

# EBRF 2011 - Conference Proceedings



"Research Forum to  
Understand Business  
in Knowledge Society"

## Proceedings of EBRF 2011

Edited by  
Marko Seppä, Mila Hakanen and Katri Mäkinen

# Electronic edition

ISSN 1797-1918

ISBN

978-951-39-4780-4 (JYU)

978-952-15-2866-8 (TUT)

978-951-44-8860-3 (UTA)

978-952-60-3613-7 (Aalto)

978-952-265-254-6 (LTY)

978-951-42-9865-3 (OY)

978-952-12-2762-2 (ÅA)

Published by

University of Jyväskylä

Tampere University of Technology

University of Tampere

Aalto University

Lappeenranta University of Technology

University of Oulu

Abo Akademi University

# Conference proceedings

## FOREWORD

Global business creation is a tough game. To welfare societies it is no longer just a game, however, but a matter of life and death. The ability of nations to sustain public services – for example, to pay salaries to researchers and educators – depends upon the jobs and tax income created by their globally growing enterprises. And yet there is no university domain dedicated to producing masters and mastery of this important art.

The 11<sup>th</sup> EBRF Conference – Global Business Creation Games: Co-Creation of Enterprise for Problems Worth Solving – urged us all to make better use of our slack resources, both tangible and intangible. This is equally acutely needed in every sector of society and from every person, both natural and legal. Like in the times of the Great Explorers, bold exploration across murky waters is again called for. Like always, some roads will be dead-ends, but we cannot find the right ones without leaving our sofa.

At EBRF 2011, we discussed with concern “time to market” for new products and businesses, but were equally concerned about time to market for the research we conduct – or whether our research has an impact on the marketplace, to begin with. This is how EBRF has challenged us, from the get-go, in 2001. With elements of an unconference, EBRF 2011 sought for ecosystem level impact by engaging entrepreneurs, executives, and policy makers in the scholarly process through what were called ecosystem level Live Case exercises. Such exercises were undertaken under six grand topics: Capital, Education, Energy, Health, ICT, and Wellbeing. All the approved abstracts and conference presentations were divided between them. The purpose was to jointly discover exciting new ways forward. At least some baby steps were taken.

Entrepreneurs can freely choose which type companies they build. They can, for example, concentrate on building businesses aimed at solving big social and ecological problems. Researchers can choose the problems and solutions they investigate, and the purposes they serve. Policy makers and innovation financiers can first define quite exactly what they want and demand *plans* that fit the bill. Alternatively, they can build agile policies that are fitted to back the most innovative, motivated and committed *teams*. For a game-change, co-creation across all borders is needed.

At EBRF 2011, each of the ecosystem level Live Case exercises produced their own global business creation canvas. One objective was to inspire the presenters of approved abstracts when finalizing their full papers, after the conference. By an ultimate deadline, altogether 20 conference presentations transformed into full research papers, all featured on the following pages. A range of 2-4 full papers emerged under each grand topic. While there are only 2 papers under ICT, there are 3 papers under Capital and Energy and 4 papers under Education, Health, and Wellbeing. To be sure, as these are not business as usual research topics or streams, there may be a paper or two, for example, under Education, with little or nothing to do with education, per se.

For important acknowledgement of our work and approach, Technology Innovation Management Review ([www.timreview.ca](http://www.timreview.ca)) decided to dedicate a special issue to EBRF 2011 conference papers. Dedicated to “Global Business Creation”, the TIM Review June issue features seven particularly insightful EBRF papers. All but one of the grand topics, namely ICT, is represented in the special issue. Also the authors whose paper did not make the special issue pulled themselves and the fellow members of their ecosystem level Live Case exercises out of their comfort zones, thereby successfully providing value-adding inspiration, provocation and stimulation across many borders. On behalf of all the organizers, I wish to thank each contributing author and participant.

In her message to the EBRF 2011 organizers, having to decline a keynote invitation, Kelly Fitzsimmons, an extraordinary lady game changer and serial entrepreneur, pointed how successful business creators come in every size, shape, gender, and colour of skin, and from every kind of family and educational background as well as type of personality. What they share in common, according to her discoveries and observations, is their willingness and ability to tolerate discomfort for unreasonably long periods of time.

At EBRF 2011, we were pushed outside our comfort zone only for a few days. Even there, it was educating enough for the organizers to take a time-out on EBRF’s future. Since 2001, the conference has continuously pushed – and stretched – the envelope in the frontier between art and science, theory and practice, having perhaps reached the limit. Consequently, the conference mission and concept are currently being reconsidered, and the conference board reorganized.

For closing, I wish to take this opportunity to thank all the participants, co-organizers and sponsors of EBRF 2011 for an invaluable contribution. As co-founder and co-organizer or chairman of the conference since 2001, I wish to warmly thank all the individuals and institutions whose co-creative efforts and support have made 11 consecutive annual international peer reviewed business research conferences possible in Finland. For me, personally, this has been a most educational, rewarding, and worthwhile journey.

Wishing all explorers both courage and passion, as well as every health, happiness, and best of luck, when enabling co-creation of great global enterprises,

On behalf of the co-organizers of EBRF 2011,

MARKO SEPPÄ

Chairman of EBRF Board

## Papers by session

### Session 1: CAPITAL

CHALLENGES IN COMMERCIALISATION PROCESSES OF PRODUCT INNOVATION AMONG SMALL FIRMS  
Pellikka, Jarkko; Kajanus, Miika; Heinonen, Mikko; Eskelinen, Tuomo

SOCIAL ENTREPRENEURSHIP PERSPECTIVE FOR QUALITY OF LIFE IMPROVEMENT AT NATIONAL  
BUSINESS SYSTEM LEVEL  
Koponen, Daiva

FROM BUSINESS ADMINISTRATION TO BUSINESS CREATION: CASE KALEVALA GLOBAL BUSINESS  
CREATION SCHOOL  
Seppä, Marko

### Session 2: EDUCATION

A SYSTEM DYNAMICS APPROACH TO THE STUDY OF WORD-OF-MOUTH AND ITS EFFECT IN AN ONLINE  
ENVIRONMENT  
Wong, Roman; Sheng, Shirley Ye

COLLECTIVE VALUE CREATION BY PLAYING WITH LEGOS. A NETNOGRAPHIC STUDY  
Kurikko, Hanna; Tuominen, Pekka

CREATING TOMORROW'S GLOBAL ENTREPRENEURS: A CASE STUDY OF THE STU CLARK CENTRE FOR  
ENTREPRENEURSHIP  
Smith, Malcolm; Warren, Robert; McRae, Mavis

PRIZM GAME FOR PROBLEM SOLVING AND INNOVATION CREATION  
Busarovs, Aleksejs

### Session 3: ENERGY

EXPLORING NEW SUSTAINABLE BUSINESS OPPORTUNITIES IN THE FOREST INDUSTRY BASED ON  
MEDIA HEADINGS  
Virkkunen, Hannu; Lampela, Hannele

FACTORS INFLUENCING THE SUCCESS OF R&D COOPETITION  
Nuojua, Outi; Tähtinen, Jaana; Palo, Teea

THE PHYSICAL INTERNET AND BUSINESS MODEL INNOVATION  
Montreuil, Benoit; Rougès, Jean-François; Cimon, Yan; Poulin, Diane

## Session 4: HEALTH

DETERMINING SOCIAL MEDIA COMPONENTS FOR SCALABLE HEALTHCARE

Amrita; Bhowmick, Bhaskar; Biswas, Dhruves

DEVELOPMENTAL IMPACT ANALYSIS OF ICT ENABLED SCALABLE HEALTH CARE MODEL IN BRICS ECONOMIES

Saurabh, Punit; Amrita; Biswas, Dhruves

INNOVATION AND VALUE-CO- CREATION THROUGH STRUCTURED INCUBATION NETWORK MODELING

Kumar, Sharad; Bhowmick, Bhaskar; Biswas, Dhruves

SUSTAINABLE SCALABLE INCLUSIVE INNOVATION: A MULTI-DISCIPLINARY KNOWLEDGE PLATFORM APPROACH IN EMERGING COUNTRY CONTEXT

Bhowmick, Bhaskar; Biswas, Dhruves

## Session 5: ICT

POSSIBILITIES AND CHALLENGES IN UTILIZING SOCIALLY MEDIATED SERVICE INNOVATION IN THE CASE OF TELECOM SERVICES

Annanperä, Elina; Rohunen, Anna; Markkula, Jouni; Naarmala, Jyri

TOWARDS A FLEXIBLE MULTI-VENDOR MICROPAYMENT SYSTEM

Rohunen, Anna; Chan, Kai Wen; Liukkunen, Kari; Tulppo, Tero

## Session 6: WELLBEING

BUSINESS ECOSYSTEM UNDER CONSTRUCTION

Heikkilä, Marikka; Kuivaniemi, Leni

THE RELATIONSHIP BETWEEN SOCIAL ENTREPRENEURSHIP AND SUBJECTIVE WELL-BEING

Sajeva, Svetlana; Rybakovas, Egidijus

FUTURE OF COLLABORATION IN MANAGING PRODUCT LIFECYCLE INFORMATION AND KNOWLEDGE

Lampela, Hannele; Denger, Andrea; Kärkkäinen, Hannu; Zoier, Markus

TRUST IN BUILDING HIGH PERFORMING TEAMS

Hakanen, Mila; Soudunsaari, Aki

# Session 1: CAPITAL

CHALLENGES IN COMMERCIALISATION PROCESSES OF  
PRODUCT INNOVATION AMONG SMALL FIRMS ([pdf](#))

Pellikka, Jarkko; Kajanus, Miika; Heinonen, Mikko;  
Eskelinen, Tuomo

SOCIAL ENTREPRENEURSHIP PERSPECTIVE FOR QUALITY  
OF LIFE IMPROVEMENT AT NATIONAL BUSINESS SYSTEM  
LEVEL ([pdf](#))

Koponen, Daiva

FROM BUSINESS ADMINISTRATION TO BUSINESS CREATION:  
CASE KALEVALA GLOBAL BUSINESS CREATION SCHOOL  
([pdf](#))

Seppä, Marko

# Challenges in Commercialisation Processes of Product Innovation among SMEs

Miika Kajanus<sup>1</sup>, Mikko Heinonen<sup>2</sup>, Tuomo Eskelinen<sup>3</sup> and Jarkko Pellikka

<sup>1</sup>Project manager, Savonia University of Applied Sciences, [Miika.Kajanus@Savonia.fi](mailto:Miika.Kajanus@Savonia.fi)

<sup>2</sup>RDI Adviser, Savonia University of Applied Sciences, [Mikko.Heinonen@Savonia.fi](mailto:Mikko.Heinonen@Savonia.fi)

<sup>3</sup>RDI Adviser, Savonia University of Applied Sciences, [Tuomo.Eskelinen@Savonia.fi](mailto:Tuomo.Eskelinen@Savonia.fi)  
Project Controls Leader, Honeywell, [Jarkko.Pellikka@honeywell.com](mailto:Jarkko.Pellikka@honeywell.com)

## Abstract

Commercialisation presents complex challenges for both large and small and medium-sized firms, particularly those operating in high technology fields. Many activities, resources and external organisations are often needed in order to bring a new product to market in increasingly competitive, dynamic modern business environments, in which the ability to rapidly create and commercialise new products is an important factor that provides several business benefits. It is therefore important to examine the problems that affect the commercialisation process, which was the main objective of this study. The study was conducted following the strategy of case study methodology (cross-cases), where the main purpose was to search for similarities and differences among three case firms in order to acquire a more sophisticated understanding of the challenges affecting commercialization process of product innovation. The results show that the main challenges confronted during the commercialisation process of product innovation can be divided into four main categories: 1) marketing, 2) financing, 3) networking, and 4) business environment. In addition, one of the main contributions of the paper is that it identifies internationalisation as one of the main challenge, which is related to all of the identified challenge categories.

**Keywords:** Challenges; commercialization process; product innovation; small and medium-sized firms; internationalization

## Acknowledgements

The authors are grateful to the Foundation for Economic Education, the Foundation of Small Business Center and the Finnish Foundation for Economic and Technology Sciences (KAUTE). In addition, we are grateful to the participants at the EBRF 2011 Conference, December 14-15, 2011 Aalto University, Espoo, Finland at where an earlier draft of this paper was presented.



## **Introduction**

Globalisation, technological developments and rapidly changing customer requirements have increased the significance of small and medium-sized firms (SMEs) due to their ability to create and exploit innovation (Allocca & Kessler 2006). According to Schumpeter's (1934) milestone study, entrepreneurs play a crucial role in the creation and exploitation of innovations, and technological innovation in particular is recognised as a prime requirement for stimulating productive capacity and ensuring global business success (Kozmetzky et al. 2004). Consequently, both researchers and policy-makers have made increasing efforts to identify ways to foster and support entrepreneurship and small technology businesses in modern, dynamic business environments in order to promote economic growth (Audretsch 2004). A process that is recognized as playing a key in this context, particularly in rapidly moving, is commercialization (Jolly 1997; Andrew & Sirkin 2003; Fetterhoff & Voelkel 2006).

Previous studies have shown that realising the potential benefits of innovation requires an effective commercialisation process (Ford & Saren 2001; Andrew & Sirkin 2003), whereby potential products are generated from ideas and transformed into market-competent products. Further, developing effective commercialisation processes is a complex, challenging task for small technology firms in the modern business environment, in which customer requirements are rapidly changing and the life-cycles of new products are shortening. This is especially significant in high technology branches since technologies are changing so rapidly that small technology firms specialising in the production of high-technology products must match or exceed the pace of change in order to maintain competitiveness (Kozmetzky et al. 2004). Partly for these reasons, small technology firms are increasingly using external competencies and knowledge, accessed via innovation-related networking, in order to accelerate commercialisation, and to reduce associated risks and costs (Chesbrough 2003; Slowinski et al. 2009). Further, as shown by empirical data presented by Feldman (1994), regional contributions to product innovation are related to the underlying inter-organisational relationships, technological infrastructure and availability of relevant knowledge inputs, all of which are mutually reinforcing determinants of a region's competitive advantage. These factors are especially important for small and medium-sized firms, which may be more deeply embedded in regional innovation systems than large corporations, and thus more dependent on the regional innovation infrastructure and social networks (Galbraith et al. 2008).

Commercialisation presents complex challenges for SMEs, particularly those operating with the product innovations in a dynamic business environment. Many activities, resources and external organisations are often needed in order to bring a new product to market in increasingly competitive, dynamic modern business environments, in which the ability to rapidly create and commercialise new products is an important factor that provides several business benefits. It is therefore important to examine the problems that affect the commercialization process, which was the main objective of this study. According to the previous studies, four main categories of problems have been identified to affect the commercialisation process the categorisation also reflects the complex, multidimensional nature of the commercialisation process. Further, the problems are related to both internal and external factors of the small technology firms, which makes it even more challenging to manage and control the process, and there is a need for more specific, concrete identification of the problems the small and medium-sized firms may face.

In this study, small and medium-sized firm technology firm is defined as an enterprise that employs less than 250 persons, has an annual turnover EUR 50 million (or less) and/or total annual balance sheet of EUR 43 million or less (OECD 2005), exploits technological knowledge and competes by developing and selling products and/or services based on technological innovations (Yli-Renko & Janakiraman 2008).

## **OBJECTIVES OF THE STUDY**

Small and medium-sized firms are currently facing increased competition characterized by product and market uncertainties, the internationalisation of markets, transfer of technologies and large amount of knowledge and information. In this environment, the ability of firms to rapidly create and commercialise new products has posed considerable challenges particularly for the small businesses (Pellikka & Lauronen 2007; Oakey 2007). In a dynamic business environment an effective commercialization process of innovation may secure the survival of a venture and may also provide benefits such as growth of turnover, higher profits and higher market share (Nevens et al. 1990). However, an empirical analysis of the concrete problems of commercialisation of small and medium-sized firms is still partly missing (see e.g. Pellikka & Virtanen 2009). Therefore, our purpose is to empirically identify the challenges that small and medium-sized firms have confronted during the commercialization process of the product innovation from the perspective of small and medium-sized firms by addressing the following research questions:

- How have the problems of the commercialization process of small and medium-sized firms been dealt with in former studies?
- What problem areas and concrete problems do small and medium-sized firms confront during the commercialization process of the product innovation?

This paper provides a framework of the problems of commercialization based on the review of literature from entrepreneurship, innovation management, new product development and marketing. We will begin by briefly discussing the concept of the 'commercialization process' and focus on the conceptual framework of the problem areas. The methodology and empirical case data obtained from four small and medium-sized firms will then be presented; the empirical results of the study will then be given and the paper will end with a discussion of the results, followed by conclusions, implications and our recommendations for managers and policy-makers.

## **Challenges of the commercialization process of product innovation**

Commercialisation is important for survival in competitive markets and has also been recognised as a key aspect of national and regional innovation policies (Clarysse et al. 2005) and the management of technological innovations (Dodgson 2000). Interest in the commercialisation process has been prompted by acknowledgement that technological improvements do not contribute to growth unless they are somehow commercialised, either in the form of new products and services, or integrated into production or service delivery processes (Andrew & Sirkin 2003). In this paper, the term 'commercialization process' refers to an essential element of the management of technological innovation (Dodgson 2000); the process whereby investments in technological innovation are effectively commercialized, from the generation of ideas through to activities sustaining the commercialized product. A comprehensive analysis of the term has been previously presented elsewhere (see in detail Pellikka 2009).

Due to characteristics such as their general lack of resources for R&D and marketing, small technology firms differ from larger firms in ways that have particular significance for innovation in high technology fields (e.g. Siu & Bao 2008). A major difference in terms of resources is that (inevitably) small technology firms have comparatively limited resources for marketing and financial activities that may limit the scope and timeframe for commercialisation (e.g. Heydebreck et al. 2000). Furthermore, limited human resources may influence a firm's propensity and ability to be aware of, and respond to, opportunities and threats presented by the external business environment compared with larger firms (North et al. 2001). In addition, they face challenges related to their limited business know-how with regard to aspects such as marketing and management, which potentially makes them more dependent on external resources and networking (Teece 2007). However, since the structure and processes in small and medium-sized firms are often more informal (and their managerial experience and expertise may be limited) their business objectives and strategies may be unclear, particularly during the start-up phase of a firm (e.g. Page West III and Noel 2009). In addition, there is a need to understand the impact of the individual traits of the entrepreneur on ways in which the business is managed and developed that affect aspects such as growth orientation, innovation activities and interest in using external support services (North et al. 2001).

## RESEARCH DATA

The focus of this study is on commercialisation processes of product innovation in small and medium-sized firms. The empirical material used in the study consisted of two types of data: 1) responses to questions asked in in-depth interviews (3 cases) and 2) documented data such as annual reports and financial statements. The interviewees were mostly the CEOs of their respective firms. Most of the data acquired were qualitative, which can be highly useful for obtaining a holistic overview of the context of investigated phenomena (Miles and Huberman 1994). Qualitative analysis therefore seemed to be an appropriate way to address the main objectives, which included exploring the ways that entrepreneurs in a particular setting come to understand, plan and manage the activities involved in the commercialization process. The decision to use a qualitative approach was also based on the fact that little is known about the phenomena under investigation, particularly in a small and medium-sized firm context, indicating that qualitative case studies would be an appropriate choice of methodology (e.g. Eisenhardt and Graebner 2007). However, although a qualitative approach was generally adopted, the option of using quantitative data to supplement the examination of the commercialization process was kept in mind, following the logic of versatile research design and enabling triangulation where possible e.g. Yin 1989). The description of the case firms have presented in Table (1).

Case firms	Year of establishment	Turnover (2010)	Number of employees	Type of Business
Case A	2001	6,7 M€	25-35	Wood component manufacturer
Case B	1985	17 M€	60-75	High-tech wood product manufacturer
Case C	2011	<1M€	1-5	New technology products for transportation business

Table 1. Description of the case firms

In order to identify similarities and differences among the case firms, an explanation-building procedure was applied in cross-site (case) analysis in an attempt to acquire further insight into issues concerning the challenges identified during the commercialisation process in these firms. Initial contacts with the case firms were made by the telephone. Each interview was conducted during November and December 2011 by using a personally administered semi-structured theme interview.

The checklist of the interview consisted of three main groups of questions:

- Background data and the history of the firm
- The description of the process of commercialisation
- The concrete problems identified during the process.

The average interview lasted from 1 to 2 hours. At the very beginning of each interview, respondents were asked to base their answers on the technology-based product that they had recently commercialised. After that, the respondents were asked to share a detailed description of the concrete problems that they have confronted during the commercialisation process. The data analysis was executed via three-pronged analysis (see Miles and Huberman, 1994). Thus, the analysis included three main phases:

- Reducing of data
- Clustering of data
- Abstracting of data.

First, the irrelevant empirical data was discarded, following which the data was clustered to constitute the main problem groups of commercialisation. During the systematic data clustering process, the main problem groups of commercialisation were formed. During the third stage, the data was abstracted and quantified to systematically exploit the empirical data.

## **RESULTS OF THE STUDY**

The results show that the main challenges confronted during the commercialisation process of product innovation can be divided into four main categories: 1) marketing, 2) financing, 3) networking, and 4) business environment. In addition, the general lack of knowledge-based resources to support various business functions (e.g. internationalisation, marketing and financing) was found to be a major problem among the case firms. Thus it is important for firms' internal activities of the firm and external support services to be targeted to complement their particular limitations of knowledge-based resources. Furthermore, the results indicate that innovation support services should be more flexible and less bureaucratic corroborating previous studies (see Heydebreck et al. 2000; Kaufmann & Tödting 2002). The entrepreneurs are normally not very well aware of the official procedures required for accessing resources such as public finance. Further, these procedures normally take more time than estimated, and there may be no need for funding that could be acquired by the time the final decision is made, particularly in dynamic business environment and industries.

In addition, the purpose of the funding may change, and hence the process may need to be started again from the beginning. The following table (Table 1) provides a detailed description of the identified challenges in the case firms. In addition, it describes what has been the impact of the faced challenge during the commercialisation process of product innovation.

<b>Category</b>	<b>Description</b>	<b>Impact</b>
Marketing	<ul style="list-style-type: none"> <li>-Fail to build national and international sales and distribution channels</li> <li>-Fail to access, gather and exploit market and customer information</li> </ul>	<ul style="list-style-type: none"> <li>-Commercialisation process took more time than estimated</li> <li>-Schedule delays due to the time-consuming market launch phase</li> <li>-Difficulties to find motivated and reliable business partners for internationalization</li> </ul>
Resources	<ul style="list-style-type: none"> <li>-Fail to acquire and allocate internal and external resources during the commercialization process especially within the region</li> <li>-Insufficient managerial and industrial business experience available at the regional level</li> </ul>	<ul style="list-style-type: none"> <li>-Difficulties to plan the required resources (e.g. engineering and financial) for the commercialization process of product innovation.</li> <li>-Cost overruns due to the relatively modest progress to bring the new innovation into market</li> </ul>
Business environment	<ul style="list-style-type: none"> <li>-Availability and content of support and development services provided by local innovation system</li> <li>-Limited number of the potential regional, national and international business partners during the commercialization process</li> </ul>	<ul style="list-style-type: none"> <li>-Difficulties to get public funding due to the complexity of the terms and decision criteria</li> <li>-Availability of the experienced individual to support the commercialisation process</li> </ul>
Planning & Management of the commercialisation process	<ul style="list-style-type: none"> <li>-A systematic model for commercialisation process of product innovation was missing</li> <li>-Lack of time and resources for applying public funding</li> <li>-Limited knowledge of the commercialization process requirements and activities</li> </ul>	<ul style="list-style-type: none"> <li>-Difficulties to manage and control the commercialisation process</li> <li>-Unfavorable changes and cost overruns during the process due to the lack of knowledge in terms of commercialisation process</li> </ul>

Table 1. The challenges during the commercialisation process of product innovation

The characteristics of small and medium-sized firms and the background of the entrepreneur should be identified when planning and developing innovation support services (see also Pellikka & Virtanen 2009). The lack of business know-how was discovered as the major deficiency of competence in the case firms. This could be alleviated by fostering and supporting the development of entrepreneurial teams with a different background of expertise (technology-orientation vs. market-orientation). Networking and active interaction with partners (e.g., suppliers, customers, universities, and public agencies) during the commercialization process is essential to ameliorate the competence of the ventures. Open innovation approach and close collaboration with customers provides real-time feedback that could be exploited in product development and marketing. That is why networking among small and medium-sized firms and their stakeholders should be one of the major goals of local policy-makers.

The results of the study also show that as part of the regional innovation system, the commercialisation environment of a region plays a key role in commercialisation processes among technology-based SMEs (see also Rosenbloom 2007). The commercialisation environment in the region (defined here as the region's infrastructure related to commercialisation including the business infrastructure, institutional arrangements, resources and knowledge-intensive services) can play an important role in fostering commercialisation in small technology firms. Notably, the sources of knowledge, such as the private and public organisations in the region, form a technological infrastructure which can promote, for example, transfer of crucial knowledge for the commercialisation process (Oakey 2007). From this perspective, external knowledge is an important input in the commercialisation process. This also means that, at least in the small and medium-sized firm context, the regional collaboration associated with commercialisation processes seems to be even more important than suggested in previous studies.

However, regional collaboration and networks are not always suitable for small technology firms due to the limited knowledge that may be locally available regarding innovation activities and commercialisation. Thus, according to van Geenhuizen (2007), there might be a need to complement the regional innovation system by additional knowledge from other regions. Further, the size of an area may be a significant factor, since it affects the agglomerative economies that can be obtained through access to networks of other firms and organisations in the region (also Pellikka & Malinen, 2011).

In addition, regional studies of high technology sectors suggest that networks of firms are crucial sources of new product ideas and knowledge that can contribute to innovation and competitiveness (van Looy et al. 2003). The small technology firms examined in this study used networking not just for generating ideas but also for other phases of the commercialisation process (e.g. business concept design, market launches, business development and maintenance). Thus, networking increases the flow of information and sharing of resources between organisations during the commercialisation process, and the results of this study indicate that these factors are especially important for small technology firms.

## Conclusions and implications

According to Schilling (2008), a firm operating in a high-technology field needs: 1) in-depth understanding of innovation dynamics, 2) a well-crafted innovation strategy, and 3) well-designed processes for innovation. All of these are essential for the effective exploitation of innovation. Indeed, particularly in high-technology sectors, innovations provide foundations for the emergence of new technology-based firms (e.g. Clarysse et al. 2005), and sound innovation strategies may increase small and medium-sized firms' knowledge acquisition capabilities and strengthen their efforts to develop and commercialise new technology-based products. In addition, to remain competitive, firms need to take advantage of new technological opportunities swiftly in order to provide their customers with new products or services and to respond to changes in customer needs and tastes (also Dodgson 2000; Kaufmann & Tödting 2002). Increased competition, shortened product life cycles, continually changing customer needs and tastes, and growing technological opportunities to serve customer needs explain the increasing importance of commercialisation of product innovation among SMEs.

Since innovation has become an increasingly important source of competitive advantage, and business investment in R&D and innovation has risen, innovative firms have become increasingly dependent on external sources of knowledge rather than in-house research. Intensified competition, shorter product life cycles and expanded technological opportunities force them to innovate more quickly and focus their R&D expenditures, while seeking privileged and rapid access to complementary new knowledge in the public and private sectors. A result of these driving forces has been the emergence of a new type of organisation of industrial research that is less centred in individual firms, based more on networks and markets, and in some cases, is more reliant on small technology firms. Such inter-organisational collaboration can provide a strong basis for the generation and commercialisation of innovation, and provide other potential benefits, such as facilitating access to new technology and entry to new markets through licensing (Chiaroni et al 2008).

In addition, rather than relying on internal resources for processes such as commercialisation, firms are increasingly participating in 'open innovation' (see Chesbrough 2003), i.e. active innovation-related collaboration between business partners, which may help firms to realize the value of new products, e.g. by acquiring technologies from external sources (Lichtenthaler 2008). Therefore, potential challenges may be overcome by the creation of partnerships with external technology providers and other partner companies including small technology firms, universities and science parks – that can all contribute specific competences and technological assets to the commercialisation process in high technology industries.



The major implications of the study for the different stakeholders are summarized below:

- Managers of SMEs to overcome the resource-related challenges during the commercialization process by networking and active interaction with appropriate partners (e.g. suppliers, customers, universities, and public agencies) to support e.g. marketing and internationalisation of the business. In addition, based on the results and the previous studies (see e.g. Pellikka 2009) an appropriate framework (incl. both internal and external part) may help SMEs to more efficiently and systematic manage all the essential parts of commercialisation process i.e. internal activities and inter-organizational collaboration and relationships (external activities)
- Venture capitalists to take care of the own expertise and hands-on capabilities in marketing and internationalisation. In addition, venture capitalists may also help SMEs to foster and support the development of entrepreneurial teams with a different background of expertise (technology-orientation vs. market-orientation).
- Local business developers, universities and education institutions to educate and train skilled employees for the commercialization process of innovation. It is for example important to ensure the availability of the skilled resources in terms of requirements of the commercialisation.

## REFERENCES

- Allocca, M.A. & Kessler, E.H. 2006. Innovation Speed in Small and Medium-Sized Enterprises. *Creativity and Innovation Management*. VOL. 15. NO. 3, 279-295.
- Andrew, J.P. & Sirkin, H. 2003. Innovating for Cash. *Harvard Business Review*. (September), 76-85.
- Audretsch, D. 2004. Sustaining Innovation and Growth: Public Policy Support for Entrepreneurship. *Industry and Innovation*. VOL.11. NO. 3, 167-191.
- Chesbrough H. 2003. *Open Innovation: The New Imperative for Creating and Profiting from Technology*. Boston: Harvard Business School Press.
- Chiaroni, D., Chiesa, V. & Frattini, F. 2008. Patterns of collaboration along the biopharmaceutical innovation process. *Journal of Business Chemistry*. VOL. 5. NO. 1, 7-22.
- Clarysse, B., Wright, M., Lockett, A., van de Velde, E. & Vohora, A. 2005. Spinning out new ventures: a typology of incubation strategies from European research institutions. *Journal of Business Venturing*. VOL. 20. NO. 2, 183-216.
- Dodgson, M. 2000. *The Management of Technological Innovation. An International and Strategic Approach*. New York: Oxford University Press.
- Eisenhardt, K.M. & Graebner, M.E. 2007. Theory Building from Cases: Opportunities and Challenges. *Academy of Management Journal*. VOL. 50, NO. 1, 25-32.
- Feldman, M.P. 1994. *The Geography of Innovation*. Dordrecht: Kluwer.
- Fetterhoff, T.J. & Voelkel, D. 2006. Managing open innovation in biotechnology. *Research Technology Management*. VOL. 49. NO. 3, 14-18.
- Ford, D. & Saren, M. 2001. *Managing and marketing technology*. London: The Thomson Learning.
- Galbraith, C.S., Rodriguez, C.L. & DeNoble, A.F. 2008. SME Competitive Strategy and Location Behavior: An Exploratory Study of High-Technology Manufacturing. *Journal of Small Business Management*. VOL. 46. NO. 2, 183-202.
- Heydebreck, P., Klofsten, M. & Maier, J. 2000. Innovation support for new technology-based firms: the Swedish Teknopol approach. *R&D Management*. VOL. 30. NO. 1, 1-12.
- Jolly, V.K. 1997. *Commercialising New Technologies: Getting from Mind to Market*, Boston, MA: Harvard Business School Press.

- Kaufmann, A. & Tödting, F. 2002. How effective is innovation support for SMEs? An analysis of the region of Upper Austria. *Technovation*. VOL. 22. NO. 3, 147-159.
- Kozmetzky, G., Williams, F. & Williams, V. 2004. *New Wealth: Commercialisation of Science and Technology for Business and Economic Development*. Westport: Praeger Publishers.
- Lichtenthaler, U. 2008. Externally commercializing technology assets: An examination of different process stages. *Journal of Business Venturing*. VOL. 23. NO. 4, 445-464.
- Miles, M.B. & Huberman, A.M. 1994. *Qualitative data analysis: An expanded source book*. Beverley Hills, CA: Sage Publications.
- Nevens, M.T., Summe, G.L. & Uttal, B. 1990. Commercialising technology: what the best companies do. *Harvard Business Review*. VOL. 68. NO. 3, 154–163.
- North, D., Smallbone, D. & Vickers, I. 2001. Public sector support for innovating SMEs: The effectiveness of support measures in London's Lee Valley region. *Small Business Economics*. VOL. 16. NO. 2, 303-317.
- Oakey, R. 2007. Clustering and the R&D management of high-technology small and medium-sized firms: in theory and practice. *R&D Management*. VOL. 37. NO. 3, 237-248.
- OECD 2005. *OECD SME and Entrepreneurship Outlook: 2005*, OECD, Paris.
- Page West III, G. & Noel, T.W. 2009. The Impact of Knowledge Resources on New Venture Performance. *Journal of Small Business Management*. VOL. 47. NO. 1, 1-22.
- Pelikka, J. 2009. *Commercialisation Processes in Small Technology Firms in the Finnish Healthcare Technology and ICT Sectors*. Doctoral dissertation. Kuopio University Publications H. Business and Information Technology 16. Suomen Graafiset Palvelut Oy, Kuopio.
- Pelikka, J. & Lauronen, J. 2007. Fostering Commercialisation of Innovation in Small High Technology Firms. *International Journal of Technoentrepreneurship*. VOL. 1. NO. 1, 92-108.
- Pelikka, J. & Virtanen, M. 2009. The Problems of Commercialisation in Small Technology-based Firms. *International Journal of Entrepreneurship and Innovation Management*. VOL. 9. NO. 3, 267-284.

- Pellikka, J. & Malinen, P. 2011. Inter-organizational Collaboration in Commercialization Process of Innovation among Small High Technology Firms. ICSB's 2nd Research and Policy Conference. October 6-8, 2011, Washington, United States.
- Rosenbloom, J.L. 2007. The Geography of Innovation Commercialisation in the United States During the 1990s. *Economic Development Quarterly*. VOL. 21. NO. 1, 3-16.
- Siu, W.S & Bao, Q. 2008. Network Strategies of Small Chinese High-Technology Firms: A Qualitative Study. *The Journal of Product Innovation Management*. VOL. 25. NO. 1, 70-102.
- Schumpeter, J.A. 1934. *The Theory of Economic Development: An Inquiry into Profits, Capital, Credit, Interest, and the Business Cycle*. (1949 ed.). Cambridge, MA: Harvard University Press.
- Slowinsky, G., Hummel, E., Gupta, A. & Gilmont, E.R. 2009. Effective practices for sourcing innovation. *Research Technology Management*. VOL. 52. NO. 1, 27-34.
- Teece, D. 2007. The role of managers, entrepreneurs and the literati in enterprise performance and economic growth. *International Journal of Learning, Innovation and Development*. VOL. 1. NO. 1, 43-64.
- van Geenhuizen, M. 2007. Modelling dynamics of knowledge networks and local connectedness: a case study of urban high-tech companies in The Netherlands. *Annals of Regional Science*. VOL. 41. NO. 4, 813-833.
- van Looy, B., Debackere, K. & Andries, P. 2003. Policies to stimulate regional innovation capabilities via university-industry collaboration: an analysis and assessment. *R&D Management*. VOL. 33. NO. 2, 209-229.
- Yli-Renko, H. & Janakiraman, R. 2008. How Customer Portfolio Affects New Product Development in Technology-Based Entrepreneurial Firms. *Journal of Marketing*. VOL. 72, 131-148.
- Yin R. (1989). *Case study research: Design and methods*. Beverly Hills, CA: Sage Publishing.

# **SOCIAL ENTREPRENEURSHIP PERSPECTIVE FOR QUALITY OF LIFE IMPROVEMENT AT NATIONAL BUSINESS SYSTEM LEVEL**

**Daiva Koponen**

*Lector, PhD candidate, Kaunas University of Technology, Lithuania,  
daiva.koponen@ktu.lt*

## **Abstract**

The given perspectives of wellbeing, quality of life, as well as national business system on perspective of social entrepreneurship, in this paper let us to explore a broader and more systematic understanding of social and economic development and growth of the country, which requires active role from all market actors and interest groups - entrepreneurs and society, academics and praxis, in order to create and co-create value and get results worth solving problems in a global game platform. The *aim* of this paper is to propose conceptual platform for future research on quality of life improvement at regional/national business system level by using social entrepreneurship perspective. Scientific literature review and synthesis in this article is applied as a research methodology.

Theoretical discussion in the paper shows that the role and initiatives of social and corporate social entrepreneurs in a certain context can become as a main driving force to enhance social and market collaboration for common value creation. Value co-creation paradigm here, as intermediate mechanism and driver for social and economic value creation and share, also is taken as one of the key determinants of growth and value creation, as well as of society's life quality improvement and country's competitiveness.

The conceptual platform discussed here will be used as an analytical tool-kit in the following research works in order to examine framework for quality of life improvement at local (municipal) level on the focus of social entrepreneurship. It will be built on qualitative research method and case studies based on objective and subjective indicators and social entrepreneurs' initiatives at local (municipal) level.

## **Keywords**

Social Entrepreneurship, Quality of Life, National Business Systems (NBS), Co-creation, Wellbeing.

## **Introduction**

In the market-driven economy, firms and organisations interact with other actors, society, individuals and the environment, as they don't exist as autarchic units. Such interactions shape and develop complex inter-organisational relationships, which create certain impact on regional/national socio-economic system, general quality of life in the country. Co-creation of such direct or indirect value can have effect on the global business arena, as well. The 'rules of the game' in global business understanding always change. Last decades show successful development of various inter-organizational forms of economic activities, i.e. clusters, industrial districts as well as regional or national systems of innovation and economic coordination, which are recognised as relevant socio-economic mechanisms and engines for the general growth, competitiveness and wellbeing of region and country. On other hand, social market inadequacies or failures that can be solved by

socially active business or societal initiatives rapidly emerge as a research and practical problem, as well.

As Jordan (2008) states, it is difficult to reinterpret general country's welfare and wellbeing without challenging the basis of the certain economic model. Jordan (2008) stress that nowadays 'societies are trapped within an economic model that fails to improve their members' quality of life. Individuals, who are free to choose private exchanges, and to create their own collective institutions, seem condemned to strive for greater economic welfare, which does not satisfy their desires. They appear to be addicted to ever-higher income and consumption, driven by the compulsion to maximise a form of utility that does not correspond to wellbeing – and *the gap between economic welfare and satisfaction with life is growing*'. As an example, Nordic countries several decades still are at the top of leading countries with socio-friendly capitalism forms, high competitiveness ratings and prospering wellbeing. There have been a lot of recent empirical research works done in the area of Nordic capitalism, Nordic Business Systems (Lilja, 2005; Fellman, 2008), etc. Anyway, there is no unified and best receipt yet founded on how to gain and maintain competitive advantage and high quality of life in certain local region or country.

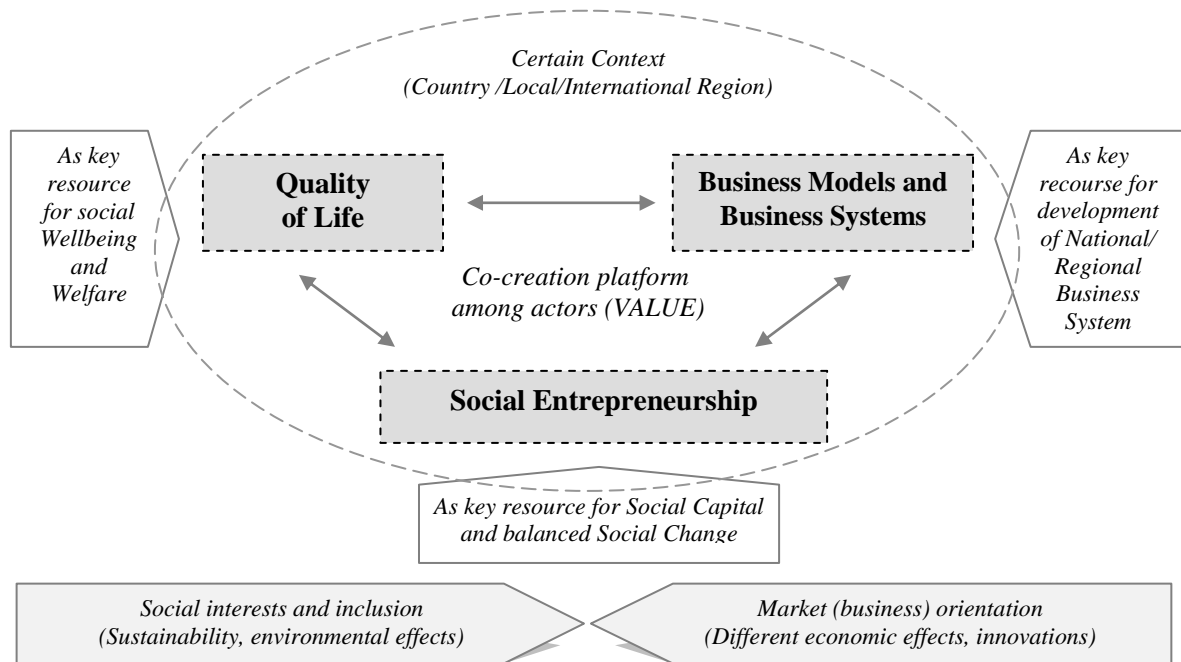
Different and unique institutional context, in which any country and its market actors are embedded, makes a big impact to its future development. According to this, we need to take a look deeper into *how all actors – business, society and policy level – can find way to work together and develop divergent and socially responsible business models in order to create and systematically develop country's competitiveness and socio-economic growth*. For the reasons mentioned above and after the inspiration of the main topics at EBRF2012 conference, the main *aim* of this paper is to elaborate theoretical understanding and propose conceptual platform for future research on quality of life improvement using social entrepreneurship perspective at national business system level. Scientific literature review and synthesis in this article is applied as a research methodology.

It must be also mentioned that in order to see the whole picture in country's and/or global playground we need to take systematic point of view. Nowadays, not only academics, but also business practioniers, social entrepreneurs, as well as policy representatives need to be able to perceive complex socio-economic systems with its variables of capitalism forms and inter-organisational formations (i.e. clusters, industrial districts) working on different economic activities, institutional arrangements, interdependencies and interactions among. In distinct, complex, open and adaptive socio-economic system is crucial to get to know your country's business system and be able to make strategic decisions in *business* (for economic effects) and *social market* (for social, environmental or other intents and effects).

### **Suggested conceptual approach and platform**

The suggested holistic approach is based on conceptual theoretical tools and mechanisms for the investigation of *systemic* economic and social growth *changes* at national business system's (i.e. ecosystem) level. It integrates three multi-disciplined paradigms through the co-creation platform in a certain institutionalised context (see in Figure 1). The concepts of social entrepreneurship, national business system and wellbeing give overall understanding about the rules in new 'globally local' business and social games. According to the given perspective, socio-economic market interactions give benefits to each member of the business system they belong. *Social entrepreneurship perspective* here helps to create social capital which may be defined as crucial resource embedded in social, business and

policy level networks and accessed as well as used by actors for their actions, i.e. value exchange, knowledge sharing, experience, etc.



**Figure 1.** Holistic approach to quality of life improvement through co-creation at national level of business system

In this article, the understanding of enterprise co-creation network is approached from systemic and holistic perspective; one that incorporates key determinants of economic competitiveness, wellbeing, social capital and business system (see Figure 1). Here *enterprise* is taken as only one of the ‘nodes’ in the whole national socio-economic business system, seeking to be successful in the contextualized and institutionalized business context. Existing enterprise business model is taken in more externally-oriented perspective. Nowadays, it’s not enough to care about vertical and horizontal relationships; not even enough to be multinational or ‘Flagship’ company, which has strong centralized business network. Entrepreneur, especially with socially significant intents, needs to develop enterprise as a purposive ‘node’ in the whole system, which can give direct or indirect value to the system, and, at the same time, get empowerment and get added value back from the system. Such two-folded dialog contributes to the general quality of life, wellbeing and higher competitiveness of the country.

According to this conceptual platform, *co-creation* is the engine for successful developing of enterprise business models, which lets to growth corporate social entrepreneurs; by their successful activities we can balance social capital and social change by helping to improve society’s quality of life and wellbeing in a certain country or region. It lets to accumulate right key resources in the system which enable and enforce mutually valuable interactions and experiences to get value and competitiveness.

It must be also pointed that given holistic platform is important in the terms of *sociality* in order clear-out social purposes and public benefits that can be identified by organisation

type, sector or achieved outputs. This can include a range of public benefits including positive environmental and sustainability impacts (see above, Figure 1). Accordingly, focus also goes on *market (business) orientation* with different economic effects that means that systematic change and experience through co-creation (especially, at corporate entrepreneurship level) can be purposively supplied to social or economic system by socially responsible business rules and actions. Social entrepreneurs here can learn from certain business models perspectives while staying focused on efforts to improve performance and increase social impact and change.

**Table 1**

Understanding of objective and subjective parameters in measuring quality of life and wellbeing according to the given perspective

<b>OBJECTIVE parameters</b> (Numbers, percentages, total sums, etc.)	<b>SUBJECTIVE parameters</b> (Society's experience, opinion, social norms, traditions, etc.)
<b>Quality of Life</b> (Social, material, physical, productive and emotional quality of life)	<b>General wellbeing</b>
<b>Business Models</b> (Value proposition and exchange)	<b>National business system</b>
<b>Social Entrepreneurship</b> (social value vs. market mechanisms)	<b>Social capital and change</b>



According to Rybakovas (2011), every single socio-economic system is equipped with its own contextually fitted measurement instrument, representing characteristics (by the means of used measurement indicators) that are important for that certain socio-economic system, but not in general terms. At the moment, scientific literature analysis and synthesis given in this paper represents conceptual understanding as a starting point for following research studies in this area (see more in Table 1). Anyway, according to the given perspective, the main categories, indicators and criteria can be responsibly depicted and it can be measured by objective and subjective parameters influenced by certain local conditions, scarce resources, strategic institutional decisions and arrangements in order to make real data-based conclusions and give recommendations accordingly to policy level, social and business representatives.

**Business Models as conceptual configurations for Value Co-creation**

The research on *business model designs and constructs* already have been widely explored in the literature (Osterwalder et al., 2005; Nenonen and Storbacka, 2009, etc.). There is quit broad understanding in this area; and generally, mostly all business model definitions contains such elements as ‘value’, ‘value proposition’, ‘value creation’, ‘resources’, ‘partners’, etc. In traditional understanding, business model notion is used to explain how certain firm can create value for its customers. Osterwalder *et al.* (2005) declare that ‘business model is a conceptual tool that contains a set of elements and their relationships and allows expressing the business logic of a specific firm. It is a description of the value a company offers to one or several segments of customers and of the architecture of the firm



and its network of partners for creating, marketing, and delivering this value and relationship capital, to generate profitable and sustainable revenue streams'. Nowadays, as Nenonen and Storbacka (2009) point out, we can understand business models as more externally-oriented market constructs, those exchanging resources, organisational capabilities, interacting and creating together value with other market actors. According to this, the definition which validates discussions above, describes business models as 'configurations of interrelated capabilities, governing the content, process and management of the interaction and exchange in dyadic value co-creation' (Storbacka & Nenonen, 2009).

As Aarika-Stenroos and Jaakkola (2012) state, value is always co-created. Vargo and Lusch (2008) in their work specify this thesis by stating that value is co-created as actors interact to apply resources. Co-creation in this case is understood beyond the firm level, i.e. as the "third stage of co-creation" (Ramaswamy and Gouilart, 2010), where we can talk about company's value exchange and development routes alongside other actors in the certain socio-economic context and to find its position and the role in the whole business system at national, local or regional level.

According to this approach, *co-creation* can be taken as one of the key determinants of growth and value creation, as well as society's life quality improvement and country's competitiveness. Also it must be mentioned that the *location* of value creation is no longer perceived to reside within firm boundaries, but value is considered to be co-created among and between various actors within the networked market. In this way we can radically move from 'value creation by the manufacturing firm to value co-creation in a network' (Nenonen and Storbacka, 2009). For this reason we follow discussion on national business system level in order to get ecosystem level understanding as a dominant way of coordinating economic, social models and activities in a certain region or country.

The concept of *national business system* was developed in economic sociology by Richard Whitley around the year 1992. During latter years academic interest in divergence of existing market economies, 'varieties of capitalism' forms and interactions among economic players has forced academics to approach this research problem deeper. The comprehensive attempts to conceptualise this phenomenon are still in ahead, but according to traditional sociological definition by Whitley (1992; 2002), 'business systems' are national level constructs and can be characterized as 'distinctive configurations of hierarchy or market-based relations which become institutionalized as relatively successful ways of organising economic activities in different institutional environments'. Whitley argues that various structural variations and interactions in terms of social, political, economic systems, culture and history, and the dominance of different economic sectors produce distinctive forms of national business systems (Valiukonyte and Zabolkaite, 2005). It brings the *context-specific* approach which is important here because of network-based nature of organisations, boundedless regions, culture specifics, information technology flows and rapid globalisation.

Following by this, national business system is considered here as a divergent way of value co-creation at national or regional level by systematically affecting existing enterprise business models, industrial clusters, social networks, and other inter-organisational formations, generating value together in order to be flexible and successful by creating value through engaged platforms and institutional arrangements. In other hand, actors

generate value together in order to be successful in the market. By these interactions they get valuable feedback and start to grow important power in the system's activities. In general, institutionalised market-based arrangements are long-term configurations, which develop and adapt over time in response to broader economic and technological challenges as well as social changes and wellbeing, which is important to discuss in next section.

### **Wellbeing and Quality of Life in Social Entrepreneurship perspective**

Generally, economic wealth and standard of living are strongly dependent on the resources that country can generate, i.e. the level of national income. Evaluation of economic performance is usually captured through the use of GDP per capita which facilitates international comparisons (Quality of life in Europe, 2004). At the conceptual level, performance of wellbeing is always twofold. Quality of life can be perceived by objective and subjective measurements. It is widely cited and well described in works of Pukelienė, Starkauskienė, 2009; Costanza, Fisher, Ali, et al., 2008; Noll, 1998, etc. The *objective* (societal or macro level) quality of life can be easily indicated; it is measured and evaluated by objective parameters. The objective quality of life is basically *about fulfilling the societal and cultural demands* for material wealth, social status, and physical wellbeing (Noll, 1998). On other side, there are a lot of subjective (individual, micro) measurements for quality of life, as well. According to Noll (1998), the subjective quality of life *is about feeling good and being satisfied with things in general*. As Rybakovas (2011) states, there is no single universally accepted system of social indicators and single standardized methodological operationalization for quality of life measurement. Anyway, all subjective and objective criteria and indicators can be aggregated into five distinctive categories (Rybakovas, 2011): material, social, physical (health-care related), productive (productive activity and work related) and emotional quality of life. Quality of life improvement, according these five categories, can be seen as reasonable goal for future strategic socio-economic development, one having potential to attract resources and investments in processes of socio-economic development. At the same time, specified contextual quality of life inadequacies or certain 'gaps in wellbeing and satisfaction with life' can be taken as opportunities for social entrepreneurs to engage their activity and take initiatives or coordination of certain socially important actions.

The terms 'welfare', 'well-being' and „quality of life“ are still used more or less synonymously in discussions about social development, social justice and public policy. In general, the notion of *welfare* is usually referred to very material aspects of wellbeing, such as only access to economic resources. At other hand, it can be used to mean less tangible conditions such as contentment, happiness, an absence of threat, and confidence in the future (Baldock, 2007). In this perspective, the term of 'social capital' in the given framework (see more in Figure 1) comes as key resource and outcome of social entrepreneurship activities in a certain business system. *Social capital* here is introduced in broader understanding where it emphasises 'the shared knowledge, understandings, norms, rules and expectations about patterns of interactions that groups of individuals bring to a recurrent activity' (Ostrom, 2000; cited in Jordon, 2000). This attributes give benefits to the whole national level business system by enhancing efforts of social entrepreneurs and rising up the whole wellbeing. The main purpose of *social entrepreneur* is to solve problems and give solutions by persuading entire societies to take new leaps by changing

the whole system. The notion of *corporate social entrepreneurship*<sup>1</sup> here is important as well, as it draws not only on tangible economic business returns, but also creates social capital and influences social change by empowering the society, which leads to quality of life improvement and more comprehensive, systematically developing national business system.

The main purpose of social entrepreneur, *in general*, is to solve problems and give solutions by persuading entire societies to take new leaps by changing the whole socio-economic system. Following by Dawans *et al* (2010), practitioners in social entrepreneurship coordinate, manage and balance their efforts around four performance criteria, which can be defined as depth of impact, blended value, efficiency and adaptability. In order to reach performance results, according to five main quality of life categories, practitioners need to take decisions and select their strategy according to four main areas: resource mobilization, stakeholder engagement, knowledge development or culture management (Dawans, Alter, Miller, 2010). Although it can be distinct models of social entrepreneurship depicted, the main social entrepreneurs' role stays the same, i.e. be able to balance *social interests with market mechanisms* by their power to combine social and economic initiatives for wider and more purposive possibilities of *value co-creation*.

Finally it can be stated that integration of business tools and social practices creates distinct patterns to develop certain region or country's business system, where social entrepreneurs becomes as main catalysts and accelerators. They are necessary for innovations and development of society that could combine the efficiency of the entrepreneurial activities with the welfare orientation of the country's governance. And social capital, including satisfaction of life and subjective societal experience, comes here as key outcome of social entrepreneurship role in a certain business system. This attributes benefits to the whole national level business system by enhancing efforts of corporate social entrepreneurs and raising the whole country's wellbeing.

### **Concluding and future discussions**

In summarising, the given holistic framework can be used as an intellectual tool-kit, available with measurable indicators, which could serve not only for the scholars or policy level representatives, but for practioners, investors, corporate social entrepreneurs and other top-level managers or board members, responsible for strategic social impact investments and outputs sharing at the local or national country's level.

The given perspectives of wellbeing, quality of life, as well as national business systems with the perspective and role of social entrepreneurship, can be taken as the major vehicle for economic development and growth, which requires active role from both - entrepreneurs and society, academics and practice, in order to create value and results worth solving problems in a global game platform. It's a valuable growth mechanism for achieving competitive advantage - from a particular enterprise position as well as from the whole socio-economic business systems perspective.

---

<sup>1</sup> The concept of *corporate social entrepreneurship* draws on basics of entrepreneurship, and is defined as "the process of extending the firm's domain of competence and corresponding opportunity set through innovative leveraging of resources, both within and outside its direct control, aimed at the simultaneous creation of economic and social value" (cited in Rybakovas, 2011).

It can be also concluded that perspective of social entrepreneurship, as a main driving force to enhance social and market collaboration for common value creation, is taken as a new approach to quality of life and wellbeing improvement. Socially active entrepreneurs help to create social capital which can be defined as crucial resource embedded in social, business and policy level networks and accessed/used by all market actors in whole business system. National business system is considered as important characteristic in value co-creation at national/regional level by systematically influencing existing companies' business models, social networks and other inter-organisational formations within certain country. Value co-creation paradigm, as intermediate mechanism and driver for social and economic value creation and share, discussed as one of the key determinants of growth and value creation, as well; the process of which affects society's life quality improvement and all country's competitiveness.

This paper is written according to the research project 'The Model of Life Quality Improvement Strategy Building at the Local (Municipal) Level' (No. MIP-024/2011), funded by Research Council of Lithuania. Following research in this area will be build on qualitative research method and case studies which will help to examine detailed framework for quality of life improvement at local (municipal) level on the focus of social entrepreneurship to achieve prospering social impacts.

## References

1. Baldock, J. (2007), 'Social Policy, Social Welfare and the Welfare State', in J. Baldock, N. Manning and S. Vickerstaff (eds) *Social Policy* (3<sup>rd</sup> edition), Oxford, Oxford University Press, pp 5-30.
2. Costanza, R. Fisher, B., Ali, S., et al. (2008). An Integrative Approach to Quality of Life Measurement, Research and Policy. *S.A.P.I.E.N.S.*, 1 (1). 17-21.
3. Dawans, V., Alter, K. 2010. *The Four Lenses Strategic Framework: Toward an Integrated Social Enterprise Methodology* [online] [accessed 10 December 2011]. Available from Internet: <<http://www.4lenses.org/>>.
4. Fellman S., Iversen M.J., Sjorgen H. and Thue L. (2008) (Eds.) *Creating Nordic capitalism: the Business History of Competitive Periphery*. Palgrave. ISBN: 978-0-230-54553-3.
5. Aarika-Stenroos L. and Jaakkola E. (2012) Value co-creation in knowledge business services: A dyadic perspective on the joint problem solving process. *Industrial Marketing Management*. Volume 41, issue 1, January, 2012, pages 15-16.
6. Jordan (2008) *Welfare and well-being: social value in public policy*. The Policy Press. ISBN 978184742 0 800.
7. Lilja K. (Ed.) (2005) *The National Business System in Finland: structure, actors and change*. Helsinki School of Economics: HSE Print. ISBN 951-791-952-2.
8. Nenonen S. and Storbacka K. (2009) *Business model design: conceptualizing networked value co-creation*.
9. Noll, H. H. (1998). *Societal Indicators and social reporting: The International Experience*. QOL Research Centre, Denmark. <<http://www.ccsd.ca/noll1.html>>
10. Osterwalder, A., Pigneur, Y. and Tucci, C.L. (2005), "Clarifying business models: origins, present, and future of the concept", *Communications of the Association for Information Systems*, Vol. 16 No. 1. pp. 1-25.
11. Payne, A., Storbacka, K. and Frow P. (2008) "Managing the co-creation of value", *Journal of the Academy of Marketing Science*, Vol. 36 No. 1, pp. 83-96.

12. Pukelienė, V., & Starkauskienė, V. (2009). Quality of Life Concepts, Measurement and Challenges. *Taikomoji ekonomika: sisteminiai tyrimai / Applied Economics: Systematic Research*, 3 (2). 51-65.
13. Ramaswamy and Guillard (2010) *The Power of Co-Creation*. Simon & Schuster Free Press, 2010.
14. Rybakovas, E. 2011. Determinants of Strategy for Improving the Quality of Life in Local Place. *Socialiniai mokslai – Social sciences* 4 (74).
15. Rybakovas, E. 2011. Determinants of Strategy for Improving the Quality of Life in Local Place. *Socialiniai mokslai – Social sciences* 4 (74).
16. Schalock, R. L., Braddock, D., Verdugo, M. A. (eds). (2002). *Handbook on Quality of Life for Human Service Practitioners*. Washington: American Association on Mental Retardation.
17. Valiukonytė, D. and Zobotkaitė, V. (2005) *Business Systems: National, Institutional and Cultural Contexts // Social Sciences = Socialiniai mokslai / Kaunas University of Technology*. ISSN 1392-0758. 2005, nr. 2(48). p. 29-36. [Sociological Abstracts; SocINDEX with Full Text].
18. Vargo, S.L. and Lusch, R.F. (2008), “From goods to service(s): divergences and convergences of logics”, *Industrial Marketing Management*, Vol. 37 No. 3, pp. 254-259.
19. Whitley R. (Ed.) (2002) *Competing Capitalisms: Institutions and Economies, Volume I*. Critical studies in Economic institutions. An Elgar Reference Collection, UK. ISBN 1 84064 749 3 (2 volume set).

# **From Business Administration to Business Creation: Case Kalevala Global Business Creation School**

**Marko Seppä**

Founding Chairman, Global Enabler, [marko.seppa@globalenabler.com](mailto:marko.seppa@globalenabler.com)

## **Abstract**

Are there any businesses left to administer? The question is of course rhetorical and aimed at underscoring how several societies are more severely in need of creators of new businesses than managers of established ones. And yet, nearly all universities only produce masters of business administration, at best. Apart from theoretical research about business creation, and education of masters of such research, universities are generally not equipped to produce knowledge for business creation or masters of business creation. This conceptual article calls for a new, complementary approach to research and education, around the theme of global business creation. Due to the limitations and restrictions related to the traditions and practices of the science of business administration, where the means justify the ends, a new exploratory field coined as the “Art of Business Creation,” where the end justifies the means, is being explored for some inspiration. For a concrete solution, the concept of a globally distributed, enterprise-centric, entrepreneurial-faculty-driven, open-innovation-based, and social-media-empowered university entity is depicted in this article. It is a new-generation private-public-partnership and “Living Lab 2.0” referred to as Kalevala Global Business Creation School. The conceptualization draws from observations and action research during the Global Venture Lab Finland experiment at the University of Jyväskylä from 2007 to 2011.

## **Keywords**

Business creation, business schools, co-creation, high growth venturing, knowledge investing, open innovation, venture capital

## **Introduction**

The University is the ultimate knowledge factory. Nations compete, among other things, on the quantity of academic and scholarly knowledge created. Research and development expenditure, as a percentage of GDP, is an established macro-level measure of innovation and so is the number of patents. The university system accounts for a lot of the quantity. (Coté and Allahar 2007)

But what is the economic value of the knowledge and the “knowledgists” produced? There are measures, education, and support readily available for those who invent and publish – either patents or journal papers – but less such for those who commercialize and turn innovative ideas, technologies or processes, into world brands. Should not The University produce knowledge and “knowledgists” that bridge theory and the real world also within the business-creation domain? (Coté and Allahar 2007, Hamel 2007)

Even the greatest invention and research result is economically worthless, unless taken up. One critical competence of nations is their relative ability to turn inventions into

new products and services, new lines of business, and entirely new enterprises, even entire industries. No nation can create sustainable new businesses without creative, bold, motivated, and determined individuals. And yet, no such university programs exist which would produce doctors of business creation who can actually “cure patients”. (Hamel 2007, Kickul & Fayolle 2007, Seppä et al. 2009, Stangler 2010)

This conceptual article depicts a concrete solution: The concept for a globally distributed, enterprise-centric, entrepreneurial-faculty-driven, open-innovation-based, and social-media-empowered university entity – a new-generation private public partnership and “Living Lab 2.0” – referred to as Kalevala Global Business Creation School. The conceptualization derives from observations and action research around the Global Venture Lab (GVL) Finland experiment at the University of Jyväskylä, from 2007 to 2011. In 2010, the term “Art of Business Creation” was coined by GVL Finland as a new domain needed to complement the science of business administration (University of Jyväskylä 2010).

GVL Finland set out to enable solving of big ecological and societal problems via university-based growth venture creation. This was sought after by integrating research, education, and innovation – and working on a vision of universities as one global business-creation platform. In the process, the role and nature of university faculty had to be re-evaluated, and the concept, criteria, and forms of knowledge reconsidered. Important encouragement and inspiration was received from interaction with various representatives of the Finnish Funding Agency of Innovation and Technology (TEKES) and the European Institute of Innovation and Technology (EIT) and with the co-founders of the UC Berkeley coordinated Global Venture Lab Network, between 2007 and 2011.

## **Philosophical foundation**

As per GVL Finland terminology, global business creation is herein defined as “the determined (joint) action of various stakeholders to swiftly and maximally realize recognized global business opportunities by fully utilizing the vehicle value of incorporation.” Overall, this article subscribes to the sentiments of The Kauffman Thoughtbook 2011 “to think differently and turn creative insights into practical, sustainable solutions”. (Ewing Marion Kauffman Foundation 2011)

In this article, entities, especially business firms, are viewed as the vehicles of their owners. According to our point of departure, the responsibility of the owners for the success of a venture is undividable. Luckily, we say, ownership can be divided – even if this should not be approached lightly. In this article, ownership is thought of as “venture parenthood” with a clear distinction made between active and passive shareholding. Whereas founding owners are thought of as biological parents and other active owners as step-parents, passive shareholders are thought of as anonymous “donors” of sorts, at best. Venture capitalists are step-parents dedicated to rapidly grooming venture babies, those both willing and able, to the cold world of faceless donors. Whereas natural persons are, by definition, limited to two biological parents, ventures – importantly – have no such limitations.

Even if owners carry an undivided responsibility for venture success, they typically have to limit their absolute decision power, over time, by allowing for contractual

arrangements with various stakeholders, such as customers, employees, financiers, and subcontractors. Owners often also appoint representatives in their stead, for example, as members of the board and CEO. Nonetheless, companies and organizations, and their actions and doings, are viewed herein as the footprints of their owners aimed at fulfilling their interest, mission, or purpose. The mission can be clear or unclear, open ended or short term, direct financial, indirect strategic, or social but it is – at any rate – always set by the owners as “venture parents”.

In terms of previous literature, this article draws from the paradigm building around venture-to-capital (V2C) or knowledge investing (Ala-Mutka 2005, Rasila 2004, Seppä & Näsi 2001) and more recent work on the “who-do” framework (Aspegren forthcoming, Kuivaniemi 2010, Porter 2009, Seppä et al. 2009). Originally, this work is rooted in the corporate strategy literature and the interest in linkages between ownership and strategy. Therein, understanding the global dynamism between *who* (exactly) owns an entity and what it can *do* – in order to maximize success – is the focus. (Seppä 2000)

Based on the literature referred to above, Table 1 illustrates the four main owner categories of growth ventures, referred to as the “principal venture parents”. The principal venture parents are divided into those gaining their parenthood by primarily investing financial capital and those primarily investing knowledge capital. The former group of venture parents builds the bridge towards passive shareholders who do not interfere with “parenthood”. An interesting archetype for a venture parent is a venture capital firm that is fully managed by salaried employees.

Table 1: Principal co-creator categories of growth venture creation

<b>Venture parents who invest</b>		Fulltime	Part-time
<b>financial</b> capital		<b>Venture Capitalists</b>	<b>Business Angels</b>
<b>knowledge</b> capital		<b>Entrepreneurs</b>	<b>Knowledge Investors</b>

The roles of entrepreneurs and venture capitalists as well as business angels have received due attention in the literature, which is also reflected in economic policies. The full potential of actors referred to as knowledge investors is yet to be discovered. Kalevala Business Creation School would focus on maximally utilizing this potential.

Methodologically, this article leans on action-research methods where scholars are themselves participants and actors in the phenomenon under investigation. At an extreme, such scholarship requires a double competence, practical as well as academic. Consequently, the best action scholars and educators challenge the popular claim: “Those who can’t do business, teach it”. To be sure, the desire to tackle this punchy claim is written deep in the “DNA” of Kalevala Global Business Creation School. (Colardyn & Bjørnåvold 2004, Gummesson 2000, Römer-Paakkanen & Pekkala 2008)



## Who-do framework

In a nutshell, who-do calls special attention to the interplay and linkages between ownership level issues and management/business level issues. In who-do, “who” refers to ownership level issues and “do” to management/business level issues. While the “do” level deals with classic business questions, and is visible/explicit, the “who” level deals with emerging ownership questions, and is invisible/implicit. On the “do” level, we ask: What is produced/offered, how, and to whom? On the “who” level, we ask: Who (should) own, why, and how? (Seppä 2000)

Classically, competitive advantage and brand value are depicted as either gained or lost on the “do” level. In the who-do framework, survival and success are strongly subject to the “who” level. In general, it is underscored that who owns, why and how, should be optimally aligned with what is produced/offered, how and to whom, to reach maximal market success. Figure 1 offers a graphical depiction of the who-do framework. (Aspegren forthcoming, Kuivaniemi 2010, Porter 2009, Seppä et al. 2009)

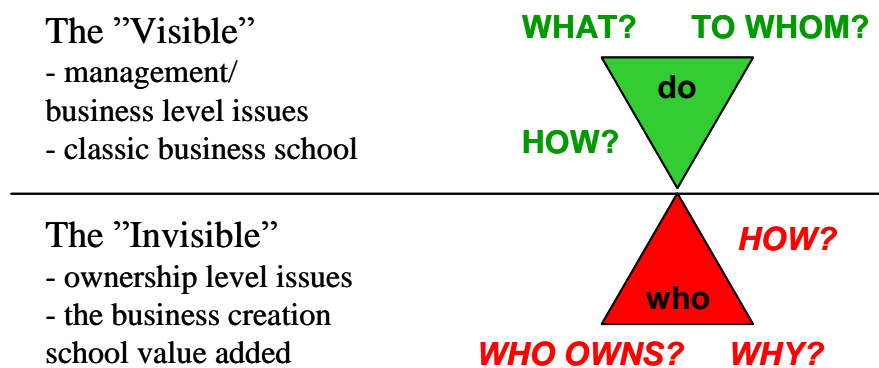


Figure 1: Basic elements of the who-do framework

To understand *who*, exactly, should own a given business, over time, we must understand *why*, exactly, each person or party would (or should) want to own the business, in order to define *how*, exactly, in terms of ownership instruments, the entity should be structured and owned. On the “do” level, we deal with classic product-market decisions and the make-or-buy question. Product or service system, organisation or way to operate, and customers or market segments make up the basic business model of any undertaking. (Seppä 2000)

Whereas the old school research and education gear around the “do” level, and “how to?” thinking, the new school is focused on the who-do interplay and “by whom?” thinking. According to who-do, an optimal composition of owners, over time, facilitates for a maximal business success. Figure 2 illustrates venture growth, over time, as who-do interplay. Put simply, the old school would only concentrate on the “do” level, and the new school on the who-do interplay: The “new who” needed to bring about the “targeted do”. The old school would concentrate on teaching the founding owner “how to” reach the next “do” level goal, and (practically) not deal with the who level. The new school leads the founding owners to think “by whom?”, instead. (Aspegren Forthcoming, Kuivaniemi 2010, Porter 2009, Seppä et al. 2009)

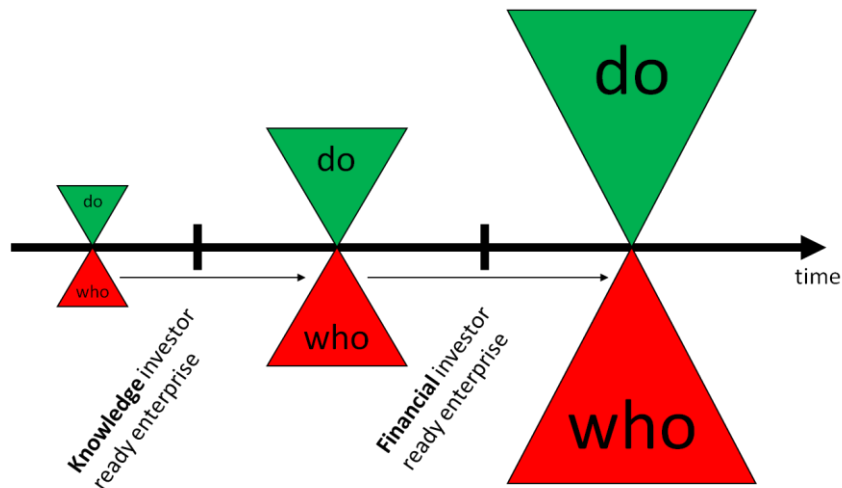


Figure 2: Venture growth, over time, depicted as who-do interplay

The inspiration of the co-creators of the who-do framework is the increased awareness for sustainability and meaningfulness in the sphere of business. Founders of business seek for ever deeper purposes. Employees and consumers increasingly require the same. Nonetheless, duly realised capital gains are to be appreciated as absolute evidence of value added. The reverse holds for inventions not moved to market or taken up.

