Co-Design: An Approach to Border Crossing, Network Innovation

Lars ALBINSSON[1], Mikael LIND[2], Olov FORSGREN[2]

[1]*Calistoga Springs Research Institute, Ramsö 1:181, Vaxholm 185 99, Sweden*
Tel: +46 70 592 70 45, Email: lars@maestro.se

[2]*University College of Borås, School of Business and Informatics, Borås, 501 90, Sweden*
Tel: +46 70 566 40 97, Email: mikael.lind@hb.se, olov.forsgren@hb.se

Abstract: Innovation is increasingly taking place in networks of organizations, both private and public. This Network Innovation is challenging traditional approaches to project management and development. In this paper we present the application of a Co-Design approach in an innovation project with more than 20 organizations as partners, including global corporations, SMEs, government authorities, universities and trade unions. Some challenges for traditional Project Management are presented and conclusions are drawn to vital properties of approaches to Network Innovation.

1. Introduction

According to Porter [1] and others, the value chain is flowing from upstream suppliers to end customer. In this system a company or organization is the innovator, perhaps in dialogue with customers and supported by suppliers. In today's businesses, however, this model is increasingly giving way to network models. (c.f. [2]) A similar development is taking place in government, where more and more services are developed in partnerships including several public organizations. Furthermore there are an increasing number of public/private partnerships striving at developing new products, goods and services.

Many companies will work in networks to create and deliver value. At the time of innovation it is not necessarily clear which company will be the supplier and which will be selling to end customers. A company may make a software innovation using Microsoft technology. If it decides to market the product by itself Microsoft will be a supplier. It may also sell the innovation to Microsoft and thereby become a Microsoft supplier. In services the trends with outsourcing, home-sourcing, multi-sourcing is breaking up established value chains. Companies like Google and Myspace live in rather sophisticated business models, where services are shared, sold or given away with payments for referrals in many steps.

In "Open Source" developments the flow between developers and users is anything but a commercial "value chain". In these value is even often detached from money. Another example is "clusters", where geographical closeness between complementary as well as rivaling organizations are put forward as an important condition for innovation.

To create, lead and be part of these types of Innovation Networks (a network of people and originations aiming at innovation) is becoming increasingly important. [The term "Network Innovation" refers to innovation taking place in networks of people and organizations.] Procter & Gamble claim "Today, more than 35% of our new products in market have elements that originated from outside P&G, up from about 15% in 2000. And 45% of the initiatives in our product development portfolio have key elements that were discovered externally."[3] Small Medium Enterprises (SME) with often scarce resources must have the ability to learn how to work in these types of environmentsl.

A lot of innovation is thus driven by and require constructive meetings between several different stakeholders. One approach to organize such innovation processes is called co-design. Co-Design Approaches has been successfully used to drive a number of Network Innovation projects and programmes:

- Volvo on the next generation sale support system [4]
- Innovation cluster MIT-2000, between Volvo, Ikea and Pharmacia Biotech. [5]
- Invention of the SEB Internet Bank concept in 1995 (one of, or the first, major bank to offering internet online transactions)
- Development of Telia Broadband Services in 1999.
- Driving demonstrator innovation in award winning 5th framework project Avanti.[6]
- Stimulation of work in big EU-R/D clusters. [7]

This paper presentd the application of a Co-Design approach in an innovation project with over 20 parrtners, including global corporations, SMEs, government authorities, universities and trade unions. Challenges for traditional Project Management are presented and conclusions are drawn to vital properties of approaches to Network Innovation.

2. Objectives

This paper presents an approach to innovation among people and organizations in networks. The objective is to contribute both to practitioners by offering practical guidelines and to researchers as a basis to further developments of theories of innovation, networks and project management. As a part of this some properties of methods or approaches to Innovation Networks are presented.

3. Methodology Used

The paper presents an action research project and elements of a Co-Design theory, building on a tradition of research from American pragmatism with social constructivist ideas. (West Churchman [8], Russel Ackoff [9], Ian Mitroff [10], and Donald Schön [11])

4. The e-Me Case

The case study is the innovative and border crossing e-Me project (funded by VINNOVA under the name eStudent Passport). Over 20 organizations including larger corporations like Microsoft, Visa, Intel, Telia, a number of smaller businesses, several universities, government agencies and trade unions are working together in the design of the next generation of internet services based on a common "personal e-service", the e-Me. The first set of clients are university students and the design has been driven by more than a 100 students in Sweden and Spain engaging in co-design, to ensure a focus on delivery of real value to end users/customers/citizens. (The project has been presented and studied in several papers C.f. [12], [13], [14]. The case description here is based on [14].)

