Open innovation system and collaboration platform for the large EU infrastructure projects – NETLIPSE case study

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Abstract

Technological and organizational excellence is the key element for business success in any modern business and project environment. Post globalization and instable business environments demand permanent improvements and changes of business processes. “Open the boxes” and exchange information, ideas and set-up collaboration with stakeholders such as customers, end-users, clients, vendors, business partners, potential competitors – this is a challenge of current (project-) organizations and their innovative environments. The open innovation environment concept was born in 2003, presented by professor Chesbrough from Berkley. Since then, researchers and practitioners are searching for successful applications of this idea. How we can improve the performance of large infrastructure projects by using this concept of work will be presented in this paper. The theoretical introduction will be illustrated by practical example of the existing NETLIPSE knowledge network. NETLIPSE is the network for dissemination of knowledge on the management and organization of large infrastructure projects in Europe.

Keyword:
Network organization, open innovation environment, collaboration platform, large infrastructure projects

1 Value Migration

Globalization of businesses and fast development of ever more useful and user-friendly, modern information and telecommunications technology enables creation of business integration and participation of partners from different parts of the world. Emerging new innovative business models better serve customers and business partners’ satisfaction needs. They alter the economic order; we witnessed a large global cultural change. National borders will become increasingly less obstacle in business and other organizations.

We see that the competencies required for a fair global business environment are very different from those typical of the industrial era in the 20th century. Unfortunately, they are still encountered in practice in most companies and project organizations.
today. The product value creation process was driven by suppliers in the industrial age (Figure 1). Significant for the industrial culture was the absence of customers’ inclusion in product development processes. The most important issue for this phase is ability to produce quality and competitive products. Many modern organizations are in the development phase of the transaction culture. The main characteristic of this phase is creation of wealth by business transactions. Organizational excellence is one of the main drivers in this stage which has been present in last twenty years. The business excellence is in search of organizational excellence, where extrinsic organizational rewards are often still more important than real intrinsic personal satisfaction of all organization’s stakeholders. Nowadays when we are entering the knowledge based economy, real intrinsic personal satisfaction becomes one of critical success factors of global competitiveness. Inclusion, collaboration, co-creation, customer satisfaction and “win-win” approaches are the main characteristics of this phase and organizational culture. The key factors in this development stage are the people involved. Competent and highly motivated people (internal and external) can provide results which reach beyond owners, managers or client expectations. This can be reached by utilization of personal excellence and satisfaction of all involved parties.

In this post globalized world, organizations are facing constant competition from both regional and the global markets; demanding to increase their pace to innovate, produce and provide at higher quality with a higher degree of customizability of their products and services. In order to secure sustainable competitiveness, the leading organizations have recognised the need to shift from classic organizational structures to being more diverse and distributed internally as well as externally, mainly depending on collaboration as a basis for competitive advantage in innovation (Mertins 2003, Firestone 2002, Beyer 2007). For organizations, this change is driven by directed and sustainable collaboration with their complementing entities holding relevant knowledge. This concept of work is supported by the idea of an open innovation environment (Chesbrough, 2003) which says that nowadays organizations needs to collaborate with their business partners and all other relevant stakeholders, to

![Figure 1: Value migration of business drivers (Semolic 2009)](image-url)
secure permanent inflow of new information, ideas and proposals to support the internal innovation processes.

For this reason supporting the right position of knowledge, information sources and their interaction to optimize the collective view of all the stakeholders is of key importance. The bigger impact of such a structure could be foreseen in the virtual associations that are mostly objective and are based on knowledge resources (Byrne 1993, Pettigrew 2003). Thus far these professional associations are mostly conceptualized in theory as knowledge workspaces that are established based on similar knowledge focuses, facilitating from professional clusters to expert groups. In practice the virtual professional platforms have proven short-lived and one of the main reasons identified is the lack of sustainable and scalable governance mechanisms.

That fact changes and produces new forms of economic and non-economic activities, whose main features are increasing responsiveness to customer requirements - users, increasing responsiveness and flexibility of business units, increasing labor flexibility, the ability to quickly respond to changes in global markets, capacity building and project team working. It is a process of changing values, which are crystallized into the formation of a new organizational post globalized culture. Values that will increasingly be, are associated with improving the level of responsiveness to customer requirements-user on the global market changes, the degree of innovation, the rise in the inter-organizational collaboration culture and interpersonal cooperation, co-creation and creativity.

2 Open innovation systems and collaborative business environment

Knowledge workers are people who are selling their knowledge based services to employee or on the open market. Peter Drucker was the first expert who introduced the term “knowledge worker” in his book, Landmarks of Tomorrow (1959). He believed that knowledge work productivity will be one of the biggest challenges in years to come.

