

# Systematic innovation and service offering development in a knowledge-intensive project organization

Seppo Kuula<sup>1</sup>, Erkka Niemi<sup>2</sup>

<sup>1</sup>University of Oulu, <sup>2</sup>Aalto University

*The main aim of this paper is to describe how to design systematic innovation management and service offering development in a knowledge-intensive project organization (KIPO). We have focused on the alignment of customer demand and competence management utilizing the Service-Dominant Logic (SDL) principles and framework.*

*The most significant difference between the industrialization driven product marketing and globalization driven service marketing can be seen in the definition of value creation, and exchange (integration) of resources. The industrial revolution came about in order to create efficiency in scale, whereas the digital revolution is scaling creativity and creating inter-industry competition. Customer interface owners are winners in this change, where customer-oriented service design is in the key role, and the value chain becomes pull-directed.*

*SDL is giving a sound foundational framework for understanding value co-creation and dynamic resource integration in the service-dominant business. In SDL framework value is provided as operant resources (competences, skills, knowledge), and value co-creation requires a change in the dominant business logic from 'making, selling and servicing' to 'listening, customizing and co-creating'. However, there is very limited amount of literature regarding practical implications how the value co-creation can be aligned with systematic competence development.*

*In the customer-oriented dynamic business environment it is important, that knowledge intensive project organizations understand not only the current, but also upcoming needs of customers, to develop and provide them the right expertise at the right time. This kind of information asset can be managed with Competence Management Systems (CMS).*

# 1. Introduction

Digitalization and increasing size of service sector in all developed economies around the world are driving the need towards more service oriented marketing and business logic, simultaneously increasing the importance of knowledge-based occupations (Starbuck 1992, Castells 2010). As a baseline for service marketing we can see, that customers consume service, regardless of whether they buy goods or services, and marketing shall be seen as relationships, networks and interactions (Grönroos, 1979; Gummesson, 1999). Service science is seeing service systems as value creational configurations of people, technology, value propositions and shared information.

Service-dominant logic (SDL) implies that value is co-created with the consumer rather than embedded in output, and core competencies like knowledge and skills are competitive advantages (Vargo and Lusch 2004; Vargo and Lusch 2014; Grönroos and Gummerus 2014). In traditional goods-dominant business logic the product is the driver of new opportunities for the firm, whereas SDL suggests that competitive advantages are created by the experiences the customer has over time, and products are only delivery vehicles for services (Vargo and Lusch 2008; Vargo, Maglio, and Akaka 2008). This means more than simply being consumer oriented; it means collaborating with and learning from customers, wide encountering interface for understanding the end-user value determination, and being adaptive to customers' individual and dynamic needs.

For KIPOs in the described service-dominant and dynamic business environment it is very important to not only understand the current and future needs of customers, but also the resource integration interface, providing them with the right experts at the right time (Teece 1997). Therefore, the KIPOs need to develop innovation and service offering based on the interests and competences of their employees in order to match them with the customer demand, as well as to guide competence management on an individual and organizational level (Collins 2001). This kind of information asset (Goodhue et al 1988, Wang et al 1998) can be managed with Competence Management Systems (CMS) (Alavi and Leidner 2001, Lindgren et al 2004).

However, there is very limited amount of literature regarding practical implications on how the value co-creation can be aligned with systematic competence development (Niemi and Laine 2016). The main aim of this paper is to describe competence management system design principles in the service-dominant business environment.

Action Design Research (ADR) (Sein et al 2011) is practice-inspired research, resulting in a theory-ingrained artifact. In line with ADR methodology, this research consists of four stages:

1. Problem formulation,
2. building, intervention, and evaluation (BIE),
3. reflection and learning, and
4. formalization of learning.

In this research we have closely followed and lead a publicly traded management, design & technology consulting company case organization to understand its busi-

ness environment following SDL since 2011, and to design and implement a CMS including organizational and technological artifacts during an R&D initiative from January 2013 to June 2016.

In the ADR we learn the importance of aligning systematic innovation and competence development with customer demand utilizing SDL. The usefulness of CMS Design Principles (DPs) will be proven in the case organization, which gains significant business benefits from the guided emergence of organizational and technological artifacts utilizing the DPs. In the ADR we learn that is essentially important to visualize the customer demand to all employees in order to facilitate lean thinking (Womack and Jones 2010). DP "Alignment with Customer Demand" is needed to stress the importance of synching the innovation and competence management efforts with external environment. CMS should help the company to align how its economics work best (customer demand) with what it can be best at in the world (competence) and what most interests its employees (passion)(Collins 2001).

## **2. Literature review**

### **2.1. Service Dominant Logic and competence management**

It was stated already 15 years ago that value co-creation with the customer will replace the traditional goods exchange process because of the internet and collective knowledge of the available solutions(Prahalad and Ramaswamy 2000). In this configuration customers are part of the enhanced resource integration network; they co-create and extract business value and are simultaneously collaborators, co-developers, and competitors. A few years later Vargo and Lusch(2004) introduced SDL through ten foundational propositions (FPs). They saw "service" as the application of competences that benefit each other (co-creation), and as the focus of economic exchange. This thinking led to a shift from operand resource exchange to operant resource exchange (e.g., competencies, knowledge, and skills). Within this logic the operant resources are the fundamental source of competitive advantage. Products are just a distribution mechanism for the service provision.