4.1 Case Background

Today students, as many other groups of citizens, are offered, indeed required to use, a rapidly increasing number of e-Services. They range from school and course sites to interactions with authorities as well as companies offering student discounts. This forces students to remember a multitude of user IDs, passwords and login procedures. On top of this students are often provided with special email accounts for courses and educations. Many students have four or more different email addresses. Consequently a lot of time is spent on logging on to different mail systems, trying to find passwords and links to various sites. While these types of problems are not only restricted to students but are rather experienced by larger groups of citizens, the project have focused students because they are

in the process of developing skills to deal with communications and schedules in the process of becoming adults, and are therefore both reflective and open to change.

4.2 The e-Me Project

The e-Me Project has taken a radical approach to this, namely to issue the student with an electronic assistant, an e-Me, that schools, authorities and companies are required to address when having an electronic contact with the student. It might be thought of as turning the internet around – rather than having students find and keep track of sites, the sites will have to come to the students and interact with them in the way specified by them.

e-Me Project Partners	
Universities:	**Government Agencies:**
Umeå University University College of Borås Stockholm School of Economics	CSN - The Swedish National Board of Student Aid Verva -Swedish Administrative Development Agency VINNOVA - Swedish Governmental Agency for Innovation Systems
Private Corporations:	City Council:
Intel WM-Data Microsoft VISA Mecenat Swedbank BAAMM Telia Liber	The City of Stockholm
	Trade union:
	TRIA
	Other:
	The LADOK consortium Calistoga Springs Research Institute

4.3 Project Characteristics

The e-Me project has three important characters that are needs to be taken into account when choosing methodologies and that affect the project management:

- Unknown Result
  The aim of the project is to make a significant innovation. This implies that the specific outcome of the project is to a large extent unknown at the outset. The vision behind it implies changes and development of technology, services and organizations.
- Multiple, conflicting Interests
  The partners represent many types of public and private organizations and their combined areas of interest are vast, overlapping and even conflicting. For instance universities compete for students and today e-services are perceived as competitive advantage. So why should several universities collaborate on such services? Public organizations and private companies that are not used to working together often distrust each other to a certain degree. In many countries, Sweden being one, there are laws regulating the ways public organizations can engage in business with companies. The IT/IS field is also characterized by so called "religious wars" on the merits of standards, architectures as wells as on proprietary vs. open technologies. To some extent the e-Me vision may even be unrealistic per se owing to the perceived conflicts of interests.
- Complex notion of the client
  The e-Me project is a network also in that is no ordinary value chain flowing in a single direction. To some corporate partners the other partners are important customers, to the universities the students are customers, the government agencies are acting on the parliament's behalf while other partners may be interested mostly in the students as future customers, members or employees.

5. Scenarios in the co-Design Approach

In the e-Me project the Co-Design Approach have been applied. It is a design approach focusing on making different stakeholders constructive participants.

The key component of the Co-Design Approach in this paper is the scenario. A Co-Design Scenario is a first person story about a client of the organization or service and his/her experience. (This is a contrast to for instance the scenarios used in scenario planning, that focus the organization c. f [15].) The Co-Design Scenario should scope the overall relationship with the organization as well as the situation where the particular artifact is used. The Co-Design Scenario should therefore include also other interactions, services and staff that might be part of the overall concept. The wide scope of the Co-Design Scenario allows the IT artifact to be designed in its context, and other stakeholders' perspectives to be considered, visualized and explored in the design process [16]. By using the Client of the innovation as the first person, the Co-Design approach centers on the value created in the use of the artifact. The outside perspective on values in the client situation allows stakeholders to re-examine their assumptions on their own role, organization and products/services. This challenge of assumptions is a critical component in innovation.

The Co-Design Scenarios will also make it possible for service providers etc to analyze consequences of the proposed idea, in terms of IT, organization, staffing, process and overall cost. Co-Design Scenarios help people be more innovative by letting everyone explore ideas. This helps reduce the feeling of risk by giving a clearer understanding of what the proposal really mean. It also allows a nuanced critical thinking, in that objections can also be explored and help improve the design, rather than just rejecting it [5] .

The Co-Design Scenario can as a starting point for existing IT development methodologies. When using RUP (IBM Rational Unified Process), the Scenario will be the basis for use cases, complementing and improving existing development approaches [16] .

