The Role of Boundary Objects in Public-Private Innovation Networks

The Story about Næstved Health School

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Introduction

The purpose of Case Studies in Service Innovation is to give the reader insights into how innovation occurs in practice and to stimulate learning from one context to another.

In 2009 the UK witnessed the publication of a number of reports in Service Innovation for example 'Supporting Innovation in Services' from UK Government Department of Business Innovation and Skills [1] and 'Hidden Wealth: The Contribution of Science to Service Sector Innovation' from the Royal Society [2].

Professor David Rhind, who chaired the Royal Society's report's working group, said:

"The service sector generates between half and three quarters of the world's wealth and accounts for over eighty percent of employment in the UK. Despite this, little research has been done into how innovation, which drives the expansion of the service sector, develops." [3]

Case Studies for Service Innovation bring together contributions from researchers and practitioners in a celebration of achievements in innovation in practice with the intention of adding to the wider understanding of how service innovation develops.

The book is organised around five major themes each reflecting recognised sources of service innovation. Each case may belong to more than one theme but for purposes of simplicity each case in reported under only one theme.

Theme 1: Business Model Innovation
Service innovation through new ways of creating, delivering or capturing value (economic, social, environmental or other types of value)

Theme 2: The Organisation in its Environment
Service innovation through an organisation engaging beyond its own boundaries, for example through public private partnerships; sourcing knowledge externally; innovation networks; open or distributed innovation

Theme 3: Innovation Management within an Organisation
Service innovation through an organisation actively encouraging innovation within its own boundaries, for example through project teams, internal governance of innovation, methods or tools that stimulate innovation

Theme 4: Process Innovation
Service innovation through changes in service design and delivery processes, for example through consumer led innovation or consumers as part of the innovation process, service operations management, educational processes

Theme 5: Technology Innovation
Service innovation through the use of technology, for example through ICT enabled innovation, ICTs that are themselves innovative and support the delivery of new services, new ICT services, new ways of delivering services associated with ICT products, technology other than ICT

Each case provides a two page description of the context in which the innovation occurred, the opportunity that led to the innovation and an overview of the innovation itself. It also addresses how success was measured, what success has been achieved to date and links to further information.

This is a pre-conference version of the case book; further analysis of the cases will be carried out at the conference Case Studies in Service Innovation on June 14th and 15th 2010, Manchester Business School, Manchester, England. A final version of the case book will be produced after the event.

About SSMEnetUK

SSMEnetUK [4] is a network of UK researchers and practitioners interested in Service Science Management and Engineering (SSME), the network is funded by the UK Engineering and Physical Sciences Research Council [5] (EPSRC EP/E056377/1) and actively supported by BT, HP and IBM.

The aim of the SSME network is to bring together researchers and practitioners in the UK who recognise the need for multidisciplinary services oriented research and education and who will help develop the wider SSME agenda within the UK.

About this Case Book

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References

[1] http://www.berr.gov.uk/policies/business-sectors/services-professional-business

[2] http://royalsociety.org/Hidden-wealth-The-contribution-of-science-to-service-sector-innovation/

[3] http://royalsociety.org/Content.aspx?id=8433&terms=hidden+wealth

[4] www.epsrc.ac.uk

[5] www.ssmenetuk.org

Theme 1: Business Model Innovation

Service innovation through new ways of creating, delivering or capturing value (economic, social, environmental or other types of value)

Case Study 1: Innovation by Intermediation: The Case of New Business Model design for the Tooling Machine Sector

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Abstract. This case study concerns the definition of new business models for SMEs in the Italian tooling machine sector (Emilia-Romagna Region). It is interesting, as it is addressed to present how the role of technology and innovation centres is evolving: shifting from a functional logic to an entrepreneurial one. The aim of this case study is threefold. Firstly, we have the business model itself here as a multi sector/multi role device. Secondly, there is the evolution of technology centres as new actors in an innovation system. Finally, the typology and nature of the innovation proposed, which is embedded in a multi-level and multi-actor innovation process.

Background

Background/context can be defined following three main considerations:

1. The progressive devolution process by which regions and other territorial units (i.e. city regions), receive increasing powers and responsibilities from the central state. Italy has always been a central managed country: Research, Technology and Innovation are no exception. It is only by a recent bill (issued in 2000) that regions in Italy have the responsibility for applied research and technology transfer. The principal outcome is that regions have to connect with universities to define common strategies and objectives, with a concrete regional impact.

2. By the same token, regions have traditionally dealt with innovation within the framework of industrial and cohesion policies. The provision of specific “real services” to districts and clusters, as well as the management of manufacturing extension programmes and infrastructures, can count on a quite well established body of knowledge among regional officers.

3. The tooling machine sector (not only in Italy) is characterised by the small dimension of firms (normally family business), and by the limited diffusion of ICT and other enabling technologies. The value chain is still dominated by producers, based on their relationships with markets and, in turn, their ability to manage the system of relations with suppliers and subcontractors.

The opportunity

The opportunity for this service-innovation, has been introduced by the disruptive effect of the economic downturn on manufacturing firms. This forced firms and researchers to focus on different key factors, other than the superior performances granted by the technological edge of Italian firms. On the other hand, the effectiveness of traditional strategies (relationship with clients) is partially countered by financial pinch and credit restriction (the demand is only potential or not existent).

Traditionally, manufacturing sectors are export leaded. Based on 2008 data, European Union weighted for the 46.8% of Italian export (other European countries are at 13.7%), while Italian Tooling machine sector exports the 66% of its production. This implies that nearly the 40% of the Italian manufacturing turnover come from the European context. If we then look at the export variations, in 2008 we can notice a diminishing trend characterising Europe and other developed countries (Europe -2.2%; North America -7.6%); while developing countries registered a positive performance (South America +16.5%; Middle East +15.4%, Oceania +13.7). On the other hand, the economic forecasts portray a situation where developed countries will still face a contraction of internal consumption and investments, while banking system endure in its credit restriction. This scenario would induce a situation in which, in turn, industrial firms (not having access to

credit) would not be able to renew their production systems or simply decide to buy other (cheaper) products (i.e. East Asia). In the first case the demand for tooling machines would be only potential, in the second it would simply disappear.

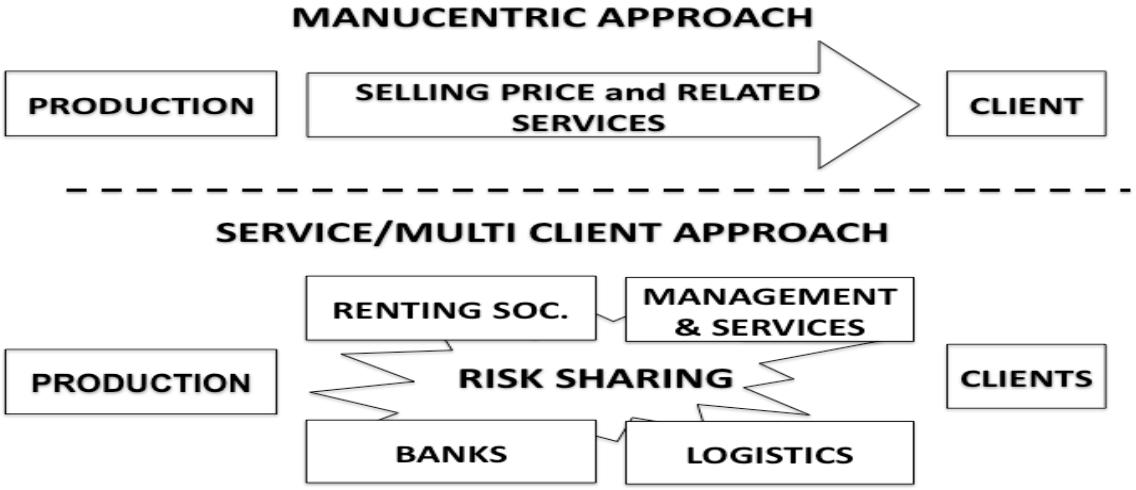
In this context the technological contents (and capacities) embedded in modern tooling machines, represented an opportunity to be exploited, but following a new (systemic) perspective. Moreover, the possibility to observe (and learn) from other sectors such as renting, aerospace and power generation represented an opportunity to scout for interesting solutions, capabilities, skills and architectures. Finally, reasoning about the research and studies on business models for manufacturing, the correct communication of new business model's value, usefulness and expected outcome, has been considered a central issue to deal with. According to the European Manufacturing Survey (2006), the diffusion of new business models seemed to be hampered by intrinsic firms' limitations (25% not adopting due to limited technical or commercial capabilities, 63% do not understand the applicability).

We interpreted these results as lacking of absorption capabilities from firms, combined with a weak relational capability from research and consultancy organisations. Conversely, this was an opportunity to explore, in order to propose new solutions for a quite conservative environment like the tooling machine sector. According to different analysis, tooling machine sector is characterised by a medium, medium/small dimension of firms, in which innovation and competitive strategies define, along with the public intervention and regulatory styles, the performances of the whole sector. For instance, the recovery of USA tooling machine sector (composed by SMEs and family businesses) has been induced by a clear turn toward entrepreneurial strategies and upgrading their technological capabilities. This decision has been decisive to raise the competitiveness of this sector that, up to that moment, has been not very interested in investing in innovation.

Description of the innovation

The innovation proposed could be defined as an architectural one, a bundling of contracts and practices that are innovative for the market/sector, but at the same time familiar for producers and consumers. The basic idea is to introduce the practice of renting and leasing in the sector of tooling machines, thanks to an adaptation of the contractual and functioning mechanisms. This should mitigate the problems (and limits) manifested by producers and clients in understanding and exploiting the new business models. In order to ease the design, communication and delivery processes, it has been necessary to expand the traditional system of partnerships adding, to the usual vertical dimension, a horizontal one. There is a bank with experience on renting and leasing contracts, a rental association with experience in the management of the contracts and the logistics of the renting and leasing processes for industrial machinery, and a research centre able to select, manage and adapt specific technologies for renting and leasing purposes.

Fig. 1. Traditional and New Business Models (our elaboration)



The innovative outcome and impact of this project can be appreciated at different levels:

1. Typology of innovation that passes from Manucentric/PSS (increase productivity and decrease energy consumption), to Service innovation based on enabling technology and the definition of new partnerships to manage and steer the innovative process.
2. The evolution in the role of technology transfer centres (here as Public Private Partnerships) from the mere transmission of policies, to be an active (entrepreneurial) actor in a system of innovation.
3. The reflexive nature and multilevel outcomes of the innovation proposed.

How is success measured?

1. Satisfaction and interest of clients and potential partners: constituency building
2. The effective introduction of new varieties (in terms of strategies and activities) by manufacturing firms or partners.
3. The definition, by the Innovation Intermediary, of managerial practices and processes more coherent with a business oriented organisation.
4. The value of this experiment can be appreciated in term of policy learning and policy transfer for regional and national governments.

What success has been achieved to date?

The project is still ongoing. A specific (integrated) research project has been submitted to blend engineering and service research.

Links to further information

http://www.musp.it
http://www.nextproject.eu/
http://www.manufuture.org/
http://www.erarental.org/publications/publications/index.html

Case Study 2: Service Innovation: Case Study on the Spa and Med Beauty at The Saujana

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Abstract. The spa industry in Malaysia is currently experiencing growth and spas in Malaysia are steadily becoming a pertinent cultural force, influencing not only how consumers care for their health, well-being, and appearance, but also how they work, travel, and socialise. As interest in physical wellness increases, spa therapy becomes increasingly popular in Malaysia and is highly recommended by many medical specialists. As a result, spas are challenged with increasing competition. At the same time, customers are looking for "new" and "unique" experiences. In response to these challenging demands and expectations, Malaysian spa therapy offers unique customer experiences involving traditional massages, floral and herbal baths, top-to-toe oil and scrub treatment, medicinal drinks, and so on. In addition, spas offer therapy that involves traditional tools, techniques, and herbal remedies from other exotic places such as Bali, Thailand, India, China, and Indonesia. In order to be the market leader and to have the competitive edge over others in the industry, many successful spas in Malaysia have formed strategic partnership alliances with the travel and tourism industry (such as airlines, hotels, travel Web portals), multinational companies, health-related facilities, recreational and sporting clubs/retreats, cosmetic, beauty, and toiletry products, and so on.

Currently, nearly 50% are 'day' spas and about 40% are located in hotels, resorts or retreats. These strategic collaborations can generate considerable income for the country. Entrepreneurs in this industry must be able to keep and attract new customers by satisfying increasingly sophisticated demands. To meet these new challenges there has recently been more emphasis on "service innovation" in the spa industry. Although innovation requires creative thinking, developing a new idea is only the first step in ensuring successful service innovation. For the spa industry, innovation helps to attract new customers as well as encouraging and promoting customer loyalty. Spas are constantly attempting to find innovative ways to serve customers more effectively and efficiently. In a nutshell, this study seeks to accomplish the following primary objectives: to identify the key elements of service innovation including innovative process, tools, and techniques that are successfully utilised at spas; to study the ways to support and implement successful service innovation at spas; and to identify the trends, challenges, limitations, and the future of service innovation in the spa industry. To this end, this study has chosen the *Spa and Med Beauty at The Saujana,* as an exploratory case to meet the above-mentioned goals.

This study is part of a nationwide study that will investigate the key elements of service innovation, and its impact on the spa industry in Malaysia via development of case studies in each of the spa category namely: '*day*' spa that is evolving from merely providing facial and body treatments to complete range of rejuvenating and therapeutic treatments; '*hotel/resort*' spa that offers spa packages cum hotel/resort facilities; '*destination*' spa is the key attraction offering spa treatments that allow customers to some lifestyle change to take effect; and the '*medical/medic*' spa focuses on professionally supervised healthcare or cosmetic procedures.

Background

This study focuses on the spa industry. Many people are still unclear as to what kind of services are being offered at the spas. This is because in numerous instances, the services available at the spas are nothing more than those provided at the beauty salons. A true spa entity should offer much more. The spa therapy was introduced by the Romans in 400BC; where the term `spa' is actually an acronym for the Latin *Solus Per Aqua* (treatment through the use of water) where streams of hot water were directed on the battle-weary bodies of Roman legionnaires, providing relief from exhaustion as well as to treat battle-inflicted scars and wounds. A regular visit to the spa is said to bring relief from internal ailments, rejuvenate the body in addition to providing

oxygen to the skin and joints. It would also make for a taut skin, stronger joints, increase resistance to diseases, increase body metabolism and relief mental stress and pressure.

The opportunity

The spa industry in Malaysia is currently undergoing excellent growth potential. The number of spas in Malaysia has grown over 200% since 2002, with more than 180 spas currently operating. As interest in physical wellness increases, spa therapy becomes increasingly popular and is highly recommended by many medical specialists. As a result, spas are challenged with increasing competition. At the same time, customers are looking for “new” and “unique” experiences. In response to these challenging demands and expectations, Malaysian spas strive to offer unique customer experiences, In their efforts to be the market leader, many successful spas in Malaysia have embarked on strategic alliances and collaborations that can generate considerable income for the country.

Description of the innovation

This study focuses on ‘service innovation’ that enables a business to deliver better services, eliminate waiting, and allow “24/7” access via modern devices such as mobile phones, Web browsers and kiosks. This study seeks to provide new knowledge on the extent of service innovation in the Malaysian spa industry. The primary goal is to develop knowledge and understand the key elements of service innovation, and its impact on the spa industry in Malaysia.

How is success measured?

Service innovation faces a number of challenges, given the complexity and intangibility of services, and also given the simultaneous occurrence of production and consumption. The spa industry can use the results from this study to embark on service innovation and provide the best service to customers. Through the application of service innovation by the spas, this can cause a catalyst effect on generating more creative ideas; developing and promoting the spa industry by providing the best service quality to the community; generating income to the nation through foreign investments (hotels and resorts), employment opportunities to the community, tourist spending, and so on.

What success has been achieved to date?

Changes in lifestyle and an increasing level of health consciousness have led many foreign tourists as well as locals (from all walks of life – middle/upper class families and busy working executives to single men/women and housewives) to visit spas in Malaysia for relaxation and treatments. To satisfy demands from varying societal levels the spa industry segments itself into the following categories:

1. The ‘*day*’ spa is the most common and is accessible by the city dwellers. It is similar to beauty salons that provide a variety of facial and body treatments, and where customers are there for only the duration of the treatment. However, to be more competitive, many day spas have been upgraded to include a full range of rejuvenating and therapeutic treatments.

2. To cater to the high demands for up-market spa resorts, a growing number of premium spas are open at various popular tourist destinations such as the island of Langkawi, Penang, and Kuala Lumpur. This type of ‘*hotel/resort*’ spa is located in a hotel/resort that usually offers a wide variety of spa packages such as gymnasium, sauna, and meditation facilities.

3. The ‘*destination*’ spa is built into a resort to serve as a facility offered to guests and is often the key attraction. The entire resort is deemed a destination spa if its packages are inclusive of spa treatments that run for a fixed minimum number of days explicitly to allow some lifestyle change to be implemented and take effect.
4. The ‘*medical/medic*’ spa is steadily gaining popularity by providing medical treatments that focus on wellbeing and preventive healthcare or cosmetic procedures that are supervised by medical professionals.

Links to further information

http://www.tourism.gov.my
http://www.dayspabusinessplan.com
http://web7.bernama.com/events/tmm2007/news.php?id=300918
http://www.globalspasummit.org/2009/resources/2007-Global-Spa-Economy-Report.php

Case Study 3: Survive by "Servicisation"[1]: A Multiple-case Study of Taiwanese Video Game Industry

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Abstract. Ten years ago, the Taiwanese video game industry was struck by a series of difficulties which put many of the local video game companies out of business. However, there were still some companies that managed to overcome the challenges by conducting manifold innovative activities and successfully transforming themselves from small offline-PC-game producer (with a business model very similar to those of conventional manufacturing companies) into large complex-online-service providers. Nowadays, even in the trough of the recent, prolonged economy downturn, compared with many other ICT sectors (mostly manufacture-based) in Taiwan, the video game industry remains a highly profitable business. Thus, the success of video game companies may provide valuable lessons for managers who wish to transform their companies from manufacturers into service providers. More significantly, this case study, by revealing the hidden innovations embedded in the process of "servicisation" of Taiwanese video game companies, may also provide valuable information to policy makers for making a better video game industry support programme in the near future.

Background

From the late 1990s onwards, Taiwanese video game-software development (VGD) companies have been encountering a series of challenges brought about by the rise of Information & Communication Technologies (ICT) and structural changes in the marketplace. The nature of video game-play and -development has also transformed profoundly ever since. Throughout the second half of 1990s, Taiwanese VGD companies had been suffering from heavy financial losses inflicted by the prevalence of software piracy (along with an ineffective intellectual property regime) and the ever-decreasing cost (along with the increasing ease) of CD-burning. These problems rapidly undermined local VGD companies' established business model (selling offline/standalone PC games through conventional arm's length transactions) and existing capabilities. During the same period of time, Taiwanese PC game developers were also facing strong foreign competition in the local market. Owing to the superior design and quality of imported games, Taiwanese video games quickly lost market shares to Japanese and American

[1] An innovation process where manufacturing is becoming more like services or firms are transforming from selling products to providing services.

console games, and then to Korean online games. As a result, many local VGD companies went out of business and the VGD sector began an overwhelming transformation.

The opportunity

Although caught in the turmoil of structural transformation, some VGD companies still saw the opportunities that arose from the development of new technologies and the growing online game market. They considered "online game-play and 3D graphics" to be the only way forward, to address the problem of software piracy and secure market share in the future (it was then Japan- and Korean-made online games getting the lion's share of growing market). However, at that time, they fell short of crucial technologies and capabilities, and did not know how to develop large-scale online games. In order to achieve their strategic visions and survive the competition, they had to learn and innovate.

Innovative activities

In order to take on continuous challenges, Taiwanese VGD companies conducted manifold innovative activities. These activities encompassed numerous incremental and radical innovations so that one cannot be differentiated from another. The nature of innovation processes of VGD companies can be characterised as a transformation from simplicity to complexity, from small to large, and from product to service. For example, at the beginning the VGD companies could only produce very simple standalone PC games. Gradually they started to develop very large and complex online systems meant to provide experience- and content-intensive services to individual clients. In the mean time, the organisation of VGD became much bigger and specialised (in terms of division of labour) as technologies and managerial tasks became more complicated and challenging.

In general, these manifold innovative activities can be categorised into the following types:

1. technology-based innovation, e.g. continuous improvement of different kinds of technological capability and developing new tool-kits for VGD;
2. process/organisation innovation, e.g. continuous improvement of project development cycle, reorganisation of company structure, establishing new departments/teams, and outsourcing;
3. product/content/experience innovation, e.g. releasing new games with new content and new gaming experiences, new artistic design, new stories, and new game-play design;
4. marketing/delivery innovation, e.g. gradually giving up the conventional distribution channels, and interacting with and marketing to end-users directly via the internet;
5. revenue/business model innovation, e.g. transforming from the conventional arm's length transaction model to new online transaction model, and designing more flexible pricing scheme to target different groups of end-user directly.

The above taxonomy is for the convenience of analysis only. We should note that all these types of innovation take place concurrently and are closely related to one another. For example, technology-based innovation is one of the most fundamental types enabling other types of innovation in VGD. New content and game design require technology-based innovation to express the new effects and experiences which artists and designers aspire to offer. Technology-based innovation also supports new marketing strategies and the new ways of delivering "products" in the online game era. In the context of VGD, content innovation is tantamount to product innovation itself. Content innovation *per se* plays an internal driving force to organisational and technological change. When the very nature of a product transforms radically from offline-PC games to large online games, the revenue and business model also change profoundly.