The eight original Foundational Premises (FPs) of Service-dominant logic(Vargo and Lusch 2004), were later expanded to ten FPs (Vargo and Lusch 2008), and translated to four core axioms (Vargo and Lusch 2014). These axioms were centered on:

1. The application of resources in reciprocal service exchange (Vargo and Lusch 2004),
2. the integration of intangible and dynamic (i.e., operant) resources that create new resources (Vargo and Lusch 2004, 2008),
3. the cocreation of value through interaction and collaboration within networks of actors (Vargo and Lusch 2008), and
4. the importance of the context through which value is created and evaluated uniquely by a beneficial actor (Chandler and Vargo 2011; Vargo, Maglio, and Akaka 2008).

Service-dominant logic and its core axioms provide a solid framework for further exploring the role of context in exchange and value creation in the modern, digitalized and globalized business and society.

Rather than focusing on a multitude of different intermediaries within global supply chains (e.g., supplier of materials, manufacturer, retailer), S-D logic views all actors as resource integrators and cocreators of value. For example, a multinational fashion apparel company may consider many internal and external actors in different countries (e.g., supplier, manufacturer, wholesaler) in the value creation process, which is represented by the outcome of a finished garment. In an international context, this traditional, linear model suggests that value is created by “producers” in one or more countries and destroyed by “consumers” in another country (Normann 2001). However, a service ecosystems view offers a more networked, interconnected, and recursive notion of value creation. In this view, all stakeholders are interconnected through shared institutions and the provision of service, and value creation occurs throughout the network at each exchange encounter, rather than at the end of the Value chain (Porter 1985), (see figure 1).



Figure 1: Value chain (Porter 1985)

Later Akaka, Vargo, and Lusch(2013) elaborated S-D logic and its service ecosystems view (Vargo and Lusch 2004, 2008, 2011) in the International Marketing discipline. They applied a service ecosystems approach to reconsider central constructs in International Marketing— exchange, resources, value, and explored the complexity of context from a service ecosystems lens by articulating how micro-, meso-, and macrolevel interactions relate and evolve.

Assumption that value is defined and co-created with the consumer, where core competencies are the competitive advantages (Vargo and Lusch 2004) leads to requirement for wide cross-organizational collaboration between the supplier and customer. Turning marketing logic from “making, selling, and servicing” to “listening, customizing, and co-creating” requires alignment between marketing, development, and delivery organizations, and makes traditional value chain (Porter 1985) thinking pull-directed. Also Slywotzky(1996) is presenting similar approach in his appreciated value migration theory, describing how a company selects its customers, defines and differentiates it offerings based on the selected customer needs, defining the tasks it will perform and configuring its resources based on those.

SDL is also claiming that all actors (individuals, firms, nations) are fundamentally doing the same core activities in engaging with resource integration, exchanging service for service, and acting simultaneously as consumers and producers (Vargo and Lusch 2014). Edvardsson et al. (2012) further studied resource integration and value co-creation, suggesting that value is contextual and reliant on structure, which is iteratively changing itself with every instance of resource integration.

In the customer-oriented dynamic business environment it is important, that KIPOs understand not only the current, but also upcoming needs of customers, to develop and provide them the right expertise at the right time (Teece 1997). Based on SDL, this need shall be seen as operant resources (skills, competences, processes). Lindgren et al. (2004) argued that interest is the most important element (not historical competence) when designing competence management systems. According to them customer demand is, of course, also important but that the knowledge-workers themselves should be aware of demand, and how the demand will evolve in the future on their own expertise area. On the other hand, Collins (2001) argued that the company must focus on the intersection of competence, passion, and demand. Therefore, Niemi and Laine (2016) introduced a design principle “alignment with customer demand” in order to stress the importance of strategic leadership of the knowledge-intensive company.

All this is leading to conclusion, that suppliers’ value proposition has to be aligned with customers’ strategic needs, which needs are dynamic and in constant change together with the the resource integration structure, requesting transparent collaboration through suppliers’ and customers’ organizations. Value is seen as an operant resource (like core competencies), and value stream has to be pull-directed. Therefore, competence management is a key factor in creating operational excellence for the company.

## **2.2. SDL and Lean thinking**

Lean thinking is having its roots in Toyota Production System (Ohno, 1988). Lean thinking was studied, explained and popularized by Womack and Jones (1996) and later explained in more details by Liker (2004). Principles of Lean thinking are; 1) identify value (value is defined by beneficiary, pull-direction), 2) map value stream (seamless resource integration with customer), 3) create flow (cross-functionality, culture), 4) establish pull (co-creation with customer), and 5) seek perfection (iterative development). As discussed before, value and value creation definitions are difficult if not impossible to unambiguously define, but Lean is describing value creating process capable (value), available (value streams), adequate (perfection), flexible, flowing, and pulled. (Womack and Jones, 1996) In the other words in Lean thinking firms just have to think the created value from its customers’ perspective, learn, iterate, improve, and revisit the value definition.