6. The Co-Design Approach in the e-Me Project

It is not always easy to know where a project originates but a reasonable point for the e-Me story is a series of meetings between Intel, LADOK, University College of Borås (UCB) and Calistoga Springs Research Institute (Calistoga) on future e-services in higher education. Most of the participants knew one or more of the others as they had previously worked together. Choosing the Students as the "Client", when thinking on the next generation e-services, led to the idea of a personalized "electronic home space". VINNOVA granted funds for a pre-study. In the pre-study more than 20 students were engaged and three basic Co-Design Scenarios were developed.
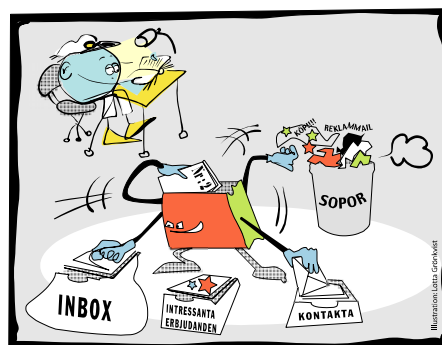

One of three original Co-Design Scenario illustration: e-Me retrieve and sorts incoming messages, offers and other matters. (From the project application 2005-04-18)

During this initial work several organizations were approached using participants' networks. The Co-Design Scenarios were used to discuss the concept with them. The

resulting application was backed by over ten partners. In the application the partners stood for 50 % (which was required by VINNOVA) of the finance of the whole project.

The application was granted and the following the Co-Design Approach we engaged more than 40 students in workshop on Stockholm, Borås and Barcelona. In these workshops the original assumptions for the project were verified and the original Co-Design Scenarios were interactively developed together with the students into ten completed stories on the students' ideal future electronic services. [12]
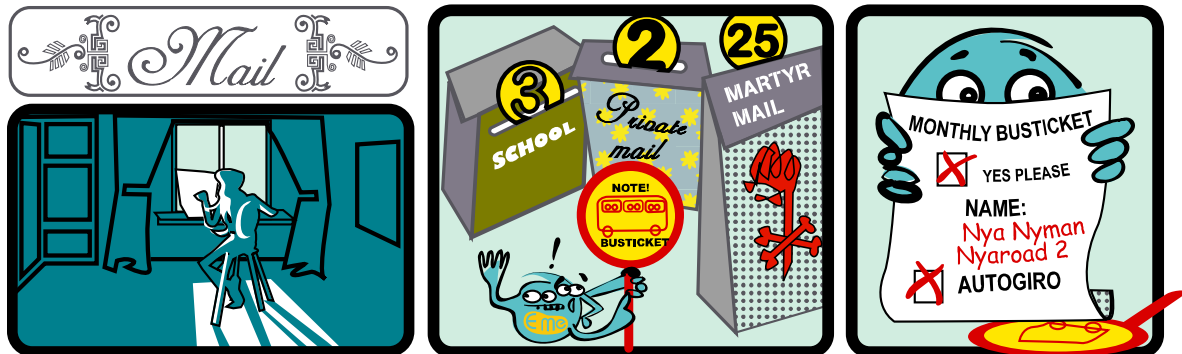
At 11 a.m. Nya logs onto her e-Me. 3 mails in the schoolbox, 2 private ones and 25 in the "Martyr-mail" inbox. Nya calls the address used when surfing for "Martyr-mail". e-Me reminds her again about renewing her monthly bus ticket. Prepared renewal form is attached.

Part of a developed Co-Design Scenario showing e-Me sorting messages and notifying its student on pending matters. The Co-Design Scenarios are 12 pages of cartoons (from [12])

These Co-Design Scenarios have been used in the work with partners. Many partners engaged in the project as they were interested in learning about what students wanted the future to be like. A number of partner workshops have been held to discuss various consequences and possibilities for partners, where the Co-Design Scenarios were viewed as a "market survey". The strong centering on the students as *clients* of the e-Me allowed partners to focus and to take an outside view of their organizations.

This supported the stakeholders to re-examine their assumptions, as stated above. For example the publishing house Liber said that they didn't think they could build a good enough electronic market place on their own as they feared to be perceived as spammers. This was a surprise to other partners as they expected each company to strive towards "owning" the "customer dialogue". Another example is that Microsoft said that given their experiences with passport etc they didn't think they could get a global acceptance of a proprietary electronic identity scheme and that they may choose to be part of joint effort to make head way. This was a surprise to some stakeholders as they assumed that Microsoft was aiming at building their own global identity scheme.

These re-examinations of assumptions were critical for many partners, who at the outset viewed the e-Me as a far reaching futuristic idea, in starting to regard it as a viable concept.