Moreover, as success in global business creation requires such an unreasonable effort – putting one’s finances, health, and relationships at total risk – the only reasonable reward would be an “unreasonable reward”. As such a reasonable reward is only received by a fraction of the teams that put up the effort; each realized such reward is all the more deserved.

### **From Business Administration to Business Creation**

By now, business is almost anyone’s game. You just need guts, some talent and insight, basic computer literacy and access to the Internet. It helps, if you have education and experience; and if you are born to a right family, in a right country, and have the right gender and colour of skin, someone might add. Regardless, an “entrepreneurial liberation” has been under way, ever since the Cold War, all over the world.

Consequently, it is ever more paralysing to just “administer” business. Regardless of whether you run an established enterprise or a fledgling venture, you need to constantly “create” business: New products, services, processes, concepts, and markets. Create or die. Nothing underscores the magnitude of this change more vividly than the rocket-like emergence of Google and Facebook among the world’s most valuable brands.

One hundred years ago, scientific management gave the answer to the question of how to organize for economies of scale and the heyday of industrialisation. The functions of management and classic disciplines of business administration became well anchored and defined over the course of the 20<sup>th</sup> century. The classic functions are still being

underscored by business schools that are producing masters of business administration all over the world.

What would Frederick Taylor – the “father of scientific management” – prescribe for the metal workshops with decreasing order books or the paper industry facing a world of ecological pressures? He might see the vast opportunities vested in empowering each individual – from employees to all other stakeholders – within a company’s reach. He might ponder how to increase everyone’s “knowledge investment” and passion for the company mission – how to engage everyone in (business) creation, rather than subject them to (business) administration.

To equip graduates with what it takes to create businesses in the Google era, The University is expected to renew itself, and the business school, accordingly. There is a call for ever more ambitious – and ever more creative, holistic, and global – university programs. The call is for approaches that (factually) integrate education, research, and innovation (i.e., the knowledge triangle) around business creation into dynamic, multidisciplinary, open-innovation-based, real-life experiments, referred to as “Living Labs” in Europe.

The whole world talks about innovation. Innovation is “the word”. But what is innovation; what is it made of, essentially? Innovation is great ideas with *proven economic value*. Put bluntly, innovation is a *commercialized invention*. Many, who talk about innovations, effectively talk only about inventions or technological inventions, to be more precise. Very few talk about the commercialization end of innovation.

It appears to be somehow noble to deal with invention and somehow lowly to deal with commercialization. The former creates something new, we easily think, and the latter steals it away by charging the maximum a customer can pay – not the minimum needed for production. The former captures the essence of capitalism, the latter of socialism. Both require management and can benefit from professional business administration.

Business schools have, over several decades, turned into well functioning ecosystems that efficiently produce Masters of Business Administration to the established managerial requirements of both the private and public sector. Due to the efficiency of their prevailing routines, only incremental changes – instead of major leaps forward – can be reasonably expected from even from the best of them. The classic theory of the firm builds around linear thinking, from invention to foundation, leadership to strategy, and marketing to finance – all the way to the administration of the public company.

In the words of a frustrated rocket scientist colleague: “Hey, come on, business creation is not rocket science”. Indeed, in our words, it is more complicated than that. Rocket science is connecting “compatible dots” under the rationality and logic of natural science. Business creation increasingly involves connecting “incompatible dots”: systems far more complicated than in rocket science, namely human beings, time, money, machines, a good day and a bad day – “minds and matter” – and all this across vast cultural and physical barriers.

There is call for ever more deeply interdisciplinary foundations from academia, by the society at large, for ever more intimate – bolder, deeper, and ever more creative – interaction with practitioners of both established and emerging companies. Such new

programs are under way in several universities around the world. (Coté & Allahar 2007, Florin et al. 2007, Hamel 2007, Kickul & Fayolle 2007, Römer-Paakkanen & Pekkala 2008, Seppä et al. 2009, University of Jyväskylä 2010)

## Kalevala Global Business Creation School

The objective, herein, is to conceptually depict a new breed of university entity: a globally distributed "business creation school". This is not something better or more important than the classic business administration school, but something supplementary. The entity is named "Kalevala" as a tribute to the Finnish national epic, which builds on the power of knowledge and knowledgists over swords and muscles and the quest for a machine of eternal wellbeing, instead of a source for world dominance, as the end goal. The term "global" stands for the challenge to create a globally shared business-creation platform.

The conceptualization of the "Kalevala Global Business Creation School" draws from the GVL Finland experiment from 2007 to 2011 ([www.GVL3.com](http://www.GVL3.com)) and the eBRC program from 2001 to 2005 ([www.ebrc.fi](http://www.ebrc.fi)). While eBRC was a research intermediary leaning on a triple-helix model and the integration of business, university, and government, with emphasis on *research*, GVL Finland was a business-creation exercise integrating the three corners of the knowledge triangle, namely research, education, and innovation, with emphasis on *education*. Going forward, it is only logical that the emphasis will be on *innovation* (or business creation).

Kalevala subscribes to open-innovation thinking, but with the creation of businesses and the launching of new ventures at core, it is fuelled by the concept of knowledge investing (or V2C investing), which is of kin to sweat-equity investing. The fact that business creation requires co-creation by an ever-larger and dynamically evolving body of owners, rather than a single principal or a small team, does not make ownership unimportant. It makes it all the more important and all the more complicated to handle. The complicated linkage between the source and ownership of an invention versus the value of commercialisation (business creation) effort, and the split of eventual proceeds is to be respected and attended at all times.

**Table 2.** Inputs and outputs in the Kalevala process

Inputs	Outputs
1. Global partnership between faculty (profs, doctoral students and lecturers)	1. New products, businesses, and enterprises (as research outcomes)
2. Dedicated students in each committed university location	2. Willing and able co-creators of global businesses and enterprises
3. Curious inventors and entrepreneurs (as live case material)	3. Great global enterprises that solve "big problems"
4. Practitioners and corporate partners (as knowledge and resource investors)	4. Return on investment for every involved person

There are four key inputs and four key outputs, in the envisioned Kalevala process, as illustrated above, in Table 2. In the subsections that follow, each input and each output is briefly introduced.

*Input 1: Faculty – from a bottleneck to enabler*

Due to the established traditions of gaining merits for tenure and professorships, business school faculty has distanced itself from practice. In particular, the faculty has distanced itself from business creation practice. Many professors are considered as experts of corporate finance, consumer behaviour or strategic planning, but very few in actual business creation action.

The faculty members of the Kalevala Global Business Creation School are practicing business creators themselves and represent scholarly backgrounds (i.e., academic disciplines) across the board. They study and teach business creation by creating businesses, as co-entrepreneurs to practicing entrepreneurs and each other, continuously and across all borders. Importantly, this new breed of faculty bridges all existing domains (and silos) of knowledge with the real world, thereby turning faculty, at large, from a bottleneck to enabler.

*Input 2: Students – from passive learners to “dream labour”*

Interestingly, the more students have to pay tuition, the more energetically they appear to engage in their studies: Spend longer hours on campus, work more intensely on group assignments, talk more with their instructors, and have higher respect for their Alma Mater. The less they have to pay, the more passive they are likely to be, as learners.

One cannot learn without motivation. This holds true for business creation, in particular. Even in no-tuition university environments, students can be turned from passive to energetic, heavily engaged action learners by offering them real-life challenges and special ownership-related responsibilities and incentives. The curiosity, creativity, and energy reserves of students can turn them into “dream labour” and Kalevala Global Business Creation School into a “dream factory”.

*Input 3: Entrepreneurs – from single mothers to networked parents*

Founding entrepreneurs are key players in business creation. Too often they are single parents, or lonely riders, without even realising it. Well-meaning advisors, consultants, mentors, and financiers make them feel they are not alone – until the bad day comes. There has not been a person or place, at the university, a business creator should turn to, unless one is a researcher having to claim an invention with the licensing office.

The Kalevala Global Business Creation School offers entrepreneurs a globally distributed Doctor of Business Creation (DBC) program whereby they can explore ways and forms of shared venture parenthood in an experimental environment at, nevertheless, market terms. Also entrepreneurs that are not interested in pursuing their own DBC can offer their ventures as live case material and participate in the shared venture-parenthood programs. This helps entrepreneurs transform from single mothers to networked parents.

#### *Input 4: Executives – from mentors to co-entrepreneurs*

Pro bono mentoring is a great tradition, even if mainly suited to professionals who have already retired from an active duty and are no longer moving with the fastest of pace. Entrepreneurs-in-residence also bring a valuable contribution to university based business creation. Some individuals look at this domain as a source for consulting revenues, while others are in search for investment-ready companies as business angels.

The Kalevala Global Business Creation School pools individual executives for a new role and capacity: that of knowledge investors. The school offers the busiest of professionals precision in terms of use of time and effort and most lucrative risk-return prospects. The executives are also offered opportunities to engage the organizations they represent in global business creation as resource investors. Overall, this expands the scope of alumni and other professional participation, in university-based business creation, from mentors to co-entrepreneurs.

#### *Outputs: From bottom to top*

##### *Output 1: Products and businesses as research outcomes*

On the ground level, the Kalevala Global Business Creation School produces new products, businesses, and enterprises as basic research outcomes. Even if the aim is always for world-class businesses, there is no guarantee that any hugely successful enterprises will emerge. Instead, tolerance for failure must be guaranteed. A significant level of trial and error is needed to enable the second, far more important output.

##### *Output 2: Willing and able global business creators*

The Kalevala Global Business Creation School produces “battle-tested”, willing, and able co-creators of global businesses. This is a level where a world-class standard can be achieved from the get-go, regardless of the level of actual business success with the bottom-level output, described above. The possibility to experience and learn from failure is, in fact, more important than business success, on the bottom level. The participating universities can supply their home regions and enterprise environments with globally connected, ready-to-go business creators.

##### *Output 3: Great global enterprises*

All action in the Kalevala Global Business Creation School, is targeted to producing great global enterprises, ones that solve Big Problems. While it is not imperative that such emerge, it is all the more likely that this will happen. The pressure is off, but every passion is on. All the resources of this globally distributed community, platform, and factory of business creators and the knowledge they need, is always targeted to the most promising target ventures, across all borders.

##### *Output 4: Return on investment for every involved person*

For each global growth venture success story produced by Kalevala Global Business Creation School, return on investment will be distributed to every involved person. The guiding principle is globally shared parenthood of all ventures and, even if some (locally leading) individuals will always own, contribute, and receive far more than the others, everyone will have a small slice of everything.

## Who-do of Kalevala Global Business Creation School

Pooling the inputs and delivering the outputs, referred to above, is easier said than done. There may be some merit in having said it, but even the greatest idea is economically worthless unless taken up, as stated in Introduction. To give Kalevala Business Creation School a shot, we'll next approach our case through the who-do framework.

There is a unique set of three questions for both levels of who-do. Metaphorically speaking, the ownership level questions (who, why, how?) define the "person" (of the undertaking under review) and the management/business level questions (what, how, to whom?) define what the person does or aims at doing.

In principle, who-do entertains two extreme points of departure. One can take the "person" as the point of departure, and maximize what that person can do, or one can take what maximally could be done as the point of departure, and shape (upgrade) the person to fit the bill. Family businesses are archetypes of the former and startups seeking for business angel and VC funding archetypes of the latter approach. Under Philosophical Foundation, we underscored that the responsibility of the owners of the success of a venture is undividable. Luckily, we continued, ownership can be divided – even if this should not be approached lightly. To be sure, one should not expect a heavily overweight person to jump nine meters. If one wants nine meters to be jumped, the person has to be fitted to the bill. It is that simple.

Since there is no "person" to be taken as the point of departure – thanks to the imaginary nature of the exercise at hand – our point of departure for Kalevala Global Business Creation School is, by definition, "what maximally could be done". Defining the maximum is, admittedly, limited to the imagination of the author, herein. Even there, imagining a globally shared and distributed university based community, platform and factory of enablers of global growth venture creation – producing Great Global Enterprises, their makers, and the knowledge needed – is at least a fair beginning.

Consequently, we start with the "do" level: What does Kalevala Global Business Creation School ideally and optimally produce/offer, how and to whom? This is closely connected with the above depiction of possible outputs and necessary inputs.

*The "do" level: What is produced/offered, how, and to whom?*

*What comprises the product/service system? What is produced/offered, and what not?* Defining the product of a university, in general, is no trivial challenge. It all starts from the core value proposition. On the broadest level, Kalevala is designed to enable the university to produce *masters* and *mastery* of global business creation to the benefit of the society at large, through real life co-creation of Great Global Enterprises (as strategy, not mission). This is achieved by offering a system of integrated products and services to various stakeholders. For example, in the Kalevala context, students (graduates) are more part of the product than an end customer. Herein, the quality of the masters and mastery produced would be measured in new jobs and capital appreciation created by their application, rather than employability of graduates and theoretical publication visibility.

*How is the operation, production and delivery organised, locally vs. globally? What is the Kalevala way to operate and what not?* The efficiency of operations, suitability of organisation and underlying leadership philosophies – culminating in being smart with the “make or buy” question – make or break any entity. Kalevala subscribes to shared venture parenthood as the cornerstone of its real life business creation. According to the prevailing paradigm, business is created very locally and often within narrow silos. The status quo is supported by the venture capital paradigm which is geared around a business plan, projections, valuation, elevator pitches, milestones and monitoring. It does not help, if the venture is publically funded and thereby, by definition, tied to serving regional/national political interests. Kalevala drills holes in these silos.

*To whom is the production offered and the branding primarily targeted?* Kalevala serves a multitude of stakeholders as customers. The overriding beneficiary is the public at large, served under the premise that responsible business creators and relevant business creation knowledge cater to the lifeline of the contemporary society, with success measured in new jobs and capital appreciation created. Under this basic premise, Kalevala is free to produce value and target its branding, separately, to each of the four categories of parties needed as inputs, to produce the outputs, referred to above.

*The “who” level: Who should own, why, and how?*

*Who (exactly) should own Kalevala Global Business Creation School, and who not?* Who owns a given faculty (as a community and/or institution) in a given university? Who owns the underlying field of science or art of the faculty in question? How do we write (and agree upon) new code, herein? In the context of Kalevala, the point of departure should be relevant individual faculty members with curiosity, if not passion, to giving it a try as a large “born-global startup team” by forming a voluntary community of same-minded individuals, a new globally connected and incorporated faculty. Direct ownership by individuals (and partnership between them) is as critical as the enabling support and consent of their university employers (as non-owners). In a nutshell, different parties should own different instruments.

*Why would or should they own?* The mission of such new faculty must be crystallised, supported and strengthened by increased acknowledgement and belongingness. Over time, a new breed of professors (of art of business creation) will emerge who are committed to producing new masters and mastery of business creation by themselves jointly engaging in real life global co-creation of enterprises, while teaching and researching. To become professors and educators of doctors who can “cure patients” they understand the importance of owning, controlling and running a global business creation platform, one which continuously drills holes in regional and thematic silos in which today “business as usual” is created.

*How should they own, over time?* The legal structure and instruments of ownership lay out the foundation of corporate governance and ownership dynamics for any undertaking. To facilitate for scalability, over time, Kalevala Global Business Creation School should have different ownership instruments available for individuals (and institutions) acting in different roles. The legal structure needs to bring together different stakeholders, the four categories of input providers, plus the underlying universities, both on the global and on a local level. Based on initial drafting, trial and



error, the Management Company plus LP Vehicles structure, which is typical to the VC industry, offers a promising structural foundation also to the Kalevala undertaking.

### *Connecting the dots*

Working on a vision of universities as one global business creation platform, Kalevala Global Business Creation School builds on existing resources as building blocks for a new, globally shared “operating system”: A community, platform and factory. The starting point is co-creation of new, Live Case based Business Creation study courses and programs. Operatively, scholarly exchange and visiting faculty roles are viewed as handy (established) instruments to get the envisioned joint venturing going. Curiosity, openness, mutual respect and total confidentiality (where needed) are among the core values to be shared by all parties.

The main “structural invention”, herein, is a new generation Private Public Partnership: The idea of using individual university courses and assignments (if not entire degree programs) not just as instruments of teaching, but also as instruments of practical intervention (“outreach”) and scholarly investigation, and “faculty outsourcing” as an instrument to produce the necessary entrepreneurial circumstance. Problem based learning emphasizes the role and responsibility of an individual student, as well as the role and involvement of both practitioners and faculty.

The main “process invention”, herein, is the application of a Live Case approach to degree programs and an entire research domain. Students will work not only on historical cases but on real life business cases stemming from the acutely open opportunity windows of established and emerging enterprises, whose representatives are members of dedicated enterprise partner and venture portfolio programs of Kalevala Global Business Creation School.

The main “conceptual invention”, herein, is the notion that knowledge capital investors are emerging aside of venture capital investors. While much of the new venture supply is heavily knowledge intensive, and in need of “smart money”, the capital supply is ever less of such nature. Paradoxically, both venture supply and capital supply have grown phenomenally, in the Google era, but to opposite directions. Kalevala Global Business Creation School builds a new domain of knowing, profession and industry between venture supply and capital supply, one catering for capital demand (by venture teams), from one hand, and venture demand (by capital teams), from the other hand.

## **Discussion and conclusions**

Rapidly growing companies and the jobs they create are the lifelines of contemporary societies around the world. While basic manufacturing and other labour-intensive domains still work for Asia, societies in America and Europe must move further upstream. While market orientation saves a lot for America, Europe faces an ever tougher challenge. We must move upstream in both the intensity of business knowledge and in mindset quality.

All said, one should wonder why there is no university domain focused on producing growth venture creators and the type of knowledge they need to create great enterprises. Universities do have research on growth ventures, and professors of such research, and

they do educate more such researchers, but few universities produce "clinical doctors", individuals willing and able to co-create global growth ventures. Universities do have the best practice of bringing in entrepreneurs-in-residence, but this is only a quick fix and saves universities time from having to -actually accept new, uncomfortable traditions.

In our time, universities could offer a globally distributed doctoral program in growth venture creation, one that produces "doctors that cure patients" in market conditions and on a shared enterprise platform. Such new breed of students would produce unique theses (of art, rather than science), while co-creating live case ventures across all borders and barriers, as co-entrepreneurs together with business creation professors, in a process open to wider such education and subject to such knowledge creation where the end justifies the means, complementing the tradition where "the means justify the ends".

To be sure, there are no internal pressures or any natural evolution that would cause universities to change the status quo. The demand for the universities to produce growth venture creators and "doctors of business creation" by professors who themselves "cure patients", in extreme action learning and action research environments, is increasingly voiced by the industry and policymakers, all over the world. But the willingness and ability of the universities to change, from within, is hypothetical only. Masters of business administration may theoretically understand that we need masters of business creation, but have a hard time depicting how, and by whom, such could be produced in practice and -- more importantly -- how, and by whom, *not*.

History will be made by the decision makers and universities who dare to lead us in this new space. With reference to how global the playing field of growth venture creation has become, and how imperative it would be to build this "new domain of knowledge" on a globally shared enterprise platform, this takes more than a standard appointment of new professors. To learn and teach global growth venture creation, they have to do it.

## REFERENCES

- Ala-Mutka, J. (2005). *Strategic Management of High Growth Ventures: A venture-to-capital framework for professional entrepreneurship*. Doctoral dissertation. Tampere: Tampere University of Technology.
- Aspegren, C. (Forthcoming). *The potent entrepreneur*. Unpublished manuscript of a doctoral dissertation. Jyväskylä: University of Jyväskylä.
- Colardyn, D. & Bjørnåvold, J. (2004). *Validation of Formal, Non-Formal and Informal Learning: policy and practices in EU Member States*. European Journal of Education, Vol. 39, No. 1. 69-89.
- Coté J. E. & Allahar A. L. (2007). *Ivory tower blues: A university system in crisis*. Toronto: University of Toronto Press Incorporated.
- Ewing Marion Kauffman Foundation (2011). *Kauffman Thoughtbook 2011*. Kansas City, Kauffman Foundation.
- Florin, J, Karri, R. & Rossiter, N. (2007). *Fostering Entrepreneurial Drive in Business Education: An Attitudinal Approach*. Journal of Management Education, Vol. 31, No. 1, 17-42 .
- Gummesson, E. (2000). *Qualitative Methods in Management Research, 2nd edition*. Thousand Oaks, CA: Sage.
- Hamel, G. (2007). *The Future of Management*. Boston, MA: Harvard Business School Press.
- Kickul, J. & Fayolle, A. (2007). *Cornerstones of Change: Revisiting and Challenging New Perspectives on Research in Entrepreneurship Education*. In. Fayolle, A.. (edt.) 2007. Handbook of Research in Entrepreneurship Education, Volume 1. Edward Elgar Publishing. Massachusetts. USA.
- Kuivaniemi, L. (2010). *Evaluation and reasoning in the entrepreneurial opportunity process: Narratives from sex industry entrepreneurs*. Doctoral dissertation. Jyväskylä: University of Jyväskylä.
- Porter, J. (2009). *Conceptual Analysis and an Insider's Empirical Case of Growth Venturing for Sustainability*. Master's thesis. Jyväskylä: University of Jyväskylä.
- Rasila, T. (2004). *Venture-to-Capital – New Framework for Growth Venturing and Professional Ownership*. Doctoral dissertation. Tampere: Tampere University of Technology.
- Römer-Paakkanen, T. & Pekkala, A. (2008). *Generating entrepreneurship and new learning environments from students' free-time activities and hobbies*. Liiketaloudellinen aikakauskirja 3/2008. Liiketaloustieteellinen yhdistys ry. Helsinki. pp. 341-361.

- Seppä, M. (2000). *Strategy logic of the venture capitalist: understanding venture capitalism – the business within – by exploring linkages between ownership and strategy of venture capital companies, over time, in America and Europe*. Doctoral dissertation. Jyväskylä: University of Jyväskylä.
- Seppä, M. & Näsi J. (2001) *Playing with the Goose – Pushing Entrepreneurs Across the Capital Gap – who, why, and how?* Paper presented at the IntEnt 2001 Conference, in South Africa. Conference proceedings of IntEnt 2001.
- Seppä, M., Biswas, D., Pessa, M., Sidhu, I., Suoranta, M., and Viteli, J. (2009). *Towards new Business School: Integrating research, education and outreach into a windmill of change*. EBRF 2009 Conference Proceedings. Tampere University of Technology and University of Jyväskylä.
- Stangler, D. (2010). *High-Growth Firms and the Future of the American Economy*. Kauffman Foundation Research Series: Firm Formation and Economic Growth. Kansas City, Kauffman Foundation.
- University of Jyväskylä (2010). *Art of Business Creation – a new domain of knowing as solution to the growth enterprise shortage*. University of Jyväskylä press release dated 24 November 2010. Jyväskylä: University of Jyväskylä.

## Session 2: EDUCATION

A SYSTEM DYNAMICS APPROACH TO THE STUDY OF WORD-OF-MOUTH AND ITS EFFECT IN AN ONLINE ENVIRONMENT ([pdf](#))

Wong, Roman; Sheng, Shirley Ye

COLLECTIVE VALUE CREATION BY PLAYING WITH LEGOS. A NETNOGRAPHIC STUDY ([pdf](#))

Kurikko, Hanna; Tuominen, Pekka

CREATING TOMORROW'S GLOBAL ENTREPRENEURS: A CASE STUDY OF THE STU CLARK CENTRE FOR ENTREPRENEURSHIP ([pdf](#))

Smith, Malcolm; Warren, Robert; McRae, Mavis

PRIZM GAME FOR PROBLEM SOLVING AND INNOVATION CREATION ([pdf](#))

Busarovs, Aleksejs

# A System Dynamics Approach to the Study of Word-of-Mouth and Its Effect in an Online Environment

Roman Wong<sup>1</sup>; Shirley Ye Sheng<sup>2</sup>

<sup>1</sup>Associate Professor, Barry University, rwong@mail.barry.edu

<sup>2</sup>Assistant Professor, Barry University, ysheng@mail.barry.edu

## Abstract

Word-of-mouth (WOM) plays an important role in reducing risk and uncertainty in purchase and consumption. Most of the prior research on WOM focused on studying either the factors that triggers consumers' participation (sending or receiving) in WOM activities or the impact WOM information has on consumers' buying decision. The relationship between the two decision processes, however, is recursive and dynamic. Most prior studies have not been focusing on such recursive relationship. Our objective for the current research is to present a system dynamics model for the study of the relationship between the buying decision and the decision to participate in WOM communication.

## Keywords

Word-of-mouth, adoption, recursive relationship, system dynamics, modeling

## Introduction

Word-of-mouth (WOM) plays a crucial role in helping to reduce risk and uncertainty in purchase and consumption (Murray and Schlater 1990). It is an informal, C2C, communication about the characteristics of a business or a product. It allows consumers to exert both informational and normative influences on the product evaluation and purchase intention of fellow consumers (Bone, 1995; Ward & Reingen, 1990). Consumers often acquire information about specific products from various online communities such as blogs and product review Web sites. Studies have shown that consumer reliance on WOM is increasing. For example, the ongoing study conducted by the Kokokusha group started in 2007 has shown that such reliance increased from 61.3% in 2005 to 76.4% in 2007.

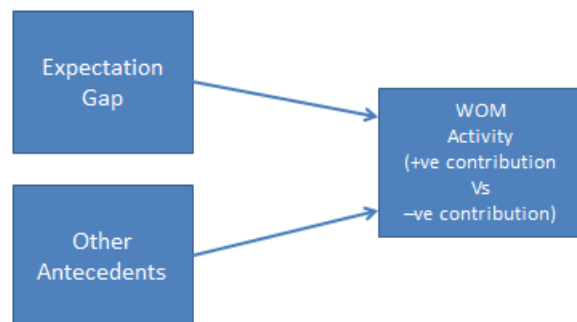


Figure 1. Contributing factors of WOM activity.

Prior research on WOM has mainly focused on studying the factors that triggers consumers' participation (sending or receiving) in WOM activities and the impact WOM information has on consumers' buying decision (Chatterjee, 2001; Chen & Xie, 2005; Chevalier & Mayzlin, 2006; Dellarocas et al, 2004; Godes & Mayzlrin, 2004). Consumers tend to place significant reliance on other people's experiences and opinions during the decision process of purchasing a high involvement product or service. This is especially the case when (a) the transparency of the product is high, (b) the product is complicated, (c) the criteria for an objective evaluation of the product are difficult, and (d) the perceived risk is high.

Past research has linked WOM activities to factors including satisfaction, loyalty, quality, commitment, trust, and perceived value. Harrison-Walker (2001) suggests that WOM valence, i.e. whether the WOM is a praise or negative, is an important dimension of WOM that may exert a significant impact on the reviewers' buying decisions. Her findings basically are in agreement with earlier investigations

about WOM (Halstead 2002; Halstead and Dröge 1991; Swan and Oliver 1989; Heitmann et al. 2007). Figure 1 indicates major contributing factors leading to consumers' participation in WOM activities. Figure 2 is a model showing WOM as a significant factor influencing a shopper's buying decision making and moderating impacts of other factors.

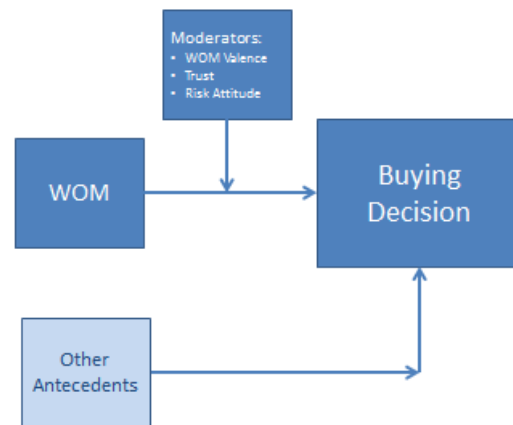


Figure 2. A model for WOM impact on buying decision.

However, the buying decision and the decision to participate in WOM communication are not disjointed. There is a recursive relationship between the two decision processes in that the buying decision of a consumer, which leads to the later evaluation of the purchased product, may then lead to the decision of whether or not to send out WOM in regard of his or her experience with the product. His or her WOM contributions in return may likely influence the buying decisions of other consumers in the online community. Figure 3 indicates such recursive and dynamic influence between the buying decisions and the decisions to send a WOM message. So far there has not been much study focusing on such recursive relationship and the dynamic nature of these two decision processes. In this current study, we concentrate on studying such recursive relationship between the buying decision and the decision to participate in WOM communication.

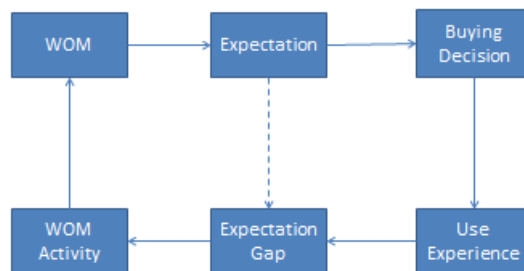


Figure 3 The recursive relationship between consumers' buy decisions and WOM activity decisions.

Our objective of the current study is to construct a computational architecture to be used as a simulation tool for the study of the dynamic recursive relationship between consumers' decision to adopt a product and how the adoption experience may trigger their contribution of

WOM messages to online review Websites, which frequently exert impacts on other potential adopters. In this paper, we are providing a brief discussion on the nature of the two decision processes and their inter-relationship, followed by a description of the system dynamics approach to simulation. Furthermore, we present in the current paper our system dynamics model for the adoption and WOM problem. At the end, we discuss some future directions to further our current research.

## **eWOM**

The type of WOM communication this study focuses is the electronic form of WOM (eWOM) such as those available on an online product or service review Website. In the following paragraphs, we briefly discuss previous studies on the motivations behind the potential adopters who go about to seek WOM messages and the adopters who take effort in sending WOM messages.

### **Senders' Motivations**

Chan and Ngai (2011) suggest social ties to be a major motivation for sending an eWOM message. By simply sharing their opinions and experience, eWOM senders are socially connected with the other unknown consumers. They concern for other consumers' benefits by providing recommendations based on their own positive experience and suggestions to avoid mistakes based on their own negative experience. Through eWOM, senders enhance their own self-worth (Chan and Ngai, 2011).

Frequent eWOM senders are also regarded as opinion leaders, who are characterized by being heavy users of mass media (Internet in this case), having hands-on experience of the products and absorbed risks of using the products, and being willing to share experiences and opinions. Opinion leaders have prescreened, evaluated, and synthesized knowledge in an unbiased way. Consumers generally believe that senders of eWOM on trusted websites usually have no vested interest with the company and the senders do not have strong commercial intent. Thus, credibility is higher with consumer generated buzz such as online reviews compared to marketer generated hypes such as advertisements.

### **Seekers' Motivations**

eWOM readers or seekers search online reviews on certain product or service because they need information. According to Chan and Ngai (2011), Biz Rate conducted a survey with 5,500 web consumers, finding that almost half of the respondents (44 %) reported that they had consulted opinion sites before making a purchase decision (Piller, 1999).

When consumers hold high uncertainties or perceived risks such as performance, social or financial risk over a purchase, their motivations of searching information to evaluating alternatives are also high. High risk associated with a buying and high interest from the eWOM seeker would increase a consumer's level of involvement. Zaichkowsky (1985) stated that consumers with a high level of product involvement would actively look for information related to the product and evaluate all the alternatives, whereas consumers with a low degree of product involvement would use heuristic cues for a speedy decision making. Therefore,



when degrees of perceived risk differ, involvement for purchasing a product differs (Zaichkowsky, 1985).

The elaboration likelihood model (ELM, Petty and Cacioppo, 1981) claims that two different information processing routes, the central route and the peripheral route, are related to the degree of involvement. Central route processes are those that require a great deal of thought and careful analysis involving extensive cognitive processing. Thus, the consumer would carefully review the eWOM. On the other hand, peripheral route processes do not involve the elaboration of the messages/reviews; instead, these processes rely on non-attribute-related elements such as the popularity of the eWOM (the quantity/volume of the reviews).

When a consumer holds a high level of involvement, s/he takes the central route to process information; whereas under conditions of low involvement, s/he tends to process information through a peripheral route. Thus, a person's unique cognitive responses to the message determine the persuasive outcome. If favorable thoughts are the result of the elaboration process, the brand or service under review will most likely be accepted. If unfavorable thoughts are generated, the product or service under review will most likely be rejected.

## **System Dynamics Approach**

System dynamics is a computer-aided approach, taking a holistic view, to study dynamic problems arising in complex social, managerial, economic, or ecological systems. Indeed, it is an appropriate method to study any dynamic systems characterized by interdependence, mutual interaction, information feedback, and circular causality.

The system dynamics approach emphasizes a continuous view. The continuous view strives to look beyond events to see the dynamic patterns underlying them. Moreover, the continuous view focuses not on discrete decisions but on the policy structure underlying decisions. Events and decisions are seen as surface phenomena that ride on an underlying tide of system structure and behavior.

### **Major Components in System Dynamics Models**

#### *Stocks and Flows*

Stocks (levels) and the flows (rates) that affect these stocks are essential components of system structure. Stocks are the accumulations or state variables, which are the memory of a dynamic system and are the reasons of its disequilibrium and dynamic behavior.

#### *Loops*

Conceptually, the concept of information flow, or feedback loops, is at the heart of the system dynamics approach. Diagrams of loops of information feedback and circular causality are used as tools for conceptualizing the structure of a complex system and for communicating model-based insights. However, the loop concept underlying feedback and circular causality by itself is not enough. The explanatory power and insightfulness of feedback understandings

are built on the underlying notions of active structure and loop dominance, that is, the ability for the model to change the strengths of influences as conditions change.

### *Endogeny*

The concept of endogenous change is fundamental to the system dynamics approach. It dictates the aspects of model formulation: exogenous disturbances are triggers of system behavior; the causes are contained within the structure of the system itself. In a system of equations, the ability to shift loop dominance comes about endogenously from nonlinearities in the system. For example, the S-shaped dynamic behavior of the classic technology adoption model ( $dP/dt = aP - bP^2$ ) can be seen as the consequence of a shift in loop dominance from a positive, self-reinforcing feedback loop ( $aP$ ) producing exponential-like growth to a negative balancing feedback loop ( $-bP^2$ ) that brings the system to its final stage. Only nonlinear models endogenously alter their active or dominant structure and shift loop dominance. From a feedback perspective, the ability of nonlinearities to generate shifts in loop dominance and capture the shifting nature of reality is the fundamental reason for advocating nonlinear models of social system behaviors.

### *Time Derivative*

Mathematically, the basic structure of a formal system dynamics computer simulation model is a system of coupled, nonlinear, first-order calculus (differentiation or integration) equations. The simulation of such systems is usually implemented by dividing a time unit into discrete intervals of length “dt” and stepping the system through time one dt at a time:

$$\frac{d}{dt} \mathbf{x}(t) = \mathbf{f}(\mathbf{x}, \mathbf{p})$$

where  $\mathbf{x}$  is a vector of levels (stocks or state variables),  $\mathbf{p}$  is a set of parameters, and  $\mathbf{f}$  is a nonlinear vector-valued function.

In a nutshell, the system dynamics approach involves:

- Defining problems dynamically, frequently in terms of graphical instruments, such as causal loop diagrams, over time
- Striving for an endogenous, behavioral view of the significant dynamics of a system, a focus inward on the characteristics of a system that themselves generate or exacerbate the perceived problem
- Thinking of all concepts in the real system as continuous quantities (e.g. amount of WOM, number of potential adopters and adopters) interconnected in loops of information feedback and circular causality (e.g. connection between buying decision and decision to send a WOM message)
- Identifying independent stocks (e.g. the WOM presented on most online product review sites) in the system and their inflows and outflows (rates)
- Formulating a behavioral model capable of reproducing, by itself, the dynamic problem of concern. The model is usually a computer simulation model expressed in nonlinear equations, but is occasionally left unquantified as a diagram capturing the stock-and-flow/causal feedback structure of the system
- Deriving understandings and applicable policy insights from the resulting model
- Implementing changes resulting from model-based understandings and insights

## A System Dynamics Model for Adoption and WOM

In this section, we present a system level model we constructed to explain the recursive relationship between online shoppers' buying decisions and their activities of sending WOM messages.

### Causal Loop between Market Saturation and WOM

In system dynamics modeling work, causal-loop diagrams (CLD) are frequently used to represent the stocks and flows in a system. CLD is a causal diagram technique that indicates how interrelated variables have impacts on one another. A CLD consists of a set of nodes representing the variables connected together. The relationships between these variables, represented by arrowed arcs (causal links), are either positive or negative. A positive causal link connects two nodes that change in the same direction, whilst a negative causal link connects nodes that change in opposite directions.

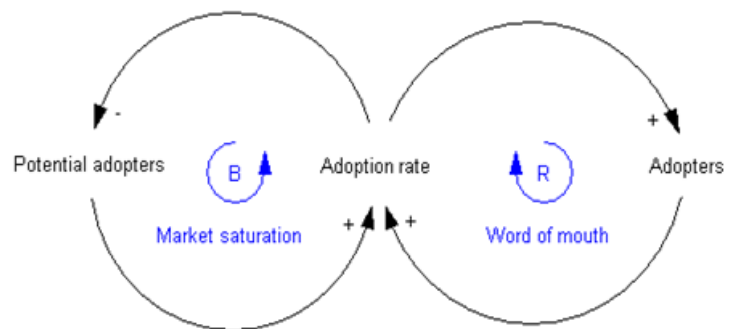


Figure 4. A causal-loop diagram indicating the dynamic relationship between adoption and WOM.

In a CLD, a causal loop, i.e. a complete circuit of flows between two variables, is either reinforcing (R) or balancing (B). The loop is reinforcing if, after going around the loop, one ends up with the result that is in the same direction as that of the initial assumption. It is balancing, otherwise, if the result ends up in a direction that contradicts that of the initial assumption. Reinforcing loops indicate the resulting causal impact that is either exponentially increasing or exponentially decreasing. Balancing loops are associated with plateauing effects.

The CLD in Figure 4 provides a representation of the two phenomena we included in our WOM and adoption model. The left-hand-side loop of the CLD represents how the change in the number of potential adopters impacts the adoption rate, which in return causing a change to the balance of the potential adopters. The causal loop is balancing by nature and labeled as 'Market Saturation'. The right-hand-side loop in Figure 4, on the other hand, represents how the change in the adoption rate brings along a change in the number of adopters, which in turn exerts an exponential impact, either positive or negative, depending on the direction of the original change in the adoption rate, on the adoption rate itself. Such a causal loop is reinforcing by nature and labeled as WOM.

### Implementation

Our WOM system dynamics model was implemented using the freeware NetLogo, which was developed by Uri Wilensky of the Northwestern University. The software can be downloaded for free for educational uses from <http://ccl.northwestern.edu/netlogo>. NetLogo has been more frequently used for modeling agent-based problems. The software comes with a programming tool called 'Systems Dynamic Modeler', which was designed for system

dynamics modeling problems. We used System Dynamics Modeler for our aggregate system model, while we use NetLogo for our agent-level modeling in our second phase of study.

The System Dynamics Modeler facilitates the modeling work by providing an intuitive graphical interface that allows the programmer to create the system dynamics model with a model diagram. Figure 5 is such a system dynamics model diagram created by the System Dynamics Modeler. The model depicted in Figure 5 is described in terms of three elements: stocks (rectangular shape), flows (broad arrow with faucet shape), and links (arrowed arc line).

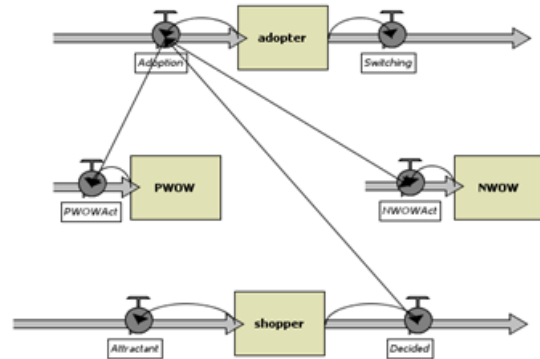


Figure 5. Major system components implemented in the system dynamics model.

A stock is a collection of things, an aggregate, a state variable. For example, a stock can represent a population of online shoppers, a collection of WOM messages, or the number of adopters. A flow brings things into, or out of a stock. Flows look like pipes with a faucet because the faucet controls how much stuff passes through the pipe. Examples include decision to buy made by the online shoppers. A Link makes a parameter value from one part of the diagram available to another. A link transmits a number from a variable or a stock into a stock or a flow.

There are four stocks identified for our model: Adopter (“adopter”), Potential Adopter (“shopper”), Positive WOM (“PWOM”), and Negative WOM (“NWOM”). Both Adopter and Potential Adopter have flows into them and flows out of them. For the Positive WOM and Negative WOM, there are only inward flows into these two stocks.

For Adopter, the inward flow is Adoption, i.e. when a Potential Adopter decides to buy. The flow pattern for this inward flow follows a gamma distribution form as is commonly observed in a lot of new product adoption cases (see Figure 6). The mathematical representation for the in-flow of Adoption is:

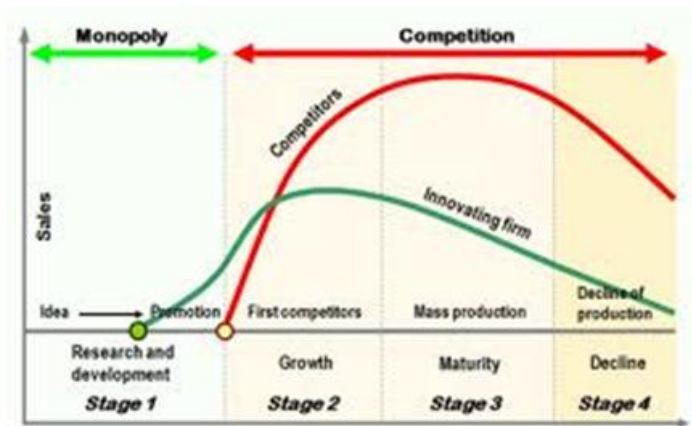


Figure 6. New products and technology adoption life cycle.

$$Adoption = shopper^k * (pwom / (pwom + \alpha * nwom))$$

where k is a scalar constant that defines the shape of the distribution; while  $\alpha$  is a multiplier constant representing how sensitive the Potential Adopter is to the Negative WOM. There is an outward flow “Switching” that causes Adopter to decrease. Switching represents the

depletion in number of Adopter due to switching to other products or end of product life cycle. Its outflow rate is a function of the number of Adopter and a switching rate.

For Potential Adopter, the in-flow is the amount of potential adopters newly attracted (“Attractant”) to consider adopting the product. The flow rate is represented as a function of Adoption and a scalar constant (“attractRate”). The outward flow of Potential Adopter is the amount of potential adopters decided to adopt the new product (i.e. “Adoption”). The mathematical representation for the stock of potential adopters (“shopper”) is as follows:

$$Shopper = a + Attractant - Adoption$$

where  $a$  is the initial number of potential adopters to start with.

For the positive WOM (“PWOM”), the in-flow is the amount of number of new positive WOM messages contributed by adopters. The flow rate is represented as a function of Adoption and a scalar constant (“pwomRate”). The mathematical representation for PWOM is as follows:

$$PWOM = b + Adoption * pwomRate$$

where  $b$  is the initial number of  $PWOM$  to start with.

For the negative WOM (“NWOM”), the in-flow is the amount of number of new negative WOM messages contributed by adopters. The flow rate is represented as a function of Adoption and a scalar constant (“nwomRate”). The mathematical representation for NWOM is as follows:

$$NWOM = c + Adoption * nwomRate$$

where  $c$  is the initial number of  $NWOM$  to start with.

In addition to the System Dynamics Modeler, NetLogo also provides a set of tools for creating fundamental user interface for input and controls. For the current exercise, the slider control allows the model users to enter parameter values in variable rates. The textbox control can be used for input or output purposes. The button control provides the model users means to activate a procedure. Figure 7 shows a variety of controls for user interface of the model.

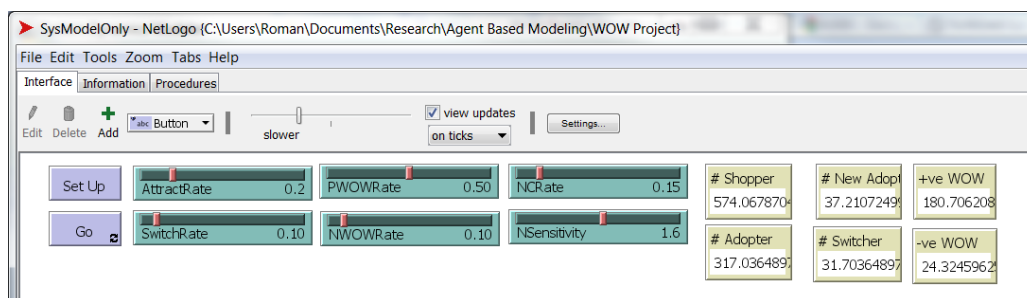


Figure 7. Sample controls used on the user interface of the system dynamics model for WOM.

## Result for Sample Configuration

The product adoption and WOM system dynamics model in this study, as explained earlier, is a system of coupled, nonlinear, first-order differentiate equations. Its simulation is implemented by dividing a time unit into discrete intervals of length “dt” and stepping the system through time one dt at a time such as the following generic format:

$$\frac{d}{dt} \mathbf{x}(t) = \mathbf{f}(\mathbf{x}, \mathbf{p})$$

where  $\mathbf{x}$  is a vector of levels (stocks or state variables),  $\mathbf{p}$  is a set of parameters, and  $\mathbf{f}$  is a nonlinear vector-valued function. In our model, the differentiation process starts with the stock adopter, followed by potential adopter, and then the two kinds of WOM.

In most new product adoption cases, the distribution of such new product adoption throughout its life-cycle usually follows a gamma pattern. As such, the mathematical characteristics of our model demonstrate a similar pattern of that of a gamma distribution pattern. Based on our initial observation of the online adoption behaviors for a certain model of digital camera on a leading shopping Website, we derived a sample of parameter values to configure our adoption and WOM system dynamics model. Figure 8 captures the change in the adoption and the number of potential adopters over time.



Figure 8. The plotting of the change in the number of adopters and potential adopters over time in a simulated online shopping community.

## Conclusion

In this paper, we used a system dynamics approach to model the recursive relationship between online shoppers’ decisions to participate in WOM activities and how these WOM activities in turn exert on impact on other shoppers’ buying decisions. We present a system level model that simulates the dynamics of such recursive relationship between the two decision processes. The contribution of the model we present is the tool we provide for the study of the complex dynamics in the product adoption process and the WOM processes thereafter.

The future direction for this research is multifold. First, we shall continue our study by going into the empirical stage of systematically observing and collecting parameter data from more real-life shopping Websites. Such empirical data will provide us with useful insights and help us validate our model, which can then be applied to assist in other marketing planning activities. The role of eWOM in the adoption decision process is important, the understanding we going to gain in this adoption-WOM problem will be valuable to marketers.

Second, we are constructing an agent based model with adaptive agents in it mimicking the various properties, including the behavioral ones, of online shoppers who buy and participate in online WOM activities. The objective is to observe the interaction of the agents in the community at a microscopic level, and compare the emerging outcomes with the aggregate system model we constructed in this study. We believe such comparative study to be valuable in terms of validating the models and reconciling unanswered questions arising in the simulation studies.

## References

- Bone, P.F., 1995. Word-of-mouth effects on short-term and long-term product judgments. *Journal of Business Research* 32 (3), 213-223.
- Chan, Y.Y.Y. and Ngai, E.W. T. (2011), "Conceptualising electronic word of mouth activity: An input-process-output perspective", *Marketing Intelligence & Planning*, Vol. 29, No. 5, pp. 488-516.
- Chatterjee, P. (2001), "ONLINE REVIEWS: DO CONSUMERS USE THEM?", in *Advances in Consumer Research* Volume 28, eds. Mary C. Gilly and Joan Meyers-Levy, Valdosta, GA : Association for Consumer Research, Pages: 129-133.
- Chen, Y and J. Xie (2005), "Third-Party Product Review and Firm Marketing Strategy," *Marketing Science*, 24(2), 218-240.
- Cheung, C.M.K., Lee, M.K.O. and Rabjohn, N. (2008), "The impact of electronic word-of-mouth: the adoption of online opinions in online customer communities", *Internet Research*, Vol. 18, No. 3, pp. 229-47.
- Chevalier, J., & Mayzlin, D. (2006). The effect of word of mouth on sales: online book reviews. *Journal of Marketing Research*, 43 (3), 345–354.
- Dellarocas, Chrysanthos (2003), "The Digitalization of Word of Mouth: Promise and Challenges of Online Feedback Mechanisms," *Management Science*, 49 (10), 1407-1424.
- Godes, D. and Mayzlin, D. (2004), "Using online conversations to study word-of-mouth communication", *Marketing Science*, Vol. 23 No. 4, pp. 545-60.
- Godes, D. B. and Mayzlin, D. "Using Online Conversations to Study Word of Mouth Communication," *Marketing Science*, 2004, 23, 4, pp. 545-560.
- Goldsmith, R.E. and Horowitz, D. (2006), "Measuring motivations for online opinion seeking", *Journal of Interactive Advertising*, Vol. 6 No. 2, pp. 1-16.
- Halstead, D. (2002). Negative Word of Mouth: Substitute for or Supplement to Consumer Complaints? *Journal of Consumer Satisfaction/Dissatisfaction and Complaining Behavior*, 15, 1-12.
- Halstead, D., & Dröge, C. (1991). Consumer attitudes toward complaining and the prediction of multiple complaint responses. *Advances in Consumer Research*, 18, 210–216.

- Harrison-Walker, L. J. (2001). The measurement of word-of-mouth communication and an investigation of service quality and customer commitment as potential antecedents. *Journal of Service Research*, 4(1), 60–75.
- Harrison-Walker, L.J. (2001), “The measurement of word-of-mouth communication and an investigation of service quality and customer commitment as potential antecedents”, *Journal of Service Research*, Vol. 4, pp. 60-75.
- Heitmann, M., Lehmann, D. R., & Herrmann, A. (2007). Choice goal attainment and decision and consumption satisfaction. *Journal of Marketing Research*, 44, 234–250 May.
- Hennig-Thurau, T. and Walsh, G. (2003), “Electronic word-of-mouth: motives for and consequences of reading customer articulations on the internet”, *Journal of Electronic Commerce*, Vol. 8 No. 2, pp. 51-74.
- Hennig-Thurau, T., Gwinner, K.P., Walsh, G. and Gremler, D.D. (2004), “Electronic word-of-mouth via consumer-opinion platforms: what motivates consumers to articulate themselves on the internet?”, *Journal of Interactive Marketing*, Vol. 18 No. 1, pp. 38-52.
- Huang, J. and Chen, Y. (2006), “Herding in online product choice”, *Psychology & Marketing*, Vol. 23 No. 5, pp. 413-28.
- Murray, K. B. (1991). A Test of Services Marketing Theory: Consumer Information Acquisition Activities. *Journal of Marketing*, 55(1), 10-25.
- Park, D.H., Lee, J. and Han, I. (2007), “The effect of on-line consumer reviews on consumer purchasing intention: the moderating role of involvement”, *International Journal of Electronic Commerce*, Vol. 11 No. 4, pp. 125-48.
- Petty, R.E. and Cacioppo, J.T. (1986), “Communication and persuasion: central and peripheral routes to persuasion”, Springer, New York, NY.
- Piller, C. (1999), “Everyone is a critic in cyberspace”, *Los Angeles Times*, December 3.
- Solomon, M. R. (2010), *Consumer Behavior: Buying, Having, and Being*, Prentice Hall.
- Swan, J. E., & Oliver, R. E. (1989). Postpurchase communications by consumers. *Journal of Retailing*, 65(4), 516–533.
- Tokyo, Japan, Kokokusha Co., Ltd (2007). Relation between 'Word of Mouth' and Mass Media Word of Mouth Research 2007 (<http://www.kokokusha.com/pdf/relationbetwomandmassmedia.pdf>)
- Ward, J.C., & Reingen, P.H. (1990). Sociocognitive analysis of group decision making among consumers. *Journal of Consumer Research*, 17, 245-263.
- Wu, P.C.S. and Wang, Y-C (2011), "The influences of electronic word-of-mouth message appeal and message source credibility on brand attitude", *Asia Pacific Journal of Marketing and Logistics*, Vol. 23, No. 4, pp. 448-72.
- Zaichkowsky, J.L. (1985), “Measuring the involvement construct”, *Journal of Consumer Research*, Vol. 12 No. 3, pp. 341-53.



# Collective Value Creation by Playing with Legos

## A Netnographic Study

Hanna Kurikko<sup>1</sup>; Pekka Tuominen<sup>2</sup>

<sup>1</sup>*Researcher, University of Tampere, School of Management, hanna.kurikko@uta.fi*

<sup>2</sup>*Professor, docent, University of Tampere, School of Management, pekka.tuominen@uta.fi*

### Abstract

A brand community can be formed by any group of people with a common interest in a specific brand and create a parallel social universe rife with its own myths, values, rituals, vocabulary and hierarchy. Brand community becomes more than a place. It becomes a common understanding of a shared identity, which can be found both face-to-face and in the cyberspace. This paper will describe and analyze collective value creation and empowerment in online brand community. It presents the main features of online brand community, the process of value co-creation and motivators for participating in online brand community. These key factors jointly characterize collective value creation and empowerment. This netnographic study focuses on an online brand community called Palikkatakomo (Brick Builders). It is a Finnish LEGO builders meeting place. Palikkatakomo was observed from November 2010 to the end of April 2011. The data consists 1,035 different postings that contains 197 distinct poster names. Palikkatakomo's members feel the sense of belonging, they create value together and they are motivated by the same kind of things. Palikkatakomo can be considered to be a collectively creative and empowered online brand community.

### Keywords

Service brand, social media, value co-creation, netnography

## INTRODUCTION

Online communities are becoming “places” of belonging, information, and emotional support that people cannot do without (adapting Kozinets 2010, 15). These social groups have a real existence for their participants, and thus have consequential effects on many aspects of behavior (Kozinets 1998, 366).

The concepts of brand community and online brand community are relatively young. These fresh topics have been seeking for their places in the academic world. Research into the area has increased steadily over the course of the last ten years (Cova & Pace 2006). Although the concept of brand community has progressed significantly, the area is still in the fundamental stages of development (Davidson, McNeill, Ferguson 2007). However, analysts are no longer questioning whether the concepts of community might have a place in marketing thinking (Cova & Pace 2006).

The brand community was defined for the first time by Muniz and O’Guinn in 2001. A brand community can be formed by any group of people with a common interest in a specific brand and create a parallel social universe rife with its own myths, values, rituals, vocabulary and

hierarchy (Muniz & O'Guinn 2001; Cova ja Pace 2006). Brand community becomes more than a place. It becomes a common understanding of a shared identity, which can be found both face-to-face and in the cyberspace (Muniz & O'Guinn 2001).

The purpose of this study is to describe and analyze collective value creation and empowerment in an online brand community. It presents the main features of online brand community, the process of value co-creation and motivators for participating in online brand community.

## **ONLINE BRAND COMMUNITY AS AN ACTIVE ACTOR**

### **The main features of online brand communities**

Muniz and O'Guinn (2001) used three constructs to identify the distinguishing features of brand communities. First, consciousness of kind is a sense of belonging to an in-group, thanks to a brand that is patronized by all of the group members. It is a connection that members feel toward one another and the collective sense of difference from others not in the community.

The second feature is the presence of shared rituals and traditions that surround the brand. Rituals and traditions perpetuate the community's shared history, culture and consciousness. Traditions include certain behavioral norms and values (Muniz & O'Guinn 2001).

The third feature is a sense of moral responsibility, which is felt sense of duty or obligation to the community. The sense of moral responsibility is what produces, in times of threat to the community, collective action (Muniz & O'Guinn 2001).

Heinonen and Halonen (2007) have identified motivators for online brand community activities. Members want to belong to something, build and strengthen their identities, get feedback from others and create something new. Trust is a crucial ingredient in all human communications but also in cyberspace.

### **The process and roles of collective value creation**

Schau et al. (2009) have identified the process of value co-creation in online brand community. The process consists of four thematic practices, which are social networking, impression management, community engagement and brand use.

Social networking is an effect that focuses on creating, enhancing, and sustaining ties among brand community members. These include welcoming, empathizing and governing. These practices operate primarily in the intangible domain of the emotions and reinforce the social or moral bonds within the community (Schau et al. 2009).

Impression management includes evangelizing and justifying. Online brand community members act as altruistic emissaries and ambassadors of good will (Schau et al. 2009).

Community engagement practices are those that reinforce members' escalating engagement with the brand community. These include staking, milestoneing, badging and documenting.

Staking, milestoneing and badging mean that community members bring out brand experiences and proclaim openly that they are fans of particular brand. Documenting occurs when brand community members construct a narrative of their brand experiences (Schau et al. 2009).

Brand use practices are specifically related to improved or enhanced use of the focal brand. These include grooming, customizing and commoditizing. Grooming means that members share for example homemade tools and advice. Customizing means modifying existing and discovering new ideas, which result in customized products. Commoditizing means that members rant or chastise some products but at the same time they have new ideas on how those products could be developed (Schau et al. 2009).

Creating new ideas is much about an individual. A single person can have his or her voice heard and creativity easily expressed through an online brand community. However, with communities collective creativity can also be boosted. All the feedback that members receive from an online brand community is important (Heinonen ja Halonen 2007). Today one-sided monologue is not enough. Online communities allow dialogue and offer users new opportunities.

### **Synthesis of the theoretical framework**

The main features of online brand community, value co-creation and motivators for participating in online brand community (Heinonen ja Halonen 2007; Kozinets 2010; Muniz & O'Guinn 2001; Schau et al. 2009) are the key factors that jointly – realized in various combinations – characterize collective value creation and empowerment in the online brand community. The collective value creation and empowerment in the online brand community may occur when its members have a sense of belonging, they create value together and they have similar motives.

The collective value creation and empowerment of the online brand community allows mutual interaction between the online brand community and the company as well as other stakeholders. Companies have an opportunity to communicate between consumers and influence their opinions (Kozinets 2010). We have moved away from one-way transaction to the relationship-based interaction model which emphasize consumers' and other stakeholders' roles in the network and communities (Cova & Cova 2002; Hatch & Schultz 2010; Merz et al. 2009; Muniz & O'Guinn 2001; Vargo & Lusch 2004). Figure 1 illustrates the process of collective value creation and empowerment in an online brand community. This provides a theoretical framework for this study (adapting Cova & Cova 2002; Hatch & Schultz 2010; Heinonen & Halonen 2007; Jaakkola 2010; Kozinets 2010; Merz et al. 2009; Muniz & O'Guinn 2001; Schau et al. 2009; Vargo & Lusch 2004).

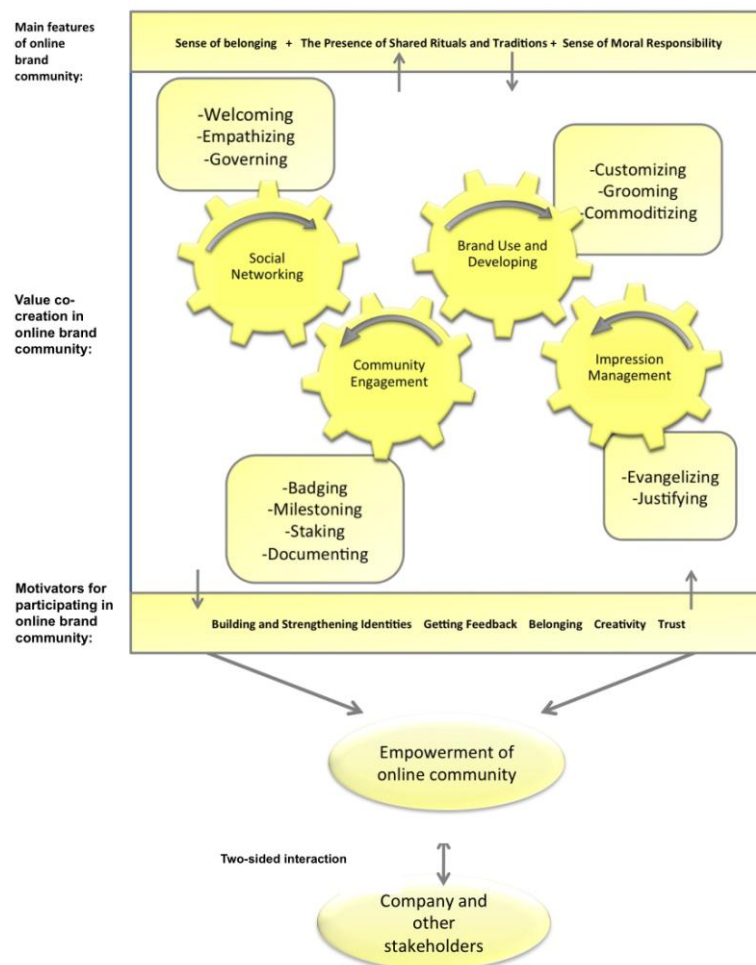


Figure 1. The process of collective value creation and empowerment of the online brand community

## CONDUCTING THE NETNOGRAPHIC STUDY

Netnography is a method developed from ethnography because of the increasing use of the Internet. As consumers are progressively taking part in online communities and networks as a part of their social life, a new method of studying those consumers, and the phenomena in general, was important (e.g. Rokka 2010, 381; Kozinets 2010, 2). Netnography can be defined as “a new qualitative research methodology that adapts ethnographic research techniques to study cultures and communities that are emerging through computer-mediated communications” (Kozinets 2002, 62). The netnography method is about an observation of participants in online contexts (Kozinets 2010, 60).

Some of the most important standards of quality in netnography are immersive depth, prolonged engagement, researcher identification, and persistent conversations. A netnographer must attend to the goal of a complete immersion in the phenomenon. The netnographer must immerse him or herself in the culture, read beyond the postings, meet people, and go places where community members go (Kozinets 2006; Muniz & Schau 2007). Netnography can be used purely or it can be blended with ethnography (Kozinets 2010, 66;

Muniz & Schau 2007, 37). In this study pure netnography is mainly used but partly mixed with ethnography.

The research begins by identifying the research topic, investigating possible online field sites, selecting an online community/communities and making cultural entrée. In this study the object is an online brand community called Palikkatakomo (Brick Builders). It is a Finnish LEGO builders meeting place. Its mission is to raise interest in LEGO in Finland. Palikkatakomo is fully fan-based and the LEGO company does not sponsor it (Palikkatakomo.org www).

Palikkatakomo was chosen because it relates to the research focus and questions. The LEGO brand has a great role in this online community. Other selection criteria were that this online brand community is Finnish and does not require any technical expertise, which ensure a deeper understanding. This online brand community is active and they have recent and regular communication. It is interactive and substantial as well, which means that there is a flow of communications between participants, a critical mass of communicators and an energetic feel. Palikkatakomo has 350 members (29.4.2011). There are over 12, 000 postings, almost 900 threads and ten different subject categories in the forum. It offers detailed and descriptively rich data. Palikkatakomo is also extremely heterogeneous. A special characteristic of Palikkatakomo is that it has members of all ages, men and women.

The community participation-observation includes engagement, immersion and data collection. Palikkatakomo was observed from November 2010 to the end of April 2011. In this study 212 pages were printed in 12-point font. These 212 pages represented 1,035 different postings that contained 197 distinct poster names. The researcher also received 32 personal mails. She participated regularly in Palikkatakomo's activities: comments posted, questions asked, feedback received from members and sense of membership gained. During the research there was an opportunity to visit the Finnish LEGO company with Palikkatakomo on 14th April 2011 and at ModelExpo 2011 event on 15th April 2011, where Palikkatakomo had a stand. Those events made it possible to discuss with Palikkatakomo's members personally. Eleven personal interviews were conducted.

For data analysis and iterative interpretation of findings a netnographer can use manual coding or qualitative analysis software programs. In this study coding was made manually and both analytic coding and hermeneutic interpretation were used. However, hermeneutic interpretation was emphasized (Bernard 2004; Kozinets 2006, 2010, 61; Moisander & Valtonen 2006,111).

Netnography also entails challenges. There are some evaluative positions for judging qualitative research: positivist, post-positivist, postmodern and post-structural. These evaluative positions have an impact on reliability (Kozinets 2010, 161). The researcher's subjective interpretation is a major challenge to netnography. Moreover, the amount of data that can be found online is immense. In order to interpret the data correctly, the researcher must possess knowledge of that particular online culture. Within a textual reality, the anonymity that is sometimes advantageous for obtaining disclosure prevents the researcher from having confidence that subjective interpretation is proper. The researcher cannot be sure for example about the discloser's age, sex or ethnicity (Kozinets 2006).

# **PALIKKATAKOMO AS AN ACTIVE ONLINE BRAND COMMUNITY**

## **The main features of Palikkatakomo**

This study into Palikkatakomo showed how the three features of brand communities and value co-creation occur in practice and what motivates people to participate in the online brand community (Heinonen ja Halonen 2007; Kozinets 2010; Muniz & O'Guinn 2001; Schau et al. 2009). The sense of belonging is the most important element of brand communities (Muniz & O'Guinn 2001). In Palikkatakomo it is based on the shared LEGO enthusiasm. The sense of belonging motivates members to join communities (Heinonen & Halonen 2007). Palikkatakomo offers a place for LEGO discussions, spreading LEGO related news and sharing new ideas and opinions with like-minded people enabling collective value creation.

According to Heinonen & Halonen (2007) and Bagozzi & Dholakia (2006) identity and its construction are the reasons for being a member. Palikkatakomo has influenced some of its members' identities. Support from the community is not limited to LEGO as a hobby. The members have learned organizational skills, cooperation, trust and courage.

Palikkatakomo also has shared rituals and traditions (Muniz & O'Guinn 2001). Older members greet and assist new members in their brand learning and community socialization (Muniz & O'Guinn 2001; Schau et al. 2009). Rituals and traditions perpetuate the community's shared history, culture and consciousness (Muniz & O'Guinn 2001). Palikkatakomo's members are interested in LEGO's history and old narratives associated with the brand. LEGO bricks' ecology is appreciated as well. Traditions include certain behavioral norms and values, too (Muniz & O'Guinn 2001). Palikkatakomo encourages the new members to read the rules and instructions of the forum. Palikkatakomo's traditions also include annual events such as ModelExpo in Helsinki Exhibition & Convention Centre. Other rituals include helping others constantly and taking active part in a variety of actions in the community.

A sense of moral responsibility, duty or obligation to the community (Muniz & O'Guinn 2001) is felt in Palikkatakomo. The members have two missions: integrating and retaining members and assisting other members in the proper use of the brand (Muniz & O'Guinn 2001). Active members have a need to raise Palikkatakomo's profile. The forum contains user-generated promotional material and new members are being actively recruited at events such as ModelExpo. The members help and advise others every day in the forum and the aim of advising is the proper use of LEGO brand.

## **The process and roles of collective value creation in Palikkatakomo**

The process of value co-creation consists of four thematic practices, namely social networking, impression management, community engagement and brand use (Schau et al. 2009). These all can be identified in Palikkatakomo.

Social networking is an effect that focuses on creating, enhancing, and sustaining ties among brand community members. These include welcoming, empathizing and governing. Greeting new members to Palikkatakomo (cf. shared rituals and traditions, Muniz & O'Guinn 2001) is

a common habit. The community has been praised for its positive welcoming of new members and good overall team spirit.

Empathizing in Palikkatakomo consists of emotional and physical support to people sharing similar interests. It includes support for brand related issues such as customizing and creating new LEGO structures. The members are interested in getting feedback (Heinonen ja Halonen 2007) from like-minded fans who really understand the art of LEGO building. Empathizing also includes support for non-brand related life issues such as illness or bullying. In Palikkatakomo this is not obvious but rather indirect. The online brand community is about mutual recognition - one-sided appreciation is simply not enough (Heinonen ja Halonen 2007).

Palikkatakomo is governed by means of articulating the behavioral expectations: the community rules and instructions of the forum. As a part of the governing process, common issues are broadcast through the forum's news section.

Collaborative learning complements the syntheses of framework as a new finding. Collaborative learning can be related to LEGO products (building, creation) or to everyday skills like cooperation, teamwork and identity construction.

Community engagement practices reinforce members' commitment to the brand community. These include staking, milestoneing, badging and documenting (Schau et al. 2009). Palikkatakomo is a rather small community, which means that there is hardly any variation of interest among members (staking). Thus there has been no interest in creating specialized items or subgroups. The layout and sorting of postings in Palikkatakomo's forum are clear and easy enough for everyone to find his or her own target of interest.

Milestoneing refers to the practice of noting seminal events in brand ownership and consumption (Schau et al. 2009). The members of Palikkatakomo bring out brand experiences and confess openly that they are fans of a particular brand. They participate actively in different events and make self-motivated promotion (ModelExpo, LEGOPARK etc.) The community is capable of organizing and building a big stand full of structures made of LEGO bricks. Activities are organized mainly via Palikkatakomo's forum, Skype & Doodle. Some of the members have met in person in past events but in every new event there are new "faceless and anonymous" members who are welcomed with joy. The members travel great distances solely to take part these events. After every event feedback is collected: what went well and what kind of things they need to improve for the future events (collaborative learning).

Badging is translating milestoneing into symbols. Building creative structures out of LEGO bricks is a strong brand signal by its own virtue. Additionally the members wear Palikkatakomo t-shirts, caps and share business cards as a symbol of the membership. Hence Palikkatakomo represents the LEGO brand and the Palikkatakomo brand at the same time.

Documentation consists of narrative brand experiences of brand community members. Documenting occurs when brand community members construct a narrative of their brand experiences (Schau et al. 2009). Documenting in Palikkatakomo is active, clear and pedantic.

Brand use and development practices are specifically related to improved or enhanced use of the focal brand. These practices include grooming, customizing and commoditizing (Schau et al. 2009). Grooming is sharing, for example, homemade tools and advice. Advice can be related to LEGO washing or how to insure LEGOs.

Customizing is about modifying the products and generating new ideas, which leads to customized products or brand related issues. In Palikkatakomo customizing is one of the major activities. One example is that a member developed a computer based storage and database service “Basebrick” for LEGO fans. This service helps LEGO fans to keep inventory on how many and what kind of bricks they own. The developer received help and advice from Palikkatakomo’s members during the development.

Commoditizing means that members rant or chastise products and advise on how brand related products are being marketed. At the same time they have novel ideas to other members and to the brand owner on how their products could be developed (Schau et al. 2009). This kind of feedback is common in Palikkatakomo and it is valuable to the LEGO company.

