

Incubating Virtual Enterprise Networks in Yorkshire – an Action Research Approach

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Abstract

Most dynamic virtual enterprises in pursuit of emerging business opportunities require a relatively stable network of partners as platform for the collaboration. The network provides common processes and rules, ICT infrastructures and tools, but also gives a basis for social relationships and trust. This article shall contribute to the understanding of how to quickly form networks that are successful and sustainable in pursuing new business opportunities. It summarises experiences from four parallel cases of incubating completely new networks in the Yorkshire & Humber region in different industries. A key element is the balanced approach to jointly pursue a major business opportunity and to build the network culture with the help of a network coach as facilitator

Keywords

Virtual Enterprise, Incubation, Network Coach, Regional Development Agency

1 Introduction

Working in virtual enterprises (VE) – a temporal configuration of companies, each bringing in their core competences, to pursue a business opportunity – has been seen as a key approach to competitiveness and growth especially for SMEs (Hanssen-Bauer and Snow 1996; Katzy 1998). However companies need to have a pre-existing relationship as basis for the fast set-up of different virtual enterprises as recent research has shown e.g. within the European VOSTER project, a state of the art evaluation of some 30 European research and development projects in the field of virtual organisation (VOSTER 2003). This collaborative network provides the platform for social interaction and trust building, governance structures and rules, predefined operational processes, and a joint collaboration infrastructure, important prerequisites for efficient reaction to business opportunities and successful delivery. However, most successful networks – especially those with a regional focus – have so far evolved out of long standing relationships, such as a regional clustering, mutual manufacturing relationships or private contacts of the actors involved (e.g. Laubacher and Malone 1997).

The objective of this paper is to contribute to the understanding of how to best and fastest incubate new virtual enterprise networks from partners with no or little joint background. This question not only concerns SMEs wanting to adopt collaboration, but also public bodies such as regional development agencies (RDAs) or regional technology centres (RTCs) that aim to be catalysts in the regional economic development. The results and suggestions presented here were derived from four action research projects, which aimed at incubating new collaborative networks in the IT, e-learning, machinery and bio-tech industries in the Yorkshire & Humber region, UK. The regional development agency Yorkshire Forward has initiated the projects with Vision Consulting and CeTIM contributing the conceptual framework, change management and research evaluation. The networks are still rather young such that the results have to be under-

stood as preliminary awaiting future assessment of the long-term developments. Nevertheless, the findings so far are quite encouraging indicating that an effective approach has been found.

In the next section, we give a short background of collaborative networks and reference models for them. Section 3 then introduces the action research approach used for developing the incubation process for developing the networks. Section 4 gives an example, how the approach was applied for developing a part of the process, while the following section summarises the resulting incubation process. The last section discusses the learnings and generalisation of the results.

2 Theoretical Background

(Riemer, Klein et al. 2001) and (Camarinha-Matos and Afsarmanesh 1999) describe different types of virtual enterprises, which are classified by their key characteristics. Such characteristics include:

- The value chain focus of the members: horizontal between similar companies vs. vertical along the value chain
- The duration of cooperation: short term for one opportunity vs. long-term for several/many opportunities
- The openness to outside members: flexible access to network vs. clear and somewhat exclusive membership rules
- The topology of the network governance and collaboration: supply-chain (information flow along bill of material) vs. hub and spoke (one general contractor) vs. peer-to-peer (dynamic, team based collaboration between equal partners)

In the context of the work described in this paper, we have assumed the virtual enterprise model of Katzy and Schuh (1998), which has received broad attention and adoption. The model takes the latter choices in each of the characteristics described: Network members cover different stages of the value chain through more complementary skills (respective competition only between a small sub-set of the companies); the network is geared towards long-term collaboration; companies are selected carefully based on trust and contributions; the companies have a peer-relationship of equals. Each of the characteristics has influence on the network incubation process.

