

# FROM PROJECT TEAMS TO A VIRTUAL ORGANISATION: THE CASE OF THE „EDUCATION PORTAL THURINGIA“

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## **Abstract**

The Organisation concept of the Education Portal Thuringia is based on the virtual type Organisation, which is consisting of independently existing partnering organisations at different locations. The intention of the education portal is to offer an integrated marketing of academic education programmes for continuous (postgraduate) education, mostly as online courses, that come from the partnering organisations. To do so a new centre was set up and a management structure is now surrounding that basis in a virtual manner. Main business processes are integrated by that internet portal to allow the handling of the very business of the education portal. In a next step this internet based management shall enable the bundling of the business process towards a joint business model that will become part of the partnering organisations' regular business.

The case study is focusing on recent demands on group-size parts of virtual organisations that belong to the education sector. Here our concept of offering continuous academic education is based on an empirical analysis. As a result the authors may define the demands more specifically. This approach is useful as there is not enough applicable data available when researching the national German or the international literature for successful cases. The paper is documenting the virtual organisation at its current stage, relating its development to the 5-phase-model of the evolution of a virtual organisation (cp. Arnold et al., 1995). Following that classification we can proof hat the education portal is already on stage four, i.e. it meets the criteria of a virtual organisation. Consequently the virtual organisation may limit its effort to the coordination of the business and may act as an information broker only.

To sum up: The Education Portal Thuringia is an organisation that was already set up as a virtual organisation. If this approach can be considered as an independent model and moreover as a successful concept of the eEvolution of a virtual organisation in the longer run, will be found out later on. What is however important for a successful development is the effective integration of the business processes of the partnering organisations as de-central, but comparable sub-organisations into a central virtual organisation, in our case the „Education portal Thuringia“.

## **Keywords**

Virtual teams; networked organization; education portal; sustainable e-business

## VIRTUAL ORGANISATIONS AS A NEW MOVE IN ORGANISATION DEVELOPMENT

Virtual organizations are a newly arising phenomenon throughout western society. We can observe virtual organizations in different fields as local communities, business relations and public administrative bodies. There are many examples as SME innovation clusters, community networks, larger structures and other forms of virtual networked organizations.

But not only professionals of many disciplines deal with this new paradigm in various settings as telework, telemedicine and other forms of telecooperation. Namely social scientific and economic research did and still does discover that paradigm as an innovative and promising approach. Consequently we may observe the increase and the specialization of research work done recently. Whereas 1990 there was no publication cited in the behavioural and social sciences (Psychology and Behavioural Sciences Collection, PsycARTICLES and PsycINFO) the number of citations was increasing continuously:

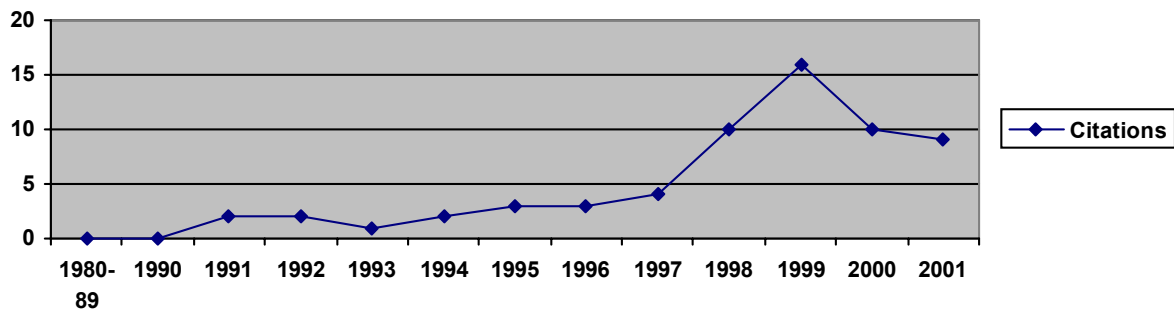


Figure: Absolute number of citations of the term „Virtual Organization” with an organizational scientific meaning

Further topics especially considered under the virtual organization umbrella changed with growing research on the field, starting with virtual reality and computational organization (1994), learning organizations (1995), organizational communication (1997), society and Internet development (1998), trust, leadership and decision making (1999), virtual universities (2000), augmented reality (2001). The first reference from the German speaking social sciences is dated 1995 and comes from a sociological approach towards the work in virtual organizations, mainly focusing on email usage in an industrial-organizational context (Stegbauer 1995).