Applying SDL means that the firm is not only restricted to making value propositions but also gets opportunities to actively participate in value creation with its customers, although value is always determined by beneficiary (Vargo and Lusch 2008). In the other words in value co-creation the supplier processes can be seen as a value stream, where core competences are the value particles, which are pull driven, bridging SDL to Lean thinking. Again, based on Lean thinking the suppliers’ efficiency can be measured with value density (level of competency), and value stream density (optimizing utilization rate of value creating actions) (Kuula, Niemi, and Haapasalo 2015). In pull-directed value creation customer is defining the need, but obviously the value proposition is still required for creating the required trust and engaging the customers. Anyhow the whole value architecture—including the delivered product and/or service, the revenue model, and the resources—have to interactively deliver and co-create the proposed value (Kuula et al. 2015).

Blank (2003) introduced later so called Lean Startup – approach for probing the ideas and needs from the customer already in the very early phase of the product/service development. Based on this, Ries(2011) presented so called Build-Measure-Learn – loop for probing the customer needs, pains and determination of value , answering question “how can we learn more quickly what works, and discard what doesn't”. This process is measuring value creation from customers’ perspective, and then learn whether to persevere or pivot the idea. Testing value creation in the lean startup model is done through the iterative, continuous, and cross-functional minimum viable product (MVP) development process.

Also Haeckel’s (1999)Sense-and-respond - centred view is bridging Lean thinking and Lean Startup philosophy to the Service Dominant Logic foundation. Main idea in Sense-and-respond – approach is to cultivate relationships that involve the customers in developing customized, competitively compelling value propositions to meet specific needs.

### **2.3. Innovation management**

Service innovation in the SDL framework is broadened to involve three different elements; the service ecosystem, the service platform, and value co-creation (Lusch and Nambisan 2015). The study saw that a common worldview, architectural alignment, and the structural flexibility of organizations were required for co-creative service innovation. Service innovation in this paper is focusing on co-created service innovation for the benefit of the customer, and requirements it set to supplier.

DTI (2007) defines that “Innovation is the successful exploitation of new ideas”. Or according to Drucker (2002) it is “the means by which the entrepreneur either creates new wealth-producing resources or endows existing resources with enhanced potential for creating wealth “.Keup et al (2012) identified six major research themes in strategic innovation management: 1) major intended and emergent initiatives, 2) internal organization adopted, 3) senior managers and ownership, 4) utilization of resources, 5) performance enhancement, and 6) external environments. In this paper we are focusing on the adopted internal organization and how to align it with external environments.

The logic of innovations needs to be understood in order to comprehend the dimensions of the required changes. (Christensen 2010, Govindarajan and Trimble 2010, Suikki et al. 2006).In 1983 Schumpeter (1983, 1912) already connected innovation to economic exchange. He defined innovation as the foundation of business improvement and the success of an organization. Christensen (2010) has dedicated his life to studying the sustainability of business and how this intimidates unpredictable, disruptive innovations. Christensen (2010) defined the difference between sustainable and disruptive innovation in his book *The Innovator’s Dilemma* (Christensen 2010). In this paper we don’t use this classification, although focus in the followed customer cases have been in sustainable innovation.

Tidd and Bessant (2013) mapped the innovation space: (each dimension can vary from incremental to radical): 1) Product / service: changes what the organization offers, 2) Process: changes the way of creation or delivery, 3) Position: changes the context in which the services are introduced, and 4) Paradigm: changes the underlying mental models whcih frame what the organization does. On the other hand,

Drucker (1985, 2002) identified the sources of innovation: 1) unexpected occurrences, 2) incongruities, 3) process needs, 4) industry and market changes, 5) demographic changes, 6) changes in perception, and 7) new knowledge. Our case organization is supporting its customers in the field of business- and service design, technology and information management, and therefore this study is focusing in offering and process development.

Teece (1997) introduced the dynamic capability framework: Sense, Seize, Transform. “the firm’s ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments”. Dynamic capabilities can be distinguished from operational capabilities, which pertain to the current operations of an organization. Dynamic capabilities, by contrast, refer to “the capacity of an organization to purposefully create, extend, or modify its resource base” (Helfat et al., 2007). This framework was taken as the backbone to the described Competence Management System (CMS) development.

Earlier research has identified best and worst practices for innovation management. Tidd and Bessant (2013) defined the model of innovation process: 1) Search: how to find opportunities, 2) Select: what and why are we doing, 3) Implement: how to make it happen, and 4) Capture: how are we going to reap the benefits. McGrath (2010) argued that with new business models, experimentation is key, and this discovery driven approach can take place both within firms and across industries. This itself may offer another source of competitive differentiation, as some firms develop superior capabilities at experimentation and consequently can build better models more quickly than their slower counterparts. Govindarajan and Trimble (2010) argued that an innovation initiative is best organized as a partnership between a dedicated team and the group that handles ongoing operations. This should help to mitigate possible tension between innovation team and core operations. Martin (2011) argued that the innovation initiatives need to have innovation catalysts, who act as internal champions. They should help and work with managers throughout the organization. Thomke and Reinertsen (2012) identified six myths hindering new product development: 1) high utilization of resources will improve performance, 2) processing work in large batches improves the economics of the development process, 3) stick to the original “great” development plan, 4) the sooner the project is started the sooner it will be finished, 5) the more features we put into a product, the more customers will like it, 6) we will be more successful if we get it right with the first time. It is easy to see how this is linked with Lean Thinking (Womack 2010) and Lean Startups (Ries 2011).

