Monitoring, Evaluation & Decision Interoperability in Networked Organisations

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Abstract. The web and wireless environment is becoming an infrastructure for speedy delivery of new information system functions within social networks consisting of enterprises and private persons. The high autonomy of participants in such networks poses a decision challenge, for instance regarding the adoptation of information systems. Insights from Actor Network Theory, strategy implementation systems by means of balanced scorecard, and results-based monitoring and evaluation in social groups, are built upon to propose the use of value-chain scoreboards. These draw upon actant generalized scorecards to achieve enhanced decision interoperability in networked organisations.

1 Introduction

In information systems methodologies, early phases in system development are increasingly emphasized and supported by development frameworks, modeling artefacts and repositories. Also in support of early development phases, [6] has elaborated a scenario management (SM) framework reflecting the know-how of the disciplines of strategic management, human-computer interaction, and software and systems engineering.

Scorecard models enable us to articulate for the system stakeholders the value impacts of information systems [3]. This paper introduces scorecard based monitoring- and evaluation activities to facilitate intervention decisions in dynamic networked organisations. Referring to the SM framework of Jarke et al., our contributions matter for two interdisciplinary research topics: the systematic capture and generation of scenarios, and the scenario management in the large.

The remainder of this paper is organised as follows. In section 2 we introduce some additional key work on which we have built. In section 3 we describe the modeling artefacts, generalized scorecard and scoreboard, for strategy modeling, strategy translation and scenario articulation in social networks. Section 4 illustrates how these artefacts matter for feeding the development team with functional priorities and for monitoring the impact of released functionality. The short paper ends with a brief outline of future research and development needs.

2 Strategy Engaging Actor Networks

Actor-network theory (ANT) is a methodology that highlights the networks giving rise to, and sustaining various forms of knowledge [7]. The networks consist of inter-connectivities between human and non-human actants such as documents and devices. Participants knowledges emerges in complex and situationally specific interactions, and cycles of construction and reconstruction combining human and non-human elements. ANT is an approach to structure and explain the links between society and technology. It offers explanations of how technology becomes acceptable and is adopted by groups in society. It suggests how technology is socially constructed. The primary focus is on stakeholders (actors or actants) and how they are involved in the shaping of technology. The theory emphasises the co-constitutive relationships between knowledges and the network of actants involved in their creation [8].

The balanced scorecard [9] is one much used device for capturing, structuring and communicating knowledge on organisation objectives. It supplements traditional financial measures with criteria that measure performance form the perspective of customers, internal business processes, and learning and growth. A diversified company such as Ingersoll-Rand, for instance, has business unit scorecards linked to the corporate scorecard[11]. A balanced scorecard-based system provides both a template and a common language for idenifying and measuring sources of value, and for assembling and communicating about them in the perspectives customer, process, learning and growth, and financial (shareholders). Linked to the balanced scorecard, the personal scorecard has been introduced by some companies to enable and encourage individuals to set goals for themselves that were consistent with the organization's [10].

A Results-Based Monitoring and Evaluation approach [15] enhances the decisional effectiveness in areas where competing interests complicate planning and execution, as is the case in dynamic networked organisations.

Scorecards exist both for enterprises and human actants, implicitly or explictly. For these actors, the scorecard is part of the organisational or individual knowledge. For acceptance by the stakeholders in a network, system functionality must have a demonstrable value. For each adopter the system must satisfy a useful purpose, at an affordable cost and for an acceptable period of time [12]. Scorecard articulation helps in identifying (value) chain re-engineering options. Retained solution options can then be analysed using the value-based requirements engineering techniques [5].

3 Generalized Scorecards and Value-Chain Scoreboards

Table 1 summarizes generalizations to the BSC perspectives. For each perspective, the generalizations are numbered and briefly justified. The first generalization reflects the intensifying focus on core competences within any organization and the resulting need for more intimate processes with external relations, customers, suppliers and allies. The collaborative processes are in the external stakeholder perspective because stakeholders come and go with the interactions in which they participate. The joint manifestation of asset (non-human actant or object) and the processes in which it con-

tributes to value creation also justifies to bring internal assets in the same perspective as the (internal) business processes (second generalization). The first and second generalization avoid the silo problem, whether for a business process, a function or a product group (see [11] for some more details). Where growth and learning have a strong inner focus, the terms sustainability, competitiveness and innovation broaden the perspective to the eco-system in which the actants are mutually dependent for their sustained well-being (3). The fourth generalization builds upon work on the sustainable livelihoods framework [14] which was applied to examine sustainability in fisheries management [13]. The assets include natural, financial, physical capital (P2) human (P2), social (P1). The upcoming trends of corporate social and environmental responsibility indicate the future potential of the generalized scorecard perspectives.

