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Change Management Implications for Network Organizations

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Abstract

The purpose of this paper is to investigate possible change management implications for networks organizations. This is achieved through applying six Critical Management Issues (CMI's) from the change management framework DELTA on a taxonomy consisting of three generic types of network organizations. The paper is built on an empirical base comprised of over 150 expert interviews and 121 questionnaire respondents. Questionnaire respondents and interviewed experts represent middle to top management of companies of all sizes involved in networks. The results show that the framework applied to the change management in the different networks highlights and addresses different management activities per CMI. Given this, we discuss the differences in managerial implications that the framework identifies for the different types of networks.

1. Introduction

Through the last couple of years there has been a substantial upswing in the amount of literature covering and addressing the notion of network organizations ¹ (see for instance [1, 2, 3, 4] for an extensive overview). The amount of literature covering the subject of this novel way of organizing (or perhaps

more precisely novel way of *conceptualizing*) the enterprise and value-creation of the corporation has however not been accompanied by a corresponding increase in the amount of research covering the factual *management* of said network organizations.

The purpose of this study is to investigate change management implications of the DELTA framework [5] on network organizations. This is achieved through applying our findings from the DELTA project (resulting in the DELTA framework for change management) to the context of network organizations. After applying the framework to three different types of network organizations (based on our findings from the PLEXUS project), we then identify and discuss change management implications.

2. Research Methodology

The foundations for this study rest to a large extent on two previous studies conducted with the participation of researchers from Göteborg University and different research-groups tied to the Department of Informatics at the same University.

The first of these projects aimed at creating a framework for change management (DELTA), and involved the participation of five major industrial enterprises within both the public and private sector. With a continuation spanning over three years, the researchers involved in the project performed a number of workshops comprising over 100 interviews

¹ The term *network organization* is in this paper defined as a temporal collaboration with a stated purpose between separate juridical entities. Throughout the paper we will also use the abbreviated term *network* to describe this notion.

with managers from the participating research partners. The project resulted in a series of academic papers [6, 7] and was finalized in 2001 through the reporting of a conceptual framework for coordinated enterprise development [5].

The second project (PLEXUS) is a project funded by the EU aimed at developing decision support tools for the management and measurement of intellectual assets in network organizations. This ongoing project, initiated in 2001, will be finalized in 2004. As an initial step in the project a two tailed survey comprised of 49 interviews and a questionnaire with 121 respondents was carried out. With a project composition comprised of partners from five European countries and a project scope directed at small and medium-sized enterprises, the project is currently developing and testing a prototype for software and methodological support with the previously stated purpose. The project has resulted in a series of academic papers [6, 7, 8] covering topics such as network management, knowledge management in networks, network taxonomies and best practices, and the process of partner selection in networks.

These two projects and their empirical foundation as well as their concluding sub-findings constitute the primary source of data for this investigation.

In order to investigate change management implications of the DELTA framework for network organizations, a delineation of the framework was performed. This was done through a summary of the DELTA frameworks central aspects into *general* critical management issues (CMI's).

The CMI's were then applied to the three different network types identified in the network taxonomy, which in turn resulted in a number of *specific* change management issues being identified for the different network types.

3. Theoretical Foundation

The theoretical foundation of this study consists of the findings from the DELTA

and PLEXUS projects. From the DELTA project a framework for change management is presented, and from the PLEXUS project, a taxonomy of three different types of network organizations.

The DELTA meta-model (Figure 1) is based on factors derived from interviews with practitioners and an extensive review of management literature [8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21].

According to the framework, the basic elements always relevant in any change management context are Enterprise Images and Stakeholders concerned in them, Development Goals and Development Processes conducting changes and realizing goals. Below follows a description of each of the elements.

Enterprise Images [11, 16, 14] is the perception of current and alternative future enterprise designs. It includes all recourses such as humans, facilities, technology etc. Many different modeling techniques are often used in order to support process models, organizational schemas, system maps, etc. Images representing the actual and near future are more concrete whilst images of the distant future are less concrete visions.

Stakeholders [11, 16, 14] are internal and external actors within and around the enterprise who in some way affect, or are affected by the enterprise development. Among these are partners, personnel, management, owners, clients, customers and authorities.