The knowledge workers are the “corner stone” of knowledge based economy. The complex and technology high demanded business environment needs experts who are capable to provide prime class solutions of complex problems. This cannot be done by one expert only. It shall be done collaboratively with participation of other experts (knowledge workers) that provide different needed expertise. The trends on the global market show that we are moving towards agile- collaborative workplaces. The “Agile Workplace” was recommended by Gartner in 2001 (Palot, Prinz, Schaffers, 2005). In this report they say that agile workplaces were representing the next important step in workplace evolution and the alignment of space and work was considered innovative, if not radical, only a decade ago but then became a mainstream practice. The main characteristics of an agile workplace are know-how, specialization, collaboration, co-creation, openness and project based work.

Formally presented main characteristics of knowledge worker:

KW (T, C, M)
Where are:

KW – Knowledge Worker
T - Talent
C – Competences
M - Motivation

Nowadays environment needs knowledge workers who are willing to collaborate with experts and stakeholders from different professional disciplines, organizations and environments. The list of different collaborative types of knowledge workers is presented in Table 1.

<table>
<thead>
<tr>
<th>Type of Knowledge Worker</th>
<th>Characteristics</th>
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<tr>
<td>Mono Culture</td>
<td>Problem solver expert without participation of other experts</td>
</tr>
<tr>
<td>Bilateral Culture</td>
<td>Problem solver expert with participation of his professional colleague</td>
</tr>
<tr>
<td>Star Culture</td>
<td>Problem solver expert with participation of his professional colleagues from different professional disciplines</td>
</tr>
<tr>
<td>Networking Culture</td>
<td>Co-creation of problem solution by participation of different knowledge workers and stakeholders</td>
</tr>
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*Table 1: Knowledge workers typology (Semolic 2009)*

We can find knowledge workers in any, small, medium or big sized organizations, as well as in profit or non-profit organizations. Beside this, knowledge workers can make their businesses as independent experts, so called “freelancers”. The trends show that we will have more and more freelanced knowledge workers, who will be on the list of organizations’ collaborators deployed by temporary-project based engagements.

Comparison between traditional and new organizational values shows trends of value migration from the “organization-centric” to “knowledge – centric” business environment. Beside this traditional company is focused on the worker’s personal productivity, while the new economy company is focused more on “interpersonal productivity” and supports a new knowledge generation by using internal and external resources. For this purpose the knowledge workers are motivating to organize, facilitate or participate in different collaborative virtual communities. The Figure 2 shows the areas of organizations’ internal and external knowledge potential.
To be successful we need to create new business ecosystems which will enable and motivate this kind of interpersonal productivity. The new economy entrepreneurs need to be capable of creating synergetic based innovative business models which will integrate strategic envisioning of their organizations, performance of innovative supporting systems by engagement of talented and competent people under the leadership of competent leaders.

The described concepts of work we are illustrating by the practical example of the NETLIPSE program initiative. The NETLIPSE program focuses on increasing and dissemination knowledge on the management and organization of large infrastructure projects (LIPs) in Europe. These projects include high speed railway lines, highways, waterways and tunnels. The main goal of this program is to create and develop an open innovation environment, where main LIPs stakeholders such as client organizations (ministries, local governments), infrastructure research and knowledge institutes and projects themselves, from different European countries can exchange their knowledge, experiences, best practices and collaboratively search for the best models and improvements of existing business designs in order to improve the level of project management at this level.

3 The Case Study of the NETLIPSE Collaborative Platform

An efficiently delivered and operated European transport network is essential if the European Union is to ensure their economic and sustainable competitiveness. The TEN-T is the European Union’s Transport Infrastructure Framework. Initially adopted in 1990, it now includes Priority Projects on 30 international axes plus wider transport
projects. These projects are targeted to improve the economic efficiency of the European transport system and provide direct benefits to the European citizens. The priority projects, mostly rail and inland waterway schemes, will help contribute to creating a more sustainable transport system and help fight against climate change. In May 2008, Vice-President of the European Commission, Mr. Jacques Barrot, presented the first progress report to the Informal Transport Council on the implementation of the TEN-T priority projects. In it, he praises the Member States and Community Institutions in their efforts to accelerate the delivery of the priority projects. Project delivery and effective realisation being a challenge of the past programming period, Barrot also promised to step up efforts in encouraging Member States to not only coordinate their transport policies by exchanging best practices, but also by identifying early obstacles to funding and solving cross border constraints.

From 2006-2008 the NETLIPSE project, a project in the Sixth Framework Programme, focussed on gathering best practices and lessons learnt in the management and organisation of large infrastructure projects (LIPs) in Europe. 15 LIPs were researched by regional knowledge teams, consisting of experts in the field of project management (representatives from the scientific, project management and client organisations). The NETLIPSE (NET-work for the dissemination of knowledge on the management and organisation of LIPs in Europe, www.netlipse.eu) project presented main findings and an overall vision of how to manage, evaluate, monitor and benchmark LIPs in April 2008. In addition to carrying out the research, the project consisted of setting up an active network for the continuous and interactive knowledge exchange in this field in order to develop the expertise of all parties involved. Dissemination tools were developed to support this continual knowledge exchange, such as a knowledge database with project information, network meetings and site visits to present and discuss results as well as a website (open and closed sections for Special Interest Groups) and a bi-annual newsletter.

