Management Information Systems: The Virtual Team Scorecard (VTS)

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ABSTRACT

Organizations resisting changes are missing opportunities to grow or to become or remain competitive. Management Information Systems (MIS) used as decision support systems may support organizations in making use of changes in environmental conditions. Nevertheless, innovative structures are needed to motivate organizations contributing in change projects. In this study, a virtual team scorecard, which can be used as a management information system, enabling requirements analyses for managing virtual teams in organizations and in virtual teams with members of different organizations, was developed in two different versions: (a) an internal VTS and (b) an inter-organizational VTS. The results revealed that the developed virtual team scorecard covers all the main strategic factors from a management perspective and, in particular, relies on the qualitative factors of the team, determines the quality and group dynamics deficits of a team, and may provide clues for knowing which factors should receive special attention. Furthermore, the developed scorecard can be used for inter-organizational teams and any kind of structured co-operation between organizations.

Keywords: scorecard, team, management information system, VTS, balanced scorecard

1. INTRODUCTION

Management information systems deal with improving the performance of organizations and people using different approaches, concepts, tools, and information technology systems. MIS are developed to combine different technologies, processes, organizational mechanism, focusing on internal and external requirements and restrictions. The success of management information systems can be measured on the (a) organizational, (b) team, (c) partnership or (d) individual level.

In this study, the main focus is placed on the team (b) and partnership (c) levels, analyzing how the balanced scorecard approach could be used to develop a tool to manage the team and partnership activities of organizations, focusing on virtual teams.

The virtual team scorecard (VTS) is a tool that can be used to complete management information systems in providing management support on the team and partnership level.

2. MANAGEMENT INFORMATION SYSTEMS

The abbreviation MIS stands for 'management information systems'. The general MIS concept focuses on providing information in a suitable, comprehensive form for different levels of decision makers on different hierarchical levels. Adding the IT dimension to the traditional MIS approach, allows decision makers to focus on speed, reliability, and accuracy of data as well as on increased data volumes and the need for new systems to handle this new dimension [3,4].

Management information systems are systems providing information about business operations, and include applications such as decision support systems, resource management systems, or project management systems. These systems provide information to decision makers, mainly in the middle and upper management, enabling them to prepare improved plans and a control mechanism for different operations within an organization. Management information systems ensure that the needed data are collected from various sources, processed, stored and distributed in an appropriate way to predefined destinations within organizations or to defined destinations outside [1,2,5]. In this work, MIS refers to a management information system, consisting of IT systems, which generate information for decision makers to achieve organizational objectives and concepts and tools used as information systems for management.

3. MANAGING A VIRTUAL TEAM

Considering management information systems (MIS) as main resources of information provision for middle and upper management, different dimensions of MIS have to be considered. According to Jamwal and Singh [4], an MIS strategy consists of the components (1) information strategy, (2) IT strategy, (3) information management strategy and (4) (change) implementation strategy. Focusing on MIS competences and strategies, MIS resources could be divided in a) technological, b) human and c) relationship ones [4]. Considering (virtual) teams, which are in the point of interest of this contribution, the intangible dimension of these three types of resources is a critical one. The intangible dimension could include aspects like MIS human capital or MIS partnership quality. The rise of the Internet has provided new types of knowledge sharing and collaboration options for companies, in which they can hire geographically dispersed knowledge

workers and create so-called virtual teams of these knowledge workers [1]. Focusing on these new collaborations and knowledge sharing options, the intangible dimension of MIS resources have to be considered. Managing virtual teams means focusing on the intangible dimension human capital with the sub-dimensions (1) INTERNAL, with (a) staff, (b) groups, (c) group dynamics, (d) virtual aspects, (3) virtual performance; and (2) INTER-ORGANIZATIONAL, with (a) partnerships, (b) virtual aspects and (c) stakeholder relevant aspects. One MIS tool to be used for focusing on the internal and inter-organizational dimensions is the virtual team scorecard (VTS), developed in this study following the balanced scorecard approach. The VTS is introduced in chapter 4. The balanced scorecard (BSC) is a performance measurement instrument, in which objectives, measures, and actions to be taken are organized following a structure of defined dimensions. These dimensions are flexible to define; the basic balanced scorecard was introduced by Kaplan & Norton in 1996 and further developed in 2004 [6,8]. In the basic scorecard, Kaplan and Norton focused on the dimensions finance, customers, learning, and an internal one. For each dimension they defined objectives, targets, and measurements, showing how dimensions influence each other. Later on, other researchers added other dimensions according to the focus they had within their studies.

4. THE VIRTUAL TEAM SCORECARD (VTS)

The virtual team scorecard (VTS) follows the general balanced scorecard approach. It can be used as a supplement to existing MIS tools and systems to focus on the internal and inter-organizational dimensions of MIS. The (1) internal VTS includes staff in general, groups within the organization focusing on intangible assets such as group dynamics, virtual performance, and other virtual aspects.