## ORGANISATION CONCEPTS OF VIRTUAL MICRO- AND MACRO SOCIAL FORMS

### Virtual Teams as a micro social virtual form

A special role in those virtual or networked organizations is taken over by the smaller units that are devoted to a certain task, from research to management. Those teams often incorporate members from the partnering organizations, often as especially selected

representatives (consisting of the CEOs who like to found a virtual or networked organization) or as newly built teams for new tasks (e.g. development of new products or joint marketing). Virtual teams may be defined as teams, where the members' primary interaction is through a combination of electronic communication systems. Members eventually never meet face-to-face.

Research on virtual teams has meanwhile become an elaborated area of interest of industrial organizational psychology, mainly concerning the impact on the Internet on individual and team work in virtual team structures (Konradt & Hertel 2002, Hertel 2002, Konradt 2000). There is an independent research line focusing on the special conditions of virtual teams. This research is mainly based on social psychological considerations, taking into account a specific group membership and the effects of the media used. That research deals with the evaluation and design of work conditions, qualifications, and performance from different points of view. It encompasses motivational gains in virtual teams, efficient leadership techniques in virtual teams, and stress and strain in cooperative Telework. Several tasks of recruitment, assessment and personal training are considered. Consequently some highly specialized models had been developed as the Social Context Cues filtered out Approach (Sproull & Kiesler 1986) and the Social Identity de-individuation Theory (Spears et al. 1990).

#### *Some differences concerning the development of virtual and traditional teams*

Virtual teams, although a quite new form of work groups, are to be found more and more. Such teams are based on the principle that members do not meet face to face at one place, but still relate to each other by using computers and telecommunication channels. By applying such technology virtual teams may fit to various tasks in a very flexible way, overcoming traditional limitations and boundaries of time, space, presence et cetera (McKenna, 2000 pg. 333). Independently of the above mentioned concepts some research tries to investigate how teams and small groups develop. Out of that tradition Arrow (1997) had described some far-reaching implications. In a comparative study (named after the fictional company as JEMCO Workshop Study) he tested the prediction power of different group development models towards change and continuity of the group structures. For his experiments he used 20 small groups, that did cooperate over a time of 13 weeks face-to-face or computer mediated. What is interesting towards our aim is Arrow's conclusion that (pg. 83): „Communication medium did matter: Changes in influence patterns in CMC groups fit the robust equilibrium model quite well, but only if early membership composition was consistent. „ However this explanation is fitting only for those computer-mediated groups with a stable membership. Groups, where members change until the 3rd week don't fit the robust equilibrium as an explanation Arrow argues that the later groups do not offer an inter-individual obligatory behavioural pattern, how the group work shall be arranged. Thus we can say that a jointly experienced group history doesn't exist in the same manner as it is for the groups with a stable membership. Moreover the lack of context cues lead to a more complicated estimation of the group members' individual contributions. Moreover students of higher semester may reuse their extended experiences with similar tasks in the experiment conducted by Arrow. Finally the author explains „that groups adapt their structure to the demands of task, technology, and other environmental features were supported by the different paths taken by groups using different communication media” (pg. 83).

As mentioned before virtual teams may be found at various places inside organizations. More specifically all tasks with the need for the combination of expertise from different parts of one organization or even from independent organizations demand the creation of a virtual team. Another factor is the limited amount of time and perhaps other resources as transportation and finances. On the other hand there is a growing number of tasks where expertise is needed in an abroad setting, and a single expert who connects to its group for counselling and support, if necessary may do work. Such tasks are maintenance of remote industrial devices, on-site counselling for smaller customers research. Those manifold applications demonstrate the need for different forms of virtual collaboration. However the challenges that result from those expectations are manifold too. Virtual teams often don't have a joint history, they are lacking experiences they may share (cp. Arrow 1997). As a consequence team membership may remain less stable and the performance of single members does perhaps not always meet the expectations. Virtual teams moreover show a lack of individual responsibility. The social motivation of the team members is of course weaker compared to a face to face group with an almost direct feed back. This is especially true if team members did never meet before in person. Technology may help downsizing that effect, however many users of videoconferences for example report that they sometimes feel like watching TV. Virtual teams can be a platform for completely independent decision of the teams. The surrounding organizational culture is weakened; sometimes it seems to have almost disappeared. Such an independent behaviour was already described in a number of studies and named group polarization effect (Spears et al. 1990). Members of virtual teams may easily develop a new, independent culture.