Development Goals [11, 14] are clear formulations of required changes necessary to transform the enterprise from its current- to a desirable future condition. The transformation may be done in numerous ways. Development Goals point out what the development work should comprise.

Development Processes [11] are the activities (development projects) concerned with the execution of the development- and change work. Depending on the degree of uncertainty, the processes may follow different process patterns such as Waterfall, Iterative, Concurrent and Explorative.

3.1 Development Relationships R (1-6)

The DELTA framework does however not solely focus on the previously described change elements; but instead it focuses on the relationship between the elements. By this approach, coordination issues regarding the relationships between the key elements

of change are identified.

Figure 1: The change elements and relationships of the DELTA framework

R1: Relationship R1 concerns differing images of the enterprise among the stakeholders; both concerning the present, but especially the future. The enterprise images play an essential role in supporting dialogue among the stakeholders and in the process of aligning their respective views and preferences concerning the enterprise and its development.

Stakeholders are identified by their role in the enterprise and its environment. Different stakeholders have specific preferences concerning the design of the enterprise, both present and future. Because they have different roles their knowledge of the enterprise, its environment and of other stakeholders varies.

A complicated aspect of development is that the structure, roles and power balance of stakeholders often change when transforming an enterprise from one state to another.

R2: The discrepancy between present and future enterprise images is the basis for defining development goals. A development goal should tell what to change in order to transform the enterprise from current to

future state.

Development goals should express the direction and magnitude of change needed in relation to what entities to change (or create).

R3: The stakeholders of an enterprise must have sufficient consensus regarding development goals. Goals that are not accepted by the stakeholders are not likely to affect the development process. Goals, on which there is disagreement, will either not be implemented or will be resisted by disagreeing stakeholders, resulting in counter-productive processes.

The ideal relationship between goals and stakeholders allows all the important stakeholders to align their specific preferences with the development goals of the enterprise. Achieving such a relationship is a highly political process based on negotiations and construction of common world views rather than enforcement by a dominant partner.

Stakeholder commitment to goals may vary over time making this relationship a living one that must be evaluated regularly. Some goals may turn irrelevant before their development process has begun; others will have to be changed half way through the process. This is a complex relationship and it is likely to be constantly partly unknown.

R4: Well defined development goals also express policies on the means to achieve use. The relation between goals and the development processes include choosing principal means to achieve each goal, designing the structure of development activities and clarifying their relation to the goals, identifying significant interdependencies between activities and choosing means for co-ordination as well as clarifying authority and responsibilities for each activity.

A development activity (process, project) must contribute to one or several of the development goals. Development work is often uncertain concerning results, time and costs. Deviations from given goals must be identified so either the goals or the project may be adjusted accordingly.

R5: Despite agreement on where to go

between the stakeholders; there may still exist different preferences on how and when to get there, i.e. the development process and how different stakeholders are involved or may influence the work. Commitment to results is usually stronger from those who have participated in the development process.

Even if the stakeholders have agreed on development goals, they will want to influence the development work in order to assure that their requirements are contained. This turns participation into a political issue. From a process (project) perspective, it is very important to have stakeholders with “the right” enterprise knowledge in appropriate projects.

R6: The activities in the development process aim at either changing an existing entity in the enterprise into a new state, or to develop a new entity and deliver it to the enterprise, thereby bringing it to a new state. In either case, new or changed entities must be integrated in the enterprise.

The aim for every development activity is to finally change the enterprise. The relation between processes (or projects) and the enterprise contain aspects of knowledge supply to the development processes, and integration of results into the enterprise going the other way. Developing new artifacts does not change the enterprise.

3.2 Critical Management Issues

Each of the previously described relationships (R1 – R6) can be summarized as a CMI's. R1 is summarized by CMI 1, R2 by CMI 2 and so on.