The (2) inter-organizational VTS concentrates on partnerships in general combined with stakeholder relevant aspects and general virtual aspects.

Table 1: Internal VTS (template)

(1) Internal VTS (template)			
Overview: _____ 📗			
[fill in a description]			
Objectives 📗			
No	Objective		Comment
1	Increasing the team satisfaction index		Sample
2	Improving virtual performance		Sample
n	Strengthen the supply chain		sample
Detailed structure 📁			
dimension	Sub-dimensions	Key performance indicators	Priority & Time frame
(1) STAFF	Group dynamics Virtual performance Other virtual aspects	e.g. Organization satisfaction index Virtual participation index	Weight for each sub-dimension
(2) GROUPS	Group dynamics Virtual performance Other virtual aspects	e.g. group interaction index, team manager satisfaction index amount of group complaints amount of group delays	Weight for each sub-dimension

Table 2: Inter-organizational VTS (template)

(2) Inter-organizational VTS (template)			
Overview: _____ 📗			
[fill in a description]			
Objectives 📗			
No	Objective		Comment
1	Improve the supply chain performance		Sample
2	To be defined		
n	To be defined		
Detailed structure 🔍			
dimension	Sub-dimensions	Key performance indicators	Priority & Time frame
(1) PARTNERSHIPS	Partner satisfaction Supply chain performance Customer satisfaction	e.g. partner satisfaction index supply chain index	Weight for each sub-dimension
(2) STAKEHOLDER	Stakeholder satisfaction Environment performance	e.g. stakeholder interaction index, environment satisfaction index amount of complaints amount of delays	Weight for each sub-dimension

In the internal VTS template, objectives have to be defined (same for the inter-organizational VTS template). A detailed structure shows the dimensions defined, corresponding sub-dimensions, key performance indicators, and priority rules and time frames.

In general for both VTS you define the dimensions: staff and groups for the internal VTS; partnerships and stakeholders for the inter-organizational one. If needed, additional dimensions could be defined. On the whole, a VTS should not have more than seven dimensions to keep the tools simple and to be able to show the interdependences of the dimensions properly. After defining the dimensions, appropriate sub-dimensions could be flexible defined (not mandatory). Sub-dimensions pre-defined but could be modified are group dynamics, virtual performance and other virtual aspects for the internal VTS; and partner satisfaction, supply chain performance and customer satisfaction for the inter-organizational VTS. For each dimension/sub-dimension, key performance indicators have to be defined; which could be used to measure the outcome of the pre-defined objectives and targets for all dimensions and the organization itself. Key performance indicators (KPI) for the internal VTS, which were pre-defined, are the organization satisfaction index, the virtual participation index, or the amount of group complaints; for the inter-organizational VTS, the supply chain index, environment satisfaction or stakeholder satisfaction index were pre-defined.

Table 3 shows a combined internal and inter-organizational VTS applied in an international company in the telecommunications industry.

Table 3: internal and inter-organizational VTS (in use)

The internal VTS focuses on internal communication structures, as the cooperation structures of the company internal virtual teams. These virtual teams work together on a project based structure. For each project one main virtual team is founded; if necessary, divided into sub-teams or sub-groups with own group objectives, targets, and performance issues. The internal VTS is used for forming, evaluating, and monitoring the team performance on an internal level.

The inter-organizational VTS concentrates on the strategic alliances that the company has with partners in different countries. The company uses the VTS to improve the daily routines of communication and interaction with headquarters and partner and among different partners, located in different countries, working in different industries. With the VTS performance tools should be in use to standardize communication and the information flow within the company's strategic network. The VTS has been in use for about 10 months and, after a period of 18 months, a review using the VTS should show the improvement degree for the company's strategic alliances. The results of this forthcoming study (after a period of 9 months) show that with the help of the VTS the strategic orientation of the company, internal communication, performance of the strategic network, and the overall alliance result could be improved (according to the pre-defines key performance indicators). The developed virtual team scorecard covers all the main strategic factors from a management perspective and, in particular, relies on the qualitative factors of the team, determines the quality and group dynamics deficits of a team, and may provide clues for knowing which factors should receive special attention.

5. CONCLUSION

To be able to establish management structures for virtual teams, the virtual team scorecard (VTS) could be used as a main source in the strategic dimension as well as in the operational dimension. A VTS follows the idea of the balanced scorecard, defining different dimensions, key objectives, actions to be taken, performance indicators, and metrics as well as time frames. The VTS developed in this study covers an internal perspective as well as an inter-organizational one and was applied in a company serving the telecommunication industry, operating on multi-national markets and international ones. The results of the forthcoming analysis show that applying the VTS could create a competitive advantage for companies.

6. REFERENCES

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