Another area that is important for any type of group work is the resolution of conflicts, that are naturally occur, often related to new developments, innovations or the change of roles and memberships. In virtual teams such conflicts can be come much heavier than in a face to face group. Critique is most likely to become harsher. Conflicts so develop much faster based on the lack of patience that we can observe in virtual surroundings. There is even more problems related to the work in virtual teams. However the examples described show some of the major lines that need to be taken into account especially careful. Work performance, management strategies and employees motivation for co-operation needs to be based on new approaches to meet those challenges.

### **Approaches on macro social virtual and related forms from social and organizational sciences**

There is different conceptual ways to describe virtual organizations, always based on the specific question and the scientific background. From an organizational psychological point of view we need to take into account concepts dealing with organization development, organizational behaviour, management theory, organization theory but also consider some experiences coming from social psychology. Meanwhile there are a number of chapters related to issues of virtual organizations in the recent editions of psychology and management text books. Those chapters deal with organization structures, organization development and culture mainly. In the following text the authors focus on some of the most relevant issues from an organisational (macro-social) perspective.

*Strategies of organization design*

Reichwald and Möslein (1999) describe three new principles of organization: modularization, the development of networks and virtualization. Those principles are a result of the ongoing organizational change and may be seen as basic principles. The modularization concepts function on the three different levels as shown in the following figure:

<b>Modularisation level</b>	<b>Modularisation by</b>
enterprise	<ul style="list-style-type: none"> <li>- profit centres with central and decentralised modules</li> <li>- business sectors and products</li> <li>- competencies</li> <li>- regions and local markets</li> </ul>
process chains	<ul style="list-style-type: none"> <li>- Institutionalisation of business processes</li> <li>- Product islands and production segments</li> </ul>
work organisation	<ul style="list-style-type: none"> <li>- Totally integrated jobs (autarkic model)</li> <li>- Partly autonomous groups (cooperative model)</li> </ul>

Figure: Levels of modularization

The development of networks is the next organization strategy. Here enterprises try to fit better to the demands of dynamic markets by forming inter-organizational cooperation's as joint ventures, simple cooperation and strategic alliances. Such networks are based on intense junctions of independent enterprises for the completion of a certain task. Depending upon the type and intensity of the junction synergies but also dependencies may result. To decrease the disadvantages and build trust, experience and stability those networks are mostly long-time relations. As there are a number of different inter-organizational networks there is still need for modelling and explanation here. The third strategy, virtualization, focuses on so called virtual, i.e. temporary forms of organizations. Such organizations develop different patterns to fit best to the demands of various projects and products and guarantee a maximum flexibility. Basic principles of virtualization design are shown in the following figure:

<b>Characteristics</b>	<b>Design principles</b>
modularity	openness-closeness-principle
heterogeneity	principle of complementarity
local and temporal distribution	principle of transparency

Figure: Basic principles of virtualization design

However in most cases combined strategies may be observed. This is necessary because of the different degrees of freedom and the different resources organizations may use to meet the challenges of the organizational change. Furthermore by going such a way organizations are even more flexible to meet different or ambiguous demands.

The flexible firm is another concept closed to those mentioned before. Here the business organization is shifted into a stable core organization with short term add-ons. The core is knowledge based and needs to incorporate the companies' main ideas, information and creativity. The „add on“ then conducts contract work and is a highly flexible work force for production due to the specific capacity of the market (McKenna 2000, Handy 1989). The concept of the flexible firm is based on earlier approaches of management studies as lean production (Womack, Jones & Ross 1990) but also high performance systems (Useem, 1997).

In Ashkenas et al. terms (1995) a closed concept is named „boundaryless Organization”. The very goal of that concept is to describe the paradigm shift toward boundaryless structures, i.e. to lay out the assumptions behind this shift, the changes in behaviour it generates, and the results it can yield. In contradiction to that concept an average traditional organization is characterized by four types of boundaries:

1. Vertical: the boundaries between levels and ranks of people;
2. Horizontal: the boundaries between functions and disciplines;
3. External: the boundaries between the organization and its suppliers, customers, and regulators;
4. Geographic: the boundaries between nations, cultures, and markets.