Table 1: Critical Management Issue corresponding to the DELTA-relationships

CMI	Description
1	Identify stakeholders in the network
2	Identify change entities and corresponding goals
3	Create change program to which stakeholders commit
4	Monitor and follow-up change progress and coordination
5	Manage power and influence structure between stakeholders through the management of change projects
6	Integrate development results into the network (so that real change emerges)

4. Network Taxonomy

The PLEXUS-study resulted in a network taxonomy comprised of three generic types of network organizations. Depending on type of business, desired future, risk willingness, leadership, culture and history of collaboration, different network types are more or less suitable and relevant. The three network types identified are: The Supply-Chain Network, the Business Network and the Research Network. These network types are differentiated by degree of knowledge integration, which in turn is defined as the extent of inter-organizational knowledge sharing and collaboration.

Below follows a description of each network type, the description includes the general structure and management of the network.

4.1 Supply-chain Network

The Supply-chain Network, SN, is comprised of a set of companies whose main motives for participating in the network are cost reduction related. The collaboration achieves cost reduction mainly through a strong focus on optimizing the interfaces

between the participating companies.

The difference between an SN and a traditional supply-chain is the special attention that the interfaces between the participating companies are given. In addition to this, there is also a general understanding of the whole chain, primarily expressed through an explicit common goal. Companies in traditional supply-chains tend to focus on the individual tasks at hand and show less interest in the overview of the supply-chain. The overview and understanding of the whole chain gives the SN-hub a substantial advantage compared to a traditional supply-chain when something becomes amiss in the product flow. By understanding the complete process, the SN-management can take appropriate action immediately and minimize problems along the product line.

An SN is successful when cost-saving goals are reached and all participants see their participation in the network as profitable. When this is not the case, discontent partners will exit causing instability. This does not however mean that the profit generated by the network as a whole gets directly distributed to the contributing partners through monetary transactions. Instead it is more common for the hub to invest the profit in the network infrastructure, mainly through specific investments in Information and Communication Technology (ICT) acting to further support and augment the optimization of the company interfaces.

Figure 2. Supply-Chain Network

The general management practice can be described as a management aimed at optimizing the processes in the supply chain through a high degree of managerial control. Given the nature of the network as encompassing a distribution of the processes geographically and culturally, there is also a focus on creating a good communicative culture. This communicative culture is clearly functionalistic, which is highlighted by the communication often focusing exclusively on the product or the orders involved in the process at hand. Regardless of the functionalistic communicative culture of the SN, the use of formalized EDI- or XML-based communication between the involved network partners is not omnipresent, but clearly complemented by the less formalized communication emphasizing more the inter-personal rather than inter-firm communication.

With the main objective for the network management of the SN being cost reduction through optimization of joint processes, the usage of goals, checkpoints, forecasting and follow-ups are important instruments.

With the output of each partner in the network being the primary focal point in the collaboration, it is possible to assess that the company transparency in the SN is relatively low. This is also emphasized by the clear

differentiation of the contributing partner's different efforts, and the fact that reliability is the most important partner characteristic in an SN.

When regarding the collaboration of the firms involved in the SN the knowledge integration is fairly limited (low). However, it is important for each partner to have the ability to identify and describe her product relevant knowledge, in order for the SN-management to respond successfully to external events.

4.2 Research Network

The Research Network, RN, is comprised of a set of companies whose main motivation for participating in a network is that of enhancing their knowledge by joint research and development ventures. With the main motivation for the individual partner being personal knowledge creation or enhancement, the synergic effects of the network are of great importance for whether or not the RN's existence is justified or not.

The RN is successful when research goals are achieved and the contributing partners experience a feeling of having enhanced their own knowledge. Success often lies in the ability to set up and execute contractual research in complex areas without losing control, overview and manageability of the task at hand.

Figure 3. R&D Network

The main activity of the network management in the RN is the creation of an environment where knowledge can be cross-fertilized and grow and where the individual contributions of the partner's knowledge can be surpassed by the joint output of the network.

For the manager to be able to create an environment where knowledge flows freely between the individual partners, it is necessary to limit the extent of managerial control. This is a direct result of a constellation with a high degree of specialization and expertise from the individual contributors and a focus on intrinsic rather than extrinsic rewards. In this case, the network management has more of a facilitating function rather than a controlling one.