The VGD innovation is conducted by PBO (Project-Based Organisation) because it has better flexibility to manage heterogeneous inputs from various types of human resource and to deliver tailor-made video games every time. PBO also has better flexibility to manage business risks and uncertainty because a project can be disbanded more easily than a department. In terms of drivers of innovation, the case study finds that the skills and knowledge for VGD are largely tacit, and difficult to codify and accumulate because most of the VGD innovative activities are ad-hoc

one-shot-deals. However, developers do manage to codify parts of the know-how and turn them into proprietary game engines and development tools for repeated use. In terms of innovation capabilities, this case study finds that VGD requires a great deal of non-technology capabilities, for example, game design, project management, and artistic-related capabilities.

Measurement of success

From an *ex-post* viewpoint, these VGD companies' success can be measured by their longevity. This is because achieving the "strategic visions" is an extremely difficult thing to do in a highly competitive business environment. In particular, these "visions" were something that they have never done before. In the mid-term, the success can be measured by whether they developed and consolidated necessary capabilities for VGD, and whether they can retain exiting gamers communities and attract new gamers by releasing different lines of video game/services which appeal to them. In the short-term, an efficient use of (in a good sense) the human resource, and delivering good quality video games on time and on budget can be used to measure the success of VGD companies.

Success to date

The cases in this study successfully survive the highly competitive business environment and met the strategic goals set ten years ago. In the present they can address the software piracy problem, and focus on the creative work and business management when making much better profits than many other ICT sectors in Taiwan. They have also diversified their lines of business by working with other local and foreign companies, and exported services to overseas markets. Meanwhile they continue to enhance their core competencies by continuous organisational learning.

Further information

This case study draws on material collected for the author's PhD thesis. For more information, please contact the author at algerlee@gmail.com.

Case Study 4: Service Innovation in Chinese Aviation Industry: The Case of Chinese Low Cost Carriers

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Abstract. Encouraged by the deregulation process in the Chinese aviation industry, three Chinese airlines have changed traditional air travel services in China by following the operation principles of western LCCs. Spring Airline offers, no frills, low fare air travel services with high quality; Shenzhen Airline provides a high standard of service at a reasonable price while China United Airline supplies simple, low fare and flexible air travel. Based on their innovative service activities, the three airlines have achieved considerable competitive advantage in the Chinese aviation industry.

Background

Traditionally, the Chinese aviation industry has been highly regulated by government authority. Since the late 1990s, the industry has witnessed a series of fundamental transformations towards deregulation, privatisation and consolidation. This has created the precondition for the emergence of the Low Cost Carrier business model in the Chinese market. A low cost carrier (LCC) refers to airlines that provide passengers point to point, no frills flights with low fares on the basis of quick, streamlined processes, minimal complexity in products and high utilisation of assets. Three Chinese airlines have sought to adopt the LCC model: Spring Airlines, Shenzhen Airlines and China United Airlines. The three LCCs have, however, set up different brand names in the Chinese market, as a result of variation in their service innovation.

The opportunity

Despite China's civil aviation industry has grown substantially since Chinese economic reforms of 1978, the total demand for air transportation is still very low compared with the total transportation market in China. The major reason for this is that the cost of air travel is too high to be afforded by most Chinese in a country where the average disposable income remains low by world standards. Encouraged by the potential demand for low cost air travel and the deregulation process in the Civil Aviation Industry, Spring Airlines (Spring), the first LCC in China, was set up in June 2005.

Shenzhen Airline (SA), a state owned airline, was founded in November, 1992. In November 2005, following a successful sale of its equity, SA became the biggest private airline in China. As the Chinese airline market has been dominated by three biggest state owned airlines, the top management team sought for an alternative strategy to encourage existing customers to consume more or attract new customers into the market. With the additional financial support from its new shareholder, offering more value through adopting LCC model seemed to a solution.

China United Airlines was set up in December 1986 by Chinese Air force. It is the only airline which is based in Beijing Nanyuan Airport, a former military airfield. CUA's idea of adopting the LCC model started when it was reconstructed by Shanghai Airlines and lost its military status in October, 2005. The Beijing market, where it is based has the highest competition. After loosing strong support from Chinese Air force, as a newly re-lunched small airline, CUA can not survive without a different strategy. As CUA was still allowed to exclusively use of military airports, the airline is able to reach destinations which are inaccessible by other Chinese commercial airlines. Based on its unique resources, targeting a market where other airlines were unwilling to serve or not able to serve is the only option available to the airline.

Description of the innovation

Spring aims to “make flying affordable for every Chinese person”. It has built up its business model on the fundamental low-cost principles of the original model created by Southwest Airline by offering a no frills, low fare and single class air travel service. The airline’s average flight fare is 55% lower than the industry average price; Promotional price ‘99 Yuan’, ‘199Yuan’ and ‘299 Yuan’ are available for all its flight routes; The lowest promotional price being ‘1 Yuan’. There is no free catering or entertainment services in flight (only a bottle of water) and no interlining service. No compensation for flight delays or cancellation is offered regardless of the reason. Free luggage allowances were decreased from the industry standard 20kg to 15kg. Spring offers only economy class tickets, though three classes of ticket price are available. These tickets at different prices offer different levels of pre-flight services and flexibility in flight cancellation and alteration. Irrespective of the selected class of the ticket, the service provided in flight will be the same. Spring also offers value added services such as “Fast Boarding” and “Direct Link” to passengers who pay a premium.

SA aims to provide passengers with a high standard of service, but at reduced cost. Its service slogan is “whenever you are with us, feel free and comfortable”. To achieve this, the airline makes continuous efforts to offer warm and unique services from start to finish. Passengers are greeted by members of SA’s ‘compass service team’ upon their arrival in the airport, who are responsible for assisting passengers through check in and flight boarding. SA also offers free safety packaging and a cleaning service for luggage, called the ‘white gloves service programme’. In flight, the airline aims to create a great family atmosphere by paying detailed attention to every aspect of service. One of its customer service slogans is “when you travel from your home to her/his home, we wish that you will enjoy your stay at our home”. To achieve this, SA designed different flight broadcasting programmes, greeting words and music, according to the local culture on different flight routes. It also uses a “relaxing travel programme”, which includes in-flight games, auctions of scale models of aircraft, and in-flight aerobics exercises. To make passengers journeys as comfortable as possible, SA offers “continuing comfortable economy class” to provide more leg room for passengers. The seat pitch for SA’s economy class has increased by 3 inches, the same as business class. To provide more flexibility to passengers, SA offers ‘one ticket, two destinations’ to allow passengers to switch their destination without incurring any further switching cost.

CUA flies point to point with limited frills air travel services. It only offers cold food and cold drinks and in-flight entertainment has been kept to a minimum. Shortly after it resumed flight service, CUA started to offer CNY290、CNY210 and CNY320 fares for its flights, which are 70% lower than tickets offered by other airlines. In July 2007, CUA launched ‘Special Economy Class’ on five domestic fight routes which would allow passengers to sit in first class as long as they pay 110% of the full ticket fare of economy class. CUA defines itself as “A fast and flexible united airline; A friendly and harmonious united airline”. As the only civil airline based in Beijing Nanyuan Airport, the company were responsible for terminal management, security check and ground/tower control. Based on its exclusive use of Nanyuan airport, it offers integrated air travel service from ground to flights. The average time it takes to enter airport terminal, check in, clear TSA security and board aircraft for CUA’s passengers is approximately twenty minutes, while for other airlines’ passengers it may take at least one hour. In particular, unlike other Chinese airlines which require passengers check in at least thirty minutes before flight departure, CUA allows its passengers to check in as late as ten minutes before the flights departure.

How is success measured? What success has been achieved to date?

Based on the low cost carrier business model, Spring achieved significant success within four years. In 2007, its annual revenue was CNY 1.23 billion and its net profit reached CNY 70.86 million. In 2008, despite the fact that the whole Chinese aviation industry experienced huge financial loss, Spring still gained CNY 21.04 million in net profit. On 30 June, 2007, China Entrepreneur magazine rewarded Spring the title of ‘future star’ - the first airline on the list since 2001. SA’s high standard service quality has been widely recognised by the market. A passenger likened the services of SA’s services “to a gentle breeze to touching the face”. On 18 April 2008, SA received the Five Star Diamond Award from the American Academy of Hospitality Science,

which confirmed SA's brand name for continued excellence and unique service innovation. Based on its low cost and flexible air travel service, CUA has achieved rapid growth in the past two years. Despite of the current economic downturn, CUA still achieved profitability from its main operations in 2008.

Links to further information

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Case Study 5: Innovation in China's Mobile Multimedia Broadcasting Service

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Abstract. With the development of mobile communication technologies, the mobile multimedia broadcasting service is becoming one of the important parts of our life. In China the CBC was set up to advance the development of CBBM service based on CBBM technology standard. This paper analysed the developing situation of CMMB service in China and summarised the innovation in the CMMB service.

Background

At the end of 2009, there were 9.64 million digital mobile TV consumers in China, 59.1% belongs to China Mobile Company, 27.9% belongs to China Broadcasting Communication (CBC) Company, which operates a mobile business based on China Mobile Multimedia Broadcasting (CBBM) technology standard. On 13th January 2010 the China's State Council executive meeting decided pushing the integration of Telecommunication net, Broadcasting net and internet, then realising the net interconnection and resource sharing [1]. This will advance the integration and development of all mobile service(s).

CBC was funded directly by the State Administration of Radio, Film and Television (SARFT) on October 2008. It is the main management institute of CMMB business, and took part in the construction of provincial joint ventures or wholly-owned subsidiary operation companies.

CBBM is self-developed by China. In 2006 CMMB was identified as the industry standard of China Mobile Multimedia Broadcasting, so CBC occupies a more important role in the promotion of the mobile multimedia broadcasting business.

The opportunity

With the development of 3G, especially 4G mobile communication technology, whose main character is supporting mobile service, 'Technology has transformed many former inseparable services into services that can be consumed at any time or place' [2].There were 32.5 thousand base stations built only in 2009. The stimated number of mobile subscribers will approach 740 million, and 3G subscribers will approach nearly 150 million in 2010 in China [3]. In the World Mobile Communications Conference which closed on February 18, 2010, the International Telecommunication Union (ITU) pointed out that the global mobile users reached about 46 million by the end of 2009, and this figure will reach 5 billion in 2010. Technology, policy and a huge potential market provide a good opportunity for the development of mobile multimedia broadcasting services.

Description of the innovation

The main innovation of CBBM business includes organization innovation, business model innovation, operation model innovation, and charging & profit model innovation.

The **organization innovation** of CBBM business is embodied in the three levels organisation structures. CBC is directly managed by the SARFT, and has overall responsibility for National CMMB network investment and network operation. Under the unified national frame, the operation and accountability of provincial subsidiaries is independent. Its main responsibilities include business management, brand building, service management, operating systems, and

organisations in the province(s) business operations. Local subsidiaries are responsible for client development and services in the region.

Many kinds of broadcasting businesses are integrated in the CBBM platform, including a public service platform, basic business platform and expanding business platform. Intergration is the main character of **the CMMB's business model innovation**.

Diversified operation models are adopted by **CBC.** Based on its own media resource and technology advantage independent operation is the main operation model of CBC. Another operation model is cooperation with network operators. CBC and China Mobile Communications Corporation signed the cooperation agreement project on March 2009. The third operation model is cooperation with terminal manufacturers. CBC and Ericsson launched three innovative interactive services: television interactive solutions, Rich media solutions and Emergent broadcasting solutions.

Charging & profit model is the key part in the long-term development of CBC. In consideration of the user's custom habit and needed be improved financial system there are some difficulties for the CBC to charge by itself. Then at present the charging model includes bundled with the terminal equipment charging model, cooperation with the operator charging model and electronic commerce charging model. The profit model includes user subscription model, advertising model, and value-added service model.

How is success measured?

The success measure indexes include the number of mobile multimedia broadcasting subscribers, the revenue of CBBM business, and the social effect of CBBM business. The social effect refers to the user's evaluation, which can be measured through customer survey.

What success has been achieved to date?

Based on CBBM platform 2008 Olympic Games was successfully broadcast in Beijing.

Summary

The innovation in the CMMB service is summed up into following: The special institute CBC was created to manage the mobile broadcasting service operation. CBBM technology innovation improved the mobile broadcasting service quality. Integrated with the important events in China and the demand of the customers the new mobile broadcasting service is developed. Adopting a different cooperating model, CBC supplies service with telecommunication operators and terminal manufacturers together. In different developing stages, a different profiting model and charging model were/are/will be adopted, and the user's custom habit was cultivated.

Links to further information

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[3]The Minister of Industry and information Report: the development situation of 3G and TD in 2009, 2010.1.14, http://www.miit.gov.cn/n11293472/n11293832/n11293907/n11368223/12976931.html

Case Study 6: Sustainable Procurement in the UK Public Sector

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Background

Public sector procurement is a very important sector of the UK economy, accounting for approximately one third of GDP.

The opportunity

The opportunity is public sector organisations to achieve socio-economic and environmental objectives through their procurement and to widen the concept of best value for money to include achieving these objectives. This is summed up in a statement from a key policy document

"Sustainable Procurement is a process whereby organisations meet their needs for goods, services, works and utilities in a way that achieves value for money on a whole life basis in terms of generating benefits not only to the organisation but also to society and the economy, whilst minimising damage to the environment" **Procuring the Future** [Sustainable Procurement Task Force, June 2006]

This paper aims to describe the Sustainable Procurement policies which are emerging within the UK public sector - with different public sector bodies given considerable discretion about how to interpret the concept.

Description of the innovation

The procurement process is re-designed to achieve these objectives.

The procurer may incorporate sustainability issues into each stage of the procurement process.

They must do so while complying with EU procurement law which requires that there must be a free market open to all suppliers within the EU.

Sustainability may be taken into account in identifying the need.

The need can be defined in such a way as to minimise the resources consumed or the user demand once it has been obtained. For example a department deciding its road transport requirements in the light of government fleet emissions targets may decide that its need is for low emission vehicles.

How is success measured?

Environmental measures include:

1. Energy usage
2. Carbon dioxide/methane emissions and other emissions
3. Water pollution
4. Waste to landfill
5. Hazardous substances
6. Natural resources
7. Water
8. Biodiversity
9. Local environment

The European Eco Label scheme distinguishes products which are environmentally friendly.

Socio-economic measures include:

1. Employment, diversity, education
2. Health
3. Community
4. Developing world supply chains

What success has been achieved to date?

For certain products government purchasing standards are now in force which are binding on government departments and the wider public sector are encouraged to adopt these. Outside these products sustainability can be assessed / illustrated through case studies:

1. Primary School catering - Linden Road Primary is the first Tameside school to receive Bronze and Silver Awards from the Food for Life Partnership –awarded for increasing locally sourced food, sustainable fish, free range eggs and chickens.
2. Aldwyn and Hawthorns Schools, :green design to minimise energy usage and using environmentally benign materials
3. Building Schools for the Future : green design features including grey water recycling and combined heat & power using biomass
4. Building Schools for the Future: making procurement opportunities available for local businesses through a series of meet the buyer events and training workshops to upskill potential suppliers http://sites.google.com/site/tamesidebsf/Home
5. Tameside Works First initiative capital investment broken into small packages and offered to local businesses

Links to further information

1. UK government documents on procurement policy and sustainable procurement particularly from Office of Government Commerce eg **Buy Green and Make a Difference**
2. Studies by NGOs eg New Economics Foundation Action Sustainability and Forum for the Future
3. Reports on procurement by Tameside MBC

Case Study 7: Innovation Perspectives of a Personal Financial Services Call Centre

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Abstract. This paper reports on a study carried out within the Centre for Service Research at Manchester Business School, examining issues of concern with existing call centre organisations and identifying innovation opportunities for the future vision of such call centres. Based on this study, a personal financial services call centre was examined and this paper reports on innovation aspects relating to business strategy, service design and evaluation that have been identified, implemented and assessed. The paper also discusses innovation opportunities that have been identified for the future of the call centre.

Overview

This case study refers to call centres that use Interactive Voice Response (IVR) technologies as the main communication medium with the customers. The overall aim of the IVR technologies used as part of a call centre operation is to service high call volumes, reduce costs, extend the business hours of support operation and improve the customer experience by identifying and segmenting callers. This case study relates to a call centre of a personal financial solutions firm that offers debt management and consolidation services to individuals. The firm use as a case study is Chase Saunders located in Manchester, UK. The firm operates an IVR system and accepts enquiries through telephone and the internet.

The opportunity

The firm started in 2003 as an organisation that generated leads from interested individuals looking for debt management services and selling these leads to organisations that were offering such services. The strategy of the firm was focusing on building the brand and market share so quality was paramount. To support this strategy, the firm employed highly skilled (and highly remunerated) operators that were allocated to specific customers and offering a highly personalised service.

The company increased its size to about 20 employees, had a very good reputation in the market and was profitable when the opportunity arose to expand their services by offering themselves the financial services and generating additional income. Their business model evolved through acquisitions and mergers to an organisation that currently offers full service to customers looking for help on areas such as debt management, debt consolidation, individual voluntary arrangements, trust deeds and bankruptcy.

Innovation perspectives

The strategy of the firm has evolved over time. Initially, the strategy was on building the brand so quality was paramount. Following the business model changes, the strategy moved towards expansion, lowering costs and increasing income. This was achieved through the separation of the enquiries and pre-qualification process from the sales and customer support processes into different departments.

Currently, the call centre structure resembles the structure of the operational processes of the firm and it is divided into three departments. The first department deals with enquiries from new customers and carries out a pre-qualification process in order to check their suitability and also satisfy the various legal requirements for companies offering financial advice and services. Enquiries received from existing customers for new services are also dealt in this department.

Operators follow a strict, well-defined decision-tree based process for the enquiries and pre-qualification process with no flexibility and variation. The second department deals with sales of appropriate financial products to individuals. Enquiries from new customers that successfully complete the pre-qualification process or calls from existing customers relating to new products and services are forwarded to the sales department. The third department is the customer service department, deals with enquiries from existing customers and operates the customer relationship management system of the organisation. The sales and customer support operators have substantially more flexibility and they are empowered to make decision in the best interests of the business and the customer while at the same time, satisfying the various legal and best practice requirements relating to financial services organisations.

The cost savings were partially achieved through the employment of unskilled (lower remuneration) individuals to run the enquiries and pre-qualification process and the customer support process while at the same time, increasing income from the highly skilled and highly remunerated sales operators through the handling of additional cases. The call centre operators are trained in-house and this training is specific to their job function. Following the separation of the enquiries and pre-qualification process from the sales and customer support processes, the training requirements for the operators working for the enquiries department were minimised substantially as these operators are required to have few basic skills. This meant that further cost savings on training were also achieved. The results of these changes were substantial as the staff increased from 20 to 120 employees within the space of two years and the firm was able to deal with an increasing volume and type of calls. Furthermore, the evaluation process and the Key Performance Indicators (KPI) used evolved over time and in fact, it has produced a continuously evolving process where the KPIs are reviewed regularly and revised accordingly and new KPIs have been introduced to reward performance e.g., best employee, compensation and bonus structures, etc.

The call centre is central to the innovation processes of the firm and there are two more examples of innovation that are worth reporting here. The first example relates to the use of externally obtained information that allowed the organisation to revise the pre-qualification and advising process. The information was obtained from Experian and related to the search terms that people use when looking for help on financial issues. It was noticed that certain terms were becoming more popular following the recent financial crisis which meant that the organisation could revise its processes to take the new terms into account. This change led to improved quality of the service provided while at the same time increasing the conversion of enquiries to sales.

The second example relates to the separation of the sales teams into teams specialising on specific financial products and services. This is currently been implemented so there is no outcomes that could be reported. Finally, the company is currently considering whether to deal with all the enquiries that successfully pass the pre-qualification stage internally (i.e., transfer them to its sales teams) or sell these leads to other organisations who offer suitable financial products.

Future opportunities

The current strategy of the firm is to further increase the quality of services while keeping performance/costs at an acceptable level. On the basis of this, the immediate future innovation opportunities that the firm has identified relate to improving systems integration, maintaining better customer profiles and exploring cross-selling and up-selling strategies.

The firm operates separate systems and databases to manage the customer lifecycle information and an integration project is underway to bring together the different systems and sources of information. Also, the current design of the call centre does not take into consideration the customer characteristics and diversity e.g., customer preferences, cultural background, customer skills, etc. This is something that the firm is looking to explore further, especially during the pre-qualification process. With reference to the IVR technology employed, the firm has identified opportunities relating to additional personalisation services that can be offered but their initial evaluation is that the technology is currently too expensive to deploy. Finally, with reference to cross-selling and up-selling strategies the firm is currently considering whether to offer additional

financial services through third parties and whether to separate the different departments of the call centre as standalone companies.

Links to further information

http://www.chasesaunders.co.uk

Babis Theodoulidis, Stephanos Strickland and David Diaz, Innovation Perspectives of a Personal Financial Services Call Centre. Available at SSRN:http://ssrn.com/abstract=1609122 , May 2010.