Further on Ashkenas et al. (1995) describe the leadership challenges that managers face when shifting a traditional organisation and provide a practical set of tools to evaluate the organizational change toward the achievement of a boundaryless organization. What is most important in the sense of the current analysis is that the concept of the boundaryless organization implies two main thoughts, describing the special meaning of information technology and flexibility for the boundaryless organization:

1. Information, resources, ideas pass throughout the structures quickly and easily so that the boundaryless organization as a whole functions far better than each of its separate parts. The information technology is the appropriate tool to be combined with the new structural aspects to form a working boundaryless organization.
2. „Because the boundaryless organization is a living continuum, not a fixed state, the ongoing management challenge is to find the right balance of boundaryless behaviour, to determine how permeable to make boundaries and where to place them. But why should organizational leaders make this effort? What is so important about becoming boundaryless? ... The boundaryless organization also evolves and grows, and the placement of boundaries may shift. Over time, the levels between the top and bottom of the organization may decrease, functions may merge together to combine skills, or partnerships may form between the firm and its customers or suppliers, changing the boundaries of who does what.” (pg. 4)

After that more theoretical review of some of the most relevant literature the following section of the paper will report our empirical data

## **THE EDUCATION PORTAL THURINGIA**

The current situation of academic continuous education may be outlined by negative and positive aspects. Among the negative issues is the universities’ low reputation as post degree educators, their difficult market position and the high competition by the private sector. Furthermore there is little interest among private users. However we can also find a number of positive issues, for example the large number of new „virtual“ universities and education portals and the manifold potentials of new information and communication technologies (ICTs). Nevertheless the position of the universities is problematic and it is questionable whether a typical public university will be able to develop that kind of product and market independently within the current organisation model. To meet that challenge the authors did develop an empirical approach to define a concept for the redefinition of academic continuous education in the German state Thuringia. The newly found education portal Thuringia is

based on the virtual type organisation, which is consisting of independently existing partnering organisations at different locations. The intention of the education portal is to offer an integrated marketing of academic education programmes for continuous (postgraduate) education, mostly as online courses, that come from the partnering organisations. To do so a new centre was set up and a management structure is now surrounding that basis in a virtual manner. Main business processes are integrated by that internet portal to allow the handling of the very business of the education portal. In a next step this internet based management shall enable the bundling of the business process towards a joint business model that will become part of the partnering organisations' regular business. To present this case study a detailed description will be developed in the following sections of the paper stepwise.

### Findings on the team level

As the case study to be presented is focusing on recent demands toward virtual organisations that belong to the education sector it is useful to investigate how new programmes for continuous academic education are being developed. This investigation is based on an empirical analysis, what is necessary as there is not enough applicable data available when researching the national German or the international literature for successful cases. So in a first empirical step we identified and surveyed 58 media development teams by the use of a standardized interview about project results (products) and project organization (process & structure of work). The teams do consist of 2-7 team members at up to 4 locations. The teams can furthermore be described by up to three phases (preparation phase, project phase, business phase). However not all teams do show all phases:

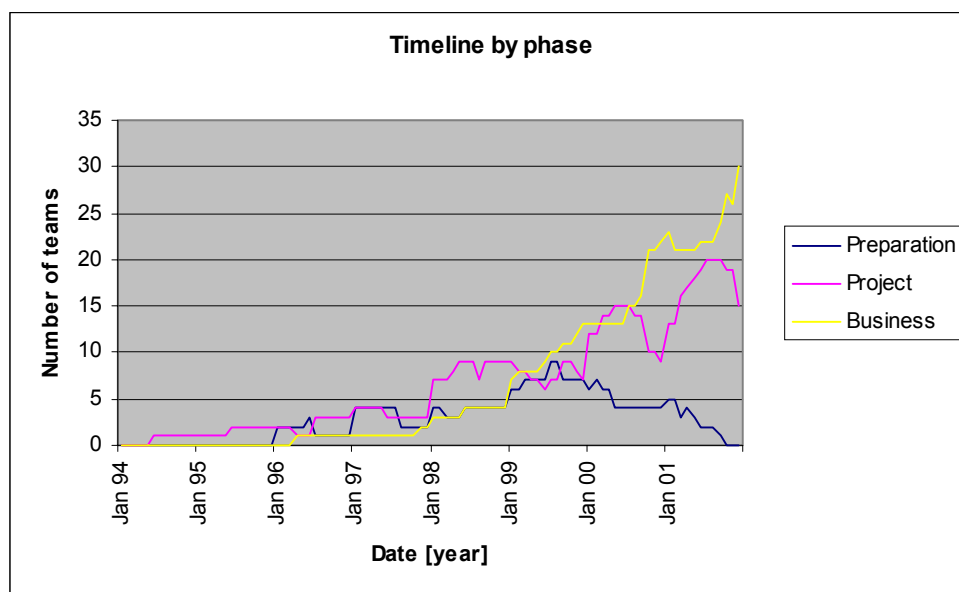


Figure: phases of team development

### *The role of communication*

In a next step the authors tried to identify data to differentiate between those development phases in order to understand why a number of teams do not reach the business phase. So the

communications channels used within those phases had been tested by applying an ANOVA with time series:

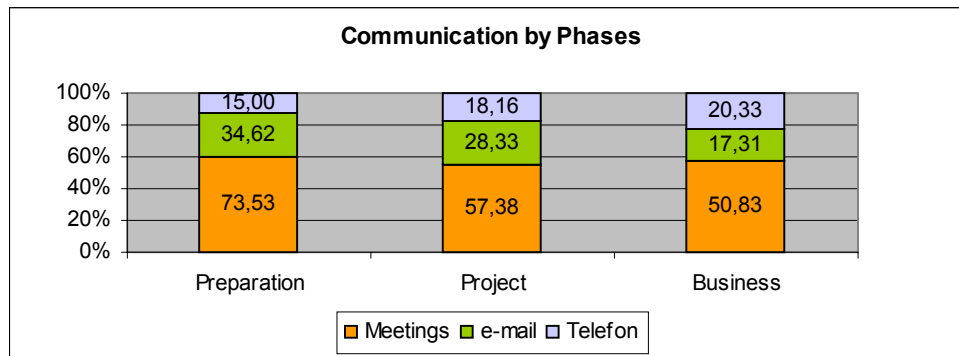


Figure: usage of communication media by phases of team development

The test shows significant results for telephone [ $F_{\text{Linear}}(1,21) = ,025$ ;  $p < ,877$  and  $F_{\text{Quadratic}}(1,21) = 3,325$   $p < ,082$ ] and also for the meetings [ $F_{\text{Linear}}(1,21) = 9,286$ ;  $p < ,006$   $F_{\text{Quadratic}}(1,21) = 4,553$ ;  $p < ,044$ ].

#### *Specific aspects of meetings*

In a next step we focused on the change of the character of the face-to-face-meetings held by the media development teams as a central mode of communication over those three project phases:

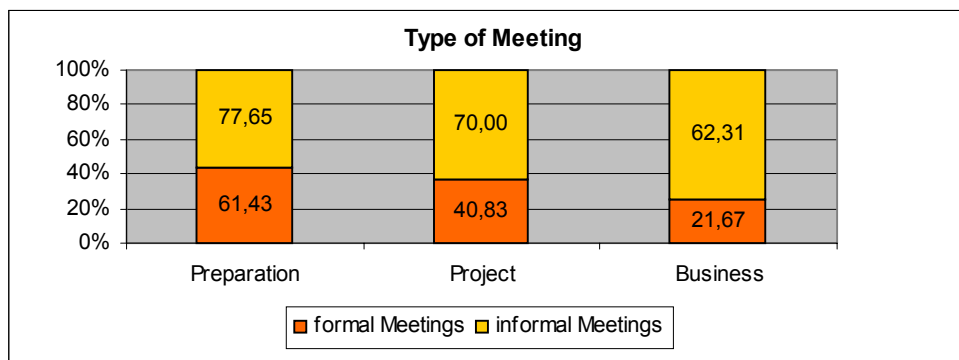


Figure: usage of communication media by phases of team development

Statistic effects had been calculated by an ANOVA with time series, that showed none directed linear effects on a significant level for both, formal and informal meetings: [ $F_{\text{formal meetings}}(1,22) = 2,977$ ;  $p < ,89$ ]; [ $F_{\text{informal meetings}}(1,22) = 3,451$ ;  $p < ,77$ ]. These results demonstrate the change of the role of the meetings over time, a process we suggest to describe as *de-formalisation*.

