manuals and guidelines, and transferring tacit knowledge, for example through visiting successful locations to see how things are done in practice.

Due to the features of PSF's, we assume that central to replication is the ability to make individual expertise collective. Such collective knowledge can be defined as the 'combination of skills, routines, norms, and values that are developed and shared by at least two employees working together, and the information available for them'. (Løwendahl et al., 2001, p. 917). However, the degree to which collective knowledge can be explicated and transferred in a codified format is limited and depends on the firm's strategy (Hansen et al., 1999; Løwendahl et al., 2001; Morris & Empson, 1998).

PSFs may emphasize either codified or personal knowledge in their strategies (Haas & Hansen, 2007). Some firms aim to solve focused problems effectively, and follow a 'reuse' tactic which closely fits to the classic idea of replication (Maister, 1982). Knowledge is extracted from the person who developed it, made independent of that person through codification, and reused for various purposes (Hansen et al 1999). The behavior and skills are standardized to some extent and transferred from experienced professionals to juniors (Morris & Empson, 1998). These tactics have also been addressed in productisation literature, where the emphasis is on clarifying the relevant dimensions of a service (Jaakkola, 2011; Valminen & Toivonen, 2011). It can be assumed that these firms more easily engage in broad-scale knowledge transfer to establish subsidiaries which benefit from common innovation and reputation.

Other firms aim to solve complex problems and keep their knowledge embedded in employees. Such knowledge can be best transferred in dialogue between individuals through brainstorming sessions, conversations, and learning-by-doing (Hansen et al., 1999). Collective norms, routines, best

practices, strong culture, interaction, and socialization processes play an important part in knowledge sharing (Løwendahl et al., 2001; Swart & Kinnie, 2003). Replication is less discussed in these contexts, partly because these firms base their strategy and image on complex expertise and the ability to solve unique assignments. Since it may be less meaningful to separate knowledge creation and transfer from one another in such firms, replication can be acquired by creating and sharing knowledge within a community rapidly and effectively. The Arrow core can therefore be understood to be embedded in collective practices and solutions, which may develop continuously as expertise accumulates in new customer cases (cf. Morris & Empson, 1998; Nicolini, 2010).

Dimensions of a replication framework for PSFs

Based on the discussion above, we propose a number of dimensions of a framework for replication of innovation in PSF's. Firstly, we suggest that the breadth of the arrow core varies from the whole business model to a specific service element, tool or practice. Consequently, replication may take place at different organisational levels, ranging from the replication of tasks at individual level to the replication of a business model in several units or locations. Second, in PSFs the arrow core is likely to be only 'partial', in the sense that it specifies certain dimensions or elements of an offering, whereas professional service provision always requires some degree of customer-specific judgment.

Third, replication encounters a number of limitations that can be categorized in cognitive or ability factors and motivational factors. Specific challenges of PSF's are the simultaneity of explorative and exploitative activities, the autonomy of the professionals and the personal judgement based on their experience that can limit the opportunities for replication. Forth, because of these characteristics, replication requires careful methods for identifying codifiable or non-codifiable knowledge and tactics for how these can be transferred or shared. Depending on the firm's knowledge base and strategy, replication may follow either a format where exploration is carried out in central location and knowledge is transferred to service providers, or a format where the arrow core is based on a shared practice which is updated continuously at the unit or location through small-scale exploration and exploitation.

Three cases of replication in a professional service firm

Method

To illustrate our framework we will discuss replication in three firm cases. We have been studying the cases through a combination of methods, by interviewing personnel at various positions, by analyzing public documentation, and through discussions in workshops with the key persons responsible for service development and execution. Draft versions of the interviews and the the case studies have been discussed and approved by the respondents and the management of the organizations involved. Two cases derive from Finland, one from the Netherlands.

All cases show the complexity of replication inside an organization where unique outputs and individual professional expertise are emphasized. The architects' office case shows how a firm succeeded in breaking the norm of uniqueness in their industry by developing replicable concepts. The consultancy firm case shows how some degree of replication is acquired in a consultancy business which strongly emphasises personified expertise. The case of the hospital illustrates how new concepts and practices can be adopted from other industries and replicated inside the organization. Furthermore it shows the opportunities for broad-scale replication of the hospital's entire business model to other locations and new partners.