Case Study 8: Optimisation of the Clients' Warehouse Logistics – A KIBS-type Service in the Manufacturing Context

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Abstract. This case study describes innovation at the convergence of manufacturing and services. It presents a KIBS-type expert service that a Finnish forklift manufacturer offers to its clients. The core of the service is the optimisation of the clients' warehouse logistics: the forklift fleet and its use. The innovativeness of the service is in its comprehensiveness; it includes not only elements that are linked to the functionality of the products (forklifts) and their operating environment, but it also tackles HR issues like work safety and the skill level of the respective drivers. The optimisation service consists of the analysis of the present situation and recommendations for the improvements; within its total portfolio, our case company also provides the means to carry out the improvements. Training of forklift drivers in the cases where knowledge deficiencies are a problem is perhaps the most striking individual example of how far into the realm of services a manufacturer can penetrate.

Background

Services today are provided not only in service sectors, but increasingly also in the manufacturing context. Many innovations in industrial services are linked to the transfer from services that support a good to services that support the client's processes in the production of the good, or the client's business in general. This also holds true in our case, which represents the sector of equipment manufacturing. Our case company is an internationally operating Finnish forklift manufacturer, which is over 60 years old and employs about 600 persons. During recent years it has increasingly adopted an approach that focuses on customer value, i.e. the service-dominant logic is visible in its practices. In addition to earlier goods-related services (maintenance, repair and renting), several services are now offered that support the client's processes and business. In our case study we focus particularly on one service of the latter type: the optimisation of the clients' logistics fleet. This service is particularly interesting, because it is actually an expert service and resembles KIBS offerings in many respects. Thus, it can be regarded as an example of the 'kibsification' of industrial services.

The opportunity

The development towards so-called *solutions business* has played an important role as an innovation driver in our case company. After a long history as a traditional manufacturer, the company started to modernise its production and to develop its offering as an integrated whole. This change, which began about ten years ago, has meant that the company no longer focuses on selling individual products on the basis of clients' orders, but pro-actively builds long-term client relationships and analyses clients' needs much more comprehensively than before. Selling the availability, i.e. guaranteeing that customers always have working equipment at hand, has become the core of its business idea. Consequently, some of the equipment related risk, that the clients earlier carried, has transferred to our case company. In order to reduce this risk, the company has developed new IT-based tools for the remote control of the installed base and started to enhance its service repertoire. Thus, the need for new services, e.g. customer training, emerged along with the change of the business model.

Description of the innovation

The innovation – the service focusing on the optimisation of the clients' warehouse logistics – is a part of the integrated solutions that our case company offers. However, because the total offering of the company has been constructed on a modular basis, this specific service can also be purchased separately. It consists of analysing the client's existing fleet and operating

environment, and developing plans regarding possible fleet renewal, maintenance and use of forklifts and other logistics equipment. The client benefits include increased efficiency, effectiveness and safety, and reduction in costs. The service also supports the client in the purchase of new logistics equipment: a careful analysis of the existing situation helps to identify what combination of products and services is optimal. From the viewpoint of the case company, the question is of a 'bridging service' which introduces the client the other offerings of the company. According to the company representatives, clients have had difficulties in perceiving the whole repertoire of equipment and services on the basis of standard presentations. Thus, the optimisation service supports the provider's marketing and selling activities. After the analysis, the client can establish a looser or tighter relationship with our case company, but it can also select a competitor. If it continues cooperation with our case company, it can select between three alternatives; it can purchase a standard service package, an extended service package, or a premium service package. In the last mentioned package, our case company secures not only the availability of well-working forklifts, but *the availability of skilled forklift drivers* as well.

The optimisation service includes six basic elements of analysis:

1. suitability of the number and type of forklifts for the specific situation of the client;
2. fleet management: how the client has organised the procurement and maintenance of forklifts and what the respective costs are;
3. examination of work safety, using indicators like the faulty use of forklifts, damages, accidents etc.;
4. inspection of the working environment, e.g. measuring the spaces where forklifts are operated ;
5. labour force issues: how often and how much the client uses temporary drivers due to seasonal variations, and what is the experience level of the drivers; and
6. warehouse processes and technology, focusing on the factors that may restrict the use of some specific forklift types. The results of the analysis are described in the form of a summary report which is presented and distributed to the client.

The optimisation service resembles KIBS in several respects. The core content of the service is *diagnosis and problem clarification* typical of consultancy. We can also identify manifestations of *co-production* in the optimisation service. The goals of optimisation are set together with the client, and during the diagnosis the self analysis of the client firm plays an important role. Different employee groups express their views of the factors in good condition and those needing improvement. The service provider's observations at site are the next step. Then the produced materials are combined and the client firm's situation described as a profile in regard to the studied factors. The results are evaluated together and the goals and steps for improvements are set. The service requires new skills and competences from both parties. The need for *analytic competences* grows and reflects - once again - a similarity with KIBS. In the manufacturing company, the change and challenges are substantial among the sales and maintenance staffs in particular. From the clients' viewpoint, the optimisation service implies moving the focus from 'here and now' issues to a strategic approach, i.e. comprehensive and long-term oriented planning of procurement and maintenance. Thus, the service stimulates a *learning process* both in the provider and in the client company – and, as is typical for KIBS, a great part of learning occurs in the mutual interaction.

Features of several types of service innovation – improvement, addition, recombination and formalisation – are found in the offering. In addition, the optimisation service supports the development of other functions in the case company. The service provides information to the maintenance management system, enabling the utilisation of this information in the product development of forklifts. At a later stage the material accumulating from different client companies can be used for benchmarking purposes, i.e. recommendations can be grounded on a broad set of real-life experiences.

How is success measured?

The company has measured the general success of its service business in terms of growth and internationalisation figures. These figures show that the development has been positive even during the present recession times, when the sales of manufactured equipment have diminished.

What success has been achieved to date?

More than a half of the company's turnover comes nowadays from service business. The optimisation service is provided, in addition to Finland, in Sweden, Denmark and Estonia. The expectation that this service supports the selling of equipment and other services has also realised. Finally, it is worth mentioning that our case company is broadly used as a best practice example of the development of industrial services in Finland.

Links to further information

The case has been analysed in the project ISO (Innovation Integrated in Service Operations) in the BIT Research Centre of Aalto University. The authors have been involved in this project, and further information can be requested from them. Some further information can also be acquired directly from the website of the company. The name of the company is Rocla (www.rocla.com)

Case Study 9: (Revisiting) Servitization: When is Service Oriented Business Model Innovation Effective?

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Abstract. Servitization is a business model innovation where a manufacturer of products expands the scope of transactions with customers by offering product-related services and, hence, more encompassing solutions. Despite being characterized as a very lucrative strategy, servitization seems to be problematic to implement and the implementation hurdles can even decrease overall financial performance of the firm. In order to contribute to our understanding on how to organize servitization effectively, we engage in an extensive case study research of a manufacturing firm that embraced this strategy. Our findings reveal the presence of positive and reciprocal relationship, a complementarity, between products and services leads to positive performance outcomes: the firm not only succeeds in developing service business on the basis of the existing product business, but the adopted business model enables for service activities to act as a driver for the development of product business as well. This feedback effect is significantly reinforced by introducing more sophisticated service offerings that increases proximity to customer. In terms of profitability, our findings reveal a clear positive effect of servitizing while simultaneously signalling a moderating impact of investments required for scaling up service activities during the servitization trajectory. These results, however, strongly relied on the managerial practices in implementation. Our findings suggest that the interplay of solution-oriented managerial cognition, incentive schemes and structure determine implementation success. These organizational characteristics need to be adjusted so that services are treated as equivalent to products and that, at the same time, the two businesses are integrated.

Background

Servitization represents a tendency of industrial goods manufacturers to extend their value proposition with services related to their product offering (Bowen, Siehl, & Scheider, 1989; Chase, 1981). Services have been present in manufacturing industries for a long time, but their role has evolved considerably. Starting as a 'necessary evil' to mitigate machine failures, services have evolved towards an important cornerstone of the manufacturer's strategy with aim to cross the commoditization chasm. Nevertheless, recent case studies indicate that servitization entails some worrisome implementation challenges that may even result in a decline of overall firm performance, the so-called "service paradox" (Oliva & Kallenberg, 2003; Gebrauer, Fleisch, & Friedli, 2005; Neu & Brown, 2008). The managerial attitudes and cultural acceptance of services as well as the organizational design choices seem to be at the heart of this debate.

The opportunity

This business model innovation in services, called servitization, has gained its first followers by claiming several strategic benefits. First, shifting focus from tangibles towards intangibles such as skills, information and knowledge makes it possible to differentiate and escape the commodity chasm of imitators and price erosions (Neely 2009, Vargo & Lusch, 2004). Second, as manufacturer learns more about customer's needs by engaging in services, customer satisfaction leads towards long term relationships, customer lock-in and subsequently competitor lock out. More recently, direct financial benefits for manufacturing firms were considered by practitioner-oriented research. First, ready-available growth opportunities can be found in large installed base of sold products (e.g. truck fleet) and customer's increasing demand for solutions. Second, in sectors that suffer price erosion but produce complex products, services have higher margin than products. Third, services also generate a more constant flow of revenues as they are resistant to economic cycles. Finally, most recent arguments take more integrated perspective. Servitization helps to reducing customer's risk or at least make the costs smoother and more predictable (Neely, 2008). More advanced service offering, like outcome-based contracts, increases the

reliability of the equipment and the efficiency of its use (Kim, Cohen & Netessine 2007). As service resources are professionalized and pooled on manufacturer side- instead of being scattered across manufacturers and customers value chains- both parties will share benefits of the economies of scale and scope (Visnjic & Van Looy 2009).

Description of the innovation

While servitization undoubtedly offers a lot of opportunities, we find that the choice of the business model as well as the implementation practices have a decisive effect on the success of this strategy.

Firm that we have researched realized this success by relying on integrated business model where products are driving services and services are also driving products. First, customer's decision to outsource services to manufacturer (motivated by higher cost effectiveness) translates on the manufacturer's side into higher demand for services for the existing products sold. Second, the development of service activities (thanks to customer proximity and knowledge spillovers) creates a positive feedback effect on the sales of products. Furthermore, by offering more relationship-intensive services, manufacturer translates more in-depth understanding of product functioning and customer's needs in additional product offerings, thereby reinforcing the positive feedback effect from services to products revenues. While this product-service complementarity (Milgrom & Roberts, 1995) creates revenue generating loop, manufacturer has to additionally invest in service-related resources and capabilities. Nevertheless, subsequent findings reveal a clear positive effect of servitizing on profitability- our firm is also able to capture value from servitizing, in form of higher profit margins. At the same time, the service investments are not distributed uniformly over the transition period - after reaping some "low hanging service fruits" in the initial stage of servitization - firm is likely to pass through an investment stage where profitability can decrease. After the investment stage, profitability picks up again once the advantages of the economies of scale out weight the investments. Indeed, tests show that the effect of service scale on the profit margin is curvy-linear with two inflection points and three stages: sharp positive effect appears early on, slows down in the midterm and picks up once again.

In order to implement the integrated model of servitization, the firm under study made careful choices with respect to the choice of management with respect to their cognition and mindsets, incentive schemes and structure. These organizational characteristics had to be adjusted so that services are treated as equivalent to products. Integration between the two activities poses itself as a necessary requirement for value creation. More specifically; we find that in order for servitization to be implemented successfully, products and services need to be organized as "partnership of equals", where two activities represent "strategic equivalents" and are, at the same time, well integrated.

How is success measured?

Given that cornerstone of this business model represent close integration between products and services, firm needed a performance measure that captures the level of complementarity, or spillovers between product and service activities. We have, therefore, constructed a so-called "servitization index", which represents a correlation-index between product sales and service sales. The design of the indicator was motivated by our empirical study that demonstrates that complementarities between products and services create positive revenue loop.

Further, we have tested this indicator by performing 10 case studies of the subsidiaries that exhibit different performance according to the servitization index (correlation indices have been calculated on the product and service sales data over 2001-2008 period). Subsidiaries with high and positive servitization index tended to have highly elaborated and integrated service business models, while the ones where the index was negative didn't pay a lot of respect to development of services and had a very poor relationship between products and services. The servitization index was, at the same time, in line with growth performance of countries. Subsidiaries with positive servitization also represent one of the best growing subsidiaries in our sample while the ones with

negative index exhibit lower growth performance, as they fail to enact positive spillovers between the two activities, thereby missing out on market opportunities.

What success has been achieved to date?

Our empirical findings, based on the financial data from the subsidiaries of the firm under study, reveal the presence of positive revenue loop between products and services. Furthermore, the feedback effect from services to products is significantly reinforced by introducing more sophisticated service offerings that increases proximity to customer. In terms of profitability, our findings reveal a clear positive effect of servitizing while simultaneously signalling a moderating impact of investments required for scaling up service activities during the servitization trajectory.

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Theme 2: The Organisation in Its Environment

Service innovation through an organisation engaging beyond its own boundaries, for example through public private partnerships; sourcing knowledge externally; innovation networks; open or distributed innovation

Case Study 10: The Role of Boundary Objects in Public-Private Innovation Networks: The Story about Næstved Health School

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Abstract. This case study concerns a public-private-collaboration in 2005-2008 between a private company, Falck Healthcare, and a municipality, Næstved commune, aimed at establishing a health school. The health school organized training courses of 10 weeks for patients with chronic obstructive pulmonary disease (COPD), type 2 diabetes and heart failure. The school was developed, tested out for a short period and then closed. The research project describe and analyse the process through which the health school was established and show how involved actors inability to construct an attractive boundary object may explain the lack of further public-private collaboration around the health school and thus the projects lack of success. Boundary objects are things/objects that exist at the junctures where varied social worlds meet in an arena of mutual concern. They have different meanings in different social worlds but their structure is common enough to more than one world to make them recognizable, a means of translation. Data were generated by means of document studies, interviews and talks with key actors

Background

The context of this case is Danish health policy and local government reform. A new health act was passed in 2005 (Act no. 546 of 24. June 2005) and a structural reform of the Danish Municipalities took effect in January 2007. The health act stipulates (§ 119) that the municipalities (municipal councils) are responsible for establishing service offers for citizens in the area of prevention and health promotion.

A more specific background of Næstved Health School is the Governments' perception of a growing need to deal with chronic diseases. About one third of the population are considered to live with one or more chronic diseases and 80 percent of public expenditures on health is used to deal with chronic diseases (http://www.sst.dk/Planlaegning_og_behandling/Planer_Indsatser/Kronisk_sygdom.aspx). There are several other reasons why it seems important for the government to promote health. First of all, if people can be motivated to take more care of their own health condition, this may increase their quality of life in the longer run. This will have a positive effect on a number of more economic measures. People will have fewer chronic diseases. Fewer persons with or without chronic diseases will have to be hospitalized. This could also lead to a lowering of absence from work due to illness. Good health offerings in a town or municipality may also inspire people and companies to settle down in a municipality. There are however problems too. Very little has been done by medical doctors in terms of research in the areas of prevention and rehabilitation. By some, this area is seen as a low status area. Patients may feel that they are let down by the health system if they have to take care of their own health. They have to be willing to learn about health and prevention. Health offerings are moreover also dependent on collaboration of the local community, the GPs and the hospitals. Just as participation of private or civil organizations, such as local fitness centres, a local diabetes association or local sports club may be needed.

The opportunity

Falck Healthcare is a division inside the larger enterprise group Falck. Falck is a private limited company which was established in 1906 by Sophus Falck (1864-1926). Its main service has been rescue and emergency services which today include ambulance services (including pre-hospital treatment), transport of patients, fire fighting and other safety- and rescue-related services for the public authorities. Falck Healthcare was created as an independent unit in Falck in 2005. According to its homepage (February 2009), it sees itself as Denmark's largest private-sector

provider of healthcare services. It has four focal areas: Employee health (health as a way to avoid illness and lost workdays), public health (assistive equipment, physical and vocational rehabilitation, accident prevention and establishment of health training centres), absence management (reviews of complicated patient cases) and temporary staff services (services of healthcare staff, physicians and specialist doctors). . A new manager took over the Næstved project in Falck's Health Care division. He and Falck reasoned that after the Danish structural/administrative reform, Danish councils did not have the competences necessary to solve the new tasks in relation to health prevention and promotion and would either have to buy them or develop them themselves. This point of view was backed up by a marketing analysis made by a private consultancy firm. Falck therefore decided to continue and try to further develop the Health School project in Næsved in order to develop a service that may be sold to other municipalities. The politicians at Næstved council were tempted and decided to join the project when the Ministry of Health and Prevention, administrating a money pool, aimed at the establishment of local health care centres, showed an interest in the public-private collaboration around the health school situated in the same building as Næstved Health Center suggested by Falck and Næstved municipal council and moreover decided to fund the health school from September 2006 to June 2008.

Description of the innovation

The idea of the health school is to give people some tools to take more control over their own health. The health school organises training courses of 10 weeks for patients with chronic obstructive pulmonary disease (COPD), type 2 diabetes and heart failure. These patients attend a common course. They are also seen as individuals with different needs for training and health promotion. After attending the course they are checked after 3 and 12 months. The innovation can be characterized as a pedagogical innovation which is meant to support Government policies of health promotion. There is nothing new in the idea of a health care centre or health promotion as such. The newness of this innovation lies in the particular framework it uses, grouping people with different chronic diseases in one common course and making use of pedagogical tools that have been developed by Falck. We can also characterise this innovation as a process innovation, a conceptual innovation and a marketing innovation at the same time. It is a process innovation because it improves the process of health promotion in the municipality as requested by the government. It could also be seen as a product innovation (a new pedagogical tool). But it is more accurately described in terms of process innovation because, in a certain sense, the product has already been invented: the idea of health promotion through patient training has been implemented in other places in Denmark. The health school in Næstved aims to improve the process. The health school is also a conceptual innovation. It contributes to the concept of health promotion by creating a service that can be generalised at the conceptual level and potentially repeated in other local communities in the form of a concrete service or advice. At this level, it is an idea/concept more than a concrete service in Næstved. Rather than being a specific offering in Næstved, it is seen by Falck as a conceptual innovation that can be introduced in many places. Furthermore, the promotion of this concept to patients, hospitals, GPs and other local actors through active networking implies that this is a marketing innovation as well. For exam-ple, information materials have been developed in order to present the new concept to patients and GPs.

How success is measured ?

The success of the public-private innovation network is measured on the basis of the degree to which the collaboration results in a permanent collaboration between Falck and Næstved Municipality around the health school. Since the health school is developed, tested out for a period and then closed, the project was unsuccessful. Data about the collaborative project were generated by means of document studies, interviews and talks with key actors. The data analysis show that involved actors inability to construct the health school as an attractive boundary object may explain the lack of further public-private collaboration around the health school after the test period ended and government funding was stopped. Boundary objects are objects/written descriptions that exist at the junctures where varied social worlds meet in an arena of mutual concern. They "..have different meanings in different social worlds but their structure is common

enough to more than one world to make them recognizable, a means of translation. The creation and management of boundary objects is a key process in developing and maintaining coherence across intersecting social worlds" (Star&Griesemer 1989:393) (1). However other types of success resulted from the project.

What success has been achieved to date?

The health school activities resulted in improvements in patients health. The Municipality´s health center moreover took over the task and some of the employees from Falcks health school profiting thereby on the learning that had taken place in the health school related to its activities. Moreover Falck Healthcare have made an experiment and learned a lesson by testing out whether a new profitable service might be developed in the area of health prevention and promotion. Falcks conclusion was that such a service should not be developed since Falck could not produce a cheaper and much better service than Næstved Health Center could itself. Moreover the local municipality including politicians and civil servants prefered to organize the service without a private partner since this made it more easy to integrate the service/health school in other health care activities as well as the management structure of Næstved Health Center. Finally politicians and civil servants in Næstved council were difficult to convince about the importance and economic value of investing economic resources in health prevention. What made this experiment and learning possible was the government funding without which it would not have taken place.

References

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Case Study 11: A Platform Innovation in Public Service

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Abstract. While the impact of public private partnerships (PPP) has been investigated, especially stressing their role in private financing of public sector projects (for an overview see Hodge and Greve 2005; OECD 2008), the micro-structure of public private innovation networks in public services (ServPPINs) has yet to be investigated in such depth. ServPPINs could be seen as broader frameworks than PPPs. The goals are more holistic, ambiguous and harder to quantitatively define. Mutual sensemaking and trust processes may play a more explicit role. It refers to network relationships between private and public agencies with focus on development and innovation potential in public services. These ServPPINs represent one way to study how "big ideas" resulting from global pressures in the "competition state" (Cerny 1995, 2008; Kirby 2002, 2004) are translated into practice. This paper represents an attempt to explore in a qualitative way how the micro-structure of the ServPPINs can be understood as a platform for change or a "platform organization" (Ciborra 1997). The paper first scrutinises a case for innovations. It then uses the concepts of platform organisation as well as "sensemaking" and improvisation to explore how these ServPPINs manage to take care of development and change (Ciborra 1997; Weick 1993; Weick 1995; Orlikowski and Hofman 1997). The proposal, which is explored in this case-study, is that the impact of ServPPINs is not to create radical new innovations, but to take a series of small actions and thereby potentially react to small cues.

Background

This case-study is part of the ServPPIN project sponsored by the EU 7th framework programme. It describes a recent development in Gribskov municipality in Denmark in public-private collaboration in elderly care between the Danish municipality and two Swedish companies. Gribskov has been known as a frontrunner and driver in public-private collaboration in Denmark. Gribskov is situated north of Copenhagen in the Capital Region. There are about 40500 inhabitants in the municipality.