### **3. Methodology**

#### **3.1. Action Design Research**

Sein et al. (2011) defined that Action Design Research (ADR) should result in a theory-ingrained artifact that is intended to solve a practical business problem. In line with ADR method, our research consists of four stages (see Figure 2). We have repeated stages 1-3 several times and, eventually, moved on to stage 4 and published our findings in the form of scientific research papers.

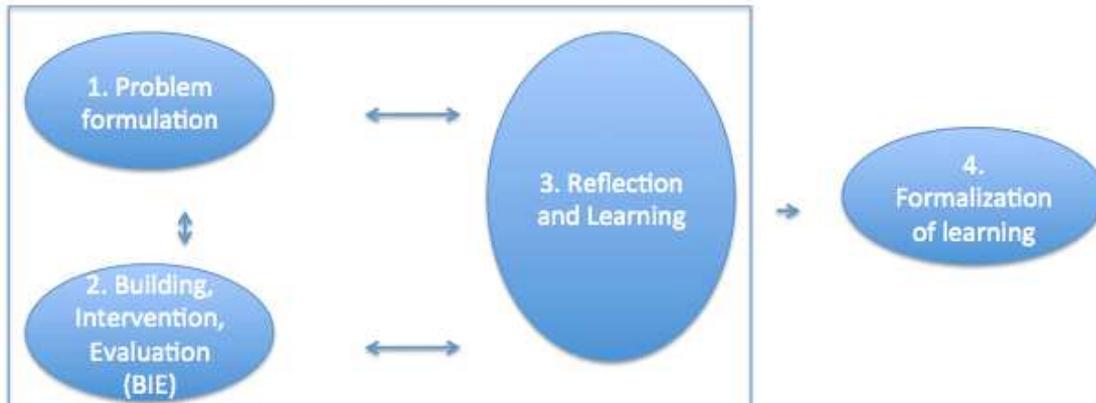


Figure 2: Action Design Research stages (Sein et al. 2011).

During the ADR in 2013-2016 we have implemented a competence management organization and software solution in a single case organization. One of the authors presented revised competence management system design principles in another article (Niemi and Laine 2016).

### 3.2. Research & Development program in Siili Solutions PLC

Siili Solutions PLC (case organization in this research) was founded in 2005 and provides design and technology services to major business-to-business customers. The sales revenue is estimated to reach €50M in 2016 and it has over 400 employees with sites in Finland, Germany, and Poland. The last years it has grown rapidly, simultaneously maintaining steady profitability: the average annual revenue growth has been over 40% with about 10% EBITDA from 2010 to 2015.

Siili started a Research & Development program in 2013 with focus on competence management. There have been three organizational interventions and five technological interventions (see Figure 3) and the total budget exceed €2M.

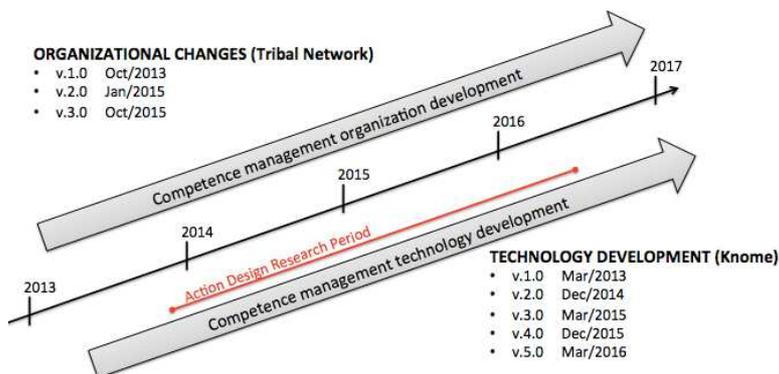


Figure 3: The organizational and technological interventions during the R&D program

### 3.3. The research team and progress

The first author is the Chief Executive Officer and the second author the Chief Development Officer of the case organization. Therefore, they have acted as “involved re-

searchers” and there has been another scientist as “outside researcher” to ensure the objectivity of the results (Walsham 1995, 2006). Besides these three scientists, the research team consisted of three members of Siili Solutions PLC’s service development organization, as well as numerous software engineers who have taken care of the development of the competence management software.

The research started in October 2013 when the second author interviewed 40 persons (employees, customers, partners) during three months and utilized dynamic capability framework (Teece 2009) to describe the current state in the case organization. The second round with 20 employee interviews was done in May-June 2015 in order to publish the interim findings. The last round of findings evaluation was done with confirmatory workshops in August 2015, and May-June 2016. In addition to these formal sessions, there have been numerous exploratory workshops among researchers and other Siili employees. The researchers have also encouraged all the employees to submit development ideas using an online collaboration tool and a dedicated email address. The researchers utilized also a lot of secondary documentation: management reports, process guides, intranet material, software quality & version control tool content, and public material like press releases and annual statements.

The research design and progress is described in more detail in Niemi and Laine (2016).