Case 1: Replication and productisation of multidisciplinary services in an architect's office

This case shows how a firm, whose business field did not appreciate replication, succeeded in leveraging its expertise by identifying replicable concepts. At mid-2000s the architect offices typically marketed themselves with artistic and unique design capabilities. The outputs were strongly linked to the reputation of a famous architect that led the design project. The office we studied wanted to act differently. The owners actively benchmarked their activities to business models identified in other industries. Instead of providing 'architectural design' and competing on the ability to draw beautiful buildings, they started providing service concepts, sometimes also labeled 'products'. The aim was to capture the tacit dimensions of the architect's capability, that is, the ability to understand human behavior in spaces, into the concepts. They aimed to clarify this capability to customers by 'productising' their expertise. As the CEO describes:

In our strategy, we have a clear goal of going into 'products' – not only into service products but also into solutions that draw on our expertise areas. Instead of calling to the owner or a contractor to ask 'do you have something we could draw?' we can state 'municipal A, you need a sports venue in this-and-that location. We are capable of designing that for you'.

They started experimenting different ideas by trying them out rapidly in customer projects. They also hired people from different professional fields, to deepen their understanding of human behavior. Those ideas that paid off were then developed more systematically. The concepts were codified to make them easier to grasp for the customers. They used different tactics: not only they aimed to describe the output (since it was somewhat unique) but also the design process and the analysis tools used, as well as interaction with the customer and the customers' customer during the design process.

As the firm grew, it re-structured itself around the successful expertise areas, each focusing on certain building or design concepts. Each team was led by an experienced architect who was responsible for developing the concept, and the team members predominantly worked on the group's assignments together. The concepts were not static: they were developed in new customer cases and used as a platform that was upgraded. Therefore, knowledge was accumulated and developed as the team members learned together and integrated new learnings into the service concept. Knowledge was, however, predominantly shared in interpersonal interactions, whereas codification mainly focused on communicating the concept to customers.

As the focus on teams and concepts suggest, leverage in this firm was acquired by detaching the architectural expertise from single heroic architects and on spreading it around a group of people. Consequently, the reputation was based on the image of the firm and its concepts. Internally this was also shown in rewarding tactics: goals were set for teams, not for individual employees. Even though these tactics are well known in other business areas, in the architectural field they were perceived as radical at the time. The interviewees noticed that other architects thought the firm was not artistic enough anymore, as business thinking and repetition of ideas was thought to kill creativity. However, the firm was able to grow with this tactic and was one of the largest offices in the field, with international activities. The growth also enabled dedicating more resources for systematic development. For the architects involved, the work environment was motivating, since they had possibilities to develop their expertise into new directions. The motivation also derived from engaging a larger group of individuals in design rather than focusing on individual 'heroes'.

Case 2: Combining personal expertise with replicable elements in a management consultancy firm

This case illustrates how replication was reached in a management consultancy firm that leaned on the unique expertise of their consultants. The firm mainly acted as a 'process consultant', i.e. it helped its customers to develop their solutions by providing tools, consultancy, and coaching to support the development processes. The firm had grown from an individual entrepreneur's successful, well-defined methods and concepts into a firm with several expertise areas. Now the firm consisted of a network of individual contractors, who each acted as an 'intrapreneur', even though they shared ideas, concepts, and customer cases with one another. Values of freedom, development, and 'craziness' characterized the firm.

This is a challenging setting for replication. Due to contractual, motivational and competence-related reasons the consultants were identified as innovative persons, and the culture stressed continuous development. Individual expertise and individual customer relationships were emphasized. However, the consultants acknowledged a need for replication and knowledge sharing to ensure the quality of the firm's image, to increase efficiency, and to reach broader customer base. Several tactics were used. Firstly, newcomers followed a yearlong socialization process, guided by a senior member. This ensured that all consultants absorbed the firms' culture and had some unity in their behavior. It also helped the newcomer to build their own business and network, and learn methods developed by other consultants. Secondly, the firm was divided into several teams based on the expertise areas, which in itself helped unifying knowledge and sharing ideas within certain area. Even though individuals' ability to develop own ideas without restrictions was emphasized, the teams also conducted some team-specific development activities: the ideas that proved successful in customer cases were analyzed and codified into replicable tools and service concepts with their own brand names.

Here replication meant conceptualizing and clarifying some service concepts and methods based on repetition in customer demand – successful elements were 'productised' and detached from individual consultants' reputation. This did not disrupt individuals' freedom to develop and exploit their own competences in a flexible manner: the 'toolkit' could be used if the person responsible for a customer case felt like doing it. They could alternatively decide to develop something on their own. Some people felt reluctant to use ready-made solutions that were seen as to undermine their customer relationships and individual expertise and experience.