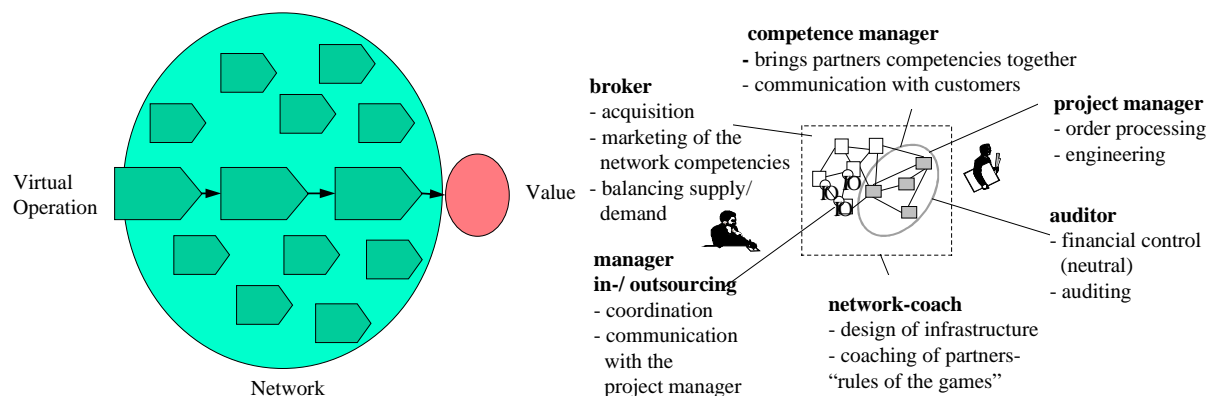


Figure 1: The virtual enterprise model and roles (Katzy and Schuh 1998)

According to this virtual enterprise model (Figure 1), a number of companies come together in a relatively stable network. The companies define joint ground rules, governance structures and ICT collaboration support. Subsets of the companies form agilely virtual enterprises or virtual operations in pursuit of new business opportunities. The company selection for a specific team is based on core competences and an offer and negotiation process. The figure also captures the

main roles in the network and virtual enterprise, such as the broker, project manager or network coach.

However, adaptation and detailing of the generic model are necessary for individual networks and their business situation during the network incubation and development phase. For example, the broker role could be assigned to one or a few dedicated persons or organisations, or each company in the network can be responsible for bringing in new orders; or rules for assembling the team for specific orders have to be defined, based on the degree of competition and trust in the network.

3 Research Approach: Action Research

The action research approach has been chosen, because it combines in-depth theoretical progress and learning with practical benefits and change for the companies involved. Action research is characterised by: a) the researcher's active involvement and collaboration, b) the intention of both, researcher and practitioners, to realise change and benefits, and c) a conceptual framework for the research (cf. (Warmington 1980; Probst and Raub 1995)). The process of action research consists of five iterative steps (Susman and Evered 1978): First problem analysis, second planning of activities (action) to solve the problem, third executing the activities, fourth evaluation (reflection) of the achieved results and fifth, capturing the learning (Figure 2). The conceptual advancement leads then to a new, improved action and reflection cycle.

Action research stands thus in the middle of, or better integrates the system design approach often used in engineering, which stresses the first part of the cycle, and the survey or case study approach of the social sciences, which places emphasis on the latter part of the cycle. The action research approach seems most appropriate for testing and understanding the incubation of virtual enterprise networks: Compared to a system design approach, it does not assume the designability of such complex and diverse organisational structures as organisational networks, but the directed facilitation and evolution in iterative cycles. On the other side, surveys and case studies are limited by the fact that few comparable examples of network incubation instances exist and they might not have taken experiences from others into account. The approach and process presented in the next chapter benefited greatly of the learning from the incubation of Vituelle Fabrik and the Aerospace Group Switzerland, two Swiss networks using the above mentioned network model.

4 Action Research Cases: Yorkshire Network Incubation

Figure 2 gives an overview of the action research approach used for developing the Yorkshire network formation process, while Figure 3 presents the result. We used two levels of action research cycles in the process development: On the top-level, we took the whole process of incubating one network as one research cycle, which we roughly planned out as four phases at the beginning of the project. We then developed the detailed actions of each of the four phases in smaller action research cycles, analysing the requirements, planning actions, enacting them, and evaluating the results. This approach allowed adjustments as we went along and direct transfer of learning between the cases without losing sight of the "big picture".