The opportunity

The collaborative approach in Gribskov has been representing a changing attitude to public-private collaboration: from focusing mostly on price of service, efficiency and disaggregation of public hierarchy towards inclusion of collaborative service development and innovation activities in a looser micro-structure that we call ServPPIN.

Description of the innovation

The interesting aspect of the case is that it has been going one step further compared to previous contracts. It has required of the Swedish and Danish contractors to participate in, and allocate resources to, collaborative development and innovation. Most NPM or PPP initiatives has been stressing competition, incentivisation and disaggregation (Dunleavy et al. 2006), while this case has been stressing collaboration. This can be seen as a "platform innovation". Furthermore, the platform has facilitated a number of concrete innovations through processes of sensemaking and improvisation.

How is success measured?

It could be argued that this new initiative in Gribskov has taken NPM to a new stage. On the one hand, Gribskov has had the lowest prices among Danish municipalities on personal care and the third lowest prices on practical help to elderly. On the other hand, the initiative has created a

collaborative micro-structure for development and innovation among the contractors and the municipality that has led to a number of concrete service innovations in the municipality.

What success has been achieved to date?

The collaboration has led to a number of concrete innovations in the services offered. Furthermore, a platform was constructed, and trust has been created on this platform between the private supplies and the municipality.

Links to further information

http://momentumdk.dk/con63.php4
http://www.servppin.com/
http://forskning.ruc.dk/site/research/fuglsang_lars(4781)/

Case Study 12: Understanding Drivers of Customer Satisfaction in the Social Housing Sector: One Vision Housing's Operational Approach and Achievements to Date

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Abstract. There is substantial service performance information and customer satisfaction data available in the social housing sector due to regulatory reporting requirements and a focus to improve service delivery. However the linkages between service standards, organisational performance and customer satisfaction are not clearly understood. Millions of pounds are spent annually in the sector on the measurement of customer satisfaction surveys and service benchmarking but there appears to be no causal link or correlation between high customer satisfaction and high service delivery standards. Recent research published confirmed the above and more research is required in the sector to fully understand the drivers of customer satisfaction in the social housing sector. This case study is how One Vision Housing (OVH), a Registered Housing Provider (RP), recognized this problem some time ago, how they have responded operationally to understand the drivers of customer satisfaction in a structured way and align their service investment based on customer feedback. OVH evaluated a number of operational approaches to increase their customer understanding. SERVQUAL was explored as a possible methodology but based on the lack of use in the social housing sector as well as the pitfalls of the approach as reported by Francis Buttle, OVH decided to go back to the basics of service quality and decided to monitor the ten dimensions of service quality over a year. This allowed OVH to evaluate trends and see how property and service investments and other operational decisions have impacted on their customers Customer survey results over a year identified the top four dimensions of service quality to improve as competence, access, responsiveness and communication. Detail analysis shows that access to services for customers has improved over the year and improvement across this dimension correlates positively with key investment decisions and operational improvements. The use of the ten dimensions of service quality to understand the linkages between customer satisfaction and service delivery is an innovative approach for the social housing sector and there is no practitioner or academic publications about this approach, the methodology, pitfalls and potential benefits.

Background

There is substantial service performance and customer satisfaction data available in the housing sector. Organisations are required to submit their customer satisfaction data annually to the regulator based on a prescribed methodology to ensure comparability across the sector (known as the STATUS survey methodology). In addition it is common practice for organisations to annually evaluate and benchmark their performance across a range of performance factors against its peers through benchmark clubs (HouseMark is the market leader). Service performance including customer satisfaction measurement are compared and organisations are ranked in terms of quartiles with Q1 performance as top and Q4 as bottom. Scrutiny of data, comparing service performance against customer satisfaction however shows weak correlation between high customer satisfaction and high service performance. Practically it means that an organisation can outperform its peers in terms of service delivery but still have low customer satisfaction and makes it extremely difficult to focus on specific service improvements that will result in an increase in customer satisfaction. This raises three questions:

1. Are the housing sector measuring and benchmarking the right things?
2. What are the real drivers for customer satisfaction in the housing sector?
3. What service delivery areas should OVH focus on to increase customer satisfaction?

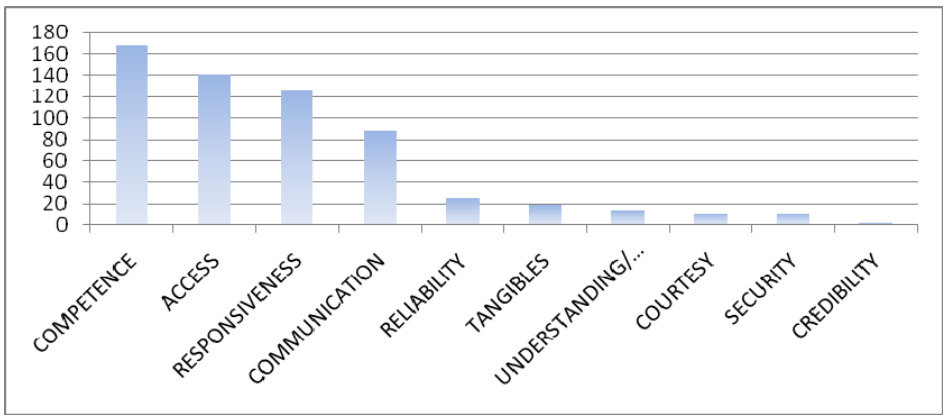
The opportunity

One Vision Housing has invested substantially in commissioning service specific customer surveys and has monthly customer feedback data available from a variety of sources. How to make the most of the intelligence and data available and to inform strategic and operational decision making became a challenge and OVH used the ten dimensions of service quality as key performance measurements.

Description of the innovation

The approach is breaking away from the traditional methodologies in the sector and focussing on the ten dimensions of service quality. It is a structured approach and not without pitfalls and can best be describes as a case of adaptive innovation. The use, reporting and findings based on the analysis of the ten dimensions of service quality have never been carried out in a recognised structured manner in the sector. We believe this approach will help the social housing sector to become aware of a new approach to evaluate their customer service data and provide meaningful insight about the drivers of customer satisfaction. It also allows organisations to be more specific about investment decisions which will lead to further efficiency gains and frontline service improvements.

Fig. 1. 2009/10 OVH SERVQUAL Importance Ranking



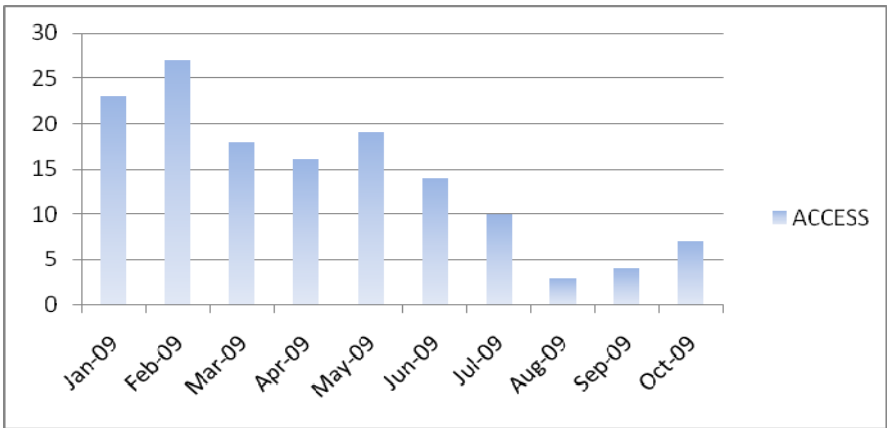
How is success measured?

OVH has developed a baseline for all ten dimensions of service quality and understand which service quality issues are most important for their customers. OVH has established trends across all the ten dimensions and have indentified the top four service quality issues for its customer base. Customer feedback showed access to services as a major issue and OVH reacted positively, invested and implemented change to make access to services easier. This includes substantial spend on both human and financial resources. In addition action plans have been put in place to improve the top four service quality dimensions – competence, access, awareness and communication.

What success has been achieved to date?

Access to services for customers has improved substantially over the last year and plotting investment decisions across the number of access problems shows how OVH's decisions have impacted positively. Over the period in question customer satisfaction with the service area studied.

Fig. 2. 2009/10 Monthly OVH Access Trends



Links to further information

www.ovh.org

SERVQUAL: review, critique, research agenda; Francis Buttle; Manchester Business School, Manchester, UK, European Journal of Marketing 30,1

Using SERVQUAL to assess customer satisfaction with public sector services; Mik Wisniewski; Managing Service Quality; 2001; 11, 6; ABI/INFORM

Case Study 13: Social Housing Asset Management: An Innovative Approach to Increase Productivity and Performance

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Abstract. There is substantial pressure on social housing sector organisations commissioning or delivering services to reduce the cost of providing services whilst maintaining service standards. In order to operationally achieve this, organisations need to evaluate their service costs, understand where and how service costs are consumed and how to use financial resources better. A key asset for social housing providers is their housing stock and the efficient management of financial resources to maintain their assets and make the best use of available resources has become more critical over the last years. This case study is how One Vision Housing, a Registered Provider (RP) has adopted private sector methodologies in their Asset Management strategies and tailor suited it for the social housing sector to increase productivity and performance. The broad methodology and thinking was adopted from private sector approaches and specifically developed for the Housing Sector at One Vision Housing. It is an innovative approach for the social housing sector and there is no practitioner or academic publications about this approach, the methodology, pitfalls and potential benefits. Although still in the early stages of implementation, it is anticipated that between 4% and 6% of cost savings in service delivery can be identified and realized in the medium term. Approximately £7 billion was spent in 2009 on maintenance and repairs of housing assets in England alone, and wider adoption of this innovation can make a significant contribution in performance for the sector. It is a good example of service innovation in the public sector or voluntary sector and an innovation that improves productivity and business performance

Background

The use of individual customer profitability analysis (CPA) as a strategic and operational management tool is well established in the private sector. CPA's aim is ultimately to identify profitably and unprofitable customers at either the individual or segment level and this information is used to develop marketing and operational tactics and also used to inform resource investment decisions. In order to understand individual profitability all costs associated with service activity are allocated at the transaction level. Comparing the income with the associated service costs on an individual basis allows a company to identify profitable or unprofitable customers. The results can be graphically presented as cumulative profitability curves also known as Whale Curves.

In the context of profitability, service providers in the social housing sector do not have the same operational options or tactics available compared to the private sector firms. However the fundamental approach is the same and whereas the motive for private firms is profit optimisation, the focus for RPs is surplus cash generation in order to release resources for investment elsewhere. The emphasis in the approach is on understanding the cost to serve, but instead of completing the analysis at the individual customer level, it is completed on an individual house or neighbourhood basis. The methodology links capital expenditure and all day to day service and repairs costs.

The opportunity

A complex range of services are typically provided by RPs. The Facilities Management or Repairs and Maintenance departments are typically responsible and provide:

1. Responsive repairs which includes Gas & Heating
2. Planned Repairs including new bathrooms & kitchens
3. Aids & Adaptations

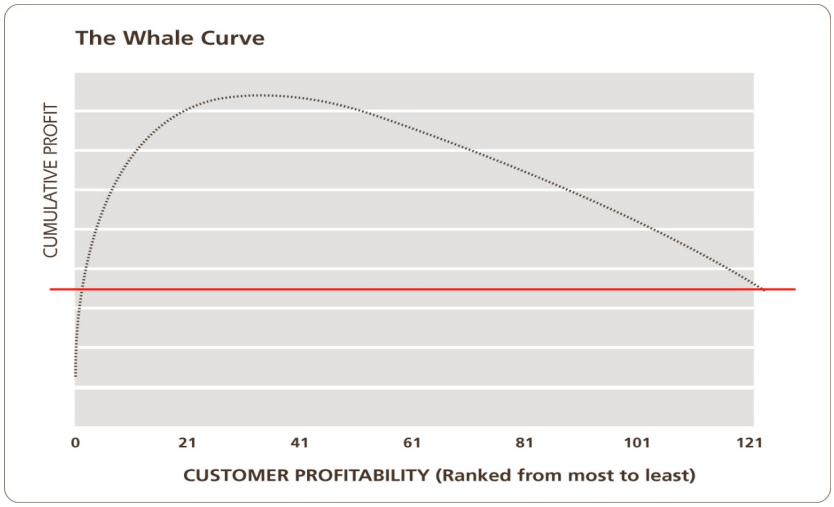
4. Environmental works
5. Capital Expenditure

Typical for the sector, service costs are understood at the service level but in isolation of the other service costs. This can be more complicated if the services are provided internally or outsourced. Capital Expenditure is planned and spent based on a typical replacement cycles and the linkages between capital costs and the associated reduction in anticipated repairs is not clearly understood. There is no collective view of all costs and associated rental income at the individual property level. This single view methodology allows practitioners to integrate all service costs at the individual stock level and make meaningful decisions about capital expenditure in particular in order to reduce maintenance and repairs costs.

Description of the innovation

The use of Whale Curves but phrased “Housing Stock Efficiency Curves” is new and innovative in the housing sector and OVH are thought leaders in this respect. The methodology provides a structured approach to allocate cost at the individual level based on customer profitability analysis and developing a specific methodology for the public social housing sector.

Fig. 1. Typical Whale Curve: KitshoffGleaves 2004



How is success measured?

Success is about understanding cost drivers and how different service costs interact at individual stock level. In order to allocate all service costs at the individual stock level companies need to:

1. Understand the different service processes and associated costs
2. Understand the workflow including rework and associated costs
3. Determine cost drivers and how they interact across the varies services

What success has been achieved to date?

OVH have identified the different service processes and has identified the amount of rework and associated costs. This has lead to an understanding of service costs and the identification of estimated savings of 220 k

Links to further information

www.ovh.org.uk

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H. Thomas Johnson, Robert S. Kaplan ;Relevance lost: the rise and fall of management accounting; Harvard Business Press; 1991

Case Study 14: Public-Private Innovation Network in Knowledge Intensive Services. Co-production or Technological Lock-in? FARMSTAR, A Case Study in Advisory Services for Farmers

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Abstract. This paper presents the results of one of the case study of the Serv-PPIN research program. It proposes to explore the dynamics and the effectiveness of a public-private innovation network (Serv-PPIN) in the sector of Knowledge-Intensive and Business Services (KIBS) (Sundbo 2009). It is grounded on an empirical case study in the sector of advisory services for farmers (FARMSTAR), so as to gain feedback about this new form of innovation network. A first research question was to test whether the dynamics of this network follows the theoretical development of the life-cycle of public private innovation networks. This cycle consists in three stages: i) a proto-industry stage or crystallization stage, when public funding is public research still associated, but the demand for the service still not articulated; ii) a commercialization and entrepreneurial stage when large firms invest (in this case EADS and farmers' cooperative) in order both to develop knowledge bases and test prototypes; and iii) a consolidation or firm growth stage, where public participation declines at a stage when a well articulated demand generates revenues streams from a successful network of firms. The case study with FARMSTAR also enables a discussion about the different typologies and forms of innovations (Gallouj and Savona 2009). It is moreover the opportunity to gather empirical evidence regarding three main areas of interest within the literature about innovation in KIBS: ad-hoc innovation, co-production and technological lock-in.

Background

This innovation consists of a new method of advisory services for farmers called "FARMSTAR". This method deals with one of the most important and controversial farming practices: nitrogen fertilization. Nitrogen fertilization is a central issue both for agricultural production (nitrogen is a major determinant of crop yield, and thus, of a farms productivity) and a serious environmental problem (nitrate is an agricultural pollutant that is the target of numerous national or European environmental regulations).

The opportunity

The opportunity derives from the growing number and strength of the environmental regulations (especially at the European level) that frame the agricultural production. Farmers have to comply with regulations with very specific content: for instance, the maximum amount of nitrogen that the farmers can spray (kg/ha) is defined precisely in the EU regulations. Complying with this standard is now compulsory for farmers in order to benefit from direct subsidies of the European Union Common Agricultural Policy (CAP). Other standards are compulsory for access to agricultural commodity markets (e.g. maximum acceptable concentration of toxins in grain). In this context, knowledge intensive business service (KIBS) are clearly to help farmers comply with sanitary and environmental regulations.

The European Commission obliges the Member states to form "national advisory systems", which will provide farmers with the relevant information and knowledge to adapt their production systems to meet regulations and standards. As a result the use of services such as FARMSTAR is increasingly seen not only as an advisory service by farmers, but also as a way to justify that they try to enhance the environmental performance of their practices. This has generated a boom for KIBS markets: a market for the software enabling a formalisation of farm practices registration (information traceability), and a market for decision support tools (methods for knowledge production) and technical advisory services.

Description of the innovation

FARMSTAR is a major innovation as, for the first time; it enables farmers to take into account the spatial heterogeneity within a given field for calculating the nitrate requirements of the plants. Before FARMSTAR, decision support for nitrate fertilization used to be based on the calculation of an average value of plants needs for a given field. With FARMSTAR, the idea is "*to bring the right amount of nitrate at the right place and at the right moment*". Farmers who subscribe to the FARMSTAR service provide information about their farms and their production systems, and receive either maps or numeric files about their fields, with precise instructions regarding optimal nitrogen quantities and spraying dates. The services are provided to users by farmers' cooperatives, which have contracts with FARMSTAR creators.

There are two main initiators of FARMSTAR Public-Private Innovation Network:

1. an applied research institute (ARVALIS) owned by farmers but heavily subsidised by public funds (agricultural taxes and contracts with ministries or regions) and with public missions;
2. a private company specialised in satellite technologies and in the development of satellite technologies for KIS applications (Info-Terra, the sister company of EADS).

The cooperation between these two constitutes the heart of the network and enables the combination of two knowledge bases: satellite technology and agronomy. Apart from ARVALIS and Info-Terra, the Serv-PPIN regroups the following actors: various partners for the distribution of the service to farmers (with different status: cooperative, public chambers of agriculture, farmers' groups, private companies), subcontracting companies, local public authorities that subsidised prototyping and R&D, etc.

How is success measured? What success has been achieved to date?

FARMSTAR has succeeded in becoming a dominant paradigm for nitrogen fertilization decision support services. This "lock-out" situation verifies some of the hypotheses of Windrum (2009): changes in the preferences of the final users (farmers: the emergence of precision farming machinery has created needs for specialized advice for some of the farmers); changes in preferences of private firms (cooperatives: the environmental regulations have created strategies of investment in intangible goods – following the definition of Hill, 1999 - that can now be considered proof of their commitment to bettering their commitment to making their activities more environmentally friendly), and change in the attitude of policy makers (with a growing importance given by agricultural policy makers to the support of technologies which efficiency can be easily measured).

The cumulative effects have worked very fast for the diffusion of this technology. First, the technological characteristics of FARMSTAR are based on statistical correlations. Thus, the accuracy of the model increases with the number of users, and reduces the uncertainty associated with the outcomes of the service for new users. This generates increased returns that can drive lock-in mechanisms. Second, the diffusion of the innovation has benefited from the unexpected and radical investments of the advisers task force of some of the biggest farmers' cooperatives.

But this success in locking out the sector of advisory services for farmers is surprising according to two points. First, it has changed the preferences of farmers who were not originally targeted, for instance some farmers who cannot apply the advice because they lack the machinery (precision farming equipments) required to monitor the amount of nitrate spayed according to the position of the truck in the field. An explanation here could be the role played by leaders in the adoption and diffusion of this innovation in the agricultural sector (some farmers are both in the board of farmers' cooperatives and at the same time some pioneers of precision farming machinery). But the most surprising point is that there is no evidence of the effectiveness of the method, and no proof that it provides better advice and prediction than more traditional agronomic methods. No actors tried to develop tests and scientific experiments so as to compare the performances of different methods. This is partly due to the difficulty for some actors to actually test the method, because they lack the knowledge about how to measure the accuracy of a spatially explicit

prediction method. This could derive from the unbalanced powers and asymmetries of knowledge bases within the network, to the benefit of Info-Terra.

Link to further information

More information can be found on the website of the EU 7th framework research program "The Contribution of Public and Private Services to European Growth and Welfare, and the Role of Public-Private Innovation Networks" (http://www.servppin.com), including the following reports

Gallouj F. and Savona M. (2009). Innovation in services: A review of the debate and a research agenda. - *Serv-PPIN – WP2, Deliverable 2.1 –A1.1a*

Sundbo J. (2009). Public-private networks and service innovation in knowledge intensive services, a report of European case studies". - *Serv-PPIN – WP5, Deliverable 5.1.2.*

Windrum P. (2009). Multi-agent framework for understanding the success and failure of ServPPINs. – *Serv-PPIN – WP2.*

Theme 3: Innovation Management within an Organisation

Service innovation through an organisation actively encouraging innovation within its own boundaries, for example through project teams, internal governance of innovation, methods or tools that stimulate innovation

Case Study 15: On the Balanced Service System as a Business Strategy for SME Gazelle Growth

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Abstract. This case study describes how a highly valued subcontractor transformed itself to become the leading enterprise information system consulting company in Finland, outperforming the big six consulting service public organisations competitive tendering. The case focuses on balanced service strategy (BSS) development through intellectual capital (IC) and addresses the use of intangible service business logic (ISBL) with the following three key dimensions: 1) relationships, 2) human, and 3) structural. The case describes how these three elements were selected and how they have helped the gazelle growth of the young medium service company. It also discusses how ISBL was used as a balanced service strategy over the course of several years, along with a compensation and reward system. Finally, it addresses the challenge of gazelle growth while implementing the BSS.