#### *Discussion*

The media development teams, which currently produce technology and content to be used for continuous academic education, can be described by the following characteristics:

- Only some teams „survive“;

- Team development may be differentiated into three phases;
- Not all teams show all phases;
- Usage of communication media is indeed changing over time;
- Communication is decreasing over time;
- Team development may be described as Virtualisation;
- Team virtualisation is a process, not at state;
- Virtualisation is accompanied by a de-formalisation of the communication.

The question whether the team development is taking place due to the usage of certain communication channels that result in those phases (and finally a sustainability of the team) or vice versa has not been identified, i.e. the question of causality is still unanswered.

### Findings on the organisation level

The model of a virtual organisation can principally be seen as a continuum arising from smaller (micro-) social forms. A useful description was already delivered by Palmer & Speier (1997, cited after Okkonen 2002):

	<b>virtual team</b>	<b>virtual project</b>	<b>temporary virtual organisation</b>	<b>permanent virtual organisation</b>
<b>range of involvement</b>	internal to an organisational function or department unit	across functions and organisations	across organisations	across organisations
<b>membership</b>	small, local	intermediate	typically large	smaller, but scaleable
<b>mission</b>	teams on specific, ongoing tasks	multiple organisational representatives working on specific projects	multiple functions responding to a market opportunity	all functions and full functionality as a working organisation
<b>length of project</b>	membership varies, but form is permanent	temporary	temporary	permanent
<b>uses of IT</b>	connectivity, sharing embedded knowledge (e-mail, groupware)	repository of shared data (databases, groupware)	shared infrastructure (groupware, WANs, remote computing)	channel for marketing and distribution, replacing physical infrastructure (web, intranet)

Figure Typology of virtual organisations after Palmer & Speier (1997)

This typology already includes the main dimensions as involvement, IT-usage and duration. It explains how the most simple form, the virtual team, may be seen as predecessor of the more complex and more sustainable virtual forms. At the most advanced stage finally the virtual organisation does have a permanent character and is scaleable.

### *Basic considerations towards the organisational situation of the Education Portal Thuringia*

As discussed before the situation was that a number of media development teams at different locations could deliver innovative products for continuous academic education, concerning both technology (infrastructure) and content (teaching material). The question now was whether a new organisational approach would enable an improved sustainability and how this new framework could be designed. There is no further argumentation needed that the concept of virtual or networked organisations as describe before could be a suitable approach. Therefore the next section will explain the conceptual way from a project team to a virtual organisation. Specifically the following issues had been of a central interest:

- Sustainability of the project teams by integration in structures of virtual organisations;
- Independent locations;
- Reconfiguration of existing organisations by a virtual structure;
- Set up of a new centre and a management group;
- De-centralised internet based support for the very business processes.

Following this consideration the concept of the education portal Thuringia had been developed (cp. Bildungsportal Thüringen 2002):