A second function of the network management is the reporting of results to other stake-holders (for instance venture-capitalists). The existence of a formalized means of reporting results may in some cases also act as a substitute for more elaborate managerial control.

Thirdly, the network management's role as a gatherer and coordinator of resources for the network is strongly challenged by the explorative nature of the RN. Without the possibility of predicting the outcome of the exploration, the resource-management aspect of the network must be regarded as a possible pit-fall.

In order for the RN to be a successful network, it has to be able to take advantage of the synergic effects attained from having experts from several fields in close collaboration. For this to take place, the transparency of the knowledge in the network must be high.

4.3 Business Network

The Business Network, BN, is comprised of a set of companies whose main motivation for participating in a cooperative network is directly related to an increase in sales or acquisition of load. A BN provides a product or service produced by a set of partners, and this product or service is then

sold by another set of partners in the network.

A BN usually has a strong hub-company who is the product- or service-owner, and the main source of value-creation lies in the dynamic structure of the BN and its ability to adapt to ever-changing market conditions. The BN is comprised of partners in both horizontal and vertical collaboration.

Figure 4. Business Network.

Management of the BN is mostly a political game of balancing the network partners. The strength of the network derives from its flexibility, this flexibility needs continual maintenance or partners will exit the network. Management of the BN must make sure resources (the partners) stay in the network with use of minimal encouragement. This way the BN has access to resources without high costs of maintaining them or of not using them.

Since the BN hub-company acts as an initiating partner and thereby attracts other partners on the notion that their participation will lead to success, the overall responsibility over the final outcome is directly attributed to the hub-company. In stating that the hub-company takes almost full responsibility over the outcome, a high

degree of managerial control is often found in the BN.

Another important role for the network manager of the BN is that of bringing in and removing contributing partners to the network. The manager must have an overview of the contributions of each partner to the total value-creation process, to be able to assess whether or not the present constellation of partners is the optimal in order to meet the current market needs. In this manner one of the main goals for the network manager of a BN is to create and retain a flexible partner constellation.

The knowledge management of the BN focuses on a high degree of collaboration between the partners. Existing in a highly turbulent environment (acting on a turbulent market), the notion of a flexible partner-constellation is of major importance for the success of the network. This is further complemented by the need for a high level of partner transparency in order for the network manager to ascertain the optimal constellation of partners for the said objective. It is in other words necessary for the network manager to have a good understanding of the relevant knowledge of the partners in order to be able to co-ordinate the constellation.

5. Results

In order to derive change management implications, the DELTA framework CMI's are applied to the described network taxonomy. The three different network organizations are used as "Future enterprise images", in the DELTA framework (see Figure 1, element Enterprise Images). This gives three clear organizational goal-states to identify change management implications from. The result is presented in a matrix below (Table 2).

Table 2. Specific CMI's resulting from application of the DELTA framework to the network taxonomy