## **4. Results**

As a KIPO, Siili needs to be able to constantly match customer demand with the correct skills and experts. As a growing organization (recruited 102 experts on 2015) this matching is very dynamic, and foreseeing upcoming needs and to be recruited expertises as well. The sales cycle from initial contact until closing the deal, is three months on average, and simultaneously the recruitment cycle, from initial contact to the first day at work, is also about the same three months. In order to sustain competitive advantage, Siili needs to forecast customer demand in the short term and long term, and to understand and develop its own competence pool.

Siili has iteratively improved its competence management in order to meet current and future customer demand since 2011, but in 2013 this development was named as strategic initiative, and therefore found more formal process, responsibilities and targets. The following descriptions are based on real life situations in a knowledge-intensive project organization during 33 months.

### **4.1. A description of the study**

Siili has described its internal processes as a value stream, where core competences are the value particles, and suppliers’ efficiency can be measured with value density (level of competency), and value stream density (optimizing utilization rate of value creating actions) based on Lean thinking (Hines et al., 2004; Liker, 2004; Womac; Jones, 2003). Service Development organization is at charge of value density, whereas business development organization is responsible for value stream density, Figure 4 (Kuula, Niemi, and Haapasalo 2015). Therefore, the competence management

is serving value creation through organization. Customer liaison process is targeting to short iterations in activity cycle, and to rapid prototyping cycles in service innovation for identifying the real value creation opportunities and best practices with the minimum waste of resources.

CUSTOMER	Emotion	Cognition	Behaviour
<b>Onstage (co-creation, creating pull)</b>	Introduction Creating trust	Service Innovation	Engagement
<b>Backstage (resource integration)</b>	Customer Selection	Service Execution	Identifying key actors
<b>Support (service exchange)</b>	Identification of Value	Cross- Functionality	Value Stream
<b>SUPPLIER</b>	<b>Learn (Ideas)</b>	<b>Build (Service)</b>	<b>Measure (Data)</b>

Figure 4. Lean SDL Encountering framework (Kuula et al. 2015).

Siili’s business model is based on co-creation with customers, meaning that the consultants take part in projects mostly at customer premises. This way of working is challenging from an employer’s point of view as: 1) it is extremely difficult to gain an overview of the current competences of employees and lead the development of competence management as a dynamic capability, 2) employees do not necessarily experience any connection with their employer but connect with the customer organization and team member colleagues instead, 3) there are five main service offerings and dozens of sub-offerings, which are very difficult to match with the thousands of competence combinations of employees.

The initial current state analysis with DCF (Teece 2007) conducted from October to December 2013, recognized two important development issues: a need for the systematization of the competence management as a dynamic capability and linking it with customer needs in the design of the service offering.

#### 4.2. Competence management organization

Siili had grown rapidly since 2010 and there was a growing need to take the next step in the development of leadership and organization in the beginning of 2013. There were four Business Unit Managers (BUMs) who were directly managing over 100 consultants. Most of the employees were working at the customer premises and had very limited contact with the rest of the Siili organization. Moreover, there was practically no any structure or practices for competence management.

Tribal Network 1.0 with matrix organization was launched in fall 2013 to formalize the new leadership model and kickoff the competence management activities. However, the main goal of this structure was to strengthen the Siili culture and to improve communications between consultants and the company leadership. In fact, this new model improved many of the current challenges, but the research team already identified the next improvement items regarding competence management.

Dynamic Competence Capability framework was launched by the R&D organization in the beginning of 2014. The aim was inspired by Teece's (2007) DCF:

1. Sense new competences for evaluation,
2. seize the formally chosen competences for learning and commercialization,
3. transform; that is to say, to continuously align the tangible and intangible assets in order to ensure sustainable competitive advantage.

Tribal Network 2.0 was launched in the beginning of 2015 because Siili had grown record-fast in 2014 and the headcount amounted to almost 330 employees. This time the goal was to formally align the DCC practices with the organizational structure and way of working. One of the major changes was to give the ownership of tribal network to the R&D function from HR even though the BUMs still had to formal line management responsibilities. Moreover, a competence development manager was nominated in order to coach the tribal leads. It was recognized, that in this kind of knowledge intensive professional service organization it was better to focus on subject-matter competence, as in tribal network 2.0, whereas the tribal network 1.0 was more HR-driven.

Tribal Network 3.0 was launched in order to strengthen the co-operation between competence management and operational business in the end of 2015. The R&D organization was given the formal line management responsibility for all the employees, but was required to start working more closely with the BUMs.

Tribal Network 4.0 was launched in August 2016 in order to link customer demand and employee interests more explicit. This new customer pull-driven approach is described in more detail after the competence management technology stages in the next section.

### **4.3. Competence management technology**

Competence management is a key function to all professional service providers. Most of the companies are still seeing service as an operand commodity, but Siili understood the operand nature of its offering already 2011, finding a sound framework for transparent value creation from SDL in 2012. Building on top of these theoretical frameworks Siili created a service vision for a new competence management tool in the beginning of 2013. The vision was inspired by SDL and the hedgehog concept (Collins 2001), and the aim of the tool was to locate the focal point of customer demand, employee competence, and employee interest. Siili dedicated a team of five consultants to develop the tool.