LEGO’s Ambassador project is closely related to customizing and commoditizing. LEGO Ambassadors are active contributors to the world-wide LEGO community by engaging in activities such as helping to extend and improve the connections between the worldwide LEGO community and the LEGO Group. TheQ is Palikkatakomo’s leading member but also a LEGO Ambassador. TheQ acts as a liaison between LEGO hobbyists and LEGO company. New ideas for improvement have been reported to the Finnish LEGO company via the Ambassador.

Impression management includes evangelizing and justifying. The community members act as altruistic emissaries and ambassadors of goodwill (Schau et al. 2009). According to our understanding only the definition “impression management” does not fully describe Palikkatakomo’s practices. In light of this study it is proposed that impression management in Palikkatakomo is divided into two parts, internal and external. This view should be a topic for further studies.

Internal impression management occurs inside the community. Members share the news about LEGO in the forum, inspiring others to brand use. The ambassador maintains communication between Palikkatakomo and the LEGO company. Impression management may also involve negative comparisons with other competing brands like “pirate” bricks.

External impression management has two concrete factors. First, all writing in the forum creates impressions of Palikkatakomo to all readers, registered (private) and unregistered (public). Hence correct language and good behavior are essential. The second important factor is common events. Events are utilized in recruiting new members and gaining attention in media, for example.

All Palikkatakomo members take part in evangelizing. Active members have more responsibility because they are available at events and in the forum more frequently than the rest.



## **Palikkatakomo's collective value creation and empowerment**

Palikkatakomo's members feel the sense of belonging, they create value together and they are motivated by the same kind of things. The online brand community helps members to share their hobby and interests with congenial and like-minded people. Feedback and new ideas for improvement have been reported to the Finnish LEGO company via Palikkatakomo. Palikkatakomo can be considered to be a collectively creative and empowered online brand community (adapting Cova & Cova 2002; Hatch & Schultz 2010; Heinonen ja Halonen 2007; Jaakkola 2010; Kozinets 2010; Merz et al. 2009; Muniz & O'Guinn 2001; Schau et al. 2009; Vargo & Lusch 2004). This is illustrated in Figure 2.

The community's collective value creation and empowerment does not automatically lead to bidirectional communication with the company or other stakeholders. However Palikkatakomo's activity allows such cooperation in which both Palikkatakomo and the Finnish LEGO company are willing to develop further. Company's investments in Palikkatakomo are still limited. The community members would be motivated to have even more active collaboration with the LEGO company, which could pay more attention to this potential channel of marketing and cooperation. The ideas born within Palikkatakomo could be significant for LEGO's research, development and marketing departments.

The members of Palikkatakomo were invited to a meeting by the Finnish LEGO company on April 14th 2011, which is a signal of strengthening cooperation. The aim of the meeting was to present Palikkatakomo's activities and to discuss practices to strengthen bidirectional interaction. The Finnish LEGO company has also recently shown greater interest at Palikkatakomo's events.

## **CONCLUSIONS AND MANAGERIAL IMPLICATIONS**

The target of the modern marketer is to enhance collective value creation between the firm and consumers. Brand communities will strengthen the relationship with consumers even further.

In light of this study it is proposed that collective value creation and collaborative learning could be utilized in many companies. Through the Internet the people who struggle with taxation, for example, could take part in some community where help and advice would be shared between users. A service channel of this kind would save time and government or company resources. Community members could be encouraged to give good advice via bonus. Active and professional members would be rewarded. Collaborative learning offers an interesting subject for further studies.

However the open nature and fragmentation of cyberspace causes opportunities as well as risks to collective value creation. Finding ways to mutual benefit can be challenging. For this reason property rights and ownership should be clearly defined. Companies and online communities should find ways of co-operation, which do not compromise business sensitive information. On the other hand, online communities should be able to capitalize from the help they give to companies. Online communities should not feel exploited. Further studies should focus on the management of online communities by taking their mutual benefits and risks into account.

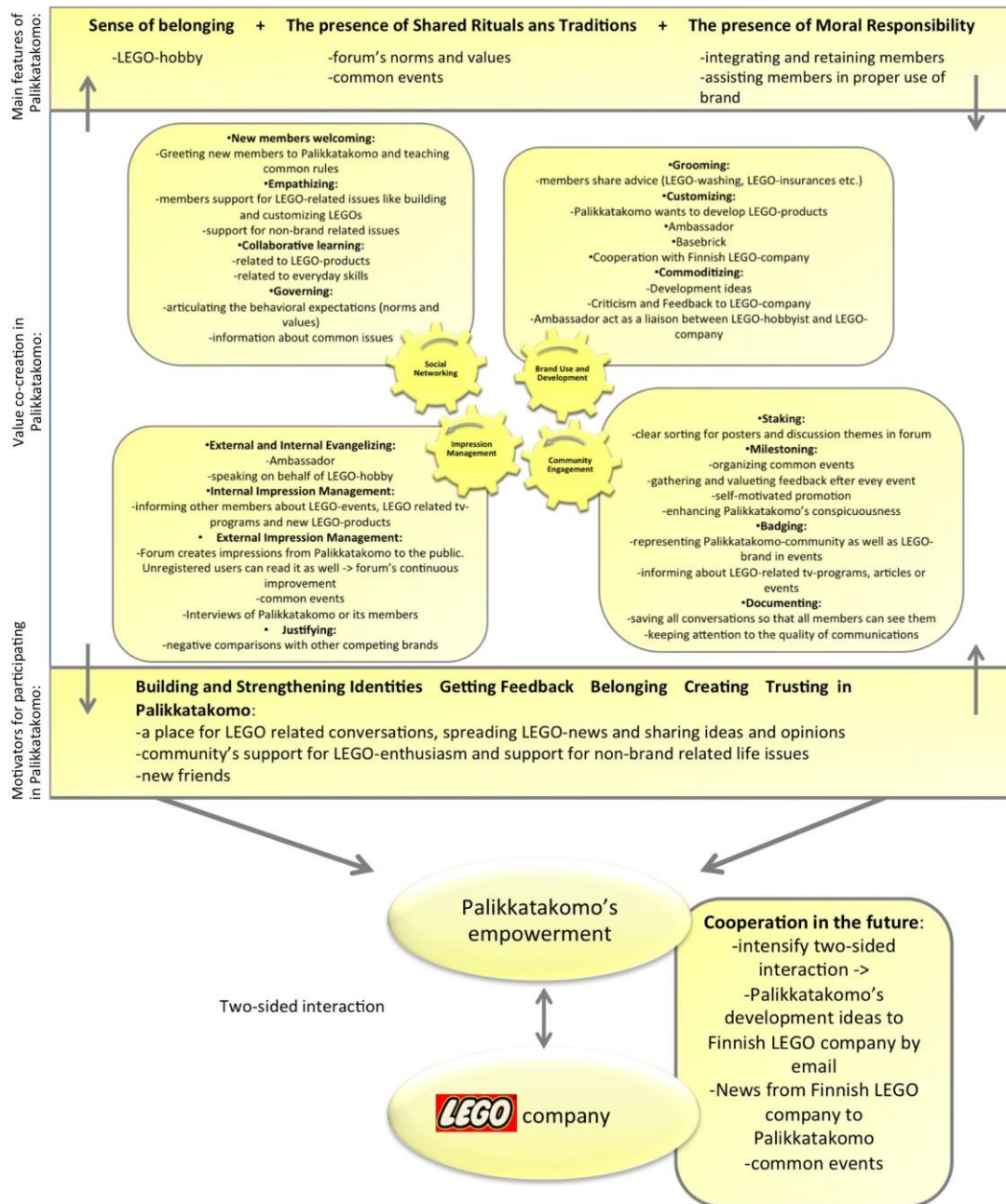


Figure 2. Palikkatakomo's collective value creation and empowerment

In general companies and their stakeholders should use the experiences and ideas born within online brand communities. Companies would already have access to large amount of potentially significant data that arises daily from online communities. This kind of data could be used more effectively and more courageously. It is important to ensure that the data generated daily by online communities reach the right stakeholders and the right employees in the organization. In this way the information will spread to everyone working in the organization. Online communities are keywords in e-marketing.

## References

- Bagozzi, Richard, P. & Dhlokia, Utpal, M. 2006. Antecedents and Purchase Consequences of Customer Participation in Small Group Brand Communities. *International Journal of Research in Marketing*, 23 (1), 45–61.
- Bernard, Yohan. 2004. La netnographie: une nouvelle méthode d'enquête qualitative basée sur les communautés virtuelles de consommation. *Décisions Marketing*, 36, 49–62.
- Cova, Bernard & Cova, Veronique. 2002. Tribal Marketing: The Tribalisation of Society and Its Impact on the Conduct of Marketing. *European Journal of Marketing*, 36 (5–6), 595–620.
- Cova, Bernard & Pace, Stefano. 2006. Brand Community of Convenience Products: New Forms of Customer Empowerment – The Case “My Nutella The Community”. *European Journal of Marketing*, 40 (9–10), 1087–1105.
- Davidson, Laura, McNeill Lisa & Ferguson, Shelagh. 2007. Magazine Communities: Brand Community Formation in Magazine Consumption. *International Journal of Sociology and Social Policy*, 27 (5–6), 208–220.
- Hatch, Mary Jo & Schultz, Majken. 2010. Toward a Theory of Brand Co-creation with Implications for Brand Governance. *Journal of Brand Management*, 17 (8), 590–604.
- Heinonen, Sirkka & Halonen, Minna. 2007. Making Sense of Social Media, Interviews and Narratives. SOMED Foresight Report 2, VTT Research Report. Espoo:TFF.
- Jaakkola, Maarit. 2010. Uuden julkisuuden sääntöjä luomassa. In Meriranta, Marjo (eds.) *Mediakasvatuksen käsikirja*. Kuopio: Unipress, 37–62.
- Kozinets, Robert V. 1998. On Netnography: Initial Reflections on Consumer Research Investigations of Cyberculture. In Joseph Alba and Wesley Hutchinson (eds.) *Advances in Consumer Research*, Volume 25. Provo, UT: Association for Consumer Research, 336–371.
- Kozinets, Robert V. 2002. The Field Behind the Screen. Using Netnography for Marketing Research in Online Communities. *Journal of Marketing Research* 39 (1), 61–72.
- Kozinets, Robert V. 2006. Click To Connect: Netnography and Tribal Advertising. *Journal of Advertising Research*, 46 (3), 279–288.
- Kozinets, Robert V. 2010. *Netnography. Doing Ethnographic Research Online*. London: SAGE.
- Merz, Michael A., He, Yi. & Vargo, Stephen L. 2009. The Evolving Brand Logic: A Service-Dominant Logic Perspective. *Journal of the Academy of Marketing Science*, 37 (3), 328–344.
- Moisander Johanna & Valtonen Anu. 2006. *Qualitative Marketing Research*. London: SAGE.
- Muniz, Jr., Albert M. & O’Guinn, Thomas, C. 2001. Brand Community. *Journal of Consumer Research*, 27 (4), 412–432.
- Muniz, Jr, Albert M. & Schau, Hope Jensen. 2007. Vigilante Marketing and Consumer-Created Communications. *Journal of Advertising*, 36 (3), 35–50.
- Rokka, Joonas. 2010. Netnographic Inquiry and New Translocalsites of the Social. *International Journal of Consumer Studies*, 34 (4), 381–387.
- Schau, Hope Jensen, Muniz Jr., Albert M. & Arnould, Eric J. 2009. How Brand Community Practices Create Value. *Journal of Marketing*, 73 (5), 30–51.
- Vargo, Stephen L. & Lusch, Robert F. 2004. Evolving to a New Dominant Logic for Marketing. *Journal of Marketing*, 68 (1), 1–17.

# Creating Tomorrow's Global Entrepreneurs: A Case Study of the Stu Clark Centre for Entrepreneurship

Malcolm C. Smith<sup>1</sup>; Robert Warren<sup>2</sup>; Mavis McRae<sup>3</sup>

<sup>1</sup>Professor, Department of Marketing, University of Manitoba, malcolm\_smith@umanitoba.ca

<sup>2</sup>Executive Director, Stu Clark Centre for Entrepreneurship, University of Manitoba,  
robert\_warren@umanitoba.ca

<sup>3</sup>Entrepreneur-in-Residence, Stu Clark Centre for Entrepreneurship, University of Manitoba,  
mcr@cc.umanitoba.ca

“When I went to university, we didn't have these opportunities. We just took ‘regular’ business courses and then, when we started a business, we learned from the School of Hard Knocks.”

Stu Clark

## Abstract

This paper presents a case study of the University of Manitoba's Stu Clark Centre for Entrepreneurship. This Centre provides experiential entrepreneurial training for youth as well as undergraduate and MBA students. The article describes the various programs the Centre is involved with both locally and internationally. These include preparing students for investment competitions, entrepreneurship day camps for at-risk youth, undergraduate entrepreneurship student exchange and national and international training of entrepreneurship teachers.

## Key Words

Entrepreneurship Education and Training; Business Plan Development; Student Exchange

## Introduction

The Stu Clark Centre for Entrepreneurship is housed in the I.H. Asper School of Business' Department of Marketing at the University of Manitoba in Winnipeg, Canada (See Figure 1). Its major focus is to encourage the development of new businesses and global entrepreneurship thinking among young adults and youth by encouraging them to consider entrepreneurship as their life's calling. Thus, the Centre's mission is to create a new breed of entrepreneurs by means of experiential education. This paper discusses the successful programs developed and implemented at this major Canadian business school which foster and promote entrepreneurship at a local, national, and international level among youth and young adults.

## Background

The Stu Clark Centre was founded in 1989 as the Asper Centre for Entrepreneurship and renamed the Stu Clark Centre in 2008 in recognition of Mr. Stu Clark, a successful

entrepreneur alumnus of the University of Manitoba, who made a major financial gift to support the Centre. It operates with an Executive Director and up to four staff members. Students involved with the Centre are mentored by a local Entrepreneur-in-Residence. Additionally, two successful entrepreneurs from the USA act as International Entrepreneurs-in-Residence. They visit the Centre two times each year and spend time advising students and speaking with the local business community. The Centre has an Advisory Board consisting of local and international entrepreneurs, faculty members from the Asper School of Business and four international universities, and major funders who support the Centre financially. With a budget of approximately Cdn\$800,000, the Stu Clark Centre for Entrepreneurship currently supports a variety of national and international programs aimed at youth as well as university students and adults. The Centre's major programs are described below.

## **Business Planning Development and Business Plan Competitions**

### **International Competitions**

Each year, the Stu Clark Centre guides undergraduate and MBA student teams in preparing a business plan for a new enterprise and some teams go on to compete in local and international investment competitions. Students develop their business plans during the Fall Semester in their "New Venture Analysis" course and the students who develop the top-ranked plans go on to represent the Stu Clark Centre and the University of Manitoba at the investment competitions which usually take place from February through May. Many of these competitions are held in the United States (e.g., Atlanta, GA; Cincinnati, OH; Louisville, KY; Portland, OR), but some are hosted by universities in such countries as Brazil, Hong Kong, and Thailand. Judges for these competitions are typically successful venture capitalists and angel investors.

Since the Centre began participating in these events, its students have won 48 first-place finishes at competitions in Europe, Asia, South America and across North America. In doing so, the student teams have won in excess of Cdn\$1 million in cash and in-kind prizes. Perhaps more importantly, over 30 businesses have been launched based in these business plans which employ over 500 people and they have raised in excess of Cdn\$30 million. Examples of successful start-ups that have sprung from the Stu Clark Centre are NovaDAQ Medical Technologies (<http://www.novadaq.com>) and Crackberry.com (<http://crackberry.com>).

### **The Stu Clark Venture Challenge**

In 2004, the Centre launched its own investment competition (The Stu Clark Venture Challenge) which takes place at the end of March each year and has attracted teams from Canada, the USA, Brazil, and Thailand. This competition consists of a tradeshow, an "elevator pitch" competition and the formal presentation and defense of business plans. Grand winners of the Stu Clark Venture Challenge gain a place in the Venture Lab Investment Competition (formerly MOOT Corp. Global Competition), which is considered the "Super Bowl" of business planning competitions. Past winners have also been invited to close NASDAQ in New York City in the late summer.

## **Wes Nicol Competition**

The Stu Clark Centre annually participates in the Wes Nicol competition which is a Canada-wide entrepreneurship competition for university undergraduate students from any discipline. The competition requires individuals to present a business plan to a panel of judges which is video-taped. Students from Engineering, Arts, Architecture, and Business have participated in the past at the University of Manitoba. The winner of this local competition has his/her business plan and video forwarded as a national semi-finalist and the videos are reviewed by a panel to select the six national finalists. Finalists travel to Ottawa, Canada to present and defend their plans in front of a panel of judges.

## **Manitoba High School Business Plan Competition**

The Stu Clark Centre also hosts the Manitoba High School Business Plan Competition which is held at the end of April each year and is open to any secondary school student in the province. As individuals or in teams of up to three, students present business plans, participate in a tradeshow, and give an elevator pitch of their new business idea. The winner(s) receive a Cdn\$2000 scholarship for post-secondary education at any business program offered in Manitoba.

## **Entrepreneurship Education for Youth**

Since 1998, the Stu Clark Centre has run summer entrepreneur “day camps” at the Asper School of Business aimed at youth who are at-risk. These camps are offered free of charge to the participants and include transportation to and from the university and lunch each day (funded by sponsors).

Prior to 2011, these camps were known as the Curry BizCamp in Entrepreneurship and were offered for two age groups. The first group was Winnipeg youth aged 12 to 14 years old. This group’s one-week camp involved lessons on how to start and run a small business, and an experiential exercise. For the exercise, students were given start-up money to purchase materials to make arts-and-crafts products. These were then sold at a local outdoor market and the students were allowed to keep their profits (See Figure 2). As a final exercise, the students gave presentations about what they had learned from this endeavor.

The second age group included 15 to 18 year-olds who participated in a two-week day camp. These students were not only taught the fundamentals of starting a small business, but also how to develop a business plan. They were coached on presentation skills and were then required to present their business plan to a panel of local judges and winners received a cash prize. The end of the camp culminated with an official graduation ceremony where certificates of participation were presented to each student.

In 2011, the format of the day camp was changed as well as the name. Now called the “New Venture Adventure”, the day camp is for 10 to 12 year olds. Camp participants learn how to be true entrepreneurs through a variety of activities, classroom lessons and they have a chance to create their own retail business. This camp (as well as the former BizCamp) is taught by locally trained entrepreneurship instructors at the Asper School of Business during the

summer vacation. The young students cover basic marketing, opportunity recognition, break-even analysis, presentation skills and learning what it takes to be an entrepreneur. This is done via formal classes and exercises, class trips, and guest speakers from the local business community. Students from the New Venture Adventure camp also develop and present a business plan. They then participate in a sales competition which begins with student receiving a small cash base to invest in their business idea. The students then go en masse to a large retail outlet where they purchase supplies with their investment funds. After returning to the business school, the students “manufacture” their product and then sell their products (e.g., jewelry, greeting cards, picture frames) to the public. As an incentive, they are allowed to keep their profits. The program also involves a retail evaluation exercise where the students travel to a local shopping mall and compare and evaluate different types of retail outlets ranging from large department stores to small independent operations.

### **North American Mobility Program for Undergraduate Business Students**

The Stu Clark Centre is part of the North American Mobility Program for undergraduate business students which is a consortium of North American Business Schools that exchange undergraduate business students who for a semester. Two universities from Canada (University of Manitoba and Laurentian University), two from the USA (University of North Dakota and the State University of New York at Plattsburg) and two from Mexico (Guadalajara and Nuevo León) are participating in this project. The Mobility Program began in 2011 and is funded by a grant from Human Resources and Skills Development Canada (HRSDC).

The purpose of this program is to further develop students’ professional mobility by acquiring the skill sets, experiences, and knowledge base necessary to understand, analyze, develop models, and practice entrepreneurship in Canadian, Mexican, and/or US markets. As part of this program, the exchange students take undergraduate courses in Product Planning and Development, New Venture Analysis, and other entrepreneurship courses at their home and host universities. In doing so, the students not only learn about doing business and living in other cultures, but they also make valuable contacts around North America.

During the Fall 2011 Semester, 11 students from the Asper School of Business, the USA, and Mexico participated in the Mobility Program at the University of Manitoba. A highlight of the semester was the “New Product Planning and Development Tradeshow” where groups consisting of students from a mix of the participating universities presented their ideas for a new product launch in a tradeshow format (See Figure 3). This was held in conjunction with a faculty symposium attended by seven professors from the American and Mexican partner universities. Students from each institution will be eligible to go on exchange to the other member universities for the next three years.

### **International Partners**

The Stu Clark Centre partners with various universities from around the world. In doing so, the Centre exchanges program ideas and best practices with its partners. Past and present partners include universities from the USA (e.g., University of Michigan, University of

Oregon, Rice University, University of Texas –Austin), Ireland (Queen’s College Belfast), France (Groupe ESC Troyes), Brazil (Fundacao Getulio Vargas), Japan (Akita University), and the Philippines (De La Salle University).

## **Training of Entrepreneur Teachers**

As part of the Paul Martin Aboriginal Education Initiative<sup>1</sup>, the Stu Clark Centre also participates as a site for teacher training in entrepreneurship. Three times per year, secondary school teachers from across Canada come to Winnipeg to be trained over four days on how to teach the typical 11<sup>th</sup>- and 12<sup>th</sup>-grade secondary school curriculum in entrepreneurship. Teachers who participate in this program must come from a school where there is a large aboriginal student enrolment. The goal of the Paul Martin Aboriginal Education Initiative is to encourage aboriginal students to continue their education and to provide them with the skills to start their own business.

## **International Outreach**

On an international scale, the Stu Clark Centre sends specially trained instructors to international locations to train local adults to become teachers of entrepreneurship. These newly trained local teachers learn the BizCamp model and provide entrepreneurship education to their local community. This has been successfully launched in the Philippines and in 2010, 21 Philipinos were trained as certified BizCamp Trainers (See Figure 4) and 60 adults from the island of Mindanao graduated from the BizCamp Program. (A brief review of this program is presented in Appendix 1.) Consequently, the Canadian Trade Commission expressed interest in developing a similar program in Vietnam and teacher training took place there in February, 2012.

## **Conclusion**

Through its various endeavors, the Stu Clark Centre carries out its goal of encouraging the development of new businesses and global entrepreneurship. It does so not only by training youth and students to develop new businesses, but the Centre also facilitates exchange of university entrepreneurship students as well as national and international training of teachers of entrepreneurship. Its success to date can be measured in terms of the number of competitions its teams have won, the number of businesses that have been started as a result of its training programs, and the accomplishment of training teachers of entrepreneurship in the Philippines and Vietnam in addition to those trained in Canada.

There seems to be a growing need for entrepreneurs – on both a local and international scale. The Stu Clark Centre for Entrepreneurship looks forward to continuing to play a role in creating tomorrow’s global entrepreneurs.

---

<sup>1</sup> The Right Honourable Paul Martin in a former Canadian Prime Minister. In this context, the term “aboriginal” refers to native Canadians who are also referred to as First-Nations people.





Figure 1. The Stu Clark Centre for Entrepreneurship office.



Figure 2. BizCamp students selling their wares at a local outdoor market.



Figure 3. North American Mobility tradeshow participants.



Figure 4. Philippine BizCamp Trainers with their Canadian instructor.

## **Appendix 1. Stu Clark Centre for Entrepreneurship launches Philippine BizCamp December 2010**

The Canadian Trade Commissioner Service (TCS MANIL) in Manila, Philippines identified a need to conduct Training in Entrepreneurship for the Indigenous People (IPs) of the Philippines located in areas hosting mining companies. The TCS contacted the University of Manitoba's Stu Clark Centre for Entrepreneurship about introducing the Curry BizCamp in Entrepreneurship program to the Philippines, specifically to help the IPs develop their business interests to create sustainable economic plans, for now and after the life of the mines are exhausted. The Curry BizCamp has been successfully training and mentoring new entrepreneurs in Manitoba since 1998. The Philippine BizCamp project, with support from TCS MANIL and the Stu Clark Centre, was launched in September 2010 and has already graduated 60 students in 2010.

The first step in bringing BizCamp to the Philippines was a "Train the Trainers" workshop which created a pool of twenty-one certified BizCamp trainers. This session, held in September, was kicked-off by Manitoba Premier Greg Selinger and was delivered by the Executive Director of the Stu Clark Centre for Entrepreneurship and a Manitoba teacher certified to train new trainers. The newly graduated BizCamp instructors then conducted a three-week pilot run of the Philippine BizCamp in October. Three mining project sites located in Mindanao's Caraga regions were chosen to host the pilot BizCamps. Participants involved 30 members of the Mamanwa and Manobo tribes of varying ages and educational backgrounds. The trainers held the first two weeks of classes at the mine sites where participants learned about business basics, spoke with local entrepreneurs and toured various businesses. The final week brought the three groups together in Surigao City where they prepared their business plans, met with coaches and receive feedback, and conduct market research outside their home territory at the local public market. The participants worked hard and practiced their presentations late into the evening. The groups, dressed in regalia, presented their business ideas to a panel of volunteer judges from the business, financial and mining sectors. Business plans included retail products based on their traditional tribal beadworks, tilapia fish farming, ginger farming, and handicrafts making use of indigenous water lily and romblom grass. Participants expertly discussed their sales projections and profit margins, as well as plans for future expansion, even though many of these participants had never finished high school.



Three teams proceeded to the final round of the business competition where they presented their ideas in front of an audience of over 100 family and friends, business and government representatives. The best business plans were: Taganito's Tatak Mamanwa Arts and Crafts for its beadworks business whose plan won the highest award; Canadian mining firm MRL Gold's Madasigen Fresh Tilapia whose cage fish farming project along

Kalinawa River will be headed by a Mamanawa whose highest education attainment was Grade 3 and SR Metals' Jaymar Ginger Farm whose half-hectare Chinese ginger farming will be run by out-of-school Manobo youths.

The highlight and reward for the participants' efforts was the opportunity to 'graduate' from the BizCamp program wearing graduation gowns and caps to a traditional graduation ceremony in the presence of family, friends and the business community. This highly emotional event represented the first time many of the IPs had participated in a graduation ceremony, since most of them never finished high school.

Many additional success stories emerged from the event. During the market research trip to Surigao public market, five of the nine teams secured initial orders for their product. This expanded the teams' market reach to bring in revenue from outside their community. The tilapia team expanded their product ideas from growing and selling whole fish to value-added products such as fish balls and smoked fish, and eventually secured angel financing for their business. The ginger farming team acquired start-up capital from the tribal chiefs who attended the business plan presentation. The pilot project was considered a success and the future expansion of Philippine BizCamp is now under development.



# PRIZM GAME FOR PROBLEM SOLVING AND INNOVATION CREATION.

**Aleksejs Busarovs**

*PhD student, RISEBA, alex@innomaniacs.eu*

## **Abstract:**

Presented paper thoroughly describes business game PRIZM, reveals its advantages and potential in terms of problem solving and innovation creation. PRIZM was created by researcher from Bath University (UK) Anja-Karina Pahl. The base of this game is principals discovered by Russian engineer, H. Altshuller, the author of well known TRIZ. PRIZM Game, as well as TRIZ is designed to solve problems, but it isn't limited only to technical problems, it could also be applied for creation of social innovation. The main difference between TRIZ and PRIZM Game is simplicity and speed of application of the last. PRIZM Game doesn't require protracted education of participants, but is able in the end to deliver solutions, which meet such criterion as cheap, simple and beautiful.

Creators of PRIZM Game has ambitious plan to distribute this method on global scale, through workshops for youth with task to develop solution for environment protection and sustainable development of humankind. The initial objective of initiative group is to deliver series of workshops in ten major languages, in all continents to 10'000 participants.

Current work summarizes previous research on TRIZ and PRIZM Game methods, as well provide results of interviews with game facilitators and participants. Main conclusion is that PRIZM Game shows high efficiency rate in problem solving, provide opportunity of rapid application, doesn't require prolonged training. The only shortcoming of this method is high costs, that significantly narrows opportunity of its application, maintaining economical feasibility. Particularly this fact can explain that major client of this game is aerospace giant – Airbus. Alongside with dissemination of this method is logical to talk about future research of PRIZM Game, particular interest is concerned about ability of this method to develop radical innovation, which can deliver breakthrough in technological domain, or business model field, thereby creating enterprise of the future.

**Keywords:** TRIZ, PRIZM Game, innovation, radical innovation.

**TRIZ - Theory of Inventive Problem Solving** is domain of knowledge, exploring the mechanisms of development of technical systems to provide a practical method for inventive problem solving. *"The goal of TRIZ: based on the study of the objective laws of development of technical systems, to give rules for the organization of a multi-screen scheme of thinking."* The author of TRIZ - H. Altshuller. (Альтшуллер, 1991).

Work on TRIZ was initiated by H. Altshuller and his colleagues in 1946. The first publication was made in 1956 (Альтшуллер, Шапиро, 1956) - is a technology of creativity,

based on the idea that *"the inventive creativity is associated with changes in technology, evolving according to certain"* and that *"laws of the creation of new work equipment must, regardless of the subjective relation to this, subject to objective laws."* (Альтшуллер, Шапиро, 1956) The appearance of TRIZ has been prompted by the need to accelerate the inventive process, the elimination of the elements of chance: a sudden and unpredictable insight, blind sorting and discarding options, depending on persons mood, etc. In addition, TRIZ is designed to improve the quality and increase the level of inventions for by removing the psychological inertia and enhance the creative imagination.

The main functions and the application of TRIZ are:

1. Inventive solution of problems of any complexity and orientation;
2. Forecasting of technical-systems;
3. Awakening, training and smart use of natural human abilities in the innovation process (primarily figurative imagination and systemic thinking) ;
4. Improvement teams (including creative), moving in the direction of their ideal (when tasks are performed, but it does not require any cost).

TRIZ is not a rigorous scientific theory. TRIZ is a collective experience of invention and studying the laws of science and technology.

As a result, its development has gone beyond TRIZ inventive problem solving in the technical field, and today is also used in non-technical fields (business, art, literature, education, politics, etc.).

### **Introduction**

Soviet patent engineer, inventor, writer and scientist Altshuller was convinced of the opportunities identified from the experience of predecessors steadily recurring techniques of successful inventions, and the opportunity to learn this technique. For this purpose, was conducted a study of over 40'000 patents, based on identified patterns of development of technical systems and devices inventions developed Theory of Inventive Problem Solving (TRIZ), the banner which was a call to make an art of invention into an exact science. (Альтшуллер, 2004)

### **History of TRIZ**

H.Altshuller began to invent an early age. At age 17 he received his first certificate of authorship (November 9 1943),and by 1950 the number of inventions exceeded ten. It is widely believed that the invention came suddenly, with insight, but Altschuler, being a scientist and engineer, set out to identify how to make the invention, and whether their creative patterns. To do this, he in the period from 1946 to 1971, studied over 40 000 patents, classified solutions for 5 levels of ingenuity and identified 40 standard methods used by inventors. In conjunction with the algorithm of inventive problem solving (ARIZ), it became the nucleus of TRIZ.

Originally "method of invention" was conceived as a set of rules such as "solve the problem - it means to find and overcome the technical contradiction."

Further development continued and Altshuller completed his theory of evolution technical systems (TRTS) explicitly formulated the main laws of technical systems (Петров, 2002). Over

60 years of development, thanks to the Altshuller and his disciples and followers, the knowledge base of TRIZ TRTS constantly supplemented with new techniques and physical effects, and has undergone several improvements.. The general theory was supplemented by experience in implementation of the inventions is concentrated in its life strategy of the creative personality (ZHSTL). Subsequently, this unified theory has been given the name of the general theory of strong thinking (OTSM).

### **Structure and function of TRIZ (Петров, а)**

1. Laws of technical systems (TS) (Петров, 2002а)
2. Information Fund TRIZ (Петров, b)
3. VePol analysis (structural analysis of the real field) of the technical systems (Петров, ЗЛОТИНА 2002)
4. Algorithm of Inventive Problem Solving - ARIZ (Петров, 1999)
5. The methods of creative imagination

### **Inventive problem and Inventive situation**

When a technical problem arises before the inventor, it is usually vague and does not contain any references to solutions. In TRIZ, a form of staging is *inventive* situation. Its main drawback is that the engineer has to try many ways and methods of solution. Through them all the time-consuming and expensive, and the random selection of paths leads to inefficient trial and error method.

So the first step on the path to the invention - to reformulate the situation so as to cut off the very wording of hopeless and ineffective solutions. This raises the question of which solutions are effective, and which - no?

H. Altshuller suggested that the most effective solution - one that is achieved "by itself", but at the expense of existing resources. Thus he came to the formulation of the ideal final result (IFR): "A certain element (X-cell) system or the environment *itself* eliminates the harmful effects while retaining the ability to perform beneficial effects."

In practice, the ideal final result is rarely achievable in full, but it serves as a guide for inventive thinking. The closer the solution to the IFR, the better.

Having clipping tool ineffective solutions, we can reformulate the inventive situation in a standard *mini-task*, "*according to IFR, everything should remain as it was, but it harmful part should disappear, or receive new, useful quality*". The main idea of a mini-problem is to avoid the significant (and expensive) changes, and consider first the simplest solution.

Formulation of a mini-problem contributes to a more precise description of the problem:

- What the components of the system, how do they interact?
- What connections are harmful, nuisance what - neutral, and what - helpful?
- What parts of the connection and can be changed, and what - you can not?
- What changes can improve the system, and what - to a deterioration?

### **Controversy**

After a mini-problem is formulated and the system is analyzed usually quickly discovered that trying to change in order to improve some parameters of the system lead to deterioration of

other parameters. For example, increasing the strength of an airplane wing can lead to an increase in its weight, and vice-versa - lightening the wing leads to a reduction in strength. In the system there is a conflict, a **contradiction**.

TRIZ distinguishes three types of contradictions (in ascending order of resolution):

- **administration of a contradiction:** *"We must improve the system, but I do not know how (do not know how, I have no right) to do so."* This contradiction is the weakest and may be withdrawn or the study of additional material, or the adoption / removal of administrative decisions.
- **Technical contradiction:** *"the improvement of one parameter of the system leads to a deterioration of another parameter."* Technical contradiction - this is staging **an inventive** problem. The transition from administrative to technical controversy dramatically reduces the dimension of the problem, narrows the field to find solutions and allows us to go on trial and error method for inventive problem solving algorithm, which either suggests applying one or more standard techniques, or (in the case of complex tasks) indicates one or some physical contradictions.
- **physical contradiction:** *"to improve the system, some part of it should be in different physical states at the same time that it is impossible."* Physical conflict is the most fundamental, because it rests on the inventor of the constraints imposed by the physical laws of nature. To solve the problem the inventor must use the reference table and the physical effects of their use.

#### **Information Fund consists of:**

- **techniques to eliminate contradictions and tables for their application;**
- **system of standards for the solution of inventive problems** (standard solutions specific class of tasks);
- **technological effects** (physical, chemical, biological, mathematical, in particular, the most developed of them now - geometry) and tables for their use;
- **resources nature and technology** and how to use them.

#### **System of techniques**

Analysis of many thousands of inventions revealed that, across a variety of technical contradictions, most of them solved 40 basic techniques.

Work on a list of such methods was initiated by H. Altshuller still in the early stages of the theory of inventive problem solving. Needed for their detection analysis of more than 40 000 patents (Официальный Фонд Г. С. Альтшуллера). These techniques are now and for the inventors of great heuristic value. Their knowledge is largely facilitates the search response.

But these methods only show the direction and the area where there may be a strong solution. A concrete solution as they are. This work is for man.

The system of techniques used in TRIZ includes **simple** and **paired** (device-anti-proton). **Simple techniques** can resolve technical contradictions. Among the simple things are the most popular **40 major** steps.

**Paired devices** (Петров, 1980) consist of a approach and anti-approach, they can be used



to resolve physical contradictions, since in this case considering two opposing actions, states, properties.

### **Standards for the solution of inventive problems**

Standards for the solution of inventive problems are complex techniques that use physical or other effects to eliminate contradictions. It is a kind of formula, which resolved the problem. To describe the structure of these techniques Altshuller established a real-field (VePolny) analysis.

Standards System consists of classes, subclasses and specific standards. This system includes 76 standards. With this system you can not only solve, but to identify new targets and to predict the development of technical systems.

### **Technological effects of**

Technological effect - the conversion of some technological effects in others, may require the involvement of other effects - physical, chemical, etc.

### **Physical effects**

Is known about five thousand of physical effects and phenomena. In various areas of technology can be used different groups of physical effects, but there are also commonly used. There are about 300-500.

### **Chemical Effects**

Chemical effects - is a subclass of physical effects, which only changes the molecular structure of substances, and a set of fields is limited mostly fields of concentration, velocity and heat. Confining ourselves only chemical effects, can often accelerate the search for an acceptable solution.

### **Biological Effects**

Biological effects - is the effects produced by biological objects (animals, plants, microbes, etc.). Application of the biological effects of the technique allows not only to expand the capabilities of technical systems, but also get results without harming nature. With the help of the biological effects you can perform various operations: discovery, transformation, generation, absorption of matter and fields, and other operations.

### **Mathematical effects**

Among the most developed mathematical effects are geometric. **Geometric Effects** (Викентьев, 2002) - is the use of geometric shapes for a variety of technological transformation. It is widely known to use a triangle, for example, using a wedge or sliding against each other two triangles.

### **Resources**

Real-field resources - a resource that can be used to solve problems or develop the system. Use of resources increases the ideality of the system.

### **Laws of Technical Systems**

Studying changes (evolution) of the technical systems in time, Altshuller identified laws of technical systems development, knowledge of which helps engineers predict the possible ways to further improve the product. For the first time formulated by H. Altshuller in his book "Creativity as an Exact Science" (M., "Soviet Radio", 1979,), the laws have been grouped into three conditional block:

- *Static* - Laws 1-3 define the conditions for the occurrence and formation of [the](#) TS (technical system);
- *Kinematics* - Laws 4-6, 9 define the patterns of development, regardless of the impact of physical factors. They are important for the early period of growth and prosperity of TS;
- *Dynamics* - the laws of 7.8 define patterns of development from the effects of TS-specific physical factors. They are important to the final stage of development and transition to the new system.

The most important law considers "ideality" (one of the basic concepts in TRIZ) system.

### **Real-Field (VePolny) analysis**

**Vepol** (matter + field) - a model of interaction in the minimal system, which uses characteristic symbols.

H. Altshuller developed methods for the analysis of resources. Several of the principles he discovered are considering various substances, and fields for conflict resolution and increase of ideality of technical systems. For example, the "teletext" uses the television signal for data transmission, filling frequent intervals between television images of the signal.

Another technique that is widely used by inventors is the analysis of substances, fields, and other resources that are not being used and which are in system, or next to it.

### **ARIZ - algorithm of inventive problem solving**

Algorithm for inventive problem solving (ARIZ) - turn-based program (sequence) to identify and resolve the contradictions, that is the solution of inventive problems (about 85 steps). ARIZ includes:

- the actual program,
- information, eating out of information collection
- management practices by psychological factors, which are an integral part in the development of methods of creative imagination.

### **Alternative approaches**

There are other approaches that can help an inventor to disclose their creativity. Most of these methods are heuristic. They were all based on psychology and logic, and none of them aspires to the role of scientific theory (as opposed to TRIZ).

1. The method of trial and error

2. Brainstorming
3. Method of synectics
4. Morphological analysis of the
5. Method of focal objects
6. Method of test questions

### **Criticism of TRIZ**

After the death of Altshuller, TRIZ has experienced stagnation in its development and some difficulty in the practical application of the theory, according to critics there are following problems: (Барышников)

- There is a methodological problem solving, in spite of her attempts to form the basis of certain patterns of development of technology.
- The distortion of the dialectical approach to the introduction of some new concepts .
- The appearance of new modifications of ARIZ complicated algorithm instead of eliminating the inaccuracies.
- There was no suitable mechanism for real-world problems of transition from conflict to formulated to solve it.
- A lot of the TRIZ tools were a bust of options despite the declaration of refusal from them.
- VePol use in the analysis of physical fields, the existence of which is not proven.
- Impossibility of introducing TRIZ into production because of the strong dependence on the personal choice of the person.

### **Modern TRIZ**

Modern TRIZ includes some schools that develop classical TRIZ and adding new sections that are missing from the classics. Well-developed technical core of TRIZ (receptions, ARIZ VePol analysis) remains practically unchanged, and the activities of the modern school is mainly aimed at rethinking, restructuring and promotion of TRIZ, it is more philosophical and advertising than technical, nature. In this regard, modern school of TRIZ often reproached in infertility and verbiage. TRIZ is actively used in advertising, business, art, early childhood development and so on, but was originally designed for technical creativity.

Classical TRIZ is a general technical version. For practical use of the technique must have a number of specialized versions of TRIZ, differing nomenclature and content of information assets. Some large corporations have used TRIZ elements, adapted to their areas of expertise. There is currently no special version of TRIZ to stimulate discoveries in the sciences (physics, chemistry, biology and so on).

The main obstacle in the development of TRIZ - the lack of methodology for the analysis of the original problem situation, diagnosis and prediction problems as a source of goal-setting improvements in socio-technical systems. To overcome this lack of development of modern methodology aimed futuristic design - "design solutions that are adequate to the Future."

One of the trends of technical progress is the intensification of the struggle for copyright product

developers. Therefore, increase of demand for innovation and respectively for the methodology and software of development. From this perspective, we should expand the database with a full range of theoretical approaches. Meanwhile, the heirs of the Altshuller divest any deviation from the position in the primary source. They are right to insist on its interpretation of the name of "TRIZ" and on the humanitarian work in an environment to pedagogy to art until his memoirs. The alternative is a loyalty to new approaches, propped up by TRIZ as a brand of theoretical developments. New aspects of the modeling of the innovation process can, in order to avoid excessive controversy, to find a new name, the more that TRIZ consists of words known to the birth of Altshuller.

### **The differences between TRIZ & PRIZM.**

PRIZM is a game that consists of a desk map, set of cards bearing the clues to solve a specific character. Time of game is one day, while it may be involved several teams looking for the solution of the same problems, each team consists of five people. It is advisable to select team members from different departments, to enhance multidisciplinary, which promotes creativity and reduces group-think. To carry out the game needed a trained facilitator, whose task to monitor the timely performance of participants in their assignment on each stage of the game before the advance to the next. The game is organized in two attempts, first - this is a test, attempt to find solution to the problem is not related to team members. This is a test phase, whose mission to familiarize players with the rules of the game in action and get the personal experience of performing tasks in real time. Typically this stage begins in the morning and last until lunchtime, during which participants are given the opportunity to rest and prepare for the second phase, which follows the same pattern as the first except that during the second phase addressed the real issue, which met addressed the group.

The game is built on combination of two kinds of thinking, they are divergent and convergent type of thinking. (Pahl, Newnes, 2007b) The first type of thinking is used to find the true causes of the problem being addressed. In the initial stages of the game, gradually scrutinizing the problem till the smallest non divisible particles that is causing the problem. By mid-game stage, when the divergent thinking ends and start searching for the solution of problems. For this purpose PRIZM cards are used, which include 40 principles developed by Altshuller. 40 principles of TRIZ together with 39 factors, which gives a matrix of TRIZ, which is extremely inconvenient to use because of its big size.. During the divergent thinking the source of problems are divided into groups depending on their type, for each group used a unique set of cards containing clues to solve problems. After the end of this phase begins filtering process in order to find solutions which will be beautiful, simple and chip. (Pahl, et. al. 2007a)

### **Strengths and weaknesses of PRIZM.**

PRIZM is itself a continuation of the evolution of TRIZ, and differs from it for the better by the fact that participants do not need to take special and long-term training, as in the case of TRIZ methods. PRIZM allows you to find a solution during one day. The fact that work is organized in team reduces the personal factor, which is characteristic for TRIZ. The main



- Альшуллер Г. С., Шапиро Р. Б. (1956). “О психологии изобретательского творчества” *Вопросы психологии*. — 1956, № 6. — с. 37-49.
- Барышников, А. ТРИЗ: Реальность и иллюзии. Retrieved from <http://inventech.ru/pub/methods/triz/> at 25.10.2011.
- Викенътев, И. Л. (2002). Система “ТРИЗ-Шанс”. Retrieved from [http://www.triz-chance.ru/geometrical\\_effect.html](http://www.triz-chance.ru/geometrical_effect.html) at 25.10.2011.
- Официальный Фонд Г. С. Альшуллера (автора ТРИЗ-РТВ-ТРТЛ) | Приемы | ТРИЗ | Работы | Retrieved from <http://www.altshuller.ru/triz/tools.asp> at 25.10.2011.
- Петров, В. (1980). Разработки, Парные приемы. Retrieved from <http://www.trizminsk.org/e/212002.htm> at 25.10.2011.
- Петров, В. (1999). Алгоритм решения изобретательских задач. Retrieved from <http://www.trizland.ru/trizba/pdf-books/ariz.pdf> at 25.10.2011.
- Петров, В. (2002). “История разработки закон развития технических систем”, Retrieved from <http://www.trizland.ru/trizba/pdf-books/zrts-01-history.pdf> at 20.10.2011.
- Петров, В. (2002а). Серия статей “Законы развития систем”. Retrieved from <http://www.trizland.ru/trizba.php?id=108> at 20.10.2011.
- Петров, В. (а). “Структуры и функции ТРИЗ”, Retrieved from <http://futureisrael.h1.ru/TRIZ/Introduction-new.htm> at 20.10.2011.
- Петров, В. (b). Книга “Базовый курс ТРИЗ”. Retrieved from <http://trizfido.narod.ru/00/petrov.htm> at 20.10.2011.
- Петров, В., Злотина, Э. (2002). Структурный вещественно-полевой анализ. Retrieved from <http://www.trizland.ru/trizba/pdf-books/vepol.pdf> at 20.10.2011.

# Session 3: ENERGY

EXPLORING NEW SUSTAINABLE BUSINESS OPPORTUNITIES  
IN THE FOREST INDUSTRY BASED ON MEDIA HEADINGS

([pdf](#))

Virkkunen, Hannu; Lampela, Hannele

FACTORS INFLUENCING THE SUCCESS OF R&D  
COOPETITION ([pdf](#))

Nuojua, Outi; Tähtinen, Jaana; Palo, Teea

THE PHYSICAL INTERNET AND BUSINESS MODEL  
INNOVATION ([pdf](#))

Montreuil, Benoit; Rougès, Jean-François; Cimon, Yan;  
Poulin, Diane

# Exploring New Sustainable Business Opportunities in the Forest Industry Based on Media Headings

Hannu Virkkunen<sup>1</sup>; Hannele Lampela<sup>2</sup>

<sup>1</sup>*Doctoral Student, Lappeenranta University of Technology, hannu.virkkunen@lut.fi*

<sup>2</sup>*Professor, Lappeenranta University of Technology, hannele.lampela@lut.fi*

## Abstract

Organizational networks and networking in its different forms is expanding rapidly. Considerable changes in the formation of business models and value networks have taken place since the old times when the business value chain was based on simple concrete needs for basic living, connected with agriculture, industrial production or trading goods and services. The purpose of the paper is to find common factors for new business opportunities in small and medium sized enterprises (SMEs) operating in the forest industry. It also takes into account the requirements for sustainable development and formation of business models based on the identified opportunities. Using critical discourse analysis and combining this with the prior knowledge of the researchers on the subject, emerging new business opportunities were identified from public discussion in business networks. The study is limited to covering Finnish media, with the aim of finding the most suitable new business ideas for the Finnish business environment in forest and related metal industries.

## Keywords

Business opportunities, media headings, SME, sustainable development, discourse analysis

## Introduction

Nowadays the public discussion and needs are initiated in networks where people exchange opinions, experiences and ideas. Fast changes in trends are following each other and are often dramatic and dynamic. In this kind of environment, it has become increasingly challenging to identify new business opportunities and build successful business models based on them using the traditional analytical approach.

The conventional business model architecture (Schekkerman, 2003) is based on combining the strategy and the business plan of the enterprise, and it guides the different functions of the enterprise. It has been noted in the literature, that business models contribute to the description of the activities in the value chain of the enterprise (Hoogervorst, 2004). According to this principal, the selected media news will reflect either operating or newly found business models during the study period of 2009-2011. As a summarizing method of study, discourse analysis has been utilized to choose and classify the found media headings. The starting point for finding the media headings has been the researchers' discussions and knowledge of the media headings, which helps to identify the relevant headings (Väliverronen, 1998).



The ontology of business models (Osterwalder et al., 2004) provides a framework for understanding the problems of handling large entities and changing information in business models and architectures. The knowledge of the business model ontology has been utilized in this study to form a structural model of classifying the media news headings.

The purpose of the paper is to find common factors for new business opportunities in small and medium sized enterprises (SMEs) operating in the forest or related metal industries. It also takes into account the requirements for sustainable development and formation of business models based on the identified opportunities. New business opportunities can be identified and this knowledge can be further utilized in building new business models. The research questions considered in the paper are: *How are new business opportunities in the forest and metal industry reflected in the professional media headings and how can they be identified from the final search results of the data, which are based on the media news?*

In this research, the sources of new business opportunities include versatile data such as public news articles (print and online), and discussions and media headings in the internet. All of them include weak signals that can be observed and identified as a new business opportunity. Networks and business models have become international, and although the emphasis of the study is in Finnish media and data collected, Google internet search engine has been included as one global source of information.

Based on researcher's prior knowledge and experience on the subject area, and utilizing critical discourse analysis to classify the data, discussions in different networks can be followed and interesting new business opportunities can be identified. Because the links from media headings to new business models are difficult to document, the data available through media headings alone is not enough to create or manifest the need for new business or business model. The media headings are used as an input data or initial findings in the research process. The research is limited to cover the awareness stage of a new business opportunity found in the media headings, and to the ontology part which connects it to the traditional business model creation process (Osterwalder, 2004), that together form the new business opportunity. The logical algorithm used to form conventional business model elements has been left out of the scope of this study.

The creation of new business models and the different ways new business models are formed has been discussed in many existing studies (see e.g. Hoogervorst, 2004). In this study, we present a process that uses media headings as the initial data for identifying business opportunities. Media headings and media studies have been used in many fields of research to analyze the importance of media for various phenomena (Väliverronen, 1998; Johnson, 2008).

The results of the research show how new business opportunities for the forest and related metal industries can be identified using online search engines and databases. In our study, the process of identifying business opportunities and building a business model based on them is different from the conventional business model creation process, in which the starting point for the opportunity identification is not clearly defined (Olofsson and Farr, 2006). In our study, the first part of the process is formed differently because the signal for the new business opportunity is found in the media headings.

After the introduction, which covers the starting points for the research such as research questions and design, the links to existing literature on business opportunity identification are briefly discussed in the theoretical part of the paper. In the following section, the research strategy, methods and data are described in more detail, and empirical results are presented next. The paper concludes with a discussion on the findings and an evaluation of the research process.

## **Theoretical Starting Points**

### **Emerging business opportunities and business models**

The emergence of new business ideas and business models has been an area of growing interest in the recent years both in business practice and in academic research. Although in traditional economics literature, the research and definition of business models is lacking (Teece, 2010), business models have been discussed mainly in the business strategy literature from several viewpoints including for example business design or architecture of an enterprise, organizational resources, narratives, innovation, transactions and opportunities and expectations (for a recent overview of literature and discussion on business models, see e.g. George and Bock, 2010; Long Range Planning special issue on business models, 2010).

Especially when focusing on forest industry and related industries, there is a growing need to identify and develop new business opportunities because of the radical structural changes in the operating environment, which have led to traditional business models and products becoming unprofitable. Also new requirements for environmental and social sustainability in forest business are a growing concern for the public, leading to the need of innovating new products, business areas and business models to transform the business. For example biorefineries and biofuel production that can be integrated to pulp and paper production have been noted to have significant business potential and competitive advantages (Hämäläinen et al., 2011)

Identifying new business opportunities and creating business models based on them can be considered as an innovation process (Teece, 2010; Chesbrough, 2010). Although these are issues of strategic planning generally appointed to the management level of the organization, the identification of new opportunities and possible changes of a business model have effects on all levels of the organization from strategic to tactical level, and the business model should be integrated with all the planning levels (Casadesus-Masanell and Ricart, 2010).

Identifying business opportunities and emerging business models can happen in several different ways, the traditional way based on company management's analytical thinking, based on strategic vision of the future developments in the business. Another possibility is a more discovery-driven approach based on experimentation, trial and error and learning (McGrath, 2010). According to Teece (2010) *“Designing a new business model requires creativity, insight, and a good deal of customer, competitor and supplier information and intelligence. There may be a significant tacit component. An entrepreneur may be able to intuit a new model but not be able to rationalize and articulate it fully; so experimentation and learning is likely to be required.”*In this paper, we present one possible exploratory process of identifying new business opportunities before they are formalized into business

models by using the public discussion and media headings as a starting point for identifying the opportunities.

### **Knowledge creation process**

The model of knowledge creation and management we follow in this study is based on the assumption, that finding the right information is a crucial step in the event chain that leads to identifying new business opportunities through media headings. Our understanding was built with the discourse analysis method and using the researcher's own competence and experiences. The importance of finding the right search criteria was also highlighted in the study that is based on using discourse analysis to identify business opportunities and develop new business models. The process of knowledge creation in this study is thus built on initial knowledge on the subject and follows a logical path with predefined steps to reach an end state of defining a business model. As a limitation of this approach it has to be noted that it is very challenging to start building a new business model if the only initial information available is the media headings, without concrete knowledge of the end results in practical business life. Lack of existing business in the identified business opportunity areas, insufficient knowledge of the markets and turbulence of the business environment set further challenges for the process.

A well coordinated knowledge creation and management process can support the creation of new business and business model. In addition, the interaction and discussions in networks support knowledge dissemination and new knowledge creation. From knowledge management point of view it is also interesting to note, how the awareness of business opportunities in media and especially in small northern countries has provided concrete results in practice. Based on this knowledge the business opportunities can be identified (Agndal and Chetty, 2007).

### **Research Strategy and Methods**

The methodology used in this study comprises of three main elements: discourse analysis, ontology and logical algorithms. The research process steps from the media headings to identified business opportunities are first, finding the initial media headings from the "media space" and using researcher experience and discourse analysis to classify the headings. Second, the ontology built for the database searches brings out the hits for the chosen media heading and these are considered as new business opportunities, which can be further analyzed for building a business model through logical decision algorithms that form the elements for the business model.

An analysis of the business environment changes and of the weak signals in the discussion networks is needed in order to define the first awakening point for a new business opportunity. No ready process could be found for this (Fairclough, 1995), but the findings from the media headings can act as the starting point. A new business opportunity can be born based on the signals in the public discussion, that lead to a logical event chain of forming a business model through excluding and including the necessary business model elements.

The analysis method in this research is qualitative and based on researcher observations made when analyzing the the initial data set of secondary data obtained from internet search engines, and professional newspaper online databases and article headings in Finland. Using professional industrial newspaper databases can be assumed to give an up-to-date picture of the practical discussion in the field.

The initial data set of 618 media headings from the years 2009-2011 is classified and summarized into 12 categories or summary headings, which have been entered into the databases for searches in different points of time in 2009 and 2011. Collecting the research data and the analysis of data is done qualitatively, also utilizing the researchers' own perceptions and the discourse analysis principles when choosing the data sample. The initial data set has been summarized to describe the new business opportunities represented in the media headings. After finding the initial media headings, discourse analysis has been used to form 12 categories or new summary headings for the data. These 12 headings have been entered into Google search engine as well as into the online databases of two Finnish professional newspapers (Tekniikka & Talous and Maaseudun Tulevaisuus). The final search results acquired at different times are then compared, to identify the new business opportunities.

According to the principles of qualitative research and discourse analysis, inductive reasoning by the researchers was used in formulating and choosing the final 12 headings. Both the initial data set and the final headings have been considered broadly, from many points of view, to avoid bias towards only fashionable topics and current news.

## **Empirical Results**

### **Database search results**

The results show that the study identified keywords or phrases connected to the media news headings that relate to either large or small number of search results. The initial organizing of the research material is based on the researcher's selection of 618 relevant newspaper or electronic media articles. The search results were then classified and twelve main categories were identified and final database searches were performed using these 12 headings. The results of the database searches at different times are shown in Table 1 in the Appendix.

In the case of a large number of search results, it can be deduced that the headings refer to existing businesses or newly emerging business. In the case of a small number of search results, the headings refer to possibilities for new business opportunities, because the topics are not widely known and discussed. The results indicate that a large number of search results reflects the topics of current professional discussion, whereas a small number of search results may indicate that there is no general discussion on these topics yet. On the other hand, a small number of search results may indicate a false finding. In this research, the interest is focused particularly on the topics with a small number of search results. This is because these would seem to have potential for new emerging businesses and new business opportunities for the existing firms, although it also increases the risks involved. It is especially relevant to sustainable business models, where any discussion appears to be quite scarce.

## Identifying business opportunities based on media headings

The process used and tested in this study for finding new business opportunities based on media headings is illustrated in Figure 1 below.

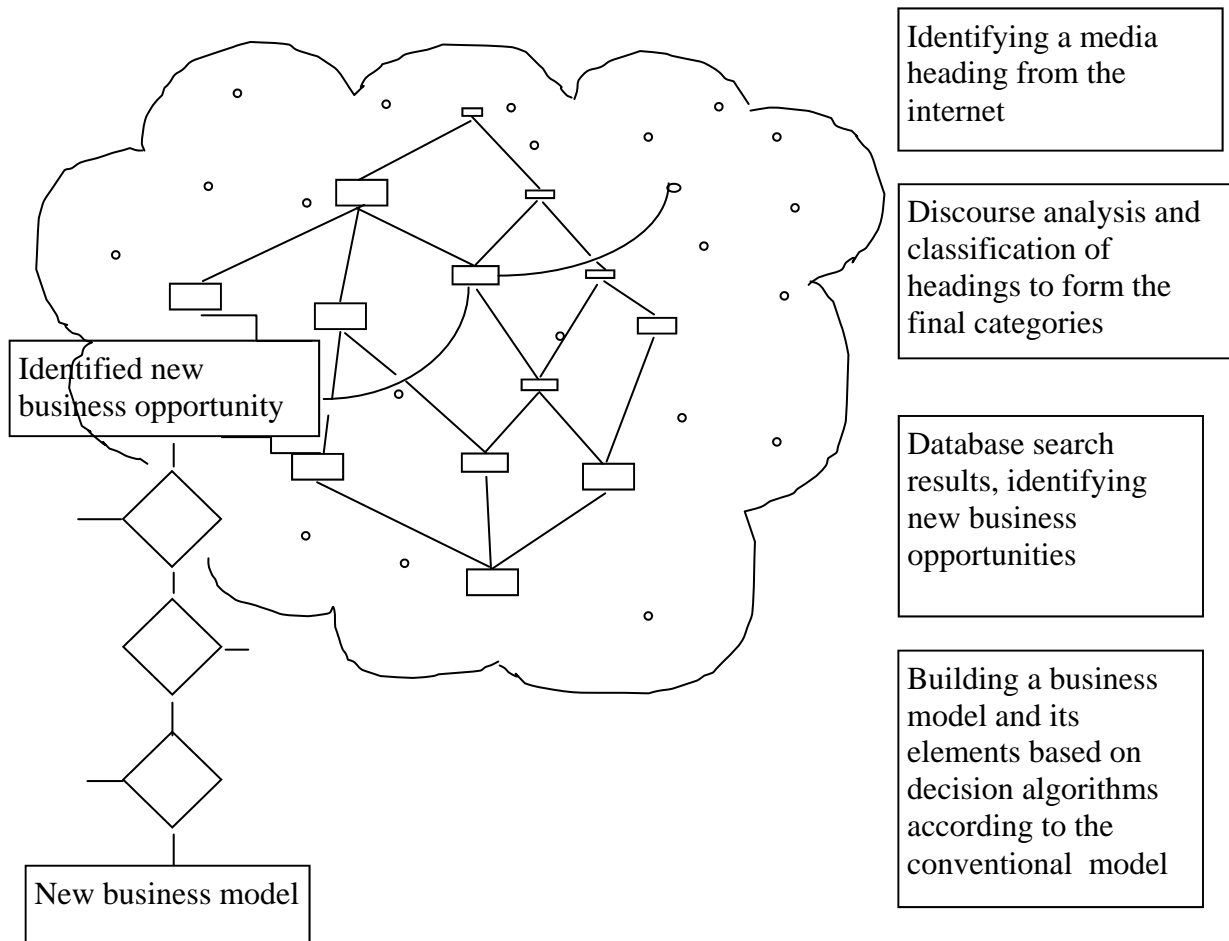


Figure 1. Process for identifying new business opportunities based on media headings

Discourse analysis is often used in for example literature research or historical research. In the analysis process, analyzing and interpreting texts leads to final conclusions. In our research, these conclusions have been partly formulated also by the prior knowledge and experience of the researchers. Using discourse analysis has helped in selecting the relevant media headings from the initial data set. Discourse analysis in this study is defined as finding relevant texts and media headings, classifying and interpreting them and also building knowledge of the general business environment and understanding it.

When combining the initial results of the discourse analysis part of the research with a logical ontology structure, this forms the base for a new business opportunity or business model. Since for this research the interest of study is in the holistic model of identifying new business opportunities and building new business models based on them, we are not interested in single media headings as such.

Theoretical studies in different fields often present ontological systems as results. As an example, in information technology the object theory is based on a defined ontology and

entities. In this research, the ontology of business models is a central structure combining the discourse analysis results with the decision algorithm of forming a business model. The concept of ontology is by nature different in philosophy and in information technology research, where it is often used to describe a logical structure that is designed for a specific purpose such as a computer program.

Combining a decision algorithm to the previous stages of the research forms a final business model and helps to define the needed elements for the business model, almost as writing code for software programs. This part has been left out of the scope of this study, since several studies already cover the conventional business model creation process and definition of business model elements (Osterwalder, 2004; Olofsson and Farr, 2006). The logical path from identifying a media heading linked to a new business opportunity towards a new business model is like problem definition and solving. The results from the database searches are facts that are combined to the algorithm to include and exclude the needed elements of a business model.

## **Discussion and conclusions**

The final search results of the study show, that a large number of search results reflects existing business and ongoing discussion related to it. On the other hand, a small number of search results show that a general discussion on the topic has not started or the knowledge is still insufficient. The final database search results acquired point to emerging business opportunities. In this research, the focus was particularly in identifying business opportunities that follow sustainable development. This limitation was seen reasonable because although the discussion on sustainability in business in different fields is increasing, not many practical examples of sustainable business have been realized.

The results of this study can be applied when identifying search results from media headings and when analyzing the links between the media headings and new business opportunities. The results can be summarized so that they reflect different emphasis and variables included in the search criteria, such as SMEs, sustainable development or forest industry in this study. The network discussions and the found search results produce facts that can be implemented in identifying and building new business opportunities.

The results show that the ongoing professional discussion and a large amount of search results correlate with each other, and a small number of results indicate an area where the discussion is still emerging. The interest of this study is particularly in these areas, since they present the best potential for identifying new business opportunities since the discussion is awaking and new possibilities can be found.

The results of this study can be applied when identifying and implementing new business models, and the results can be considered valid because they describe existing business models, which are already discussed in the media. For example for the summary heading biofuel, the database search results increased considerably during the two-year research period. This development can also be observed and confirmed in practice, as the building of Tolkkinen biofuel plant that produces biofuel and its by-products was initiated in Porvoo in

2011. Although our results have not been confirmed with other studies, we see that there is need for further analysis and research in using the media headings in identifying new business opportunities.

New business opportunities and business models are required if the operations of the large Finnish forest and machinery industry enterprises are to be changed so that they use more sustainable business models. This change could also include more collaboration possibilities with SMEs by developing joint information, management, and technology systems.

### **Evaluation and limitations of the research**

The discourse analysis method, applied to the media headings in this study, can be applied to many other kinds of data analysis based on written material. In this study, an exploratory process was built for identifying business opportunities based on media headings. Many examples on how new business models are created are presented in the existing literature, but any matching this approach could not be found.

Based on this research method, where the initial data set was summarized from 618 media headings to 12 categories and final database searches performed based on these, there is no clear mathematical model or equation that could be applied to achieve the same results. Regarding the ontology used in the study, the risks of false findings are cumulating if the initial chosen headings are not correct. As regards the limitations of the study, it must be recognized that the wording of the media headings is often inaccurate and can affect the quality of the final search results. In addition, using singular and plural forms of words, for example, might produce different results. Media headings are by nature often ambiguous, and can affect the quality of searches and search results. Because the selection and classification of media headings was also done based on the researcher's own experience, this might lead into some bias in the final results.

### **References**

- Casadesus-Masanell, R. and Ricart, J. E. 2010. From Strategy to Business Models and onto Tactics. *Long Range Planning*, Vol. 43, Issues 2-3, April-June 2010, pp.195-215
- Chesbrough, H. 2010. Business Model Innovation: Opportunities and Barriers. *Long Range Planning*, Vol. 43, Issues 2–3, April–June 2010, pp. 354-363
- Chetty, S. and Agndal, H. 2007. Role of Inter-organizational Networks and Interpersonal Networks in an Industrial District. *Regional Studies*, Vol. 00.00, pp. 1–13, 2007.
- George, G. and Bock, A. J. 2011. The Business Model in Practice and its Implications for Entrepreneurship Research. *Entrepreneurship Theory and Practice*. Vol. 35 No. 1 (January 2011) pp. 83-111
- Fairclough, N. 2009. *Media discourse*. London, Edward Arnold.
- Hirsjärvi, S., Remes, P. and Sajavaara, P. 2000. Tutki ja kirjoita, 5. painos. Helsinki, Tammi. (In Finnish)
- Hoogervorst, J.A.P. 2004. Enterprise Architecture: Enabling Integration, Agility and Change. *International Journal of Cooperative Information Systems* Vol. 13 No. 3 pp. 213-233

- Hämäläinen, S. Näyhä, A. and Pesonen, H-L. 2011. Forest biorefineries - A business opportunity for the Finnish forest cluster. *Journal of Cleaner Production*. Vol 19 pp. 1884-1891
- Johnson, M.W., Cristensen, C.M. and Kagermann, H. 2008. Reinventing your business model. *Harvard Business Review*. December 2008 pp. 50-59
- Long Range Planning special issue on business models. 2010. *Executive Summaries*. Vol. 43 No. 2-3 pp. 146-155
- McGrath, R.G. 2010. Business Models: A Discovery Driven Approach. *Long Range Planning*. Vol 43 No. 2-3 pp. 247-261
- Olofsson, L. and Farr, R. 2006. Business model tools and definitions – a literature review. VIVACE project deliverables [E-document], available at [http://www.vivaceproject.com/content/engine/bmt&d\\_full.pdf](http://www.vivaceproject.com/content/engine/bmt&d_full.pdf)
- Osterwalder, A. 2004. The Business Model Ontology: A Proposition in a Design Science Approach. Universite de Lausanne, Ecole des Hautes Etudes Commerciales. Working paper
- Osterwalder, A., Parent, C., Pigneur, Y. 2004. Setting up an ontology of business models. [E-document], available at <http://en.scientificcommons.org/43263135>
- Teece, D. J. 2010. Business Models, Business Strategy and Innovation. *Long Range Planning*. Vol. 43 No. 2-3 pp. 172-194
- Väliverronen, E. 1998. Mediatekstistä tulkintaan. In Kantola, Moring and Väliverronen (eds.) *Media-analyysi – tekstistä tulkintaan*. Helsingin yliopiston Lahden tutkimus- ja koulutuskeskus. Tampere, Tammer-Paino Oy. (In Finnish)



Appendix

Table 1. Summary of the database search results

Selected headlines from autumn 2009	The researcher's selected headlines from the key source	Media Source Title and date	Result Sample Date	Result Sample Date	Result Sample Date
Summary 448 pcs	Summary 12 pcs	Google	4.12.2010	Teknikka&Talous	Maaseuduntulevaisuus
	Bio Oil	Teknikka & Talous	2.12.2009 974 pcs	4 pcs	1 pc
	Co2 waste	Helsingin Sanomat	28.9.2009 101 000 pcs	over 200 pcs	6 pcs
	The forest industry's export market	Maaseudun tulevaisuus	7.5.2010 12 500 pcs	3 pcs	53 pcs
	Graphic paper	Teknikka & Talous	3.5.2010 41 100 pcs	0 pc	85 pcs
	Intelligent Bio Packaging	The researcher's own media title	1 pc	0 pc	2 pcs
	Wood Products and Energy	Metsäteollisuus	23.9.2009 53 500 pcs	5 pcs	0 pc
	Forest Products Fibre Products	The researcher's own media title	66 pcs	0 pc	5 pcs
	Forest Seed	Arvopaperi	30.7.2009 449 pcs	0 pc	0 pc
	Forest and the membership of the WTO	The researcher's own media title	11 400 pcs	3 pcs	0 pc
	Intelligent networks and energy	The researcher's own media title	9 230 pcs	0 pc	0 pc
	Franchising in the forest industry	Helsingin Sanomat	26.2.2010 56 700 pcs	0 pc	6 pcs
	Forest divot	The researcher's own media title	5 pcs	0 pc	0 pc
Selected headlines from autumn 2009	The researcher's selected headlines from the key source	Media Source Title and date	Result Sample Date	Result Sample Date	Result Sample Date
Summary 618 pcs	Summary 12 pcs	Google	4.12.2010	Teknikka&Talous	Maaseuduntulevaisuus
	Bio Oil	Teknikka & Talous	2.12.2009 5 900 pcs	4 pcs	17 pcs
	Co2 waste	Helsingin Sanomat	28.9.2009 651 000 pcs	over 200 pcs	6 pcs
	The forest industry's export market	Maaseudun tulevaisuus	7.5.2010 3 330 pcs	3 pcs	13 pcs
	Graphic paper	Teknikka & Talous	3.5.2010 1 700 000 pcs	0 pcs	1 pc
	Intelligent Bio Packaging	The researcher's own media title	4 pcs	0 pcs	0 pc
	Wood Products and Energy	Metsäteollisuus	23.9.2009 313 000 pcs	6 pcs	3 pcs
	Forest Products Fibre Products	The researcher's own media title	61 pcs	0 pcs	0 pc
	Forest Seed	Arvopaperi	30.7.2009 734 pcs	0 pc	0 pc
	Forest and the membership of the WTO	The researcher's own media title	67 100 pcs	4 pcs	4 pcs
	Intelligent networks and energy	The researcher's own media title	102 000 pcs	0 pc	0 pc
	Franchising in the forest industry	Helsingin Sanomat	26.2.2010 16 700 pcs	0 pc	0 pc
	Forest divot	The researcher's own media title	981 pcs	0 pc	0 pc

# Factors Influencing the Success of R&D Coopetition

**Outi Nuojua<sup>1</sup>; Jaana Tähtinen<sup>2</sup>; Teea Palo<sup>3</sup>**

<sup>1</sup> *Doctoral student, Oulu Business School, University of Oulu, outi.nuojua@oulu.fi*

<sup>2</sup> *Professor, Oulu Business School, University of Oulu, jaana.tahtinen@oulu.fi*

<sup>3</sup> *Doctoral student, Oulu Business School, University of Oulu, teea.palo@oulu.fi*

## **Abstract**

Operating in a dynamic business environment demands the simultaneous utilization of collaborative and competitive strategies. Close R&D relationships among competitive high-tech firms are common even if they seldom succeed. This study aims to elaborate on the factors influencing the success of dyadic R&D coopetition. Drawing upon a single case illustrating a coopetitive dyadic R&D relationship, the study identifies the challenges and the success factors of R&D coopetition as well as the R&D coopetition capabilities that help firms to overcome challenges and exploit success factors. The study provides theoretically important insights by addressing the issue of coopetition success. Moreover, it shows that firms can actively pursue coopetitive R&D relationships but success in doing so requires a profound understanding of the factors influencing the relationship success.