The following description of the development of the first phase "Preparation" shall exemplify the action research process:

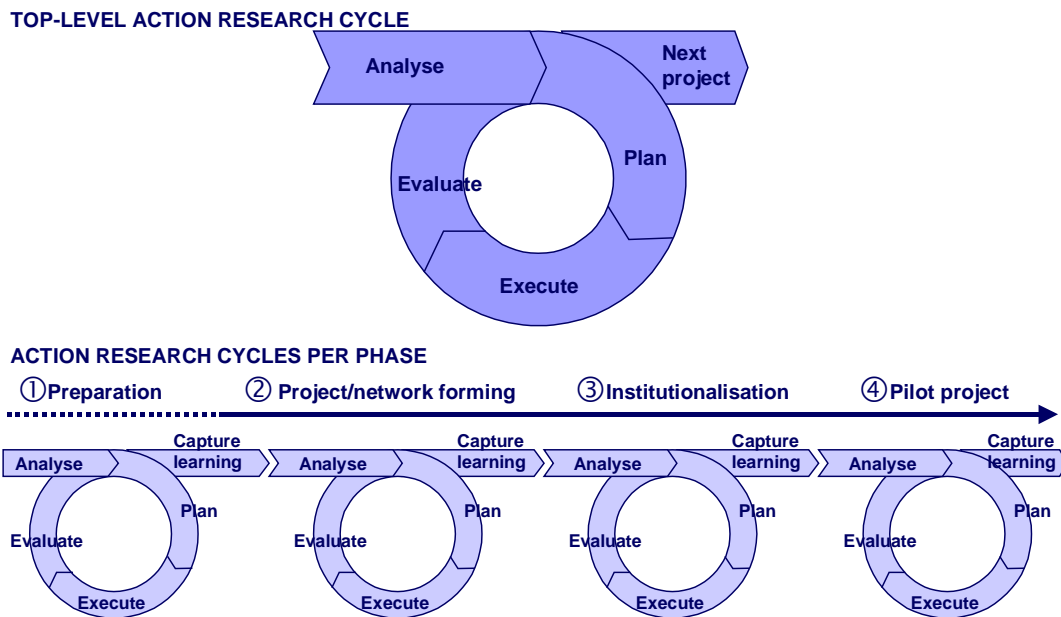


Figure 2: Action research approach for Yorkshire network incubation

4.1.1 Analysis

Yorkshire Forward (YF) became aware of the concept of virtual enterprises during 2002 and realised that it might provide great benefits to SMEs in the region for fostering their innovativeness and competitiveness. Furthermore, collaborative networks and virtual enterprises could provide the platform for other advanced (e-)business practices. The first successful collaborative networks should provide a positive signal to other companies to join in or found further networks.

However, the challenge of the first preparatory phase was, how to best identify companies which might be interested in collaboration and would fit together. YF had initiated clustering projects for example in the machinery and biotech industry, through which companies could be approached. However, in other industries, such central company knowledge did not exist and there were no industry associations or other bodies, who might be informed about profiles of companies in the region.

4.1.2 Action planning

For the industries with strong clusters (machinery and biotech), the project would collaborate with the cluster manager and rely on his company knowledge to identify potential candidates. He would send invitations for a kick-off meeting to the companies outlining the principles and potential benefits of virtual enterprises.

For the other industries, we planned to contact companies from different lists of YF and ask for the potential relevance of collaborative networks to the companies' business practice based on three scenarios: putting together different companies' competences for more ambitious projects, installing a strong broker to bring in new business, or having an internal market for capacity and competence levelling. Depending on the interest, we would visit the companies and discuss potential projects in more detail and then invite promising candidates to the kick-off.

4.1.3 Action

For the machinery and biotech industry, not much effort was spent on preparation. About 35 machinery and 15 biotech companies have been invited to the kick-off based on the selection by the cluster manager. Of these, about 25 respective 10 CEOs or other senior managers attended the kick-off meeting, from whom most continued in the further network forming.

Outside these clusters, we have phoned a random sample of forty SMEs of very different industries from a list of companies, who were participating in a programme for broadband adoption. We also tried other company listings, but found these companies most approachable. About 80% of the companies' CEOs or senior managers could relate to the three scenarios and were interested to follow-up on networks. We then visited about 25 companies in person. These companies ranged from single person companies to a size of about 50 employees. We discussed their industry situation, potential other companies they worked with, their own role within the industry, and potential pilot projects for collaboration. Most companies wanted to continue their engagement and attended the kick-off workshop. Two potential networks emerged from the kick-off, one in the area of e-learning with about 12 partners, the other in IT and related services with about 10 partners. Other participants from e.g. the arts or events management could be potentially supported at a later stage.