"There is nothing like gazelle entrepreneurship—it's like rock 'n' roll!"
Mika Helenius, Founder and CEO

Background

Founder, chairman of the board and eventually the CEO of the case company Mika Helenius successfully transformed the professional services ICT subcontractor to a market leader in high end consulting services. The company become well known as the "brains" and "hands" behind twenty or more leading innovative digital services companies in Europe. For the first three years from the start of the company, leading venture funding companies knew where to turn if they needed to secure investment, service launch plans, and, especially eliminate risks. After two years, this company had generated close to one million Euro's in revenue with over 30% profit after taxes, had six owning partners and was employing more than ten highly educated post-graduate students who were soon to graduate. It had relied too strongly on best-of-the-best engineering skills and on the customers calling for help. However its growth had now stagnated and the company needed a new gazelle service strategy that would take them to next level on the services growth path.

The opportunity

The company was listed twice both 2001 and 2002, as one of the top 50 software "companies to follow" in Finland. It was the only privately owned, less than five years old, and growing organically. At the same time, it was facing its biggest challenge: the market had disappeared rapidly after the millennium boom and the order books were close to zero. CEO Mika Helenius analyses the situation:

"This was a time when the engineers understood that the other functions in the organisation were equally important. The customer value through solution sales was fully deployed to throughout the organisation. Services products, concepts, models, and standard agreements suddenly became important elements to increase scalability and performance. The questing was not to succeed with one narrow capability rather with all at the same time. The logic of services was finally understood widely among analytical engineering and technology experts."

Description of the innovation

In early 2002, Mika Helenius, who had been now CEO only for less than half a year, was contacted by the Finnish Federation of Technology Industries (FFTI). They asked if his company

would be interested in participating in a project between twenty one Scandinavian information technology companies. The aim was to develop a guideline to assess, measure, and report intangible assets in small and medium enterprises (SME). Helenius saw this project as a big opportunity and he realized the insight to the BSS. The project would provide hands on knowledge on required internal growth, service value development and outside funding capabilities such as reduced internal risk rate:

"Our engineering service processes were outstanding at that time! Our close university engagement and research cooperation resulted in an agile, services-oriented Cycles-of-Control (CoC) framework. But we still need a holistic service development framework for the company. This Nordic harmonised knowledge indicators project, Putting IC into Practice), provided us a lens to develop the BSS. The other twenty one similarly sized technology companies provided a great service business benchmarking opportunity."

The PIP indicators were developed over a two-year period, from 2002-2004. The indicators enable a service company to efficiently and effectively develop its intangible assets, such as service, in a balanced and systematic way. As a result of the two year process, the following set of main indicators was selected by the participating companies and adjusted by the case company:

1. Human Capital - Employees, staff turnover and recruiting, education, skills and competence, employee satisfaction and attitude, and executive competency
2. Structural Capital - Information systems, information architecture, quality management, innovativeness, competence development, working conditions, and corporate governance
3. Relational Capital - Customers, marketing, brand and image, visibility of expertise, and business networks

The actual innovation was not in these indicators, but rather in how they affect the BSS through the internal risk rate or interest rate used in the weighted average cost capital (WACC) calculations of a company. At this point, the role of the balanced system became so clear that the company invested heavily in all of the indicators during 2003-2007. The BSS can be used for any company wants to become a leader by re-segmenting the professional services sector. The typical factors used to differentiate a professional services company in public service sourcing, or acquisition processes are references, education, certification, experience, and quality. The companies also must be able to demonstrate that they are as free of risk as possible in the eyes of customers, acquisition parties, and financial institutions. Helenius speaks about his insight on BSS:

"The BSS was the key to our service business success. These kind of results would not have been possible without a holistic service value systems (SVS) thinking. In the complex knowledge and technology industries, service dominant logic (SDL) developed in marketing and service logic (SL) using value co-creation are not extensive enough. Service systems science is much more comprehensive and complex, so it is therefore a challenging phenomenon to understand, especially without experience in the right contextual sphere."

How is success measured?

Success was measured according to the company's profitable growth and how risky the company is perceived to be by customers and financiers. These indicators made it possible to transform, lead, and expand the services company by more than 50% annually between 2001 and 2007. The five-year growth factor exceeded 700% with every Y2Y improvement. The company was eventually financed by partners, new minority partners and interestingly banks without any guarantees. It was listed three times on the Deloitte Fast Technology 500 EMEA list and appeared several times in the TOP 100 Organic Growth Companies in Europe.

What success has been achieved to date?

A publicly listed company acquire the case company in 2007 because it had unique capabilities in public sector customer, overall service competences, complex service systems delivery and

service projects. The total value of the deal exceeded 300% of the annual revenue at closing; even the case study company exceeded positive profitability. The return on investment for the founders was more than 1000% in less than ten years. Each of the four founders became a millionaire and the majority of minor partners earned an additional one to two years' worth of salary as a bonus.

Link to further information

http://www.linkedin.com/in/MikaHelenius

Case Study 16: *Trus*TECH – Innovators in the Field Of Innovation

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Abstract. *Trus*TECH is an NHS organisation and part of the NHS Innovation Hub network. It provides advice on and assistance with managing innovation arising from all aspects of the NHS healthcare provision. As one of the first NHS Innovations Hubs to be established, *Trus*TECH has a wealth of experience in intellectual property management. Since 2001 *Trus*TECH have been supporting the NHS in the North West with innovation management, including Intellectual Property advice, Service Innovations, in-depth market research studies and support for commercialisation of innovations. *Trus*TECH also manage the NW Innovation Fund, via InnovateNow, on behalf of the NW Strategic Health Authority

Background

*Trus*TECH are based in Manchester Royal Infirmary, (with offices in Preston and Liverpool), and offers support and advice from inception to commercialisation of devices and services, with a tangible benefit to patient experience and cost savings to the NHS. Where a Trust has successfully implemented a novel service innovation, which may be of benefit to other Trusts; *Trus*TECH also offers the opportunity for assessment of innovations under its Service Innovation Scheme and gives support for advertising and implementing the service in other Trusts.

*Trus*TECH was established in early 2001, as a partnership between Central Manchester University Hospitals NHS Foundation Trust, the Royal Liverpool and Broadgreen University Hospitals NHS Trust, and the University of Central Lancashire. It receives its core funding from the Strategic Health Authority (SHA) and the Department for Business Skills and Innovation (DBIS).

*Trus*TECH works with NHS staff across all disciplines with Trusts in the NW Region, Cheshire, Cumbria, Greater Manchester, Lancashire and Merseyside, and has experience in managing a diverse range of innovative ideas, including those in the following fields:

1. Service delivery
2. Biotechnology
3. Diagnostics and therapeutics
4. Medical devices and equipment
5. Software
6. Training and educational materials

The opportunity

As an Innovation Hub, *Trus*TECH is an advisor to NHS Trusts, (Acute, PCT's, Mental Health etc.), helping them to meet the obligations of the Department of Health (DH) policy on managing IP arising from within the NHS. The DH has issued guidance on the management of IP in the NHS and *Trus*TECH works with Trusts to meet the requirements of these documents.

*Trus*TECH facilitates the building of relationships across the NHS to disseminate innovative ideas and acts as a point of contact between the NHS and industry to build commercial relationships.

Description of the innovation

The *Trus*TECH Service consists of 3 distinct offerings;

1. *Trus*TECH Service Innovation Scheme recognises that not all innovations benefit from commercialisation. It is sometimes more appropriate to share innovations freely within the

NHS and, with this in mind *Trus*TECH developed the Service Innovation Scheme. The *Trus*TECH Service Innovation Scheme, set up in 2005, raises awareness of service innovations and encourages NHS staff to review and modify procedures.

2. *Trus*TECH Technology Service which initially involves auditing or assessment of the innovation and assessing their value and potential to be of benefit to a wider market either through commercialisation or free dissemination to other Trusts. This includes looking at competing products, market size, potential development route/costs and IP protection. *Trus*TECH will report back to the Trust providing advice on protecting the innovation through legal rights know as intellectual property rights (IPR) and on the commercial potential. If a Trust wishes to engage *Trus*TECH to assist in the further development and commercialisation of its IP, then *Trus*TECH will work with the Trust to cover these 'commercialisation' services. Support and IP advice from inception to commercialisation of devices and services with a tangible benefit to patient experience and cost savings to the NHS
3. *Trus*TECH Commercial Team actively interacts with commercial organisations and can help broker engagement between NHS organisations and companies. They are an Innovation Gateway, facilitating knowledge and technology transfer between the NHS and the commercial and academic sectors.

How sucess is measured?

Table 1. How success is measured and success achieved to date.

How success is measured	Success achieved to date
Number of Members	85% of Trusts in the NW region are *Trus*TECH members
Successful promotion and Management of the Regional Innovation Fund on behalf of the SHA	The financial year of 2009/10 saw the launch of Rounds One and Two of InnovateNoW; there have been 352 applications from NHS employees within 60 NW Trusts. To date 38 projects have been awarded, (round 2 will conclude May 2010)
No. of competition entries and winners	Over the last seven years, *Trus*TECH, through its innovation competition, has identified over 700 innovations and created over 85 award winners, benefiting thousands of patient's lives, providing a tangible cost benefit to the NHS and continuing a culture of innovation in the North West NHS.
Securing of funds for innovation in the NW	Over £8 million of external funding has been secured for the NW, which has been wholly used to support the NHS organisations primarily to develop their innovative ideas including; 1. Establishment of Medilink North West (the medical device and healthcare SME support network). 2. Establishment of ACTNoW (the NHS clinical trials facilitation system for the North of England). 3. Establishment of the NHS National Technology Adoption Centre (to address barriers to adoption of proven technologies entering the NHS). 4. Facilitation of a regional Bid for modernisation of the Regional Genetics Laboratories.
The number of innovations assessed and supported as well as the number of those that progress to be successfully developed / implemented	From April 09 to March 10 1. we had 192 new enquiries, did 116 evaluations of technology and service and agreed strategies for the development of 21 new innovations with NHS Trusts 2. Brought 6 new products to market
Commercial Innovation	Brokered 12 new collaboration agreements incl. Operation of the Smart Solutions for HCAI Programme, IP development agreements and a collaborative venture for a new MedTECH incubator centre

Links to further information

www.Trustech.org.uk
www.InnovateNow.org.uk

Case Study 17: Information Technology Enabled Business Platforms

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Abstract. Comoditisation of products has been researched and understood for many decades. However, over 70% of the GDP of major nations is dependant on service industries. Little is understood about how services industries commoditise. The notion of business platforms [1] provide some important clues. A combination of a business platform supported by an innovative information technology system can disrupt industries as organisations such as Google and eBay have demonstrated. This talk will introduce a technique for assessing an organisation to identify candidate business platforms and how to apply information technology to create industry disruptions. In addition, it will provide initial experiences from using these techniques.

Background

The role of information technology (IT) systems as a potential industry disruptor had been well understood from the early 1960s. IT systems continue to drive innovation in many industries. For the services industries, IT systems will continue to be a major disruptive force, that will be used by leaders for competitive advantage. The IBM Component Business Modelling (CBM) method [1] has provides an tool to analyse a firm. The results from a CBM analysis, identifies the core capabilities in a firm and also their supporting costs, to create a heat map of transformation opportunities. This highlights the areas where IT systems can allow innovation of the business. This analysis, typically considers areas within the boundaries of the current firm.

Business Platforms [2] provide historical insight into how leaders have emerged in some services industries have established their leadership position. Organisations such as Google, eBay, Paypal, IBM , Microsoft and Intel are all seen as platform leaders. The business platform can be considered as a combination of the processes, capabilities and resources required to provide a service to an ecosystem of businesses. The business component has a clearly defined scope and purpose as identified using the analysis method. The business platform in contrast does not have such a precise definition. By taking a business component, offering it to an ecosystem of complementers and customers a business platform can be created. This provides the opportunity for the business platform to benefit from a range of economies and so create competitive advantage or drive commoditisation of an aspect of a business.

The opportunity

The opportunity is to develop a repeatable and structured technique to assess industries or organisations to identify areas of commoditisation. This insight would allow service organisations to develop strategies for competitive analysis or to disrupt adjacent industries.

Description of the innovation

A technique has been developed that can identify the business components that could be transformed into business platforms and lead services innovation. The description of a business platform in [3] identifies six essential characteristics for a successful business platform, that also aids distinction of business components and business platforms. The six characteristics can be summarised as:

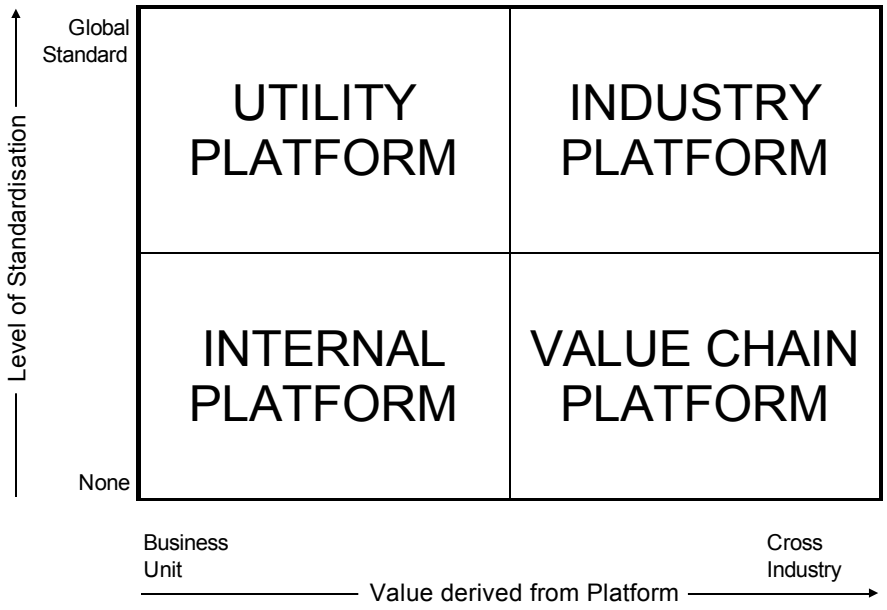
1. The platform allows unique capability or service within an organisation to be accessed by partners and customers
2. The platform is perceived as open and the interfaces to the services are based on agreed standards

3. Innovation and novel use is encouraged for all complementers
4. Partners are able to add value to and capture value from the platform
5. The core platform provider is able to capture value through the platform to profit in provision of the platform and afford its maintenance
6. The platform can be evolved, so that new or enhanced facilities can be provided non-disruptively

These characteristics can be used to identify how a business component can be transformed into a business platform. In the form of a business platform, the business component not only serves an internal population, it can be offered to complementers, partners and adjacent industries.

The business platform provider has to maintain the trust of the ecosystem by either establishing an independent standard and allowing the creation of competition in equivalent providers or creating a community that are willing to leverage the unique benefits the platform offers. In analysing a number of business platforms, the two factors that can be used to develop strategies for creation of a platform have emerged. Firstly, the status of the standards associated with the platform and secondly how the value can be realised using the platform. The following figure below shows the four types of platform that exist.

Fig. 1. Four types of platforms that exist



Although the business platform does not necessarily imply the use of IT systems to enable the innovation, [4] shows how software platforms have the potential to be a key factor in innovation. In addition, considering the business platform as a two-sided marketplace [5], allows the platform provider to develop a sustainable value capture model.

How is success measured?

This results from the analysis is the identification of revenue generation or value creation of an organisation. This can be readily quantified as financial measure. In addition, the competitive advantage or barriers to entry created by the ecosystem of platform complementers is a key measure of success.

What success has been achieved to date?

This technique has been trailed with four firms in Retail, Manufacturing, and Banking over the last 18 months. For each firm between two and six business platform opportunities we identified and programmes have been initiated to create the standards or the ecosystems of complementers.

Links to further information

[1]Component business models – Making specialization real available at: http://www-935.ibm.com/services/us/gbs/bus/pdf/g510-6163-cbm-making-special-real.pdf
[2]Platform Leadership, detailed at: http://www.platformleadership.com/
[3]Platforms, Markets and Innovation, Gawer, available at: http://www.e-elgar.co.uk/Bookentry_Main.lasso?id=13257
[4]How Software Platforms Drive Innovation and Transform Industries, *available at:* http://mitpress.mit.edu/catalog/item/ebook.asp?ttype=2&tid=11447
[5]Two-Sided Network Effects: A Theory of Information Product Design, available at: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1177443

Theme 4: Process Innovation

Service innovation through an organisation actively encouraging innovation within its own boundaries, for example through project teams, internal governance of innovation, methods or tools that stimulate innovation

Case Study 18: Soft Systems Methodology and Innovation

Giles Hindle

Warwick Business School

Introduction

This case will focus on process and organisational innovation and on how to make innovation happen in practice within organisations. We utilise a set of tools from soft systems methodology (Checkland and Poulter 2006, Checkland and Scholes 1999). Application contains three steps, which are mostly completed within facilitated workshops:

1. ***Situation Mapping:*** The situation is expressed on a whiteboard using a simple mapping tool – see the case vignette for an example. The mapping process gives participants the opportunity to step back from the situation, surface different points of view and develop an holistic view of the situation.
2. ***Design Modelling:*** The next step involves developing a range of creative ideas for the future. SSM uses systems modelling tools to help construct designs of the process or organisational unit the group wishes to innovate.
3. ***Action Planning:*** A final step is needed where the systems models are compared with existing arrangements to identify desirable changes and develop action plans to take the situation forward.

Although the application of SSM is presented here as a logical three step process, it is important to realise real-world projects will be open, messy and will require iteration between stages. There are two main reasons for this. Firstly, as with many design and problem solving processes, participants will have new ideas and change their views as the project develops. Secondly, it is likely that new designs and action plans may not achieve the outcomes intended by the project team. This is due to the complex nature of real-world change processes and should not be seen as failure by the project team. Rather, SSM encourages participants to view such projects as part of an experiential learning process which in principle is never ending. Hence, the application of SSM becomes part of the ongoing culture of the organisation, not simply a one-off project.

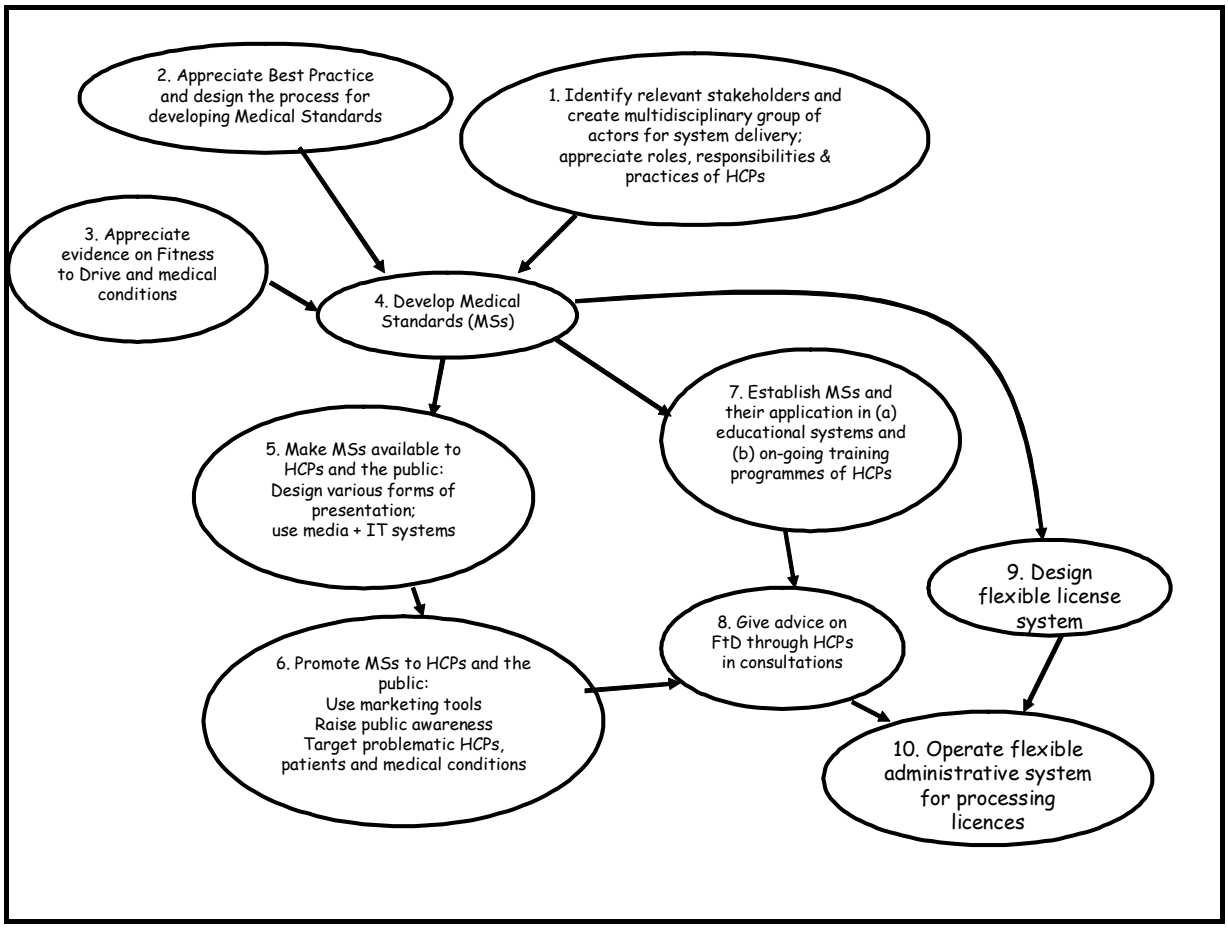
Case Vignette – Department for Transport [pubic sector service]

The case vignette explores the innovation of a large public sector service - the Department for Transport's arrangements to deliver Medical Standards on fitness to drive. The Medical Standards determine whether a patient with a medical condition such as diabetes or dementia are able to retail their driving licence. A series of workshops was run with a range of stakeholders including hospital consultants, GPs, occupational therapists, nurses, social workers, patients, Department for Transport staff and others. The purpose of the workshops was to identify issues with the current system (mapping) and generate structured ideas for how the system might be improved in the future (modelling).