## **Keywords**

Dyadic relationships, coopetition, R&D coopetition capabilities

## **Introduction**

Markets are undergoing a great change as traditional, vertically-integrated organizations are rapidly being replaced by relationships and networks (Halinen & Törnroos 2005). Moreover, firms are increasingly utilizing collaborative and competitive strategies simultaneously (e.g. Lado, Boyd & Hanlon 1997). High-tech firms in particular are developing close R&D relationships with direct competitors, aware that such collaborative arrangements can have favorable effects on firms' technological offerings and innovation capabilities (Ritala & Hurmelinna-Laukkanen 2009; Quintana-García & Benavides-Velasco 2004). The field of coepetition has received increasing attention from both scholars and practitioners (e.g. Bengtsson, Eriksson & Wincent 2010; Bengtsson & Kock 2000; Lado et al. 1997; Brandenburger & Nalebuff 1996). However, cooperation between competitors has not been covered in earlier research widely enough even though coepetitive arrangements hardly ever succeed (e.g. Draulans, deMan & Volberda 2003). Hence further research on coepetition in the context where it is most common, R&D, is required.

This study aims to elaborate on the factors influencing the success of dyadic R&D coepetition by focusing on the question of *what affects the success of R&D coepetition*. Examining the challenges and the success factors behind coepetition in R&D as well as the R&D coepetition capabilities that help firms to overcome challenges and exploit success factors increases our knowledge about how firms can successfully develop and manage coepetitive R&D relationships. Operating in a dynamic business environment demands both traditional business competences and the capability to manage strategic inter-organizational relationships and networks (Möller, Rajala & Svahn 2005). Further, as different types of business networks require distinct organizational arrangements and capabilities (Svahn & Westerlund 2007), exploring the factors influencing the coepetition success in R&D context is justified. However, as networks are composed of relationships of individual firms, the unit of analysis in this study is an academically interesting and managerially challenging dyad.

The study is organized as follows. First the characteristics of coepetitive R&D relationship are discussed. The second section outlines the nature of organizational capability and goes on to suggest a categorization of R&D coepetition capabilities. There follows a model of successful R&D coepetition that is presented along with the design of case study and its empirical results. The study concludes with an evaluation of the research quality and highlights the theoretical and managerial implications and suggestions for a future research.

## **Characteristics of a coepetitive R&D relationship**

The term *coepetition* is defined here as simultaneous cooperation and competition between competitors (e.g. Bengtsson & Kock 2000). Scholars (e.g. Easton & Arajou 1992) exploring coepetition stress that competitors can be involved in direct relationships with each other in different ways. Furthermore, coepetitive relationships are usually understood through their value creation and appropriation because the additional value is jointly created but its appropriation is competed over (e.g. Ritala & Hurmelinna-Laukkanen 2009).

In vertical relationships partners have a mutual interest to interact (e.g. Morgan & Hunt 1994) whereas competitors are often forced in interaction with each other (Ring & Van De Ven 1992). Heterogeneity of firms' resources leads to both intense rivalry between direct competitors and interdependence. As a result, cooperative relationships are usually in conflict, as the interests of individual firms cannot be fulfilled simultaneously. (Bengtsson & Kock 2000.) Moreover, conflicts create challenges for trust development and further information and knowledge sharing because of the fear of opportunistic behavior. Competitors are presumed to pursue their own interests, while at the same time restraining this natural behavior in order to make their alliances work (Das & Teng 1998). Hence strategic fit and motivation are essential elements of a successful cooperative relationship (Zineldin 1998).

Cooperative R&D relationships are common between strongly R&D orientated high-tech firms that have high resource compatibility and weak competitiveness (Choi 2005; Miotti & Sachwald 2003). R&D relationships with competitors, focusing on sharing essential technological information and knowledge, are created to increase the influencing power (e.g. Ritala & Hurmelinna-Laukkanen 2009), to improve the absorptive capability of technological information (e.g. Ritala & Hurmelinna-Laukkanen 2009), and to strengthen the innovation capability of firms (e.g. Bengtsson & Kock 2000) as well as to decrease the costs and risks of new technological solutions (Zineldin 2004). Cooperative relationships are built around diametrically different logics of interaction (Bengtsson & Kock 2000) which creates an arena for cooperative dynamics with a variety of different combinations of cooperation and competition (Bengtsson et al. 2010). In the R&D context, competitors usually interact through pre-competitive projects which involve public funding and cooperation with non-competitive firms and public research institutions (Miotti & Sachwald 2003). Therefore, this study suggests that the challenges of R&D cooperation arise from both the cooperative R&D relationship and the cooperation form of which the dyadic relationship is part.

Challenges and success factors widely affect the cooperative R&D relationship. Based on the theoretical frame, the challenges surrounding R&D cooperation are trust development, conflict handling, information and knowledge sharing, and problems that arise from the involvement of public organizations. Success factors on the other hand concern anticipated benefits, the motivation for R&D cooperation, resource compatibility, reciprocal interdependence, R&D orientation, and weak competitiveness. Operating in a dynamic business environment does though require distinct cooperative capabilities (Möller et al. 2005) as gaining sustainable competitive advantage is often based on interaction between firms (Johnsen & Ford 2006). The following section discusses R&D cooperation capability by applying the studies of capabilities in the cooperative R&D context.

## **R&D cooperation capabilities**

The idea of organizational resources and capabilities stems from the resource-based view (Human & Naudè 2009) that explores the management of capabilities and resources inside firms (Gulati, Nohria & Zaheer 2000). In general organizational capability comprises a complex set of skills and collective learning, exercised through organizational processes to ensure superior coordination and functional activities (Day 1994). In this study, however,

*R&D coopetition capability* stands for know-how that facilitates the interaction, problem-solving and relationship development between the cooperative competitors (Croom 2001).

The dynamic capability view complements capability theory by showing how capabilities are modified in a dynamic environment. Teece, Pisano and Shuen (1997) assert that dynamic capabilities integrate, build, and reconfigure the internal and external competences of a firm. The approach emphasizes the role of management and therefore it should be connected with the challenges caused by operating in relationships (Möller, Svahn, Rajala & Tuominen 2002). R&D coopetition capabilities are here regarded as dynamic capabilities because dyadic R&D coopetition demands dynamism as both the coopective relationship and the R&D processes are dynamic (see Bengtsson et al. 2010; Zollo & Winter 2002; Eisenhardt & Martin 2000).

Earlier studies have suggested only a few capability frameworks for establishing and managing relationships and networks (e.g. Möller et al. 2005; Ritter & Gemünden 2003). Research has not tackled the capabilities that are required in coopective R&D relationships. In pursuit of identifying R&D coopetition capabilities, research on dynamic capabilities (e.g. Eisenhardt & Martin 2000; Teece et al. 1997), relational capabilities (e.g. Blomqvist & Levy 2006; Croom 2001; Lorenzoni & Lipparini 1999), technological know-how (e.g. Nerkar & Paruchuri 2005; Miotti & Sachwald 2003), and specialist skills (Ritter & Gemünden 2003) were explored and categorized into managerial capabilities, social capabilities, technological know-how, and specialist skills. *Managerial capabilities* are here regard as the activities required in establishing and maintaining a single relationship (Ritter & Gemünden 2003) whereas *social capabilities* are the exhibition of useful behavior in social settings (Helfert & Vith 1999). *Specialist skills* on the other hand concern the “technical side” of the relationship (Ritter & Gemünden 2003) while *technological know-how* is composed of the technological capabilities in which the firm specializes (Nerkar & Paruchuri 2005) and the capabilities of developing new competences, such as learning (Teece et al. 1997), innovation capability (Wang & Ahmed 2007), and absorptive capability (e.g. Miotti & Sachwald 2003).

Based on the theoretical framework, a case study was conducted in order to provide an empirical grounding for the model of successful R&D coopetition. The following section describes the empirical research design and examines its key results.

## **The case study**

### **Research design**

A case study approach was chosen because the method allows an in-depth exploration of a contemporary, complicated and social event strongly embedded in its context (Yin 2003, 13). Moreover, the case study is an appropriate method because it is used widely in examining the decisions and behavior of groups and individuals within organizations and inter-company relations (Halinen & Törnroos 2005). The study focuses on a single case, in which competing firms develop a virtual open source software platform. The case was chosen on the basis of the eventual learning derived from the case (see Stake 1995, 4), and as it was a good example

of a typical cooperative R&D relationship (see Yin 2003, 41). The cooperation focuses on a pre-competitive project involving public funding and cooperation with public institutions (see Miotti & Sachwald 2003). Furthermore, the case was an example of a successful relationship as the project achieved its own goals by creating new business opportunities locally and supporting the growth of its core partners.

The empirical data were primarily gathered through five semi-structured interviews that provided an understanding of the factors influencing the success of R&D cooperation. The semi-structured form was chosen for the interviews because it is reasonably systematic and comprehensive (Eriksson & Kovalainen 2008, 82), while interviewees can still freely present their own thoughts (Flick 1998, 76) because the tone of the interview is kept informal (Eriksson & Kovalainen 2008, 82). As represented in Table 1, the interviewees were employees of competitive firms who were involved in the project from its inception. The exception was the project leader, who was not directly employed by either firm, and whose views provide another perspective on the relationship between the two competitors. All audiotaped interviews were held at the firms' facilities or at the researchers' university facilities. The secondary data consist of written documents that supplement the primary data. The empirical data is summarized in Table 1.

<b>Firm</b>	<b>Type</b>	<b>Interviewee</b>	<b>Occasion</b>	<b>Duration</b>
Aku	Interview	Chief Executive Officer	07.03.2011	1 hour 40 minutes
Aku	Interview	Programmer	22.03.2011	1 hour 5 minutes
Mikki	Interview	Chief Executive Officer	15.03.2011	30 minutes
Mikki	Interview	Programmer	28.03.2011	30 minutes
Project X	Interview	Project leader	15.03.2011	1 hour 15 minutes
Aku	Home pages		March 2011	
Mikki	Home pages		March 2011	
Project X	Home pages, interest group magazine		April 2011	
Public organization	Home pages		April 2011	

Table 1. Empirical data of the study

The empirical data were analyzed and manually arranged into themes arising from the theoretical framework and the empirical data. This kind of abductive reasoning allowed us to make the best of both the theoretical knowledge and empirical data (see Kovács & Spens 2005). Moreover, the thematic analysis allowed examination of relevant content from the empirical data (see Eriksson & Kovalainen 2008, 219). Each interview was analyzed individually and then compared to discover common patterns. Primary importance was ascribed to the challenges and the success factors of R&D cooperation as well as to R&D cooperation capabilities. Following that step, the empirical data was carefully compiled as a

narrative story in order to provide an empirical grounding for the theoretical model. Generally, the empirical part of the study reinforced the existence of aspects included in the earlier theoretical framework and prompted the emergence of new aspects as well. The next section first provides a brief case description before presenting the analysis.

### **Case description**

Project X, which aimed to develop a virtual open source software platform, began in the summer of 2007 when a private financier suggested for several local firms a cooperation to leverage their R&D know-how. Only two firms saw the proposition as relevant to their core business. Thus Aku, specializing in design and development of collaborative multiplayer games by harnessing high-end 3D game technologies, and its competitor Mikki, offering a full range of solutions and services for 3D virtual worlds, became the actors in Project X.

At first Project X consisted of experimental applications and was organized through an *ad hoc* structure. The idea for the platform came from existing technology and the development process began by designing new features into an old system. The general purpose of the project was to create an environment for both professionals and amateurs. In order to capture the potential of the platform, the principal organizer of the project was soon replaced by a public organization. Acting as an umbrella organization, the public agency handled the fundraising and general organization. The city of Oulu and a multinational telecom company with a local presence became the largest financiers. The decisions concerning Project X were made by a management group whose underlying goal was to support the creation of local know-how and new business opportunities.

During the project, three key changes occurred affecting the technological direction and competitiveness of the participating firms. The first change concerned the replacement of the existing virtual environment with an entirely new system. New virtual environment enabled the creation of a simpler and more coherent software platform without the problems inherent in its predecessor. The change was technically challenging and it forced the firms into close cooperation. Aku and Mikki were no longer developing single features for an existing platform but creating a whole new system. The second change occurred when Mikki merged with another firm, Pluto. This increased the competitiveness between the participating firms as their core focus areas became closer. Moreover, as a result of the merger, Mikki also became interested in the features that Aku had been focusing on from the beginning. In addition, Aku realized the importance of the features that Mikki had been suggesting all along. As a final change a fourth firm, Roope, joined the project at the end of the development process and changed the dynamics of decision-making. Project X ended in 2010 but the firms involved continued to develop the core technology into 2011.

### **Research findings**

The research findings focus on the challenges and the success factors of R&D cooperation as well as on the R&D cooperation capabilities. We do, however, describe the R&D cooperation capabilities through the mirror of the challenges and success factors of R&D cooperation because separating the causal links between the factors would be extremely difficult.

### *Success factors of R&D cooptation*

The idea for the R&D cooptation did not originate with the participating firms. However, the strong *motivation for R&D cooptation* at all organizational levels was emphasized. Withdrawals in the middle of the project could have created challenges that would have slowed down or changed the platform design.

“Establishing a relationship should begin from a mutual desire to cooperate.”  
(Chief Executive Officer, Aku)

“Of course someone withdrawing would have been a considerable slap in the face and nothing could have compensated for it.” (Project leader, Project X)

The commitment of firms was one factor that affected the success of the R&D relationship. The participating firms were not bound to the project through long contracts but through a highly developed enthusiasm. Specifically in the early stage of cooptation, long-term commitment was required as conflicts between rivals and a shortage of resources threatened continuation of the cooptative relationship. As a consequence, in the future the firms will consider carefully the kind of R&D projects they will engage in and with whom. Overall, a *partner identification capability* may have enhanced the success of the cooptative R&D relationship by ensuring the right choice of partner.

“It is always a better situation if you can choose whether you cooperate or not, and with whom.” (Chief Executive Officer, Aku)

In Project X, *anticipated benefits* supported and led to R&D cooptation because the technology required in platform design was highly sophisticated and none of the participating firms could have created it alone. The cooptation was beneficial as it enabled the allocation of risks and costs and the absorption of essential know-how. Furthermore, better results were possible within a shorter period of time and cooperation with competitors brought credibility and visibility for the software, as no single firm owned the platform. In addition, the project brought rare and strongly required compatible *technological capabilities* together. Informants stressed the particular role of *resource compatibility* in ensuring individual responsibilities got divided. Resource compatibility and knowledge sharing created *reciprocal interdependence* which made replacing a partner difficult and strengthened cooptation.

Firms with a principal focus on R&D activities invariably improve their R&D skills. In Project X, a strong *R&D orientation* encouraged Aku and Mikki to attend to the cooptative R&D relationship as the design of the platform created new R&D opportunities by improving the firms’ knowledge of 3D technology. Specifically, the need for the platform within the partner firms was quite general and intangible as neither of the firms used it in its final form. The platform design was only a foundation for the firms’ own applications and did not bring any competitive advantage in itself. The firms still needed an *innovation capability* to exploit the technology and gain competitive advantage.

The innovativeness of one firm strengthened the innovation activities of the other by stimulating technological capabilities. In practice the benefit of *strengthened innovativeness*



occurred after the cooperation stage, when intangible and quite general outcomes of the project were competed over. The project aimed to increase the influencing power of both firms and also other local firms. The platform was designed to be a general *de facto* standard for users to design their own technological content on, and they would then own, update and control that content on the platform. Hence the platform conferred independence and so increased the *influencing power* of individual firms. Moreover, that was an anticipated benefit which led to a cooperative R&D relationship.

Aku and Mikki are specialized in different core areas. As a game research center, Aku focuses on visual elements and graphics whereas Mikki offers computing systems. Therefore, there was a *weak competitiveness*, which supported the emergence of a relationship, between the competitors. The specialization did however create conflicts, since both participants' distinct ambitions could not be fulfilled at the same time. Tension between the partners hindered communication and interaction, despite their being located in the same city. Nonetheless, *geographical proximity* led to R&D cooperation because the fundamental goal of the project was to support local knowledge and that enabled dynamic interaction between the rivals.

“It is a good thing that they [Aku] are at the same city so that we can meet face-to-face.” (Programmer, Mikki)

#### *Challenges of R&D cooperation*

Challenges to the R&D cooperation arose from both the cooperative R&D relationship and the cooperation form of which the dyadic relationship was part. In Project X the informants raised *trust development* as a difficult issue stemming from conflicts and both firms' lack of experience of operating in a cooperative R&D relationship. Conflicts arose partly because of *the role of the public organization*, which provided only *general goals* instead of specific requirements. All decisions concerning technological content were resolved between the firms, but their contrasting ambitions created some antipathy. In other words, the firms found *objective setting* difficult, which could have been solved partly by acquiring improved negotiation capabilities. Tension between the partners created a lack of communication and a situation where the firms developed overlapping designs that fitted only their own goals.

“As we had two firms doing the same thing, everyone had their own core ambitions... In the worst case, we had situations where both firms were going towards their own goals.” (Programmer, Aku)

The demand for interaction was reduced by identifying clear roles and responsibilities. Moreover, a *resource coordination capability* was used in problem solving as it calmed the inflamed situation.

“Of course, if it gets really bad, assertive dividing of responsibilities calmed the situation down.” (Chief Executive Officer, Aku)

The role of the public organization was considered to mainly be that of a fundraiser, filling a gap in the other partners' capability to gather enough funding for the development process.

Hence *economic competences* were required from the project leader who raised and allocated funds between the firms.

Both firms pointed out the importance of *communication and interaction capabilities* because of their positive effect on the cooperative relationship. Particularly at the operational level, communication was important because it supported efficient design activity. Programmers were interacting and sharing knowledge through meetings, e-mails, chat-rooms, and in the course of updating the common database. Having a *resource mobilization capability* was important because flexible sharing of technological information and knowledge increased the learning of individual programmers and the firms as a whole. *Learning* was seen as vital to improve firms' technological and innovation capabilities and provide an advantage in subsequent *result appropriation*, which was otherwise seen as challenging. Alongside a learning capability, exploiting the knowledge demanded an *absorptive capability*.

Communication reduced the incidence of confrontations and helped with the overall *conflict handling* which was considered a challenge. Furthermore, a *problem-solving capability* was seen as fundamental because it steered the relationship in the right direction. The project leader was responsible for administrative tasks as well as the management of the cooperative relationship, and in disputes assumed an administrative and supportive role. It is clear that the project leader required a *project management capability* and a *relationship development and maintenance capability*.

“The project leader organized the cooperation between the different organizations and ensured that the development proceeded and the funds were allocated correctly.” (Programmer, Aku)

“As a project leader I only tried to keep the wheels rolling.” (Project leader, Project X)

The partner firms handled the problems and disputes by using a *negotiating capability* and capability for *empathy* too.

“The most important thing in cooperation is that you can arbitrate and cooperate... and you must be capable of compromises.” (Project leader, Project X)

“We talked about the disagreements.” (Chief Executive Officer, Aku)

After the disputes were resolved and the level of trust and commitment increased, the partners felt that the cooperative atmosphere improved. Hence a *capability of developing trust and commitment* proved an important factor in the relationship between competitors. However, partners still found technological *information and knowledge sharing* challenging because they did not know exactly what information they could or should share. Sharing important technological knowledge may also be protected because of the immaterial rights involved. Therefore certain *legal skills* are important in R&D cooperation. The effect on relationship success, though, seemed quite insignificant.

*Summary of factors influencing the success of R&D cooperation*

In Project X, the cooperative R&D relationship was built between R&D orientated firms that had a high resource compatibility, weak competitiveness, and geographic proximity. The resource compatibility created reciprocal interdependence as the new platform could not be devised by one firm alone. Additionally, the fact that the firms were motivated to pursue cooperative R&D relationship by the anticipated benefits proved a prerequisite for a successful relationship. The anticipated benefits of the R&D cooperation focused on increasing the influencing power, improving the absorption and innovation capabilities as well as decreasing the costs and risks of new innovations and enhancing the credibility of the resultant solution. All in all, as Figure 1 shows, the success factors were elements which supported the cooperative R&D relationship but also led to a dynamic interaction between rivals.

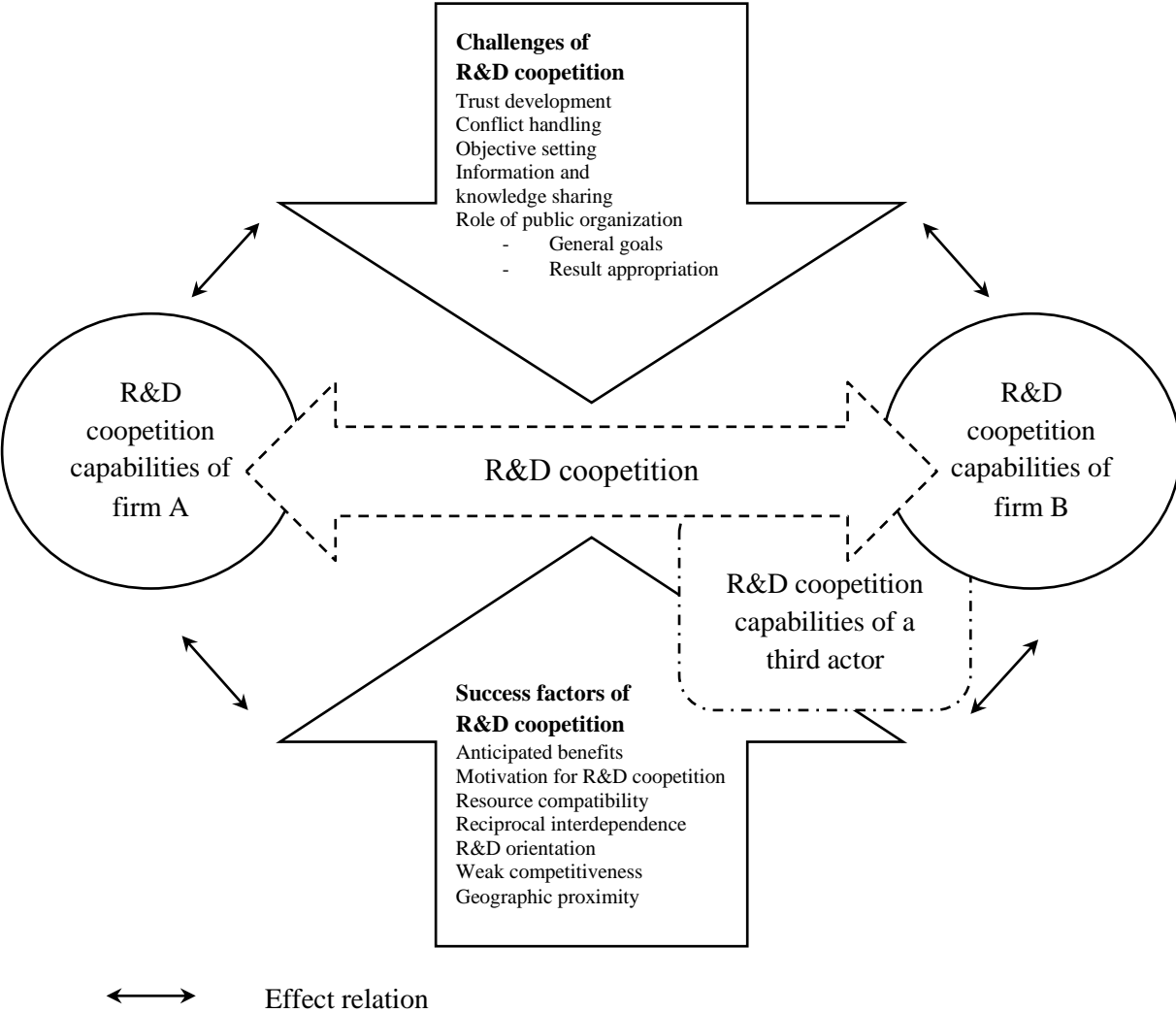


Figure 1. Factors influencing the success of R&D cooperation

As suggested in the theoretical framework, challenges affecting the R&D cooperation arose from both the cooperative R&D relationship and the cooperation form of which the dyadic relationship was part. In the cooperative R&D relationship, setting the objectives and result appropriation was affected by the role of the public organization, since its purpose was limited to achieving rather intangible results by its choice to set only general objectives. In addition, the distinct interests of rivals created conflicts and further complicated trust development and technological information and knowledge sharing.

R&D cooperation capabilities, categorized as managerial capabilities, social capabilities, technological know-how, and specialist skills, facilitated the success of R&D cooperation. However, the case made it clear that a third actor in the interaction process can contribute capabilities required for a successful cooperative R&D relationship. The R&D cooperation capabilities are summarized in Table 2.

<b>Managerial capabilities</b>	<b>Social capabilities</b>	<b>Technological know-how</b>	<b>Specialist skills</b>
Partner identification capability	Capability of developing trust and commitment	Technological capabilities	Economic competences
Project management capability	Communication and interaction capabilities	Innovation capability	Legal skills
Resource coordination and mobilization capabilities	Negotiation capability	Absorptive capability	
Relationship development and maintenance capability	Problem-solving capability	Learning	
	Empathy		

Table 2. R&D cooperation capabilities

Starting with managerial capabilities; it was clear that the ability to identify the right partner as well as relationship development and maintenance were essential. A prerequisite was that firms were motivated to work together throughout in order to make the relationship a success. Successful R&D cooperation required further efficient resource coordination and mobilization and development of project management capability as well as communication and interaction capabilities. Continuous interaction along with the capabilities to empathize and negotiate helped trust development and problem-solving activity. Through their communication and interaction firms showed the commitment which improved the possibility of success.

A productive cooperative R&D relationship demands technological know-how. Potential cooperation partners targeting industry-wide solutions should have compatible technological capabilities. On the other hand, as the results of cooperative relationships were general,

learning and absorptive and as well as innovation capabilities are evidently essential. Targets achieved in the cooperative R&D project were just a foundation for firms' own innovation processes. Finally some economic competences and legal skills were required to allocate funding efficiently and manage the issues of immaterial rights. However, specialist skills did not seem as significant as other R&D cooperation capabilities.

## Conclusions

The study aimed to elaborate on the factors influencing the success of dyadic R&D cooperation by answering the question of *what affects the success of R&D cooperation*. Specifically, the study identified the challenges and the success factors of R&D cooperation as well as the R&D cooperation capabilities that could help firms to overcome challenges and exploit success factors. Prior theoretical discussion has stressed that cooperative relationships hardly ever succeed (e.g. Draulans et al. 2003). However, this study shows that understanding the challenges and the success factors of R&D cooperation as much as possessing R&D cooperation capabilities could help firms to benefit from their cooperative R&D relationships. Hence this study supports the finding that firms can simultaneously exploit both cooperative and competitive strategies (e.g. Bengtsson & Kock 2000; Lado et al. 1997). The study contributes to the earlier research by identifying the factors influencing the success of dyadic R&D cooperation.

Competitors usually enter R&D relationships through public projects (Miotti & Sachwald 2003). Thus the challenges of R&D cooperation arise from the R&D relationship as well as from the collaborative form of which the dyadic relationship is part. Prior literature on cooperation has described cooperative relationships as difficult; and that difficulty as stemming from the competitiveness between the partners (Bengtsson & Kock 2000). On the contrary, this study argues that any antipathy may arise from contradictory objectives and from difficulties in trust development. Moreover, the tension between the rivals affects the sharing of technological information and knowledge, the importance of which is strongly expressed in earlier studies (e.g. Ritala & Hurmelinna-Laukkanen 2009; Zineldin 2004). Success factors of R&D cooperation, on the other hand, were identified as elements which supported the cooperation as much as they lead to a dynamic interaction between the competitors. This study confirmed the success factors recognized in prior research (see Gnyawali & Park 2011; Choi 2005; Miotti & Sachwald 2003; Zineldin 1998) but also introduced geographic proximity as a new factor positively affecting the cooperative R&D relationship analyzed.

Scholars have suggested that operating in a dynamic environment demands both traditional business competences and the capability to manage inter-organizational relationships (Möller et al. 2005). In this study we argue that R&D cooperation capabilities are essential, as such skills will help firms to overcome challenges and exploit success factors of R&D cooperation. Researchers have recently emphasized the role of cooperative capability in terms of cooperation success (Gnyawali & Park 2011). This study contributes to the theoretical discussion by identifying R&D cooperation capabilities and categorizing them as managerial capabilities (see also Ritter & Gemünden 2003), social capabilities (see also Ritter & Gemünden 2003; Helfert & Vith 1999), technological know-how (see also Wang & Ahmed

2007; Nerkar & Paruchuri 2005; Miotti & Sachwald, 2003; Teece et al. 1997), and specialist skills (see also Ritter & Gemünden 2003). Moreover, the study increases the knowledge of academics and practitioners by suggesting that a third actor in the interaction process can contribute capabilities vital to a successful R&D relationship.

Today, organizations cannot avoid interaction with direct competitors and thus cooperative relationships have become a new strategy to address the challenges of the dynamic business environment. This study provides management with an understanding of the ways in which firms can succeed in cooperative R&D relationships. Furthermore, it encourages firms to actively seek such relationships to gain competitive advantage through improved innovations. However, as cooperative relationships are challenging, firms should focus on finding the right partner and developing close interaction as a basis for a successful relationship.

The quality of this study has been enhanced by choosing the empirical case carefully and enabling the study to be repeated by describing the research design in detail. The study is however based on a single case and that constitutes its main limitation. Future research should be conducted in different contexts and industries with a network approach and multiple cases. Moreover, studies that concern direct cooperative relationships are reckoned.

## References

- Bengtsson, M. & Kock, S. 2000. "Coopetition" in Business Networks – To Cooperate and Compete Simultaneously. *Industrial Marketing Management*. Vol. 29. No. 5, 411-426.
- Bengtsson, M., Eriksson, J. & Wincent, J. 2010. Co-opetition Dynamics – An Outline for Further Inquiry. *International Business Journal*. Vol. 20. No. 2, 194-214.
- Blomqvist, K. & Levy, J. 2006. Collaboration Capability – A Focal Concept in Knowledge Creation and Collaborative Innovation in Networks. *International Journal of Management Concepts and Philosophy*. Vol. 2. No. 1, 31-48.
- Brandenburger, A.M. & Nalebuff, B.J. 1996. *Co-opetition*. New York: Currency Doubleday.
- Choi, P. 2005. The Nature of Co-opetition: Literature Review and Propositions. *American Marketing Association*. Winter, 105-106.
- Croom, S.R. 2001. The Dyadic Capabilities Concept: Examining the Process of Key Supplier Involvement in Collaborative Product Development. *European Journal of Purchasing & Supply Management*. Vol. 7. No. 1, 29-37.
- Das, T.K. & Teng, B.-S. 1998. Between Trust and Control: Developing Confidence in Partner Cooperation in Alliances. *Academy of Management Review*. Vol. 23. No. 3, 491-512.
- Day, G.S. 1994. The Capabilities of Market-Driven Organizations. *Journal of Marketing*. Vol. 58. No. 4, 37-52.
- Draulans, J., deMan A-P. & Volberda, H.W. 2003. Building Alliance Capability: Management Techniques for Superior Alliance Performance. *Long Range Planning*. Vol. 36. No. 2, 151-166.
- Easton, G. & Arajou, L. 1992. Non-Economic Exchange in Industrial Network in Axelsson, B. & Easton, G. (Eds.) *Industrial networks – A new view of reality*. London: Routledge.

- Eisenhardt, K.M. & Martin, J.A. 2000. Dynamic Capabilities: What Are They? *Strategic Management Journal*. Vol. 21. No. 10-11, 1105-1121.
- Eriksson, P. & Kovalainen, A. 2008. *Qualitative methods in business research*. London: Sage Publications.
- Flick, U. 1998. *An introduction to qualitative research*. London: Sage Publications.
- Gnyawali, D.R. & Park, B.-J.R. 2011. Co-opetition between Giants: Collaboration with Competitors for Technological Innovation. *Research Policy*. Vol. 40. No. 5, 650-663.
- Gulati, R., Nohria, N. & Zaheer, A. 2000. Strategic Networks. *Strategic Management Journal*. Vol. 21. No. 3, 203-215.
- Halinen, A. & Törnroos, J.-Å. 2005. Using Case Methods in the Study of Contemporary Business Networks. *Journal of Business Research*. Vol. 58. No. 9, 1285-1297.
- Helfert, G. & Vith, K. 1999. Relationship Marketing Teams. Improving the Utilization of Customer Relationship Potentials through a High Team Design Quality. *Industrial Marketing Management*. Vol. 28. No. 5, 553-564.
- Human, G. & Naudè, P. 2009. Exploring the Relationship between Network Competence, Network Capability and Firm Performance: A Resource-Based Perspective in an Emerging Economy. *Management Dynamics*. Vol. 18. No. 1, 2-14.
- Johnsen, R.E. & Ford, D. 2006. Interaction Capability Development of Smaller Suppliers in Relationships with Larger Customers. *Industrial Marketing Management*. Vol. 35. No. 8, 1002-1015.
- Kovács, G. & Spens, K.M. 2005. Abductive Reasoning in Logistics Research. *International Journal of Physical Distribution & Logistics Management*. Vol. 35. No. 2, 132-144.
- Lado, A.A., Boyd, N.G. & Hanlon, S.C. 1997. Competition, Cooperation, and the Search for Economic Rents: A Syncretic Model. *Academy of Management Review*. Vol. 22. No. 1, 110-141.
- Lorenzoni, G. & Lipparini, A. 1999. The Leveraging of Interfirm Relationships as a Distinctive Organizational Capability: A Longitudinal Study. *Strategic Management Journal*. Vol. 20. No. 4, 317-338.
- Miotti, L. & Sachwald, F. 2003. Co-operative R&D: Why and with Whom? An Integrative Framework of Analysis. *Research Policy*. Vol. 32. No. 8, 1481-1499.
- Morgan, R.M. & Hunt, S.D. 1994. The Commitment-Trust Theory of Relationship Marketing. *Journal of Marketing*. Vol. 58. No. 3, 20-38.
- Möller, K., Rajala, A., & Svahn, S. 2005. Strategic Business Nets – Their Type and Management. *Journal of Business Research*. Vol. 58. No. 9, 1274-1284.
- Möller, K., Svahn, S., Rajala, A. & Tuominen, M. 2002. Network Management as a Set of Dynamic Capabilities. Competitive paper submitted to 18<sup>th</sup> Annual IMP Conference, September 5-7, Dijon, France.
- Nerkar, A. & Paruchuri, P. 2005. Evolution of R&D Capability: The Role of Knowledge Networks within a Firm. *Management Science*. Vol. 51. No. 6, 771-785.
- Quintana-García, C. & Benavides-Velasco, C.A. 2004. Cooperation, Competition, and Innovative Capability: A Panel Data of European Dedicated Biotechnology Firms. *Technovation*. Vol. 24. No. 12, 927-938.
- Ring, P.S. & Van De Ven, A.H. 1992. Structuring Cooperative Relationships between Organizations. *Strategic Management Journal*. Vol. 13. No. 7, 483-498.

- Ritala, P. & Hurmelinna-Laukkanen, P. 2009. What's in It for Me? Creating and Appropriating Value in Innovation-Related Coopetition. *Technovation*. Vol. 29. No. 12, 819-828.
- Ritter, T. & Gemünden, H.G. 2003. Network Competence: Its Impact on Innovation Success and Its Antecedents. *Journal of Business Research*. Vol. 56. No. 9, 745-755.
- Stake, R.E. 1995. *The art of case study research*. Thousand Oaks: Sage Publications.
- Svahn, S. & Westerlund, M. 2007. The Modes of Supply Net Management: A Capability View. *Supply Chain Management*. Vol. 12. No. 5, 369-376.
- Teece, D.J., Pisano, G. & Shuen, A. 1997. Dynamic Capabilities and Strategic Management. *Strategic Management Journal*. Vol. 18. No. 7, 509-533.
- Wang, C.L. & Ahmed, P.K. 2007. Dynamic Capabilities: A Review and Research Agenda. *International Journal of Management Reviews*. Vol. 9. No. 1, 31-51.
- Yin, R.K. 2003. *Case study research: Design and methods*. Thousand Oaks: Sage Publications.
- Zineldin, M. 1998. Towards an Ecological Collaborative Relationship Management: A "Co-opetitive" Perspective. *European Journal of Marketing*. Vol. 32. No. 11-12, 1138-1164.
- Zineldin, M. 2004. Co-opetition: The Organization of the Future. *Marketing Intelligence & Planning*. Vol. 22. No. 7, 780-789.
- Zollo, M. & Winter, S.G. 2002. Deliberate Learning and the Evolution of Dynamic Capabilities. *Organization Science*. Vol. 13. No. 3, 339-351.



# **The Physical Internet and Business Model Innovation**

Benoit Montreuil, Jean-François Rougès, Yan Cimon, Diane Poulin

CIRRELT Interuniversity Research Center  
on Enterprise Networks, Logistics & Transport  
Université Laval, Québec, Canada

{benoit.montreuil,jean-francois.rouges,yan.cimon,diane.poulin}@cirrelt.ulaval.ca

## **Abstract**

Building on the analogy of data packets within the Digital Internet, the Physical Internet is a concept that dramatically transforms how physical objects are designed, manufactured and distributed. This approach is open, efficient and sustainable beyond traditional proprietary logistical solutions often plagued by inefficiencies. The Physical Internet redefines business models and value creation patterns. Firms are bound to be less dependent on operational scale and scope trade-offs as they will be in a position to offer novel hybrid products and services that would otherwise destroy value. Finally, logistical chains become flexible and reconfigurable in real time, thus becoming better in tune with firm strategic choices. This paper focuses on the potential impact of the Physical Internet on business model innovation, both from the perspectives of physical Internet enabled and enabling business models.

## **Introduction**

Global markets are in constant turmoil and intangible assets are integral to building sustainable competitive advantages and therefore to firms' value-creation efforts (see Lapointe and Cimon, 2009). However, current logistical paradigms are based on obsolete proprietary paradigms and breed important inefficiencies that render them unsustainable. On the economic front, logistics represents a significant burden on the gross domestic product of most countries. Furthermore, if only for energy-related issues, global logistical costs are rising faster than international trade. On the environmental front, logistical activities are known to be carbon intensive. On the social front, moving physical objects globally to populations in emerging and developing economies is too often precarious.

Furthermore, critical variables like costs, delays and quality have a major influence on the design of value chains, thus acting as major constraints on business models. These constraints have a bearing on supply and how that supply is created. For example, e-commerce websites and mass customization efforts are hindered in part by delivery costs

as well as by the sometime prohibitive coordination efforts required to match production and the appropriate distribution channels.

By enabling to move and deploy physical products seamlessly though logistical networks like data packets move through the digital Internet, the Physical Internet (PI,  $\pi$ ) spans four layers in order to solve this conundrum (Montreuil, 2011a & 2011b). At a first layer lies a Realization Web for open distributed conception and manufacturing of objects. At the second layer is embedded a Distribution Web that serves to openly deploy encapsulated objects across territories and markets. The third layer involves seamlessly moving encapsulated objects though an open multimodal Mobility Web. These layered webs the Physical Internet enabled Logistics Web can (re)combine to the infinite, thus creating yet unheard of possibilities for business model innovations.

### **The Physical Internet as enabler**

On one hand, the Physical Internet as outlined by constitutes a path breaking solution to the inefficiencies of traditional proprietary models (Montreuil, 2011). It rests as an open, global, interconnected and sustainable logistics system. This system is based on standard containers that move though distributed multimodal transportation networks connecting open logistics facilities, enabling a global Logistics Web. As such, in order to clearly differentiate it from classical logistical activities, it is said to be  $\pi$ -enabled as the Physical Internet goes beyond the development of agile networks known in the literature (Montreuil and Frayret, 2000; Lee, 2004).

On the other hand, business models can be thought of as the way a company creates value in a competitive landscape (see Magretta, 2002) and may be dynamic as value creation patterns shift within and between firms (Mason and Leek, 2008). Furthermore, they are a complement to traditional product market strategies (Zott and Amit, 2008) and, when used appropriately, are a driver for firm performance.

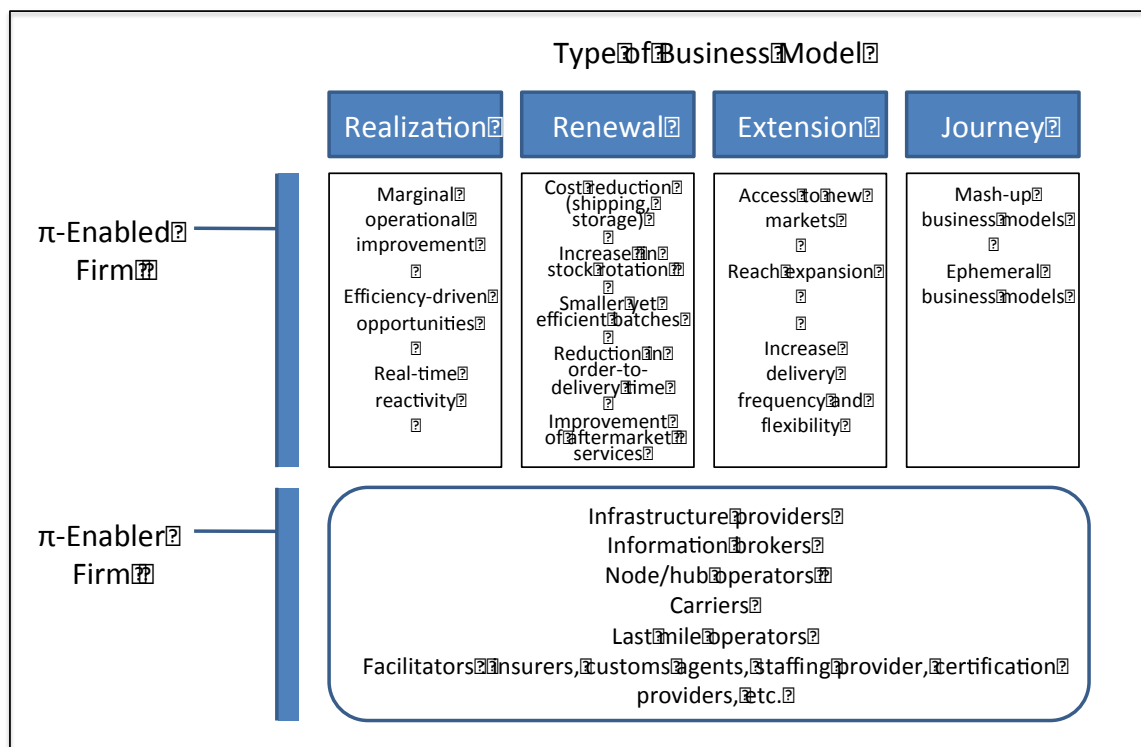
### **A key driver of business model innovation**

The Physical Internet is a key driver of business model innovation. In rapidly evolving industries, such as optical networking at the end of the 1990s, firms have been shown to acquire innovative capabilities from the market (e.g. Carpenter et al., 2003). Value can also be created from innovations that result from efficient knowledge transfer. Chesbrough (2007) mentions open innovation as an element to be taken into account in firms business models. The Physical Internet provides the framework to go beyond this

view by enabling business model innovation and not just business models around specific types of innovation.

Past work by Linder and Cantrell (2000: 10-13) identifies four types of business models: realization, renewal, extension and journey. They go on to specify that realization models are focused on maximizing returns and suggest a level of operational excellence. Renewal models are based on the constant evolution of products and services while remaining true to their original model. Extension models, for their part, involve adding new value creating activities within the firms' value chain. Finally, journey models focus on major overhauls and transformation of the firms' business model. Linder and Cantrell (2000: 13) further suggest that as a firm moves along that continuum, the more transformational the changes involved become.

**Figure 1: What the different types of business models imply for  $\pi$ -Enablers and the  $\pi$ -Enabled firms**



Source: Adapted and expanded from Montreuil (2011); Linder and Cantrell (2000)

In the context of the Physical Internet, there are two important categories of firms involved: the  $\pi$ -Enablers and the  $\pi$ -Enabled. As depicted in Figure 1, while the former provides baseline infrastructural tools such as containers, vehicles, services and software, the latter exploits the potential value creation induced by the Physical Internet to create

value for the full range of stakeholders involved. This may be explained by the fact that value is co-created by firms that are now in a position to leverage their asymmetries, notwithstanding their respective levels of heterogeneity (Papadopoulos et al., 2008).

Figure 1 shows the relationships between  $\pi$ -Enabler firms and  $\pi$ -Enabled firms. The introduction of the Physical Internet will force firms to innovate.  $\pi$ -Enabler firms are bound to provide the necessary physical and material infrastructure including a full range of services. The standardisation that this suggests for the Physical Internet to be efficient (containers, vehicles, equipment, etc.) will transform current providers. For example, one can imagine that carmakers will use standardized containers both for inbound supply purposes and outbound distribution purposes, thus altering (Renewal) their business model highly dependent on trucking – in North America at least. This may lead them to adopt or devise radically different logistical solutions (Extension) or even to create new bundles of products-markets-services that go beyond car manufacturing (Journey). By the same token, infrastructure providers will be strongly impacted. The Mobility and Distribution Webs discussed earlier means that transit centers, hubs, distribution centers and warehouses will be flexible nodes of an elaborate and flexible network that will transform the way cargo, storage and routing will be done. Last-mile operations are then to be better customized for rural and urban deliveries that will prove less dependent on traffic patterns and population density. This may be done using a mix of public/private means, whether proprietary or not. In turn, customs agents, insurers, logisticians, information systems developers will be impacted as new services will become profitable despite a change in intermediation relationships that will provide for real-time optimization.

### **Toward increasingly transient yet robust business models**

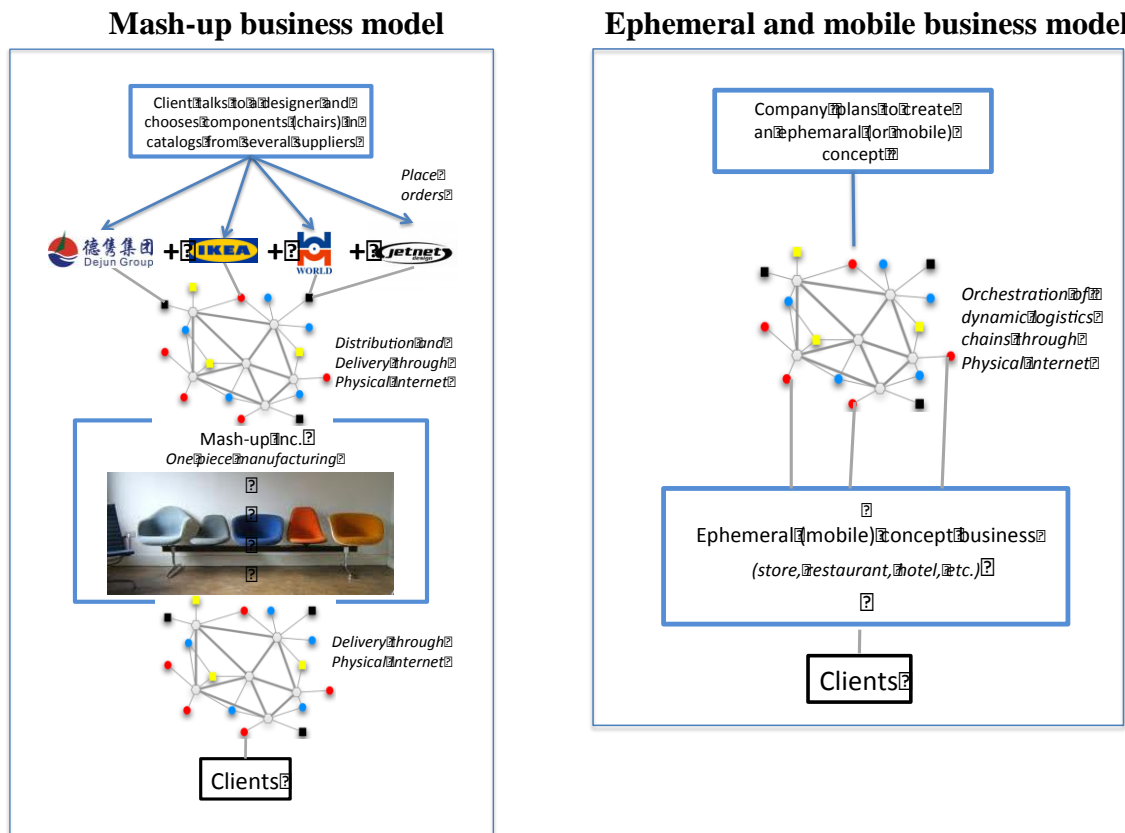
Business models in the realization category have one option for change: a relentless drive toward efficiency and operational excellence. Business models focused on renewal will allow firms to go beyond the constraints imposed by their value chains. Manufacturers will have the opportunity to reduce costs of supply, storage and shipping, to minimize order-to-delivery time and to develop reactivity. Retailers will improve the efficiency of their logistics flows, notably increasing stock rotation frequency and in-store product availability, which are key success factors when small, customized batches are at the core of their competitive advantage.

Those engaged in extension driven business models will cover an ever increasing span of products and markets in an ever increasing economically viable manner. Manufacturers will have the opportunity to reach new markets by increasing frequency, reducing

constraints related to lot size and cost of delivery. The mass customization of products will become easier thanks to the reduction of shipping costs and with the development of a distributed network of open factories which will enable the creation of a more flexible and adaptive value chain. For their part, retailers will have the opportunity to open stores in new markets at the periphery of existing logistics networks, in areas that are not profitable in the current context. The development of profitable smaller “rightsized” shops will be profitable.

On another note, journey business models will be deployed in many ways. Figure 2 depict two such ways as mash-up models and ephemeral models. First, mash-ups are a bundle of many consumer trends, with the impetus to mix existing elements, such as combining many branded elements in order to create a unique product that corresponds to an individualized experience. This type of business model is currently very complex to implement as uniqueness is harder to come by and often very costly. The Logistics Web enables small batches to be made at a lower cost and closer to customers, which is ideal for fragile or highly specific orders.

**Figure 2: Mash-up and ephemeral business models**



Ephemeral business models are characterized by mobility and customer experiences akin to those of pop-up stores. This model specifically addresses the need for leading edge and strong customer experience. When a business adopts this model, it provides a highly tailored consumer experience. It renders small market niches very attractive as it does not require the wide proprietary infrastructure of classical department stores.

Nowadays, many business models coexist. The Physical Internet multiplies the opportunities for tailored models that simultaneously enrich customer's experiences and drive high value creation for businesses to thrive from. By allowing efficient, seamless, open, decentralized and distributed mobility, distribution, production and supply in tune with point-of-sale mobility and flexibility, the Physical Internet provides numerous opportunities for enhancing existing business models and designing novel business models. It allows transforming now unprofitable or unreachable markets and ideas into attractive business opportunities.

## **Conclusion**

Introducing a new infrastructure like the Physical Internet generates an intense wave of innovative change in business models. Firms are now in a position to leverage their asymmetries in order to push further value creation (Cimon, 2004). Electricity and the Digital Internet were game changers just as the Physical Internet will be. This will also be consistent with finding novel means of refining and testing business models beyond examining single-product firms (e.g. Huelsbeck et al., 2011). It provides the anticipation required for firms to adapt their business models for becoming resilient in the face of unorthodox industry dynamics (Hamel and Välikangas, 2003).

Thus, the Physical Internet will instil a change of several orders of magnitude as this infrastructure and business models will continue to influence one another. Firms will seize on the occasion to improve on a spectrum that spans from improving on current operations to radically altering them. Further research on the topic is much needed. For example, there should be research focusing on the strategic role of communications and information technology when considering the morphology of business models (Cimon et al., 2009) and its alignment on strategy (Rouges et al., 2010). There is also critical need for research pushing the frontiers of current business paradigms challenged by a Physical Internet enabled world. For example, it could help the introduction in the material world of efficient and sustainable cloud manufacturing and cloud storage (e.g. Montreuil 2011a, Xu, 2012).

## References

- Carpenter, M., Lazonick, W., O'Sullivan, M. 2003. The stock market and innovative capability in the New Economy: the optical networking industry. *Ind Corp Change* **12**, 963-1034.
- Chesbrough, H.W. 2007. Why companies should have open business models. *MIT Sloan Management Review* **48**, 22-+.
- Cimon, Y. 2004. Knowledge-related asymmetries in strategic alliances. *Journal of Knowledge Management* **8**, 17-30.
- Cimon, Y., Poulin, D., Pellerin, R., Frayret, J.-M., Karuranga, É. 2009. The strategic role of information technology in the value creation process of small and medium enterprises: Integrating business models, performance and assimilation. *Proceedings of the 2009 International Conference on Industrial Engineering and Systems Management*, 8 p.
- Hamel, G., Välikangas, L. 2003. The Quest for Resilience. *Harvard Business Review* **81**, 52-64.
- Huelsbeck, D.P., Merchant, K.A., Sandino, T. 2011. On Testing Business Models. *Accounting Review* **86**, 1631-1654.
- Lapointe, A., Cimon, Y. 2009. Leveraging intangibles: how firms can create lasting value. *Journal of Business Strategy* **30**, 40 - 48.
- Lee H. 2004. Triple-A Supply Chain. *Harvard Business Review*, October, 2-12.
- Linder, J., Cantrell, S. 2000. Changing Business Models: Surveying the Landscape. Accenture Institute for Strategic Change.
- Magretta, J. 2002. Why business models matter. *Harvard Business Review* **80**, 86-+.
- Mason, K.J., Leek, S. 2008. Learning to build a supply network: An exploration of dynamic business models. *Journal of Management Studies* **45**, 774-799.
- Montreuil, B. 2011a. Toward a Physical Internet: meeting the global logistics sustainability grand challenge. *Logistics Research* **3**, 71-87.
- Montreuil, B. 2011b. The Physical Internet Manifesto, v1.10, [www.physicalinternetinitiative.org](http://www.physicalinternetinitiative.org)
- Montreuil, B., Frayret, J.-M. S. D'amours. 2000. A strategic framework for networked manufacturing. *Computers in Industry* **42**, 299-317.
- Papadopoulos, A., Cimon, Y., Hebert, L. 2008. Asymmetry, heterogeneity and inter-firm relationships. *International Journal of Organizational Analysis* **16**, 152-165.
- Rouges, J.-F., Poulin, D., Bergeron, F., Cimon, Y. 2010. The alignment of IT in SMEs and its contribution to performance: Research directions. In *Information and Communication Technology and Small and Medium Sized Enterprises: From Theory to Practice*, Poulin, D., Tran, S. (Eds.). Cambridge Scholars Press: Newcastle upon Tyne, 69-95.
- Xu, X. 2012. From cloud computing to cloud manufacturing. *Robotics & Computer-Integrated Manufacturing* **28**, 75-86.
- Zott, C., Amit, R. 2008. The fit between product market strategy and business model: Implications for firm performance. *Strategic Management Journal* **29**, 1-26.

## Session 4: HEALTH

DETERMINING SOCIAL MEDIA COMPONENTS FOR SCALABLE HEALTHCARE ([pdf](#))

Amrita; Bhowmick, Bhaskar; Biswas, Dhruves

DEVELOPMENTAL IMPACT ANALYSIS OF ICT ENABLED SCALABLE HEALTH CARE MODEL IN BRICS ECONOMIES ([pdf](#))

Saurabh, Punit; Amrita; Biswas, Dhruves

INNOVATION AND VALUE-CO- CREATION THROUGH STRUCTURED INCUBATION NETWORK MODELING ([pdf](#))

Kumar, Sharad; Bhowmick, Bhaskar; Biswas, Dhruves

SUSTAINABLE SCALABLE INCLUSIVE INNOVATION: A MULTI-DISCIPLINARY KNOWLEDGE PLATFORM APPROACH IN EMERGING COUNTRY CONTEXT ([pdf](#))

Bhowmick, Bhaskar; Biswas, Dhruves



# Determining Social Media Components for Scalable Healthcare

**Amrita<sup>1</sup>; Bhaskar Bhowmick<sup>2</sup>; Dhruves Biswas<sup>3</sup>**

<sup>1, 2, 3</sup>, *Rajendra Mishra School of Engineering Entrepreneurship,*

<sup>3</sup>*Electrical & Electronics Communications Engineering, IIT Kharagpur;*

*Indian Institute of Technology (IIT), Kharagpur, India*

*<sup>1</sup>iamthealchemist@gmail.com; <sup>2</sup>bhowmickb@gmail.com; <sup>3</sup>dbiswas@ece.iitkgp*

## Abstract

The issue of access is an essential concern for any health care policy formulation and reform, especially in emerging nations such as India. It has been recognized that all people deserve access to similar levels and quality of health care services. Penchansky and Thomas (1981) recognized five dimensions of access to health services as affordability, acceptability, accommodation, availability and accessibility. Seventy three percent of Indian population lives in the semi-urban and rural areas. The strong mismatch of ratio of hospitals to patients, rising costs of health care, rapidly changing demographics, increasing population and heightened demands in pricing for technological healthcare usage in emerging economies necessitate a unique health delivery solution model using social media. The prominent gaps in the healthcare delivery among the population which has greater disease burden might be relaxed using social media tool. Based on research we framed the key question of this paper as what are the expectations of consumers or users of social media for healthcare. The authors have tried to find how these factors depend on social media for healthcare.

## Keywords

Entrepreneurship, patient satisfaction social media, healthcare, mobile healthcare, networking

## 1. Introduction

The advent of social media and social networking has completely changed the way world saw the Web1.0 in 1993 (Leiner et al., 2000) which was used to search for and read information and later Web 2.0. Social media has become a buzzword everywhere in the new generation of digital communications. Barry Wellman (1995) had defined social networks as computer networks which link people as well as machines. People are becoming more conversant with social media due to numerous players offering mobile and handheld devices having social networking applications at competitive prices. In present scenario, people use social media right from business, automobiles, arts, bookmarking, cooking, entertainment, general networking and what not. It creates highly synergistic virtual environment where individuals and communities share, co-create discuss, and modify user-generated contents and this process mostly employs mobile and web based technologies (Kietzmann & Hermkens et. al, 2011). Supporting and adopting social networking interventions can lead to the cost effective and scalable solutions for development and it has already left no area untouched. This change

is transformational for healthcare consumers whose ideas have shifted from costly high-tech healthcare to non-traditional healthcare using social media.

There have been various attempts to reform healthcare by innovative healthcare delivery models. They are mostly the private sector (Bhattacharya et al, 2010) players benefiting the poor. Most of them are efforts made by the local entrepreneur with some non-profit seeking organizations or partnerships with bigger organizations. Many successful efforts have also been done for developing telemedicine like De Novo Group and Arvind Eye Care System, IBM Health-care solutions, Voxiva, Narayana Hrudayalaya and Pilot Projects by Indian Space Research Organization (ISRO) with Apollo Hospital (Ghosh et al, 2011) in the rural and semi-urban regions for healthcare delivery. Moreover, wide prevalence of mobile usage adds to the flexibility of the healthcare delivery system in India. Recent reports on mobile usage shows that India constitutes 10 percent of the total mobile usage in the world. This is very clear when we look at the 1.2 billion population residing in India out of which 72 percent are from the rural areas.

However, technology has influenced the spread of information and in the manner it can be disseminated to the world. The advent of new technologies and media has also made the society well informed about the happenings in the other parts the world in many ways. This has made the modern Indian society aware of the new technologies being developed for healthcare too. Conversely, they are ignorant about the usage and outcomes of the same. There lies the issue of “Technology to Health (T2H)” Gap (Amrita et al 2010, Amrita & Biswas 2011). The healthcare needs an overhaul. We need to develop a model which should cater to the healthcare needs of the Indian population. Keeping in mind the mobile usage statistics and technology awareness, we might rely on the most effective methods of social media for the purpose.

## **2. Literature Review**

Barry Wellman (1995) had defined social networks as computer networks which link people as well as machines. Social media can be defined as a group of internet based rich applications such as collaborative projects, blogs, content communities, social networking sites, virtual game worlds and virtual social worlds that build on the ideological and technological foundations of Web 2.0 and it also allows the editing of user generated contents (UGI) (Kaplan & Haenlein, 2010; Kambil, 2008; Jacobs, Egert & Barnes, 2009; Short, Williams & Christie, 1976; Daft & Lengel 1986). . It creates highly synergistic virtual environment where individuals and communities share, co-create discuss, and modify user-generated contents and this process mostly employs mobile and web based technologies (Kietzmann & Hermkens et. al, 2011).

In the recent trends the technological advances have increased the health costs (Mueller et al., 1993; Cowan et al., 1999; Berndt et al., 1999; Cutler et al., 1999). Technology is prevalent in healthcare but the major expenditures are limited to profit-making sectors such as surgery and treatment (Lohr, 2005). Medical technologies have also been termed as the “culprit” behind the rise in health spending (Cowan et al., 1998). Cost effective new technology often turns expensive after diffusion into patients with mildly symptomatic disease, or those who were

previously too ill for treatments (Goldsmith, 1994). The challenges of high-technology is formidable as it is creating a chaos in the healthcare system by high price points and accretion of assorted interest groups creating an ideologically divided public, and a steady stream of new and expensive technologies added to those already in place (Daniel Callahan, 2008). However, these challenges can be relieved for those who might use information technology to an extent by knowing about similar kinds of patients with same disease patterns, share their experiences and many more by the introduction of a one step ahead social media tool for healthcare. It is widely accepted that even while reducing unit costs of new technologies, the net health expenditure is often increased by increasing the overall volume (Schwartz, 1994). Thus, social media for healthcare as technology intervention strategy in information technology may exert their influence through both volume and price effects. Technological interventions at every stage in innovation will direct to sustainable healthcare system especially in the emerging economies context.

There have been many versions of this social media networking in the last two to three years with Facebook being the highest rated in the current scenario. Those who are at least able to use computers are connecting to their friends and family through such sites rather being in touch through e-mails and text messaging. There have been tremendous efforts to improve the functionality and user interface of these sites. Moreover, these are getting more popular amongst the younger generations (McMillan and Morrison, 2006). It is also popular amongst those who use mobiles which connect to internet. Internet World Stats ([www.internetworldstats.com](http://www.internetworldstats.com)) has reported that Asia alone has 44 percent of total internet users as on 31 March 2011. India alone has 100.0 million users which is 10.7 percent of the total internet users in Asia. Keeping in mind the internet and mobile usage the same can be employed for creating health care social media.

Tim Weber (2010) the BBC Business Editor in a statement explained the impact of social media by telling that just a smart tweet on a blog post or a devastating video can be forwarded to hundreds of friends at the click of a mouse which might kill a project or a company's reputation and hence the share price. Utilizing the power of social media might create healthy communities. It has been seen from the survey of internet, that there are many social media networks which deal with doctor networks, nurses' networks, popular disease support forums, health blogs, patients voices and expert answers. Kahn (2008) in a research for social media users for social health has stated in Health 2.0 that consumers who search for health information are at an average age of 35 to 40 years. It has also been stated that the consumer-generated content in health is finding a receptive audience as well. Health blogging has already been seen as an influential category in social media especially for the chronic conditions. However, there is a gap in the existence of an all inclusive social media tool which could be more than a portal for social media where people would be able to share specific health care interests, contact to doctors, patients of same kind sharing a common and private forum, search for applicability of medicines they are using as well as rate themselves on a health-ability index.

Presently, social media builders and business creators are focusing to introduce new avenues for the usage of social media in different fields. Though it has been a recent phenomenon, tremendous businesses are being carried out through it. It has reached to a point where the

social media is being used not only for friendship, buying-selling and sharing ideas, but for noble reasons like healthcare.

Parks and Floyd (1996) in their research have stated about the online relationships which over time gets expanded and are then broadened to include family and friends too. Ryan (2000) has proved in her research that those communities that demonstrate higher levels of interpersonal, lively, face-to-face contact have subsequent high qualities of lives. It has been observed that the building blocks of a successful social media are identity, conversations, reputation, sharing, relationships, presence and groups. The benefits of using social media in healthcare might be focused on accessibility, usability, immediacy and privacy. It could be a vent to those patients who do not dare to share their thoughts with local community and seek medication results.

### 3. Objective

Based on research we framed the key question of this paper as what are the expectations of consumers or users of social media for healthcare. Hence the following are the key questions:

- a. Determining the factors which affect the social media components of healthcare.
- b. Finding which of the above determined factors affect the preferences of users of social media.

### 4. Methodology

The paper is based on the premise that the health customer is able to choose from where and whom they get treated or prefer the kiosk relationship for taking such decisions.

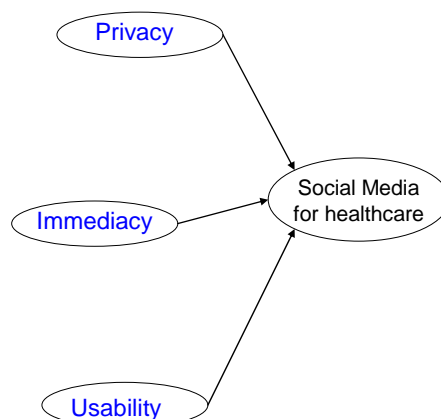


Figure 1: Model for Components determining Social Media in Healthcare

**Step 1:** The factor analysis was conducted using the response on what factors the users of social media would like in a social site created especially for healthcare.

- A simple questionnaire was created with 48 factors and respondents were asked to rate these factors.
- Received response from 45 respondents who belonged to different backgrounds of education and profession.

**Step 2:** Three factors namely **privacy, immediacy and usability** were obtained from the above step.

- These were used as the independent variables to predict the dependant variable called the social media and regression analysis was performed.
- SPSS 19 was used to analyze regression.

### *Questionnaire Design*

A questionnaire with variables of privacy, immediacy, usability, social media and demographic profiles were designed. The distribution of the questions in 5 sections was as follows:

Table 1: Questionnaire Design

<b>Section</b>	<b>Variable</b>	<b>No. of questions</b>
1	Privacy Issue	8
2	Immediacy	8
3	Usability	10
4	Social Media	12
5	Demographic Profile	10

The questionnaire was designed as a webpage using the tool of google forms from [www.google.com](http://www.google.com). This link of the form was shared using various online methods such as email, facebook, twitter and some forums. The 5 point Likert Scale options ranging from 'Strongly Disagree' to 'Strongly Agree' was used. There were multiple choice questions for some measuring variables.

### *Data Collection*

The data was collected using the online form in an excel sheet. However, the response rate was very low and after 5 reminders, 92 response were generated. It is assumed that the sample is highly random due to the fact that people from various age and domains responded to the survey. Since the number of data points collected 'n'=92, we can say using the Central Limit Theorem (i.e., sample size is > 30) holds true. Hence the data is normally distributed.

### Hypothesis Testing

The hypothesis looks at the perspective of how the indicator variables affect social media for healthcare.

$$H_0 : \beta_0 + \beta_2 + \beta_3 + \dots + \beta_{26} = 0 \quad \dots \text{Null Hypothesis}$$

The null hypothesis establishes that the independent variables privacy, immediacy and usability do not affect the dependant variable social media for healthcare.

$$H_a = \beta_i \neq 0 \quad \dots \text{Alternate Hypothesis}$$

The alternate hypothesis established that at least one of the coefficients of the components determining social media for healthcare are not zero.

## 5. Results

An analysis of primary data from 92 respondents out of the numerous distributed questionnaires over the internet has been done.

Table 1: Respondents distribution

Category	No. of respondents
Rural	5
Semi-urban	35
Urban	37
Metropolitan	15

The socio-economic characteristics of the respondents are show below in table 2. These characteristics are representative of the population who would at least try using social media for reasons of health information and usage.

Table 2: Socio-economic characteristics of respondents

Characteristics	Percentage (out of 92 respondents)
<b>Gender:</b>	
Male	84
Female	16
<b>Age:</b>	
15 to 24	28
25 to 35	65

36 and Above	6
<b>Education:</b>	
Matriculation	11
Graduate	34
Post Graduate	55
<b>Annual Income:</b>	
715€ to 1430€	10
1430€ to 5715€	30
5715€ to 11445€	35
11445€ and above	25

Based on the ranking of the mostly used social media sites, the people were enquired about their presence with first 15 of them i.e. Facebook, Twitter, LinkedIn, MySpace, Ning, Google Plus+, Tagged, Orkut, hi5, myyearbook, Meetup, Badoo, bebo, mylife, and friendster

The social media presence of the respondents have been seen as follows:

- 100% of the respondents use at least one social media site. The most common of them are facebook, twitter, linkedIn, google+ and orkut.
- Only 11% use healthcare sites in internet.
- 39% know about at least one of the healthcare sites.
- 50% of them do not know or searched about the healthcare sites.

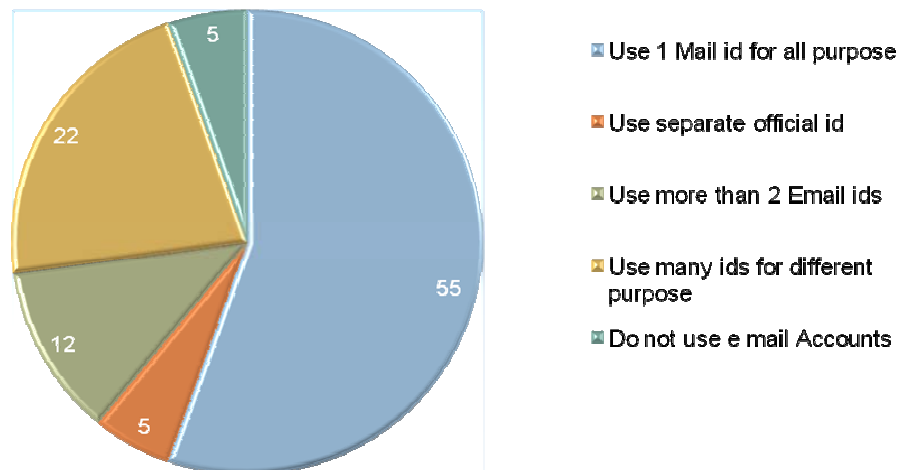


Figure 2: Social media presence of the respondents

### Anova Testing

Regressing the data using SPSS 19, the following table in anova was derived. The test statistic used was F test where from the log table the value of  $F=1.81$ .