4.1.4 Evaluation

Generally, the approach of cold-calling worked surprisingly well. A large percentage of companies showed interest and continued to do so throughout the preparation phase – and indeed got into the networks. However, it was also important to have the companies themselves identify further potential partners, either based on existing working relationships or on the reputation of these companies in the market. More time should have been spent on visiting them and understanding the different competencies of the companies. In addition, more companies should have been identified to bring a larger critical mass together. 15-25 companies with a mix of complementary and competitive business scope are a good starting point for a network.

It was also important to identify some potential candidates for key roles such as brokers, project managers or those with natural authority for network leadership among the companies.

The two cluster based networks would have benefited from some company visits before the kick-off to better understand the needs and business setting of them. Therefore, we decided to hold the following workshops of the next two phases in turn at the different companies to foster this understanding, but also the joint exchange and learning.

4.1.5 Capture learning

The actual process and learning was carefully documented to capture the learning from the cases. A detailed blueprint of the concepts and the process were developed for further network incubation projects.

5 The Network Incubation Process

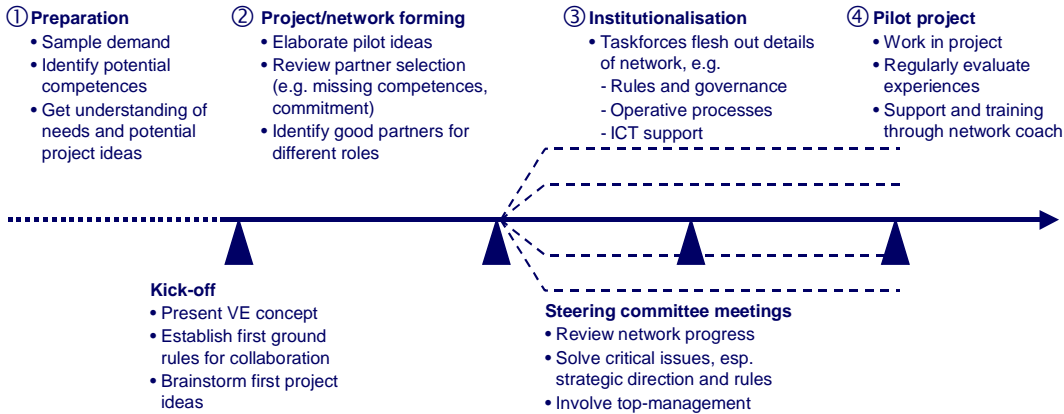


Figure 3: Network incubation process

Figure 3 summarises the network incubation process developed through the action research methodology presented in the last section. Therefore, we present only the results:

5.1 Phase 1: Preparation

The detailed development of this phase through action research was described in the last section. The objective of this first phase is to identify a critical mass of suitable companies and to understand their requirements, the business setting and industry roles. Whatever way was chosen to first identify potential companies, the prospective network coach should visit them and build understanding and a relationship before the actual kick-off. It is also important to identify further companies, especially those who could fulfil key roles such as broker or project managers in the network, based on existing business relationships and their reputation in the industry. The companies should also become already aware of potential models of collaboration and the business benefits for them, for example through discussing the different network scenarios.

5.2 Phase 2: Project/Network Forming

This phase is characterised by the parallel development of pilot project ideas and the network as a community of companies. It is important, that the network coach balances expectations and focus between the two sides: The goal is a strong collaborative network, which has good cohesion and can win successfully many projects, but without tangible projects, managers tend to loose interest, and discussions and network design might become too theoretical. The coach should also try to identify and engage key partners for different roles, e.g. as opinion leaders, facilitators, brokers or project managers.

In the kick-off workshop, the basic concepts of collaborative networks and virtual enterprises are presented. Then, the participants elaborated first ground rules based on the question: what would destroy collaboration for you? Then they would brainstorm about first pilot project ideas.