Table 1. Comparing Perspectives in Balanced and Generalized Scorecard

Nr.	Balanced SC perspective	Generalized SC perspective
P1	Customer	External Stakeholders, Collaborative Processes & Social capital
P2	Internal Business Processes	Internal Assets, Business Processes & Human capital
P3	Learning & Growth	Sustainability, Competitiveness & Innovation
P4	Financial	Value Flows & Stock (money, material, information, knowledge)

The generalized scorecard can be completed for the economic behaviour of any actant, in particular organizational actants and human actants, or their roles with respect to business processes. Within organizations structures as hierarchies of networks of organizational units, a scorecard can be defined and completed for each unit or team. Figure 1 shows a possible domain model for scorecards and the indicators that must be measured to fill the scorecards and dashboards.

The central question, for instance regarding the adoption of new IS functionality in a network, is whether the IS product and the implied process changes are creating sufficient value for (all) its intended users, such that a sufficiently large number of them is willing to adopt the product (learning & investing) in their anticipated roles in the value chain?

For a given social network that instantiates the model in Figure 2, it may be impossible to know the exact scorecards for each participant. Yet if reasonable hypotheses are made and refined by dedicated and targetted fact finding techniques, value propositions can be articulated. Generally it is preferable to invest in services/products that provide a solution to a problem (market pull) rather than pushing a service/product (push) into the market that has not yet had a manifestation of market pull. The market pull is reflected in problems perceived by the target stakeholder/actants in the value chains in which they participate.
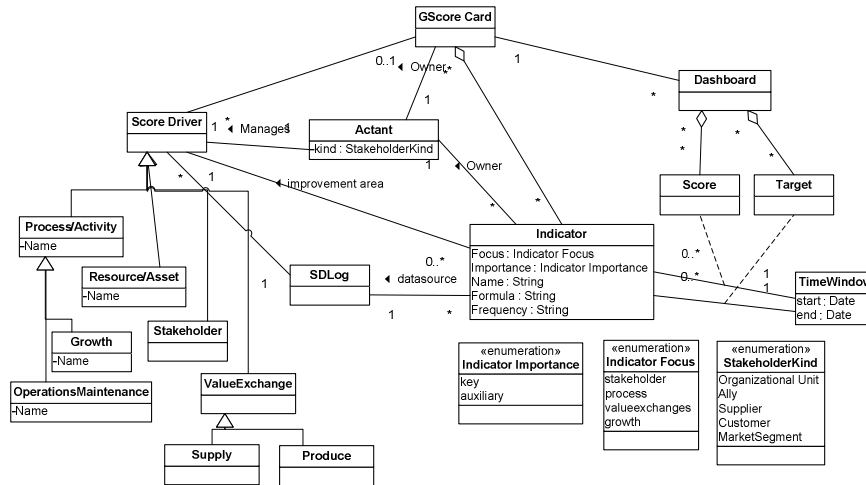
Fig. 1. A domain model for Generalized Scorecards.

For the systems planner, for this reason, it is of value to know for each actant within the scope of a change-initiative, the indicators related to the anticipated system services. These indicators can be collected in a scoreboard per value-chain. As performance monitoring within organisations, the establishing of a practice of Actor Network Monitoring & Evaluation within a social network is a cross-cutting concern. Cross-cutting synchronically because to achieve the value-impacts, multiple stakeholders must adopt together, for instance due to network effects. Cross-cutting diachronically, first to determine functional priorities, and beyond system release in the transition and production phases for evaluating the value-impacts. The Enterprise Unified Process [1] adds transition, production and retirement phases to the system life cycle. The ten monitoring and evaluation steps proposed in [15] offer a reasonably precise description of the required network-wide and cross-cutting functionality in this regard.

4 Conclusion

Information Systems targetted at value-chains using the emerging web and wireless ICT infrastructure often have a disruptive aspect for several of the links involved. In this paper we have given a first outline of a "social strategic system" that can deliver improved alignment capability to IS development teams targetting organisational and social networks. Where the extraordinary power for uncovering opportunities for value creation of a strategic system that vertically links strategic themes across balanced scorecard objectives, measures and initiatives has been claimed [11], we follow. Not just for corporate strategy, but for the value chains that make up the social fabric,

and the phasing in and out of systems releases into the activities of the value-chain links.

Acknowledgement

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