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	25,228	26	,970	1,818	,027
	Residual	34,685	65	,534		
	Total	59,913	91			

a. Predictors: (Constant), Usability10, Privacy Issues6, Immediacy5, Immediacy4, Usability3, Usability6, Privacy Issues7, Privacy Issues3, Immediacy1, Privacy Issues2, Immediacy3, Usability8, Immediacy2, Usability1, Privacy Issues4, Privacy Issues8, Privacy Issues1, Usability9, Privacy Issues5, Immediacy8, Usability4, Immediacy6, Usability2, Usability5, Usability7, Immediacy7

b. Dependent Variable: Social Media6

The p-value = 0.027 which is  $< 0.05$ . Hence the model is significant. At 95% confidence interval we can say that the Null hypothesis can be rejected which says that all the coefficients are zero. Hence the designed model is fit.



*Reporting the Standardized coefficients - Beta*

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	,990	,750		1,320	,191
Privacy Issues1	,059	,075	,104	,785	,436
Privacy Issues2	,118	,085	,166	1,381	,172
Privacy Issues3	,030	,075	,054	,408	,685
Privacy Issues4	,051	,088	,076	,580	,564
Privacy Issues5	-,008	,103	-,009	-,075	,941
Privacy Issues6	-,080	,098	-,115	-,825	,413
Privacy Issues7	,164	,070	,281	2,333	,023
Privacy Issues8	-,180	,090	-,271	-2,006	,049
Immediacy1	,071	,069	,130	1,032	,306
Immediacy2	-,149	,072	-,243	-2,067	,043
Immediacy3	,094	,083	,144	1,139	,259
Immediacy4	-,016	,072	-,025	-,220	,826
Immediacy5	-,211	,098	-,271	-2,149	,035
Immediacy6	,018	,138	,018	,127	,899
Immediacy7	-,145	,134	-,177	-1,078	,285
Immediacy8	-,021	,089	-,036	-,238	,813
Usability1	,037	,112	,052	,330	,742
Usability2	,056	,120	,069	,468	,642
Usability3	-,026	,087	-,039	-,301	,764
Usability4	,163	,102	,217	1,603	,114
Usability5	,161	,127	,189	1,266	,210
Usability6	-,064	,067	-,108	-,947	,347
Usability7	,233	,126	,296	1,849	,069
Usability8	-,166	,123	-,205	-1,353	,181
Usability9	-,019	,091	-,026	-,205	,838
Usability10	,047	,078	,075	,601	,550

Table 2: Reporting the Standardized coefficients – Beta

*Interpreting results*

Looking at the p-value and the t the following are significant:

- Privacy Issues 7, 8: 0.23, 0.49
- Immediacy 2, 5: 0.43 , 0.35
- Usability 7: 0.069

However, looking at the higher t value and lower p value following might also be considered:

- Privacy Issues 2
- Immediacy 1, 3, 7
- Usability 4, 5, 8

### *Significant Beta*

- Privacy Issues 7, 8:
  - o Users should be able to send private messages to people other than friend/s. Sig:0.23, Beta: 0.164
  - o You would like to meet your friends of health groups in person. Sig: 0.49, Beta: - 0.180
- Immediacy 2, 5: ,
  - o You would like to get suggestions only from doctors. 0.43 Beta: -0.149
  - o You would like to get direct and frank opinions on your health discussions. Sig: 0.35 Beta: -0.211
- Usability 7:
  - o You would like to be part of directory listings in the interests' column. Sig:0.069 Beta: 0.233

### *Considerable Beta*

- Privacy Issues 2
  - o Users can send request to friends of friends and their friends Sig: 0.172, t: 1.381 Beta: -0.1180
- Immediacy 1, 3, 7
  - o You would like to get suggestions from anyone on health questions and experiences you are sharing on your wall. Sig: 0.306, t: 1.032 Beta: 0.071
  - o You would like to get suggestions only from people with some experiences. Sig: 0.259, t: 1.139 Beta: 0.094
  - o You would like to see videos from people talking about their health problems and how they recovered. Sig: 0.285, t: -1.078 Beta: -0.145
- Usability 4, 5, 8
  - o You would like to learn the operations of the site in just few hours. Sig: 0.114 t:1.603 Beta: 0.163
  - o You would like to check and administer your setting sometimes. Sig: 0.210 t: 1.226 Beta 0.161
  - o You would like to use advance preferences in search and fetch fields. . Sig: 0.181 t: -0.1353 Beta: -0.166

Looking at the results we can explain that considering the **privacy** on the social media for health

- Private messages in a social media has a strong positive relation.
- People do not like to meet their social health groups which has a negative relation.
- However, people like to know about other friends of friends and has somewhat positive relation.

Considering the **immediacy** on the social media for health

- There is a negative relation telling that they do not like to get opinions only from doctors on the social media sites.
- People are interested to get suggestions from anyone on health questions and experiences

- They like to get suggestions only from experienced people
- It is surprising to know that they are not interested to get videos and posts explaining their health issues.
- However, they also do not like to receive very frank opinions from their friends on these public sites.

Considering the **usability** on the social media for health

- There is a positive relation telling that part of contacts in the social media sites.
- People are interested to learn the using and preferences of these sites quickly suggesting that people are willing to use the sites provided there are no issues in handling the sites.

## 6. Conclusion

Determining the components, privacy of messages and their contacts searching are most important. Around 40 percent of the respondents belong to the semi-urban and rural area and do not prefer to search the internet. Where as 50 percent like to search the health information in the internet. There is a strong relation in preference to be in the contacts lists of interest groups. This suggests that people are willing to adopt and try the new ways in being healthy and aware.

The implication of usefulness of social media has been well understood through its usage in marketing and other dominant domains. The understanding of social media components for healthcare can make the world more connected and informed. This would become more important when we take the case of unconnected and rural areas of emerging economies like India and China. A social media inclusive of doctors, superspecialty hubs, retail for health and community itself could largely improve the conditions of affordability, availability and accessibility for healthcare. The results let the designers of social media of health to keep in mind the weight-age of healthcare components. The results explain that people are willing to use the social media sites for health. However, it needs lots of efforts, awareness and innovation in the process.

## References

- Amrita, ., Das, P. Saurabh, P. & Biswas, D. 2010. An entrepreneurship driven wellness business model for non-metro Indian cities. Comb2010i, Vantaa, Finland.
- Amrita, Saurabh.P, Biswas .D. 2009. Health Problem Mitigation through Advocacy of Public-Private-Partnership for Solution of Local Health Problems through Service Based Health Care Models. RVIM Journal of Management, Vol.2 No.1 pp. 41-56
- Berndt ER, Bir A, Busch SH et al. The Medical Treatment of Depression, 1991-1996: Productive Inefficiency, Expected Outcome Variations, and Price Indexes. NBER Working Paper Series, No. 7816, National Bureau of Economic Research, 2000.
- Biswas, D., Amrita, ., Saurabh, P. & Das., P. 2010. The education-enterprise model and its interaction to Indian healthcare sector. Combi2010, Laurea Publications: 210-225.

- Biswas, D. 2008. Role of Education-Enterprise Model for Developing Growth Ventures in Differing Economic Contexts, Keynote: EBRF Conference-2008, University of Jyväskylä, Finland
- Bourdieu, P. (1986). The forms of capital. *Handbook of Theory And Research for The Sociology of Education*. J. G. Richardson. New York, Greenwood: 248.
- Cooper, A.C. (2003). Entrepreneurship: The past, the present, and the future. In Z.J. Acs and Audretsch, D.B. "Innovation and firm size in manufacturing", *Technovation*, Vol. 7, pp. 197-210.
- Cowan CA, HC Lazenby, AB Martin, et al. National health expenditures, 1998. *Health Care Financing Review*. 1999;21:165-210.
- Cowan CA, HC Lazenby, AB Martin, et al. National health expenditures, 1998. *Health Care Financing Review*. 1999;21:165-210.
- Cutler DM, McClellan M, Newhouse JP, Remler D. 1999 Pricing Heart Attack treatments. NBER Working Paper Series, No. 7089, National Bureau of Economic Research,
- Garrison LP and DM Brown. Assessing the Impact of Changes in Technology on Medicare Expenditures for Physician Services; Background, Issues, and Options. Final report submitted to the Health Care Financing Administration, Project HOPE Center for Health Affairs, 1991.
- Goffman, E. (1967). *Interaction Ritual: Essays on Face-to-Face Behaviour*. New York, Pantheon Books.
- Goldsmith J. 1994. The impact of new technology on health costs. *Health Affairs*. Summer;13(3):70-9
- Jane Sarasohn Kahn (2008), People who need people use social media. *Health 2.0*. [Available at: <http://www.health2blog.com/2008/01/people-who-need.html>]
- Kavanaugh A. L., Patterson S. J. (2001) *The Impact of Community Computer Networks on Social Capital and Community Involvement, Impact of Networks*. Sage Publications Vol. 45 No. 3, November 2001 496-509
- Kietzmann, J. H., Hermkens K., McCarthy I.P., Silvestre B. S. (2011). Social media? Get serious! Understanding the functional building blocks of social media. *Business Horizons*. Vol 54, pp. 241—251
- Leiner, B.M., Cerf, V.G., Clark, D.D., Kahn, R.E., Kleinrock, L., Lynch, D.C., Postel, J., Roberts, L.G. and S. Wolff (2000) 'A Brief History of the Internet' [Available at <http://www.isoc.org/internet/history/brief.shtml>]
- Lohr, S. Health industry under pressure to computerize. *New York Times* (Feb. 19, 2005); [www.nytimes.com/2005/02/19/business/19health.html](http://www.nytimes.com/2005/02/19/business/19health.html)
- McMillan, S. and M. Morrison (2006). "Coming of Age With The Internet: A Qualitative Exploration of How The Internet Has Become An Integral Part of Young People's Lives." *New Media and Society* 8(1): 73-95.
- Mueller C, Juday T, Mercurio M, Rawal M, Weisblatt M, and Wilensky J. 1993 Estimating Changes in Medicare Inpatient Operating Costs from Scientific and Technological Advances in FY 1994. Final Report submitted to the Prospective Payment Assessment Commission, Project HOPE Center for Health Affairs,
- Parks, M. and K. Floyd (1996) 'Making Friends in Cyberspace', *Journal of Communication* 46(1): 80–97.
- Penchansky, R. and Thomas, J.W. (1981). "The concept of access: definition and relationship to consumer satisfaction", *Medical Care*, 19:127-40.

- Rettig RA. Medical innovation duels cost containment. Health Affairs. 1994 Summer;13(3):7-27.
- RUPRI Center for Rural Health Policy Analysis. Rural Implications of the Medicare
- Ryan, A. (2000). My way [Review of the book Bowling alone: The collapse and revival of American community]. New York Review of Books, 67(13), 47-50.
- Schwartz WB. In the pipeline: a wave of valuable medical technology. Health Affairs. 1994 Summer;13(3):70-9
- Taming the Beloved Beast: How Medical Technology Costs Are Destroying Our Health Care System by Daniel Callahan. Princeton, NJ: Princeton University Press, 2009, 288 pp.
- The second that is a wealth of information about social networking and online life: Wellman, B. and C. Haythornwait, Eds. (2002). The Internet in Everyday Life. New York, Blackwell.
- Weber, T. (2010, October 3). Why companies watch your every Facebook, YouTube, Twitter move. Retrieved November 5, 2010, from <http://www.bbc.co.uk/news/business-11450923> [www.traffikd.com/social-media-websites](http://www.traffikd.com/social-media-websites)

# Developmental Impact Analysis of ICT Enabled Scalable Healthcare Model in BRICS Economies

Punit Saurabh<sup>1</sup>, Amrita<sup>2</sup>, Dhruves Biswas<sup>3</sup>

<sup>1,2</sup> Vinod Gupta School of Management, Indian Institute of Technology (IIT),  
Kharagpur, India

<sup>1</sup>[punit.saurabh@gmail.com](mailto:punit.saurabh@gmail.com); <sup>2</sup>[iamthealchemist@gmail.com](mailto:iamthealchemist@gmail.com);

<sup>3</sup>Electrical & Electronics Communications Engineering, IIT Kharagpur;  
<sup>5</sup>[dbiswas@ece.iitkgp.ernet.in](mailto:dbiswas@ece.iitkgp.ernet.in), [dhruves@gmail.com](mailto:dhruves@gmail.com)

<sup>1,2,3</sup> Rajendra Mishra School of Engineering Entrepreneurship, IIT Kharagpur  
<sup>1,2,3</sup> Science & Technology Entrepreneur's Park (STEP), IIT Kharagpur

## Abstract

The objective of the paper is to provide an in-depth analysis of the developmental impact to be made at the ground level by the ICT enabled scalable healthcare model if implemented in BRICS economies. In order to provide a proper conceptualization, planning and implementation of the model while making it consistent with the long-range goals of the community for whom the model is being implemented, the authors have conducted a developmental impact analysis of the model.

According to Edwards (2000) *“The development impact assessment process makes use of existing information, where possible to determine potential impacts of a proposed development employing techniques to gather additional, new information, where necessary while providing a framework to integrate these data, models, spatial and statistical analyses and experiences in other locales to predict development impacts”*.

The proposed “development” in this case is the ICT enabled scalable Healthcare Model and the community implied are the patients and other stakeholders engaged with the working of the Healthcare model for a profitably sustainable cause. As the model is positioned for developing countries in the BRICS region due to its globally replicable strengths, special emphasis is being made to highlight the need for implementation of the model in these regions. BRICS stand out for Brazil, Russia, India, China and South Africa who are experiencing a rapid economic growth on account of a robust market performance and unmet prospects of growth. A major section of the population resides in these BRICS nations which comprise of more than 60% of the world population. The major impediment in the way of providing basic healthcare facilities is acute poverty which in turn creates a viscous cycle difficult to break in.. Hence, even though the emphasis of the model hinges mostly on its implementation, yet it has major implication for other regions afflicted from similar socio-economic problems like Sub-Saharan, Latin American, Central Asian and Asia-Pacific nations.

## Keywords

Developmental impact Analysis, BRICS, Higher Education Institutions (HEI), Healthcare, Education and Enterprise model (E-E Model), ICT

## **Acknowledgement**

The authors sincerely acknowledge the contribution of the management and support staff of Science & Technology Entrepreneurs' Park (STEP) of Indian Institute of Technology, Kharagpur, India.

## **Background**

Goldman Sachs economist Jim O'Neill bracketed BRIC a decade ago as four of the world's fastest developing large economies. Later, South Africa joined the grouping and added another dimension to the overall group philosophy, name and architecture. With the rising economic growth the need for health care reforms has led to an increasing efforts made by the federal governments to address the needs of the growing population through customized health centered programs. Unfortunately the issues relating to implementation of these programs or measures are too huge to be addressed by governments alone and effective interventions from the private sector are needed to solve them. Ward (2007) mentions two well known health experts namely Stephen Lewis (2007) and Roy Romanow (2007) who have stated that improved leadership is key to making the changes that are necessary (e.g. waitlist management, fiscal sustainability, primary care reform, end-of-life care. Health service delivery in emerging nations like India is under significant pressure due to lack of social infrastructure and which can be effectively implemented by leadership in initiating innovative business ideas. Several reasons which include low budget outlay for health, escalating costs resulting from demographic shifts, are all driving health toward a major transformation

Major population residing in BRICS (Brazil, Russia India, China, and South Africa) countries belonging to the middle and bottom of the pyramid (BOP), face a widening healthcare gap with their developed counterparts which keep on growing notwithstanding the efforts taken by successive governments to bridge them. Consequently a major portion lacks the basic healthcare infrastructure facility which often leads to terrible hardships to the people residing in these countries. Evidence exists showing that as the role of the primary care physician in the delivery of medical care increases, health outcomes improve and costs decline. The developmental analysis of the current model is done in view understand the intricacies of the model implementation in order to provide a proper conceptualization, planning and implementation while making it consistent with the long-range goals of the patients ,doctors and other stakeholders of the model.

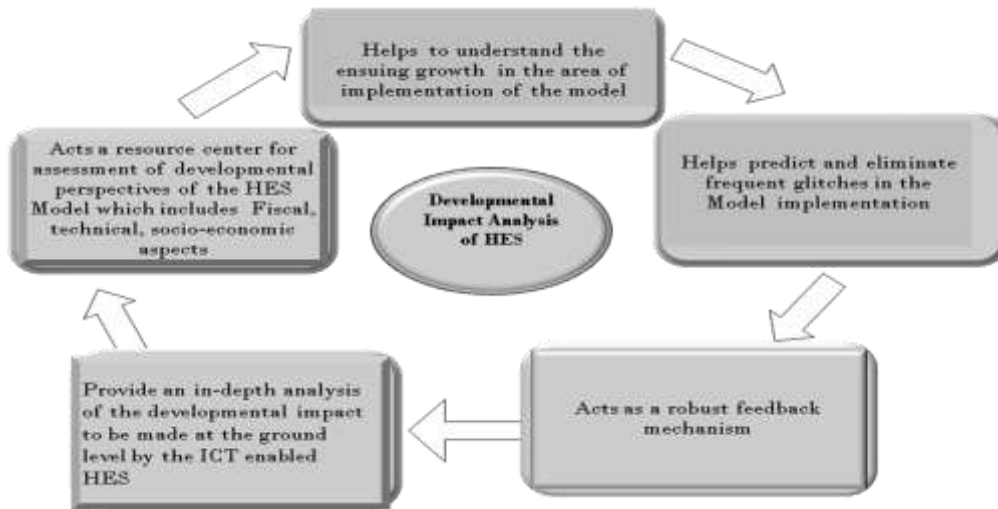


Figure 1: Need for Developmental Impact analysis (DIA)

### Methodology

The authors have been part of the Health Care Exchange System (HES) Model since its very conceptualization. Since the past 2 years after its initiation, several iterations in the HES model have helped in making the module better and fundamentally strong to face the market forces. The fact is that some of these pilot projects in several such kiosks numbering 8 are still being done with profound results emanating out of it. Most of the data provided by the authors have originated from the actual working and conceptualization of the model. The authors provide an insight into the positive impact of the model and its potential to create employment opportunities, value for the stakeholders to a varied extent. The developmental impact analysis in all the aspects which includes the technical, socio-economic, fiscal along with future potential of the model has been discussed.

### Overall Description of the Model & current status

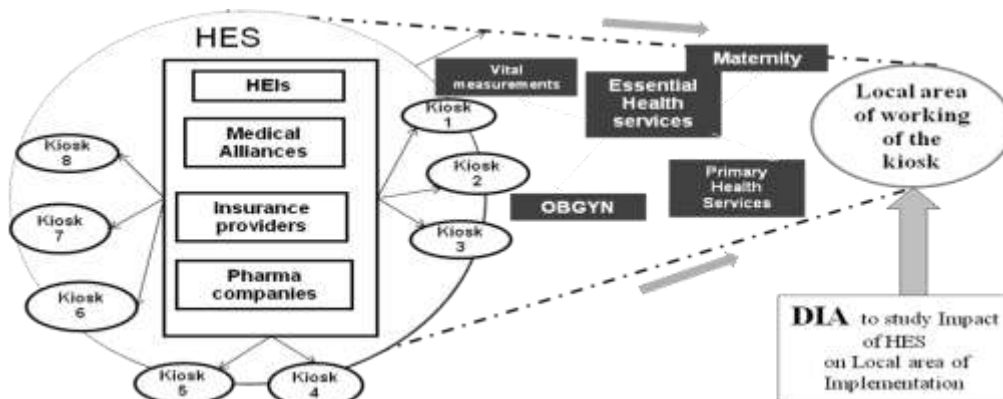


Figure 2 : Developmental Impact Analysis (DIA) of Health Exchange System(HES) Model



The Low cost scalable Healthcare Model had been conceptualized and set up by professors and students of IIT in 2007, with leadership from a stellar global advisory board, is actively involved in globally collaborated innovative solutions of local problems driven by market solutions brought out by local social entrepreneurs. Driven by “*equity ownership of entrepreneurs*” and community platform to deliver innovative health services through leveraged private enterprise network, they established a unique and vigorous entrepreneurship driven Scalable Low Cost Scalable Healthcare Delivery Model to build innovative mechanisms and channels, offering flexibility to networked service providers such as tertiary wellness providers, pharmaceuticals, diagnostic, post-tertiary homecare, elderly care, OBGYN services including maternity and epidemic outbreaks. This 3 tier model comprised of a super-specialty hub surrounded by a constellation of health kiosks working at different levels, providing accessible and readily available quality healthcare. Disruptive intellectual property (IP) driven Technology Business Nodes (TBN) are the focal points for creating business infrastructure which engages in providing medical, ambulance, diagnostic and referral facilities while conducting health-camps periodically. Moreover, TBN kiosks which is in its fourth version, also act as immunization center, public health awareness and other related service centers under a single umbrella. At present 15 Health kiosks have already been set-up in West Bengal with CET, UCB & University Alliance of Finland as a co-partners.

The aim of the developmental impact analysis of the model emanates from that the health kiosk model has a huge potential for success in the area of implementation in all domains and aspects. This could be a source of business for entrepreneurs and businessmen, social upliftment and means for development for the local area due to its favorable impact while fulfilling the health related gaps in the local area of impact.

**Major points of emphasis of the developmental impact analysis will be as follows:**

- (1) Technical Performance analysis of the Health Care model
- (2) Potential Market analysis of the Health Care model in the BRICS economies
- (3) Fiscal Impact analysis of the Health Care model
- (4) Socio-Impact analysis of the Health Care model



Figure 3: Developmental Impact Analysis and its parts

Major points of emphasis have been discussed in brief.

### **(1) Technical Performance analysis of the Health Care Model**

Innovative healthcare products specifically developed for implementation and wide commercialization prospects in BRICS countries form an integral part of the Business Design of Low Cost Scalable Healthcare Delivery Model. The technical performance analysis of the model consists of in depth technical analysis of the technical instrumentation and devices and components which are or will be part of the overall model. Also, some of the devices being installed are being used for the first time and need to be tested to evaluate the efficacy of the devices. The technical analysis forms part of the overall aim to develop business architecture, and intelligence for the health exchange system. Some of the components which form part of the analysis which are being integrated and form part of the study are as follows:

- (a) Technical Architecture of the model*
- (b) Specifics of the technical components and its integration with the model*
- (c) Efficacy of the components under installation*
- (d) Need of the devices and its adaptability with the architecture*

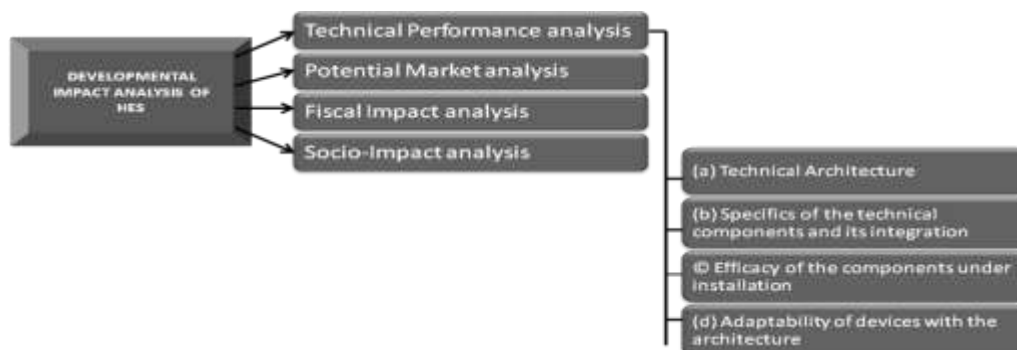


Figure 4: Technical performance Analysis and its sub- parts

The technical plan of action of model implementation and architecture supporting the model needs to be studied carefully. The technical environment of the model and its overall architecture has been discussed in brief.

#### ***(a) Technical Architecture of the model***

Some of the devices being installed at the kiosks are sensitive to environment. Few more devices are developed by the entrepreneurs of HEIs themselves for providing cost effective solutions. The testing equipments are connected to computer system and directly transferred to the test data for storage. The Kiosks are equipped with wireless communication devices and IT infrastructure with basic healthcare facilities, emergency medicines and testing facilities. The system monitors and delivers patient's physiological readings to the hospitals and provides an alert mechanism triggered by the patient's vital signs which is linked to a medical

practitioner's mobile device. The device has already been developed and installed at the kiosks for remote patient monitoring based on data mining approach. The devices installed at the kiosk are secure Android based mobile application platform. The devices were first developed and tested at the Health lab at IIT-Kharagpur STEP facility before installation at the Kiosks.

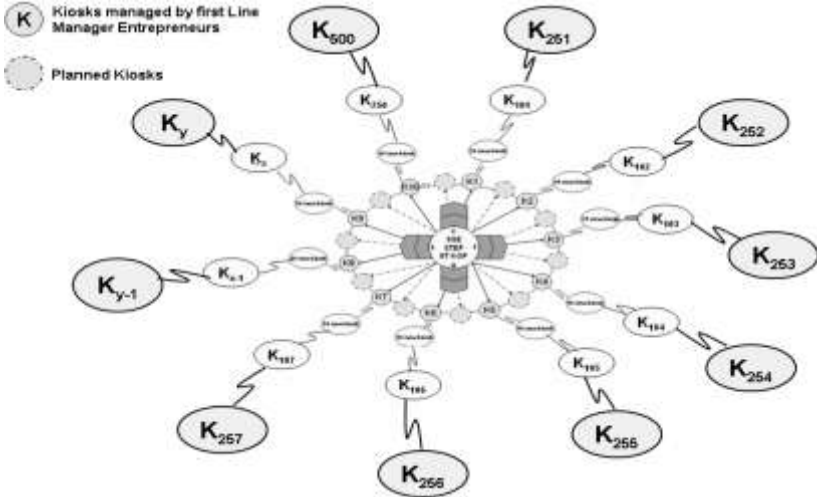


Figure 5: Scale up Model of HES Kiosk Model

The model combines disruptive technology with health business model to reach up to a unique price point. In hardware part multifunctional medical instrument have been developed to measure several data medical data and innovative power sensor based devices which collect those measured data via Android based technology and send it to data base of medical alliance via GSM. For combining hardware part with data generated by healthcare provider, interactive ERP based software has been introduced.

***(b, c, d) Specifics of the technical components, its efficacy, need and its integration with the model installation & adaptability***

The Kiosks are also home to Multi functional Medical Instruments capable of measuring ECG, Blood Pressure, Pulse Rate, Plethysmograph , Pulse-oximeter, and Phono-Cardiogram using a single device integrated with the available devices . This portable device is available at the Health kiosk in a portable mode which helps it to be carried to the patient house when needed. The health care device have integrated data collection, analysis and storage facility where the data for a medical test can be collected and transferred to the installed device for resending store data to the central database.. Depending on the data, the patient’s health condition is assessed and assistance is provided accordingly. Though this device is expensive to install but the market region it targets have a greater volume which make this tests cost effective. Looking at the above technical architecture and the evolving challenges, the technical impact analysis will have a positive role in understanding and successful

implementation of the model. We now discuss the healthcare providers who are part of the overall model.

### ***Healthcare providers: Hub Hospitals and Health kiosks***

Most of the centers of excellence in healthcare service and delivery are located in the urban areas. Even if the wellness infrastructure exists, the facilities are limited and are inadequate in meeting the healthcare demands. Tertiary care hospital tied up to this model to address potential market of low income group of the society. Hospital like Mission hospital is major stake holder of existing model.

The kiosk health services are inclusive of hospital services, Pharmaceuticals, Wireless handheld monitoring devices as well as the diagnostic. Each and every service has customers from the target areas. These hospital services are provided by the partner hospitals. These hospital services have the following components:

- ⇒ Tertiary Diseases
- ⇒ Ambulatory Services
- ⇒ OBGYN
- ⇒ Emergency Care
- ⇒ Preventive HealthCare Checkups
- ⇒ Diagnostic services

The tertiary diseases will have the major surgical diseases covers prevention schemes to improve the quality of life for people with various diseases by limiting complications and disabilities, reducing the severity and progression of disease, and providing rehabilitation (therapy to restore functionality and self-sufficiency). Unlike primary and secondary prevention, tertiary prevention involves actual treatment for the disease and will be conducted primarily by health care practitioners related or registered to SSE, rather than public health agencies. This would also support the patients by leveraging on the original cost of the packages for tertiary treatments provided by the hospitals. The ambulatory services will be provided by the kiosks for faster, cheaper and better service to the local people. The kiosk entrepreneur has the responsibility to provide the customer service as well as the emergency care to the patients. These patients who are referred by the kiosks either for the hospital services or the emergency care will be a customer to the pharmacy products sold at the kiosks.

To make healthcare facilities affordable this model introduces technology interaction and interventions designed to deliver quality products and services intended for the customers at a fraction of market costs. To interconnect the hub with the spoke, various state-of-the-art technologies are being incorporated. Following technologies are the key component of this Model.

### ***Technical Impact Analysis of this Model***

The model has been implemented by IIT-KGP based SSE and has shown impacts on the lives of the entrepreneurs trained in TEDP training program. There has been a learning experience for the research scholars, the academicians and the entrepreneurs as well as all the

stakeholders involved with the selfless mission. But most importantly, the impact on companies and entrepreneurs participating in implementing the health kiosk will be huge. There are already several companies working on the integration of the technology and instruments installed with the kiosk. On an average 500 kiosks are due to be set up within a period of three year once the model kiosks have been tested in a fool proof manner. This will create opportunities for extensive involvement of software and hardware based companies dealing in the development, supply of healthcare products presently being installed in the Model Health Kiosk.

**(2) Potential Market analysis of the Health Care Model in the BRICS**

The model provides tremendous scope and value for money for patients, entrepreneurs, technologists, doctors and health professionals, innovators, educationists with innovative content, products and solutions seeking a cut in the healthcare income pie. The Health business-model is not only applicable for developing nations in the BRICS region but in the Sub Saharan Nations, Latin, Asia pacific regions as well. According to GEM (2010), there is a considerable percentage of Africans who intend, through necessity, to open their own enterprises and healthcare is one of the priority areas. Delivering basic health services and providing institutions that respond to the legitimate demands and needs of the population needs to be met



Figure 6: Potential performance Analysis and its sub- parts

The deep divide remains a problem not only in the developing economies but also in the other developed countries depending on the status. Delivering basic health services and providing institutions that respond to the legitimate demands and needs of the population needs to be met. For example - Several states in the United States of America (USA) like New Mexico which fall in the most inaccessible places have a considerable population of elderly people residing at those places who need healthcare support as a majority of them gradually lose functioning ability and require either additional assistance in the home or a move to an eldercare facility. In such cases there is a need to provide quick and effective healthcare services to the elderly people which are closer to their residential areas.

Similarly people living in accessible parts of Scandinavian countries like Finland, Greenland, and other Central European nations can be benefited tremendously due to the positives of the model as these countries also have a considerable population of elderly people living in isolated areas. The Healthcare model discussed above is different from existing healthcare

models also because of its alignment with various national and international stakeholders who are or wish to be its part in the long run. Thus there is a huge potential market hidden in emerging nations as well as developed nations.

The stakeholders who are potentially going to be benefitted by being part of the model are

**Healthcare partners:** The model has an elaborate list of partners' right from the kiosk owner to registered medical practitioners (RMP), doctors, hospitals, pharmaceuticals, manufacturing industries for mobile health devices, innovators, academicians, business providers and researchers, health professionals etc. The Model though would directly benefit the numerous patients who could not access basic healthcare due to non availability of medical facilities in there region. These partners other than having the return on their investment have the social return on investment too. The hospitals and doctors with the kiosks tie-ups are based on their quality and availability in the region of kiosk. The RMPs (Rural Medical Practitioners) of the region are best suited for identifying the local problems and bringing the traffic to the kiosks. The academicians and researchers are partnered for business simulation and introduction of innovative products into the kiosks that get directly benefitted due to the extensive research and data generation potential which can be harnessed by them.

**Vendors:** Vendors are given first preference to sell their products through kiosks based on their relevance to the model. Companies like Sensenet Technologies & Ikure and several other health based companies who will sell and utilize their business opportunities in local regions and which have huge growth potential. The potential for growth is also high for those companies involved in the content development for medical and educational domain. The software and hardware selection is totally customized based on the regions and type of population domicile in the region. The basic facilities like diagnostics, computer education etc. will be available in all the kiosks which also require specific high end instruments which can potentially be harnessed by several prospective organizations working in the domain of health and medical technologies. The other facilities of workflow optimization will be based on the choice and experience of the business owners.

**Entrepreneurs:** Model aims to help the students who have been provided with Technology Entrepreneurship Development Program (TEDP) training supported by Department of science and technology (DST), Government of India. The TEDP students are trained to serve their local region by initiating kiosks in their areas and become entrepreneurs. After the training the students/trainees become the stakeholders of the Health kiosk Model. The organization has already trained 600 students out of which 105 trainees have started their units in various domains inclusive of health kiosk businesses.

**The Plan:** Based on the success of our Pilot Project presently under implementation, there is a plan to setup 100 kiosks end of 2013 in the first year where the projected sales volume is 2,131,200, all the services altogether, leading to a total sale for US \$ 7,716,879.

The scale up plan for setting up kiosks is as follows:

Year 1 --> 100 kiosks

Year 2 --> 100 of Year 1 + 150 new setups = 250 kiosks

Year 3 --> 250 of Year 2 + 250 new setups = 500 kiosks.

### Impact of Healthcare model in job creation

These scalability plans are viable, keeping in consideration the demand for economical healthcare services and the fewer number of players in the field for providing such facilities. On an average a kiosk involves 4 full time people creating direct jobs for 4. There will be at least 3 indirect jobs created and sustained due to the kiosk operation in companies involved in the kiosk ranging from vendors, suppliers, transportation, canteen, medicine and pharmacy, hospital doctors, consultants, and nurses etc. Thus on the whole 10 jobs direct and indirect at the least count \* estimated 500 kiosks = 5000 jobs will be a boon for the local economy greatly impacting them positively. The number is inclusive of all jobs created due to the healthcare model.

### (3) Fiscal Impact analysis of the Health Care Model

According to Edwards 2000 “Fiscal analysis involves assessing the public service costs and revenues associated with the development. According to the researcher, such an analysis projects the net cost of the development on the fiscal balance sheet of the community. Since fiscal feasibility plays an important role in determining whether or not to proceed with a proposed development, fiscal impact analysis is a critical component of any development impact assessment” The health care model which has a vision to scale up into a large precedent setting model will have wide ramifications on various aspects such as the financial social as well as economic aspects. The fiscal impact analysis of the model is of much help to understand the fiscal management side of the model and its impact on the market and stakeholders it is serving or planning to serve.



Figure 7: Fiscal Impact Analysis

### Summary of Total Investments Required and Return on Investment

Total capital requirement for establishing this kiosk based HES system including the funding for infrastructure and operating expenses is \$4.52 million for setting up 100 kiosk within the first year of initiation (by 2013), \$6.2 million (new 150 kiosk, taking the total to 250 kiosks) for second year and \$11.2 million for third year for another (new 250 kiosk, taking the total to 500 kiosks), and is shown as follows:-

Table 1 : Total investment required

		<b>Total investment required (in \$) at current rate of inflation at 5%</b>		
	<b>Unit Kiosk (Yearly)</b>	<b>Year 1 (100 kiosk)</b>	<b>Year 2 (New 150 kiosk)</b>	<b>Year 3 (New 250 kiosk)</b>
<b>Capital Expenditure</b>	12,213	1,221,300	2,900,588	5,679,045
<b>Operating Cost</b>	10,514	3,303,600	3,303,600	5,527,200
<b>Total investment required</b>	<b>22,727</b>	<b>4,524,900</b>	<b>6,204,188</b>	<b>11,206,245</b>

Table 2: Unit Sales Prices (US \$)  
HES Model

Hospitals Services	3.67	5.50	8.26
Pharmaceuticals (As legalized centres for quality medicine through Hopital/Doctor/Pharma companies Tie-ups)	2.95	4.43	6.64
IKURE,Sensenet /ICT Services	0.80	1.20	1.80
Insurance	3.50	5.25	7.88
Other Services and products	11.26	16.89	25.33



**Table 3: Sales Forecast (US \$) HES Model**

<b>Sales Forecast (US \$)</b>	<b>Year 1</b>	<b>Year 2</b>	<b>Year 3</b>
Hospitals Services	3,156,840	11,838,150	35,514,450
Pharmaceuticals (As legalized centers for quality medicine through Hospital/Doctors/Pharmaceutical companies Tie-ups)	2,859,600	10,723,500	32,170,500
IKURE- Sense net /ICT Services	210,000	787,500	2,362,500
Insurance	126,000	472,500	1,417,500
Other Services and products	959,160	3,596,850	10,790,550
<b>Total Sales (in US \$)</b>	<b>7,716,879</b>	<b>27,418,500</b>	<b>82,255,500</b>

The above table shows the sales forecast for 100 kiosks in the first year (by 2013). The second year will have another estimated 150 new kiosks added followed by 250 in the third year (2015) taking the total to 500 kiosks. The direct unit costs involved has been taken from the direct manpower and other direct costs on electricity to run the particular service equipments.

#### **(4) Socio-Impact analysis of the Health Care Model**

A socio economic impact analysis according to Edwards helps to measure the potential socio-economic impacts of a development and the changes occurring due to demographics, market analyses; public services; employment and income levels; and aesthetic quality of the community. The innovative health awareness system helps village health committees to become independent bodies and work with the national healthcare system and other projects. (Alexandra, 2008) According to the researcher, in order to provide and deliver appropriate medical care, effective planning and management of health services is essential. According to Harper & Pitt (2004) with increasing demands from both public and political domains, the provision and successful utilization of objective decision-making tools is a challenging yet vital task. A part of the study hence caters to the important aspect of socio-economic impact the Healthcare model on the community where it is being implemented or is planned to be implemented.



Figure 4: Socio Impact Analysis

The team involved in scaling up the healthcare Model is intensely involved in creating a healthcare delivery model with the judicious and disruptive mix of technology and business models, powered by local population trained as social entrepreneurs. It has laid significant emphasis on a globally collaborated solution (knowledge capital, co-creation and co-entrepreneurship doctrines). Apart from a cost effective and scalable architecture for tertiary and secondary health care delivery system, we are pioneering the creation of the “highways to health” that is essential for all-inclusive economic development of BASIC economies, which so far public funding has failed to create.

The novelty of powering the HES model by social entrepreneurs, allowing optimized global solutions through local involvement, enabling state of the art pioneered Health Exchange System (consisting of near simultaneous optimization of affordable and scalable hardware and software combinations) for delivering Health Wellness Services 2.0 in a much better manner. We have further invoked time-tested methods of microfinance models, involving self-help groups, secondary business solutions through energy, education and environment businesses to increase affordability of the participants as well as significantly increase network penetration are the basis of our sustainable solution. The financial profits allow improvement in Health infrastructure, while the social profits involving global collaboration for local solutions by local people increases inclusivity, which ultimately decreases the incremental operating expenses that is necessary for affordable price points. Further innovations help create synthesis in branding, insurance price models, scale-up strategies with a host of partners from healthcare industries as well as from hardware/software organizations.

The output has resulted in creation of eight micro-enterprises, with income generation over three times prior to the impact. Our business design includes the central business plan for the expansion of the health kiosk model from pilot to scaled system at a modest capital requirement of \$4.52 million for year 1 for 100 kiosks, \$6.20 million for year 2, increasing up to 250 kiosks, and \$11.21 million for year 3, increasing up to 500 kiosks by end of 2015. This funding for infrastructure (mostly related with hardware and software component of HES), and operating expenses will have a return of capital of 2.5 years, with a net profit generated around \$26.9 million at the end of Year 3, from a total projected capital utilization of \$21.93 million up to Year 3. This labyrinth of wellness network powered by our HES would cost several tens of times higher by a public investment system due to its inherent inefficiencies, higher overheads, lack of free enterprise structure and following old economics. Our novel delivery model provides a low cost private alternative powered by local social entrepreneurs, and co-created by global partners, with significant opportunities for several players in our proposed “highways to health”, giving birth to hundreds of micro enterprises that will create

rapid economic growth along with solving a majority of the healthcare crisis in the developing economies. As mentioned that, when the HES model is fully implemented will be able to sustain more than 5000 jobs (direct and indirect in the local regions of implementation of the health kiosk. This will have a tremendous positive impact in the socio-economic condition of the community and the economy as a whole.

## Conclusion

The results of the development impact analysis of the healthcare model could have significant value in the long term. While making an honest the development impact analysis of the model, we may identify issues that have a positive or negative impact on the stakeholders in terms of one or more related areas. For example, the setting up of a healthcare kiosk in a secluded region may result in a positive impact on both the community as well as the provider and on the socio-economic needs of community members (e.g., new jobs, health). Researchers believe that there is an urgent need for identifying common issues between the various types of impacts will help organize and integrate the information collected during the assessment process of the healthcare model which will help in its global replication in the long term.

## References

Alexandra, S., (2008), “Healthcare For Remote Regions – An SDC Project In Kyrgyzstan Sets The Standard”, Central ASIA Project Briefing, CIS department

GEM (2010), “GEM Middle East and North Africa 2009 regional report”, available at [www.gemconsortium.org/article.aspx?id%4163](http://www.gemconsortium.org/article.aspx?id%4163) (accessed January 2011)

Harper, PR & Pitt, MA (2004), “On the challenges of healthcare modeling and a proposed project life cycle for successful implementation”, *Journal of the Operational Research Society*, Vol.55, 657-661

Mary M. Edwards, 2000, , *Community Guide to Development Impact Analysis*, Wisconsin Land Use Research Program, Program on Agricultural Technology Studies, University of Wisconsin–Madison, WI 53706, accessed on 26th of September,2011

Starfield, B. 2005, *Contribution of Primary Care to Health Systems and Health*, *The Milbank Quarterly*, Vol. 83, No. 3 2005 (p.-457-502)

[www.guardian.co.uk/healthcare-network/2011/jul/13/brics-health-services-brazil-russia](http://www.guardian.co.uk/healthcare-network/2011/jul/13/brics-health-services-brazil-russia)  
accessed on 9/11/2011

Ward, T. (2007), “A background and commentary to the conversations on health”, unpublished paper prepared for The Centre for Health Leadership and Research Royal Roads University, Victoria, October

Romanow, R. (2007), “Canada’s Health Temperature, Justice Emmet Hall Memorial Lecture”, paper presented at the National Healthcare Leadership Conference, Toronto

# INNOVATION AND VALUE-CO- CREATION THROUGH STRUCTURED INCUBATION NETWORK MODELING

Sharad Kumar<sup>1</sup>, Bhaskar Bhowmick<sup>2</sup> and Dhrubes Biswas<sup>3</sup>

<sup>1, 2, 3</sup>Rajendra Mishra School of Engineering Entrepreneurship, Indian Institute of Technology – Kharagpur, India

<sup>3</sup>Electrical & Electronics Communications Engineering, Indian Institute of Technology (IIT), Kharagpur, India

## Abstract

The initiation incubation system some decades ago was established to support the start-ups during their initial phase of development. In the current era of information technology and social media, only incubation at one place does not satisfy the needs of the start-ups for co-creating value through innovative solutions. There have been numerous strategies and programs to encourage and support start-ups for business development and improve their prospects for long-term success. It is required that the existing incubation systems should use business intelligence for sharing resources, knowledge capital and other services. The current business practices of effective business incubators have however, generated positive results for start-ups by bringing industry and academia together. This conceptualization has occurred by finding the role of an incubator and entrepreneurs, and how they can work together to creating the value by innovative product and services.

**Keywords:** Innovation, Co-creation, Value, Incubation, Network

## Introduction

Innovation is a driving force of welfare and contributes to increasing the standard of living. It is considered to be a critical component of business productivity and competitive survival. Technological innovations present vast opportunities for product innovation which is introduction of new types of goods and services for the external market, process innovation which is enhancement of internal production processes for goods and services. The existing literature suggests “value co-creation” is an outcome of innovation, which is from innovation (as a new artifact) to innovating (as a set of co-creation practices). It is a process that involves discovering new ways of co-creating value through more effective participation in resource integration. The value co-creation process not only occurs within a provider and customer dyadic relationship but also involves several participants as dynamic operant resources in a many-to-many perspective. (Gummesson, 2008; Mele, Colurcio, Russo Spena, 2009) Value co-creation is unique to the individual network system, as it comprises creating value-in-use through the integration of the firm’s value offering and the consumer’s operant resources (Vargo and Lusch 2008). Value co-creation, is an emerging business and innovation paradigm describing how customers and end users could be involved as active participants in the design and development of personalized products, services and experiences (Prahalad & Ramaswamy, 2004; Payne, Storbacka, & Frow, 2008).

The individual innovator faces greater challenges to develop and commercialize a market ready product. That includes lack of access to capital, lower education levels, and less focus on commercial efforts in emerging economies context, less knowledge about existing product and service and unawareness about the competitors. In connection with the existing challenges, business incubators can provide structured support to solve these challenges.

## **Literature Review**

There is abundant literature existing dedicated to the discussion of value co-creation structure, mechanisms and processes. Literature on innovation and value co-creation has concentrated on Innovation, Incubation, co-creation and value co-creation and their possible effects on the ecosystem.

**Innovation:** Innovation can be defined as “the intentional introduction and application within a role, group or organization of ideas, processes, products or procedures, new to the applicable unit of adoption, designed to significantly benefit the individual, the group, or wider society” (West, 1990). This definition is largely accepted among researchers in the field of originality (Anderson, et al., 2004), as it captures the three most important characteristics of innovation: (a) novelty, (b) an application component and (c) an intended benefit (Lansisalmi, et al., 2006). This is a driving force of welfare and contributes to increasing the standard of living. Technology has always played an important role in driving innovation, and it will continue to do so in the future, but for many companies technology will gradually move from being a driver of innovation to an enabler of innovation.

**Co-Creation:** In the last few years, “co-creation” has emerged as an attractive label used by different research traditions within marketing, management and innovation to depict a new and promising vision of innovative phenomena. (Vargo and Lusch 2004, Prahalad and Ramaswamy 2004). Scholars use the term co-creation to address how social and technological changes enable organizations, groups and individuals to interact, collaborate, and solve problems, by jointly creating value (Ramaswamy and Gouillart 2010; Chesbrough 2011).

**Value Co-Creation:** Value co-creation is unique to the individual, as it comprises of creating value-in-use through the integration of the firm’s value offering and the consumer’s operant resources (Vargo and Lusch 2008). The value co-creation process involves the provider creating superior value propositions, with customers determining value when a commodities or service is consumed. “The customer is always a co-creator of value: There is no value until an offering is used—experience and perception are essential to value determination” (Payne et. al. 2008). This is an emerging business and innovation paradigm describing how customers and end users could be involved as active participants in the design and development of personalized products, services and experiences (Prahalad & Ramaswamy, 2004; Payne, Storbacka, & Frow, 2008). Literature suggests that the basic variables for an “Innovation and Value co-creation” are understanding of consumer needs and their satisfaction by novel products. Consumer’s satisfaction is the only thing that provides the value to any efforts.

## **Objective**

Literature review suggests there are many studies about innovation and co-creation, a comprehensive understanding of all the elements that shape the innovation process and co-creating is still lacking. We aim to begin filling this gap in social and technological aspect where combination of resources will create the value. The paper focuses on structuring a model incubation network for revitalization of the entire “Innovation and Value co-creation ecosystem”.

## **Defining Structured Incubation Network Model**

There are several factor to consider when evaluating and selecting innovators/entrepreneurs in the incubation network. Each opportunity contains its own set of considerations and limitations based on elements including type of innovation, product and most prominently, the proposed solution’s ability to address the challenges. An structures incubation network evaluating the independent innovators/entrepreneurs on: relevance of primary business idea, identifying their needs and expectations, methods to fulfill these expectations, feasible success of startups, the economic impact of business idea, entrepreneurial skills and approach, technical feasibility, cultural or organizational impact on society and value creation.

Incubation is an important instrument for start-up businesses/entrepreneurs. Start-ups emerging from university incubation system rely mostly on the incubators within the university. Unlike the developed nations, incubators in resource constrained economies, lack many facilities and are not at par with the services. However, a well calculated design for sharing the resources mutually might help to develop the network. There is a need for intelligent identification of resources which are critical for the development of start-ups. A business incubator is a physical entity providing small businesses with space, support services, and networks to entrepreneurs, investors, and clients. The term ‘incubator’ was derived from the fundamental meaning of the term: the artificial nurturing of a chicken egg in order to hatch them faster in a sheltered environment. The same hatching concept is applied to the incubating of companies; it speeds up new ventures’ establishment and increases their chances of success (Hansen et al., 2000). An incubator thus hatches new ideas by providing new ventures with physical and intangible resources (Allen and Bazan, 1990). Public university incubators can have a positive effect on incubated firms (Stemberg, 1990; Felsenstein, 1994; Mian, 1996; Scott, 2000). They increase the survival rate of new ventures by reducing the entrepreneurs’ resource constraints in their pursuit of opportunities (Mian, 1997; Stevenson and Jarillo, 1990; Timmons, 1999). Incubators can also accelerate the time-to-market and likelihood of success (Allen and McCluskey, 1990). Structured incubation efforts require input and support from a range of stakeholders: ie organizations and people in government, local business, education, large regional employers, capital providers, and community leaders. For incubations support, entities draw upon their networks to connect incubated businesses with resources, suppliers, clients, etc. Entities with best success rates have regular collaboration and high levels of communication which requires more specialized incubation and focus on services. Not all incubation efforts take specific industry focus, but, specializations provide greater value from networks, tailored relationships,

and industry knowledge. A good infrastructure, easy access to capital, trained workforce, experienced managers, government and political support to minimize barriers will strengthen start-up activity and growth of innovative product based business.

Incubation systems for start-up companies became a popular economic development approach in India as a result of the confluence of a number of factors including economic restructuring, theory of innovation evolution, rise of “technopolis,” and new insights regarding the role of small businesses and entrepreneurialism (Lewis, 2001). Even after these efforts, vast majority of new, innovative product based enterprises failed as a result of three common problems: lack of capital, poor managerial skills, and insufficient understanding of the marketplace. The spirit of this strategy was that local innovation and new firm formation will result in endogenous growth (Eisinger 1988; Massey et al. 1992; Atkinson 1991). Co-incubation is a broader concept of innovation/startup support where two or more tenant companies and incubator jointly work for startup support. Basically this is a network of incubators and startup innovation business units. It reduces risk of startup failure, increases longevity, and increase growth and fueling the local economy directly and indirectly.

### **Incubation Support System at IIT Kharagpur:**

The co-incubation system at IIT Kharagpur has looks upon networking as a key element in the success of start-up venture firms. The co-incubation or networked incubator concept has received much attention in the literature due to association of incubators and its capabilities to improve a firm’s performance. Firms associated with strong incubators network received higher support, reached faster growth rates, be more innovative and verified better ability to deal with market with a new product. Co-incubation efforts require input and support from a range of stakeholders. This includes organizations and people in government, local business, education, large regional employers, capital providers, and community leaders. For Co-incubation, stakeholder cooperation best benefits startup businesses, support entities draw upon their networks to connect incubated businesses with resources, suppliers, clients, etc. A best success depends on regular collaboration and high levels of communication among incubators and incubates. Co-incubation: A full range of care is available for startup businesses to address their requirements as they advancement in their development.

Figure (1) show that the existing startup support system at IIT Kharagpur. An entrepreneur can come up with novel business idea in technology domain for product as well as service at this incubation centre and they can get support through available mechanism. They can use the knowledge diffusion platform to develop the product, where a chain of business support interties like funding opportunity, expert mentoring and other lab infrastructure is available to the entrepreneurs. Till the product development phase and venture creation process, they can be offered these facilities across the country wherever the incubation centers are available. But, IIT Kharagpur has extended the business support at the product diffusion level, where we are offering them business intelligence, market research, business architecture and business network support. The researchers at IIT Kharagpur are working on different aspect of above mentioned areas on live businesses or startups, which are incubated at this Science and Technology

Entrepreneurs Park and Technology Business Incubator, Indian Institute of Technology Kharagpur..

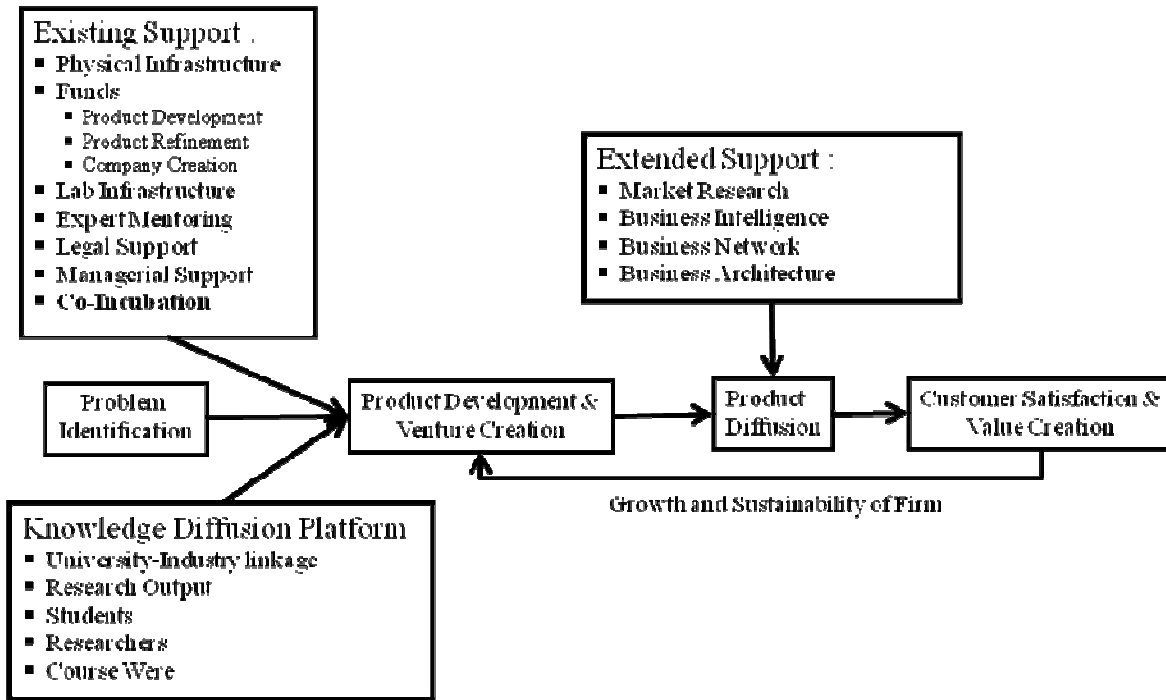


Figure 1: Business Incubation Model

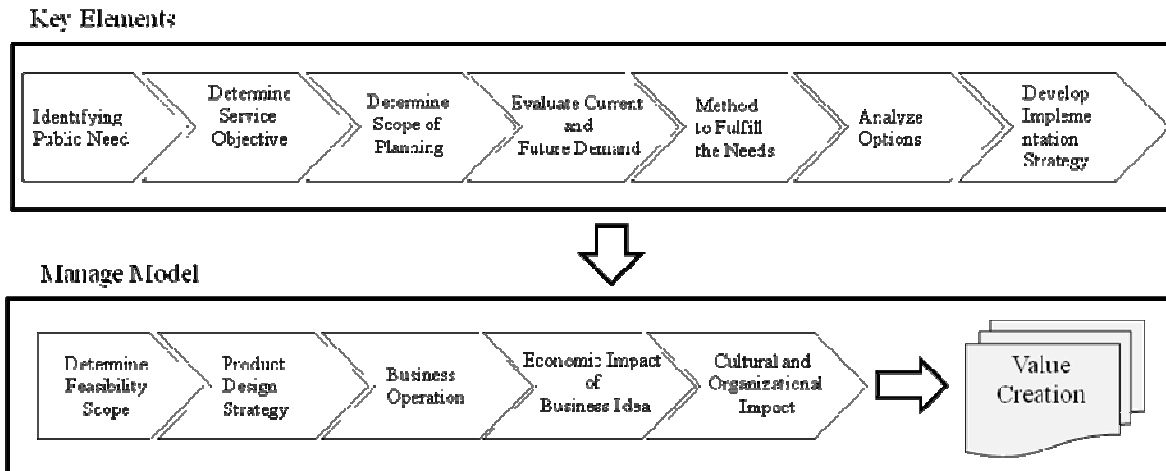
## Network Modeling

The term 'Network Modeling' is coming from Computer Science. It was originally developed by Charles Bachman, a computer scientist. The model was known as Bachman diagram. Network modeling is used as a tool for decision making in any complex system. This is a flexible way to represents the objects and relationship among them inside the incubation network. Network modeling is supportive to gain understanding of how the attributes of structured incubation network is working under various scenario from today to future. It is helpful to assess the performance of innovators success and failure, impacts of proposed innovation, impacts of proposed operational modifications, development, the supporting information for planning, to allow existing infrastructure to be utilized in its maximum capacity, to support the development of an optimized resources works program. It provides service providers with the information necessary to make optimal decisions in relation to system operation and planning to achieve the desired service standards and it will lead to value for money to customers.

This paper conceptualizes the business incubation network modeling. This conceptualization has occurred by finding the role of an incubator and how they can work together to do extremely



well. The structured incubation network modeling defines the organization of the enterprise in terms of its governance structure, business processes, and business information. Structured incubation network modeling for “innovation and value co-creation” primarily focuses on the support of product design motivations, business operations and customer’s satisfaction and value created by product and service to the end user.



**Figure 2: Business Network Modeling**

Figure (2) show that the conceptual framework we develop starts with recognition of the centrality of key elements and manage model for processes of innovation and value co-creation. Processes include the identification of problem area, service objectives, planning and procedures, tasks, strategies, mechanisms, activities and interactions, which support the innovation and value co-creation. The framework architecture consider customer, finances, and the ever-changing market to align strategic goals and objectives with decisions regarding products and services; partners and suppliers; organization; capabilities; and key initiatives. This process need to view the relationship between the provider and the customer as a interactive set of experiences and activities performed by the provider and the customer, within a network system.

### **Expected Outcomes and Contribution**

The potential benefit of the structure incubation network modeling is to support and sustain the local innovation (Product/Service) and deliver value. This would also increase the survival rate of new ventures, the sharing and collaboration of the assets of the business network. This paper provides an overall impact of the networking modeling process for structured incubation network and highlights issues that should be considered to ensure that models capably deliver consistent outputs for innovation and respective value for customers. The sharing and collaboration of the assets through the business network and business intelligence would play the major role for identifying and decision making for resource between the partnering incubators. Co-incubators network should be created across the country and worldwide where specific knowledge base would get created through industrial or education development. Business architecture can play the role of structural tool to execute the requirement of startup

ventures as per their needs. It fulfills the strategic goals of incubator as well as incubatees to identify their business capabilities and value stream.

## **References:**

- Prahalad, C. K. & Ramaswamy, V. (2004), *The future of competition - co-creating unique value with customers*, Boston: Harvard Business School Press
- Payne, A., Storbacka, K. & Frow, P. (2008), "Managing the co-creation of value, *Journal of the Academy of Marketing Science*, Vol. 36, pp. 83–96
- Stoyan Tanev, Pavel Durchev, Hristo Milyakov, Petko Ruskov, Steve Allen and Tony Bailetti, (2010) *Open Source Innovation (Beyond Software) Workshop*, Strasbourg, France, Feb. 24-25,
- West, M.A. (1990), *The Social Psychology of Innovation in Groups*. In M.A. West and J.L Farr (Eds.), *Innovation and Creativity at Work: Psychological and Organizational Strategies* Chichester, UK: Wiley, pp. 309-334.
- Anderson, N., C. De Dreu, and B.A. Nijstad. (2004), *The Routinization of Innovation Research: A Constructively Critical View of the State-of-the-Science*. *Journal of Organizational Behavior*, Vol.25, pp. 147-173.
- Lansisalmi, H., M. Kivimaki, P. Aalto, and R. Ruoranen. (2006), *Innovation in Healthcare: A Systematic Review of Recent Research*. *Nursing Science Quarterly*, Vol. 19, pp.66-72.
- Vargo, S L., Lusch R.F (2008), "Service-Dominant Logic: Continuing the Evolution," *Journal of the Academy of Marketing Science*, Vol.36, pp.1-10.
- Vargo, S L., Lusch R.F (2004). "Evolving to a new dominant logic for marketing", *Journal of Marketing*, Vol.68, No.1, pp. 1-17.
- Lewis, D. A., (2001), *Does Technology Incubation Work? A Critical Review*, Rutgers University
- Eisinger, Peter. (1988), *The Rise of the Entrepreneurial State: State and Local Economic Development Policy in the United States*. Madison, WI: University of Wisconsin Press
- Massey, Doreen, Paul Quintas, and David Weld. (1992), *High-Tech Fantasies: Science Parks in Society and Space*. London: Routledge.
- Atkinson, Robert. 1991. *Some States Take the Lead: Explaining the Formation of State Technology Policies*. *Economic Development Quarterly*, Vol. 5, No.1, pp.33–44.
- Gummesson, E. (2008), "Customer centricity: reality or a wild goose chase?" *European Business Review*, Vol.20, No.4, pp.315-330.

Mele, C., Russo Spina T., Colurcio M., (2009), Alternative Logics for Innovation: a call for service innovation research”, (, Proceedings of “Forum on Service: Service- Dominant Logic, Service Science and Network Theory, Napoli.

# SUSTAINABLE SCALABLE INCLUSIVE INNOVATION: A MULTI-DISCIPLINARY KNOWLEDGE PLATFORM APPROACH IN EMERGING COUNTRY CONTEXT

Prof. Bhaskar Bhowmick<sup>1</sup> & Prof. Dhruves Biswas<sup>1,2</sup>

<sup>1</sup>Rajendra Mishra School of Engineering Entrepreneurship, Indian Institute of Technology – Kharagpur, India

<sup>2</sup>Electrical & Electronics Communications Engineering, Indian Institute of Technology (IIT), Kharagpur, India

**Abstract:** This paper seeks to reflect on the nature and evolving challenges of an innovation ecosystem model in emerging country context. It discusses the literature of innovation and entrepreneurship development in micro and macro perspective relating to the real life data in Indian context. It argues for exploration and exploitation of sticky knowledge in innovation based entrepreneurial development processes through dissemination of knowledge locally and globally. It conceptualizes a multidisciplinary knowledge platform in creating, converting, and communicating the elements of facilitating a sustainable, scalable, inclusive innovation.

**Key Words:** Inclusive innovation, Knowledge platform, Emerging country, Innovation ecosystem

## Introduction:

The word “*Innovation*” originated from the Latin word *innovatus*. *Innovatus* is the noun form of *innovare* which means “to renew or change,” stemming from *in-*“into” + *novus-*“new”. Innovation has been conceptualized as an inherent effect on organizational desire to transform, improve and translate into a complete new one. The desire to change either can be internal or external as a result of competitive game. It has got a capacity to change different things at different levels. From the market or industry perspective innovation is an ability of an organization to disrupt the dynamic equilibrium of the market. From the organization perspective the innovation could impact not only to its product or services, but to the culture, structure, and processes. Hence something to be called as true innovation” must satisfy the criteria of distinct identity within the existing and having an impact on the adopter. It might start from a completely new idea or recombination of existing ones. Hence the innovation process is a complex one having started from invention<sup>1</sup> or discovery<sup>2</sup>, validation of market, and diffusion. The process of innovation is thus identified as the development and implementation of innovative ideas by people (innovators) and engages in transaction with others within an institutional context.

---

<sup>1</sup> Invention is a visualization of structure where there is none before.

<sup>2</sup> Discovery is identifying the existing structure for the first time.

Innovations by its very nature results from and create uncertainty. As Innovation is not a sequential process where everything is planned and uncertainties are kept to a minimum. The uncertainty gets multiplied with the complexities in the system. Therefore management in innovation driven organizations must have unique exposure to knowledge of market opportunities, internal capabilities and how to exploit the opportunities. Innovation itself a knowledge creation process, but the reasonable question would be, 'How do you really conserve the sticky knowledge?' The contexts and challenges areas discussed in a emerging country perspective identifies four fold of problem areas as rightly identified by Van De Ven (1986) as (1) human problem of managing attention to the need to innovate (2) a process problem of converting ideas into meaningful businesses, (3) a structural problem of managing the local and global issues, and (4) a strategic problem of institutional leadership.

This paper examines the established structures of innovation, incubation, and enterprise development models in emerging country context and evaluates the impact on technological, social, economic perspectives of a knowledge platform. It extends its search towards the role of higher education institutions (Biswas, 2008; Biswas, Amrita, & Saurabh, 2010) in providing the ecosystem supports to structured innovation. It asks the basic questions like (a) how knowledge based innovation can be translated into practice through the interactive process of different stakeholders, (b) how the key challenges of emerging country perspective can be addressed, and (c) what is the structure of knowledge network in facilitating the innovation and entrepreneurship development process. It further conceptualizes a multi-disciplinary knowledge platform supporting sustainable, scalable, inclusive innovations.

### **Innovation in emerging economy:**

The concept of innovation has evolved significantly in the last decade as in the emerging economy knowledge has been seen as the key source of competitive advantage. It is also noted that capacity of creating and exploiting the scientific knowledge and technology is the basic determinant of success in the knowledge driven economy. The capacity of innovation is highly dependent on the ability to access and manages information. It is also important for the firms in the knowledge economy to select and organize information which is relevant the core competence of the firm. Secondly, the mode of innovation also has been shifted from technology push to market pull. In such a case the collaboration between the key actors or the stakeholders are very much important. The new mode of knowledge production is based on the linkages among academia, industry, and government (Gibbons et. al., 1994). The knowledge based innovation is captured in Tripple Helix Model (Etzkowitz and Leidesdorf, 1997; Cooke and Morgan, 1998; Baber, 2001; Sutz, 2001; Etzkowitz and Leidesdorf, 2001; Etzkowitz, 2003). The basic assumption made in these models is that the innovation happens in the **space** between the organizations rather within them. The new models of innovation indeed call for rethinking and conceptualizing the space rather than

focusing on one actor. The recent literature on innovation draws both the technological aspect of innovation and the social aspects like inter-organizational relationships, R&D activities, network of innovators, industrial clusters etc. The emerging issues like organizational learning for competitive advantages (Atwell, 1996), the role of social networks (Liebeskind, Oliver, Zucker, and Brewer, 1996) and technology transfer, and learning to manage innovation (Bessant et. al., 1996; Morgan, 1996). The spaces where the innovation activities take place, the wider support infrastructure which facilitates the innovation process have been paid little attention.

Emerging economies are low income-rapid growth countries using economic liberalization as their primary engine of growth (Hoskisson, Eden, Lau & Wright, 2000). The unique settings of institutions in emerging economies are so different that it requires different focus for innovation and entrepreneurship development. If information is a source of power, then it has also to believe that the flow of information is different in emerging economy context. There is a reason to believe that managing the structured innovation and knowledge management in emerging economy perspective will be different in terms of the process and its impact. This is because of the fact that the nature of information flows between firm and the external parties are different due to the specific institutional factors (Powel & DiMaggio, 1991) in emerging economic scenario. The technology focused innovation enabled industries are becoming an increasingly important part of many emerging economies (Bruton and Rubnaik, 2002). The ecosystem of innovation and incubation is supported by managerial perspective of enabling tries to understand the factors that facilitate and inhibit the development of processes. The emerging economies being low income rapid growth countries using economic liberalization as primary engine of growth (Hoskisson, Eden, Lau, & Wright, 2000); the responsibility remains that growth to be inclusive and hence the challenges are inbuilt. The emerging economy experience explains, the innovation in technology focused areas like creating and managing knowledge (Nonaka, 1994) is different as the complexity and different demand situation in the environment.

There are evidences that the knowledge capital and innovation is highly concentrated in certain regions. Silicon Valley in USA is one of the most prominent examples of clusters of innovation. The local character and knowledge development process over a long period of time brings the unique ecosystem of innovation support (Brown and Dugaid, 2002). The explanation to the uneven pattern of innovation success is the 'sticky knowledge', which is created and diffused during the innovation process. The stickiness comes from the fact that the proximity facilitates the integration of multidisciplinary knowledge which is tacit and thus person embodied. It thus supports the scalability of innovation to a large extent. There is also the geographical importance for a particular type of innovation to sustain for a longer period of a time. The geographical contexts are thus shape the concept of regional innovation networks, industrial

districts, and innovation milieu (Scott, 1988; Beccatini, 1990; Camagni, 1991; Cooke and Morgan, 1991). The challenges of sustainable, scalable, and inclusive innovation through creation of geographically determined innovation ecosystems are many folds. The human part of it is largely ingrained into existing practices and functions due to long term institutionalization and colonization effect. This has the limitation of creativity for new ideas, identifying new opportunities, and making those economically viable options. The process limitation lies into the extent the innovation can lead to monetising the effort due to the absence of knowledge platform (Kogut & Zander, 1992) which can otherwise substitute and contribute towards the value creation process. There is also structural problem of managing the relationships and building networks. The strategic challenges are the existing with type and available institutional leadership. The complexity attains towards a new height when assume the cultural plurality in emerging country context.

**The Distributed Eco-system Approach and Developments:**

The innovation ecosystem for business incubation is put forth as a preferred community-wide strategy to maximize prospects for economic betterment in emerging economy. The natural distribution of incubator and incubatees might also demand certain community advantages from each other. Consequently we need to look into the system of building co-incubation which might originate and work providing them a proper architecture for sustenance and growth. It goes beyond a physical location to include a community approach and involve stakeholders to build the infrastructure, capital investment, education, government support, and cultural values to promote flourishing startup businesses or entrepreneurs. Only this collective effort provides the process of ‘incubation’ necessary to give existence and growth for startup businesses or entrepreneurs; fostering healthier, dynamic communities for society. Education plays a leading role in idea generation and innovation and takes part as an important stakeholder to the ecosystem. It has now transitioned from ‘director of learning’ to ‘facilitator of learning’ and develops the students serving social requirements through creating micro-enterprises.

The concepts of distributed national innovation systems are defined as follows by different researchers:

Sl no	Author	Definition
1	Freeman (1987)	The network of institutions in the public and private sectors, whose activities and interactions initiates, import, and modify the diffused technologies.
2	Lundvall (1992)	A system of innovation is constituted by elements and relationships which interact in production, diffusion, and use of new and economically useful knowledge.

3.	Patel and Pavitt (1994)	A national innovation system is the national institutions, their incentive structures, and their competencies, that determine the rate direction of technological learning (or the volume of composition of change-generating activities) in the country.
4	Niosi and Bellon (1995)	A national system of innovation is the system of interacting private and public firms (either large or small), universities and government agencies, aiming at the production of science and technology within national orders. Interaction among these units may be technical, commercial, legal, social and financial in as much as goal of the interaction is the development, protection, financing, and regulation of the new science and technology.
5.	Metcalf (1995)	That set of distinct institutions which jointly and individually contribute to the development and diffusion of new technologies and which provides the framework within which governments forms and implement policies to implement the innovation process. As such it is a system of interconnected institution to create, store and transfer the knowledge, skills an artifacts which define new technologies.

