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From Idea to Knowledge

Performance of Virtual Organisations

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ABSTRACT

As the ratio of knowledge intensiveness increases, the significance of a formal organisation structure decreases. When knowledge is a commodity and the main input is information, an organisation should be flexible. However, the free flow of information and knowledge is often impeded in a formal organisation structure. When an organisation is based on either temporary functional needs or on serving a common strategic goal with no formal limits, it is called a network or virtual organisation. Increased efficiency in a functional organisation is often attributable to synergy and engagement.

The objective of this study is to define and enlighten the performance of knowledge work, and especially the knowledge work in virtual organisations. The key topics consist of the virtual organisation concept, the framework of performance measurement and definitions of performance. Methodologically the paper is, firstly, a conceptual analysis the goal of which is to outline the theoretical framework of virtual organisations. Secondly, the case provides an ethnographic description, so no general conclusions are made. However, the case is used for creating hypotheses for further studies.

This paper is based on a literature review emphasising current knowledge on knowledge work and virtual organisations. The paper also includes a case description of an ongoing research project and the results of interviews of core members of a virtual organisation. This paper introduces a framework for performance measurement in knowledge work and points out the critical success factors of a virtual organisation.

INTRODUCTION

The change of society (from an industrial to a service and even to an information-based society) has generated a new particular group of workers; people who work their way through information, solve problems and make plans, i.e. knowledge workers, experts or professionals (see. e.g. Bell 1974; Castells 1996; Rifkin 1997). In this paper, the phrase ‘knowledge worker’ is used as a name for “white-collar workers” who process and

utilise information and knowledge. They work mainly in service production, but some of their tasks are more like traditional production. The common feature of all these workers is expressed in the ambiguity between the product and the process. Usually, the product is composed of a plan or an advice, thus it is not easy to define a physical product. Production and consumption, and the utility of consumption of services do not always occur simultaneously; hence the advantages can only be perceived after a long period of time.

Before information society, knowledge work was seen as the support function of production, e.g. R&D. However, due to the specialisation of R&D organisations, the increase in the demand for services, the complexity of society, and information-related commodities and services have made knowledge work common (Kasvio 1994, 65).

Some authors, e.g. Kasvio and Sipilä, separate knowledge workers into two categories (Kasvio 1994, 65-66; Sipilä 1996,15). Firstly, production-related work, i.e. research and development, is seen as an individual part of the industrial process. Secondly, knowledge work is defined in contrastive ways by different professional groups which establish their own profession, e.g. lawyers, medical doctors or engineers. Drucker (1999a, 88) approaches knowledge work from the viewpoint of a technologist, a person who applies knowledge of the highest order. A technologist, e.g. a medical doctor, has both the knowledge and the manual skills to serve patients (ibid.) The technologist can interact with a customer, but it is not necessary for the productive process. Thus, by definition, a computer operator is also a technologist. For another group of knowledge workers, such as lawyers, direct contact with a customer is needed and the customer performs an active role in the production process.

Knowledge workers work in different sectors of the economy; for instance, in health care, legal and financial services, research and development and information industry. Moreover, knowledge workers represent their profession, which is acquired through a certain education and skills required. The demands of jobs for a formal education and skills vary from medical doctors and lawyers to people working in the information technology industry. There is a distinction between a knowledge worker and a skilled worker as a knowledge worker is actively seeking new solutions to problems. A skilled worker, on the other hand, is not expected to develop new methods to do the work.

Knowledge organisation has its own special features. Firstly, the value of an organisation is equal to, or higher than, the combined knowledge of its employees. They are highly educated, and they perform tasks that involve complex problem-solving. Secondly, the proportion of human capital is dominant and organisations are person intensive, so the knowledge in the organisation is linked primarily to its personnel whose experience and learned skills are even more important than their formal academic knowledge. Thirdly, the personnel of the organisation tailor the product to meet the clients' special needs. (Sveiby 1990, 40; Kasvio 1994, 65).

Savage (1996) gives the attributes for new managerial challenges caused by changes in the business environment, e.g. the globalisation of markets, ever faster technological developments and the increased importance of knowledge-based assets. These attributes are: How do we move beyond the fragmentation of companies?; How is accountability maintained in flat, dynamic network organisations?; How are the focusing and coordination of multiple cross-functional task teams supported?; How incorporate the capacity for continuous learning and quick market responsiveness in an organization's structure? As a partial solution, Savage suggests an increased flexibility by building co-operative networks, in which different organisations and organisation members could learn from each other and gain positive network externalities[1].