One team changed this logic: they made a mutual agreement that tied everyone to develop and to provide common service concepts. They wanted to differentiate themselves from competitors who mainly marketed their services with abstract images; the team wanted to show that they have a well-studied and tested formula for customer assignments. They 'productised' their services and planned a systematic, continuous development of their concept collectively in order to maintain its effectiveness. The competence levels of team members were monitored until they were competent to independently provide the services. The agreement also reduced the consultants' business risk as they aimed to collectively ensure customer assignments for everyone.

Albeit the teams' productized services and service elements were more profitable than non-productised ones, these practices did not suit all teams. This was partially because of the personality and style of the consultants and the firm's culture. Replicability also seemed to depend on the nature of the service: in some service areas it was easier to identify repetition in customers' problems than in other. Especially the ability to grasp ambiguous – and sometimes emotional – customer problems in consultancy services was considered as difficult to replicate, since a personal touch and confidence deriving from experience were needed. Therefore the case depicts a situation where both codified and replicable, and non-replicable elements coexist.

Case 3: Hospital – internal and external knowledge exchange and replication

This case is about a hospital that has specialized in high-level eye care and surgery. The hospital is a centre of excellence in ophthalmic care. It is known for its collaboration with international partners in their field and for their knowledge exchange with business partners from outside health care. The hospital uses a number of *guiding principles* for the organization of the care. Safety of patients, visitors and staff is one of the leading principles. Others are anxiety reduction for patients and hospitality. Anxiety reduction is achieved by giving good information in advance (predictability), there should be a companion along with the patient (two are better than one), transparency (show all) and a pleasant hospital building. Less anxiety means faster healing, more security (the patient pays attention to what is happening) and greater satisfaction (see also: Korne et al, 2010).

Knowledge exchange and replication of other industry practices

Through collaboration with the aviation industry (KLM and Amsterdam Airport) the hospital has developed and implemented a number of new practices about safety by introducing clear agreements and protocols, cooperation between different disciplines and working on a safety culture. The new safety practices included risk analysis, time-out procedure, crew resource management and the ‘black box’ (recording surgery). For other organizational innovations the hospital has learned from hotels, retailers and other companies outside healthcare. Examples are patient planning and booking, taxi service and valet parking. For the development of their replication formula the hospital looked into practices of large retail chains and specialists in franchising.

One of the organization innovations is the *patient journey* or *clinical journey* in which the care is coordinated from a patients’ perspective, not from the viewpoint of the individual professional or the department. The purpose of a patient journey is to optimize service, matching information and combining appointments, especially for regular diseases as cataract.

Replication outside the hospital

One of the challenges for the hospital was to find a way to leverage the successful development of their new practices and the high standards of care beyond the borders of their own organization. They looked for opportunities to replicate their success with general hospitals and other parties in health care. To this end, the *Eye Care Network* was established in which opticians, optometrists, ophthalmologists collaborate. This network is the franchise formula through which 15 partner hospitals collaborate and have implemented the formula of the eye hospital (about 15 % of the Dutch market). Part of the formula is standardization of processes and protocols. The contracts leave some level of flexibility for adaptation to local conditions. Partner organizations adopt about 90 % of the practices and standards.

The diffusion of the new practices is coordinated by a team of 10 internal consultants. They check-in with the partners in the network every two weeks, consult the management of the partner organization, give workshops and monitor the implementation. For the Eye hospital the network offers also opportunities to learn from experiences elsewhere, for benchmarking and to have a testing ground for new ideas and approaches. One of the methods that are used to replicate the practices and protocols inside and outside the hospital is a program of training and culture change called *Eye care air*. Elements of this program are: team sessions, workshops, visits to partners (“*What if KLM would run your hospital*”), mystery guests, internal visitations, etc.

Managerial challenges and issues

One of the challenges is to *involve every professional* and *every function* in the transformation process. In the Dutch health care system most of the medical specialists are organized in independent partnerships and are not on the payroll of the hospital. That means a strong collaboration effort from

all parties when organizational innovation is the objective. Senior management with a clear vision that is accepted by the staff is important, as well as a set of guiding principles. Another issue is the *authority of the source of new knowledge*. In issues like safety and planning the airline industry and the role model of the captain in the cockpit turned out to be convincing sources.

For the success of the *external replication* two issues were important: the *productivity promise* at the start and the *long term results*. To convince partners to collaborate with the Eye hospital it needed evidence on the results of treatments and practices. To replicate the success of the Eye hospital forced the management of the Eye care network to have a deep and clear understanding of their business model. In the first 2-3 years in most cases there is 'low hanging fruit' to harvest. For long term commitment it is also important to realize further improvements and innovations. Therefore continuous development is needed.