These discussions resolved many perceived conflicts and have already led to several joint business ventures. For instance LADOK, CSN, Mecenat and the students unions have developed a joint e-service to verify if someone is an active student, a service now being used by companies offering students discounts and authorities. The Co-Design Scenarios allowed these partners to examine the potential use of such collaboration between commercial actors and government entities normally perceived as dangerous and difficult.

The developed scenarios were verified by a questionnaire sent to 16 000 students in Sweden and we got more than 3 200 answers back. In the questionnaire we asked the students to rank different kinds of e-services that would be preferred [13]. These kinds of results were brought into the partner workshops and were an important incitement for ensuring an interest from the partners. The largest partner event arranged was in Stockholm at the end of the first project year, an e-Me symposium, to which desired key personnel from partner organizations were invited. The symposium had approx. 100 participants.

During Q3 2006 an e-Me pilot prototype was developed, using the standard IS development methodologies RUP and DSDM (Dynamic Systems Development Method). In Jan 07 almost 120 University College of Borås students were invited as co-designers, using the pilot e-Me in their daily work. Several partners put up additional funding. This prototype covered some core services, such as mail aggregation, calendar, contact management, archives and mood management. The e-Me is accessible both on the web and via mobile phone. The prototype also covers interaction with single service providers (both official and private organizations) and match-making organizations.

At the time of writing the pilot test have recently been concluded and the results point at even this tiny version of the e-Me is sufficient to be of great value to the students. Therefore a group of the partners have already started to invest in a realization of the e-Me concept.

7. Reflection on the e-Me Project and the Co-Design Approach

According to Roberts [17] "A project is a oneoff process with a single definable endresult or product." Traditional Project Management (PM) normally assumes that the goal of the project is fairly well defined before the start. The standard project is also owned by one organization even though it may involve several. "Project success and failure criteria are usually set by the … executives of *the parent organisation* at the outset." [Our emphasis] [17] These assumptions make Network Innovation a challenge for traditional PM, often resulting in the innovation process being pushed out of the project, into a pre-process, and the network forced to accept some hierarchy among partners and people. The Co-Design Approach offers tools to support Innovation Networks, also in a project context. As we have seen in the e-Me case above the Co-Design Approach allowed the gradual development of the innovation, the e-Me. It originated as a rather unspecific idea that was developed into three loose scenarios and later emerged as 10 detailed stories possible to use as requirements specification. The reason the Co-Design Approach is useful is that they focus the *clients' use* of the innovation, rather than the *product* of the innovation:

- They allow a design of the whole before the details. This helps overcome difficulties in having to define the results of the project before starting it. This scalability also supports the rather gradual establishment of Innovation Networks that normally happens. It is less common that Innovation Networks are established out of the blue.
- They put the innovation client at the center of the process, enabling partners to focus on the value created in the innovation, rather than organizational borders or other current structures. This supports the partners in the network in developing constructive roles in making the Co-Design Scenarios real, helping overcome perceived conflicts of interest.

The Co-Design Approach was useful in the project pre-stage, during the pre-study and in the main project, thereby overcoming the difficulties introduced by the traditional view of projects. We can also see that the Co-Design Approach works well with IS project methodologies like DSDM and RUP. The Co-Design can here be viewed as larger system, creating suitable rooms and conditions for several projects. This expansion of PM follow the lines suggested for future research on "broader conceptualization of projects" in [18].

8. Conclusions and Summary Recommendations

A critical success factor of Network Innovation is to bring many differing people, interests and perspective into an innovation process, still focusing the end client/customer/citizen. This paper presents a few challenges to traditional Project Management. These include:

- The ability to manage projects with an unknown outcome. Innovation projects more or less by definition start with unclear or unknown outcome.

- The ability to centre innovation on the client/customer/citizen. Even in single organization projects, focusing customer needs is a challenge. This escalates dramatically when project encompasses multiple organizations.
- The ability to manage conflicting interests. Multi organizational innovation has to encompass multiple, often conflicting interests.

The presented Scenario technique in the Co-Design Approach enables such a process, allowing stakeholders to re-examine their assumptions and for new ones, in a dialogue and the case demonstrates how this supports the Network Innovation.

We suggest that future research focus on:

- Co-Design Scenarios as requirement specs for "traditional" IS development methods
- How iterative, scalable processes like the Co-Design Approach can give structure to the early phases in project that are often not covered in contemporary project management
- How the Co-Design Scenarios can be further developed to even better support the re-examinations of stakeholder assumptions.

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