New structures and processes, e.g. inter-firm collaboration, flexible working, team working, knowledge management and organisational learning, characterise new organisations and ways of working (Jackson 1999a). According to Jackson (ibid.), there are three reasons for this. Firstly, the demand for more flexibility by individuals, combined with improvements in technological capabilities and cost effectiveness will make new working arrangements viable and attractive. Secondly, the need for improved innovation and organisational learning demands new knowledge management systems to help an organisation acquire, accumulate, exchange and exploit organisational knowledge. And thirdly, as access to, and transfer of, knowledge and expertise will increasingly take place across boundaries (both organisational and spatial), internal networks, dispersed project groups and inter-firm collaborations will become more and more common.

VIRTUAL ORGANISATIONS

The phrase 'virtual organisation' stands for a task, project or permanent organisation which is decentralised and independent of any spatial connection (e.g. Fisher and Fisher 1998; Hoefling 2001). The characteristics of a virtual organisation are: dispersion, empowerment, restlessness and interdependence (IMPACT programme 1998/2001). Dispersion means that there are at least multiple locations and, moreover, multiple local cultures and languages. Empowerment refers to the division of responsibility across the network. Restlessness denotes the acceptance of change in organisational practices and customs. However, the most important characteristic of a virtual organisation is its interdependence as individual members (persons or organisations) of a network must cooperate in order to gain synergy benefits. Forms of interdependence vary; it could be

[1] Network externality, i.e. synergy, refers to the economical concept of external effect, which affects organisations or individuals and causes economical gain or loss and is not compensated. Positive externality is an economical benefit, which comes from outside the organisation and is free for any individual or organisation.

forged in the shape of a strategic alliance, a partnership, value chain or outsourcing. Figure 1 describes a typology of virtual organisations.

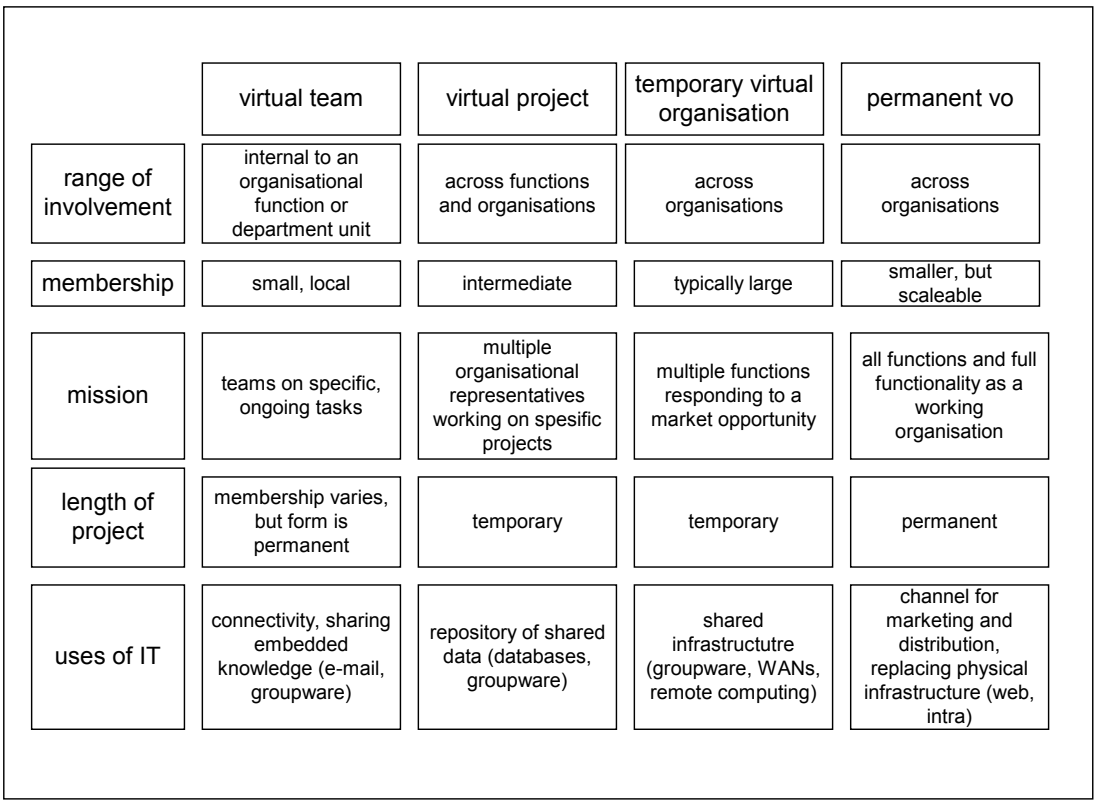

Figure A: Typology of virtual organisations (Palmer, J & Speier, C:,1997/2001).