Comparison of the replication strategies and tactics in the three cases

In table 1 we summarize a number of findings in the three case studies of our research. The three cases show different settings for replication. In addition to differences in service types, the firms were *at different phase of replication process*. The Architects' office had just moved from a situation with practically no systematic replication into a format which was based on replicable solutions. The Consultancy firm faced a rather stable situation where replicable elements co-existed with highly personalised consultancy styles. The hospital case shows how firm actively developed its business by identifying opportunities for adoption of new practices from outside the organization, followed by internal replication and outside replication of new practices in new locations and with new partners.

The cases show *a variety of levels for replication*, ranging from individual and team levels to the level of the firm and network of firms. These differences were partially due to the nature of the service: the first two case firms offered a range of services, and replication focused on creating replicable concepts within specific expertise areas. The consultancy case also included individual-level replication: some consultants productised their own tools, but did not necessarily put much effort in sharing them with other consultants. The hospital case shows a broad-scale replication which was intentionally pursued from the beginning, likely because of the systemic nature of service: the customer journey often involved a variety of experts, which created the need to streamline the whole process instead of optimizing a specific function.

The *managerial challenges* were partly similar among the firms. One of these was managing collaboration between professionals. This challenge was emphasized in the hospital since several professional groups needed to be involved, whereas coordination was easier in the first two cases where professionals shared their location and expertise area. Second, continuous development was a challenge in each firm, leading to different solutions for keeping the replicable concept coherent and up-to-date. In the first two cases, the professionals worked quite intensively together, and new knowledge was shared in daily interaction. A similar process took place for the development and integration of new practices and methods. For the external replication in new units of the hospital a team of internal experts ensured the unity of practices between locations and explored ideas for improvement.

The cases differed in how replication influenced their external and internal image: the first two cases based their business on coping with rather ambiguous problems, due to which replication was sometimes seen to undermine individual expertise and creativity. In the hospital case, on the other hand, replication was intentionally pursued to reduce ambiguity and raise quality, safety and the patient overall experience. Therefore, the consequences of replication for the firm's image differed based on the nature of the service.

Table 1. Replication in the three cases of professional service firms

	Architect's office	Consultancy firm	Eye hospital + Eye care network
Strategic objectives of replication	<ul style="list-style-type: none"> - To pursue growth - To gain new position in the marketplace - To build reputation on the firm's and its products' image instead of on the capabilities of individual architects 	<ul style="list-style-type: none"> - To ensure high quality - To spread knowledge - To make profits more easily - To gain broader customer assignments - To minimise the consultants' personal business risk 	<p><i>Internal replication:</i></p> <ul style="list-style-type: none"> - Increasing safety - Patient anxiety reduction - Enhancing patient experience <p><i>External replication:</i></p> <ul style="list-style-type: none"> - Leveraging results - Creating care network
Level and object of replication	<ul style="list-style-type: none"> - Service concepts at team level - Customer promise and service process model - even though outputs are tailored for each customer 	<ul style="list-style-type: none"> - Consulting methods and service concepts at individual and team levels - Process models (customers themselves create their own content). 	<p><i>Internal replication:</i></p> <ul style="list-style-type: none"> - Service concepts - Tools and methods <p><i>External replication:</i></p> <ul style="list-style-type: none"> - Business model, incl. service concept & processes - Standards for quality, safety and patient experience
Managerial Challenges	<ul style="list-style-type: none"> - Building the image on replicable concepts - Communicating the tacit elements of expertise to customers - Continuously developing the service concepts 	<ul style="list-style-type: none"> - Identifying repetition in complex customer problems - Codifying / sharing personified expertise - Contract model does not encourage consultants to invest in collaborative development - Personality styles and autonomy of consultants favor innovation instead of replication 	<p><i>Internal replication:</i></p> <ul style="list-style-type: none"> - Involvement of medical professionals - Cross disciplinary collaboration - Execution of practices & external knowledge <p><i>External replication:</i></p> <ul style="list-style-type: none"> - Understanding + evidence of the business model - Adaptation of the formula to local conditions - Dynamic development and continuous improvement
Replication strategy and tactics	<ul style="list-style-type: none"> - Identifying best concept by rapidly testing it in customer cases - Codifying the benefits and the service processes for customers to show unique expertise - Cumulating the expertise and experience within specialized teams 	<p><i>General practice in the firm</i></p> <ul style="list-style-type: none"> - productizing the simplest tools and services and branding them separately - allowing the consultants to decide themselves when to use the replicable tools - extensive socialization process for newcomers <p><i>One specific team</i></p> <ul style="list-style-type: none"> - building a team contract which motivates the consultants to collaborate - Systematic and collaborative development of the concepts - Ensuring the competence levels of individuals before allowing them to use the service concept 	<p><i>Internal replication:</i></p> <ul style="list-style-type: none"> - Guiding overall principles - Authority of knowledge source - Program of training and culture change <p><i>External replication:</i></p> <ul style="list-style-type: none"> - Franchise format - Program of training and culture change - Dedicated implementation team