Tool named KnoMe version 1.0 was launched in spring 2013 to provide complete transparency on the stored competence data for all employees. The first version of

the tool included CVs, basic search, and a functionality to print out the CVs for sales purposes. The main focus was on technology skills and project history of each employee.

In fall 2014 the next iteration of KnoMe kicked off as the development, again as part of the DCC initiative. There were several reasons:

1. The company had grown so much that it started to be impossible for anyone to remember individual-level competences, and competences wanted to separate from experts,
2. company size and high profitability allowed an increased investment in R&D
3. there was a need to replace an inadequate commercial HR application at one of the acquired companies, and
4. company was preparing first international operations.

KnoMe version 2.0 was released at the end of 2014 after a significant development effort. It was the first true competence catalogue including information on the ongoing and latest projects as well as a solid architecture that enabled continuous delivery in short one-week development and release cycles. KnoMe version 3.0 was released at the beginning of 2015 to support the new Tribal Network 2.0. After the go live each employee was able to see who belonged to which tribe immediately after the employment contract was signed. KnoMe version 4.0 was released in December 2015 and supported the new organization launched in October 2015 and included completely renewed user interface as well as an early release of customer and project management. KnoMe version 5.0 was released in the beginning of 2016 launching integration with the ERP system that contained the master data and realized working hours of each customer and project.

In summer 2016 Siili launched a new development phase aimed at deploying customer pull-driven service development way of working. Competence management organization and system were both serving well the needs they were developed for, but the service development organization itself had receded from operational activities and customer work. As earlier presented, according to SDL customer is determining the value and it is requesting wide and transparent collaboration through organization. Therefore, innovation team kind of approach cannot be used for more than temporarily driving the change. In the next section we discuss the expected results from the new way of working and compare them with the theories presented in the literature review section.

## **5. Discussion: pull-driven competence development**

Based on SDL, in the service economy neither product nor service creates value on its own—value is co-created with the customer. In other words value is embedded in the value creation processes rather than provided as a service to the customer. Co-creation allows for customized services (products) while still taking advantage of economies of scale. As also presented in the literature review, based on both, SDL and Lean philosophy the created value is based on operant resources, and customer determine value of the offering. Based on Lean thinking, in service co-creation the

supplier processes can be seen as a value stream, where core competences are the value particles, and suppliers' efficiency can be measured with value density (level of competency), and value stream density (optimizing utilization rate of value creating actions). In practise this means, that value stream has to be pull directed, and traditional value chain (Porter 1985) has to begin from the customer needs. This is leading to the facts, that for service integrator the competence management is a key function for the company and its profitability, competence management system can be seen as the enterprise management system, and product/service development has to liaise with the customer, understanding the value determination and value creation process of its customers.

This research is part of practice-inspired ADR, which started in Finland already 2011, and where studied professional service provider company was recognizing the competence management as a key competitive advantage 2013 based on theories of SDL and Lean Thinking. Company was defining its value chain first based on Porter (1985), translating it to own functions (figure 5). The organization and competence management systems are evolved and improved, and this evolution has opened the practical implications to researchers.



Figure 5: Value Chain, SILLI

For simplifying the value chain, and aligning it with the organizational responsibilities and SDL, Company was integrating some functions together. Outcome was the baseline for the upcoming activities and measurement of the value stream (figure 6).



Figure 6: Simplified Value Chain

Original approach for service development and competence management was based on productized service solutions in 2011. Two years later the studied company recognized that both service development and competence management are the key factors for competitiveness and profitable growth as the resource integrator based on SDL in service economy. Company understood that it has to be able to shorten the distance between the customer needs and its expertise acquisition, and connected service development organization directly to the customer interface. Value proposition was based on hypothesis and existing expertise, but approach was always technologically agnostic and co-creative with the customer. This approach is described in figure 7.

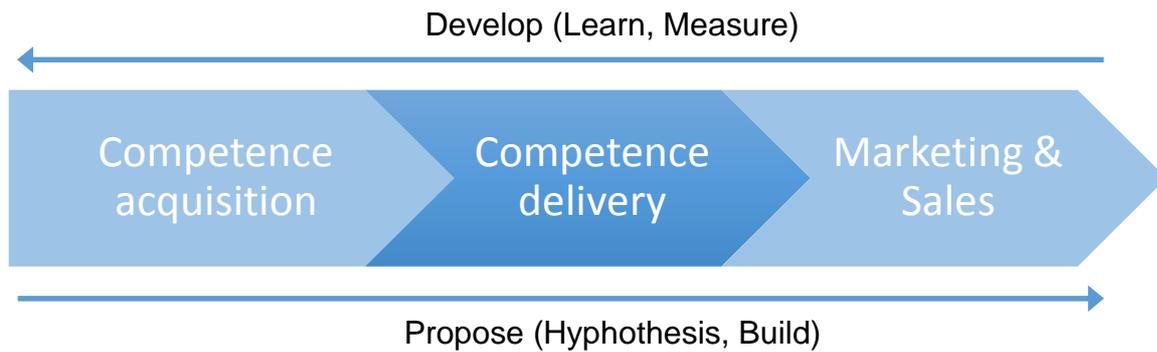


Figure 7: Value based competence management

Iterative development of service development and competence management organization and tools were described earlier, but the latest phase of development is still in process. Anyhow this study has already now proved that the competitiveness of the company can be iteratively improve with ADR, service-dominant logic can be seen as a sound framework for studying value creation in the service economy, and operant resource management is a key factor in improving the value stream efficiency of the company.