The Figure 3 illustrates working environment of the NETLIPSE open collaborative platform.
From 2008-2010, the NETLIPSE network has run under the TEN-T Annual Programme and now consists of partners from governmental institutions, knowledge institutes and private organisations from 15 European countries, organisations managing and sponsoring the 15 researched projects and other interested organisations involved in sponsoring and realising LIPs in Europe. At the bi-annual Network Meetings representatives from more European member states have participated.

One of the key goals of NETLIPSE is to improve the level of project management of these projects on a European level. Next to the development of the Infrastructure Project Assessment Tool (IPAT) for the assessment of projects, the Network has erected Special Interest Groups where knowledge development and dissemination takes place.

The NETLIPSE Special Interest Groups (SIGs) are dedicated to researching, developing and disseminating knowledge based on vast experiences of specific topics in the management and organization of LIPs. Interested members from the network can join or lead a Special Interest Group by organizing or attending group discussions on specific themes, organizing events, presenting at conferences and/or preparing publications, tools etc. Network members can be members of more than one SIG. The SIG is free to decide its own purpose, as long as it corresponds to the overall goal of the NETLIPSE network namely, developing and improving the management and organization of large infrastructure projects in Europe. In the future it is possible that disseminating and developing this knowledge is not solely limited to the European boundaries. For now, this limit is challenging enough.

Each Special Interest Group is coordinated by an Issue Manager. This is an individual who is responsible for keeping the SIG alive and running, i.e. initiating SIG meetings, events and products and finding the topics that will create value for all the SIG members. In order to tackle the chances of being a short lived initiative due to the lack of sustainable and scalable governance mechanisms (as mentioned before), the SIG Issue Manager and its members need to create a value that is recognized by all its members. As of yet, sharing experiences and best practices and carrying out research in teams, has proven very beneficial. As one client representative stated: “participating in the SIG meetings and doing a NETLIPSE case study, has been better than any management training whatsoever”.

Depending on the needs of the SIG, various supporting communication tools have been developed such as the internet-based virtual environments and dedicated communities on the website. These sections are open to SIG members only and consist of an archive with relevant articles, publications and presentations, contact information of SIG members, etc. The SIGs meet regularly, at least at every Network Meeting which take place twice a year.

The number of SIGs is not limited. If more than two Network members decide it interesting enough to initiate a SIG, they are free to submit a request to the NETLIPSE Board. The Board decides on the feasibility of a SIG, which may have a temporary nature, i.e. for the research or development of a specific topic, or have a more ongoing nature. As of 2010, there are four SIGs up and running:
1 **Business Cases:**
Dedicated to discussing the challenges of and developing an effective business case in large infrastructure projects to be used as an important tool in the decision-making phases.

Issue Manager: Matt Dillon, Project Sponsor, Department for Transport, UK.

2 **Stakeholder Management & Communication**
Dedicated to discussing the challenges of and developing effective stakeholder management & communication tools and approaches for successful execution of large infrastructure projects operating in an ever-increasing influential environment.


3 **Contracting & Tendering**
Dedicated to discussing lessons learnt, challenges and developing new insights on effective contracting and tendering strategies for large infrastructure projects.

Issue Manager: Prof. Konrad Spang, Chair of Projectmanagement, Universität Kassel, Germany.

4 **Project Management**
Dedicated to improving the quality of the management and organization of LIPs in Europe.

Issue Manager: Prof. Brane Semolic, Head of Project & Technology Management Institute University of Maribor, Faculty of Logistics, Slovenia.

The enthusiasm of all NETLIPSE Network members is proven to be the cork that the network floats on. Proof of this is the quality of the discussions that have taken and are taking place, the benefits experienced by the delegates who can translate the experiences of colleagues to their own (national) contexts, the fact that more member states are signing on supporting the network and the increasing number of delegates at general meetings.

**Conclusions**

In the modern business environment, organizations will establish and maintain their competitiveness not solely by optimizing their own potentials, but more often by being able to use the resources of others and by interconnecting them into an overall process of creating new value. Methods and forms of organizing different modalities of virtual organizations and collaborative platforms are based on innovative flexible business models. The described concepts of work can generate value for every involved organization, profit and non-profit, as we could see from practical example of the NETLIPSE program. Governmental organizations can reduce capital
expenditures and risks, commercial organizations can increase their competences, knowledge centers actively participate on the “knowledge market” and finally LIP’s customers’ satisfaction level can be improved.

References


Chesbgough, H.: Open Innovation, Researching a New Paradigm, Oxford University Press, 2006


Hertogh M. & Co.: Managing Large Infrastructure projects, AT Osborne BV, Hilversum, 2008


Semolic, B.: Basic Principles of Knowledge Based Economy Flexible Organizations, IPMA Festival of Knowledge’09, P&TMI, FL-University of Maribor, 2009

Semolic, B. & Kovac, J.: Governance of Virtual Networks: Case of Virtual and Living Laboratories, Infonomics for Distributed Business and Decision-Making Environments, Business Science Reference (IGI Global), 2010