The arrangements to deliver medical standards on fitness to drive may be viewed as a system which creates Medical Standards (MSs) on fitness to drive; endeavours to ensure they are implemented in practice though the co-operation of healthcare professionals (HCPs); and operates an administrative function in Swansea to process licensing decisions. The data collected in mapping workshops included a range of stakeholder views from straightforward improvements to existing operations right through to fundamental changes to the underlying philosophy of the system. For example, some GPs requested quick reference internet pages, whereas some occupational therapists wanted a move away from licensing/exclusion to a more supportive philosophy. The data was structured using a systems model which captured the 10 core activities of the current DVLA system. This model enabled data to be associated with a particular activity within the current system or else identified as (a) a systemic feature of the system, (b) an environmental constraint upon the system or (c) an alternative philosophy for system redesign. See Figure 1. It's worth noting this first model was *descriptive* – i.e. it described the *existing*

operation of the DVLA's fitness to drive system. It was not a creative design at this stage. The reason for building a descriptive model first was to create a baseline understanding of the system.

Fig. 1. Descriptive Model of the DVLA system (the baseline)



Innovating the system

The modelling language of SSM is flexible in practice and can be used to develop models in a variety of ways. One way is to develop models from explicitly stated philosophies or points of view; for example, a hard-hitting legalistic model of the "system to deliver MSs on fitness to drive" could be constructed. This approach would allow the implications of adopting a particular point of view to be explored in a rigorous manner and facilitates a structured discussion. A second approach is to create models in the form of ideal designs; for example, various ideal designs of a "system to deliver MSs on fitness to drive" could be constructed to allow creativity to surface within a problem solving team. A third approach involves a more operational and detailed point of view. Here the activities *within* a model can be viewed as sub-systems and modelled. Building ideal type models of such sub-systems can help develop ways of improving the effectiveness or efficiency of existing arrangements. Hence, there was a wide range of modelling options open at this stage of the project, both for the system as a whole (the "system to deliver MSs") and the 10 core activities within the baseline model.

In this project, we undertook the first and third options mentioned above (see Hindle and Franco 2009) – we explored changes in philosophies and changes to the core activities. For example, we modelled the implications of adopting a "supportive" philosophy for fitness to drive, based upon views expressed by Occupational Therapists in a stakeholder workshop. This model introduced

the idea of creating “Support Packages” rather than “Medical Standards” for the relevant medical conditions and drivers were kept on the road where possible or given travel support, rather than being licensed off the road. The model (and others) was then systematically compared with existing arrangements to assess the implications for possible implementation. Innovating a part of the system, on the other hand, entailed selecting one of the activities within the baseline model and creating a design model of it; i.e. regarding the activity as a sub-system. Building models of subsystems is useful when one wants to innovate or “tune” specific aspects of the existing system; for example, Activity 5 in the model above, “Make MSs available to HCPs and the general public” was viewed as “a system to make MSs available to HCPs and the general public”. When modelled in this way and compared with existing arrangements, we recognised opportunities to identify target markets for MSs and to design communication “products” for each group. Another idea was to place communication “products” along the care pathways of the various medical conditions, thus improving the hit rate with patients and HCPs.

In this project, the various models based upon alternative philosophies and the models based upon sub-system designs were ways of capturing and articulating views expressed in stakeholder workshops. Here SSM was operating as a type of research methodology to capture and structure qualitative stakeholder data. The analysis was fed back to the client organisation in the form of a report which then informed the internal decision making processes of the DVLA. Often SSM practice consists of workshops with decision takers, but in this case, due to the large scale nature of the public sector service, it was necessary to involve a range of stakeholders in the innovation process.

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Case Study 19: Opportunities to Improve Health Visiting Services through Lean Thinking

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Abstract. This paper presents the findings of a 13 month lean implementation in National Health Service (NHS) primary care Health Visiting services from May 2008 to June 2009. Value stream mapping was utilised to demonstrate the current level of waste in common tasks for the participating Health Visiting service. This was compared to the redesigned future process map. Stakeholder mapping was also conducted to demonstrate the multiple links to other services that needed to be considered in the future state service design. Quantitative data was provided through a ten day time in motion study of a selected number of staff within the service. This was analysed to provide an indication of waste activity that could be removed from the system following planned improvements. The value stream map demonstrated that there were 67 processes in the original Health Visiting service studied. Analysis revealed 65 % of these processes were waste and could be removed in the redesigned process map. The baseline time and motion data demonstrates that clinical staff performed on average 15 % waste activities and the administrative support staff performed 46 % waste activities. Opportunities for significant waste reduction have been identified during the study using the lean tools of value stream mapping and a time in motion study. These opportunities include simplification of standard tasks, reduction in paperwork and standardisation of processes. If these improvements were to be conducted successfully it would free up resource within the organisation, which could be redirected towards providing better direct care to patients.

Background

Health visitors (HV) are public health nurses working with children up to five years old and their families. They are responsible for delivering early intervention, prevention and health promotion for young children and families.[1] In recent years the demand for health visiting services has increased due to the greater social, cultural, racial and geographical diversity in the UK.[2] Services are under pressure to deliver care to more patients with constrained resources.[3] There is now a need to improve healthcare by transferring the philosophies, tools and methods from other industry sectors.[4] These methods include Total Quality Management (TQM),[5] the Toyota Production System (TPS),[6] six sigma[7] and lean.[8-9] This study focuses on the applicability of lean within NHS primary care HV services.

The aim of the study was to identify ratios of value-added (VA), non value-added (NVA) and waste activities, as generally defined in Lean Systems methodology to identify opportunities to remove waste from a system resulting in more client-facing time with users of Health Visitor service.

Working with Health Visitors (HV) and their Administrative Support Workers (ASW) in a PCT in Southern England, data was collected over five days at various HV locality bases in a city based PCT. The observers used time intervals to examine the working day of both HVs and ASWs in a 3:2 ratio. Their activities were grouped into VA, NVA and W and revealed 15% waste for HVs and 46% for ASWs (see Table 1).

The opportunities

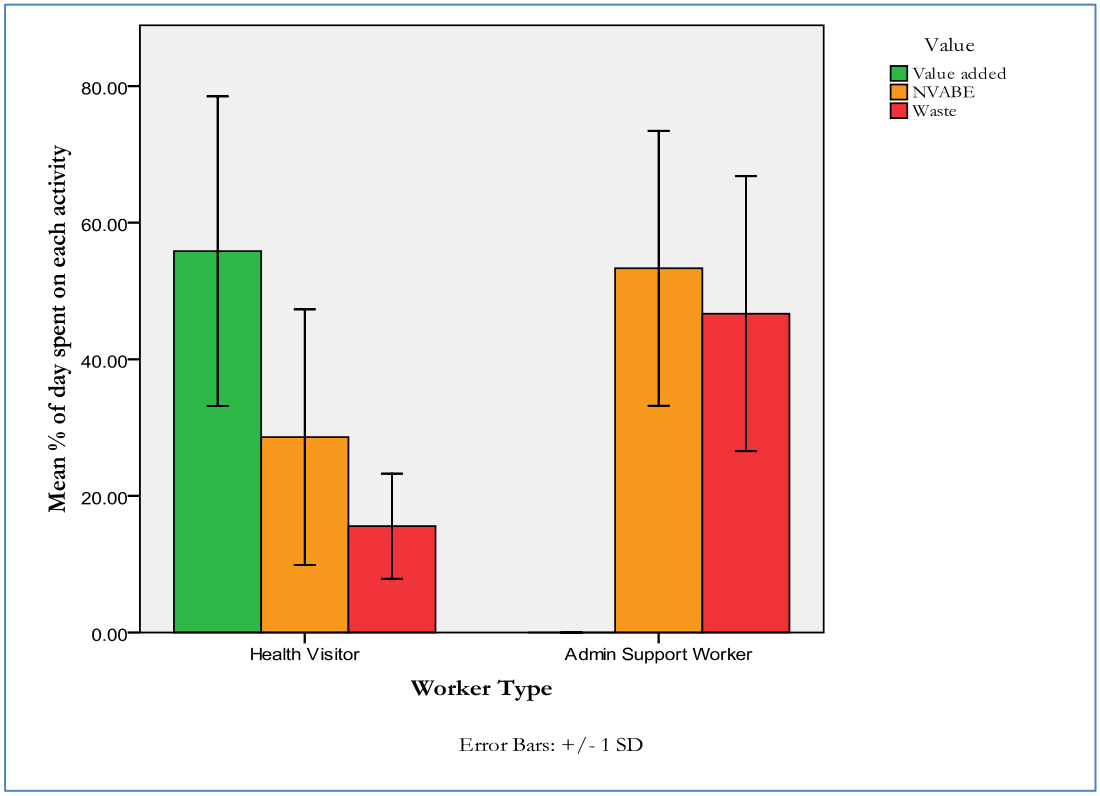
The results showed that a sustainable amount of waste is present in the service with HVs at 15% and ASWs 46%. This potential to increase the value added activity performed by HVs is high. The

total amount of waste in the service provides a useful benchmark against which to measure future improvements. So what were the obstacles to creating efficiencies that would free up HVs?

Description of the Innovation

The waste identified from the study revealed the vast amount of challenges the HV services face.

Table 1. Activity by worker type as a percentage of their time



Problems, seldom existing in isolation, were made more complex by the interdependencies of multi-skilled teams working across multiple sectors and organisations.

Isolated attempts to tackle issues were visible from innovations by staff to make life easier. But the 'sticking plaster' effect that had been used to repair defects in the system, such as additional forms to safeguard against problems reoccurring, had only added to the layers of waste in the system.

A new approach would be required to achieve real, beneficial change.

How is success measured?

HV Waste - 15%

1. Travel to failed visits
2. Searching for client notes/files/information
3. Deciphering hand written documents
4. Booking & re-booking meeting rooms
5. Filling in statistics forms
6. Opening & processing post
7. Telephone ping pong
8. Waiting Time
9. Faulty IT equipment

ASW Waste - 46%.

1. Searching for information
2. Duplication of stats info
3. Checking others work
4. Chasing tasks
5. Opening door to building
6. Building maintenance issues
7. Resolving double booking
8. Telephone ping pong

Implementing lean thinking in health visiting

To solve complex problems, such as those evident in HV services, requires the disciplines of techniques such as 8D Problem Solving and other elements of a Lean Systems approach. Early on in the process, the root cause of the problem is identified and an interim containment action or 'quick fix' is implemented.
The process then continues by identifying a long term solution to the problem. This is then implemented and the 'quick fix' is removed. In this way the system will continuously improve rather than becoming an intricate network of "work-arounds".

The dedication and commitment of Health Visitors and their ASW's can not be questioned. For them to deliver the kind of service they aspire to deliver, let alone respond to the organisational directives of central government, it's evident that systematic change must take place on the ground.
Improvements to working practices must take place whilst continuing to deliver day to day services. Lean thinking and its systematic application provides opportunities to bring about that change.

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Case Study 20: e-Government Service Provisioning and Adaptation by End Users

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Abstract. We present a service innovation scenario where semantic web services and visual process specification allow public sector workers to easily modify and adapt e-Government services and processes, thus responding to new challenges such as the implementation of the European Services Directive and other recent developments. Our use case is based upon a novel service delivery platform developed in the EU FP7 project SOA4All.

Background

Public administrations have to deal with hundreds of different procedures that are typically implemented in one or more legacy systems or even executed manually. At the same time, the increasing number of regulatory changes and new regulations asks public administrations to constantly adapt their procedures in a flexible and cost efficient way. For instance, the EU Services Directive [1], [2] requires administrations to implement a one stop e-Government approach where constituents can file requests for public services via a single point of contact, which coordinates all necessary activities.

As a consequence, public administrations need to constantly adapt their service offerings to the specific needs of each constituent. Considering the tight budgets together with the high costs that would be caused by a traditional software development process under such dynamic conditions, it becomes evident that new solutions are required. The fields of e-Government and End User Development (EUD) are particularly relevant: Public administrations typically have to deal with numerous administrative procedures, interacting with citizens, businesses, and other administrations [3]. Their IT infrastructure is often heterogeneous with disconnected island solutions, and many public services are still executed manually. Changes to existing or the implementation of new IT applications often require lengthy and costly software development processes that are mostly handled by external solution providers.

An alternative to dedicated software development projects by IT professionals is the so-called EUD where professional users who do not have programming skills are enabled to perform smaller development tasks by a user-friendly EUD tool. Such tools often rely on wizards, programming by example, or graphical programming. Different studies have shown a general positive attitude towards EUD among professional end users, and EUD activities are in fact already widespread in different organizational contexts. We are therefore confident that a technological solution allowing civil servants to create new or adapt existing administrative procedures with an appropriate EUD tool will not face unnecessary obstacles to its uptake.

The opportunity

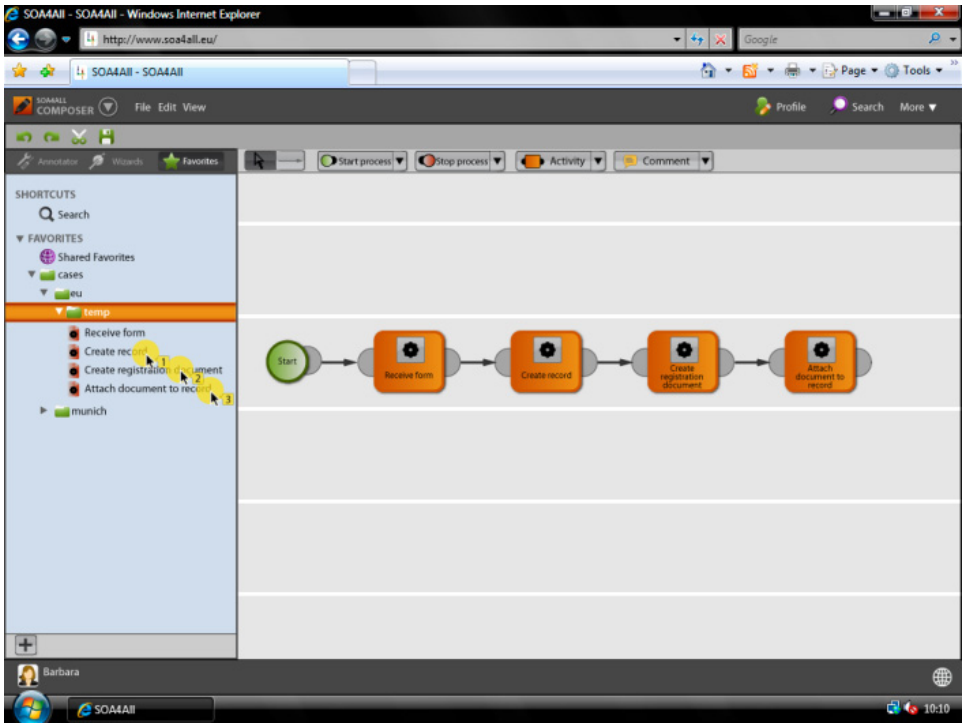
In the EU FP7 project SOA4All, we investigate different key technologies that help to address such challenges based on advanced service technologies. We envision an open and flexible *Service Delivery Platform (SDP)* where administrative procedures are handled over a central internet portal that serves as a single point of contact between the public administrations and constituents. This SDP allows composing administrative procedures of semantic web services together with human tasks. Differentiating from existing service composition tools, we explicitly address civil servants with regular IT skills as our target users in order to create a large user

basis, leveraging the professional expertise and local knowledge of our users for creating and modifying effective administrative procedures.

Description of the innovation: a service selivery platform for the public sector

In the following, we describe how our proposed SDP can bring about innovative ways of delivering e-Government services using the example of the procedure to register a new business in the City of X. Barbara is a process expert in the public administration of the City of X in Germany. When the SDP is introduced in order to realize a constituent-friendly one-stop e-Government solution, her task is to create process models for selected standardised administrative procedures. In our example, Barbara models the process of registering a business using the process editor depicted in Figure 1.

Fig. 1. Web-based interface of SDP



Like the other tools of the SDP, the process editor has a simple web-based user interface that can be accessed via a standard Web browser. For each step of the process, Barbara selects either a human task or a semantic Web service. In order to simplify the modelling process, we have designed a new graphical process notation that contains just a few elements such as start, end, process step and connectors between these steps. Before the process modelled by Barbara is ready to be deployed, the responsible manager Claudia verifies that it complies with all legal requirements. Thus, the SDP allows several users to collaboratively design and discuss process models. Sometime later, the City of X decides to simplify payment procedures for its citizens and to support payment by credit card in addition to the traditional invoicing scheme.

Consequently, all administrative processes that involve a payment need to be adapted. Thanks to the SDP, this modification is rather simple and therefore the workload for these adjustments can be distributed among the employees. In our example, Egon handles the incoming “Registration of a Business” requests. As a domain expert he is able to modify the existing process model to choose an alternate payment service depending on the constituent’s selection in the registration form of the city’s Internet portal. In the final phase, the modelled process is executed via the SDP. For instance, the Spanish citizen Jose uses the Internet portal to register his newest coffee shop: In order to expand his Spanish business, he decides to invest into a new branch in the City of X.

Usually this process would take up a considerable amount of time and money. But with the single-point-of-contact principle already implemented, Jose is able to manage the entire procedure via the web interface from his office in Madrid. In the corresponding form of the city's Internet portal, he fills in all required information including his preferred payment method. The according administrative procedure is then handled by Egon, who executes any human tasks involved in the procedure while the other steps are executed automatically.

Advantage of the innovation in comparison with existing solutions

The main advantage of the envisioned SDP in comparison with state of the art solutions is a substantial efficiency gain because:

1. The platform allows the automation of processes and workflows that were (semi-)manual before.
2. Civil servants can handle simple process development tasks themselves instead of requiring a more expensive and potentially longer IT development project.
3. Development tasks that cannot be handled by end users will be faster and cheaper due to the seamless interaction among parties over the platform.
4. The SDP is also a shared process repository so that new processes or modifications become immediately visible to all users, reducing propagation times and costs.
5. The modularity of the underlying service-oriented architecture (SOA) allows public administrations to buy only those services they really need, reducing the TCO of their IT infrastructure.

Conclusions and outlook

Public administrations constantly face new challenges that require adapting their mode of operation like the EU Services Directive. Implementing such requirements demands a flexible IT infrastructure. Combining the principles and technologies of SOA, semantic web services, Web 2.0, and lightweight process composition, the SOA4All SDP will help to realise such an advanced infrastructure that will allow civil servants with average IT skills to handle typical administrative procedures. Using web-based tools, civil servants can search, model, annotate, modify, share, analyse, and execute administrative procedures in the form of lightweight processes. Currently, we are developing a first version of the SDP. As soon as it is ready, we plan to evaluate it with end users from the public sector and other domains.

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Case Study 21: Including Customer Representatives in the Development of the Service Innovation "Model" for an Insurance Company

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Abstract. This case study describes an innovation process in which customer representatives participated. The case company is a medium-sized Finnish insurance company, which has developed several individual service innovations during recent years (e.g. online application and decision concerning indemnities, and a specific mapping service concerning insurance needs). Yet, the company has realised that its innovation activities are still quite product-oriented, focusing on the development of insurance products and IT systems. Our case study describes an action research project, where the authors together with the company have pursued a new type of process model for service innovation which would support the systematic implementation of a strong customer perspective. In our paper, we concentrate on the description of customer interaction in this work. This interaction was organised as a series of development workshops where representatives of customers participated.

Background

The perception of the customer, not only as a co-producer of services, but also as a co-developer is expanding. In the traditional way of perceiving the market, customers become involved at the point of exchange. The perspective of co-development presupposes that starting the interaction with customers much earlier – in the innovation of service offerings – generates new knowledge and ideas, and provides additional value both to the customer and the provider. Co-development leads to better identification of customer needs and the close interaction process favours creativity. The recent ideas on the opening of innovation activities follow the same line of thinking.

This paper presents a case study of a medium-sized Finnish insurance company. The company has developed several individual service innovations during recent years. These innovations have been based on broad, systematically gathered customer information. When our case study started in 2008, the company had recognised the need to develop their service innovation processes to be more customer-oriented. According to their notion, these processes were still too product-oriented: innovation efforts were targeted first and foremost to the development of insurance products and IT systems. The company was not only interested in increasing its customer-oriented attitudes in general, but wanted to develop such *a new type of process model for service innovation*, which would support the systematic implementation of a strong customer perspective. During the last two years we have carried out an action research -based case study, where these aims have been pursued. The final model is still under construction, but we have abundant material which illustrates both individual service innovations and *experiences of the interaction with customer representatives in innovation*. In this paper, we focus on the latter material and describe a series of development workshops where representatives of customers participated.