## 6. Conclusion

Digitalization and increasing size of service sector in all developed economies around the world are driving the need towards more service oriented marketing and business logic, simultaneously increasing the importance of knowledge-based occupations. Service-dominant logic (SDL) implies that value is defined by, and co-created with the consumer rather than embedded in output, and core competencies like knowledge and skills are competitive advantages. Knowledge-intensive project organizations (KIPO) need to develop innovation and service offering based on the interests and competences of their employees in order to match them with the customer demand, as well as to guide competence management on an individual and organizational level.

In this paper we looked into an innovation management and service offering development initiative in a knowledge-intensive project organization Siili Solutions PLC. We have conducted an action design research program focusing on competence management during 2013-2016. In the program we have designed, implemented, and evaluated a competence management system including organizational interventions. The design was guided by previously published theories such as service-dominant logic (Vargo&Lusch 2004, 2008) strategic management (Collins 2001), and competence management system design principles (Lindgren 2004).

### 6.1. Theoretical contribution

According to Hevner et al. (2004), design science research should explicitly present the theoretical contribution in order to differ from regular system development and consulting assignments. We have designed, implemented, and evaluated a competence management system in a case organization to understand how to systematical-

ly design and develop innovation management capabilities. The management of the case organization has evaluated the design, appreciates the results, and the organization has grown profitably during and after the research period. Therefore, this action design research is a “weak market test” realization of market-based research validation (Kasanen et al. 1993), because there is one case organization using the designed construction and appreciates the usefulness.

## 6.2. Practical contribution

(Sein et al. 2011) defined that ADR should result in a theory-ingrained artifact that is intended to solve a practical business problem. The case organization needed first to systematically manage its competences and later on to align this management with customer demand and innovation management. In this paper we have described the design and development program with organizational and technological interventions in the case organization, which could be useful for other companies facing similar challenges.

Finally, our research provides new evidence how scientific theories can be applied in authentic professional services context and help KIPOs in systematic innovation management and service offering development.

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## 8. References

Akaka, Melissa Archpru, S. L. Vargo, and R. F. Lusch. 2013: The Complexity of Context: A Service Ecosystems Approach for International Marketing. *Journal of Marketing Research* 21 (4): 1–20.

Alavi, M. and Leidner, D.E. 2001: Knowledge Management and Knowledge Management Systems: Conceptual Foundations and Research Issues. *MIS Quarterly* (25: 1), pp.107-136

Blank, Steve. 2013: Why the lean start-up changes everything. *Harvard business review* 91.5 (2013): 63-72.

Christensen, Clayton M., Stephen P. Kaufman, and Willy C. Shih. 2008: Innovation killers. *Harvard business review* 86.1 (2008): 98-105.

Christensen, Clayton M. 2010: *The Innovator's Dilemma: The Revolutionary Book That Will Change the Way You Do Business*. 1. Collins Business Essential ed., [25. Nachdr.]. New York, NY: Harper Business.

Collins, C. 2001: Level 5 Leadership: The Triumph of Humility and Fierce Resolve. *Harvard Business Review*, (January), pp. 65–76.

- Drucker, Peter F. 2002: The discipline of innovation. *Harvard business review* 80 (2002): 95-104.
- Drucker, Peter F. 1985: *Innovation and Entrepreneurship*.
- DTI 2007: *Innovation in Services*. Occasional Paper No. 9. London: Department of Trade and Industry.
- Edvardsson, Bo, Per Skålén, and BårdTronvoll. 2012: Service Systems as a Foundation for Resource Integration and Value Co-Creation. In *Special Issue – Toward a Better Understanding of the Role of Value in Markets and Marketing*, edited by Stephen L. Vargo and Robert F. Lusch, 9:79–126. Emerald Group Publishing Limited.
- Grönroos, Christian. 1979: An Applied Theory for Marketing Industrial Services. *Industrial Marketing Management* 8 (1): 45–50. doi:10.1016/0019-8501(79)90017-8.
- Grönroos, Christian, and Johanna Gummerus. 2014: The Service Revolution and Its Marketing Implications: Service Logic vs Service-Dominant Logic. *Managing Service Quality: An International Journal* 24 (3): 206–29. doi:10.1108/MSQ-03-2014-0042.
- Gummesson, Evert. 1999: Total Relationship Marketing: Experimenting With a Synthesis of Research Frontiers. *Australasian Marketing Journal (AMJ)* 7 (1): 72–85. doi:10.1016/S1441-3582(99)70204-1.
- Goodhue, D., Quillard, J., & Rockart, J. 1988: Managing the Data Resources: A Contingency Perspective, *MIS Quarterly* 16(1): 267–274.
- Govindarajan, Vijay, and Chris Trimble: Stop the innovation wars. *Harvard Business Review* 88.7/8 (2010): 76-83.
- Haeckel, Stephan H. 1999: *Adaptive Enterprise: Creating and Leading Sense-and-Respond Organizations*. Boston: Harvard Business School Press.
- ILO 2015: *World Employment Social Outlook: The changing nature of jobs*. Research Department, International Labour Organization, Geneva.
- Keupp, Marcus Matthias, Maximilian Palmié, and Oliver Gassmann. 2012: The strategic management of innovation: A systematic review and paths for future research. *International Journal of Management Reviews* 14.4 (2012): 367-390.
- Kuula, S, and Haapasalo, H. 2016: Continuous and Co-Creative Business Model Creation. In *Service Business Model Innovation in the Healthcare and Hospital Management*. Vol. 12/2016, approved for publication in 12/2016
- Kuula, S., Niemi, E., and Haapasalo, H. 2015: *Service Dominant Logic – How to Systematize Service Business*. RESER 2015.
- Liker, Jeffrey K. 2004: *The Toyota Way: 14 Management Principles from the World's Greatest Manufacturer*. New York: McGraw-Hill.
- Lindgren, R., Henfridsson, O., and Schultze, U. 2004: Design Principles for Competence Management Systems: A Synthesis of an Action Research Study. *MIS Quarterly*, 28:3
- Lusch, Robert F., and SatishNambisan. 2015: Service Innovation: A Service-Dominant Logic Perspective. *MIS Quarterly* 39 (1): 155–75.
- McGrath, Rita Gunther. 2010: Business models: a discovery driven approach. *Long range planning* 43.2 (2010): 247-261.