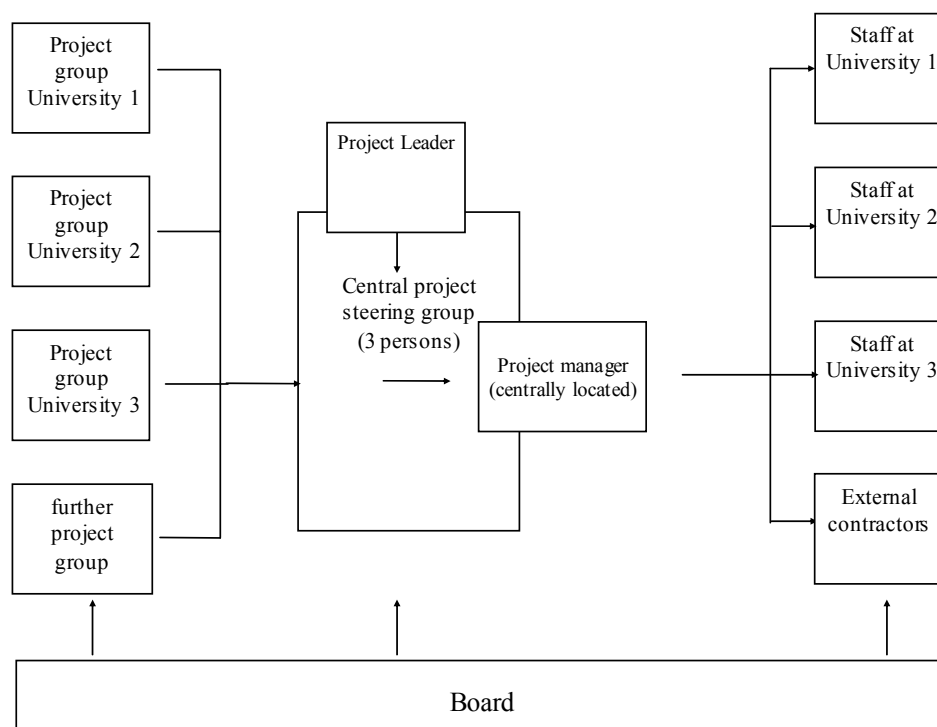


Figure: Organisation structure of the Education Portal Thuringia

The figure is the translation of an original drawing from the first official project proposal. It contains only the central management structure, but does not show the early stage media development teams. However it describes how the new centralised structure should incorporate all partnering institutions, three independent universities at different locations. The new centre, consisting of the central project steering group, the project leader, the project manager and the board was planned to be linked to the partnering organisations only virtually

by the use of different information and communication channels.

Within the next paragraphs the described intervention shall be documented in the light of suitable theoretical concepts. One of the best-fitting models comes from Arnold et al. (1995), who explains in his 5-phase-model the evolution of a virtual organisation. This is considered being a stepwise process that starts with the traditional linear organisation model („phase 0”). The linear linkage at this stage does only allow regional chains of production with direct integration of the final customer – as it is for the traditional continuous education program at a typical university, when face-to-face training is offered in a local training centre. Until phase three the linear linkages are cut off and the production chain is reconfigured. At stage 4 finally a new virtual centre is set up, serving as centre for a new networked relation between the different suppliers and the customers too. Thus the new organisation models is more dynamic but eventually more stable too, as it may allow the continuous integration of the customers but also the exchange of a certain supplier by another, for example the exchange of an continuous education module offered by one chair by another chair. The following figure displays the complete reconfiguration process:

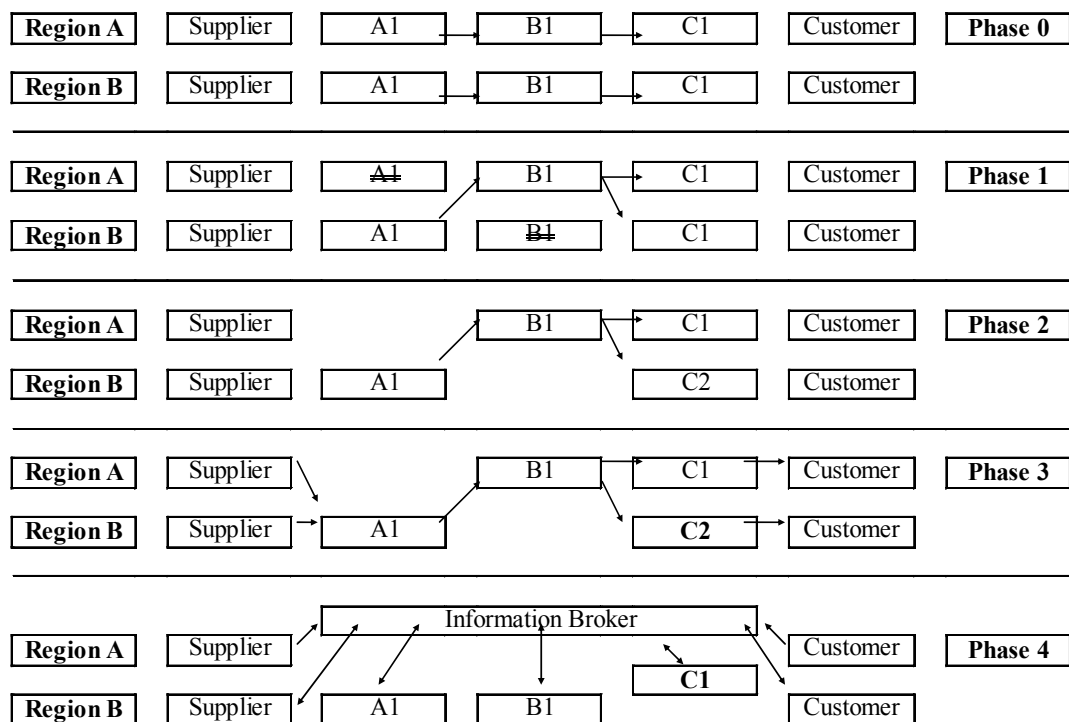


Figure: General development model of virtual organizations (cp. Arnold et al., 1995)