The simplest form of a virtual organisation is a virtual team, which is a local team utilising technology in order to ensure better connectivity, shared knowledge and lower costs. The difference between a regular and a virtual team is its spatial, and in some cases chronological, dispersion. A team is still formed to perform a common task, but people do not have to be in the same place. Virtual teams are suitable, e.g. for R&D projects and teleworking. The opposite of a virtual team is a temporary virtual organisation, which is temporary and entails a large network of people, based on voluntary membership, and aiming to perform a specific task. For instance, software companies have a large network of beta testers, i.e. people who test their products and thus are part of a development project. As a large network is not easily managed, entry into, and exit from, a network should be made as easy as possible in order to maintain its functionality for the duration of a task.

A virtual project exacts a temporary organisation for a certain task which has a beginning and a designated end. A virtual project reflects the idea of virtual working as

it is established to be virtual, and thus network externalities and benefits from synergy are gained. A virtual project can also mark the origin of a permanent virtual organisation if a project is successful. There are, therefore, no significant differences between a virtual project and a permanent virtual organisation.

Hoefling (2001) states that work is becoming more people-centric than place-centric, thus the performance of basic functions, such as buying, selling, working, researching, sharing information and communicating, are independent of a certain place, i.e. workplace. According to Glegg (1990), organisations must meet new challenges in the postmodern world (cf. Savage 1996) and thus abandon Weberian ideas of rigidness, technological determinism, differentiation and demarcation as organisational virtues. If a postmodern organisation is to be flexible, de-differentiated, de-demarcated and multi-skilled, information society must add better performance through virtuality.

PERFORMANCE AND EFFICIENCY IN VIRTUAL ORGANISATION

In the case of knowledge work, it is not meaningful to try to measure numbers of output and input in quantity, nor to use the concept of productivity in the classical sense of the word. Thus, knowledge work should be evaluated by the concept of performance[2]. According to Sink (1983, 36), there are seven criteria that constitute the overall performance of a firm (organization): 1) effectiveness, 2) efficiency, 3) quality, 4) productivity, 5) quality of work life, 6) innovations and 7) profitability.

Drucker (1999a, 83 – 84) gives six factors to determine knowledge-worker productivity: 1) Knowledge-worker productivity demands that we ask the question. "What is the task?"; 2) The responsibility for their productivity lies with the individual; 3) Continuous innovation is part of the work and the workers bear the responsibility for it; 4) Work requires continuous learning for product improvement; 5) Productivity consists of both quantity and quality, with the emphasis on quality; 6) A worker is an asset not a cost. The factors differ for manual work and this affects how the criteria for performance are defined. The factors for manual work are: 1) The question is: "What is to be done?"; 2) The responsibility for productivity lies with the management; 3) Work is routine; 4) Work requires continuous learning, but learning leads to process improvement; 5) Productivity consists of both quantity and quality, with the emphasis on quantity; 6) A worker is a cost.

Combining performance and knowledge-worker productivity criteria, Sink defines seven criteria of knowledge-work performance, explained by Drucker's productivity concept.

[2] Websters' dictionary defines performance as the ability to perform or fulfil a task, or the manner in which a mechanism performs. Synonyms for performance are efficiency, effectiveness and efficacy.

Firstly, effectiveness means having the right solution on the right scale to a problem defined by a customer. Secondly, efficiency should be understood in its economical sense, i.e. a solution is produced with a minimum of input. Thirdly, quality refers to the accuracy of a solution. Fourthly, productivity equals number output. Fifthly, the work should be performed under such conditions which help and encourage workers to do their best. Sixthly, innovations are guaranteed in a state where workers aim to construct new and better solutions to problems rather than mechanically apply old ones. Seventhly, profitability means that revenues must exceed costs. These are the necessary conditions of performance and the failure to meet even one of them could have a negative influence on performance.