The creations of clusters as the center of local industrial development have been in the studies for long. In the context globalization of economies, the emergent country clusters are going to play a major role in the developments. They would appear as important factors in innovation and competitiveness due to the intensity of interactions in the newly industrial dynamics. The clustering of facilities can be explained by the idea that the knowledge spillovers should be more likely to occur to occur at the local level This has led to a contradictory view of globalization, as the national economies are being open to global opportunities the local innovations are restricted to a particular space of importance. The conceptual developments of the clusters are eventually evolving as the clusters of industries networked through commercial involvements with global stakeholders. In these local systems of innovation centers to these clusters are mostly connected with the stakeholders in their spatial proximity, while the local networks acts as open systems. This point view is properly reflected in the discussion (Porter, 1998) as local-global complementarities in a globalize world context. But, the learning and innovation discussions show that the geographical proximity does not appear per se neither as a necessary and sufficient condition. In general, the discussions on knowledge based economy consider the network of relationships as a natural medium to



spread the information and establish linkages. The role of these linkages for creation and dissemination of knowledge should be rethinking in emerging country context. The dispersed structures of innovation specialties interacted through multiple activities through the active intervention of information and communication technology would be the efficient design for the same.

### **Creating a Multi-disciplinary Knowledge Platform:**

Innovation ecosystem is a model which enables participants across enterprise boundaries to focus on value creation for customers and accelerate the transition from research to production. The main novelties for today's innovation ecosystems compared with earlier times can be found in the use of information and communication technology platforms. To benefit from the agglomeration or ecosystem of that time you had to be physically present in that place and time is no more a valid argument. The information and communication technology platform makes it possible for the innovators to develop a deeper relationship with the customers and suppliers. This Platform provides a common base to all the interacting organizations by providing them a knowledge sharing system. This helps them to shorten the time required to react and adopt the changes in the market. An innovation ecosystem model encompasses more than knowledge inputs and incorporates all relevant factors and stakeholders that generate value to customers and overall society. Innovation ecosystems build a collaborative advantage and a strategic asset for growth and profitability for future. A self-sustaining ecosystem is needed to make innovations viable. In Schumpeter's words, innovation ecosystems are primarily about successful innovative regions, covering the innovators, incubators, entrepreneurs, and investors.

Knowledge creation through innovation ecosystem leads to the discussion of knowledge based economy. This also involves human capital development and opportunity recognition. Human capital is defined as the individual's stock of education, experience, skill and intelligence. As per Becker's (1964, 1993) Human Capital Theory education and experience develop skills that enable workers to be productive. Human capital is enhanced through such learning and this manifests itself in varieties of high value opportunity recognition, skill enhancement, resource acquisition and its use. World Bank offers a formal definition of Knowledge Economy which states, economy that creates, disseminates and uses knowledge to enhance its growth and development. The actual knowledge bases and related competences of various industries and sectors in the economy, it is clear that knowledge creation and innovation processes have become increasingly complex, diverse, and interdependent. Nonaka and Takeuchi (1995) have identified that the process of knowledge exploitation and exploration requires a dynamic interplay in between tacit and codified forms of knowledge. Thus these knowledge processes have become increasingly inserted into various forms of networks and innovation systems- at regional, national and international level.

The knowledge repository reflects two basic components of knowledge. The first one is knowledge as an object which has got its particular structure and content. The knowledge structures provide the contexts of interpreting in the accumulated content. In the special case when the knowledge repository is treated as “knowledge platform”, then the different views of the content may be derived from a particular repository structure. The degree of flexibility in the structure enables to alter and combine views to have a dynamic and interactive to use for different context setup. The knowledge as object becomes the knowledge process. Knowledge based economy uses the data as its raw material and transforms it using technology, various analysis tools and human intelligence and transforms it into knowledge and expertise. The knowledge-based economy is one where the generation and utilization of knowledge contribute to a significant part in economic growth and wealth creation. While traditional factors of production, that is labor, capital, raw materials and entrepreneurship, remain important, knowledge will be the key factor driving growth, creating new value and providing the basis to remain competitive. While information technology will be the fundamental enabling tool, the nucleus of the knowledge-based economy will be human capital - essentially the capacity to create, innovate, generate and exploit new ideas as well as apply technology and exercise superior entrepreneurial skills. Existing industries will become more knowledge-intensive, while new knowledge-based and enabling industries will emerge. Accordingly, the economy will be characterized by knowledge-based activities and high-technology industries accounting for a significant share of employment, Gross Domestic Product (GDP) and exports. Besides being a factor of production, knowledge of technology adaptation and management orientation will become a specified commodity to be traded.

The cultural pluralism in India makes the immediate requirement for a knowledge platform to address the issues, which can be accessed by the participants of larger unified innovation ecosystem beyond, geographical and culture boundaries. This escalates the concept of local approach to a global solution through building social capital. It demands the specific resources and capabilities and commands its space for incubating scalable, sustainable, inclusive innovation. The talented, educated, and multicultural young talent base would serve the base for scale and scope of innovation in emerging country perspective. The nature and the structure of the platform would be addressing the purpose of innovation in terms of maximization of efficiency and optimization of capacity. The balancing of scale, scope, and speed of innovations would ensure the effectiveness of the platform as a whole. This also ensures the quality of the knowledge exchange initiatives. The outline of the knowledge platform exhibits the innovation converging multi-culture, multi-disciplinary, multi-domain approach to address the issues of sustainability, scalability, inclusiveness of innovation. The higher education institutions (HEI) like **Indian Institute of Technology** in India aptly fit to conceptualize elevated space. A specific case in IIT kharagpur suggests the potential of

a platform (Fig. 1), built on the facilities and capabilities in the ecosystem. The TBI (technology Business Incubation) Lab at Science and Technology Entrepreneurship Park IIT Kharagpur, GVL (Global Venture Lab) of University consortia at IIT Kharagpur, and ILAB (Innovation Lab) at Rajendra Mishra School of Engineering Entrepreneurship, IIT Kharagpur invoke the conceptualization of a knowledge platform.

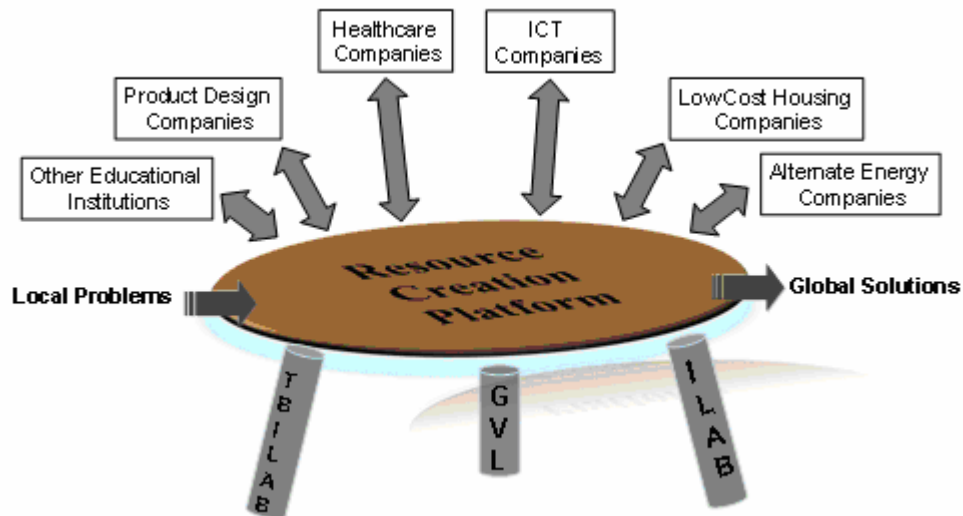


Figure 1. Resource Center Approach: A Conceptualization at IIT Kharagpur

The rate of opportunity finding in a complex environmental situation of emerging economy is dependent on the information sharing and knowledge dissemination. The entrepreneurial organizations aiming for technological innovation, the monitoring and managing the flow of technology information is a prerequisite. The ability of the organization to recognize the relevant information, assimilation and apply is related to its absorptive capacity (Kohen and Levinthal, 1990). This capacity is the critical part of organization's innovation capability. The potential of information and communication technology in a purposeful manner in this direction is thus critical. It becomes the faster way of fighting the competition by the stakeholders of the innovation network. The creation of an external environment that has social and cultural norms favorable to innovation is likely to produce more innovation and entrepreneurial organization (Hofstede, 1991; Baumol, 1992; Shane, 1993). The social economists coined the term as regional innovation system to describe collective setting of industrial organizations, academic institutions, and government along with the Science and Technology parks. The resource platform can work in a bigger and effective way supporting the collective conceptualization. The concept of the

resource platform acts as a facilitator to the entrepreneurial firms to (1) offer relevant information and communication, (2) control the behavior and integrate the efforts at global level, (3) act as a repository of the sticky knowledge in the entrepreneurial building process, (4) help in finding the appropriate fund raising, and (5) support with expert guidance from global knowledge sources.

**Concluding remarks:**

This paper has examined a broad spectrum of literature concerning the innovation and entrepreneurial development process at micro and macro levels of understandings and extracted the relevant concepts for designing a resource platform facilitating the process of entrepreneurship development in emerging country perspective. The paper goes beyond the understanding of tacit and codified knowledge, and conceptualizes knowledge base in terms of synthetic, analytical, and symbolic knowledge. These distinctions lead to the specifics of knowledge creation, development, and utilization for identified industry domains. The criteria of successful strategies, actions, and outcomes of converting knowledge into structured innovation and compete with transmitting and absorbing new knowledge base are identified. This study argues the need and conceptualizes the knowledge platform in identifying, incubating, innovating, and creating micro enterprises focused on social requirements. It fosters the multi disciplinary knowledge platform as a framework for sustainable, scalable, inclusive innovation in emerging country perspective. The role of higher education institution is identified, evaluated, and re-conceptualized through this paper.

**Reference:**

- Baber, Z. 2001. Globalization and scientific research: The emerging triple helix of State-Industry-University relations in Japan and Singapore. *Bulletin of Science Technology Society*, 21(5), 401-408.
- Baumol, W. J. 1993. *Entrepreneurship, Management, and the structure of payoffs*. MIT Press. Cambridge.
- Besant, J. S., et. al. 1996. Learning to manage innovation, *Technology Analysis and Strategic Management*, 8(1), 59-70.
- Biswas, D., Amrita., Saurabh, P., & Das, P. 2010. The education-enterprise model and its interaction to Indian healthcare sector, *Combi2010*, Laurea Publications, 210-225.
- Biswas, D. 2008. Role of Education-Enterprise Model for Developing Growth Ventures in Differing Economic Contexts, *Keynote: EBRF Conference-2008*, University of Jyväskylä, Finland.

- Brown, J. S. & Dugaid, P. 2000. Mysteries of the region: Knowledge dynamics in Silicon Valley, in Miller et. Al. (Ed.), *The Silicon Valley edge: A Habitat for innovation and Entrepreneurship*. Stanford University Press, Paolo Alto.
- Bruton, G.D., & Rubanik, Y. 2002. Resources of the firm: Russian high-technology startups, and firm growth. *Journal of Business Venturing*, 17, 553-577.
- Etzkowitz, H. 2002. *The Triple Helix of University - Industry – Government Implications for Policy and Evaluation*, Working paper 2002-11, ISSN 1650-3821, Institutet för studier av utbildning och forskning, Stockholm.
- Freeman, C. 1987. *National System of Innovation: A Case of Japan Technology policy and Economic Performance: Lessons from Japan*. Printer Publishers. London.
- Friedman, T. 2005. *The World Is Flat: A Brief History of the Twenty-First Century*, Publisher by Farrar, Straus and Giroux, ISBN -0374-23288-4.
- Gibbons, M, Limoges, C., Nowtny, H., Schwartzman, S., Scott, P., and Trow, M. 1994. *The new production of science: The dynamics of science research in Contemporary societies*. Sage Publications.
- Hall, B. 2005. *Innovation and Diffusion*, in Fagerberg, J., Mowery, D. and Nelson, R. (Eds.), *The Oxford Handbook of Innovation*, Oxford University Press, Oxford.
- Hoskisson, R. E., Eden, L., Lau, C. M., & Wright, M. 2000. Strategy in emerging economies. *Academy of Management Journal*, 43, 249-267.
- Hofstede, G. H. 1991. *Cultures and organizations. Software of the mind*. McGraw Hill. London.
- Hoskisson, R. E., Eden, L., Lau, C. M., & Wright, M. 2002. Strategy in emerging economies. *Academy of Management Journal*, 43, 249-267.
- Kogut, B., & Zander, U. 1992. Knowledge of the firm, combinative capabilities, and the replication of technology. *Organization Science*, Vol.3 pp.383-397.
- Kohen, W. A. & Levinthal, D. A. 1990. Absorptive capacity: A new perspective on learning and innovation. *Administrative Science Quarterly*, 35, 9-30.
- Liebeskind, J. P., Oliver, A. L., Zucker, L., and Bewrer, M. 1996. Social Networks: Learning and flexibility: Sourcing scientific knowledge in new bio-technology firms. *Organization Science*, 7(4), 428-443.
- Lundvall, B. 1992. *National Systems of Innovation: Towards a Theory of Innovation and Interactive Learning*. Printer. London.

- Metcalf, J. S. The Economic Foundation of Technology Policy: Equilibrium and Evolutionary Perspectives. In: Stoneman, P. (ed.). Handbook of Economics of Innovation and Technological Change. Blackwell Publishers. Oxford.
- Morgan, K. 1996. Learning by interacting: Interfirm networks and enterprise support. Network of Enterprise and Local development. OECD (Ed.), OECD, Paris, pp. 53-66.
- Neosi, J., & Bellon, B. 1995. Une Interpretation Evolutioniste Des Politiques Industrielles. Revue D'Economie Industrielle, 71, 213-226.
- Nonaka, I. 1994. A dynamic theory of organizational knowledge creation. Organization Science, Vol.5 pp 14-37.
- Nonaka, I., & H.Takeuchi.1995.The knowledge creating Company. Oxford University Press.
- Patel, V. & Pavitt, K. 1994. National Innovation System: Why they are important, and how they might be measured and compared. Economics of Innovation and New Technology, 3(1), 77-95.
- Porter, M. 1998. Clusters and the new economics of competition. Harvard Business Review, Nov-Dec, 3-54.
- Powell, W.W., & Dimaggio, P.J. 1991. The New Institutionalism in Organizational Analysis, University of Chicago Press, Chicago, IL.
- Shane, S. 1993. Cultural influences on national rates of innovation. Journal of Business Venturing, 8, 59-73.

## Session 5: ICT

POSSIBILITIES AND CHALLENGES IN UTILIZING SOCIALLY MEDIATED SERVICE INNOVATION IN THE CASE OF TELECOM SERVICES ([pdf](#))

Annanperä, Elina; Rohunen, Anna; Markkula, Jouni; Naarmala, Jyri

TOWARDS A FLEXIBLE MULTI-VENDOR MICROPAYMENT SYSTEM ([pdf](#))

Rohunen, Anna; Chan, Kai Wen; Liukkunen, Kari; Tulppo, Tero

# POSSIBILITIES AND CHALLENGES IN UTILIZING SOCIALLY MEDIATED SERVICE INNOVATION IN THE CASE OF TELECOM SERVICES

**Elina Annanperä<sup>1</sup>; Anna Rohunen<sup>2</sup>; Jouni Markkula<sup>3</sup>; Jyri Naarmala<sup>4</sup>**

<sup>1</sup>*Researcher, Department of Information Processing Science, University of Oulu,  
elina.annanpera@oulu.fi*

<sup>2</sup>*Researcher, Department of Information Processing Science, University of Oulu,  
anna.rohunen@oulu.fi*

<sup>3</sup>*Senior Research Fellow, Department of Information Processing Science, University of Oulu,  
jouni.markkula@oulu.fi*

<sup>4</sup>*Development Manager, Anvia Plc, jyri.naarmala@anvia.fi*

## **Abstract**

Open customer involvement methods have started to interest companies as well as researchers due to the increasing popularity of social media. At the same time, awareness of the possibilities for involving customers into the companies' service innovation activities has increased. In this paper, a framework is presented to provide a practical tool for choosing suitable and precise means for service innovation where social media is utilized in appropriate forms. A telecom field setting is used based on a case company and general observations from the field. Using the framework, telecom companies will be able to make informed decisions whether the most suitable service innovation approach for them is more towards open innovation or company centric closed innovation. The optimal service innovation solution for each company should be based on rational decision of the right level of openness and utilisation of the most suitable social media methods and tools in the right phases of the innovation process. The framework can be used for supporting this rational decisions making; how to plan service innovation and what kind of methods and tools to use in specific phases of the process.

## **Keywords**

Open Innovation, Service Design, Social Media, Telecom

## **Acknowledgement**

The study presented in this paper was carried out in Quicksteps research project, funded by The Finnish Funding Agency for Technology and Innovation (Tekes) and consortium of companies. This study is based on collaborative research with Western Finland Centre of Design MUOVA.



## **Introduction**

During the recent years, manufacturing companies have been more and more moving towards services, following the rise of service industry; knowledge-intensive services have become the main economic activity in the western countries (Chesbrough, 2011). In order to be able to guarantee future growth in the service sector, extending service innovation has become a necessity. One possible approach in seeking cutting edge innovations is to involve customers in service innovation. However, bringing customers into the service innovation process can be a challenge to companies.

Open innovation has been promoted as a means to transforming traditional closed in-house innovation to more open form, by including stakeholders of the company in the innovation development. Open innovation is often seen from the company network point of view. However, customers are an extensive creative force in innovation, which can be utilised in generating truly new and useful services. Furthermore, open customer innovation approaches are particularly suitable in service design, as service provisioning involves the customers closely.

The benefits of customer involvement have been demonstrated by Sanden et al. (2006) and Edvardsson et al. (2006) showing that the companies can benefit from having an active relationship with their customers. Engaging customers for creating new innovations is one of the ways for gaining a competitive edge. Within service innovation research, involvement of customers by engaging them in companies' service innovation process is a current trend. Methods and tools for customer involvement have been developed and adapted from product innovation research, where customer involvement has a longer tradition (von Hippel & Katz, 2002).

In the few last years, the use of social media has also been explosively growing. Companies are facing the pressure to join this world and to be present there for their customers. Social media is a good platform for communication and brand building, offering growing variety of different services. In addition, increasingly popular social media has also provided new efficient tools for engaging customers and customer communities in service design. This can facilitate new forms of open innovation as well. However, it is challenging to the companies to make informed decisions about which services are suitable for which kind of activities.

While open innovation paradigm has gained increasing attention during the last decade, open innovation as presented by Chesbrough (2003) is not always an option. Company's business model, market situation and the industry's demands affect on the chosen innovation process. The issue of studying the relationship of open and closed customer innovation leads to the possible customer involvement methods and tools in the service design process.

Our study presented in this paper explores the use of social media in the customer-centric service innovation process. As a part of our ongoing research project, we have developed a decision support framework for choosing appropriate social media methods and tools for service innovation within companies (Annanperä et al. 2011). The preliminary evaluation of the framework, conducted earlier by using case study approach, revealed that the customer-centric approach is not always the best solution for all companies. It may, for example, not fit

to the current business model or company policy. Application of the framework for deciding on most suitable service design activities have revealed that certain business fields may have more obstacles than for using the open customer innovation approaches. Therefore, the framework needs further assessment when making decision about service innovation methods and tools, take into account companies' situation and readiness.

In this paper, we present an evaluation of this framework in a telecom industry service design case, by assessing its validity and applicability to service design challenges in company context. We study how the service design innovation process can be executed in a real company in the telecom industry field. The telecom field has its own special characteristics that make the business environment slightly different in comparison to other fields of business.

This paper is organized as follows. First, we will discuss the current state of service innovation activities and customer involvement in the telecom sector. Then, the framework for socially mediated service innovation will be presented. The case setting is presented after that, and the use of the framework in the case setting presented. Finally, the outcome of the case as well as the lessons learned from the case are discussed and conclusions given.

## **Service innovation in telecom industry**

The telecom industry has recently faced several industry challenges that emphasize the focus of open innovation and partnership collaboration, such as the need to shorten time to market, the need to lower costs of integration, converging industries, and dropping margins on existing services (Nesse 2008). In addition, the industry has stopped looking for killer-applications and thus frequently has to rely on the creativity and technology from outside partners (Nesse 2008). As Bigliardi et al. (2012) state in their study, conducted in the ICT industry, the observed cases of application of open innovation model are diverse as regards dynamics, actors and the target of innovation. However, in the ICT industry all the innovations have to be systemic, meaning that innovations make benefits only if they are used in conjunction with complementary ones (Bigliardi 2012). Therefore, the search for strategic innovation is the key factor that characterizes the companies in the ICT industry (Bigliardi 2012).

Based on the literature, it seems that customer integration in service innovation has not been extensively investigated in the telecom sector yet. In this section, the current state of the use of open innovation methods and customer interaction in the ICT industry and, specifically, in the telecom industry, is discussed. Two studies, one of which focused on customer integration methods and the other on customer interaction in service innovation, are examined and synthesized, in order to gain insight into current uses of open innovation in telecom service design. Customer integration methods used at Deutsche Telekom are first briefly presented, after which the key results of an empirical study of customer interaction in service innovation are summarized. The latter study was conducted in the context of services that do not typically necessitate intensive person-to-person interaction in service production (cleaning and security, financial services industry, information and communications technology services).

## **Examples of application of customer integration methods**

As a part of a consistent open innovation approach, at Deutsche Telekom customers were participating in the development processes as equal partners. The authors state that, in the future, increasing modularization and simplification of service development will involve customers more and more in the development of innovations, in addition to partner companies and institutions. Four customer integration methods were used as follows: lead user method, ideas competition, virtual communities, and toolkits for innovation. (Arnold et al. 2010)

**Lead user method.** The lead user method was used for “online gaming”, including the following phases: defining the search field, ascertaining trends, identifying lead users, and lead user workshop. It was confirmed that the lead user method is generally suitable for use, and the method can be also tailored to other innovation projects. Despite this, the three developed product concepts (casual gaming, linking real and virtual worlds, all-in-one platform) did not fulfil the company’s expectations of the radical level innovation. The authors concluded that, in the future, the aim should be to generate numerous ideas in an open-creative session, to be prioritized and fleshed out only in the final stage, instead of a clear focus on developing one product idea per group.

**Ideas competition.** The ideas competition “Television of the Future” was carried out. The ideas competition was geared to both the developers (including individuals, companies, start-ups, and other institutions) and consumers with no technical know-how. Task specificity and the required level of detail differed for the developers and consumers: higher levels of development were demanded from the developers. Developers were left free to choose any topic (topic areas such as participation in TV, community applications, or new business models were suggested). Further, developers submitted written project proposals, from which the company’s experts selected the 10 best contributions. These projects were assessed by a jury consisting of internal and external experts, and three of the ten participants were selected to qualify for the next stage. Finally these finalists developed their application on Deutsche Telekom’s IPTV platform, and the jury selected the final winner based on the following criteria: usability, customer benefits and quality of the technical solution. When it comes to the end customers, they were asked to submit their own ideas on the “TV of the Future” via video or text messages. Initial results indicate that ideas competitions should also be used in the future as a worthwhile means of integrating customers.

**Virtual communities.** A joint development platform for the future Internet was developed, together with other research institutions. The community that was created encompassed means of interaction with the members and initiation of their own innovation communities. The platform combined multiple developers and organizations and provided access to specific research findings. It facilitated sharing and commenting on ideas. Since there was the access to a large pool of developers specializing in telecommunications and web-based services, the findings of in-house research and development could easily be validated. In addition, joint developments could be implemented. In the future, the use of consumer communities for innovation development can be expected to increase. This matches well the fact that many

telecommunications products are tailored to special communities and frequently include specific community elements.

**Toolkits for Innovation.** A toolkit for innovation was provided to web application developers and geared primarily to enterprise customers and developers. The Deutsche Telekom “Developer Garden” provided network-centric services, such as voice call and short message service that were based on open interfaces. A modular approach was adopted, making it possible to developers to easily integrate core telecommunications network functionalities into their applications and test these without spending a lot of time and money.

### **Examples of customer roles in key innovation activities**

In the study conducted by Kuusisto and Riepula (2011), customer interaction in service innovation was studied, especially in the context of services that do not typically necessitate intensive person-to-person interaction in service production. They examined customer interaction in service innovation in three business service sectors as follows: cleaning and security, financial services industry (FSI), and information and communications technology (ICT) services (12 cases in all). Specifically, intensity of customer interaction and specific customer roles in service innovation processes were investigated. The types of innovation processes in the examined service sectors were also studied. In the study, it was assumed that the innovation processes examined were likely to be more in-house than co-produced with the customer.

In 11 out of the 12 cases, the service development process was characterized as organized and driven by the service company. In three FSI cases and in two ICT cases the structure of the service development was relatively well pre-defined. Instead, in the rest of the cases a multifunctional project development team was set up on an ad hoc basis. The project team was typically made up of the service provider’s own employees, and decisions on the roles and participation of customers in innovation activities were done during the project. In none of the cases, the innovative idea was found in the actual service process but generated before the implementation. In the study, the customer roles were found in key innovation activities (initiation, evaluation, development and testing, launch) as follows:

**Initiation.** Although in the 12 cases the idea was more often generated or born within the innovating firm than initiated by customers, partners or other actors, the analysis conducted in the study revealed that customers acted as important catalysts of service development processes. It was found that customer feedback, suggestion or request often triggered the initiation of the development project. Clear screening activities were not always identified. It is still obvious that some screening and selection activities had taken place already before officially setting up the service development project team (for example, surveying customer reactions to new service ideas). However, also examples of “traditional” screening phase were identified: customers representing different market segments were contacted to obtain their reactions to alternative service features, and to assess purchase intentions.

**Evaluation.** In the study it was discovered that evaluation was not a separate but an overarching activity. In the cases where service development followed a pre-structured model, market size and profitability were evaluated, to some extent, already before a separate development stage. In other cases, evaluation was done along the way. Customer commitment

to take in use or buy the new service was often needed to make the “go” decision, in order to secure resources to development. The authors concluded that customers can have a key role in internal marketing of the service in the innovating firm. If the new service needed to be offered to customers at an early stage, and there was a high pressure to quickly define key service elements and the service process, evaluation was preceded by a “pre-development” phase.

**Development and testing.** With the exception of two FSI cases, customers were involved in development. In some cases, development was first conducted within the innovating firm. Pilot customers were then sought to assess and provide feedback for further specification of service. In the rest of the cases, development application and testing very much took place simultaneously.

**Launch.** In the cases that were studied, no clear separation between testing, implementation, and launching often existed. The launch was seen as a gradual process instead of taking place at a particular point of time. In the cases, after the service had been tested with potential customers or implemented for the first time, the service provider often formalized the service somewhat more, produced marketing material and made publicity for it. The most concrete signs of launching were found as follows: pushing out a press release, adding the service to the company’s website, and starting to offer the service for customers as a part of the normal tendering process.

### **Discussion on the current uses of open innovation in telecom service design**

Based on the findings presented in the two studies described above, it seems that various methods for customer integration and interaction exist and are used in the telecom sector. These methods vary in terms of intensity of the customer involvement in the idea generation stage, the level of the task specificity, and how detailed product knowledge is demanded from the customers. For example, in ideas competition the customers are invited to submit their ideas, to be assessed by experts. On the other hand, in the study by Kuusisto and Riepula (2011), it was found that customers often acted as important catalysts of the service development process, instead of generating the ideas as such. In a similar vein, development is sometimes first conducted in the innovating firm, after which pilot customers are sought to assess and provide feedback for further specification of the service (Kuusisto & Riepula 2011). One challenge related to the existing methods is how to foster generation of radical level innovations. This can be done, for example, through an increase of the number of the ideas at the beginning of the innovation process instead of having a clear focus from start. When it comes to the future use of the customer integration methods, consumer communities, for example, seem a promising method in the telecom sector, where many products are tailored to special communities and including specific community elements.

### **Framework for evaluating socially mediated service innovation**

Open customer involvement in the telecom sector, as presented above, is used to some extent to bring value to the service innovation process of the companies presented above. The idea is not new, however, as these methods are in general a part of service design research as well as open innovation research nowadays. The methods available for customer involvement are

increasing with the increasing of the popularity of social media. The companies are entering social media and seeing the possibilities in collaboration with the users. At the same time the variety of different social media tools and services is increasing, allowing the companies to implement these tools into their service innovation and customer contact strategies.

The background of the framework presented next, was to explore new methodology for service design conducted in cooperation with companies from different fields. The companies' needs for a guided process for their service design activities were recognized during a research project. One of the new methods to be introduced to companies was the use of social media in finding new ideas for services as well as evaluating the viable concept ideas.

The research on social media utilization as a service design tool led to the development of the framework for socially mediating service design, Table 1 (Annanperä et al. 2011). The purpose of this framework is to offer the companies a tool for decision making in their service design activities. The idea is that the company could include in their service design process methods that would suite them best. In each of the stages of the service design process, the company can choose to use either in-house resources or open customer innovation methods, or combine them as needed. The open methods can include the utilisation of social media, as is suggested based on the company cases in our research project.

Service design stage	Tasks and activities	In-house methods	Utilization of Social Media
		Open methods	
Idea - Generation	Gathering information about customer needs	Surveys Interviews Workshops	Observation of Weblogging and microblogging
	Reviewing company assets and strategies	Open idea contests Customer panels Open Internet questionnaires	Networking sites and communities
- Evaluation	Market research Brainstorming  Screening of the ideas Selection of the ideas for concept stage		For example: Facebook Wikis
Concept - Design	Specification of the concept Preparing presentation of the concept, e.g. a visual or chronological presentation (customer journey)	Professional design, in-house specialist team or expert evaluation	Collaboration in content creation  Content sharing and multimedia
- Evaluation	Evaluation of the concept with respect to popularity, feasibility etc. Selection of the concepts for service pilot stage	Open collaborative design Open customer evaluation of the concepts	For example: Flickr Facebook YouTube Ning etc.
Service (pilot) - Design	Creating a mock-up of the service Going through the simulation	Service simulation built by designers in-house evaluation team	Collaboration in content creation
- Evaluation	Evaluating the simulation of the service Selection of the pilot services for service production process	Service simulation with customers collaboration	Games and virtual worlds  For example: Ning Facebook SecondLife

Table 1. Framework for socially mediated service innovation (Annanperä et al. 2011)

The social media utilisation recommendations in Table 1 are based on the planning of the company cases in a project service design research project, as well as in existing research. The framework was constructed based on the needs and possible methods that could be used for open customer involvement in service design, including the use of social media. For instance,

the company could choose to use open, social media tools for gathering ideas for the services by launching an idea competition, where social media users could vote on their favourite ideas. The ideas could then be refined into service concepts as an in-house activity and the decision about the most suitable services to fit the company's service portfolio could be decided based on the company's aims and strategy. Finally, when the service concept is chosen, it is turned into a pilot service that could be again run through by the potential users of the service. This final service evaluation phase could be either conducted with a chosen number of customers coming to try the service with the company representatives, or the service mock-up could be placed online in social media, for the users to try and evaluate. In the latter case, a closed social media tool could be utilized where users could be invited, if a completely open solution seems too open to start with.

During the service design activities in the project the companies went through the service design process. First, their needs were gathered with interviews. The ideas were generated using various service design techniques: workshops, probing, and observation, for instance. The work of preparing the ideas into ready concepts was conducted so that the companies made the decisions regarding their case for the most suitable ideas and concepts for them. The concepts were prepared by service designers, the evaluation of the concepts was conducted using customers and open social media tools and methods in some of the cases and an invitation based closed social media tools in other cases.

## **Application of the framework for a telecom service design problem**

The general need for new ideas for services can be seen from the literature of telecom sector service development. To specify the needs and target the solutions based on the framework, we use as a background reference one of our research project partner companies: a Finnish telecom service operator. The set service innovation problem was to finding novel services that would already exist somewhere in the world, which could be brought in and adapted to local customers. The service design interest would be in finding tools for screening existing trends and service concepts that could be adapted to the existing service portfolio. The emphasis of this kind of need is at the beginning of the service design process, where the ideas for services are gathered.

As is the case in most telecom companies, this company has also started to use social media. Their communications department is promoting the company and answering customers' questions. However, the customers are not requested specifically to provide new ideas for services they would be interested in. Some other telecom companies have more specific customer interaction activities available in their web sites, examples can be found in the web sites of some the biggest telecom players in Europe. (e.g. Orange, TeliaSonera, T-Mobile). As a way to get the customer point of view to service development, the company occasionally uses a form of customer focus group method, where selected customer are gathered together to give feedback to new services.



## **Proposed solutions based on the framework**

Based on the interviews conducted in the company, and the research on found practices in the telecom field, the proposal for the suitable methods for service design was formed. Using the earlier presented framework, the suitable open and closed process parts can be selected. To illustrate the use of the framework and the choices that are estimated as the most suitable ones for the company, options for both closed and open service design activities are presented.

### *Idea generation and evaluation*

In the idea generation and evaluation stages, the company could use social media observation as a closed, in-house activity. This would include following of blogs and conversations, and social media aggregation tools. Although social media use may be seen as an open activity, the observation does not require interaction with the other social media users. If the use of social media was seen unfitting, a more traditional approach would be to invite customers to a workshop to work on some ready scoped ideas that the R&D personnel has found in the internet, or to think of completely new services.

If the company wants to actively engage social media users in finding the solutions to its service design needs, the users could be requested to link the most interesting new telecom services or applications they come across in the net to the company's Facebook page.

### *Concept design and evaluation*

Concept design step can be done as an in-house stage. The company can complete the needed information in order to adapt the idea to the strategy and service portfolio.

On the other hand, in Concept evaluation step, the company could benefit from open user input through social media to evaluate the potential of the service concepts. The recommended tool for this step is Facebook, or alternatively some other social media platform that allows rich communication and sharing of content. In particular, if the company is already using some social media service as its primary communication channel, the same social media channel would possibly serve as the presentation channel for the concept material as well.

### *Service (pilot) design and evaluation*

The service piloting can be done as an in-house activity among the company personnel. In that case, the pilot is constructed by the internal design team, and the evaluation of the pilot can be done by asking company personnel to evaluate the service pilot. Services in the telecom field are often electronic services, so constructing a beta version for the staff to try out could be a convenient solution.

On the other hand, since telecom services can often be piloted online due to their nature, the evaluation could be performed openly. The design of the final concept, if the outside ideas are already taken into consideration and included in the service, can be done by constructing a pilot service internally. The evaluation of the service pilot could be brought to a game like platform (e.g. a Facebook game) or to a virtual reality platform such as SecondLife.

## **Findings on applying the decision support framework**

In the previous chapter, we presented the application of our decision support framework, intended for choosing appropriate social media methods and tools for service innovation, in a case of a telecom industry company. When applying the framework in this business sector, we made the following findings.

The existing research on telecom service design reveals that some big companies in Europe are currently using some forms of open innovation activities in their service design processes. Telecom industry companies in Finland are also starting to collect ideas for new services from their users, as can be seen from their web pages. However, some companies see that they need to guard their ideas more, perhaps because of the competition against the bigger companies in the industry.

Our framework aims at guiding companies' service design process for choosing the most suitable means, tools and methods, for their service design cases, taking into account the prevalent situation. The evaluation of the framework in the telecom industry case was performed to find out how it can be used in a highly competed industry. The companies who are interested in collaborating with its customers via social media have the potential to engage them in different stages of the service design process. The use of social media services for monitoring the current hot topics and emerging trends in conversations and blogs was seen as a good new way of finding novel services from around the world. However, at the service concept evaluation phase, there can be reasons not to leave the developed concepts openly available in social media service. The evaluation of service concepts can be performed as an internal evaluation, for example by some key personnel.

Open, social media utilizing ways of connecting with the customers is becoming more and more popular in the companies. These methods are found useful for tapping into the needs of the customers. It should be noted that social media tools can be used even if a limited number of customers, maybe only certain invited customers, are to be involved in the service design process. There are several closed tools available in the field of social media that suits these situations.

Adoption of open, socially mediated means for service design requires a certain mindset from the companies. This mindset is often related to the company's strategy. There exist studies on the readiness of the companies with respect to open innovation. Corresponding issues have been presented how readiness or maturity with respect to openness has roots in the companies' strategies and how they see the benefits of customer involvement in service design. The companies' readiness to customer-centric open innovation should be clarified before the service design process, in order to fully utilize the potential of the open methods in the service design process, and to make appropriate decisions while using the decision support framework. There are already available some methods for measuring companies' maturity for open innovation. For example, Enkel et al. (2011) have developed a tool that includes a set of questions that can be used by companies to benchmark themselves. The open innovation maturity framework of Enkel et al. (2011) is mainly intended for measuring the current status of the company. It does not include the use of particular methods, such as social media. For future research, our decision support framework could be accompanied by a benchmarking tool for helping the companies in developing their service innovation process.

## Conclusions

Open customer involvement methods have developed recently due to the increasing popularity of social media. At the same time, companies are becoming aware of the possibilities for involving the customers in their service innovation activities. In the telecom sector, various methods for customer integration and interaction exist and are used. These methods vary in terms of intensity of the customer involvement in the idea generation stage, the level of the task specificity, and how detailed product knowledge is demanded from the customers. In this paper, a framework is presented to provide a working tool for choosing suitable and precise means for service innovation where social media is utilized in appropriate forms. Telecom companies will be able to make informed decisions whether the most suitable service innovation approach for them is more towards open innovation or company centric closed innovation. The optimal service innovation solution for each company should be based on rational decision of the right level of openness and utilisation of the most suitable social media methods and tools in the right phases of the innovation process. The framework can be used for supporting this rational decisions making; how to plan service innovation and what kind of methods and tools to use in specific phases of the process.

Based on the case presented here the framework was assessed in the telecom field. There seems to be no immediate need for changing the framework at this point, since it offers different choices for different companies. One of the ideas of the development of the framework was however to provide the companies food for thought for opening their service design processes. Building a tool for helping in the decision making was one aspect of the process change. Recognizing the need to change the internal processes is a key aspect in bringing on the change.

In order to help the companies in the early stages of the moving to open service design methods, there should be a framework that helps the companies to see the different choices they could make in terms of openness and the tools they could use. There is a need for categorising the companies for their readiness for using open solutions and including this point of view to the framework.

## References

- Annanperä, E., Naarmala, J. & Markkula, J. 2011. Breaking the mould: From open to socially mediated service innovation. Nordic Academy of Management Conference 2011 (NFF 2011). Stockholm, Sweden.
- Arnold, H., Erner, M., Möckel, P. & Schläffer, C. 2010. Options for Customer Integration in the Open Innovation Paradigm at Deutsche Telekom. In: Arnold, H., Erner, M., Möckel, P. & Schläffer, C. (Eds.) Applied Technology and Innovation Management: Insights and Experiences from an Industry-Leading Innovation Centre pp. 89-98. Berlin Heidelberg: Springer.
- Bigliardi, B., Dormio, A. I. and Galati, F. 2012. The Adoption of Open Innovation within Telecommunication Industry. European Journal of Innovation Management. Vol. 15, No. 1, 27-54.

- Chesbrough, H.,W. 2003. The Era of Open Innovation. MIT Sloan Management Review, Vol. 44 No. 3, 35-41.
- Chesbrough, H. 2011. Open Service Innovation. San Francisco: Jossey-Bass.
- Chesbrough, H., Vanhaverbeke, W., & West, J. (Eds.) 2006. Open Innovation: Researching a New Paradigm. New York: Oxford University Press.
- Edvardsson, B., Gustafsson, A., Kristensson, P., Magnusson, P. & Matthing, J. 2006. Introduction. In Edvardsson, B., Gustafsson, A., Kristensson, P., Magnusson, P. & Matthing, J. (eds.). *Involving Customers to New Service Development*. Imperial College Press. London.
- Enkel, E., Bell, J. & Hogenkamp, H. 2011. Open Innovation Maturity Framework. International Journal of Innovation Management Vol. 15 No. 6, 1161-1189
- Kuusisto, A. & Rieppula, M. 2011. Customer Interaction in Service Innovation: Seldom Intensive but often Decisive. Case Studies in Three business Service Sectors. International Journal of Technology Management Vol. 55 No. 1-2, 171-186.
- Matthing, J., Sanden, B. & Edvardsson, B. 2004. New service development: learning from and with customers. International Journal of Service Industry Management Vol. 15 No. 5, 479-498.
- Nesse, P. J. 2008. Open service innovation in telecom industry – case study of partnership models enabling 3<sup>rd</sup> party development of novel mobile services. 12<sup>th</sup> International Conference ICIN, Bordeaux, France.
- Rohrbeck, R., Hölzle, K. & Gemünden, H. G. 2009. Opening Up for Competitive Advantage – How Deutsche Telekom Creates an Open Innovation Ecosystem. R&D Management Vol. 39 No. 4, 420-430
- Sanden, B., Gustafsson, A., & Witell, L. 2006. The Role of the Customer in the Development Process. In Edvardsson, B., Gustafsson, A., Kristensson, P., Magnusson, P. & Matthing, J. (eds.), *Involving Customers to New Service Development*. Imperial College Press. London.
- von Hippel, E., & Katz, R. 2002. Shifting Innovation to Users via Toolkits. Management Science Vol. 48 No. 7, 821-833

# Towards a Flexible Multi-vendor Micropayment System

**Anna Rohunen<sup>1</sup>; Kai Wen Chan<sup>2</sup>; Kari Liukkunen<sup>3</sup>; Tero Tulppo<sup>4</sup>**

<sup>1</sup>*Researcher, Department of Information Processing Science, University of Oulu,  
anna.rohunen@oulu.fi*

<sup>2</sup>*Research Assistant, Department of Information Processing Science, University of Oulu,  
usochan@gmail.com*

<sup>3</sup>*Project Manager, Department of Information Processing Science, University of Oulu,  
kari.liukkunen@oulu.fi*

<sup>4</sup>*Researcher, Department of Information Processing Science, University of Oulu,  
tero.tulppo@oulu.fi*

## **Abstract**

To be economically feasible, micropayment systems are expected to be efficient, with low transaction and computing costs. Their security protection should also be light. In addition to an appropriate technological solution, user-related issues such as consumer choice, preferences, and the state of the market have to be taken into account to foster the success of a micropayment system. A micropayment system is a networked good with positive network effects. As the network becomes more valuable and more users join in, a bandwagon effect appears, leading to a positive feedback loop. Further, micropayment markets can be conceptualized as a two-sided market involving both consumers and merchants subject to positive network effects: the value of the system to consumers depends on the number of merchants adopting the system and vice versa. In this study, a micropayment system pilot was developed for a small business with restricted resources, scarce labor force, and a growing number of products and vendors. After discussing the problems of token-based micropayment and the advantages of applying account-based micropayment, an account-based system was considered an appropriate starting point for the pilot system. Smart-M3 platform was chosen as the technical solution for the implementation because of its portability and the scalability of the technology.

## **Keywords**

Electronic Payment System, Micropayment, Multi-vendor, Smart-M3 Platform

## **Acknowledgement**

This paper is based on a research project conducted in the Devices and Interoperability Ecosystem (DIEM) research program, and it was financially supported by the Finnish Funding Agency for Technology and Innovation (Tekes).

## **Introduction**

A micropayment system is an electronic payment system that is intended to provide low-value and high-volume transactions. A low-value transaction means that the actual price of a purchase is small, for example, from a few cents to a dozen euro. Therefore, to be economically feasible, a low-value transaction must be accomplished at very low transaction costs or computing costs. As the profit margin of a single transaction that a micropayment system can benefit from is rather small, the system's success relies on high-volume

transactions: a huge number of low-value transactions. Although the risk of low-value transactions is relatively low, security protection is necessary. The protection, however, should be light-weight in order to reduce transaction costs. Although micropayment systems have remarkable potential for bringing benefits to both consumers and merchants, very few of the existing systems have been successful (See-To et al. 2007).

Abrazhevich (2001) states in his study on the classification and characteristics of electronic payment systems that the whole payment system can fail despite good technological solutions and successful implementation. User-related issues such as consumer choice, preferences, and the state of the market have to be taken into account to ensure users' acceptance. In their study, Tan and Tan (2009) have discovered the critical factors that contribute to the success of an e-micropayment system in the context of a contactless smart-card ticketing system (EasyCard). Their findings show that an e-micropayment system is a networked good with positive network effects. As the network becomes more valuable and more users join in, a bandwagon effect appears, leading finally to a positive feedback loop. In their study, the users were also expecting the operator to increase the number of value-add locations, methods of value-add, and discounts. In addition, the users were of the opinion that the operator needed to attract more transport-related, retail, and large corporations to accept EasyCard. These factors reinforce one another, resulting in a "chicken or egg" situation. Therefore, the operator has to adopt a multi-pronged approach to achieve the ultimate objectives: a broad user base and extensive usage. Further, See-To and al. (2007) emphasize that micropayment markets can be conceptualized as a two-sided market, involving consumers and merchants subject to positive network effects on both sides. This means that the value of the system to consumers depends on the number of merchants adopting the system and vice versa. Based on an analytical model developed in their study, a "survival mass" of merchants and consumers is required for a micropayment system to exist. Similarly, a "critical mass" of the acceptance levels is needed for the market to take off and remain stable.

The objective of this study was to develop and implement a micropayment system pilot for a small business which had its own billing system for its customers. In this study, the context of small business was characterized by restricted resources, scarce labor force, and a growing number of products and vendors. In addition, flexible business relationships with partners, lower entry costs, and management of customer service configuration were perceived as issues to be considered when implementing the pilot system. After conducting a literature review on electronic micropayment systems, an account-based micropayment system was concluded to be an appropriate starting point for the pilot implementation. A few characteristics of electronic payment systems, which were identified in the literature and which were relevant to the micropayment system pilot to be implemented, were used as guidelines for the system development. Smart-M3 platform was considered a technical solution for the implementation because of its portability and the scalability of the technology.

This paper is organized as follows. In the related research section, existing micropayment systems identified in the literature are discussed in the categories of token- and account-based systems. A few characteristics of electronic payment systems, which are relevant to the micropayment system pilot to be developed, are also briefly described. The research setting and methods are then described. Finally, the results and conclusions of the study are presented.

## Related research

A variety of micropayment systems has been developed in recent decades. In this study, micropayment systems are classified into 1) token-based, 2) account-based, and 3) debit card- or credit card-based micropayment systems, according to how a transaction is processed. Several token-based micropayment systems are first introduced, and the reasons for their fall are described, after which account-based micropayment systems are discussed. Debit card- or credit card-based systems are not discussed in this study because most of the processes in card-based systems are managed by the card issuers, such as banks. In addition to the two types of micropayment systems, a few characteristics of electronic payment systems identified in the literature are presented. The presented characteristics are selected based on their relevance to the micropayment system pilot that was developed in this study.

### Token-based micropayment systems

Tokens in a token-based micropayment system are like coins in the real world: they are used for the exchange of goods in the digital realm (Párhonyi et al. 2006). The generation of tokens is highly secured, so fraud and double-spending are prevented. However, the costs associated with the identification of tokens and the central administration of issuing tokens are high. In addition, most micropayment systems have been aimed at providing high security and untraceable transactions, leading the system design to focus on the generation of token cryptographic keys. The token-based approaches of micropayment systems did not spread and deploy on a large scale due to their vendor specificity, token specificity, and rather poor interoperability (Párhonyi et al. 2006). For example, PayWord (Rivest & Shamir 1996), MicroMint (Rivest & Shamir 1996), Payfair (Yen 2001), Millicent (Manasse 1995), and NetPay (Dai & Grundy 2007) are token-based micropayment systems. They will be described briefly below.

- **PayWord** (Rivest & Shamir 1996) is characterized as a credit-based micropayment system. However, it can also be classified as a token-based system because the generation and use of a payword chain are essential within the system. The payword chain is a collection of paywords (tokens). It is generated and signed based on a credit-based certificate and vendor identification. Thus, payword chains are vendor specific. In practice, the vendor does not verify paywords one after another but only verifies the last payword.
- **MicroMint** (Rivest & Shamir 1996) is optimized for unrelated low-value payments. The generation of tokens is rather cheap if the total number of tokens to be generated is high enough. The tokens can be spent separately in transactions. However, they are vendor specific and hence cannot be used across vendors. This drawback hinders the scalability of the system.
- **Payfair** (Yen 2001) enhances the implementation of PayWord and enables a non-vendor-specific, token-based micropayment system. In the system, tokens are created for general purposes. Once users spend tokens on a vendor, the vendor verifies the tokens within the transaction by connecting with the token issuers. In other words, tokens are not self-proven as valid.

A few other examples of micropayment systems that apply specific tokens exist. For example, Millicent (Manasse 1995) applies vendor script issued with authority to help users and vendors claim validation of token spending. NetPay (Dai & Grundy 2007) is based on

PayWord, and it improves the scalability of the payword chain, in which payword tokens can be spent on different vendors.

### **Account-based micropayment systems**

Account-based systems rely on trust of user identification, along with account management. Each user is usually connected to an account profile, which informs the system about the user details (i.e., bank account and preferred payment methods). Typically, users are invoiced on a monthly basis. Recently, account-based micropayment systems have become the most common micropayment system and are widely accepted on the Internet, such as NTT DOCOMO's i-mode, with 47.5 million subscribers in 2011 (NTT DOCOMO), and PayPal, which had over 100 million active registered accounts in 2011 and is available in 25 currencies (Paypal).

### **Characteristics of electronic payment systems**

The characteristics of electronic payment systems identified in the literature (Abrazhevich 2001; Lee et al. 2001; Párhonyi et al. 2006) were assessed and synthesized as regards their relevance to the micropayment system pilot developed in this study. They will be used as guidelines for the system development. The identified characteristics are as follows: scalability, interoperability, type of account validation, ease of use/user friendliness/usability, security, privacy/anonymity, reliability, and traceability and trust. These characteristics are briefly described in Table 1.

<b>Characteristic</b>	<b>Description</b>
Scalability (Abrazhevich 2001; Párhonyi et al. 2006)	The payment system should be scalable so that it can handle the addition of users and merchants. Merchants should be allowed to join without complex processes in order to enable them to focus on their business activities. In an account-based system, there is no need for users to do any installations or configurations.
Interoperability (Abrazhevich 2001; Párhonyi et al. 2006)	An interoperable payment system depends on no dominating organization. However, the current fact is that a standardized and open solution is still lacking. Most popular micropayment systems depend on one or more major commercial organizations.
Type of account validation (Abrazhevich 2001; Lee et al. 2001; Párhonyi et al. 2006)	Although account validation might involve a number of processes on store- and retrieve-related information, the point here is to define the type of validation (i.e., online or offline authorization). Account-based systems rely on one or a few central authorities, so they are mostly implemented as online validation systems.
Ease of use, user friendliness, or usability (Abrazhevich 2001; Lee et al. 2001; Párhonyi et al. 2006)	Registration and signing-in processes should not be too complex. The use of the user interface should be convenient.
Security (Abrazhevich 2001; Lee et al. 2001; Párhonyi et al. 2006)	The payment system has to protect transactions from malicious attacks, and non-repudiation and fraud attempts



al. 2006)	from both users and merchants.
Privacy and anonymity (Abrazhevich 2001; Lee et al. 2001; Párhonyi et al. 2006)	When payment is based on an anonymous system, such as real money, tracing the source of the money and the one who spends it is difficult. An account-based system can complete a transaction without revealing a user's personal information to merchants. However, a transaction is bundled with an account, and the person can be traced back through the transaction.
Reliability (Abrazhevich 2001)	If a payment system is not reliable, users and merchants would not use it. In the case of a payment system, users can simply become convinced of its reliability when their purchased goods are delivered, whereas merchants can claim the amount of money of the goods from the system.
Traceability and trustworthiness (Abrazhevich 2001; Párhonyi et al. 2006)	Although anonymity protects users' information from merchants, the payment system can trace transactions back to the buyer. Trustworthiness is necessitated to make users feel safe about their information and money.

Table 1. Characteristics of micropayment systems that were used as guidelines in the system development

## Research setting and methods

The objective of this study was to develop and implement a micropayment system for a small business. The design science approach by Hevner et al. (2004) was applied, with the micropayment system as a design artifact. The environment, the knowledge base, and the design science research cycles of the study are presented in Figure 1.

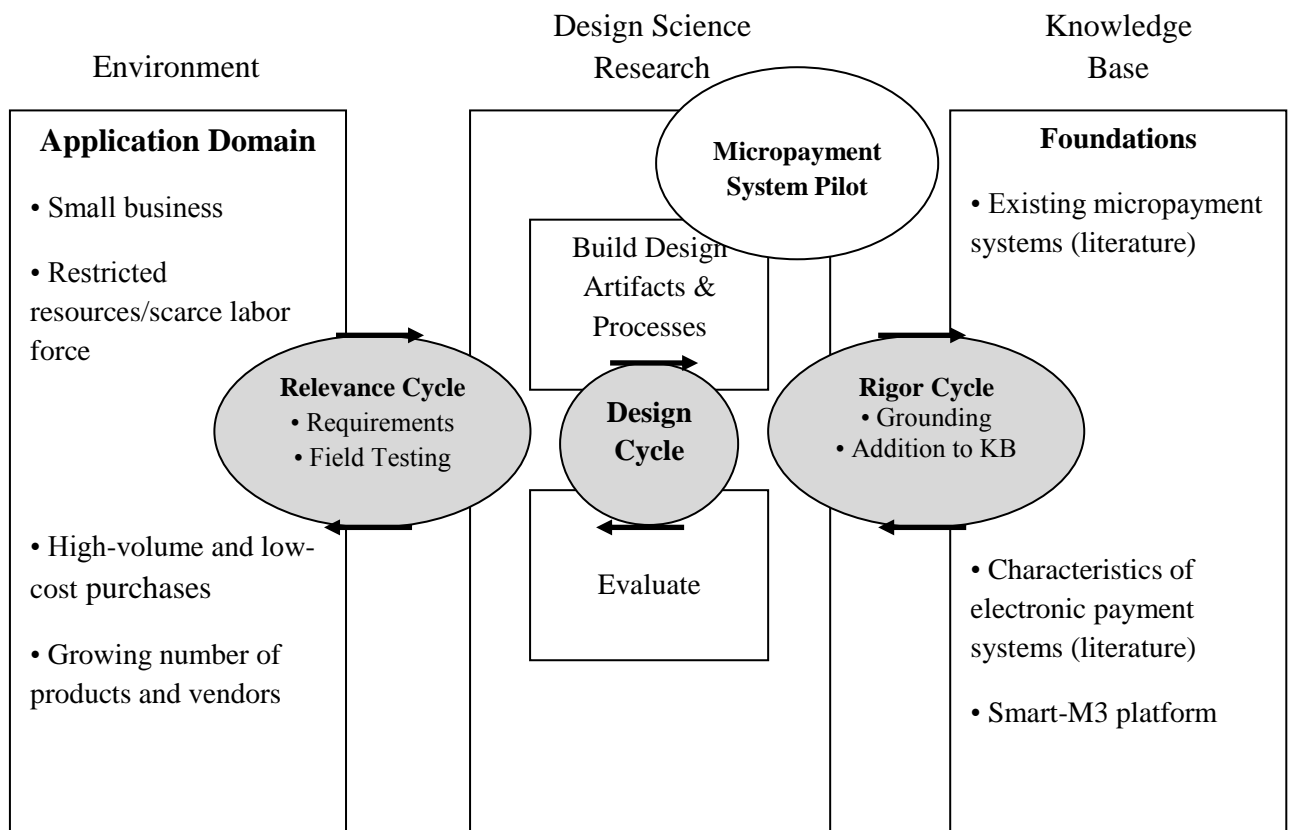


Figure 1. Design science approach utilized in the study

The environment of the study encompasses the following contextual issues that the micropayment system pilot to be implemented intends to solve:

- Small business with restricted resources, especially scarce labor force
- No (direct) cash flow in the use case
- High-volume and low-cost purchases
- Growing number of products and vendors
- Flexible business relationships with partners
- Lower entry costs
- Management of customer service configuration

The system development was based on a knowledge base that consisted of the existing micropayment systems in the categories of token-based micropayment systems (PayWord, MicroMint, Payfair, Millicent, and NetPay) and account-based systems (NTT DOCOMO's i-mode and PayPal). In addition to these existing systems, the knowledge base of this study included the characteristics of electronic payment systems identified in the literature (Abrazhevich 2001; Lee et al. 2001; Párhonyi et al. 2006). The technology-related characteristics "scalability" and "interoperability" were especially found to be relevant to the system to be implemented. Correspondingly, the user-related characteristics "ease of use" and "privacy" were also of essence.

After discussing the problems of token-based micropayment and the advantages of applying account-based micropayment, an account-based system was found to be a suitable starting point for the multi-vendor micropayment system pilot. Smart-M3 platform was considered a technical solution for the implementation of the micropayment system pilot because of its portability and the scalability of the technology. This platform is a knowledge-sharing space between devices and among services within a smart environment, allowing different parties to join with very loose relationships. A typical Smart-M3 platform consists of a semantic information broker (SIB) and several knowledge processors (KP). The SIB stores the messages shared by KPs and decides which KPs can “see and take” the messages. As the relationships between KPs and SIB are rather loose, the communication between KPs is very independent. For example, a user KP informs SIB that the user wants to buy an item. The SIB stores the message in the sharing space and informs the host KP to validate the user account and bill information. Once these are validated, the SIB then informs related merchant KPs to take the messages and deliver goods. In this case, the merchant KPs do not see any user information, and all sensitive processes are done by the host KP without leaking information to irrelevant parties. (Honkola et al. 2009, Honkola et al. 2010)

The micropayment system pilot has not yet been systematically evaluated. However, its performance has been demonstrated in project consortium meetings and field-related events, and feedback from these events has been collected.

## **Results**

In this study, the following goals were achieved utilizing the Smart-M3 platform for the implementation of an account-based micropayment system pilot:

- New vendors can be included in the system without changing the design
- A vendor can join the smart environment easily if it follows the design principle
- Malicious information retrieval and cheating on transactions are prevented
- Bank account and personal data are secured without hindering the transaction process

The overall transaction process of the micropayment system pilot is described below and presented graphically in Figure 2.

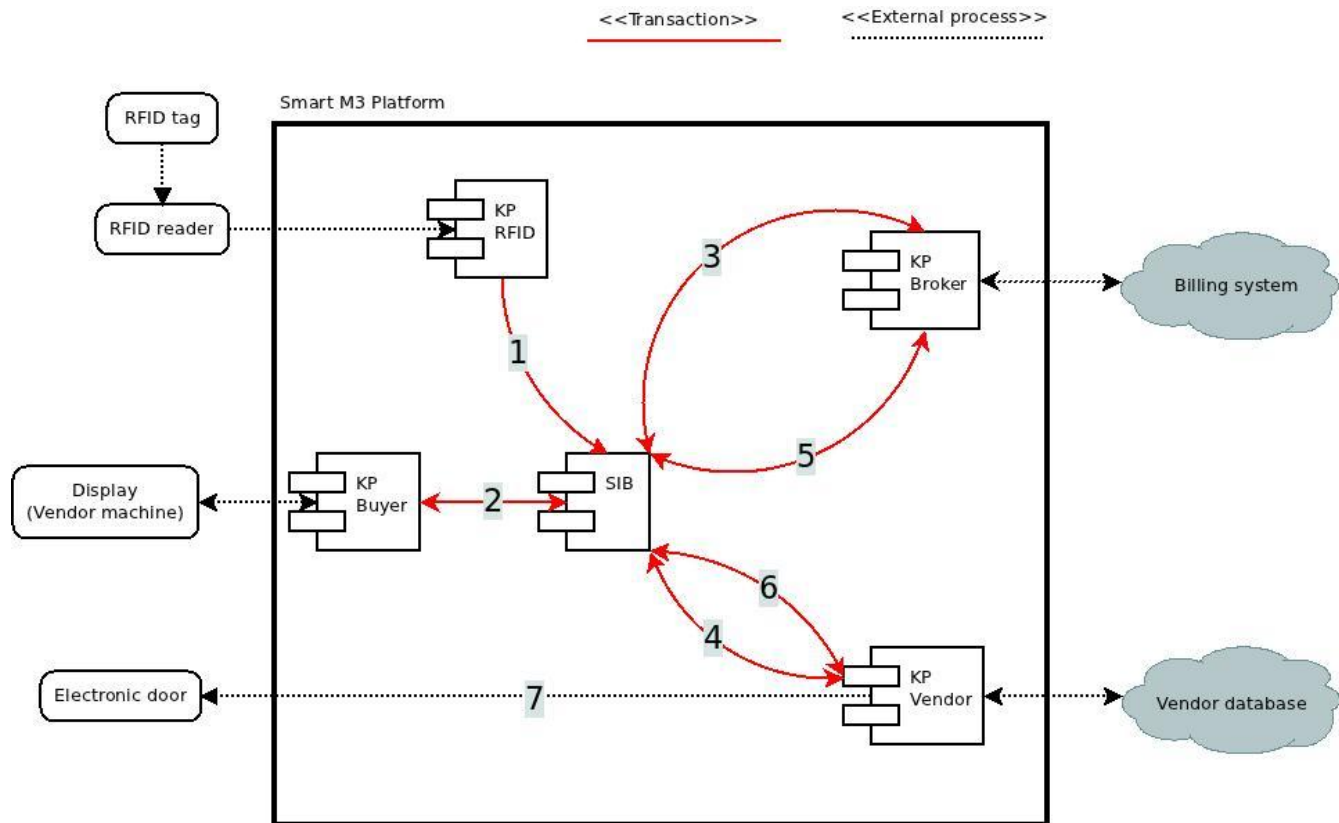


Figure 2. Overall transaction process of the Smart-M3 platform

1. RFID KP is triggered, and it assigns personal information to SIB.
2. Buyer KP is triggered, and it assigns goods information to SIB.
3. Broker KP secures personal information and informs (demanded) Vendor KP to check goods information, which prevents Buyer KP from providing incorrect goods information.
4. Vendor KP confirms the goods information based on the vendor's customized goods database.
5. Broker KP accomplishes the charging and billing process, which prevents cheating on charging, and then informs Vendor KP to deliver the goods.
6. Vendor KP is asked and confirmed to deliver the goods. The goods are delivered.

## Conclusions

The objective of this study was to implement a micropayment system pilot for a small business with restricted resources, scarce labor force, and a growing number of products and vendors. On the basis of the results of a literature review conducted in this study, an account-based system was considered an appropriate starting point for the pilot. In addition, a few characteristics of electronic payment systems taken from the literature (such as scalability, interoperability, ease of use, and privacy) were used as guidelines for the system

development. Smart-M3 platform was considered a technical solution for the implementation of the micropayment system because of its portability and the scalability of the technology.

The micropayment system pilot developed in this study has been demonstrated in project consortium meetings and field-related events. According to the feedback collected from these demonstrations, the system provides a small business with the following advantages:

- Opportunities to establish additional services and products
- Opportunities to further enhance the micropayment application by adding new features through KPs
- Savings due to decreased wage costs related to the sales of supplementary products
- Ease of building KPs that enable new vendors to join to the system
- Opportunities to generate new services based on data from the system

The pilot micropayment system proved to be a suitable solution to a multi-vendor environment while dealing with low-value and high-volume transactions and a growing number of products and vendors. Overall, the system implemented in this study illustrates how micropayment and its network effects can be promoted efficiently and conveniently.

## References

- Abrazhevich, D. 2001. Classification and characteristics of electronic payment systems. Proceedings of the Second International Conference on Electronic Commerce and Web Technologies, 81–90
- Dai, X. & Grundy, J. 2007. NetPay: An Off-line, Decentralized Micro-payment System for Thin-client Applications. Electronic Commerce Research and Applications. Vol. 6. No. 1, 91–101
- Hevner, A., March, R., Salvatore, T., Park, J. & Ram, S. 2004. Design Science in Information Systems Research. MIS Quarterly. Vol. 28. No. 1, 75–105
- Honkola, J., Laine, H., Brown, R. and Oliver, I. 2009. Cross-domain interoperability: a case study. Proceedings of the 9th International Conference on Smart Spaces and Next Generation Wired/Wireless Networking / the 2nd Conference on Smart Spaces, 22–31
- Honkola, J., Laine, H., Brown, R. & Tyrkkö, O. 2010. Smart-M3 information sharing platform. Proceedings of 2010 IEEE Symposium on Computers and Communications, 1041–1046
- Lee, Z.Y., Yu, H.C. & Ku, P.J. 2001. An analysis and comparison of different types of electronic payment systems. Proceedings of the Portland International Conference on Management of Engineering and Technology (Vol. 2), 38–45
- Manasse, M. 1995. The Millicent protocols for electronic commerce. Proceedings of the First USENIX Workshop on Electronic Commerce, 9
- NTT DOCOMO. Operating Data, <<http://nttdocomo.com/about/operating/index.html>>
- PayPal. Financials, <<https://www.paypal-media.com/about>>
- Rivest, R. & Shamir, A. 1996. PayWord and MicroMint: two simple micropayment schemes. Proceedings of the International Workshop on Security Protocols, 69–87

- Párhonyi, R., Nieuwenhuis, L. & Pras, A. 2006. The Fall and Rise of Micropayment Systems. In: Lammer, T. (Ed.) Handbuch E-Money, E-Payment & M-Payment, 343-362. Heidelberg: Springer.
- See-To, E., Jaisingh, J. & Tam, K. 2007. Analysis of electronic micro-payment market. Journal of Electronic Commerce Research. Vol. 8. No. 1, 63-83
- Tan, W.-K. & Tan, Y.-J. 2009. Critical Factors Influencing the Successful Development of e-Micropayment Program. Proceedings of the International Conference on Management and Service Science, 1-4
- Yen, S.-M. 2001. PayFair: a prepaid internet ensuring customer fairness micropayment scheme. Computers and Digital Techniques. Vol. 148. No. 6, 207-213

# Session 6: WELLBEING

BUSINESS ECOSYSTEM UNDER CONSTRUCTION ([pdf](#))

Heikkilä, Marikka; Kuivaniemi, Leni

THE RELATIONSHIP BETWEEN SOCIAL ENTREPRENEURSHIP  
AND SUBJECTIVE WELL-BEING ([pdf](#))

Sajeva, Svetlana; Rybakovas, Egidijus

FUTURE OF COLLABORATION IN MANAGING PRODUCT  
LIFECYCLE INFORMATION AND KNOWLEDGE ([pdf](#))

Lampela, Hannele; Denger, Andrea; Kärkkäinen, Hannu;  
Zoier, Markus

TRUST IN BUILDING HIGH PERFORMING TEAMS ([pdf](#))

Hakanen, Mila; Soudunsaari, Aki

# **Business Ecosystem under Construction**

**Marikka Heikkilä<sup>1</sup>; Leni Kuivaniemi<sup>2</sup>**

<sup>1</sup>Project Researcher, University of Jyväskylä

<sup>2</sup> Assistant Professor, Jyväskylä School of Business and Economics

## **Abstract**

In recent years, we have seen the rise in interest on new service concepts that would take the advantage of capabilities of ecosystems instead that of single companies. In this paper we describe the initial steps on a new business initiative and how the ecosystem starts developing around the core. We use action research approach in one case of building joint service, sports receipt, for health exercise and wellbeing markets. The research paper concludes with an ecosystem model consisting of six sub-ecosystems having different change drivers and clockspeeds.

## **Keywords:**

Business ecosystems, business networks, business model, health exercise and wellbeing (HEW) markets

## **Two challenges of the western world: lack of growth businesses and poor health**

Western countries swim deep in public health problems. News in September 2011 reported that every second Finn sits more than 6 hours per day. The physical activity of around half of the population in Finland is too low and is causing severe health problems (Vuori, 2003). Low activity levels cause increased costs - alone in Finland 400 million euros - in form of additional sick days and early retirement (Fogelholm et al., 2007). It can be stated that one of the biggest risks in well being of western people is the uncontrolled growth of health problems, and in the near future the same challenges are more often faced also in the developing countries.

At the same time world is experiencing a global economic crisis to which governments, politicians as well as researchers attempt to find solutions. As the competition has gotten global and the resources seem scarce, it is obvious that the economic crisis challenges our understanding on what comes to the venturing and business creation as well. Due to the crisis we have an ever-deepening need of new market solutions and growth ventures that are able to create value and at the same time help to solve the big problems of our time. Finding solutions to such problems may require linking the imagination and innovativeness of several actors from various backgrounds and industries into a common business ecosystem.

Our research goal is to describe the various stakeholders needed in creation of a new innovative business. We aim to recognise the different domains of players involved in ecosystem under



construction in the context of a new service for the health exercise and wellbeing market. What kind of players are/should be involved, why and how their inclusion in the initialising ecosystem impacts the operations of the whole? By seeing parties as co-creators of the business model we formulate our qualitative research questions:

1. What are the key sectors of an ecosystem under construction?
2. How do these sectors impact the growth of the ecosystem?

In our previous studies (Heikkilä, 2010) we observed the expansion of the business ecosystem to follow the process of collaborative business modelling depicted in Fig 1. (Heikkilä, 2010).

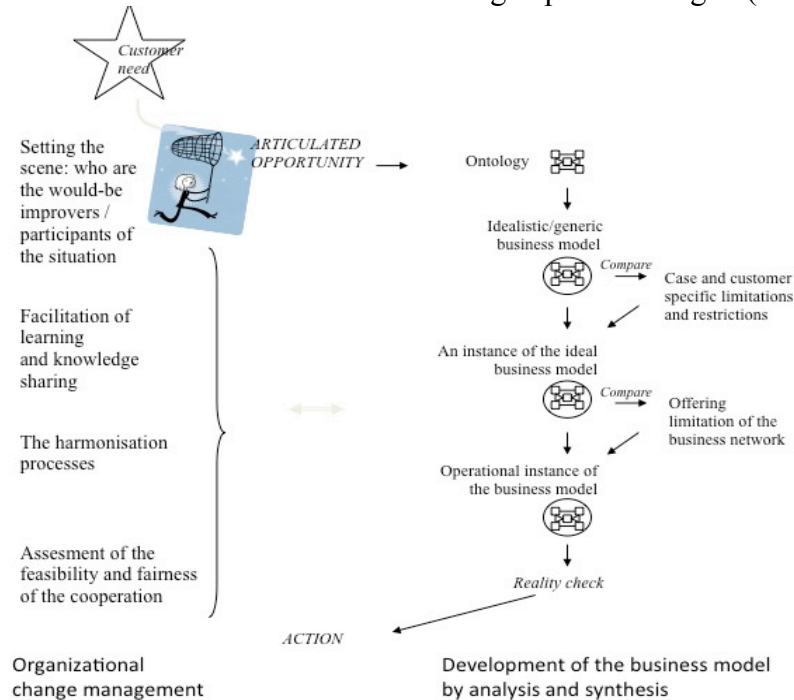


Figure 1. Collaborative process of networked business modelling (Heikkilä, 2010)

The collaborative process consists of two parallel processes: 1) the systematic analysis, improvement and adjustment of business model and its components (on the right hand side of the figure), and 2) the organisational change management process (left hand side). That is, at the same time as the joint business model is being developed, a serious amount of effort has to be put on change management, to select the collaborators and escort the partners to harmonise the network strategy, and to synchronise its operations as well as evaluate the feasibility of the operational business model. In this paper, we are concentrating on the very first tasks of the change management, setting the scene and selection of the players.