## CONCLUSION: SETTING UP A VIRTUAL ORGANISATION AS STRATEGIC INTERVENTION

The Education Portal Thuringia is an organisation that was already set up as a virtual organisation. If this approach is to be considered as independent model and moreover as a successful concept of the Evolution of a virtual organisation in the longer run will be found out later on. What is important for a positive development is the effective integration of the

partnering organisations' business processes into a decentralised but comparable model of the virtual organisation „Education Portal Thuringia” (Köhler et al. 2002). The development of this virtual organisation at its current stage may be seen in the light of the mentioned 5-phase-model of the evolution of a virtual organisation (cp. Arnold et al. 1995). Following that classification we can prove that the education portal is already in phase four, i.e. it meets the criteria of a virtual organisation. Consequently the virtual organisation may limit its effort to the coordination of the business and may act as an information Broker only.

### **Tasks for the management of a virtual organisation**

Virtual networked organisations are indeed considered as a new, independent type besides the traditional divisional or functional organisation (cp. Schreyögg, 2001). When following such an argumentation we need to define the specific demands for the management of the new third organisational form. This definition can principally also serve as criterion for the evaluation of the virtual character of different examples of virtual organisations. Schreyögg 2001 (pg. 301) argues, that main demands towards the management of such virtual organisations are to take into account the co-existence of different involved organisation forms, to incorporate those different partnering organisations and to ensure the temporal stability of the cooperation (nevertheless the virtual organisation will principally be of a dynamic character).

For the realisation of steering tasks the management of that virtual organization is confronted with a number of problems due to the manifold character of the organisation form. Those problems are mainly related to the personal and organisational aspects of the virtual organization. Organisational issues are the selection of appropriate partners (Schreyögg, 2001), the strategic positioning and the management, consisting of regulation and control. This core competency needs to be allocated within the network and not with partnering organisations (Sydow, 2001). Concerning these partnering organisations their integration is especially important. Here fore the special networked architecture of the virtual organization can serve as a moderator. However this networking competency needs to be of a flexible character (Reiß 1998) to build a dynamic and integrative organisational culture. Due to Ritter & Gmünden (1998) appropriate communication structures and personnel management procedures do have a core function. The individual (personnel) aspect of the virtual organization is mainly provided by the social and conceptual competency of the network manager, based on the ability to establish, support and eventually end (inter-)organizational relations. Those (inter-) organizational relations are the basic frame for the organisational cooperation, that needs to result in a „disembedding“ of the main organizational processes (Arnold et al., 1995), that will be allocated within the network (Froschmayer 1997).

When combining the argumentation of Arnold et al. (1995) and Schreyögg (2001) we can conclude four resulting main tasks for the management of virtual organisations:

1. Selection (who and what should be integrated and remain into the virtual organisation?);
2. Information and communication (How in the sense of procedure and channel are the necessary tasks to be coordinated?);
3. (Re-) allocation (How are tasks and resources to be distributed within the virtual organisation?);
4. Moderation & evaluation (how are costs and benefits to be distributed between partnering organisations and how are the different expectations of all partnering organisations about it agreed within the virtual organisation?).

In that sense the concept of the virtual organisation is always - and independently of the

economic sector (business, education, administration) - a new solution of the dilemma of integration and flexibility by a fast and comprehensive integration of hyper-organisational processes. The eventual disadvantage of incomplete process- and data models is overcome by the extensive usage of advanced information and communication technologies for both, knowledge management and communication processes. However such loose coupling of Information systems and organizational procedures results in an extended coordination effort that is often met by the introduction of hierarchies, which are in many cases related to the development of a virtual organisation (cp. Ahuja & Carley 1999). Still, a virtual organization is incomplete in all important areas of organizational structure as localisation, organizational boundaries and stability but has an almost real character – or with the words of Snow (et al., 1999): „A virtual or networked organization is multisite, multiorganisational and dynamic”.

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