Virtuality does not require redefining the concept of performance since it is applicable to virtual organisations. Some criteria of performance are emphasised as far as virtual organisations are concerned, as the criteria are used as a justification for virtuality or risk of decreased performance.

Effectiveness for a virtual organisation means independence of time and place; thus the network is available to a larger extent. Efficiency is the optimal allocation of resources, i.e. any resource is available, but used only if needed. Quality is ensured by the optimal allocation of competence. A large network facilitates the evocation of responses to new ideas; this way virtual organisations, if large enough, can be more innovative than conventional organisations. Ideas, at least, are delivered more effectively in a network. Nevertheless, if there is a lack of personal contacts at work, there is a risk of alienation from set goals and the cooperation between individuals might suffer. It could be said that virtuality presents a challenge to human resource management. Profitability seems to be the reason why virtual organisations work for due to synergy profitability increases and new possibilities open up. From the profitability angle, virtuality makes it possible to adapt new products or business ideas which were, earlier, unprofitable.

THE EACCELERATOR CASE

The eAccelator case study is part of a larger research project which aims to build tools for strategic performance measurements in a knowledge-work context. Previous research and participation in performance measurement system design draw attention to organisational virtuality, thus this paper. In the research project, researchers use action research to study performance and performance measurement in a knowledge-work context. Action research was the method selected because researchers wanted to gain deep insight into the case partners. Also, it is easier to motivate an organisation and people to cooperate when they have a mutual goal.

Aiming to enlighten the organisational virtuality and performance of a virtual organisation, an inquiry with open-ended questions was e-mailed to the core group of an

organisation called eAccelator. The questions were divided into two categories. The first category was about organisational performance and strategy. The second category concerned virtuality. As a single case exploration, the results are descriptive and aim to enlighten two types of virtual organisation, i.e. the virtual project and the permanent virtual organisation, employing the typology of Palmer and Speier.

eAccelerator is part of a larger, partly EU-funded, programme called eTampere, which is a five-year development project the general objective of which it is to make Tampere leader in the research, development and application of issues related to information society. The task of eAccelator is to operate venture projects as a medium between starting companies and venture capitalists or to incubate new companies. Its product is knowledge on financial, general and technological management for companies admitted to the programme. eAccelator is now a five-year virtual project consisting of 15 core experts in venture capital projects, an advisory board of 54 persons; 22 corporate finance experts, 16 experts in the management of company growth and 17 experts in technology. The aim of the programme is to incubate and to make a successful exit after three years. A successful exit means either the founding of a new company, which is ready to cope on its own but still has a limited ownership, or a new public company which is listed, e.g. in HEX, and therefore is acknowledged.

eAccelator's products are knowledge and contacts. Its customer start-up companies have believable business plans, but they lack in capital, and knowledge of managerial issues. As a mediator between ventures and capital, eAccelator plays the role of catalyst. Its most important task is to generate venture capital funding for customer companies. Its secondary task is to give advice about economical, managerial and technological issues. The core of the organisation plays an active role in solving problems.

eAccelerator is built up as a virtual project. Its virtuality is perceived through its practices. The people in the core group of the company have permanent positions and established status. The advisory board is more flexible. The people in the core group work with each other whenever possible, as their task are partly similar. Most of the time of the core group is consumed by customer service. If a customer's problem cannot be solved by the person him/herself, she/he starts actively to seek a solution in the whole organisation. If the problem still remains unsolved, she/he refers the customer to an outside consultant, and thus outsources problem-solving.

The advisory board is designated to help the core personnel in customer service and they are the primary source of knowledge on legal, managerial and technological matters. The advisory board plays a central role in evaluating new customer ventures and making contacts with investors. Advisory board members do not necessarily collaborate closely with the core personnel, but they are available if their special knowledge is needed.

By arranging the eAccelator organisation in a virtual form, large economies of scope comparative advantage are gained. The comparative advantage is based on absolute and relative competence of the personnel throughout the organisation. Firstly, absolute competence is external and brought out by the fact that eAccelator has more knowledge and information than its customers have; customership is thus based on asymmetrical knowledge. As the customers are not able to cope with their growth on their own, there is a market for eAccelator competencies. Secondly, relative competence is internal and perceived in the positions of the personnel. Every member of the network has a substantial amount of knowledge in his/her field of expertise, but there is always a person who is more competent in other fields. By summing up all personal competencies, synergy emerges, thus giving the organisation its form.