The opportunity

Among the individual service innovations created by our case company, two cases are worth mentioning in particular: online application and decision concerning indemnities, and a specific mapping service concerning insurance needs. As regards the former, the innovation is in the decision-making – the customer gets *the decision during the same on-line session* where he/she makes the application. (Online application as such is broadly used in Finland nowadays, i.e. it is no longer an innovation.) Thus, our case company does not require medical reports or receipts before making the decision, but asks them afterwards if the situation is unclear. As regards the

needs mapping service, the innovation lies in its deep and comprehensive nature and its *different applications for different age groups*, including seniors who are often considered less attractive to the insurance business. (In its basic form needs mapping service is not an innovation; it is provided in some form by all insurance companies in Finland.) In our case company, the mapping service is carried out as one hour face-to-face discussion with the customer, and it covers broadly the issues which may influence the economic security of the customer. The service is free of charge and it does not put the client under any responsibility to purchase new insurance products. However, the discussion often reveals gaps or overlaps in the customer's insurances, deposits or loans, and in this way leads to seeking solutions which may benefit the service provider.

It was the needs mapping service that led the company to realise that there was still much to be done in its customer-orientation. As the company had carried out systematic R&D for years regarding its insurance products, it wanted its genuinely service-focused processes to be systematic as well. This led to the search for a new process model. In the development of this model, the analysis and further development of the above-mentioned innovations as well as some other services played a central role.

Description of the innovation

The part of the development process where customer representatives participated was carried out in the form of eight workshops. The company has 'customer juries', from which the workshop participants were gathered. As a rather small group was judged best for the work, only six customer representatives were invited. In addition, five persons from the company took part in the work. Each *customer workshop* had a specific focus and each of them was followed by an *intra-firm workshop*. In the latter, the customer workshop and its implications for the next step were judged, and ideas for the more general innovation model were gathered. Customer workshops lasted three and half hours and in-house workshops two hours. An individual service – life assurance – was used as an example to make the discussion concrete.

The first workshop was future-oriented. After the introduction of the aims of the work, the task of the participants was to identify important phenomena that are linked to insurance services in the present and in the future. The participants were asked to structure future phenomena using the concepts of *trends and weak signals*, whose combination enables a simultaneous consideration of the prevailing development and the emerging phenomena. In the second workshop, the participants addressed the question of how insurance services should be renewed in order to make them correspond to customer needs in the best possible way. The foresight perspective was included also here: instead of merely focusing on the immediate necessities of change, the customers were asked to imagine the services after five years in their ideal form. In this workshop, *service blueprinting* was used as the main tool assisting the work.

In the third workshop, the task of the participants was to describe *what a good service means in different situations*. In-depth understanding and respect for the needs and desires of the customer were highlighted as the most important expression of a good service. However, also information in the form of clearly 'packaged' solutions (instead of quantities of details) was considered highly important. Based on these results, the fourth and last workshop analysed *the characteristics of a successful customer encounter*. Socio-drama was the method applied in this workshop: the participants went through four types of customer encounters, representing situations previously identified. For socio-drama, customers (and in one case company representatives) formed pairs – one person played the role of a customer and the other the role of service advisor. The rest of the participants formed an audience and their task was to seek answers to the following questions: What does a genuine understanding of the customer's situation mean in practice? How can the respect for the customer be expressed? What type of information is useful for the customer and in which form should it be presented? What does it mean to offer a solution for a customer? Each 'piece' of socio-drama was followed by lively discussion and resulted in many new ideas for the development of insurance services.

How is success measured?

The company has measured the general success of its new services in terms of new customers who have been attracted to the company. These figures show that the development has been very positive.

What success has been achieved to date?

The development of an alternative service innovation model has continued in our case company after the process in which customers participated. Also other new methods of customer involvement have been tested, including future-oriented concept building. This approach seems promising especially at the very beginning of the process: in the idea generation phase.

Links to further information

The case has been analysed in the project ISO (Innovation Integrated in Service Operations) in the BIT Research Centre of Aalto University. The authors have been involved in this project, and further information can be requested from them. Some further information can also be acquired directly from the website of the company. The name of the company is Tapiola (http://www.tapiola.fi/wwweng/briefly/).

Case Study 22: “SMS for Life” Pilot - Roll Back Malaria (RBM) Partnership

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Abstract. "SMS for Life", the result of a public-private partnership involving the Roll Back Malaria Partnership, Novartis, Vodafone, IBM and the Tanzanian Ministry of Health and Social Welfare, used mobile and electronic mapping technology to track and manage the delivery and stock levels of antimalarial drugs to health facilities in rural locations in Tanzania. The "SMS for Life" system sent weekly automated SMS messages to staff at participating healthcare facilities, prompting them to check the stock of antimalarial medicines, and reply with an SMS that included detailed stock levels. These messages were collected in a central web-based system that provided District Medical Officers with stock level information accessible via the Internet or their mobile phone. Accurately monitoring the amount of medication available in a given location reduces the risk of running out of stock and ensures that treatments are available to malaria patients. The pilot elicited a high response rate, with a measured accuracy of 94% and the reduction or elimination of stock-outs of the five drugs tracked at the facilities involved.

Background

Stock-outs of malaria treatments at the health facility level in many sub-Saharan African countries have been a persistent problem for many years. In Tanzania, 93 % of the population are at risk for malaria
infection. Malaria is a preventable disease but without the right treatment it is life threatening. The number of malaria cases in Tanzania is estimated to be 11 million, resulting in 60-80 thousand deaths per year.

The opportunity

Accurately monitoring the amount of medication, such as ACTs and quinine injectables, available in a given location reduces the risk of running out of stock and ensures that treatments are available to malaria patients, even in the most remote areas, where and when they are needed.

Description of the innovation

A solution was developed using mobile phones, SMS messages, internet and mapping technology to visualize weekly stock inventory of Artemisinin Combination Therapy (ACTs) and Quinine Injectable at 129 health facilities and 226 villages.

Over the course of a year, the Project Team designed the system, created a data repository, trained key staff and implemented the solution for a 21-week pilot in three districts of Tanzania: Ulanga, Kigoma Rural and Lindi Rural. These districts are located in three different regions and supplied from different Zonal Stores with a catchment population of 1.2 million people.

How is success measured?

The SMS pilot was monitored using a combination of remote and in-country monitoring.

Key areas of assessment / findings:

1. System ease of use – the system was simple and easy to use.
2. Response rate - the response rate of health workers across all three districts remained consistently high throughout the pilot. 95 % of health facilities responded with stock counts every week with 93 % responding within the time limit to receive mobile phone airtime credit.

3. Data Accuracy - The project team calculated an overall data accuracy rate of 94 %. This was supported by surveillance visits to 116 (90 %) of the 129 health facilities to carry out full physical stock counts.

What success has been achieved to date?

The SMS for Life pilot had three objectives:

1. Demonstrate that visibility of weekly stock levels of five key medicines at health facilities on the outer edges of the Tanzanian Public Health System would promote action to reduce stockouts
2. Demonstrate that a state-of-the-art data gathering infrastructure can be made available via simple, basic everyday tools like SMS and mobile phones, to people situated in the remotest locations in sub-Saharan Africa.
3. Demonstrate the effectiveness of a public-private partnership model.

SMS for Life has achieved its three objectives and lead to the following recommended proposals:

1. The implementation of the SMS for Life solution in all districts of Tanzania
2. Implementation in other African or non-African countries that have a need to bring visibility to medicine stocks at the health facility and district levels, and eliminate/reduce stock-outs
3. Encouragement of the use of the solution to track other medicines of priority in national environments
4. The application of the SMS for Life solution to disease surveillance

Links to further information

Description of ‘SMS for Life’ on Roll Back Malaria Website - http://www.rollbackmalaria.org/psm/smsWhatIsIt.html
Pilot Report - http://www.rollbackmalaria.org/globaladvocacy/pr2010-04-21.html

Theme 5: Technology Innovation

Service innovation through the use of technology, for example through ICT enabled innovation, ICTs that are themselves innovative and support the delivery of new services, new ICT services, new ways of delivering services associated with ICT products, technology other than ICT

Case Study 23: Chasing the Long Tail: Growth through Personalised Telecoms Services

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Abstract. We highlight one transformational path for traditional telecom operators from several available to them to respond to challenges of declining revenues in their traditional business. The new opportunities appearing in the so-called 'Telco 2.0' world stem from using advanced service technology to provide access to telco's infrastructure in a two-sided business model, enabling easy creation of services to exploit small niches of opportunities within open service ecosystem. A telco can take the role of platform provider, service provider or service reseller in such ecosystems.

Background

Traditional telco business models, also dubbed "Telco 1.0" are characterised as operator-run closed environments, with tight control over the whole value chain and processes, and direct revenues achieved via network/billing silos. The operator offers services to mass market such as voice calls or text messages (SMS), with little or no customisation. The model relies on vertical integration, where the telco owns or controls the network. It uses a very simple cost and revenue model, where the operator incurs cost by maintaining the network, purchasing equipment and providing customer facing services (support, billing, etc), and receives revenue by billing users for services used, traditionally on usage-based tariffs.

The reasons for the past popularity of this model were the capital-intensive nature of telecoms infrastructure and the organisational culture prevailing in former utilities. The infrastructure was predominantly relying on fixed copper lines and centralised routing, so the lack of flexibility and inertness is inherent in such model, The situation started to change with the advent of mobile telecommunication services and the appearance of the "virtual providers" which do not own the infrastructure but specialise in customer service aspects (*e.g.* Virgin Mobile in UK). These developments rendered Telco1.0 assumptions invalid. Also, the telecoms sector has been subject to market liberalization in the last 20 years, bringing competition to it. In many cases, this has meant a separation between wholesale and retail providers and we have seen the emergence of the Telco 1.5 model. This latter model (Telco 1.5) has been associated with increased network capabilities, leveraging IP technology and protocols such as Parlay3 and SIP, expanding into broadband, mobility and networked IT services (known as 'new wave' areas).

These traditional and (formerly) lucrative ways of doing business are, however, coming under increasing pressure due to a number of factors: declining fixed voice business, changing customer expectations for increased variety of services received, and blurring of industry sector boundaries, where TV and media companies provided telephone services and vice versa. Telcos have also been challenged by webcos such as eBay and Google and even discount retailers entering the communication marketplace.

The opportunity

Telcos can exploit their existing assets and strengths by exposing their capabilities via innovative service platforms. They would thus move from a 1-sided to a 2-sided business model, tapping into new revenue streams from novel products and services. In brief, 2-sided business models are those in which revenues flow in two directions. When exposing their capabilities via a platform, a telco can take on various roles:

1. Platform Provider – here the telco offers a platform from which its own and/or other organisations' capabilities can be exposed;

2. Service (Capability) Provider – the telco exposes some of its own capabilities, either on its own platform or via a platform belonging to another organisation;
3. Application Provider – the telco creates applications and services built from compositions of its own and/or third party capabilities;
4. Application Reseller – the telco offers an environment wherein application developers can publish their applications for sale, effectively making the telco a reseller of these applications with an appropriate revenue sharing agreement.

Which role(s) a telco will wish to take on depend on the commercial environment(s) in which it is operating and its own technological and business preparedness.

Description of the innovation: a service delivery platform for the public sector

In response, telcos are moving to expose capabilities via the Internet and embrace a two-sided business model in **open service ecosystems**. This is a part of a larger initiative that is changing the web from a place offering primarily information to users to a so-called 'service web'. The established webcos and telcos are among the leaders in this trend with organisations such as Amazon, Google, AOL, BT and Telefonica among those who have already moved in this direction, along with many smaller start-up webcos. The **Telco 2.0** initiative introduces the notion that telcos should use the opportunity provided by their position in the value chain in order to develop new "2-sided" business models, extracting value from both sides of a value chain. One side is the traditional revenue where customers pay for core telco services such as voice and messaging; the other revenue side is made possible by the telco's position as a platform provider, offering platform services to third party businesses who then build on those services to offer services and applications to their own customers.

Exploiting the "long tail": Opening up the platform access to third parties allows the market to innovate by implementing new niche personalised services, which are currently not viable commercially given the application development costs. Services exposed via the Telco API can be divided into 3 main segments:

1. *Operator branded services*: using core telephony services in combination with third party features to create a new offering;
2. *Co-branded services:* services that enable a brand's customers to be accessible to an operator, e.g. operator's Facebook widget.
3. *Long tail services:* services too niche for operators to consider offering to customers today.

Having and exposing the Telco API is not enough: in order to achieve critical mass, operators must nurture and support an application developer community (innovation community). For the API to be used it is necessary to make it easy for the applications to get on the operator's network, easy to be discovered by early adopter customers, and to have easy to use tools for the community that enables rapid application development. Allowing developers to create their own applications and providing them an option to be a part of an ecosystem (e.g. "iPhone App Store") gives an opportunity for Telcos to take a share of the revenue, hence implementing new business models described in the next section.

Existing developments

Telcos are already responding. BT is redefining its roles and offerings within the 21CN programme, aiming to deliver a new IP-based 'future-proof, flexible, intelligent' network. This coincides with other restructuring or network transformation (*e.g.* France Telecom and Deutsche Telekom, Netherlands KPN, and Verizon). China Telecom aims to become integrated information service provider. Most are providing free or credit-based usage of published capabilities via an API, whilst reserving the option to change the model. Another approach comes from Ribbit, using the concept of "bringing your own network" (B-Y-O-N) and using their platform to build communications into the business by leveraging an existing underlying carrier network.

There are also lessons learned available – Microsoft has shut down its own Telco 2.0 initiative called CSF (Connected Services Framework) product in December 2008. The reason offered was that current deployments in 30 service providers, had required a much higher degree of

customisation than expected, prompting the software giant to focus more on the delivery of Web services via Exchange Online and SharePoint Online and leave the telecom service delivery platform business to systems integrators.
As mentioned above, in addition to telcos, webcos and, increasingly, device manufacturers (Nokia, Motorola, etc.) are also participating in this new environment and, in addition, there are many smaller companies offering functionality over the “internet of services’.

The technology providing such functionality over the internet of services is the focus of the EC project SOA4All, providing a platform and development environment for creating and consuming services. This can promote services and facilitate telcos in exposing capabilities in a user-friendly manner. Allowing end-users and third-parties to combine services in different ways will promote new personalised services and the Long Tail business model. SOA4All technologies benefit environments where a large number of services and users are foreseen, since the semantics involved in these technologies provide an intelligent way of dealing with this scale, and will ultimately enhance the user experience.

Conclusions and outlook

There are a number of challenges that need to be addressed in order that SOA4All technology can play its full part in assisting in the transformation from Telco 1.0 to Telco 2.0, including billing technologies, integration issues and choosing the correct business model and service ecosystem model (open like Facebook or closed like Apple appStore). Once these challenges are resolved, service technology such as the one developed on SOA4All would provide valuable support to telecom operators, helping them to re-invent themselves in order to tap into the new opportunities in a world dominated by web-enabled service providers. Indeed, the telecoms sector is in a period of rapid change with falling traditional revenues but many new opportunities in the new Digital Ecosystem (telecommunications, media and information, software/technology) as the borders between the sectors are increasingly blurred. There is an increasing need to reconsider business and structural models to compete effectively in this new world. Otherwise telcos are in danger of becoming utility companies offering bandwidth at ever-decreasing margins.

Case Study 24: Achieving Service Innovation through a Health Education Programme: Insights from Working with South Asian Women

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Abstract. International evidence confirms that patient educational self-management courses help people with long-term conditions to improve their daily health management, which benefits their quality of life and, in the UK, provides a small cost saving. People from South Asian (SA) backgrounds who live in the UK experience substantially worse health than other groups, yet few SA people attended the pilot phase of one self-management course: the Government-funded Expert Patients Programme (EPP). The six structured sessions last 2½ hours per week, and are delivered by trained tutors. Key topics include communication, nutrition, exercise, cognitive symptom management, contracting and problem-solving. For the current case-study, Punjabi Sikh Indian women offered experiential insights about living with arthritis and attending the EPP. Analysis, which revealed promising areas for service innovation and improvement around components of this course and its delivery, which may in turn result in improved resource efficiency and quality of life for this group.

Background

Based on Stanford University's self-management model, the UK's EPP is a free self-management course that helps people with long-term health conditions to improve their daily health management, whilst offering a small cost saving. Government funding has allowed such courses to become widely available to people living with long-term conditions. However, concerns were raised about exacerbating substantial existing minority ethnic health inequalities, when few SA people attended the pilot phase of the EPP. The World Health Organisation and the Department of Health advocate the cultural tailoring of patient educational self-management courses, through engagement with target communities, to address these increasing health inequalities. As with many other long-term conditions, arthritis is more prevalent amongst SAs in the UK than in the majority White population. Yet little is known about SA community-members' experiences of living with and self-managing arthritis, their understandings about self-management courses, what barriers and enablers to attendance may exist for them, or their experiences of attending EPP.

The opportunity

This exploratory study afforded an opportunity, from the perspectives of Punjabi Sikh Indian women living in the UK, to describe:

1. their experiences of living with and self-managing arthritis, prior to attending the EPP;
2. their understandings about self-management education, before their enrolment on the EPP, to identify perceived barriers and enablers to participation;
3. their experiences of attending a Punjabi-language EPP.

Description of the innovation

For this novel case-study, 10 Punjabi Sikh Indian women with arthritis (mean age 65 years) were recruited at a community centre in an area of urban deprivation, in the UK, prior to attending the EPP. Interviews were performed in English, or in Punjabi with a trained, qualified interpreter. Data, translated where necessary, were transcribed in English, before being qualitatively analysed using Interpretative Phenomenological Analysis, in what is believed to be a methodological

innovation. Four participants were re-interviewed after attending a Punjabi-language EPP, which had been culturally modified in light of the initial findings.

How is success measured?

The success of this research is confirmed by the striking and unique results that the analyses revealed. Prior to EPP attendance, participants actively self-managed their physical symptoms of arthritis, such as pain, by using tailored combinations of prescription medication (painkillers), dietary modification (e.g. traditional Indian herbal remedies) and yoga. These women also engaged familial and spiritual sources of psychological and social (psychosocial) support, in order to better self-manage psychosocial aspects of their arthritis experiences, such as adjustment to disease.

Numerous enablers to self-management educational participation were identified, of which some were culturally-situated. For instance, the women understood that dietary advice is given at self-management courses, and felt that examples using vegetarian Indian foods would be most relevant. Similarly, self-management education that addresses their prevalent herbal medicine usage would be pertinent and exercise guidance that considers this group's widespread use of yoga, would also be beneficial.

Potential barriers to these women's participation in self-management education were again more similar than different to those found in White populations. However, linguistic considerations were highlighted by some women. Several participants expressed a preference for self-management programmes to be conducted in Punjabi, if possible, to enable as many members of their community as possible to attend and benefit. Although some participants could speak and read some English, Punjabi courses would enable them to "understand it fully" whereas "If it is in another language, we only understand half". Importantly, no conceptual barrier to self-management, or health education per se was identified.

Following their attendance on a Punjabi-language EPP course, the participants had all learnt new techniques that helped them to actively self-manage their arthritis. They particularly welcomed the culturally-tailored information about dietary modification and exercise that they received on the Course. These women greatly appreciated the opportunity to attend the Punjabi EPP, finding it a positive, shared learning experience.

What success has been achieved to date?

This novel case-study identified promising areas for innovation to this health education Programme, which was refined to better meet the needs of this culturally and linguistically diverse group. This may, in turn, improve their quality of life, whilst offering a small cost saving. The importance of this study has been recognised by the EPP's national management, and in the divergent disciplines of Health Psychology, Rheumatology, self-management, diversity in healthcare, and Interpretative Phenomenological Analysis. The necessity to consider patients' experiences during the introduction of the NHS Self Care agenda is increasingly being acknowledged.

Links to further information

Agility in Self Care, University of Warwick: http://www2.warwick.ac.uk/fac/sci/wmg/research/self-care/

Self-management websites: UK http://www.expertpatients.co.uk/ US http://patienteducation.stanford.edu/

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Case Study 25: The Benefit of Knowledge Sharing: A Case Study of Real Estate Brokerage Service

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Abstract. The Taipei Association of Real Estate Brokers (TAREB) integrated all resources from members and government to install an electronic commerce (e-commerce) website, which is shared with all members. In order to successfully implement e-commerce and knowledge sharing, this association also formulated a reasonable commission share system and a disputation arbitration mechanism to encourage and ensure house agents to share information and objects. Finally, all members of TAREB enjoyed an expansion of the market, cost reduction, profit increases and numerous benefits which are brought by e-commerce and knowledge share.

Background

Before 1980, because the industry of real estate brokerage in Taiwan was in its infancy, the performance of a house agency depended on the interpersonal skills and sale capabilities of an individual broker. However, some brokers may ruin the reputation of a house agency and consumers may loose faith in it. Along with economic growth of Taiwan, consumers felt the importance of transaction security and brand equity of a house agency. Some agencies with good reputations and management policy started to operate the chain store model for the industry of real estate brokerage. Hereafter, the chain store model has become the mainstream in this industry. The individual house agency survived in this industry by operating niche market strategy.

The depression of 2000 significantly impacted the industry of real estate brokerage in Taiwan. The chain-store house agencies stayed alive in this market by shutting down some unprofitable branches. However, the individual house agency faced a rigid challenge, and some individual house agencies were forced to retreat.

In the meantime, Taipei Association of Real Estate Brokers (TAREB) considered e-commerce as a possible solution, because e-commerce might reduce the tangible cost such as store rent and the huge labour cost. Therefore, TAREB decided to install a website to exploit the opportunity brought by IT/Internet to help all members. In the introduction stage of website, TAREB provided free web page and IT training courses for all members. However, the response of members is very disappointed.