CMI + = Easy - = Difficult	1) Identification of stakeholders in the network	2) Identify change entities and corresponding goals	3) Create change program to which stakeholders commit	4) Monitor and follow-up change progress and coordination	5) Manage power and influence structure between stakeholders through participation in projects	6) Integrate change results into the enterprise
Supply-Chain Network Change management Settings	+ Inventory of actors in already existing supply-chain + Clear roles and incentives for each partner due to place in supply chain + Plenty of time for the process of aligning enterprise images among partners - Difficult to introduce new partners in a well established group	+ Cost-cutting through the optimization of interfaces between the partners + Easy to identify due to change entities are within respective partner or in their interfaces - Difficult to comprehend consequences of change throughout all partners due to only interfaces are commonly known	+ Make visible and understandable the mutual benefit of cost-cutting through partner interface optimization -Rearrange roles in a well established group	+ Measure cost-cutting progress from interface optimization project -Difficult to forecast overall progress due to low transparency into each partners change work	+ Decentralise action, let involved (with the interface), partners run projects -Ensure future Hub overview of interface, implies an agreement concerning power shift and increased transparency of respective interface	+ Roll-out interface optimization program in to live operation -Synchronization of internal change events between differing partners
Research Network Change management Settings	-Identification of possible future research partners; selection based on expertise and previous history of collaboration -Identification and ownership of intellectual assets to be used	+ Elimination of collaborative research start-up bottlenecks; minimize start-up administration and costs; optimize research environment and group - Identification of change due to uncertainty regarding expected output and resources of the network	+ Draw attention through offering a competitive and attractive research environment suitable for the research task at hand -Differing opinions on ends-means relations due to differing knowledge background and interests	+ Align research tasks with overall goal - Balanced and timed sharing of created knowledge within the network -Recursive refinement/re-evaluation of change goals based on continuous new knowledge from development and research activities	+ Research facilitators (sponsors, owners, etc) and researchers shall run change project together; this ensures mandate to manage and creation of an environment suitable for the two-tailed network management -Each partners goals will be based on their respective available knowledge and private forecasts	+ Operationalize network research start-up activities in to the organization
Business Network Change management Settings	-Network participants hard to distinguish from customers / suppliers -Difficult to find possible new partners willing to accept network terms and at the same time competent -Difficult to create critical degree of trust without history of transaction	-Increase acquisition of load through optimal partner constellation towards each specific market opportunity -Hub must continually manage network through knowledge master and political placement	-Attract action through customized, individual partner fronts, tailored in order for network to appear attractive regardless of viewpoint	-Ensure political power through testing of mandate to manage towards partners +Compare partner turnover, market change and profit - Difficult to relate specific activities to a directly correlating goal	-Ensure political power through selective information distribution + Encourage internal competition + Award loyalty to "network"	-Continually update partner constellation in order to ensure optimal network to meet ever changing market needs

6. Discussion

There are a number of identifiable differences concerning network CMI's depending on network type.

CMI 1, the identification of stakeholders in networks, varies to a great extent depending on the type of network. In a Supply-chain network the stakeholders are easily identified since the collaboration builds an a foundation of previous business, the business network may experience significant difficulties concluding in who is to be seen as part of the network, this becomes a bigger problem as distance increases from the hub company. The difference of view regarding the collaboration makes categorization of network stakeholders problematic.

In the research network, partners may change as knowledge about the solution increase and reveal new needs.

CMI 2, change entities and their corresponding goals, calls for similar types of management actions regardless of network type. However the issue increases in difficulty dependent on unclarity regarding who are partners and variety in knowledge and enterprise image among the partners.

CMI 3, in order to create change programs to which stakeholders commit, the managing hub partner may choose several different approaches; in the Supply-chain network, commitment is easily attracted through the visibility of mutual benefits of cost cutting. In the Business network there is a need to customize each change program towards each partner in order to show a political, biased, view suitable for the purpose of the hub partner. In the research network, commitment to a common change program among the partners is dependent on the partners interpretation of the ends-means relevance in the change program. High degrees of uncertainty may heavily decrease the willingness to engage in real change. Thus, change management varies from reasoning and logic to politics and marketing related actions.

CMI 4, Monitor and follow-up of change

activities also differentiate substantially depending on the type of network, the activity varies between follow-up of simple measurement (Supply-chain) to testing and ensuring political power and mandate.

CMI 5, any collaborative action is an act comprising and moving power; participation gives influence. In the research network, the participant most suitable and competent conducts collaborative efforts. In a Business network, the hub partner, ensuring the appropriate power balance, carefully distributes all action. Thus, activities vary from professional to strategic actions.

CMI 6, In order to harvest the fruits of project results in the network, it is essential to incorporate project outputs in to regular operations. In the Supply-chain network this is equal to rolling out the cost-cutting activities, in the business network the activity concerns the changing of partners.

7. Conclusions

All analyzed CMI's (with the exception of CMI 2) gave substantially different types of management issues to address depending on type of network. Thus, it is most important to be fully aware of the implications the network type has on critical management issues.

This result also indicates that the DELTA framework contributes to the analysis of change management issues in different types of networks. Of course this does not exclude that other issues also may be of importance.

The paper also sheds light on the possible danger of blindly following CMI's without sufficient contextual awareness and the need to further probe into complex collaborative environments in order to complement CMI's.

Whilst an intra-organizational perspective biases most change management models this paper offers a framework to analyze and differentiate managerial issues on inter-organizational type.

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