The remainder of the paper is organized as follows. In the next chapter, Relevant Research, we review the existing literature on ecosystems. After describing the action research method applied in our research, we present the case study. Finally, in Analysis, we draw some conclusions from the case. We end this paper with a summary, contributions and limitations of this study, and concluding remarks and suggestions for future work.

## **Relevant Research on Ecosystems**

Recently it has become quite common in research literature to conceptualize business networks by comparing them to biological ecosystems (Iansiti & Levien, 2004a p. 35). Similar to biological ecosystems a business ecosystem is formed by large, loosely coupled networks of entities. These entities such as firms, organisations, entrepreneurs etc. interact with each other and the health and performance of each actor is dependent on the health and performance of the whole. That is, the actors are simultaneously influenced by their own capabilities and their interaction ties with the other players in the ecosystem (Håkansson & Ford, 2002). The trend of many firms looking for new opportunities beyond their existing industry explicates (Solaimani et al., 2010) that contemporary ecosystems are not restricted to any single industry but cross a variety of industries (Moore, 1993).

Perhaps the major difference between the concepts of business ecosystem and business network is in the variety of actors. Typically business networks are considered as groups of firms co-operating in designing, producing and delivering products to customers. Business ecosystem, in turn, includes partners and subcontractors but also complementors, competitors, customers and potential collaborator companies as well as public bodies, local incubators, investors and even research institutes and universities (Moore, 1998). An ecosystem is expected to have a heterogeneous structure, with actors adopting dramatically different roles that influence different aspect of the stability and productivity of the whole. This especially is the case when complex knowledge is needed, and the sources of expertise are widely dispersed (Powell et al., 1996).

As Iansiti and Levien (2004b) point out, it is merely an academic exercise to try to draw the boundaries of an ecosystem. Instead it is more helpful to recognize the types of organisations or players that are or would be involved. Each ecosystem typically encompasses several domains that it shares with other ecosystems (Iansiti & Levien, 2004b). At the birth phase innovative ideas may come from large corporations or organisations, but often they are suggested and pushed forward by entrepreneurs, or in spin-off companies. Many of the seeds of new businesses die young, but perhaps are revitalised some later date when getting more fertile grounds.

## **Pragmatic abductive action research**

Fighting Low Activity by Business Creation (abbreviation: LA) is a next generation Tekes funded project. The project focuses on preventing health issues (e.g. obesity, type 2 diabetes) typical of Western industrialized countries by developing significant global export goods based on Finnish wellbeing know-how. These product and service innovations, spread with help of new service business and e-Business models, are expected to have a significant impact on public health and national economy. One example of the business concepts being examined in this project is exercise prescription, an innovation in the field of preventive health care.

Our research method is Action Research, AR, where researchers actively participate in the business decisions by producing knowledge for the players in the ecosystem. Whereas other research methods seek to study organisational phenomena but not to change them, the action

researcher is simultaneously studying the phenomenon and creating organisational change (Heikkilä, 2010; Aspegren et al. 2011).

Action research, building on pragmatist philosophy (Baskerville & Myers, 2004), is an established research method in social sciences. In pragmatism the investigator and the research object are assumed to be interactively linked so that the findings are literally created as the investigation proceeds (Guba & Lincoln, 1994). Here, we researchers are actively taking part in the Ecosystem under Construction (EuC) - the object of our study. We aim to make purposeful use of propositions, models or theories - and question whether they are useful in practice "in the sense of helping people to better cope with the world or to create better organisations" (Wicks & Freeman, 1998, p. 129).

Our theoretical reasoning is moving back and forth between empirical discovery and theory in abductive manner (Paavola, 2004, 2006). Even though having been heavily criticised, abduction is seen as a method to test new ideas or for making sense of new situations (Richardson & Kramer, 2006), which is the case in creation of an ecosystem. The original theoretical framework is successively modified, partly as a result of unanticipated empirical findings, but also of theoretical insights gained during the process (Dubois & Gadde, 2002). By combining partners and researchers, previous knowledge and understanding from several complementing areas, such as business, law, information systems, sports and medicine, we aim to provide new theoretical explanations and practical methods to find potential cures for the western world's problem of meagre physical activity.

## **Case: Exercise prescription**

Previous studies have found written physical activity (PA) prescriptions useful in motivating patients to increase physical activity (Swinburn et al., 1998). Among the most inactive patients the prescriptions supplemented with additional written materials mailed later on to the patients, led to modest short term improvements in self-reported physical activity levels (Smith et al, 2000). A study carried out in Finland pointed out that three most important improvements required in order to increase the usage rate of PA prescriptions are: 1) an electronic prescription system, 2) increased training and 3) better fit of the PA prescription process and tools with the daily practise of the doctors (Ståhl, 2005). So far, the societal embedding of this well being improving innovation has not been a success.

The current case of creating business around physical activity prescription takes advantage of the lessons learned from the pioneering projects above. The business model for sports receipt service was created by an entrepreneur. It requires building an ecosystem around the business. He claims that the previous trials of introducing health exercise prescriptions failed in addition to the above mentioned three reasons also because of 4) missing financial incentives of the supplier side. Where as the previous trials were initiated and run by governmental offices or institutions in an aim to improve wellbeing of the citizens, this time the innovation provides also potential profits for several commercial players in the health and wellbeing industry. It holds a great potential in prevention and care of cardiovascular and musculoskeletal disorders as it offers an easy to use-solution to intervene the patient's health problem caused by lack of exercise.

The entrepreneur agreed with the LA-research project to have the exercise prescription as a case of building ecosystems around new business concepts. With the help of the research group a set of potential core organisations were identified. The figure 2 shows the layers of ecosystem (Moore, 1993; 1998) and the players of the Health Exercise Prescription at the time of writing this paper. There are total 6 organisations involved and negotiations with two more are on going. The other organisations shown in the figure were recognised by the LA researchers based on previous literature.

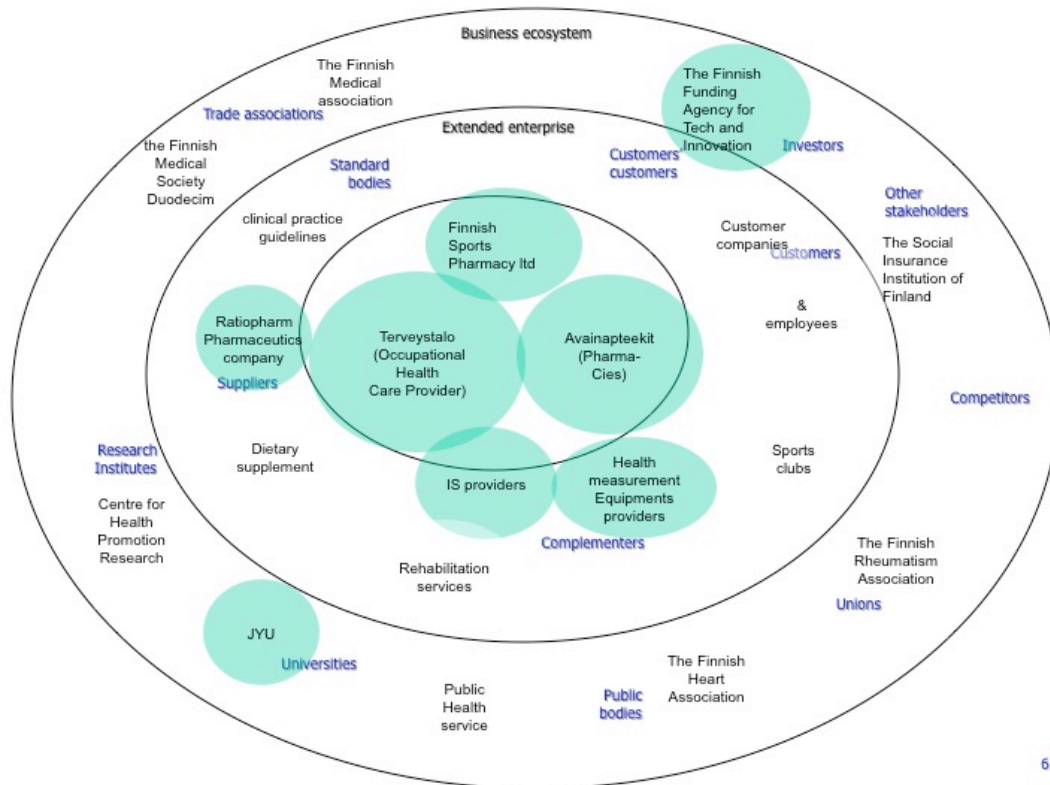


Figure 2. Current state of the ecosystem

Due to the strong business initiative and the drive of the entrepreneur, the exercise prescription captured the attention of the biggest market players in Finland in the HEW industries. Initially, there were several prospects for the core partners, and those pharmacies, pharmaceuticals, and medical centres that had the most interest in the business idea were met in person. After negotiations one of Finland’s leading healthcare service companies, Finnish Terveystalo Pls. was selected to core contributors. Its core assets are doctors and a large customer base: The company has over 2,000 practitioners providing occupational healthcare in more than 150 locations. And it has the customer contacts to companies that purchase occupational health services for their employees. This provides a good fit with the planned business model in which occupational health care patients are considered to be the most important segment of the new service.

In order to improve the customer reach and easy access to the service the entrepreneur wants to involve also pharmacies. In Finland there is at least one pharmacy in each community, in most

communities there are multiple pharmacies. Most of the pharmacies are privately owned. The activities of pharmacies are controlled with licences provided by The Finnish Medicines Agency, a central administrative agency operating under the Ministry of Social Affairs and Health. Currently majority of turnover comes from prescription drugs, but pharmacies are seeking possibilities to expand to service business. They seem to have good possibilities in succeeding in their new strategy since the last survey shows that customers are highly satisfied with the service level of the pharmacies (Apteekkariliitto, 2010). After negotiations a chain of 64 privately owned pharmacies, Avainapteekit Ltd. joined the team. Their task in physical activity prescription business would be counselling and recurrent measuring of the improvement in physical health of the patients.

In addition to the occupational health care company and the pharmacy chain, the company of the entrepreneur, Finnish Sport Pharmacy, naturally holds one of the core positions in the business model. Whereas in previous experiments the researchers and public instances were leading the formation of the ecosystem, in this case the leader is the entrepreneur. His company is focusing on exactly to those issues pointed out as most critical to success: Training of staff, which was the main activity of his company in recent year. Also a large pharmaceutical company in the Finnish prescription and OTC market, ratiopharm Oy, is committed to help in training of practitioners. Even more importantly, he plays the main role in creation of a fluent process that fits with the daily practise of practitioners (and customers) and provides benefits for all the parties involved, and designing and running an electronic prescription system that makes this process possible.

The value add in the new business model does not come from automation of processes but from totally new process consisting of tasks carried out in multiple organisations. This requires also information systems that facilitate and support this process innovation and transformation (Mooney et al, 1996). Currently there are no information systems or measurement equipment in place that would transfer necessary information between the partners. That is why the now on-going second phase in creation of the ecosystem involves business negotiations with information systems providers and health monitoring equipment suppliers. IT is actually the major cost issue the entrepreneur has to solve before a proof of concept can be done to demonstrate whether the business model is fiscally sound. For proof of concept a minimalist prototype or pilot is needed to demonstrate how the business idea will play out in the real world and why, really, all the core companies are needed to provide the services.

## **Analysis of the evolution of the ecosystem**

The idea of boosting physical activity of patients with prescriptions has been suggested by several researchers already in late 90's. In Phase 0, the first pilots were carried out by public instances. The adoption of the sports prescriptions however halted and died down after the public financing ceased. Phase 1 presents the new start, where the development is driven by an entrepreneur, who has invested a lot of time in creating and promoting a business model requiring close collaboration of several companies. The evolution is illustrated in the following figure 3 showing the groups involved in the previous trial in Finland (marked with horizontal lines) and the construction of the current trial (marked with grid). The figure illustrates how previously the ecosystem consisted of mainly the most outer layer; universities and research

institutes working with several unions and associations. In the current case the ecosystem building started from the core and additional partners or collaborators are carefully selected from the next layers.

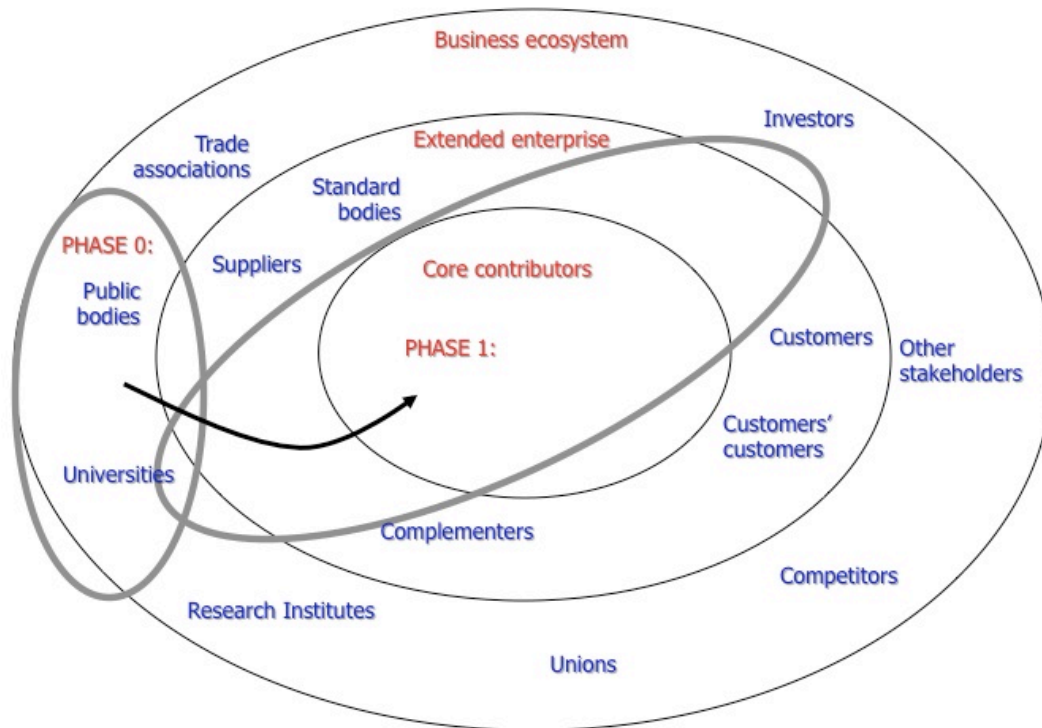


Figure 3. The evolution of the ecosystem of health exercise prescription.

Currently, the challenge in boosting the growth of the ecosystem is how to recognise who are the next actors or areas that should be contacted and involved in collaboration. For doing this, one might find it useful to divide the ecosystem map into differing sub-sectors as we have done in Figure 4. The sectors are recognised from business modelling literature. Business model articles typically list external forces that affect the success of the business. These forces include competition / co-opetition, policies and legal environment, social or technological change and changes in customer demand (Nalebuff & Brandenburger, 1996; eFactors, 2002; Hoffner et al, 2004; Osterwalder, 2004). Furthermore, it is claimed that, in addition to the business, the ecosystem should attract research. The salience of the symbiotic relationship of business and research may be seen in Silicon Valley (Sydänmaalakka, 2011).

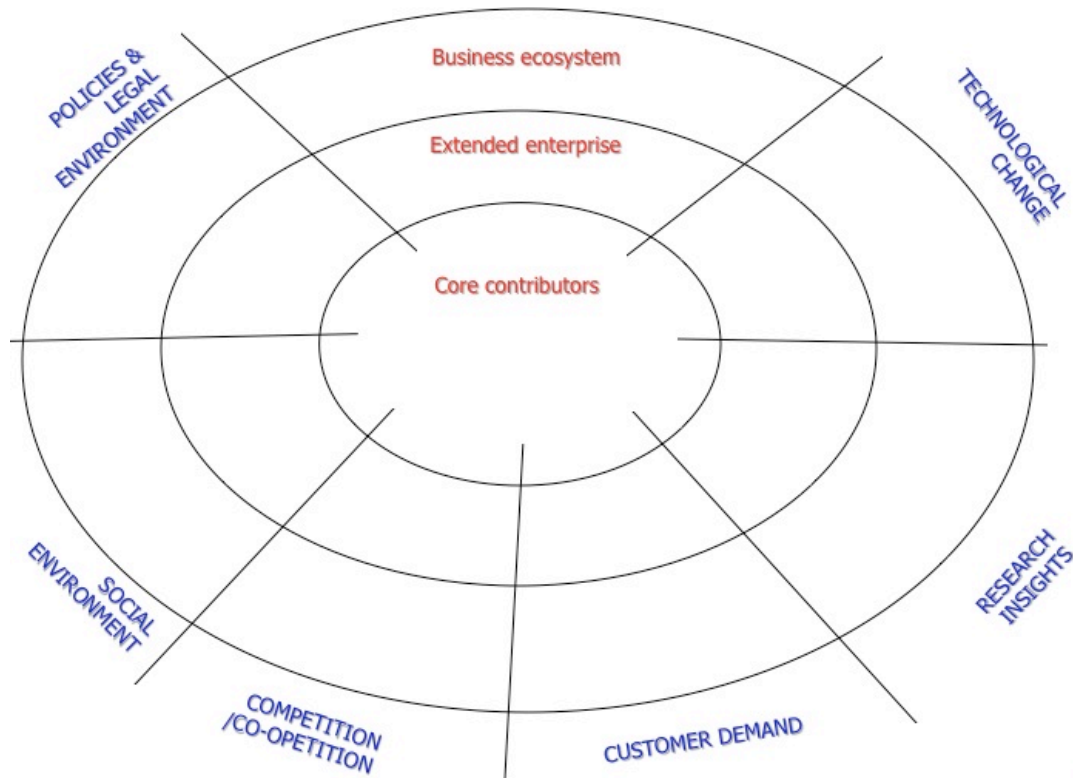


Figure 4. Sub-ecosystems & driving forces of change

We suggest that when considering the expansion of the ecosystem one should carefully consider all the six sub-ecosystems recognised in the Figure 4 and plan in what order the sectors should be covered. Our research so far has already revealed that there are significant differences in the clockspeed of the ecosystems and this should be taken into account in planning. The clockspeed characterizes the general velocity of change in the sector and the pace of the firms' internal operations (Mendelson & Pillai, 1999). We have tentatively placed the sectors in the clockspeed order, fastest being the technology sector and slowest the legal environment and the policy setting. This has practical implications: The sectors one most probable finds actors willing to cooperate in new innovative initiatives are the technology and research sectors. On the other hand, as no quick changes are expected to accrue in legal and social environment, a business initiative can build on the current laws and social custom. However one should always be aware of the status of preparations of new laws and policies, and act accordingly.

## Discussion

This paper presents early results from an on-going action research study on business ecosystem. The business case examined is exercise prescription, an innovation in the field of preventive health care. An entrepreneur who has created the business model is pushing the business

initiative forward. His goal is create a functioning business network consisting of companies that jointly provide health prescription services - profitably. This business network supported with other actors providing and co-creating supplementing services, products and research in co-operation with public institutions forms the ecosystem.

We suggest that the expansion of an ecosystem can be analysed and even perhaps planned by considering six differing sub-ecosystems: Technology, research, customer demands, competitors, social environment, and legal & policy environment.

It can be stated that so far the entrepreneur and the researchers have served as the base for HEW network. In the future we work to widen the network together with the growth entrepreneurs, corporations, as well as by teaming with researchers from different fields. Thus in the future the business and research network will serve as a platform to which the ecosystem is built one piece at the time. The usage of this approach can be seen in it's grandeur form in Silicon Valley, but whereas there it has developed in time and without guidance, our aim is to seek proactively the best fitting components for the ecosystem to flourish.

The ecosystem is built on trust and benefit for all the participants. In the business the gains have to be measurable and quite fast. This sets pressure for the action research, but on the other hand rewards the research team as we receive immediate feedback on our input. Our research hypothesis either work on real market situation or they do not. If they do our research job has wider meaning and impact in/for the society on both health and growth.

## References

- Apteekkariliitto (2010). Apteekkiasiaa päättäjille. Available from [http://www.apteekkariliitto.fi/media/pdf/apteekkiasiaa\\_paattajille\\_2010\\_suomi.pdf](http://www.apteekkariliitto.fi/media/pdf/apteekkiasiaa_paattajille_2010_suomi.pdf)
- Aspegren, C., Joseph, M., Biswas, D. & Seppä, M. (2011). Milestone approach for fund raising of a social enterprise. NFF Conference paper. Stockholm, August 21-24 2011.
- Baskerville, R., & Myers, M (2004). Special issue on action research in information systems: making IS research relevant to practice – foreword. *MIS Quarterly*, 28(3), 329–335.
- Dubois, A., & Gadde, L-E. (2002). Systematic combining: an abductive approach to case research. *Journal of Business Research*, 55, 553–560.
- eFactors (2002). E-business Model Roadmap. Deliverable 3.1. of Information Systems Technologies e-Factors Thematic Network Report, IST-2001-24868.
- Fogelholm, M., Paronen, O. & Miettinen, M. 2007. Liikunta – hyvinvointipoliittinen mahdollisuus. Suomalaisen terveystieteiden tutkimuskeskuksen tila ja kehittyminen 2006. Sosiaali- ja terveysministeriö, Opetusministeriö, UKK-instituutti.
- Guba, E., & Lincoln, Y. (1994). Competing Paradigms in Qualitative Research. In N. Denzin and Y. Lincoln (Eds.), *Handbook of qualitative research*. Sage Publications.
- Heikkilä M. (2010), Coordination of complex operations over organisational boundaries, (Diss. thesis, University of Jyväskylä), Jyväskylä Studies in Computing 111.



- Hoffner Y., Field S., and Facciorusso C., (2004). "The Typed Domain – A Recipe For Creating Virtual Enterprises", Proceedings of the IFIP WCC 2004.
- Håkansson, H., & Ford, D. (2002). How should companies interact in business networks? *Journal of Business Research*, 55, 133-139.
- Iansiti M. & Levien R. (2004a). *Keystone Advantage: What the New Dynamics of Business Ecosystems Mean for Strategy, Innovation, and Sustainability*, Harvard Business School Press Books.
- Iansiti, M. & Levien, R. (2004b). *Strategy as Ecology*. *Harvard Business Review*, March 2004.
- Mendelson, H., & Pillai, R. R. (1999). Industry clockspeed: Measurement and operational implications. *Manufacturing & Service Operations Management*, 1(1), 1-20.
- Mooney, J., Gurbaxani, V., & Kraemer, K. (1996). A Process Oriented framework for Assessing the Business Value of Information Technology. *DATA BASE*, 27(2).
- Moore, J., (1993). *Predators and Prey: A New Ecology of Competition*; Harvard Business Review May/June 1993
- Moore, J. (1998). The Rise of a New Corporate Form. *Washington Quarterly*. Vol. 21(1), 167-181.
- Nalebuff, B., & Brandenburger, A. (1996). *Co-opetition*. Profile Books.
- Osterwalder, A. (2004). *The Business Model Ontology: A Proposition in a Design Science Approach* (Diss. thesis, l'Ecole des Hautes Etudes Commerciales de l'Université de Lausanne).
- Osterwalder, A., & Pigneur, Y. (2002). An e-Business model ontology for modelling e-Business. In Loebbecke et al. (Eds.), *The proceedings of the 15th Bled Conference on E-Commerce*, Bled, Slovenia.
- Osterwalder, A., & Pigneur, Y. (2009). *Business Model Generation*.
- Paavola, S. (2004). Abduction as a logic and methodology of discovery: The importance of strategies. *Foundations of Science*, 9(3), 267-283.
- Paavola, S. (2006). *On the Origin of Ideas : An Abductivist Approach to Discovery* (Diss. thesis, University of Helsinki, Department of Philosophy). Retrieved from <http://urn.fi/URN:ISBN:952-10-3487-4>
- Powell, W.W., Koput, K. and Smith-Doerr, L. (1996). Interorganizational Collaboration and the Locus of Innovation: Networks of Learning in Biotechnology. *Administrative Science Quarterly*. Vol. 41, No. 1 (Mar., 1996), pp. 116-145
- Richardson, R., & Kramer, E. (2006). Abduction as the type of inference that characterizes the development of a grounded theory. *Qualitative Research*, 6, 497-513.
- Smith, B., Bauman, A., Bull, F., Booth, M., and Harris, M. (2000). Promoting physical activity in general practice: a controlled trial of written advice and information materials. *British Journal of Sports Medicine*, 34 (4): 262-267.
- Solaimani, S., Bouwman, H., De Reuver, M. (2010) *Smart Home: Aligning Business Models and Providers' processes; A case survey*, In: *Proceedings of the 21st Australasian Conference on Information Systems (ACIM)*, Brisbane.
- Swinburn, B, Walter, L., Arroll, B., Tilyard, M. and Russell, D. (1998) *The Green Prescription study: A randomised controlled trial of written exercise advice provided by general practitioners*. *American Journal of Public Health*, 88 (2): 288-291.
- Ståhl, T. (2005). RESEPTILLÄ liikkeelle -Liikkumisresepti -hankkeen arviointi. Liikunnan ja kansanterveyden julkaisu 170. Liikunnan ja kansanterveyden edistämisyhteistyö LIKES

- Sydänmaalakka, P. (2011). Johtamisesta on tullut yhä haastavampaa: Miten johtaa verkostoja ja ekosysteemejä? <http://www.pertec.fi/tutkimus/artikkelit/>. 10.10.2011
- Wicks, A., & Freeman, E. (1998). Organization Studies and the New Pragmatism: Positivism, Anti-Positivism, and the Search for Ethics. *Organization Science*, 9(2), 123-140.
- Vuori, I. 2003. Lisää liikuntaa! Edita Prima, Helsinki.

# The Relationship Between Social Entrepreneurship and Subjective Well-being

Svetlana Šajeva<sup>1</sup>; Egidijus Rybakovas<sup>2</sup>

<sup>1</sup> *Kaunas University of Technology, svetlana.sajeva@ktu.lt*

<sup>2</sup> *Kaunas University of Technology, egidijus.rybakovas@ktu.lt*

## Abstract

There are many factors which influence subjective well-being of individuals and communities. Such elements may include demographic factors, social and economic, institutional, environmental, and cultural conditions in economy and society. This study examines how one of these factors, namely, social entrepreneurship, contributes to enhancing subjective well-being at a national context. Researchers define social entrepreneurs as those who create social value by developing innovative solutions to social problems. Subjective well-being refers to people's personal evaluations of their lives. The relationship between social entrepreneurial activities and subjective well-being exists due to the fact that subjective well-being is highly dependent on social circumstances that, in turn, are positively influenced by social activities, provided by social entrepreneurs. A general hypothesis validated in this study is that a higher level of social entrepreneurship in a certain country conditions a higher level of subjective well-being.

## Keywords

Social entrepreneurship, social entrepreneur, subjective well-being, relationship.

## Introduction

The notions of happiness and satisfaction constitute an essential part of life quality. When people get happier, they become more satisfied with their lives, jobs, and attainments. Lyubomirsky, King, and Diener (2005) show that happy people are successful in many spheres of life and this success is at least partly due to their happiness (see Larsen, Eid 2008, 8). Happy people are, among other things, more satisfied with specific domains such as health, finances, and friendship. Happiness of people also brings many benefits for society. As Lyubomirsky (2001, 239) states, happiness has a number of positive by-products, which may benefit not only individuals, but also families, communities, and societies. Citizens that are high in well-being might facilitate governance, they can increase the wealth of a nation by earning more money and creating more opportunities for others, they might be more productive and profitable, they might be healthier, and might create more satisfying social relationships (Larsen, Eid 2008, 9). So, there are many positive consequences that subjective well-being has for a single individual and for society in general.

Researchers of happiness and life satisfaction show that the level of subjective well-being is not much predicted and caused by objective economic factors. Veenhoven (1990) shows that people can be subjectively happy in an objectively bad condition, or feel unhappy in good ones. Pan, Zinkhan, and Sheng (2007) also suggest that economic growth has no effect on

happiness. Much more effect on subjective well-being might be achieved when there is a positive impact on the factors which are directly linked to people's safety and security, meaningfulness of jobs and fluffiness in life, positive social relationships, and so on. These factors are related to social circumstances, and the more improvement people see in these areas, the happier they might be.

Policy makers improve economic and social environment by solving social problems. Significant and quick changes in the social area, however, are hard to attain. Policy is limited to resources, and its effectiveness of directly impacting upon the subjective well-being of individuals and communities is not high. Current social and economic realities show that social policy fails to effectively meet the needs of various groups, and social change is slow. New solutions of how policy could contribute more to social change, which can have positive impact on the well-being of citizens, should be found in this context.

It is accepted that the level of subjective well-being changes in response to changed circumstances (OECD 2011). Thus, the level of subjective well-being may increase by improving a social environment. Social entrepreneurship is suggested to be an effective model of social development and change. This notion is supported by such authors as Nicholls (2006), who stress that social entrepreneurs influence social behaviour for the good. The main areas in which social entrepreneurs create change are poverty alleviation through empowerment, health care, education, environmental preservation, sustainable development, etc.

It is intuitively clear that social entrepreneurship relates to subjective well-being. The evidence of such a relationship, however, has not been determined enough. This encourages exploring the hypothesis that positive changes in social entrepreneurship could have a positive effect on subjective well-being of individuals and communities.

The purpose of this paper is to examine the relationship between social entrepreneurship and subjective well-being at a country level.

In order to achieve this purpose, research literature analysis and the comparison of some selected countries with different development level, using statistical data, have been selected as the main research methods. This research has been based on secondary data from the surveys that represent rankings of nations by different criteria.

The research has been divided into three main sections. As our starting point, we take the investigation of the concepts of subjective well-being and social entrepreneurship. The main focus is to conceptualize subjective well-being in order to understand the concept and to explore its main components. Then we examine how social entrepreneurship can contribute to enhancing subjective well-being of individuals and communities. The relationship between social entrepreneurial activities and the elements of subjective well-being is then analyzed by investigating the correlations between different variables.

This study shows that social entrepreneurship has a potential to improve the subjective well-being of a country or a region. It also contributes to a deeper understanding of the fact that the policy can impact upon a higher level of subjective quality of life through encouraging social entrepreneurship.

## Conceptualization of subjective well-being

The study opens with discovering the concept of subjective well-being and analyzing its distinct components.

Veenhoven (1984) defines subjective well-being as the degree to which an individual judges the overall quality of her or his life as a whole in a favorable way. In order to explore subjective well-being, people are usually asked whether they are happy or satisfied with their life. Typical questions are: ‘Taken all together, how happy would you say you are: very happy, quite happy, happy, not very happy, not at all happy?’ (World Database of Happiness) or ‘All things considered, how satisfied would you say you are with your life these days? Please tell me on a scale of 1 to 10, where 1 means very dissatisfied and 10 means very satisfied?’ (European Quality of Life Survey, 2009). Answers to such questions are used to construct numerical measures of both individual well-being (the well-being of persons) and social well-being (the well-being of groups and communities) (Angner, 2010).

Diener (1984) suggests that there are three hallmarks to the area of subjective well-being. First, it is subjective – it resides within the experience of the individual. Second, it is not just the absence of negative factors; it also includes positive measures. Third, it includes a global assessment rather than only a narrow assessment of one life domain.

Various alternative conceptualizations of subjective well-being have been offered in literature. Common across the definitions of subjective well-being is the fact that subjective well-being is associated with the concept of life satisfaction and happiness in life, and has several components.

Diener (1984) proposes three distinct components of subjective well-being: life satisfaction (global judgments of one’s life), positive affect (experiencing many pleasant emotions and moods), and negative affect (experiencing few unpleasant emotions and moods). More recently, Diener (2000) has also included satisfaction in a specific life domain, e.g., satisfaction with work or health in the definition of subjective well-being. Veenhoven (1991) presented the classification of well-being concepts where the objective and subjective aspects of individual and collective well-being were underlined. Samman (2007) proposes four aspects of subjective well-being, summarized in Table 1 below.

Reference	Components of subjective well-being
Diener (2000, 34)	(1) <i>Life satisfaction</i> (desire to change life; satisfaction with current life; satisfaction with past; satisfaction with future; significant other’s views of one’s life); (2) <i>Satisfaction with important domains</i> (work; family; leisure; health; finances; self; one’s group); (3) <i>Pleasant affect</i> (joy; elation; contentment; pride; affection; happiness; ecstasy); (4) <i>Unpleasant affect</i> (guilt and shame; sadness; anxiety and worry; anger; stress; depression; envy).
Diener, Tov (2012)	(1) <i>Positive (pleasant) emotions and moods</i> (joy; enjoyment, fun; interested; elated, ecstatic; calm, relaxed; affectionate, caring; loving, warm; happy, pleased; proud, pride; grateful, thankful; optimistic; active, energetic; awe, wonder; optimism; nostalgia, reminiscence, etc.); (2) <i>Negative (unpleasant) emotions and moods</i> (anger, rage, irritation; sad,

	melancholy, depressed; fearful, anxious; worried, stressed; guilt, shame; jealous, envious; frustrated; regret, rumination; pessimism, etc.); (3) <i>Cognitive judgments of life and various aspects of life</i> (judgments of life as: satisfying; purposeful; meaningful, etc.; judgments of life domains: work; social relationships; health; leisure; income; housing, etc.; judgments of self-domains: self-efficacy; ability to help one's group; respect from one's group; family is doing well, etc.); (4) <i>Motivational and other concepts reflecting well-being</i> (engagement; optimism; trust; positive energy).
Human Development Report (2010)	(1) <i>Overall life satisfaction</i> ; (2) <i>Satisfaction with personal dimensions of well-being</i> (job; personal health; standard of living); (3) <i>Elements of happiness</i> (purposeful life; treated with respect; social support network); (4) <i>Negative experience</i> .
National Accounts of Well-being, 2009	(1) <i>Personal well-being</i> (transformed Standard Deviation; emotional well-being; positive feelings; absence of negative feelings; satisfying life; vitality; resilience and self-esteem; self-esteem; optimism; resilience; positive functioning; competence; autonomy; engagement; meaning and purpose); (2) <i>Social well-being</i> (supportive relationships; trust and belonging); (3) <i>Well-being at work</i> .
OECD (2011)	(1) <i>Positive experiences</i> (well rested; treated with respect; chose how time was spent; proud of something you did; learned or did something interesting; enjoyment); (2) <i>Negative Experiences</i> (pain; worry; sadness; boredom; depression; anger).
Samman (2007)	(1) <i>Meaning in life</i> ; (2) <i>Self-determination</i> ; (3) <i>Domain-specific</i> and (4) <i>Overall life satisfaction</i> ; and (5) <i>Happiness</i> .
Veenhoven (1991)	(1) <i>Overall individual subjective well-being</i> (life satisfaction; contentment; hedonic level); (2) <i>Aspects of individual subjective well-being</i> (job satisfaction; self-esteem; control belief).

Table 1. Components of subjective well-being

As we can see from Table 1, there are a number of separable components in subjective well-being. Among other parts, overall life satisfaction, pleasant and negative emotions, and satisfaction with specific life domains are widely recognized as the main components of subjective-well-being in research literature. This conceptualization of subjective well-being as composed of several components has also received consistent empirical support in various global surveys and reports, such as Human Development Report (2010) or National Accounts of Well-being (2009).

Each of the components of subjective well-being represents a distinct way of evaluating one's life. The component of *life satisfaction* represents a broad, reflective appraisal a person makes of his or her life. Life satisfaction can also reflect *satisfaction in specific domains of life*, such as money, health, work and employment, social relationships, leisure, housing, and education. *Positive affect* reflects pleasant moods and emotions, such as joy and contentment. *Negative affect* includes moods and emotions that are unpleasant and represents negative responses people experience in reaction to their lives, health, events, and circumstances. In order to explore the relationship between subjective well-being and social entrepreneurship, all of these components must be measured.

## Contribution of social entrepreneurship to subjective well-being

Recent theoretical and empirical studies show a positive link between entrepreneurial activity and the quality of life. Samli (2008, 204) notes that when an entrepreneur develops new solutions to manufacture and distribute products and services, the quality of life for those, who are involved in these activities, improves. Social entrepreneurship is a part of the area of entrepreneurship. According to this, we can make some analogies of how social entrepreneurship can contribute to the quality of life of individuals and communities. By making the analogy with entrepreneurship's positive impact on the characteristics of societal quality of life, we also see a strong link between social entrepreneurship and subjective well-being.

According to Zahra et al. (2008, 118) 'social entrepreneurship encompasses the activities and processes undertaken to discover, define, and exploit opportunities in order to enhance social wealth by creating new ventures or managing existing organizations in an innovative manner'. Although social entrepreneurship may differ in forms, size, and seeking objectives, it has common motives to address social problems.

Nicholls (2006, 13) defines social entrepreneurship by its two constituent elements: a prime strategic focus on social impact and an innovative approach to achieving its mission. According to the author, the combination of a social mission and entrepreneurial creativity marks out social entrepreneurship as distinct from other public, private, or civil sector activities.

Social entrepreneurs, among their other roles, play the role of change agents by adopting a mission to create and sustain social value (not just private value). They seek to achieve a balance between the creation of social value and motivation to maximize financial return. They seek to solve social problems or engage with a key social issue (Shastri, Banerjee, 2010). This means that the creation of social value is of high priority among social entrepreneurs. As Dees (1998) states, for social entrepreneurs a social mission is central. The social mission focus equates to the identification of an unmet social need or a new social value creation opportunity (Nicholls 2006, 13). The term "social" refers to the fact that social entrepreneurs develop products and services which 'cater directly to basic human needs that remain unsatisfied by current economic or social institutions' (Seelos, Mair, 2006, 243-244).

The summary of the role of social entrepreneurship in enhancing subjective well-being follows in Table 2.

Role of Social Entrepreneurship	Contribution of Social Entrepreneurship to Subjective Well-being
Provides innovative solutions to unsolved social problems (OECD 2010).	If innovation has direct effects on economic growth and economic growth (or income) has direct effects on subjective well-being, then innovation may well have causal consequences for subjective well-being (Dolan et al., 2008).
Recognizes social problems (Shastri, Banerjee 2010).	Social entrepreneurs are oriented to solving social problems that are important in society. These social problems include the questions of tolerance, freedom, unemployment, lost productivity, and other which are germane to the quality of human life.

Improves people's lives by promoting social changes (Shastri, Banerjee 2010).	There is a wide range of social needs that remain unsatisfied by markets or social systems. By paying direct attention to such needs, social entrepreneurs achieve social change. Social change refers to the social transition initiated by social and economic reforms. Improvement in social and economic policy in turn could lead to enhancing the life quality of people.
Addresses serious social problems on a worldwide scale while enhancing social wealth (Zahra et al. 2008).	In social entrepreneurship, social wealth creation is the primary objective (Mair, Marti, 2006). Entrepreneurs enhance social wealth by creating new markets, new industries, new technology, new institutional forms, and new jobs (Mair, Marti, 2006). All these contribute to higher economic development that reflects in higher income. There is an evidence of a positive relationship between income and subjective well-being within countries (Diener 2009, 26). Research also shows that, in wealthy nations, basic needs are better met and people are more likely to feel safe and secure (Diener 2009, 167). All of these attributes also indicate higher subjective well-being.
Caters to basic human needs (Seelos, Mair 2005, 241).	Subjective well-being is affected by the fulfillment of basic needs. When basic needs are not met, the well-being of individuals and societies tends to decrease (Diener 2009, 157). Researchers show that in the countries where the basic needs of people are met more effectively, the level of subjective well-being is higher.
Encourages established corporations to take on greater social responsibility (Seelos, Mair 2005, 241).	Corporations that take responsibility for meeting social and environmental challenges more actively provide major social effect by social investment and philanthropy programmes. Ethical and socially responsible business decisions could affect many different people, groups, and institutions, which, in turn, can influence the well being of society. For example, the link between corporate social responsibility and job satisfaction (well-being at work) is recognized (Tamm, Eamets, Mõtsmees, 2010).
Creates employment (Nicholls 2006).	Studies consistently show a large negative effect of individual unemployment upon subjective well-being. Campbell et al. (1976) state that unemployed people are the unhappiest group, even when income differences are controlled (see Diener 2009). Studies also show that national unemployment rates reduce subjective well-being (Dolan, Peasgood, White, 2008).
Addresses the areas of unmet social need (Nicholls 2006).	Social entrepreneurship provides goods and services which the market or public sector are either unwilling or unable to provide. This may lead to higher satisfaction with different life domains.
Fosters pathways to integrate socially excluded people (Nicholls 2006).	Social entrepreneurs target underserved, neglected, or highly disadvantages populations. Integrating socially excluded people allows them to realize their human and social potential. An increased activity of people improves their subjective well-being.

Table 2. Social entrepreneurship's contribution to subjective well-being

Summarizing the analysis carried out, we can make two key premises. First, a social entrepreneurial activity is an effective mechanism for generating social value and a promising



instrument for addressing social needs; second, social entrepreneurship leads to social transformation which develops positive attitudes of individuals towards their lives. This confirms the idea that social entrepreneurship, as a mechanism that leads societies to more efficient social and economic outcomes, can improve individuals and communities' lives and can increase their well-being. A theoretical assumption of the relationship between social entrepreneurship and subjective well-being is then examined by exploring the interrelatedness of the selected variables.

## **The evidence of the relationship between social entrepreneurship and subjective well-being**

In order to test the link between social entrepreneurship and subjective well-being, secondary data from the surveys that represent rankings of nations, using criteria of social entrepreneurship and subjective well-being, have been explored.

This study uses the data on 47 selected countries from surveys, conducted in 2009 through 2011. It is important to note that the data on social entrepreneurship on which this paper has been based is available only from a sole survey presented by Bosma, Levie and Global Entrepreneurship Research Association (2010). This limits the scope of the research. That is why the results of this study can not be used to provide an in-depth explanation of the treated relationship and can only be used as an initial insight into the research problem.

### **Variables and sources of data**

Data from the Global Entrepreneurship Monitor (GEM) 2009 are used as the main data source of social entrepreneurship across countries. GEM is an international research program that provides annual data on entrepreneurial activity at the national level with the samples of randomly selected adults in each participating country. GEM 2009 includes a special study of social entrepreneurship, based on the interviews with 150,000 adults in 49 countries. In order to identify the socially entrepreneurially active population, GEM 2009 asked each respondent the following question: *'Are you, alone or with others, currently trying to start or currently owning and managing any kind of activity, organization or initiative that has a particularly social, environmental or community objective? We refer to this group as 'social entrepreneurs'*.

As literature research has shown, there is a large number of possible indicators of subjective well-being: overall life satisfaction, satisfaction with specific life domains, happiness, and emotional well-being. This study has chosen to focus primarily on eleven most widely used indicators: average happiness, overall life satisfaction, positive and negative experience, satisfaction with job, personal health, living standard, and some other.

Data on subjective well-being in 2009 through 2011 can be found in several reports and databases. The World Database of Happiness, the OECD website Better Life Initiative, the Eurobarometer survey, National Accounts of Well-being, and Human Development Report are among the main sources used in the present research for the data that represent rankings of nations using the criteria of subjective well-being.

	Source of data	GEM 2009	GEM 2009	GEM 2009	GEM 2009	GEM 2011	HDR 2010	HDR 2011	HDR 2010	HDR 2010	HDR 2010	HDR 2010	WDH 2000-2009	OECD 2010	Eurobarometer 2009	Eurobarometer 2010	NAW 2009	NAW 2009	NAW 2009
Economy	Country/ Variable	Nascent Social Entrepreneurial Activity. %. 2009	Social Entrepreneurial Activity in New Organizations. %. 2009	Social Entrepreneurial Activity in Established Organizations. %. 2009	Social Entrepreneurial Activity in Early-Stage Organizations. %. 2009	Total Social Entrepreneurship. % of the working population. 2009	Overall life satisfaction (scale 0-10). 2006-2009	Overall life satisfaction (scale 0-10). 2006-2010	Satisfaction with job. 2006-2009. % of employed respondents who are satisfied	Satisfaction with personal health. 2006-2009. % of employed respondents who are satisfied	Satisfaction with standard of living. 2006-2009. % of employed respondents who are satisfied	Negative experience index (scale 0. most negative-100. least negative). 2006-2009	Average Happiness. 2000-2009 (scale 0-10)	Positive Experience Index. 2009	Life satisfaction. 2009 I1 (Very satisfied. %)	Life satisfaction. 2010 I1 (Very satisfied. %)	Personal well-being	Social well-being	Well-being at work
Factor-Driven	Algeria	0.8	0.3	0	1.1	1.9	5.6	5.3	66	87	61	33	5.4	-	-	-	-	-	-
	Guatemala	0.1	0	0	0.1	0.5	7.7	6.3	92	88	76	23	7.2	-	-	-	-	-	-
	Jamaica	1.2	2.3	0.6	3.4	6.8	6.7	6.2	82	88	50	18	6.7	-	-	-	-	-	-
	Morocco	0.3	0.3	0.3	0.4	0.8	5.8	4.7	69	88	71	19	5.4	-	-	-	-	-	-
	Saudi Arabia	0.1	0.1	0	0.2	0.2	7.7	6.3	92	84	77	19	6.5	-	-	-	-	-	-
	Syria	0.7	0.2	0	0.9	1	5.9	4.5		89	67	31	5.9	-	-	-	-	-	-
	Uganda	0.7	1.6	0.8	2.2	4.1	4.5	4.2	53	64	35	31	4.8	-	-	-	-	-	-
	Venezuela	3.4	0.1	0	3.6	4.4	7.8	7.5	86	90	80	19	7.5	-	-	-	-	-	-
Efficiency-Driven	Argentina	2.2	1.9	3	4.1	7.6	7.1	6.4	83	87	70	21	7.3	-	-	-	-	-	-
	Bosnia and Herzegovina	0.6	0.2	0	0.8	0.9	5.8	4.7	76	75	39	25	5.6	-	-	-	-	-	-
	Brazil	0.2	0.2	0	0.4	0.4	7.6	6.8	86	82	74	24	7.5	76.6	-	-	-	-	-
	Chile	1.7	0.8	0.2	2.4	3	6.3	6.6	81	73	68	27	6.6	77.1	-	-	-	-	-
	China	1.4	1.2	0.3	2.6	4	6.4	4.7	78	80	60	17	6.3	72.8	-	-	-	-	-
	Colombia	2.7	0.7	0.1	3.4	5	7.3	6.4	82	84	69	25	7.7	-	-	-	-	-	-
	Croatia	1.3	1.3	1.1	2.6	4.4	6	5.6	-	-	-	28	6	-	-	-	-	-	-
	Dominican Republic	0.8	1.4	0.8	2.2	3.6	7.6	4.7	69	80	57	32	7.6	-	-	-	-	-	-
	Ecuador	0.4	0.1	0	0.5	0.7	6.4	5.8	-	-	-	27	6.4	-	-	-	-	-	-
	Hungary	2	0.6	0.1	2.7	3.9	5.7	4.7	83	69	43	26	5.5	64.8	5	5	4.41	5.1	4.8

	Iran	1	0.3	0.2	1.4	2	5.6	5.1	71	82	55	37	5.9	-	-	-	-	-	-
	Jordan	0.3	0.3	0.1	0.6	0.9	5.7	5.6	80	89	72	28	5.9	-	-	-	-	-	-
	Latvia	1.4	0.5	0.7	1.9	2.8	5.4	4.7	79	63	33	24	5.4	-	9	8	-	-	-
	Malaysia	0.2	0	0	0.2	0.2	6.6	5.6	86	87	68	15	6.5	-	-	-	-	-	-
	Panama	0.9	0.3	0.1	1.2	1.7	7.8	7.3	91	85	73	15	7.8	-	-	-	-	-	-
	Peru	3.4	0.1	0.1	3.5	4.1	5.9	5.6	74	72	54	28	6.2	-	-	-	-	-	-
	Romania	1.3	0.3	0.1	1.6	2.6	5.9	4.9	74	65	42	25	5.7	-	5	6	-	-	-
	Russia	0.4	0.2	0.1	0.6	1.2	5.9	5.4	74	56	36	16	5.5	58.8	-	-	-	-	-
	Serbia	0.4	0.7	0.5	1.1	1.8	5.6	4.5	73	73	35	28	5.4	-	-	-	-	-	-
	South Africa	1.2	0.6	0.1	1.8	2.3	5	4.7	66	79	47	24	5.8	71.1	-	-	-	-	-
	Uruguay	1.9	0.7	0.3	2.6	3.2	6.8	6.1	79	84	67	23	6.8	-	-	-	-	-	-
Innovation-Driven	Belgium	1	0.7	0.9	1.7	3	7.3	6.9	89	88	84	24	7.3	73.7	28	29	5.16	4.92	5.4
	Finland	1.2	1.4	1.9	2.6	5.1	8	7.4	90	84	84	15	7.9	72.8	37	31	5.52	5.26	5.2
	France	1.6	0.6	0.4	2.2	2.6	7.1	6.8	87	84	72	29	6.6	72.7	18	18	4.97	4.8	5
	Germany	0.5	0.2	0.4	0.7	1.6	7.2	6.7	88	82	88	22	7.1	73.2	22	24	5.14	4.88	4.9
	Greece	1.3	0.6	0.8	1.9	2.9	6.8	5.8	80	82	57	23	6.4	66.6	8	6	-	-	-
	Hong Kong	0.2	0.2	0.3	0.5	1	6	5.6	81	80	78	26	6	-	-	-	-	-	-
	Iceland	2.3	1.6	1.5	3.9	6.1	7.8	6.9	-	84	82	17	8.2	83.3	-	63	-	-	-
	Israel	0.9	0.9	1.4	1.8	4	7.1	7.4	80	80	71	33	7	63.1	-	-	-	-	-
	Italy	0.8	0.4	0.5	1.2	2.5	6.7	6.4	82	85	77	27	6.7	73.2	7	11	-	-	-
	Republic of Korea	0.4	0.4	0.1	0.7	1.4	6.3	6.1	68	71	71	23	6	61.9	-	-	-	-	-
	Netherlands	0.5	0.4	0.4	0.9	1.5	7.8	7.5	92	85	91	16	7.6	72.2	50	53	5.33	5.3	5.6
	Norway	0.6	0.3	0	0.9	2.2	8.1	7.6	-	82	91	16	7.9	75.5	-	-	5.61	5.77	5.5
	Slovenia	1.3	0.7	1.1	2	3.6	7.1	6.1	88	78	70	26	6.9	66.2	21	21	5.04	4.78	5
	Spain	0.4	0.2	0.2	0.5	0.9	7.6	6.2	86	84	78	29	7.2	72	11	14	5.12	5.58	5.2
	Switzerland	2.4	0.3	0.1	2.7	4.3	8.9	7.5	93	89	89	21	8	76.4	-	-	5.8	5.52	5.5
	United Arab Emirates	2.4	2	0.4	4.3	6.3	7.3	7.1	84	93	78	28	7.3	-	-	-	-	-	-
United Kingdom	0.8	1.3	1.8	2.1	4.2	7.4	7	87	85	88	24	7.1	75.5	42	35	5.07	4.9	5	
United States	2.9	1.1	0.5	3.9	5	7.9	7.2	86	83	75	28	7.4	76.3	-	-	-	-	-	

Notes: SEA – Social Entrepreneurial Activity; GEM – Global Entrepreneurship Monitor; HDR – Human Development Report; WDH – World Database of Happiness; OECD – OECD Factbook; Eurobarometer - Eurobarometer search system; NAW – National Accounts of Well-being.

Table 3. Data used in the study

	Total SE	Nascent SEA	New SEA	Established SEA	Early-Stage SEA	OLS 2009	OLS 2010	JS	HS	LS	NEI	AH	PEI	EBar 2009	EBar 2010	PWB	SWB	WWB
Total Social Entrepreneurship (Total SE)	–	.845**	.774**	.614**	.959**	.218	.285	.039	.043	.020	.034	.343*	.323	.117	.246	.082	-.173	-.157
Nascent SEA (Nascent SEA)	.845**	–	.501**	.323*	.933**	.132	.224	.024	.002	-.085	.075	.256	.302	-.508	-.261	-.164	-.278	-.212
SEA in New Organizations (New SEA)	.774**	.501**	–	.794**	.702**	.059	.094	-.127	-.057	-.083	.107	.180	.198	.378	.459	-.206	-.427	-.147
SEA in Established Organizations (Established SEA)	.614**	.323*	.794**	–	.489**	.100	.137	.041	-.082	.075	.082	.172	.064	.568*	.603*	-.166	-.584	-.193
SEA in Early-Stage Organizations (Early-Stage SEA)	.959**	.933**	.702**	.489**	–	.162	.219	.003	.028	-.069	.075	.295*	.315	-.036	.118	-.110	-.164	-.194
Overall life satisfaction (OLS 2009)	.218	.132	.059	.100	.162	–	.851**	.805**	.436**	.790**	-.418**	.942**	.571**	.837**	.862**	.925**	.770**	.818**
Overall life satisfaction (OLS 2010)	.285	.224	.094	.137	.219	.851**	–	.769**	.441**	.821**	-.348*	.846**	.505*	.872**	.902**	.843**	.551	.811**
Satisfaction with job (JS)	.039	.024	-.127	.041	.003	.805**	.769**	–	.506**	.751**	-.400**	.717**	.458*	.866**	.866**	.878**	.238	.749*
Satisfaction with personal health (HS)	.043	.002	-.057	-.082	.028	.436**	.441**	.506**	–	.572**	-.183	.440**	.523*	.607*	.639*	.516	.240	.629*
Satisfaction with standard of living (LS)	.020	-.085	-.083	.075	-.069	.790**	.821**	.751**	.572**	–	-.309*	.738**	.543**	.841**	.840**	.806**	.522	.710*
Negative experience index (NEI)	.034	.075	.107	.082	.075	-.418**	-.348*	-.400**	-.183	-.309*	–	-.352*	-.075	-.540	-.556*	-.817**	-.427	-.553
Average Happiness (AH)	.343*	.256	.180	.172	.295*	.942**	.846**	.717**	.440**	.738**	-.352*	–	.666**	.815**	.883**	.982**	.708*	.847**
Positive Experience Index (PEI)	.323	.302	.198	.064	.315	.571**	.505*	.458*	.523*	.543**	-.075	.666**	–	.515	.666*	.674*	.260	.427
Life satisfaction (EBar 2009)	.117	-.508	.378	.568*	-.036	.837**	.872**	.866**	.607*	.841**	-.540	.815**	.515	–	.977**	.717*	.117	.570
Life satisfaction (EBar 2010)	.246	-.261	.459	.603*	.118	.862**	.902**	.866**	.639*	.840**	-.556*	.883**	.666*	.977**	–	.717*	.117	.570
Personal well-being (PWB)	.082	-.164	-.206	-.166	-.110	.925**	.843**	.878**	.516	.806**	-.817**	.982**	.674*	.717*	.717*	–	.655*	.807**
Social well-being (SWB)	-.173	-.278	-.427	-.584	-.164	.770**	.551	.238	.240	.522	-.427	.708*	.260	.117	.117	.655*	–	.668*
Well-being at work (WWB)	-.157	-.212	-.147	-.193	-.194	.818**	.811**	.749*	.629*	.710*	-.553	.847**	.427	.570	.570	.807**	.668*	–

Notes: SEA - Social Entrepreneurial Activity

\*\* . Correlation is significant at the 0.01 level (2-tailed). \* . Correlation is significant at the 0.05 level (2-tailed).

Table 4. Correlations between social entrepreneurship and the elements of subjective well-being

The World Database of Happiness, directed by Veenhoven (2012), Erasmus University Rotterdam, offers the opportunity of examining the happiness in 148 nations since 2000 to 2009. Happiness is measured with the help of the following question: *'Taking all things together, how happy would you would you say you are these days? Answers: very happy, quite happy, not very happy, or not at all happy'*.

OECD Better Life Initiative provides Better Life Index which allows comparing well-being across countries, based on 11 topics the OECD has identified as essential, in the areas of material living conditions and quality of life. The report, entitled *'How's Life?'*, released in October 2011, explored these areas in detail. The report has measured and compared the quality of people's lives in the areas of health, education, local environment, personal security, richness of community ties, and the overall satisfaction with life.

Eurobarometer surveys record significant shifts in European public opinion with the social and economic situation across European countries. Life satisfaction is measured using the following question: *'On the whole are you very satisfied, fairly satisfied, not very satisfied or not at all satisfied with the life you lead? Answers: very satisfied, fairly satisfied, not very satisfied, not at all satisfied, don't know'*.

National Accounts of Well-being measures people's subjective well-being: their experiences, feelings and perceptions of how their lives are going, as a new way of assessing societal progress. The Human Development Report is an annual report made by the Human Development Report Office of the United Nations Development Programme. It presents statistical information on different aspects of human development. Several indicators of dimensions of subjective well-being are available in this report.

Table 3 presents the data used for analysis.

### **Correlations of the variables**

Table 4 has summarized the relationship between different indicators by showing the Spearman correlation between the scores in 47 countries. The correlation can vary from 0 (no relation) to 1 (strong relation) or -1 (strong negative relation).

The study shows a significant relationship between social entrepreneurship and two variables of subjective well-being. Total social entrepreneurship has a significant relationship with an average happiness (with the correlation of 0.343,  $p < 0.05$ ). In innovation-driven countries this correlation becomes stronger (0.513,  $p < 0.05$ ), and also quite a strong relationship with positive experience appears ( $r = 0.517$ ,  $p < 0.05$ ).

Different phases of social entrepreneurship can be distinguished, including nascent, young, and established social entrepreneurial activity. The study shows a significant and quite a strong relationship with a rate of social entrepreneurial activity in established organizations and the level life satisfaction (2009:  $r = 0.568$ ,  $p < 0.05$ ; 2010:  $r = 0.603$ ,  $p < 0.05$ ).

The level of social entrepreneurial activity in early-stage organizations has a significant relationship with average happiness (with a correlation of 0.295,  $p < 0.05$ ). In innovation-

driven countries quite a strong correlation between social entrepreneurial activity in early-stage organizations and positive experience index could be seen ( $r = 0.517$ ,  $p < 0.05$ ).

Other social entrepreneurship variables investigated in this paper do not appear to relate to variables of subjective well-being in any significant manner.

The results do not support a strong link between social entrepreneurship and subjective well-being. Social entrepreneurial activities do not directly improve all the aspects of subjective well-being at a national level. Such effect might be indirect or it has not been identified due to study limitations.

A major limitation of the research arises from data accessibility. Only restricted data on subjective well-being and social entrepreneurship is available. We can not see the dynamics of selected variables. That is why this study provides only initial insight on the relationship between social entrepreneurship and subjective well-being. Future researchers may seek to analyze the interrelatedness of social entrepreneurship and subjective well-being at a regional level, where the outcomes of entrepreneurial activities and their impact on the overall and specific judgments of citizens could be measured more precisely.

## **Conclusions**

Social entrepreneurship is recognized as an important element of the contribution to subjective well-being of individuals and communities. Social enterprises address the seizing opportunities which others miss, meeting of social needs, creating social value across social innovations and, consequently, stimulating social change. Social entrepreneurs create social change through empowerment, health care, education, environmental preservation and sustainable development, etc. These areas are linked directly to the areas of subjective well-being. According to this, it has been pointed out in the paper that the more improvements people see in these areas, the more satisfied they are about their lives. The empirical research results about such a relationship between social entrepreneurship and subjective well-being at a national level, however, do not strongly support the assumptions made on the theoretical basis. The strongest relationship was only found for social entrepreneurship and two variables of subjective well-being: average happiness and life satisfaction. The results of other correlations do not show any strong direct link between social entrepreneurial activities and subjective well-being.

## **References**

- Angner, E. 2010. Subjective well-being. *The Journal of Socio-Economics*. Vol. 39, 361-368.
- Bosma, N., Levie, J. & Global Entrepreneurship Research Association. 2010. *Global Entrepreneurship Monitor. 2009 Global Report*.
- Diener, E. & Tov, W. 2012. National Accounts of Well-being (pp 137-159). In *Handbook of Social Indicators and Quality of Life Research*, edited by K.C. Land, A.C. Michalos, M.J. Sirgy. Springer. ISBN 978-94-007-24204.
- Diener, E. 1984. Subjective well-being. *Psychological Bulletin*. Vol. 95, 542-575.

- Diener, E. 2009. Subjective well-being (pp 11-59). In *The Science of Well-Being: The Collected Works of Ed Diener*, edited by A.C. Michalos. ISBN 978-90-481-2349-0. Springer.
- Diener, Ed. 2000. Subjective Well-Being. *The Science of Happiness and a Proposal for a National Index*. *American Psychologist*. Vol. 55. No 1, 34-43.
- Dolan, P., Metcalfe, R., Powdthavee, N., Beale, A. & Pritchard D. 2008. Innovation and well-being. NESTA Working Paper. September.
- Dolan, P., Peasgood, T. & White, M. 2008. Do we really know what makes us happy? A review of the economic literature on the factors associated with subjective well-being. *Journal of Economic Psychology*. Vol. 29, 94-122.
- Hoogendoorn, B. & Hartog, C. 2011. Prevalence and Determinants of Social Entrepreneurship at the Macro-level. EIM Research Report, June.
- Human Development Report. 2010. *The Real Wealth of Nations: Pathways to Human Development*. 20th Anniversary Edition. The United Nations Development Programme. Available at [http://hdr.undp.org/en/media/HDR\\_2010\\_EN\\_Complete\\_reprint.pdf](http://hdr.undp.org/en/media/HDR_2010_EN_Complete_reprint.pdf).
- Larsen, R. & Eid, M. 2008. Ed Diener and the Science of Subjective Well-Being. In *The Science of Subjective Well-Being*, edited by M. Eid and R.J. Larsen. New York. The Guilford Press.
- Lyubomirsky, S. 2001. Why are some people happier than others? The role of cognitive and motivational processes in well-being. *American Psychologist*. Vol. 56. No. 3, 239-249.
- Mair, J. & Marti, I. 2006. Social entrepreneurship research: A source of explanation, prediction, and delight. *Journal of World Business*. Vol. 41, 36-44.
- National Accounts of Well-being: bringing real wealth onto the balance sheet, edited by M.Murphy. 2009. United Kingdom. ISBN 978-1-904882-50-3. Available at <http://cdn.media70.com/national-accounts-of-well-being-report.pdf>.
- Nicholls, A. 2006. Introduction. In A. Nicholls (Ed.), *Social entrepreneurship: New models of sustainable social change* (pp. 1-35). Oxford, New York. Oxford University Press.
- OECD Better Life Initiative. 2012. Available at <http://oecdbetterlifeindex.org>.
- OECD. 2010. Social Entrepreneurship and Social Innovation. In *SMEs, Entrepreneurship and Innovation*, Chapter 5, 185-215.
- OECD. 2011. Subjective Well-Being. In *How's life? Measuring well-being*. Chapter 12, 265-282.
- Pan, Y., Zinkhan, G. & Sheng, S. 2007. The Subjective Well-Being of Nations: A Role for Marketing? *Journal of Macromarketing*. Vol. 27. No. 4, 360-369.
- Samli, A.C. 2008. Entrepreneurship Economic Development and Quality of Life in Third-World Countries. *Applied Research Quality Life*. Vol. 3, 203-213.
- Second European Quality of Life Survey. 2009. Luxembourg. Office for Official Publications of the European Communities. ISBN 978-92-897-0847-0. Available at <http://www.eurofound.europa.eu/pubdocs/2009/02/en/2/EF0902EN.pdf>.
- Seelos, C. & Mair, J. 2006. Profitable business models and market creation in the context of deep poverty: a strategy view. IESE Occasional Paper. No. 7/6. October.
- Shastri, V. & Banerjee, P.M. 2010. From Corporate Social Responsibility to Global Social Entrepreneurship (pp 1-15). In *Social responsibility and environmental sustainability in business: how organizations handle profits and social duties* /edited by Preeta M. Banerjee, Vanita Shastri.

- Tamm, K., Eamets, R. & Mõtsmees, P. 2010. Relationship between Corporate Social Responsibility and Job Satisfaction: The Case of Baltic Countries. The University of Tartu FEBA. ISBN 978-9985-4-0649-6.
- The Eurobarometer website. 2012. Available at [http://ec.europa.eu/public\\_opinion/index\\_en.htm](http://ec.europa.eu/public_opinion/index_en.htm)
- Veenhoven, R. 1990. Is Happiness Relative? *Social Indicators Research*. Vo. 24, 1-34.
- Veenhoven, R. 1991. Questions on happiness: classical topics, modern answers, blind spots (7-27). In *Subjective well-being: an interdisciplinary perspective*, edited by F. Strack, M. Argyle, N. Schwarz. Oxford. Pergamon Press. ISBN 0-08-037264-3.
- Veenhoven, R. 2012. Happiness in Nations. *World Database of Happiness*, Erasmus University Rotterdam, Assessed on 2012 01 at: [http://worlddatabaseofhappiness.eur.nl/hap\\_nat/nat\\_fp.php?mode=1](http://worlddatabaseofhappiness.eur.nl/hap_nat/nat_fp.php?mode=1)
- Zahra, S., Rawhouser, H., Bhawe, N., Neubaum, D. & Hayton, J. 2008. Globalization of social entrepreneurship opportunities. *Strategic Entrepreneurship Journal*. Vol. 2, 117-131.

### **Acknowledgements**

This article has been written in the frame of the Project 'The Model of Life Quality Improvement Strategy Building at the Local (Municipal) Level (GKGS)' (No. MIP-024/2011) funded by the Research Council of Lithuania.



# Future of Collaboration in Managing Product Lifecycle Information and Knowledge

**Hannele Lampela<sup>1</sup>; Andrea Denger<sup>2</sup>; Hannu Kärkkäinen<sup>3</sup>; Markus Zoier<sup>4</sup>**

<sup>1</sup>*Professor, Lappeenranta University of Technology, hannele.lampela@lut.fi*

<sup>2</sup>*Researcher, Virtual Vehicle Competence Center, andrea.denger@v2c2.at*

<sup>3</sup>*Professor, Tampere University of Technology, hannu.karkkainen@tut.fi*

<sup>4</sup>*Researcher, Virtual Vehicle Competence Center, markus.zoier@v2c2.at*

## Abstract

In product lifecycle management (PLM), there is a strong trend towards improving collaboration and co-operation in intra and extra organizational activities. This trend is derived, on the one hand, from the growingly important need for collaboration in the course of products' lifecycle, and on the other hand, from the novel forms of collaboration brought forth by e.g. the maturing of social media and web 2.0 technologies. The idea of PLM is to extend the concept of information and knowledge management to cover the whole life cycle of products. PLM aims to interconnect all major organizations and stakeholders that have an impact to the success of a product during the course of products' lifecycle. This paper gathers findings of Austrian and Finnish research projects considering better utilization of PLM in near future. The paper approaches the topic of collaboration with the focus in the future towards 2020. The first set of findings considers trends in collaborative PLM by utilizing scenario planning and expert surveys. The second set of findings considers issues by describing and analyzing industrial examples. The outcome of the paper are development suggestions for future collaboration in PLM by a discussion of the use of social media and web 2.0 technologies in the field of collaboration and communication of knowledge and information between lifecycle phases. In the near future systems supporting the PLM concept are supplemented or partly replaced by web 2.0 technologies.

## Keywords

Product lifecycle management, collaboration, future PLM, social media, Web 2.0

## Acknowledgements

Research for this paper was funded by Finnish Technology Agency, Tekes and participating companies. The authors would like to acknowledge the financial support of "COMET K2-Competence Centres for Excellent Technologies Programme" of the Austrian Federal Ministry for Transport, Innovation and Technology (BMVIT), the Austrian Federal Ministry of Economy, Family and Youth (BWFJ), the Austrian Research Promotion Agency (FFG), the Province of Styria and the Styrian Business Promotion Agency (SFG). We would furthermore like to express our thanks to our supporting industrial and scientific project partners, namely "AVL List GmbH", "BMW AG", "CSC Computer Science Consulting Austria GmbH", "MAGNA STEYR Fahrzeugtechnik GmbH & Co KG", Vienna University of Technology, University of Kaiserslautern, and to the Graz University of Technology.

## Introduction

Product lifecycle management (PLM) is a systematic and controlled concept for managing product related information efficiently throughout the entire product lifecycle (Sääksvuori and Immonen, 2008). The idea of PLM is to extend the concept of information and knowledge management to cover the whole life cycle of products to the extended enterprise. PLM covers various types of product related information from product design and manufacturing all the way to the end of use, after sales and service phases, as well as to the end of the lifecycle, to the scrapping of the product. PLM has been referred to as “the next step of product development”, as it provides new ways for managing knowledge and information in distributed collaboration teams (Ameri and Dutta, 2005). According to Golovatchev and Budde (2007) complexity of relations in manufacturing industry requires collaborative PLM processes with defined interfaces, i.e. there should be an informational architecture that supports collaboration. Moreover, the change in industrial operation logic, e.g. the concept of an extended product needs also tighter managerial connections. E.g. Sharma (2005) approaches the issue from the perspective of collaboration supported innovation.

Traditionally, information and communication technology (ICT) has been more dominant in the beginning of lifecycle (BOL) phases than in the middle of lifecycle (MOL) and end of lifecycle (EOL) phases (Terzi et al., 2010). From the global perspective of the internet, social media and web 2.0 are strongly changing the interaction- and communication scheme, as well as the management of information and knowledge. One important reason is that they enable the integration of unstructured information and even tacit knowledge to current traditional information systems that allow mainly the use of structured and explicit information. This is problematic because much information about e.g. customer needs is not necessarily very structured, even if it needs to be included and used in development decisions. The key features of web 2.0 technologies offer also flexibility and enhanced transparency of information. The user, either engineer or buyer of product, is placed in the centre of the information exchange by enabling them to consume, modify and add information and enabling new weights for the relevance of information (Stocker, 2011).

The issue of collaboration in the field of PLM has been studied somewhat, but not in detail. The specific point of future collaboration related to PLM is not yet covered in the current literature. There are new collaboration ways and tools such as social media, but to put the ideas of utilisation of CSCW (Computer Supported Collaborative Work), social media or web 2.0 in action in PLM context, there is a need for the depiction of future trends in the field of PLM and also for discussing the praxis of such collaborative trends.