Description of the innovation

After realising the difficulty of introducing TAREB's website, TAREB developed the first innovative business model, the commission sharing system. In addition, TAREB applied the government funding to help members to establish their own websites, and prepared some budget (around 4,000 US dollars) to encourage members who had good IT capabilities to support the decision made by TAREB and to share their house objects with other members by using hyperlink. TAREB set up the standard commission ratio for all objects. Then, the commission is separated by 6:4 or 5:5 for the agency which figured out the house objects and the agency which actually sold the object. However, this model did not provide good results, because members only shared house objects which are hard to sell and would not share cash cow which the original finders had no time to sell with other members. Even worse, some members sold the objects shared by other members and refused to share the commission.

Then, TAREB designed a disputation arbitration mechanism to help the original finders get the commission back. If the original object finders can propose the contract between the original object finders and house owners, TAREB will consider the house agency which refuses to share the commission as an “information thief”. Then, TAREB will warn the information thief by a formal letter, and suspend the membership and account of the information thief until it pays the commission by the ratio. If the aforementioned house agency does not accept the arbitration and still refuses to pay, TAREB will help the original object finders bring a suit against the unfaithful house agency. This mechanism effectively minimised the disputation as related to information theft. The cohesion of TAREB members also is increased. The market of real estate brokerage in Taipei is enlarged and boomed.

In addition to the above management systems, TAREB also introduced advanced IT technologies such as Virtual Reality, Mobile Commerce, and GPS(Geographic Position system) to help members to manage individual brokers, reduced cost and enhance transaction efficiency and customer satisfaction.

What success has been achieved to date?

Initially, after introducing e-commerce, TAREB only expected to leverage IT technologies to reduce cost and increase transaction efficiency. However, TAREB established two innovative business mechanisms and achieving the following benefits resulted from knowledge sharing:

1. The transaction time is shortening. Before TAREB helped all members to website to share information and to conduct collaboration commerce, individual house agencies had required at least three day to complete all processes of developing a house object, including signing the contract with house owner, taking picture for the house object, verifying the house object, preparing documents for the house objects. Especially, the process of verifying the house object takes one day to complete. After implementing IT technologies, house agencies only require ten minutes to verify house objects from the government agencies. In addition, house brokers can ask help from their fellow workers to take pictures of the house object. Therefore, all processes of developing a house object can be expected to complete in one and half hours. Once the object development is completed, house agencies can post this object on there website. All members of TAREB will do their best to sell this object. Therefore, the transaction time is shortened.

2. The collaboration commerce promoted by TAREB can come up with performance synergy. In the early years, the brokers with interpersonal skill and sale experience may achieve a lot of transactions every month. But the novice may take a month to achieve nothing and no commission. Because TAREB establish a supply chain with well labour division, both novice and veterans can play their own roles and make sure that they can receive commission every month. Also, every house shares the website maintenance cost with each other. It helps to reduce IT cost. In addition to monetary benefit, many intangible benefits can be achieved such as enhancing customer satisfaction, confirming customer loyalty, and ensuring that every house will attract someone to take care no matter how hard to sell it promoting manpower quality by information sharing, and overall performance booming.

3. Real-time and accurate performance auditing. In the past, house agencies asked their house brokers to fill in a lot of forms and join a sale review meeting to audit performance of every broker. After introducing e-commerce and relative IT systems, every transaction will be real-time and accurately recorded and IT also can help its completion. Every house agency can access the TAREB website and its own human resource management system to review performance. This way can provide real-time and accurate performance auditing with a paperless way. In addition to broker performance, house agencies can also identify hot objects or hot area from the website.

4. Expansion of overall market. Since information share can reduce redundant work on the same objects, the brokers can have more time to develop new objects. Therefore, more second-hand houses will be released. It increases the object supply. On the other way, the buyers have more convenient and real-time way to access house object information that will speed up the transaction and increase the total quantity of transactions.

To sum up, all members of TAREB enjoyed an expansion of market, cost reduction, profit increases and the numerous benefits which are brought by e-commerce and knowledge sharing.

Links to further information

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Case Study 26: Using Virtual World Technology to Deliver Educational Services

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Abstract. Despite increasing educational use of immersive virtual environments for seminars, lectures and teaching related events there is an absence of ceremonial events such as graduation. Graduation is not simply an 'event' but a cultural practice, a ritual, marking a life-transition point and public recognition of achievement. This case study reports a recent innovation in the delivery of educational services in which university students take part in an official graduation using Second Life.

Background

Virtual Worlds [VWs] are a significant development for both the Internet and society as a whole. The 3D capability and, importantly, a personal viewpoint, make them highly immersive and compelling for virtual learning. There is already a sizable body of literature reflecting the growing use of VWs in education. In particular, as educators gain access to Second Life technologies, adaptable, conceptual spaces are being created. There is also much work on simulating real-life situations or environments and projects using highly accurate real-world simulations as educational tools. Other initiatives examine the types of space required for effective learning in a variety of subject areas and create suitable spaces for online collaboration in multi-user virtual environments

The opportunity

Yet documentary evidence for support of alumni groups or holding educational ceremonial events in Second Life is limited. Graduation ceremonies have been streamed as video presentations into virtual auditoria but these still required physical presence to take part, conspicuously absent are graduation ceremonies run uniquely within Second Life using avatars to represent the graduands.

In this case study, we describe running such a graduation event. We argue that for students, graduations are a fulfilment of the investment (time, finance, emotion) they have made in their education and the start of a new phase of life. Academic Graduations are a symbol of transition in lifespan development; a ritual event marking the passage or transition in our social status, for example, from student to professional, from learner to worker. Moreover, academic 'Graduations' are used as a symbol of achievement and success by individuals, educators, organisations and governments alike. The power lies in this symbolism; the degree certificate, the graduation gowns, the academic procession, the speeches, the photographs, etc., graduations represent attainment of some sort of 'expertise'.

For academic organisations, the symbolic significance of the Graduation is as a mark of achievement in teaching students, providing the necessary infrastructure, and as a measure of their ability to attract successful students. Many e-learning programmes without such a ceremony do not provide students the opportunity for closure that is demonstrated as important on other courses Importantly, in an age of distributed learning, they are also forgoing the potential to a) validate the University's legitimate power and unique ability to confer the awards, b) attract new students by demonstrating success in helping students to succeed. So, the seemingly simple act of giving and receiving a certificate has a series of possible consequences beyond the ceremony itself that can impact on the educational organisation.

Description of the innovation

The Manchester Business School Second Life Island was built as a space that takes the idea of 'the 3d web' literally. It uses familiar website paradigms of top level and secondary navigation to determine the design of the virtual space, creating an environment where navigation is intuitive and rational. The 'physical' structure acknowledges that it exists in an environmental where the usual constraints of physics (atmosphere/climate, gravity, etc.) do not apply, therefore there is no need for windows, roofs and doors and we are able to create an 'impossible' structure that defies real world building conventions. The structure is based around a tower that is accessed by a lift and forms the backbone of the site where each colour coded level represents the top level navigation. From each level the visitor can access a number of modular spaces. These represent the secondary navigation. Visitors land at a central hub (or home page). Although the overall aesthetic is futuristic there is a sense that the space is underpinned by old technology as massive cogs work in the background, so referencing a local industrial heritage.

This graduation case concerns a Managing Projects course for a major international company, a distance learning course supported heavily by e-Learning technologies yet lacking a formal graduation due to the difficulties inherent in gathering together geographically dispersed, critical staff. The cohort for the event was from UK, USA, Norway, Germany and Egypt.

The Second Life Award Ceremony provides an opportunity for Senior Management in the company to mark the importance of the achievement by the delegates while minimising travel costs, time commitments and disruptions to major projects and helping reduce the carbon footprint of such an event. The Group Director of Projects for the company took part in the ceremony to underline its importance. The Programme Deputy Director provided overall project management including University and company approvals, formal invitations, a trial and a dress rehearsal, whilst a commercial company provided design, technical development and delivery.

The ceremony took place in two 'rooms' developed for this purpose in Second Life: a small ante-room where delegates and guests arrive, are welcomed, and can return to at the end of the award ceremony (celebration phase) and the main 'hall' where the actually ceremony was conducted (The Whitworth Room). We sought to recreate reality enough to give participants some sense of comfort, following the established order of ceremony while at the same time taking advantage of the new environment. For participation with minimum effort, we created avatars for each graduate from photographs and provided gowns, simplified avatar gestures to essential items only, and provided a simple user guide describing how to move and interact, limited to essential information required to take part in the ceremony. Most graduands also took part in a dress rehearsal following a formal Order of Ceremony document sent to all participants prior to the event.

Speeches were pre-recorded; avatars and gowns were provided appropriate to the status of dignitaries. During the ceremony, we provided experienced operators for dignitary avatars, and a marching script to ensure that the dignitaries marched in time during the procession. Graduates received their certificates by a script controlled handshake with the vice chancellor. We made the event a memorable experience for participants by providing a souvenir video of the occasion, downloadable certificates and an opportunity for networking with fellow graduates.

How is success measured?

Success was measured by gathering feedback from all key stakeholders using short questionnaires and telephone interviews where appropriate. A range of measures were explored to assess social and emotional impacts of the ceremony such as feelings of importance and self-esteem; design issues such as ease of use, ease of navigation; and control; and issues related to the six essentials of rituals (Grimes, 1994) i.e. ritual space and time; ritual objects, sounds and music; identity; and ritual action.

What success has been achieved to date?

The first ceremony in February 2009 was successfully concluded (Financial Times); graduates enjoyed the ceremony and felt engaged, as evidenced by spontaneous celebratory behaviours at the end of the ceremony that mirror those in 'real life', e.g., throwing hats in the air and cheering. For the MP programme, a second event was held in February 2010 and we would expect to run the event 3 times per annum for up to 35 delegates per cohort.

Links to further information

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Case Study 27: Partnering for Technology-led Innovation to Deliver Enterprise Service Innovation - Ultra High Resolution Seismic Sensing Solution

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Abstract. Many clients are looking to technology partners or suppliers to help them innovate. They believe with their in-depth technology and industry expertise, vendors should pro-actively offer them innovation services that will help them succeed in business. HP's converged approach to innovation is unified, client-focused and aligned to business strategies that achieve outcomes that matter most to our customers. Central to this approach is our ability to help clients explore, evaluate and leverage HP's innovation assets - including our partners and industry best practice - to apply the right technology and solutions. One such example of this successful partnership approach to innovation is with one of HP's global energy clients and the application of HP's ultra high resolution Seismic Sensing Solution.

Background

The oil and gas industry requires high-quality seismic data to accurately assess exploration prospects for commercial viability and to effectively monitor in-production reservoirs. By delivering a much higher channel count and a broader sensor frequency range than are currently available, the new system promises to vastly improve the quality of seismic data.

HP is collaborating with a global energy company around a joint innovation agenda in which a particular focus is to develop a wireless sensing system to acquire extremely high-resolution seismic data on land. The companies will use their complementary knowledge, expertise and experience to produce this ground-breaking enterprise innovation solution that can sense, collect and store geophysical data.

HP is approaching sensing networks not just as sensing or moving data or crunching it, but from a holistic perspective. Using networking expertise in HP's Networking division, and consulting and integration through their Enterprise Services division (formerly EDS), not to mention business intelligence, storage and data center technologies. The ground-breaking solution will be delivered by HP Enterprise Services.

The opportunity

MEMS accelerometer is a sensor that can be used to measure vibration, shock or change in velocity. By deploying many of these detectors as part of a complete sensor network, HP will enable real-time data collection, management evaluation and analysis. This information empowers people to make better, faster decisions, and take subsequent action to improve safety, security and sustainability for a range of applications, such as bridge and infrastructure health monitoring, geophysical mapping, mine exploration and earthquake monitoring.

The HP sensing technology enables a new class of ultra sensitive, low-power MEMS accelerometers. Up to 1,000 times more sensitive than high-volume commercial products, sensors based on this technology can achieve noise density performance in the sub 100 nano-g per square root Hz range to enable dramatic improvements in data quality. The MEMS device can be customised with single or multiple axes per chip to meet individual system requirements and benefit applications such as bridge, infrastructure and seismic monitoring.

The sensing technology is a key enabler of HP's vision for a new information ecosystem, the Central Nervous System for the Earth (CeNSE). Integrating the devices within a complete system

that encompasses numerous sensor types, networks, storage, computation and software solutions enables a new level of awareness, revolutionising communication between objects and people.

In the first commercial application of CeNSE technology, HP and a global energy company will build a wireless sensing system to acquire high-resolution seismic data. By vastly improving the quality of seismic imaging, the new system will allow our client to more easily and cost-effectively explore difficult oil and gas reservoirs.

Sensor nodes, however, are only part of the challenge of CeNSE. At a typical data rate, one million sensors running 24 hours a day would require 50 hard disks running in parallel to capture the 20 petabytes of data created in just six months. It then has to be crunched to extract meaningful information.

Description of the innovation

The importance of Enterprise Innovation is widely recognised, but knowing how to stimulate, manage and globally connect innovative thinking within an organisation can prove challenging - a challenge HP is responding to with its client-centric approach - The Innovation Agenda. HP is also expanding its innovative approach by offering 'Innovation '*as a service'* to help clients gain real business advantage by innovating in their own domain. Through this service, HP can help clients build a framework for innovation that is geared towards addressing the client's key opportunities and challenges and help the customer develop a strategic approach to innovation to drive transformation that is firmly aligned to their business outcomes.

Enterprise innovation as a Service is designed to help its client innovate and is based on a composite set of tools for the client to use to drive and manage innovation across their own organisation, whether it's across the client's research and development activities, creating new services, or collaborating with their partners and industry peers or mergers and acquisitions. This is leading to new and novel ways in which HP's clients are using IT to drive and support their ideas, encourage their creativity and thought leaders and create business advantage.

Additionally, HP has its own highly-effective research and development capability, HP Labs, which focuses on near and long-term research and developing the next generation of leading technology and business advantage and collaborates with academia, industry and, of course, its clients. One of the objectives of the 'Innovation as a Service' from HP is to link the HP Labs work to the customer, to identify areas of potential collaboration and linkage around future content and services.

HP, along with a global energy company and leading edge technology developed from HP Labs has developed an inertial sensing technology that enables a new class of ultra sensitive, low-power MEMS accelerometers that are up to 1,000 times more sensitive than high-volume, commercial products.

Integrating the devices within a complete system including IT services that encompasses numerous sensor types, networks, storage capabilities, and computation and analysis tools that monitor the environment, assets, and health and safety, enables a new level of awareness, revolutionising communication between objects and people.

The new sensing technology represents a breakthrough in nano sensing research and uses the fluidic MEMS technology co-developed over the past 25 years by HP Labs - the company's central research arm - and the company's Imaging and Print Group. The technology is a key enabler of HP's vision for a new information ecosystem, the Central Nervous System for the Earth (CeNSE).

The companies will use their complementary knowledge, expertise and experience to produce a ground-breaking solution to sense, collect and store geophysical data. The system is designed to integrate seamlessly with high-performance computing and seismic imaging environment and to be deployed safely and more cost-effectively than current systems and services.

How is success measured?

The success of this innovation will be measured against client, industry and environmental factors:

1. Better and faster decision-making in the business
2. Increased clarity of existing and alternative energy resources
3. Ability to perform more targeted oil exploration thereby reducing environmental impact
4. Harnessing the potential of the client's processing and imaging technology on land
5. Transferability of sensor network expertise to other domains such as public safety in cities and environmentally sustainable resource management

Case Study 28: Meeting in Web Browsers: The PowerMeeting Real-Time Collaboration Service

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Abstract. Built on the latest Web 2.0 technologies and practices, the PowerMeeting real-time collaboration service enables team members to meet and work together using standard Web browsers as front-end. The service offers a team workspace integrated with textual and voice communication channels, various generic and task-specific groupware tools, and group process facilitation mechanisms. Using such a comprehensive collaboration service can help teams work together more efficiently. The service can also be easily integrated into other collaboration environments for example, by embedding its workspace URLs in the content of Emails, Blogs, Wikis, Blackboard learning systems, or social networking sites such as Facebook. Initial case studies and usability evaluations have provided encouraging feedback on the service.

Background

The Web has been used as a platform for information sharing and collaboration support. The collaboration services provided over the Web are mainly for supporting asynchronous collaborative activities. Examples of such services include BSCW [8] and Blackboard [9]. However, until recently real-time collaboration services that use standard Web browsers as frontend have been rare.

The opportunity

With the emergence of many Web 2.0 technologies and practices, web-based services for asynchronous collaboration support have become more interactive and media rich. Wiki, Blog and Facebook are typical examples of such systems [5]. More importantly, the latest Ajax (Asynchronous JavaScript, and XML) [1] and server push technologies have made it possible for the Web to support the two-way communication between Web browsers (i.e. Web clients) and Web servers. Such two-way communication makes the implementation of real-time collaboration services on the Web possible [7]. Examples of such real-time collaboration services include Google Wave (for instant messaging, shared text editing, and small groupware gadgets) [3], Google Docs (for shared document editing), Microsoft Office Live (for shared editing of MS Office documents), ThinkTank (for real-time decision support) [4].

Most existing real-time collaboration services, such as Google Docs and Microsoft Office Live [6], provide support for document editing, instant messaging, and whiteboarding. They have not provided task-specific groupware tools that address the needs in various application domains. ThinkTank provides a few task-specific tools for decision making; however, this Adobe Flash based system does not support third parties to develop and add their own tailor-made tools. Google Wave provides an open development environment. However, due to its specific (Operation Transformation based) concurrency control mechanism and its simple groupware gadget specification, only very simple groupware tools (with a textual attribute list as its data structure) can be developed and integrated into the Waves. None of the above mentioned systems have integrated voice communication channels and meeting process support for distributed teams to coordination their actions in their working sessions. To address these deficits, we need to create an open extendible environment that allows sophisticated groupware tools to be developed and integrated into it, and has integrated support for voice communication and group process facilitation.

Description of the innovation

The PowerMeeting real-time collaboration service aims to address the above mentioned deficits and requirements. PowerMeeting provides a shared workspace, identifiable by a URL (uniform resource locator) and accessible using a standard Web browser [7]. Users can enter a workspace as session chair or participant and work together on shared information objects using various groupware tools. In the workspace, an agenda list can be created by the users, used and adapted by the session chair to control the group working process. Each agenda item corresponds to a collaborative activity and a groupware tool that is suitable for the group activity. Currently, groupware tools available in the service include a group calendar, a task diagram editor, a project planning and monitoring tool, a pin card board, a remote presentation slide tool, a brainstorming and categorising tool, a multi-criteria decision making tool, a cooperative mind-map tool, shared HTML page, and a constraint-based flexible process support tool.

The system is expansible; various groupware tools can be developed and integrated into the system using a shared model-view programming model and a groupware toolkit (a Java class library). An optimistic concurrency control mechanism maintains the data consistency across the client and server. The system is implemented using Google Web Toolkit (GWT) [2], Ajax push technology, and MySQL database. With GWT and the PowerMeeting toolkit, the only prerequisite knowledge needed for the tool development is Java -- is a widely used object-oriented programming language, which is supported by freely available professional strength software engineering tools (e.g. Eclipse and NetBeans) and has large numbers of potential application developers [7].

How is success measured?

The PowerMeeting service has been tested and evaluated using a wide range of metrics on system performance, user task performance, and user satisfaction in five usability studies. It has also been measured in three case studies. In these studies, data for the metrics have been collected from three sources: 1) manually recorded in experiments, 2) automatically logged by the PowerMeeting system, and 3) automatically logged by Google Analytics service. Users involved in the studies include end users for testing the usability of the service and tool developers for testing the usability of the groupware programming model and toolkit.

What success has been achieved to date?

The service has been online since the 13th of November 2008 and has been continuously updated based on the feedback received. Based on the data collected from Google analytics, it has attracted quite a high number of users with a reasonable average time-on-site per visit and a high return rate (more specifically, over 2000 visits by users from 70 counties/territories, with an average 3.42 minutes time on site per visit and a 50% return rate). Based on data from the system logs, it has achieved a sub second groupware performance in terms of average round trip time of transactions. The optimistic concurrency control mechanism has got a good test result: Users' changes are immediately reflected on user interface; the conflict rate is low and in all tests data consistency has been maintained.

On the tool expansibility side, the PowerMeeting framework including its shared model-view programming model and groupware toolkit has achieved a good level of "learnability". Students with a low to medium level of Java programming experience have been able to familiarise themselves with the framework within a couple of weeks, and then proceed to design and implement their groupware tools successfully in their thesis projects.

The service has been used in teaching and learning of two postgraduate courses and also used in many student group projects. In addition, five formative usability studies and three case studies have been performed. Lots of improvements have been suggested, some of which have been implemented. Results from the studies indicate that most of the groupware tools have got a good task completion rate and good time-on-task performance. Many of the tools have also had a good

level of user satisfaction. Compared with ThinkTank, PowerMeeting is more open and extensible and has integrated support for textual and voice communication. Compared with Google Wave, PowerMeeting can support more sophisticated groupware tools and have better facilitation support for group processes. Comparing with Google Docs and Microsoft Office Live, PowerMeeting provides task-specific groupware tools beyond joint editing of office documents.

Links to further information

More information on the PowerMeeting real-time service (including the online service itself) can be accessed at: www.powermeeting.co.uk

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