- Niemi E. and Laine S. 2016: Competence Management System Design Principles – Action Design Research, 37th International Conference on Information Systems (ICIS), approved for publication in 12/2016
- Ōno, Taiichi. 1988: *Toyota Production System: Beyond Large-Scale Production*. Cambridge, Mass: Productivity Press.
- Porter, Michael E. 1985: *Competitive Advantage: Creating and Sustaining Superior Performance*. New York : London: Free Press ; Collier Macmillan.
- Prahalad, Coimbatore K., and Venkatram Ramaswamy. 2000. “Co-Opting Customer Competence.” *Harvard Business Review* 78 (1): 79–90.
- Ries, Eric. 2011. *The Lean Startup: How Today’s Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses*. 1st ed. New York: Crown Business.
- Schumpeter, Joseph A. 1983: *The Theory of Economic Development: An Inquiry into Profits, Capital, Credit, Interest, and the Business Cycle*. Social Science Classics Series. New Brunswick, N.J: Transaction Books.
- Sein, Maung, Ola Henfridsson, Sandeep Puroo, Matti Rossi, and Rikard Lindgren. 2011: Action Design Research. <http://bada.hb.se/handle/2320/9888>.
- Slywotzky, Adrian J. 1996: *Value Migration: How to Think Several Moves ahead of the Competition*. Boston, Mass: Harvard Business School Press.
- Starbuck, William H. 1992: Learning by Knowledge-Intensive Firms. *Journal of Management Studies* 29 (6): 713–40.
- Teece, David J., Gary Pisano, and Amy Shuen. 1997: Dynamic Capabilities and Strategic Management. *Strategic Management Journal*, 509–33. Sein, M., Henfridsson, O., Puroo, S., Rossi, M., and Lindgren, R. (2011): ‘Action Design Research.’ *MIS Quarterly*, 35 (2).
- Thomke, Stefan, and Donald Reinertsen. 2012: Six myths of product development. *Harvard Business Review* 90.5 (2012): 84-94.
- Tidd, J., and Bessant, J. (2013): *Managing innovation: Integrating Technological, Market and Organizational Change*,. Vol. 5. Chichester: Wiley, 2003.
- Vargo, S. L., and R. F. Lusch. 2004: Evolving to a New Dominant Logic for Marketing. *Journal of Marketing* 2004 (Vol. 68 (January 2004), 1–17).
- Vargo, S. L., and R. F. Lusch. 2008: Service-Dominant Logic: Continuing the Evolution. *Journal of the Academy of Marketing Science* 36 (1): 1–10. doi:10.1007/s11747-007-0069-6.
- Vargo, Stephen L., Paul P. Maglio, and Melissa Archpru Akaka. 2008: On Value and Value Co-Creation: A Service Systems and Service Logic Perspective. *European Management Journal* 26 (3): 145–52. doi:10.1016/j.emj.2008.04.003.
- Vargo, S. L., and R. F. Lusch. 2014: Inversions of Service-Dominant Logic. *Marketing Theory* 14 (3): 239–48. doi:10.1177/1470593114534339.
- Wang, R. Y., Lee, Y., Pipino, L., & Strong, D. 1998: Manage your information as a product, *Sloan Management Review*, Summer 1998, pp. 95–106.
- Womack, J.P., and D. T. Jones. 1996: *Lean Thinking: Banish Waste and Create Wealth in Your Corporation*. New York, NY: Simon & Schuster.

**Authors:**

SeppoKuula, University of Oulu, Industrial Engineering and Management  
P.O. Box 4610, FIN-90014 University of Oulu, FINLAND  
seppo.kuula@siili.fi

Erkka Niemi, Aalto University, Information Systems Science  
Runeberginkatu 14-16, 00100 Helsinki, FINLAND  
erkka.niemi@aalto.fi