In two to three further workshops, the ground rules and project ideas were further developed. A good pilot project idea would have a strong element of joint business development and collaboration and be sufficiently ambitious to give a real business benefit to the participants. On the other hand, the business should be achieved within a maximum of six months to allow good learning and keep the momentum. Finding such business idea was the first test case for the new network.

5.3 Phase 3: Institutionalisation

During this phase, the network members split into different task forces elaborating the details for network collaboration and operations. These could include the ground rules, governance structures, bidding and order delivery processes, ICT support, and fleshing out the pilot project. Each company should be involved in at least one task force, but no company should be involved in all. Instead, the task forces report to a steering committee, which motivates the task force members and solves critical issues. The steering committee must involve top management of all partners to foster ownership and avoid issues arising from conflicts between network and company strategy or policies. The phase between network kick-off and operative pilot project start typically lasts 2-4 months.

5.4 Phase 4: Pilot Project

The pilot project serves especially as learning example to try-out and improve collaboration. Therefore, the network coach should be very sensitive to any issues of practical collaboration and even more to wrong motives or attitudes for cooperation among the companies and raise them to the network level. Here, corrective actions regarding individual network members or the network rules and processes should be taken. In such iterative cycles, the network develops its distinctive trust, culture, and routines, which determine the long-term success and sustainability of the

network. While the incubation phase lasts about one year, network maturity can be expected to require three to five years of collaboration and development.

6 Discussion: Guiding Principles for Incubating the Networks

While individual learning from the phase-oriented action research cycles has already been included in the descriptions above, some key learning can be summarised as guiding principles for the network incubation:

- **Joint learning and experience:** Organisational and personal change follow the principles of Structuration theory (Giddens 1984; Sydow and Windeler 1998). This theory assumes, that each actor, e.g. a company manager, in a social setting directs his actions by his goals, but also by a reflective perception of his environment, which in turn is influenced by the actions of other people, especially of opinion leaders and change agents. Jointly, the actors form a dynamic process of organisational behaviour. As consequence, the network members have to go jointly through goal-oriented action, but also reflection and learning cycles to develop the new network compatible behaviour and a network culture.
- **Clear business benefit:** Especially SMEs cannot afford spending time on potentially unproductive activities. They must be able to clearly identify the business benefits from the network collaboration, but even of most preparatory activities. Although external funding of the network coach is quite important for getting SME networks off the ground, it should be strictly restricted to the coach or other support, but not include any company time or their expenses, to avoid any fund chasing from the beginning.
- **Pilot projects:** As consequence of the aforementioned principles, we have placed strong emphasis on pilot projects, which shall exemplify the principles of collaboration and thus provide a good possibility for learning. The pilot projects should be of sufficient size, innovation and ambition to be clearly seen as benefit for the companies involved.
- **Balanced network development:** The pilot project should not however lead to neglecting the network development towards a long-term community. Therefore, sessions and workshops on the pilot project are matched with network building events
- **Network coach as change agent:** The network coach, who was introduced in the virtual enterprise model above, takes the important role of facilitating change among the SMEs. He must show independence and competence to be respected by the SME managers, but also have a feeling for group dynamics..
- **Foster innovation through interaction:** One of the biggest values of networks is bringing different people from different backgrounds and skills together, and through this creating innovation and entrepreneurship. The pilot projects demonstrated such ideas, e.g. offering e-learning solutions to a completely different market or developing innovative solutions for traditional components of machines. The network should foster such interactions and make the benefits visible to its members.

7 Conclusions

The network incubation process presented in the previous sections has so far proved effective to incubate new collaborative networks in the four different industry sectors. Companies with no or little previous relationship started to cooperate in the network development and in the pilot projects. Although the networks are still quite young, they seem to have taken the first important hurdle.

The action research approach has been very successful for the development of the incubation process. It has allowed good planning of actions but also constant feedback from practical application resulting in effective learning and improvement. Many issues could not have been foreseen from a purely theoretical design perspective. On the other hand without the theoretical and conceptual rigour of planning and evaluating the process, much insight and improvement would have been left unattended. The authors therefore argue, that action research is the most suitable approach for advancing understanding and the state of the art in similar problems as those presented in this paper.

Future work will accompany the further network development, focusing on creating additional momentum for active collaboration and detecting and solving issues that might destroy trust.

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