The performance of eAccelerator could be viewed from two perspectives. Firstly, as a project it has explicit goals to achieve. Secondly, performance is the key factor to reach those goals, thus success factors for strategic goals should be defined. In very knowledge-intensive and customer-orientated cases, the role of the personnel is emphasised. As eAccelerator is very dependent on its current stakeholders, the performance should be measured by a performance measurement framework which emphasises the perspective of the stakeholder. Neely and Adams (2001) apply the stakeholder perspective in their Performance Prism framework. The key question is what strategies the organisation should adopt to satisfy stakeholders' wants and needs. In the long term, successful organisations have a clear picture of who their key stakeholders are and what they want, and what it is that the organisation wants from its stakeholders. They have a clear business model and understanding of what constitutes good performance of the organisation and what it is that drives it.

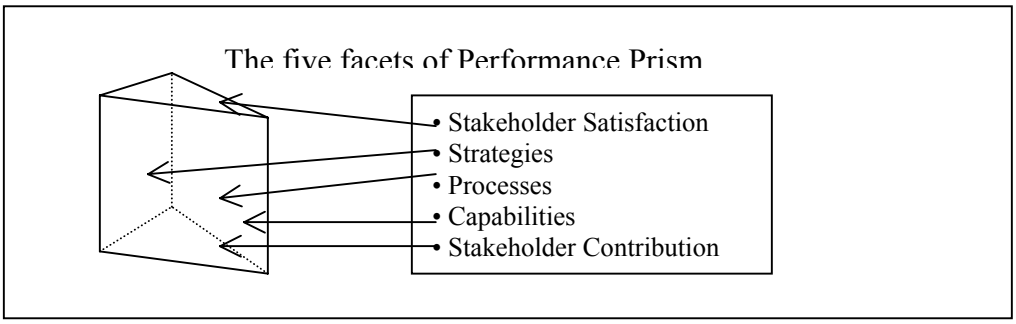

Figure 2 The Performance Prism Framework (Neely and Adams 2001, 3)

The Perfomance Prism has a descending order of facets of the prism, from stakeholder satisfaction to stakeholder contribution. Strategy is an instrument for pleasing stakeholders. Processes are derived from strategy and they are dependent on capabilities and stakeholder contribution. If one also wants to use the Performance Prism for operative purposes, measures should be defined in order to construct a measurement

system. Implementing the prism is somewhat analogical to implementing any other balanced performance measurement system. In this context, it means that after the five facets are articulated and strategies defined, measurement system implementation has similar phases to those of the Balanced Scorecard-system or equivalent (see e.g. Hannula et al 2002; Toivanen 2001).

The work in eAccelator is very knowledge intensive, thus performance should also involve the competencies in the organisation. Especially, the competencies of the core group are a key success factor for the organisation. Competence evaluation should be part of the performance measurement system and it should be grounded on two premises. Firstly, the stakeholder perspective should articulate what the critical competencies for successful accomplishment are, i.e. the network should cover as large a proportion of different types of knowledge of business as possible. Secondly, competencies required must accumulate, thus performance evaluation should take organisational and personal learning perspectives into account. Moreover, every person in the core group must have an opinion on personal strengths and weaknesses, and they should develop both.

CONCLUDING REMARKS

Performance and performance improvement are two of the central interests of business management. By adopting new organisational structures or new ways of practising business, organisations are able to generate revenue from new sources. Performance measurement in a virtual organisation context is quite similar to any other performance measurement. However, networks are not easily put into formal organisational charts, nor apprehended. The context of knowledge work is more complicated because it is very abstract. Moreover, operational measures are difficult to derive from success factors. Yet absolute and relative competence should be taken into account when performance is defined, for it is the key to understanding knowledge work.

The action research project in the eAccelator case is in its very beginning. Further research will concentrate on performance measurement system design and implementation. Attention should also be paid to issues of measuring performance of networks or measuring the value of network externalities, for eAccelerator could appreciate its unconventional way of practice in its market value. Further research on this topic in general should be extended to research on venture capital industry for new practices and ideas to emerge. Finally, mediator industry in the venture capital branch in Finland is a new form of business and our attention should be drawn to it.

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