The *tactics of replication* were rather similar in the first two cases. Both cases show that services were codified for marketing purposes, but internally knowledge was shared interpersonally: the persons interviewed told that they did not have the time or energy to write manuals that would have to be updated once in a while. Only some services included codified internal processes or formulas to support knowledge sharing and control the service delivery. In these cases, therefore, the image of the service was detached from individual professionals, but the expertise as such was not detached from the specific team. Newcomers had to be socialised through an extensive learning process. The Hospital, on the other hand, was able to codify its formula both for internal and external purposes. However, also this case shows the importance of training and having ‘intermediaries’, i.e. internal consultants, who support replication through face-to-face conversations.

The cases also show different degrees of freedom for the service providers to make their own judgments. In the Architects’ office and in the Hospital, individual deviations from the general formula were not accepted (note that replication in these cases focused on replicating the general concept and service processes, whereas the customer-specific solution was tailored to each customer). Certain improvements for the formula were, however, made locally: in the Hospital, some room for localization was accepted and in the Architect’s office, the team could collectively decide to develop their service concept into certain direction. In the Consultancy firm, on the other hand, everyone was able to decide themselves whether to use the replicable solutions or not. Only one team deviated from this practice and made all decisions together. The interviewees in this case noticed that they need to develop more ‘productised’ services if the aim was to grow rapidly, but at the time, priority was given to freedom and innovativeness.

Discussion & conclusions

In this paper, we suggest that the concept of replication (Winter and Szulanski, 2001) provides an insightful addition to the discussions of knowledge sharing in PSFs, if it is developed in such a way that it fits to this context. We have made propositions for conceptualising replication in firms that provide professional services. Now we aim to evaluate reasons for differences in replication strategies and tactics between PSFs based on our exemplary case studies.

Firstly, we suggested that the *breadth of the arrow core vary from the whole business model a specific service element, tool or practice*. We suggest that this depends on the type of service: in services that address complex problems and that require developing the knowledge base dynamically, expertise most likely cumulates within specialist teams, which leads to replication at lower levels in the organization. In cases where there are complex interdependencies between components or expertise areas that are involved in the creation of the customer’s solutions, replication is more useful if it covers the whole business model.

We also suggested that the *Arrow core* is likely to be 'partial', in the sense that it specifies certain dimensions or elements of an offering, whereas service provision always requires some degree of situational judgment and customer-specific improvisation. Based on the cases, we suggest that the Arrow core may cover the overall customer promise and a description of the service processes, whereas professionals need to make customer-specific judgments concerning how the firms’ competences could best be used in each customer case. In addition, depending on the type of the service and the level of replication, we suggest that especially the core expertise underlying the Arrow core may be continuously developed, rather than ‘frozen’. In large-scale replication this may require coordination between units or locations to identify useful ideas and commonly develop them. In small-scale replication, the development may take place hand-in-hand with service delivery, provided that the new solutions spread within the location and the Arrow core remains coherent.

We explored the relevance of the replication concept for professional services and developed an initial framework for describing and analyzing the objectives and objects of replication, as well as the limitations and challenges and the strategies and tactics used by professional service firms.

Limitations and future research ideas

Our approach has a number of limitations. The concept of replication needs further elaboration and specification. The literature on replication is rather inconclusive about what replication means, what can or should be replicated and how the process works. These ideas should be explored and tested systematically through empirical studies.

As we mentioned in the introduction replication is important for PSF's as a way to leverage their innovation efforts and to realize growth. One of the remaining research questions is: how can replication between teams, or units, or locations be realized through personified knowledge sharing – how can PSF's grow in size and simultaneously maintain their identity?

Different strategies and tactics for replication exist, even within one organization. This depends on the nature of the service and the customer base. Replication of the business model of such an organization might be a challenge for managers and for researchers. As we know that PSF's have been growing at a high rate over the last two decades and have become an important part of our economy the relevance of these research questions is growing and the answers might have an impact on the success of many PSF's.

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