The aim of the paper is to outline the most important aspects and demands for collaboration in future PLM. Thus we have formulated the research questions as “*How can web 2.0 support collaboration and communication in product lifecycle information and knowledge management?*” Moreover; the paper approaches the topic of collaboration with the specific focus in the future towards 2020. This paper gathers findings of Austrian and Finnish research projects considering better utilization of PLM in near future. The empirical findings are twofold. The first set of findings considers trends in collaborative PLM by utilizing multi-disciplinary expert surveys and interview material to construct future PLM scenarios. The second set of findings considers requirements of collaborative PLM, utilizing the scenarios as well as addressing the issue by describing and analyzing industrial examples.

## **Theoretical Background**

### **Future PLM**

As a term, 'future PLM' refers to outlooks in the field of PLM activities. In its widest extension future PLM covers issues regarding possible and/or desirable development trends. In literature the topic is covered in terms of general trends and trends regarding PLM setting. General aspects regarding the future of PLM are related to an extension of the PLM activities, so that it fully covers BOL phase, mostly MOL phase, and weakly EOL phase of life cycle (Terzi et al., 2010). Moreover, arrangement of IT-architecture, or IT related issues more general, are currently in flux due to change in PLM related software (Golovatchev and Budde, 2007). Organizing industrial activities raises the most obvious aspect, the need for better co-operation between different actors in lifecycle. The collaboration issue is emphasised by several authors (e.g. Terzi et al., 2010; Golovatchev and Budde, 2007; Grudin 2006; Abramovici, 2007). There is also a need for better integration of processes, in terms of each lifecycle phase, which could be considered under the label of collaboration (e.g. Golovatchev and Budde, 2007; Abramovici, 2007).

A study conducted by Abramovici (2010) shows that user acceptance is one of the highest risk factors in the implementation of PLM. According to Golas (1997) a company in its environment represents an open and targeted social system (ref. in Stocker, 2011). Humans in the field of automotive industry are working in complex socio-technical systems. No matter how much technically dominated this operational environment is – the creative, social and individual facets of people remain very important, they are working with complex technical systems in a social system. Working in complex systems is on the one hand characterized by routines and on the other hand by exceptional situations or crises. These situations require e.g. that people make decisions under time pressure and high risk or find new innovative solutions within very limited time. Therefore people are the highest potential in a company and have to get major support in communication and collaboration to achieve the corporate goals.

### **Web 2.0 and social media technologies in PLM**

During the last few years, there has been rapid technological development and new possibilities have emerged for collaboration, communication and the management of product lifecycle information and knowledge. Some of the major changes are related to the novel possibilities offered by the advent and, in the business sense, the maturing of web 2.0 and social media-based approaches (e.g. Gartner, 2010). Social media integration in PLM has been an important trend of major PLM vendors, allowing e.g. the use and sharing of non-structured and tacit knowledge, which are problematic in traditional types of PDM and PLM systems. According to Lehtimäki et al. (2009) web 2.0 means technologies that enable users to communicate, create content and share it with each other via communities, social networks and virtual worlds - faster and easier than ever before. They emphasize the power of users to select, filter, publish and edit information, as well as to participate in the creation of content in social media (Tredinnick, 2006).

According to literature (e.g. Paroutis and Saleh, 2009; Levy, 2009; Bernoff and Li, 2008), web 2.0 and social media provides quite novel and useful ways of interacting and collaborating in the innovation process, as well as for creating new information and knowledge for innovations. No found current studies (see e.g. recent PLM literature review of

Terzi et al., 2010) have elaborated the real impacts of social media and other novel collaboration forms to the future of PLM systems. Reflecting the development and the novel possibilities, according to Terzi et al. (2010), all the PLM suppliers are continuously and rapidly expanding their offerings via various mergers and acquisitions of niche companies. A major trend here is that increasingly, they are trying to integrate new tools and ways of collaboration to PLM systems, which utilize various web 2.0 applications. Examples of these are tools such as blogs, wikis, instant messaging, as well as mobile interfaces allowing remote information retrieval, delivery and communication at any time and any place. Also PDM and PLM users see increasingly the need and possibilities of adopting the above types of collaboration tools in the management and in the creation of new product information and knowledge.

In the business community, discussions about Enterprise 2.0 tend to focus predominantly on one of two different aspects: technology and corporate culture. According to the definition of McAfee (2006), Enterprise 2.0 means the application of social software in companies and between companies and outside stakeholders. The main driving force for adoption of Enterprise 2.0 is the spread of the relevant technologies in people's personal lives, so that it may already be strongly prevalent among the workforce. However, business leaders perceive the phenomenon as being weak on organizational and commercial aspects. They want a form of Enterprise 2.0 that can transform companies towards more openness, transparency about knowledge and knowledge holders and stronger networking. This places emphasis on the changes that are to be achieved in the organization rather than on the route to those changes, which may or may not involve the use of new technology.

### **Collaboration trends and requirements in PLM**

Concerning the different emphases in collaboration and communication in the different phases of product life cycle, we can make some generic distinctions in the earlier and later phases of lifecycle. These emphases set different requirements for ICT- based collaboration (see Figure 1 below).

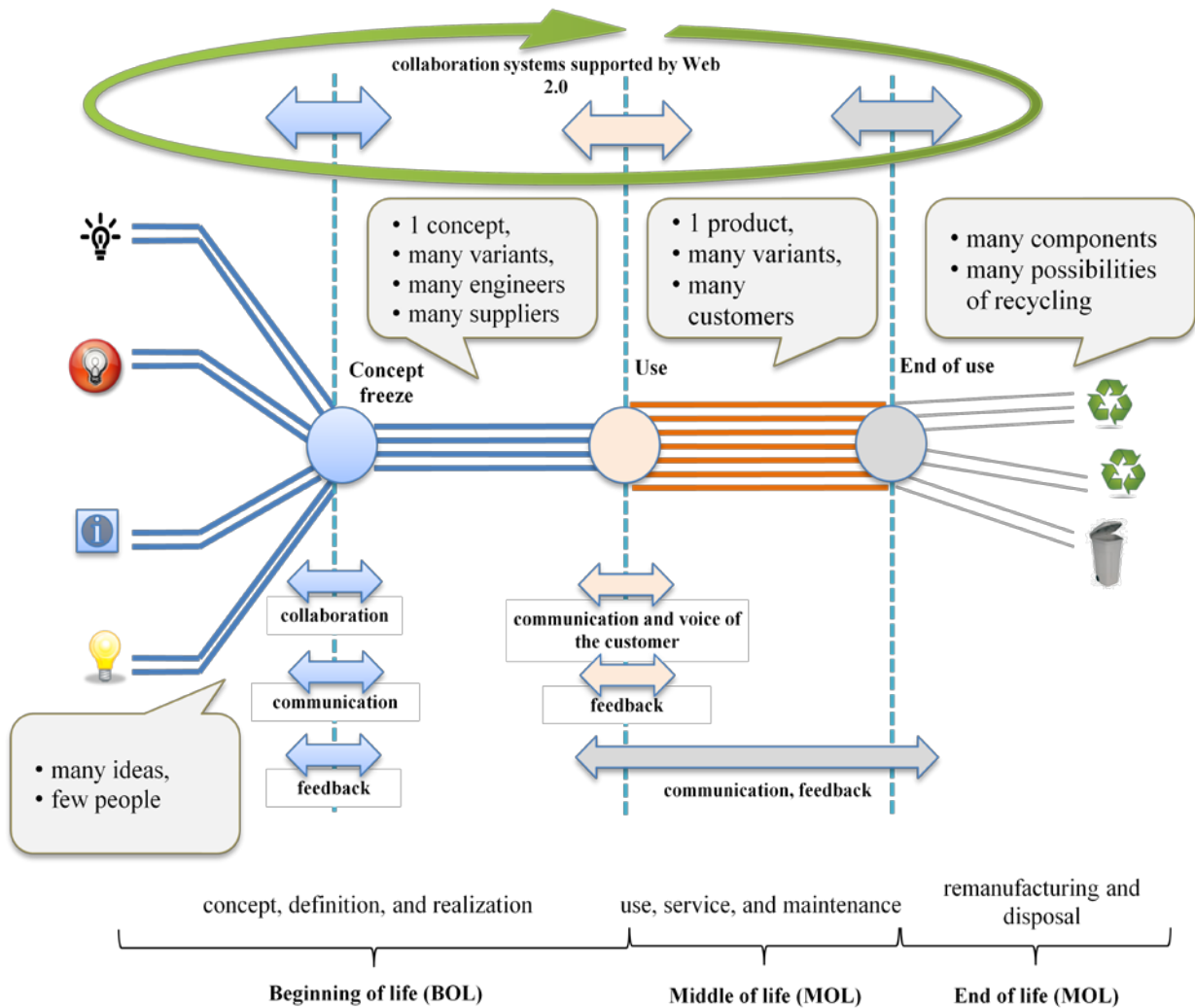


Figure 1. Changing emphases in collaboration and communication in different phases of product life cycle (Denger 2011b).

People working from diverse locations can use social software such as wikis and blogs (Stocker et al., 2010) as a modern way of disseminating information and knowledge within the company, which creates a simple form of community. For example, Opel uses podcasts in training of sales personnel (Back et al., 2008). Among others, blog posts of customers are being used increasingly in the concept phase of new products so that the products can be adapted to the customer's needs.

Contained in the general assumption that the way companies are organized will change dramatically in future is the implication that the definition of workplaces and working time models will also change. The collaboration models of the future, as illustrated by Enterprise 2.0 phenomena, will lead to a state in which experts increasingly operate like freelancers and develop their own individual profiles of capabilities and offer these directly or via special intermediaries through networks. The company of the future will concentrate on its core competences even more strongly than at present and will focus on the generation and protection of intellectual property. These shifts will require equivalent changes in PLM

implementation models, which will affect how goals are defined, how the system is introduced and how it is used (Denger et al., 2011a).

The different emphasis of ICT in the collaboration in the different phases of product development processes can be described by Boutellier et al. (1998), see Figure 2. First, in the early stages of the life cycle, there is a lot of tacit knowledge that should be identified and made useful, while in the later phases, the emphasis changes towards the management of explicit knowledge, such as documents. Second, in the early stages of the life cycle, the emotional-level tasks of promoting creativity and developing networks are more at focus, and in later phases the rational-level tasks of coordination and information exchange have a bigger role.

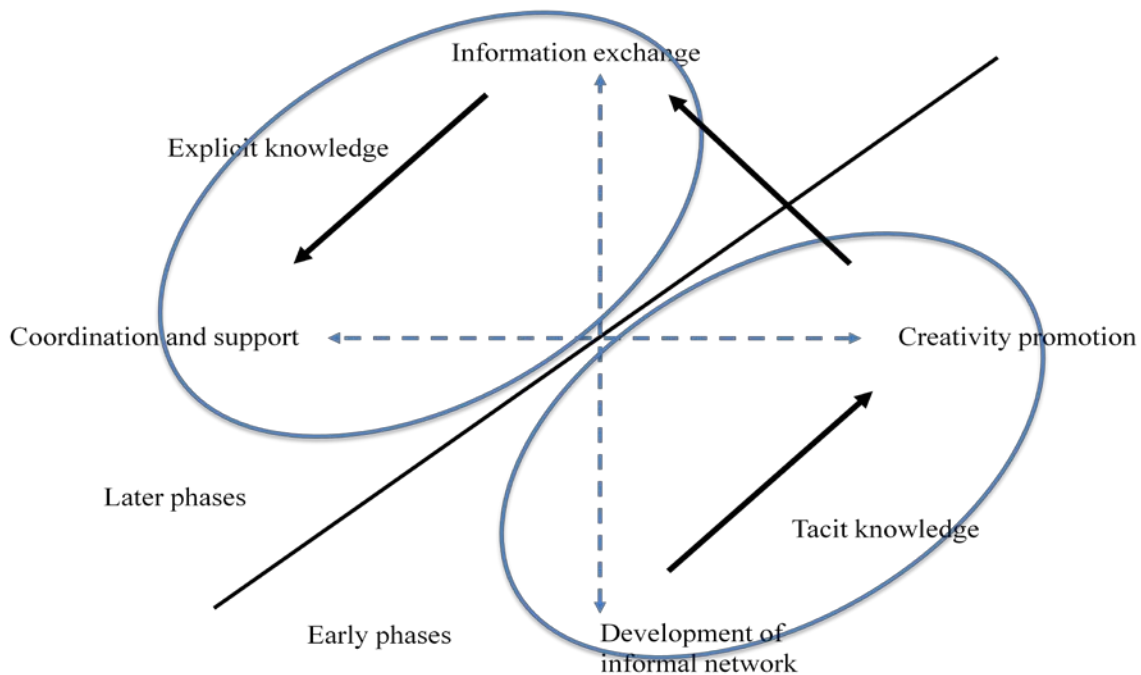


Figure 2. Changes in the emphases of ICT supported collaboration in different phases of dispersed product development (Boutellier et al., 1998)

Software development in Open Source projects, especially in large ones, has similar challenges to product development. A comparison of tools and shared virtual environments used in networks of open source development and traditional product development can provide additional aspects of collaborative work on innovative products. Furthermore there is a trend to take innovations from the professional software development process and adapt them to enhance product development (e.g. local workspaces with private data).

One example can be recent experiences of Apache Software Foundation. Taking a look on the development of the project Hadoop, they identified three main aspects to enable an open and transparent development culture

- an open and transparent communication, offering proposals for discussion and always presuming an positive attitude of every member

- focusing on an objective and goal oriented discussion by enabling respect and a meritocracy (more experienced developers have more influence, appointments and responsibilities)
- pragmatism and lenience, e.g. to support new developers getting faster on the know how level needed to contribute to the project

Although there is no perfect solution, these aspects support the creation of open innovation, handling of conflicts and setup of a large project with developers that differ in their level of skill and interest. (Baldeschwieler, 2011). One of the tools used by the Hadoop project is a wiki basing on MoinMoin wiki software, which is used to organize support activities like documentation, FAQ and success stories. Most of the other tools used by the development community are traditional ones, like mailing lists or IRC channels. As most of the developers are ICT experts, they like the reduced user interfaces and are able to handle the limited usability of these tools, but even companies thinking on the establishment of new ways of collaboration can benefit from their experience enabling collaboration practices in complex environments.

## **Research Methodology and Data**

The research was designed using methodological triangulation of qualitative interviews, scenarios and case studies. The process started from qualitative expert interviews, which were used as basis for scenario building. The chosen future scenario is then compared to the current state in companies described as short example cases, to identify the gaps and form suggestions for development steps for the organizations.

### **Qualitative interviews as a method of study**

The industrial as-is situation has been elaborated with a series of quantitative and qualitative interviews. Interviewees came from the field of engineering, sales or IT. Within the interviews the focus was laid on the different phases of the product development process (i.e. strategy finding, concept derive, serial development, production planning and after sales).

A detailed analysis of all results and factors taken into consideration leads to the quintessence that there is a desire for a simple use of PLM supporting systems and a new people-oriented strategy in process and organizational planning. There is a need to elaborate, under which conditions e.g. a simultaneous engineering team works most efficiently and how it can be supported by a refined PLM process. Strategies for a more relaxed procurement of the information in order to maximize the project result are required.

### **Scenarios as a method of study**

Scenario planning is a strategic planning method used to make flexible long-term plans. The method is based on creating a series of 'different possible future scenarios' generated from a combination of known factors and environmental trends (Schoemaker, 2002). It involves aspects of the process of understanding how things influence one another within a whole.

At the beginning of scenario planning some megatrends are presented in detail. Megatrends are long-term forecasts with an eminent impact on all actors in the market. Most frequently selected megatrends for scenario planning in the field of PLM are “globalization”, “demographic change”, “digital lifestyle”, “cultural diversity”, and “individualisation”. The scenarios are based on drivers such as demographic or cultural issues, with plausible alternative economic, social, technical, legal and environmental trends. These scenarios outline how product development may change until the year 2020 (Schmeja and Fachbach, 2010). The first scenario (“Extreme globalization”) informs about excessive globalization and why organisations reach an enormous level of complexity. The second scenario gives an account of the opposite of globalisation – “Disconnecting”. The third scenario (“Ride on the information waves”) focuses around data and information representation in highly cross-linked companies. In the fourth scenario people are seen as the most important factor within product development (“People take center stages”) (Denger et al., 2010). In this paper, scenario development was seen as a suitable method of study because although the future visions of PLM in general have been presented in several studies, scenario approaches researching the future collaboration of PLM, developed together with multi-disciplined experts from various fields, were not found in the PLM –related studies of other authors. We focus especially on the fourth scenario “People take center stages” because this was seen as the most preferable and interesting scenario by the experts who participated in the process.

### **Case studies as a method of study**

In the third stage of this research, the current status of PLM use in two companies was studied by qualitative interviews and other material gathered during a two-year research project, to form short case descriptions that are used as examples of the situation today. The companies were selected purposefully so that first, they represent different types and sizes of organizations. Accordingly, the companies have different challenges and different needs for collaboration. Second, both the companies are relatively advanced in PDM and PLM, as well as related collaboration using traditional collaboration means, this implying them to be knowledgeable in various collaboration needs and challenges in PLM. In PDM/PLM they are somewhat above the average in their industries. Third, they have not yet implemented social software extensively, even though they see the need of advancing collaboration by means of web2.0 technologies. The stages of the research process and their connections are illustrated in the following Figure 3.



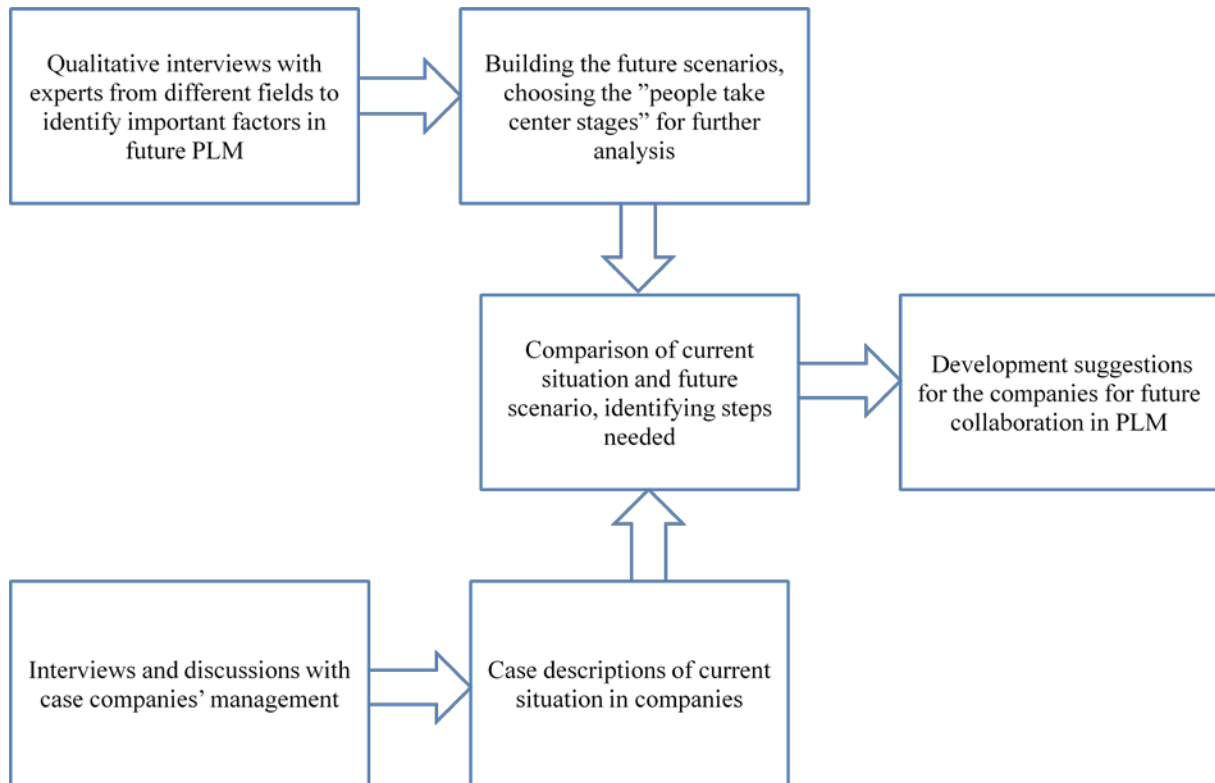


Figure 3. Stages of the research process

## Findings

### Scenario “People take center stages”

The scenario “People take center stages” is formed upon the following assumptions: A) Recognition of importance of employees B) Mutual trust within companies increases acceptance and understanding of PLM due to deployment of new technologies, processes and organization forms C) High cultural diversity in companies D) Deep PLM integration, and E) Flexible infrastructure and working conditions in complex business environments. The third stage of the research process was the comparison of the scenario with the current situation in the case companies. By comparing the chosen “People take center stages” scenario description with the current status of the case companies, future collaboration requirements for PLM can be identified as an outcome and some suggestions can be given on future development steps for the companies. A summary of the scenario “People take center stages” is provided below:

*“Workers will organize in flat organizational structures. Work is understood goal-oriented and as a way of self-realization. This is supported by social network platforms in the enterprises. These platforms are connecting employees across various locations in order to achieve the common objective of the project itself. Transparent and consistent communication increases the acceptance and confidence in these new organizational models.*

*Companies provide a flexible approach for infrastructure which is available outside the corporate boundaries, too. Jobs are no longer bound to the business location. Intelligent networks with high-performance interfaces allow a secure exchange of data and information.*

*The advanced technology allows for many employee groups better access to software systems. It has been identified that the systemic support is not to evaluate and it has been seen as supportive measure. Customers and suppliers are also part of these platforms, in order to participate in the creation of a product. Separate innovative platforms will increasingly arise.”*

### **Case studies and development suggestions for future collaboration in PLM**

In using scenarios for strategic development in any area of a company’s operations, the last stage of the process is mapping the current situation and comparing that to the future vision presented by the scenario. We have done this in two business to business companies in Finland, which operate in different fields and although both of them have been developing their PLM practices in recent years, their approach to collaboration in PLM differs from each other.

#### **Case A**

The company is a global manufacturer of utility vehicles, and has a long history in PLM within its own organization. The development stage of the PLM practices can be considered advanced, as the different units function under the same PLM system and principles worldwide. The collaboration in PLM area is wide-spread also outside the company’s own organization. Although the partners of the company have access to some real-time PLM information through shared information systems, social media tools such as wikis or blogs are not currently utilized in collaboration.

Today, the development of PLM in the company is mainly concentrated on IT-related issues, as in many organizations. When comparing the basic assumptions of the “People take center stages” -scenario with the current situation, the mutual trust between organizations and deep PLM integration as well as high cultural diversity do exist at least to some extent, and development emphasis should be placed more on highlighting the role of the employees instead of technical development, and enabling flexible infrastructure and working conditions.

Looking at the increasing collaboration requirements in PLM in the future, the company needs to establish novel ways of communicating and disseminating PLM information and knowledge in its partner network. This will mean new competence requirements for the engineers, sales and support people alike. Implementing practices that support more people-centered approach to PLM and utilize for example new social media tools also mean changes in the general management of the organization, and the change process itself might be challenging.

## **Case B**

The company is a Finnish software company, having a long experience in product data management. The company's solutions are used worldwide and it has several partners and suppliers. The company is quite advanced in PDM and PLM. It is quite well aware of various collaboration needs and challenges in PLM, as well as the most common web 2.0 technologies currently available and their opportunities. It has experimented with web 2.0 solutions and implemented already some early solutions, e.g. blogs and wikis in getting feedback about their products.

The company sees a clear trend that their customers' business is increasingly linked with more partners and projects, where product data management expands outside a single company's borders. This brings novel types of challenges and requirements for product information management. In general, finding the right information in PDM/PLM systems is difficult. Concerning collaboration-related challenges, often product information-related documents are much in the need of restructuring and amendments, during a short time-interval, when the documents are first created. The creation of product information documents in PDM/PLM systems has higher demands and requirements, and has a much higher limit, than what would be the ones for creating documents in a less formal systems, such as wiki, where other can e.g. comment (and thus improve) the document concerning e.g. customer-related collaboration in PDM/PLM context. For instance in customer emails, lots of important information and useful opinions are brought up, but the collaboration –related challenge is that this email-based conversation and dialogue is difficult to be documented in PDM/PLM systems.

The company already utilizes a wiki as a project documentation and project management tool in the context of product development. The attitude towards wikis is, in general, quite positive, because the interviewees experienced that e.g. searching for certain information is partly easier than in traditional PDM/PLM. In wikis, the authoring of documentation that is yet to be finalized is easier, and more persons can participate in the process. Also, the commenting of document contents is possible using wikis. Wikis are also seen, according to interviews, as one perspective to the management of documents in PDM/PLM. The wiki includes also a blog- type of solution, which is used as a project diary in the development of few products. It is used in summarizing different topics, as well as sharing experiences on the most important matters that happened during the projects. The interviewees mentioned that blogs could be used also for documenting new project-related ideas and thoughts, for management's reporting tool, and instead of communication in many situations where group emails are normally used. Implementing social media- based practices that support more people-centered approach to PLM seems reasonably easy, also due to the small size of the company (<100 employees), and as the benefits and other results have been confirmed, probably more social media -related solutions are integrated on the need-basis.

## **Discussion and conclusions**

The scenario process demonstrated clearly that first, in order to understand how collaboration and knowledge should be managed during the product's lifecycle in the future, not only the engineer's viewpoints and understanding are sufficient, but also the insight of multiple experts understanding widely various economic, social, technical, legal and environmental aspects is

essential. This was achieved with the scenario method of this study, the similar of which were not found in the literature.

Second, as demonstrated in the cases of this study, important challenges and needs to support the collaboration and communication of knowledge and information between lifecycle phases were found, especially between MOL and BOL phases, which current traditional PLM approaches are not able to efficiently deal with. Social media solutions were found to provide novel possibilities to answer these challenges, and should be adopted in companies that are dealing with PLM.

Third, as the need for wider collaboration between partners is increasing through external networking becoming an essential part of any development processes, the challenges of managing the product related information and knowledge become more complex. More research is needed especially concentrating on the network aspects of PLM, and how can social media tools help in organizing, disseminating and creating product related information within the partner network. Also different types of networks have different needs and requirements for the product related information, traditional supplier networks differ from innovation and development networks considerably in this respect.

Some of the anticipated benefits of integrating web 2.0 applications to PLM solutions from the standpoint of future collaboration, when heading towards the “People take center stages”, include the easier management and use of information and knowledge in collaboration, which is not yet structured enough to be gathered and disseminated by traditional PLM/PDM solutions. Second, also tacit knowledge will be better used and integrated in near future collaboration. Third, an important aspect in PLM-related collaboration is that users may experiment and easily modify the information structure, enabling easier collaboration and information transfer. Fourth, the web 2.0 -based systems are quite quick and easy to implement, as well as be used also by non-PDM and data management experts, such as sales and after sales, compared to current systems.

If a web 2.0 application in a company should operate successfully, it must have people who know how to use it. The organization must provide an intensive training. However, many companies have ignored this because it is costs. Also tailoring a web 2.0 application to the company's preferences can be a challenge. It is very rare that companies will accept e.g. a collaboration system as it is. One of the biggest weaknesses of hierarchical organizations is the poor dealing with the skills of employees (Buhse and Stamer 2010). First platforms started with a community of experts who published exact content to all employees, now each employee could be an author, with own ideas and vision. How can head of department or the owner of the company find the right content for the company?

In the near future systems supporting the PLM concept are supplemented or partly replaced by web 2.0 technologies. Old infrastructures often structures around one or a few dominant systems are replaced by a flexible coupling of smaller services well suited on project type and team. Especially new technologies will eventually replace current software architecture paradigm, as current trends in that field are towards services and integrated systems, away from old and rigid “single-system-will-rule-it-all”-paradigm.

## References

- Abramovici, M. 2007. Future trends in product lifecycle management (PLM). In *The Future of Product Development*. Part 12 pp. 665-674. Springer.
- Abramovici, M. 2010. Benefits of PLM in der Automobilindustrie. Benchmarkstudie 2009, In *Proceedings of Product Life live 2010*, pp. 170-186. VDE Verlag GmbH, Berlin.
- Ameri, F. and Dutta, D. 2005. Product Lifecycle Management: Closing the Knowledge Loops. In *Computer-Aided Design & Applications*, Vol. 2, No. 5, 2005
- Back A., Gronau N. und Tochtermann, K., 2008. Web 2.0 in der Unternehmenspraxis. Grundlagen, Fallstudien und Trends zum Einsatz von Social Software. Oldenburg Wissenschaftsverlag.
- Bernoff, J. and Li, C. 2008. Harnessing the Power of the Oh-So-Social Web, In *MIT Sloan Management Review* 49(3), pp. 36-42.
- Boutellier, R., Gassman, O., Macho, H, and Roux, M. 1998. Management of dispersed product development teams: the role of information technologies. In *R&D Management*. Volume 28, Issue 1, pp. 13–25, January 1998
- Buhse, W., Stamer, S. 2010. Enterprise 2.0: Die Kunst, loszulassen. Rhombos-Verlag, 3. Aufl. (Mai 2010)
- Denger, A., Maletz, M., and Helic, D. 2010. Social Computing: A Future Approach of Product Lifecycle Management, In *Proceedings of I-KNOW 2010*, pp. 451-457, September 1-3, 2010, Graz, Austria
- Denger, A., Schmeja, M., Unzeitig, W., Schlüter, W., Peschke, F., 2011a. Product Lifecycle Management (PML) - Ein Blick auf den Mitarbeiter von Morgen. In: *ProduktDaten Journal*, Vol. 18, No. 2, pp. 55 – 59
- Denger A., Stocker A., and Maletz, M. 2011b. Zur Relevanz von Enterprise 2.0 und Product Lifecycle Management (PLM) in der Automobilindustrie. In: *Workshop Proceedings Mensch & Computer 2011*, Sept. 11 – 14, 2011, Chemnitz, pp. 91 - 98
- Gartner 2010. Gartner's the Top 10 Strategic Technologies for 2011 <http://www.gartner.com/it/page.jsp?id=1454221> (accessed 12.04.2011)
- Golas, H. G. 1997. *Der Mitarbeiter*, Verlag Cornelsen Lehrbuch 1997, 9th Edition
- Golovatchev, J. D. and Budde, O. 2007. Next generation PLM – an integrated approach for the Product Lifecycle Management. In *Proceedings of ICCPR2007: International Conference on Comprehensive Product Realization 2007*, June 18-20, 2007, Beijing, China
- Grudin, J. 2006. Enterprise Knowledge Management and Emerging Technologies. In *Proceedings of the 39th Annual Hawaii International Conference on System Sciences*
- Lehtimäki, T., Salo, J., Hiltula, H., Lankinen, M. 2009. Harnessing web 2.0 for business to business marketing - Literature review and an empirical perspective from Finland. In *Oulu University Press*.  
[http://www.digibusiness.fi/uploads/reports/1265364241\\_harnessing%20web%202.0.PDF](http://www.digibusiness.fi/uploads/reports/1265364241_harnessing%20web%202.0.PDF) (accessed 29.4.2011)
- Levy, M. 2009. Web 2.0 implications on knowledge management. In *Journal of Knowledge Management* Vol. 13 No 1 pp. 120-134
- McAfee, A., 2006. Enterprise 2.0: The Dawn of Emergent Collaboration, In: *MIT Sloan Management Review*, Vol. 47, Nr. 3, pp. 21-28.
- Paroutis, S. and Saleh, A. 2009. Determinants of knowledge sharing using Web 2.0 technologies. In *Journal of Knowledge Management* Vol 13, 4

- Schmeja, M. and Fachbach, B. 2010. Quo Vadis PLM? Anforderungen an ein zukünftiges, erfolgreiches Product Lifecycle Management, ProSTEP iViP Symposium, 28-29 April 2010, Berlin
- Schoemaker, P. J. H. 2002. Profiting from Uncertainty: Strategies for Succeeding No Matter What the Future Brings. Free Press.
- Sharma, A. 2005. Collaborative product innovation: integrating elements of CPI via PLM framework. *Computer-Aided Design* Vol. 37 pp. 1425-1434
- Stocker, A. und Tochtermann, K., 2010. Wissenstransfer mit Wikis und Weblogs. Fallstudien zum erfolgreichen Einsatz von Web 2.0 im Unternehmen, Gabler-Verlag.
- Stocker A. 2011. Enterprise 2.0. Offenheit und Transparenz durch Social Media. 3rd FuturePLM Forum, March 3. 2011, Graz, Austria
- Sääksvuori, A. and Immonen, A. 2008. *Product Lifecycle Management*. Berlin
- Terzi, A., Bouras, D., Dutta, M., and Kiritsis, D. 2010. Product lifecycle management, from its history to its new role. *International Journal of Product Lifecycle Management* Vol. 4 No.4 pp. 360- 389
- Tredinnick, L. 2006. Web 2.0 and business: a pointer to the intranets of the future? *Business Information Review*, Vol. 23 No. 4, pp. 228-34

# TRUST IN BUILDING HIGH PERFORMING TEAMS

**Mila Hakanen<sup>1</sup>; Aki Soudunsaari<sup>2</sup>**

*1*Researcher, University of Jyväskylä, School of Business and Economics, mila.hakanen@jyu.fi

*2* Researcher, University of Jyväskylä, School of Business and Economics, aki.soudunsaari@jyu.fi

## **Introduction**

In global business world, conscious team building is one of the key factors to success. It is better to have an A team with a B plan, than to have a B team with an A plan. Winning teams can overcome obstacles and react faster to changing surroundings. When building high performing teams, one of the most essential things is trust. Team work is based on shared value creation. Trust usually indicates greater openness, which is an enabler for value creation. Trust and cooperation, team work, is a two-way interaction. Trust increases cooperation but also cooperation can build trust. (Nahapiet & Ghoshal 1998.) This study concentrates on how trust can be managed in the building of a high performing team. The goal of this study is to enhance the team building and trust between the parties in a business ecosystem and to provide knowledge about building networks and multicultural ecosystems when creating global success stories. The main research question is “What is the relationship between trust and team performance?” (Erdem, Ozen & Atsan 2003)

This study is part of a project called Globally scalable business models in Health, Exercise and Wellbeing (HEW) markets (abbreviation: LA). LA is a next generation Tekes funded project in which Business Creation comes together with top research forming an Ecosystem in the HEW industries. Our big vision is to bring together the relevant knowledge and the most talented people all over the world, whether their passion is in business or in research, to create an ecosystem that helps our mission to bring sustainable business solution for the HEW problems of our time. LA’s core is in creating an environment where the researchers from different backgrounds, such as health, sports, gerontology and public health, can easily access the relevant data and a complete HEW set up for their research.

## **Keywords**

trust, team, health, wellbeing

## **Research Methodology and Design**

This research will be executed with methods of action research. Action research is an approach and a research strategy, where the researcher has an active role for solving problems inside the target community. For example, a researcher will define the goals and objects together with the target community. (Jyrkämä 1978.) Action research is an inquiry that is “done *by* and *with* insiders to an organization or community, but never *to* or *on* them” (Herr & Anderson 2005). The main aim is to gain changes in social activities (Jary & Jary 1991).

This approach is created in social sciences and it enables studying the phenomenon on a more profound level. The starting points for a study are practice and problems worth solving. The researchers’ role is to participate in the development process constantly and also to co-create the best practices. The researcher and the research object will work together to solve the challenges and the findings composed through this interactive process. (Guba & Lincoln 1994). This research perspective is not confined in some data collection method but enables the use of qualitative and quantitative methods. Action research requires engagement with people. Dialogue can succeed through trust. (Reason & Bradbury 2008)

The data will be collected through monitoring and interviews. Data collecting started in June 2011 and will continue until the end of the year 2012. The target group is our partner companies but also the research group that will be working together constantly. The representatives of the partner companies are from the top level of management. The research group consists of three Doctors, two PhD students and three master’s students. In this research, we are interested in finding out how does trust develop and grow in the business ecosystem? How can the building of trust be supported? Can trust be managed? And what is the relationship between trust and team performance?

## **Case companies**

Finnish Sport Pharmacy is a start-up company and the entrepreneur is the developer of a basic business model for an exercise prescription that aims to offer better physical health for people with help of an innovative service business concept. Finnish Sport Pharmacy is growing fast and it seeks for business and research partners for solving big problems. The LA project concentrates on the development process and business modeling with Finnish Sport Pharmacy.

Finnish Terveystalo Plc. is one of Finland’s leading healthcare service companies offering versatile healthcare, occupational healthcare, medical and examination services in more than 150 locations around Finland. ratiopharm Oy is a major pharmaceutical company in the Finnish generic, branded prescription and OTC market. ratiopharm belongs to Teva Group, which is a leading global pharmaceutical company, committed to increasing access to high quality



healthcare by developing, producing and marketing affordable generic drugs as well as innovative and specialty pharmaceuticals and active pharmaceutical ingredients. Avainapteekit Ltd. is a Finnish pharmaceutical chain with 77 independent outlets.

## **Trust as a foundation for cooperation**

Social capital consists of trust, communication and community. In this research the focus will be on trust, but also communication is seen as a necessary phenomenon for trust building. Social relationships will have effects on the success of organizations and teams (Nahapiet 2009). Social capital is needed in every team and it creates a competitive advantage that enables better resources (Nahapiet & Ghoshal 1998). Social capital is like glue that creates flexibility and shared learning (Vuorinen 2005). The roots of social capital research are in community studies. Jacobs (1965) studied city neighborhoods, and this study reveals the importance of cooperation that is based on trust and collective actions.

Putnam (2000) describes social capital as social networks but also as trustworthiness and the norms of reciprocity. Social capital is not a unidimensional concept (Putnam 1995). It is typically researched and seen as a resource for social action (Bourdieu 1986; Coleman 1988). Baker (1990) has defined social capital only as the structure of the relationship networks. Coleman, in turn, claims social capital “to exist in the relations among persons” (Coleman 1988). Nahapiet and Ghoshal (1998) define social capital as the sum of the actual and potential resources embedded within, available through, and derived from the network of relationships possessed by an individual or social unit. Social capital departs from other kinds of capital because it increases in use. It also needs maintenance or it will be lost. (Nahapiet & Ghoshal 1998)

In this research, the focus will be on trust. However, trust is difficult to define theoretically. Ring and van de Ven (1992) define trust as “confidence in another’s goodwill”. Trust is a commitment to cooperation before there is any certainty about how the trusted people will act (Coleman 1990). Adler (2001) distinguishes three sources of trust: a calculative form of trust via assessment of the costs and benefits, familiarity through continuing interaction, and values and norms that cultivates trustworthy behavior. Fukuyama (1995) describes trust as arising expectations of honest and cooperative behavior. Trust can be seen as a flexibility that turns up in difficult circumstances and times (Ilmonen, Jokivuori, Juuti, Kevätsalo & Liikanen 1998). Lack of trust will lead to breaks in communication, delegation, empowerment, productivity and results (Erdem, Ozen & Atsan 2003).

Openness builds trust, which increases the communication between people even more. The building materials of trust are also empathy, respect, interest of others life and genuine listening. The process of trust goes from feelings and images to experiences and facts. The communication cannot be only based on facts; interaction demands also information about feelings and emotions. Also shared norms and morals help to increase trust. Confidentiality will be measured by

competences, morals, norms and goodwill. Trust is based on the transaction of facts and feelings; mere fact-based communication does not build the personal relationships. (Ståhle & Laento 2000.) Trust brings the risk that has been taken based on the feelings, others' behavior and the conclusions about cooperation. Trust is expressed in the behavior towards others. (Costa 2000.) Trust is also based on the probability calculus where the emphasis is on advantages and losses of the interaction (Tyler and DeGoey 1996).

Varamäki et al. have defined several different types of trust-belief. Prowess belief focuses on the trustee's skills. In predictability belief, trust is based on behavior logic. Honesty belief means trusting the other's word. Integrity belief is composed of trust on agreements. Goodwill belief indicates belief on the other's behavior in problem solving. Reciprocity belief is based on the belief that partners help each other mutually. Fear belief consists of the idea that partners do not contravene agreements because of the fear of losing their reputation or clients. (Varamäki et al. 2006.)

Trust research is typically focused on a rational and social perspective of trust (Kramer & Tyler 1996). In this study trust is seen from a rational perspective and its viewpoint of interpersonal relationships. Trust can be considered as a foundation that enables people to work together, and it is an enabler for social interactions. Trust has a crucial role when global business teams and networks are being built. (Harisalo & Miettinen 2010.) Trust increases communication, and rich and open communication is essential for the emergence and growth of innovations. The research concentrates also on the cultural aspect of trust. Stages of trust vary in different countries. Countries are divided into low-trust and high-trust societies. Finland is among of high-trust countries. Cultural norms, religions, habits and heredity impact on people's behavior. (Doney et al. 1998) In Europe, people usually trust each other, as long as the other does not behave in an untrustworthy way. Situation is different for example with the Chinese, who do not trust their business partners before they prove themselves trustworthy. (Batt 2008.)

In this research, trust is considered as trusting in others' behavior and goodwill that can grow or vanish due to interaction and experiences. Trust usually takes a long time to develop. Past experiences and interactions affect trust; moreover, the other's interactions also have effects. A person's common trust towards people can decrease through bad experiences. Trust is a very fragile area that can be broken easily. Building trust takes a lot of time, but it can be lost very quickly. Trust is a complicated aspect between persons, but trust on the team level is an even more complex aspect. Trust increases communication between team members, which is a core issue in shared learning. Trust also increases commitment and loyalty. Larson and LaFasto (1989) argued that four elements are needed in trust building: honesty, openness, consistency and respect. Without one of these dimensions, trust can fray or even break. (Larson & LaFasto 1989.)

## **Communication supports trust**

Trust supports communication and vice versa. People share information voluntarily, and as a consequence of trust, people are willing to share ideas and be involved in sharing information. (Ståhle & Grönroos 2000.) Interaction can be measured by the quality and extent of interaction. Varamäki et al. have defined the optimum of interaction, which means a genuine dialog that includes an open and responsive atmosphere but also reciprocal respect. (Varamäki et al. 2006; Varamäki et al. 2004.) Shyness to share ideas or comments, weak social skills and the lack of views or distrust are common reasons for problems in the communication process. The rooting of ideas and allocation of feedback is easier in a trusted relationship. (Mäkipeska & Niemelä 2005.)

Ståhle and Laento (2000) have defined four types of dynamics in an interaction process: rival, critical, consensus oriented and collaboration oriented. Rival dynamic means an argumentation of own competences. People are not responsive to others' ideas. Critical dynamic causes arguments and also interruptions are common. Consensus oriented communication concentrates on avoiding those subjects that could produce disagreements. Genuine listening and plugging into the other's ideas belong to collaboration oriented communication, which includes all three dynamics in balance. Collaboration orientation also consists of readiness for shared learning and development.

## **Building trust in high performing teams**

Team is a basic unit of performance for most organizations and it melds together the skills, experiences and insights of several people (Katzenbach & Smith 1993). High performing teams aren't usually a collection of the brightest individuals. They are functioning entities that have diverse roles for the team members who complete the needed skills and knowledge to succeed. Healthy rivalry between team members enables the team's performance, but only if the team is built on robust trust. (Tienari & Piekkari 2011.)

Trust building is a relatively slow and long process compared to the rest of the fast paced business processes. Enhancing trust can be sped up by open interaction and good communication skills (Ståhle & Laento 2000). Shared experiences create trust and trust, in turn, enables deeper interaction and level of expression between team members (Mäkipeska & Niemelä 2005). Trust building requires openness, informing, honesty and arguments (Ruuskanen 2003). Trust enables free idea sharing, which is the basis of innovation processes. A high level of trust raises the probability to create successful companies. (Mäkipeska & Niemelä 2005.) Usually the feeling of trust is based on intuition and emotions (Ståhle & Laento 2000).

Coole (2009) studied teams in IT companies and defined the characteristics of a high performance team. Teams have a clearly defined and commonly shared purpose, mutual trust and respect, clarity around individual roles and responsibilities, high level of communication,

willingness to work towards the greater good of the team and a leader who both supports and challenges the team members. There is also a climate of co-operation and an ability to voice differences and appreciate conflict. A high performing team does not sweep inevitable differences under the carpet and it values openness.

Järvenpää, Knoll and Leidner (1998) have researched the team building in global virtual teams. The research revealed the importance of sharing personal information, such as background, work experience and current organizational contexts. Trust, benevolence, ability and integrity were perceived to increase because of team building exercises. The exercises focused on enriching communication and creation of team identity, team spirit. In high-trust teams people expressed their feelings, for example excitement, more freely. Team members also gave recognition and feedback to each other. Disagreements were discussed more openly. Overall, high-trust teams had more open interaction and discussion. (Järvenpää, Knoll & Leidner 1998.) Reagans and Zuckerman's (2001) research about R & D teams reveals the connection between communication frequency and productivity: more frequent communication creates higher productivity. The research also shows that homogeneous teams yield a lower level of productivity.

Larson and LaFasto (1989) have also described three most important characteristics for team leaders: sharing the vision successfully, creating the needed changes and motivating the team members to their best actions by supporting healthy climate and high energy. Team members should internalize the vision and desired targets to get to the high performing state. Team members should also be open to hear others' opinions and take part in team discussion.

## **Early Findings**

Very early research findings reveal the importance of trust in team building. Trust has been built profoundly in the level of the project team. Most of the team members have been working together before, so they know each other and trust has been built through shared experiences, active communication and mutually respectful behavior. The LA project consists of co-creation on different levels and for example in business modeling, it is important to share critical information and personal ideas.

Early findings show also that the business partners do not commit 100 percent to the business network development without trust both in the personal and in the business concept level. Enhancing trust needs a community of enrichment and regular interaction between all partners. Also value creation and shared learning could be increased if high-trusted relations could be built. One of the key ingredients for better communication is genuine listening and respecting other team members' ideas. This study has also shown that only fact based communication does not build personal relations. Trust takes time to develop, but without conscious actions like one-on-one meetings with different partners and team building exercises, the probability for success decreases.

## **Discussion**

The ongoing research has been emphasizing the importance of trust and team building. Several elements are needed in the building of high performing teams. Trust can be seen as a “hygiene factor” for team performance. Trust is a crucial, needed factor. (Erdem, Ozen & Atsan 2003.) Without trust, the team members are not willing to voice their opinions, questions and improvement ideas. Also the team members do not display their feelings and they are not willing to help others. (Sitkin & Roth 1993; Jones & George 1998.) All these aspects are crucial in co-creation of business networks and in the building of high performing teams.

As we have found out, trust is needed when high performing teams are built. In a relationship that is built up by trust, cooperative behavior is likely to happen (Jones & George 1998). The teams need knowledge transfers where trust is the enabler (Adler 2001). A lack of trust will show up as problems in communication, empowerment and quality (Owen 1996). In modern organizations trust is even more a core matter because the organizations cannot rely on formal policies and rigid rules (Erdem, Ozen & Atsan 2003). When building high performance teams, we should make sure that everyone shares the common goal or goals, is committed and understands what is needed to get there – both in personal and team level. (Tienari & Piekkari 2011.) Team members should also have competence trust for each other which is based on the trustee’s knowledge and expertise (Sako 1992).

## References

- Adler, P. 2001. Market, Hierarchy, and Trust: The Knowledge Economy and the Future of Capitalism. *Organization Science*, Vol. 12, No. 2, pp. 215-234.
- Baker, W. 1990. Market Networks and Corporate Behavior. *American Journal of Sociology*, Vol. 96, No. 3, pp. 589-625.
- Batt, P. J. 2008. Building Social Capital in Networks. *Industrial Marketing Management*, Vol. 37, No. 5, pp. 487-491.
- Bourdieu, P. 1986. The Forms of Capital. In J. Richardson (Ed.), *Handbook of theory and research for the sociology of education*, pp. 241-258. New York: Greenwood.
- Coleman, J. S. 1990. *Foundations of Social Theory*. Cambridge, MA: Harvard University Press.
- Coleman, J. S. 1988. Social Capital in the Creation of Human Capital. *American Journal of Sociology*, Vol. 94, pp. 95-120.
- Coole, S. 2009. *Building a High Performing Team. Proven techniques for effective team working*. Cambridgeshire: IT Governance Publishing.
- Costa, A. C. 2003. Work team trust and effectiveness. *Personnel Review*, Vol. 32, No.5, pp. 605-622.
- Doney, P. M., Cannon J. P. & Mullen M. R. 1998. Understanding the Influence of National Culture on the Development of Trust. *The Academy of Management Review*. Vol. 23, No. 3, 601-620.
- Erdem, F., Ozen J. & Atsan N. 2003. The relationship between trust and team performance. *Work Study*, Vol. 52, No. 7, pp. 337-340.
- Fukuyama, F. 1995. *Trust. The Social Virtues and The Creation of Prosperity*. New York Free Press.
- Guba, E. & Lincoln, Y. 1994. Competing Paradigms in Qualitative Research. In N. Denzin and Y.S. Lincoln (Eds.), *Handbook of qualitative research*, pp. 105-117. London: Sage.
- Harisalo, R. & Miettinen, E. 2010. *Luottamus - Pääomien pääoma*. University of Tampere: Tampere University Press.
- Herr, K. & Andersson, G. 2005. *The Action Research Dissertation. A guide for students and faculty*. London: SAGE.
- Ilmonen, K., Jokivuori, P., Juuti, P., Kevätsalo, K. & Liikanen, H. 1998. *Luottamuksesta kiinni: Ammattiyhdistysliike ja työorganisaation suorituskyky*. University of Jyväskylä: University Press.
- Jacobs, J. 1965. *The death and life of great American cities*. London: Penguin Books.
- Jary, D. & Jary, J. 1991. *Collins Dictionary of Sociology*. Glasgow: HarperCollinsPublishers.
- Jones, R. & George, J. 1998. The Evolution of Trust and Cooperation: Implication for Teamwork and Tacit Knowledge. *Academy of Management Review*, Vol. 23, No. 2, pp. 531-46.
- Jyrkämä, J. 1978. Toimintatutkimuksen teoriasta ja tutkimuskäytännöstä. Teoksessa *Sosiaalipoliittinen yhteistyksen vuosikirja*; 37-71.
- Järvenpää, S., Knoll, K. & Leidner, D. 1998. Is Anybody Out There? Antecedents of Trust in

- Global Virtual Teams. *Journal of Management Information Systems*, Vol. 14, No 4, pp. 29-64.
- Katzenbach, J. & Smith, D. 1993. *The wisdom of teams: Creating the High-Performance Organization*. Cambridge, MA: Harvard Business School Press.
- Kramer, R.M. & Tyler T. R. 1996. *Trust in organisations*. Frontiers of Theory and Research. Thousand Oaks. CA: Sage Publications.
- Larson, C. E. & LaFasto F. M. J. 1989. *Team Work. What must go right / What can go wrong*. London: Sage.
- Mäkipeska, M & Niemelä. T. 2005. *Haasteena luottamus – työyhteisön sosiaalinen pääoma ja syvärakenne*. Helsinki: Edita yritysulkaisut.
- Nahapiet, J. 2009. *Capitalizing on Connections: Social Capital and Strategic Management*. In Viva Bartkus and James Davis (Eds.). *Social Capital: Reaching Out, Reaching In*. Edward Elgar Publishing Ltd.
- Nahapiet J. & Ghoshal S. 1998. *Social Capital, Intellectual Capital and the Organizational Behaviour*. *The Academy of Management Review*, Vol. 23, No. 2, pp. 242-266.
- Owen, H. 1996. *Building teams on a display of trust*. *People Management*, Vol. 2, No. 6, pp. 34-37.
- Putnam, R. 2000. *Bowling alone*. New York: Simon and Schuster.
- Putnam, R. D. 1995. *Bowling alone: America's declining social capital*. *Journal of Democracy*, Vol. 6, No. 1, pp. 65-78.
- Reagan, R. & Zuckerman E. W. 2001. *Networks, Diversity, and Productivity: The Social Capital of Corporate R&D*. *Organization Science*, Vol. 12, No. 4, pp. 502-517.
- Reason, P. & Bradbury, H. 2008. *The SAGE Handbook of Action Research. Participative Inquiry and Practice*. Los Angeles: Sage.
- Ring, P. & van de Ven, A. 1992. *Structuring cooperative relationships between organizations*. *Strategic Management Journal*, Vol. 13, No. 7, pp. 483-498.
- Ruuskanen, P. 2003. *Verkostotalous ja luottamus*. University of Jyväskylä: University Press.
- Sako, M. 1992. *Prices, quality and trust: Interfirm relations in Britain and Japan*. Prices, quality and trust: Interfirm relations in Britain and Japan. Cambridge University Press.
- Sitkin, J. & Roth, N. 1993. *Explaining the limited effectiveness of legalistic remedies for trust distrust*. *Organization Sciences*. Vol. 4. No.3, pp. 367-92.
- Stähle, P. & Grönroos, M. 2000. *Dynamic Intellectual Capital – Knowledge Management in Theory and Practice*. WSOY: Porvoo, Helsinki, Juva
- Stähle, P. & Laento K. 2000. *Strateginen kumppanuus – avain uudistumiskykyyn ja ylivoimaan*. Helsinki: WSOY.
- Tienari, J. & Piekkari, R. 2011. *Z ja epäjohtaminen*. Helsinki: Talentum.
- Tyler, T. R. & DeGoey, P. 1996. *Trust in Organizational Authorities: The Influence of Motive Attributions on Willingness to Accept Decisions*. In Kramer, R. M., Tyler, T. R. *Trust in Organizations. Frontiers of Theory and Research*. California: SAGE.
- Varamäki, E., Kohtamäki, M., Vesalainen, J., Järvenpää, M., Laitinen E.K., Wingren T., Vuorinen, T., Sorama, K., Tuominen T., Markkula J., Helo P. & Hallila J. 2006.

- Pyranet -käsikirja verkoston suorituskyvyn arvioimiseksi ja kehittämiseksi. University of Vaasa: Selvityksiä ja raportteja 128.
- Varamäki, E. Pihkala T., Järvenpää M. & Vesalainen J. 2004. Pk – yritysverkoston kasvupolut & suorituskyvyn mittaaminen verkostoissa. University of Vaasa: Selvityksiä ja raportteja 108.
- Vuorinen, T. 2005. Verkostot organisoitumisen muotona. Hermeneuttinen analyysi Kahdenvälisten suhteiden rakentumisesta kärkiyrityskontekstissa. Vaasa: Acta Wasaensia No 150.



# EBRF 2011 CONFERENCE PROGRAM

Wednesday, December 14, 2010 Conference Center Dipoli, Espoo, Finland

08:30-17:00 Registration (main lobby)

## Plenary Session Auditorium

09:00-10:30

09:00-09:20 Opening words by Marko SEPPÄ, Chairman of the EBRF Board and Marko TURPEINEN, Head of the EIT unit at Aalto University

09:20-09:40 Keynote: Born Globals as the Way Forward



**Reijo LUOSTARINEN** is Founder and Professor Emeritus of International Business (IB) programme and the Centre for International Business Research at Aalto University. He has served as President of European International Business Academy (EIBA) and has a vast global experience via visiting professorships, board memberships and consulting. Today, he chairs a number of Born Globals and devotes time & energy to advancing the art of global business creation.

09:40-10:00 Keynote: Business Administration vs. Business Creation



**Taneli TIKKA** is a Serial Entrepreneur and Play Maker known from Internet based ventures such as IRC-Galleria, Dopplr, Muxlim, StarDoll, RunToShop, and Vakuutuskone.com. This Aalto University School of Economics graduate currently serves as CEO of Soprano Brain Alliance and assists the TEKES funded accelerator program Vigo as member of the steering board. Looking back at 2010, the FIPA nominated him as Finland's Opinion Leader in ICT.

10:00-10:20 Keynote: Business Administration vs. Business Creation



**Mark HARRIS** has over 30 years of experience in the high tech industry, most recently at Intel. As Director of Higher Education for Europe, he was responsible for advancing innovation in key areas of Intel, collaborating with top universities to expand their curricula. During the past decade, he built Intel's Global Technology Entrepreneurship with UC Berkeley. He has experienced first-hand the difficulties, especially in Europe, of building entrepreneurial ecosystems.

10:20-10:30 Q&A

10:30-11:00

Networking break

## Six Parallel Sessions

Six Parallel Sessions						
11:00-12:30	"CAPITAL" Room 24	"EDUCATION" Room 21	"ENERGY" Room 22	"HEALTH" Room 12	"ICT " Room 13	"WELLBEING" Room 4B
<b>Session chair</b>	Prof. Reijo Luostarinen	Prof. Malcolm Smith	Prof. Benoit Montreuil	Prof. Marko Turpeinen	Dr. Rosalind Jones	Dr. Roberto Santoro
	<p>CHALLENGES IN COMMERCIALISATION PROCESSES OF PRODUCT INNOVATION AMONG SMALL FIRMS Jarkko Pellikka, Miika Kajanus, Mikko Heinonen, Tuomo Eskelinen</p> <p>ACCELERATING CO-CREATION AT NATIONAL BUSINESS SYSTEM LEVEL: SOCIAL AND BUSINESS PERSPECTIVES Daiva Valiukonyte</p> <p>THE ROLE OF BUSINESS FAMILIES IN GROWTH VENTURING – BUSINESS FAMILIES AS BUSINESS ANGELS Päivi Patja</p> <p>FROM BUSINESS ADMINISTRATION TO BUSINESS CREATION: CASE KALEVALA GLOBAL BUSINESS CREATION SCHOOL Marko Seppä</p>	<p>THE STU CLARK CENTRE FOR ENTREPRENEURSHIP: A CASE OF CREATING TOMORROW'S GLOBAL ENTREPRENEURS Malcolm Smith, Robert Warren, Mavis McRae</p> <p>COLLECTIVE VALUE CREATION BY PLAYING WITH LEGOS. A NETNOGRAPHIC STUDY Hanna Kurikko, Pekka Tuominen</p> <p>A SYSTEM DYNAMIC APPROACH TO THE STUDY OF WORD-OF-MOUTH AND ITS EFFECT IN AN ONLINE ENVIRONMENT Roman Wong</p> <p>PRIZM GAME FOR PROBLEM SOLVING AND INNOVATION CREATION Aleksejs Busarovs</p>	<p>EXPLORING NEW SUSTAINABLE BUSINESS MODELS IN THE FOREST INDUSTRY BASED ON MEDIA HEADINGS Hannu Virkkunen, Hannele Lampela</p> <p>FACTORS INFLUENCING THE SUCCESS OF R&amp;D COOPETITION Outi Nuojua, Jaana Tähtinen, Teea Palo</p> <p>SERVICE DESIGN AS A TOOL FOR IMPROVING E-RETAILING USER INTERFACES Taina Vuorela, Helena Ahola, Sinikka Suutari</p> <p>THE PHYSICAL INTERNET AND BUSINESS MODEL INNOVATION Benoit Montreuil, Jean-François Rougès, Yan Cimon, Diane Poulin</p>	<p>DETERMINING SOCIAL MEDIA COMPONENTS FOR SCALABLE HEALTHCARE Amrita, Bhaskar Bhowmick, Dhruves Biswas</p> <p>INNOVATION AND VALUE-CO- CREATION THROUGH STRUCTURED INCUBATION NETWORK MODELING Sharad Kumar, Bhaskar Bhowmick, Dhruves Biswas</p> <p>MOBILE VOICE SERVICE DEPLOYMENT FOR DEVELOPING COUNTRIES: CASE RURAL INDIA'S BOTTOM OF THE PYRAMID Mikko Ruohonen, Markku Turunen, Himadri Das, Gururaj Mahajan</p> <p>PRAGMATISM AS A PHILOSOPHY FOR ACTION RESEARCHERS Merie Joseph, Antti Hautamäki, Christian Aspegren</p> <p>ECOSYSTEM EQUATION – A METHOD OF COLLABORATIVE LEARNING AND INNOVATION TO SOLVE WICKED PROBLEMS Christian Aspegren, Amrita, Merie Joseph, Mari Suoranta, Ikka Hämäläinen, Dhruves Biswas</p>	<p>THE CREATION OF A NEW BORN GLOBAL – THE FIRST STAGE OF A THREE STAGE ROCKET Christian Aspegren, Marko Seppä</p> <p>POSSIBILITIES AND CHALLENGES IN UTILIZING SOCIALLY MEDIATED SERVICE INNOVATION IN TELECOM FIELD Elina Annanperä, Jyri Naarmala, Anna Rohunen, Jouni Markkula</p> <p>TOWARDS A FLEXIBLE MULTI-VENDOR MICROPAYMENT SYSTEM Anna Rohunen, Kai Wen Chan, Kari Liukkonen, Tero Tulppo</p> <p>ENTREPRENEURIAL MARKETING ORIENTATION: A MULTI-STUDY OF SOFTWARE TECHNOLOGY COMPANIES Rosalind Jones, Mari Suoranta</p>	<p>THE RELATIONSHIP BETWEEN SOCIAL ENTREPRENEURSHIP AND SUBJECTIVE WELL-BEING Svetlana Sajeva, Egidijus Rybakovas</p> <p>ARCHITECTURE OF A BUSINESS ECOSYSTEM UNDER CONSTRUCTION Leni Kuivaniemi, Marikka Heikkilä, Mari Suoranta, Aki Soudunsaari, Mila Hakanen</p> <p>TRUST IN BUILDING HIGH PERFORMING TEAMS Mila Hakanen, Aki Soudunsaari, Leni Kuivaniemi, Marikka Heikkilä, Mari Suoranta</p> <p>FUTURE OF COLLABORATION IN MANAGING PRODUCT LIFECYCLE INFORMATION AND KNOWLEDGE Hannele Lampela, Andrea Denger, Hannu Kärkkäinen, Markus Zoier</p>

12:30-14:00

Lunch: Divided into Thematic Tables

The Six Parallel Ecosystem Level Live Case Exercises Begin

14:00-15:30

Capital Room 24

Business creation and VC require spicing up. In CAPITAL, we work to turn knowledge (capability, capacity, competence, compassion and contacts) of individuals and slack resources of institutions into investable capital.



Keynote Player: **Will CARDWELL**, Head of Aalto Center for Entrepreneurship (ACE). This born American, former venture capitalist, growth venture CEO and managing director of Technopolis Ventures is well groomed as the quarterback of enterprise in Finland's new innovation university.

Education Room 21

Education of global business creation requires a globally scalable platform, but also inspiring environments, locally. In EDUCATION, we design an ideal content and space around Aalto's new Otaniemi Campus.



Keynote Player: **Lesley HETHERINGTON** Is Director of Entrepreneurship and Enterprise Skills at the University of Aberdeen and Senior Teaching Fellow and architect of comprehensive future curricula for the Scottish Programme for Entrepreneurship. She is also Co-Chairs the European Roundtable on Entrepreneurship Education EREE.

Energy Room 22

Co-creation of research, ventures and policies is required around the smartest energy solutions. In ENERGY, we discuss the scaling of waste-to-energy technologies, production and delivery models.



Keynote Player: **Guus KEDER** has over 20 years experience from corporate finance, venture capital and growth venture creation. Currently, he is active in building Ukrainian renewable energy technologies to world markets.

Health Room 12

Health delivery models differ from society to society and segment to segment. In HEALTH, we focus on ecosystem level modeling of processes and organizations in the context of the Rural India Health Kiosk venture.



Keynote Player: **Dhrubesh BISWAS** is Professor of Electronics and Head of Rajendra Mishra School of Engineering Entrepreneurship at IIT Kharagpur. He has co-founded several technology ventures in America, Asia and Europe, is a Co-Founder of Global Venture Lab (GVL) and the Founding Father of the Rural India Health Kiosk.

ICT Room 13

Business creation across all borders is possible thanks to ICT enabled solutions, such as Social Media. In ICT, a virtual Great Enabler mechanism for global business creation, connecting all stakeholders, is addressed.



Keynote Player: **Marko TURPEINEN** is the Director of EIT's unit in Finland. He heads the Helsinki node of ICT Labs, one of EIT's three Knowledge and Innovation Communities (KICs). The Aalto University professor also holds a chair in media technology at KTH in Stockholm.

Wellbeing Room 4B

Wellbeing is the basis of our actions, but our body is often seen as a transportation to our heads to get into meetings. In Wellbeing we are co-creating solutions to health, exercise and wellbeing ecosystem under construction, an open platform for research and business.



Keynote Player: **Roberto Santoro** is a leading figure in the European Living Lab arena and the Founding Chairman of the European Society of Concurrent Enterprising Network ESoCe-NET, a non-profit organization bringing together academics, researchers and industry practitioners to stimulate the exchange of ideas, views, practices and latest research and developments in the diverse field.

15:30-16:00

Networking break




## The Six Parallel Ecosystem Level Live Case Exercises Continue

<b>16:00-17:00</b>	<b>Capital</b>	<b>Education</b>	<b>Energy</b>	<b>Health</b>	<b>ICT</b>	<b>Wellbeing</b>
<b>19:00-19:30</b>	<b>Networking reception and "Family Picture" hosted by <i>Global Faculty Partners for Problems Worth Solving LP Ky</i></b>					

### Conference Dinner in Luolamies, Dipoli

<b>19:30-22:00</b>	<p><b>With a Special Keynote Address by</b></p>  <p><b>Jose Manuel LECETA</b> is the newly appointed Director of the European Institute of Innovation and Technology (EIT). Before, he served as International Director of CDTI, the Spanish Innovation Agency, for six years. A specialist in international innovation economics, he is a strong believer in the game-change capacity of pan-European partnerships towards delivering impact in the field of entrepreneurship education and the creation of new business in Europe.</p>
--------------------	---

Thursday, December 15th, 2011

08:30-17:00	<b>Registration open</b>
08:30-10:00	<b>DOING GOOD BY DOING BUSINESS</b> Plenary session crossing all six Live Case ecosystem exercises
10:00-10:30	<b>Networking break</b>
10:30-12:00	<b>The Six Parallel Ecosystem Level Live Case Exercises Continue</b>
12:00-13:00	<b>Working lunch: : Divided into Thematic Tables</b>
13:00-14:30	<b>The Six Parallel Ecosystem Level Live Case Exercises Continue</b>
14:30-15:00	<b>Networking break</b>
<b>Plenary Session Auditorium</b>	
15:00-17:00	<p><b>15:00-15:30 Keynote: Challenges of University based Business Creation</b></p>  <p><b>Paul DINE</b> is Founding Partner of Global Leadership Alliance and Assistant Dean of Top Talent Study Programs at NJIT. The makings of this cross-cultural guru include service as Professor of Theology at Pontificio Collegio Beda, in Rome, a career as a Siemens Executive with global responsibilities related to cross-cultural group education &amp; training, and another career as Management Professor teaching, cross-culturally, around the world.</p> <p><b>15:30-16:00 Keynote: Dangerous Ideas: The best ones have highest resistance</b></p>  <p><b>Alf REHN</b> is a globally renowned Business Thinker, writer and speaker, and Professor of Management and Organization at Abo Akademi University. He also serves as Chairman of Finland's fastest growing advertising agency, Satumaa. The Times has labeled him a "star of the future" and Thinkers 50 ranked him #13, in their Guru Radar, among the world's top business thinkers. His most recent book, Dangerous Ideas, presents an alternative take on creativity and business.</p> <p><b>16:00-16:30 Closing keynote: The Greatest Enabler? It is all about U</b></p>  <p><b>Christian ASPEGREN</b> is Founding Managing Partner of Global Faculty Partners for Problems Worth Solving LP, a born global to be launched at EBRF 2011 Global Business Creation Games. Christian has almost 40 yrs of experience of developing and launching market leader products and services as Product Manager, CEO, Management Consultant and Entrepreneur. In 2009, he joined GVL Finland, as Co-Creator, and candidate for PhD on Global Venture Creation.</p>
16:30-17:00	<b>Victory Ceremonies and Closing Auditorium</b>
17:30-24:00	<b>START UP SAUNA DEMO DAY (RECOMMENDED EXCURSION)</b> Start Up Sauna has Open Doors at <b>Nosturi, Telakkakatu 8, in HELSINKI</b>  Registration via <a href="http://startupsaunademoday2011.eventbrite.com/">http://startupsaunademoday2011.eventbrite.com/</a>

## Review board for EBRF 2011

Dr. Jukka Ala-Mutka, Aalto University  
Prof. Galyna Akmayeva, Infonomics Society  
Prof. Dhruves Biswas, IIT Kharagpur  
Prof. Malin Brännback, Åbo Akademi University  
Dr. Daniela Carlucci, University of Basilicata  
Prof. Chuck Comegys, Merrimack College  
Dr. Amol Gore, University of Mumbai  
Prof. Mika Hannula, Tampere University of Technology  
Dr. Kristina Heinonen, Hanken School of Economics  
Dr. Rosalind Jones, Bangor University  
Prof. Eila Järvenpää, Helsinki University of Technology  
Prof. Johanna Kujala, University of Tampere  
Prof. Hannu Kärkkäinen, Tampere University of Technology  
Prof. Antti Lönnqvist, Tampere University of Technology  
Prof. Benoit Montreuil, University Laval  
Dr. Jussi Okkonen, Tampere University of Technology  
Prof. Jan Pawlowski, University of Jyväskylä  
Prof. Markus Pessa, Tampere University of Technology  
Dr. Jarkko Pellikka, Honeywell  
Prof. Vesa Puhakka, University of Oulu  
Prof. T. Ramayah, University of Sains Malaysia  
Dr. Marko Seppänen, Tampere University of Technology  
Prof. Charles A. Shoniregun, Infonomics Society  
Prof. Malcolm C. Smith, University of Manitoba  
Dr. Mari Suoranta, University of Jyväskylä  
Prof. Marko Torkkeli, Lappeenranta University of Technology  
Prof. Carol Tenopir, University of Tennessee  
Prof. Jaana Tähtinen, University of Oulu  
Prof. Roman Wong, Barry University

## Organizers

The EBRF 2011 Global Business Creation Games conference is organised by GVL Finland.

In November 2010, GVL Finland expanded nation-wide. University of Jyväskylä, Tampere University of Technology and University of Tampere - jointly referred to as University Alliance Finland - were joined by Aalto University, Åbo Akademi University, Lappeenranta University of Technology and University of Oulu.

[Global Venture Lab](#) (GVL) action started as American-Finnish-Indian cooperation in 2007. The three co-founders represent Indian Institute of Technology at Kharagpur, University Alliance Finland at University of Jyväskylä, and University of California at Berkeley. In 2008, University Alliance Finland chose the University of Jyväskylä led GVL Finland five-year pilot program (2007-2011) as a research cluster of excellence. In November 2009, GVL Network was formally launched as a community of 26 university members worldwide.

GVL Finland works to launch a nation-wide, second stage pilot of a distributed, globally scalable ecosystem platform for a new domain of knowing - coined as "Art of Business Creation" - where academicians, entrepreneurs, policy makers and students co-create new knowledge, new companies, new policies and new masters, simultaneously, together.

GVL Finland's current mission will reach maturity at EBRF 2011.

