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The influence of power and interest on designing inventory management systems

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ABSTRACT

Based on a stakeholder perspective in this article results of an in-depth exploratory case study are presented. In our study we focus on how the established relationships among stakeholders within the Production-Sales interface may influence the process of (re)designing an Inventory Management System. Our exploratory case study indicates that different stakeholders may have different perceptions of the inventory management system and the way this system affects the power and interest position of the stakeholders involved. There are some strong indications that the attitude and behaviour of the stakeholders during the implementation as well as the usage of the inventory management system can be dominated by their assessment on how the system will affect the power and interest position of the stakeholders. The process of designing and implementing inventory management systems in other words, is not only a technical process but also a process subjected to perceptions and attitudes related to the power and interests of the stakeholders. It is important for project management to be aware of the different perceptions stakeholders may have of the potential effects of the system in order to guide the behaviour of the stakeholders. The framework presented in this article can be a first step in deepening our understanding of the mechanisms going on during the adoption of inventory management systems.

1. Introduction

It is widely acknowledged in literature that the design of Inventory Management Systems is of significant importance for the overall performance of manufacturing companies (Blinder and Maccini, 1991; Rabinovich and Evers, 2002). Although different definitions exist, Inventory Management Systems are generally described as integrated systems designed to integrate, standardise and automate decision processes related to the management and control of inventories. Inventory Management Systems in other words, provide the information to decision-makers within organisations on a strategic, tactical and operational level in order to support inventory decisions (Nagarur et al., 1994). In many cases Inventory Management Systems consist of a collection of software modules, which are linked by an integrated and often central organised database. Inventory Management Systems however, also include non-software elements like procedures and arrangements on how different parties involved in the decision-making processes on inventories interact and communicate with each other (Chen and Chang, 2009).

Different studies have emphasised the existence of multiple stakeholders involved in inventory-related decision-making processes (de Vries, 2009). Additionally, many studies have advocated the existence of conflicting interests between these stakeholders (Konijnendijk, 1993; O'Leary-Kelly and Flores, 2002). Less attention however is paid to the process of shaping Inventory Management Systems and only few studies present empirical data on how this process takes place (de Vries, 2009).

In our study we focus on how the established relationships among stakeholders within the Production-Sales interface may influence the process of (re)designing an Inventory Management System. In doing so, we concentrate on the power distribution and the interests of the stakeholders involved in this shaping and implementation process. In the next sections case data is analysed by applying a conceptual model, which focuses on the interdependency between the (re)design process of an Inventory Management System and the power and interests of the key-actors involved in this process. Our main aim is to reveal some of the underlying mechanisms, which take place during the process of (re)designing Inventory Management Systems. Noticeably, many of the stakeholders involved in this process have different interests and hold different sources of power. As will be illustrated by our case study, the key-actors often use their varying amounts of power to influence the (re)design process in a way, which serves their own interests. Our case study suggests that there are some

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strong indications that this influences both the (re)design process as well as the outcomes of the process.

We view our contribution from two perspectives. First, our article aims at contributing to the theory on inventory management by presenting a model, which encompasses the role different stakeholders play during the process of (re)designing and implementing an Inventory Management System. In doing so, we focus on the role of power and interests. This role has not been fully explored and hardly any articles in the area of Inventory Management have addressed this issue explicitly. Secondly, this article presents empirical case data aimed at exploring the complex mechanisms that take place between the stakeholders during this (re)design and implementation process. Hopefully, this more in-depth understanding will enable practitioners to adopt more effective implementation strategies.

2. Theoretical backgrounds

2.1. Inventory management systems

Without doubt, the way inventory systems are shaped is generally considered as an import key factor for the success of companies (Bonney, 1994; Vastag and Whybark, 2005; Gaur et al., 2005; Jammernegg and Reiner, 2007; Cannon, 2008). It will be of no surprise therefore that many studies have highlighted the design of inventory systems from different perspectives (Hong and Zhong, 1994; Hafeez et al., 1996; Aggelogiannaki and Sarimveis, 2008; Battini et al., 2009). An analysis of existing literature on the building blocks of inventory systems shows that four elements often are considered as essential when designing and implementing inventory systems (De Vries, 2005). Generally, inventory systems encompass a physical dimension, planning and control elements, an information dimension and organisational aspects. Inventory systems in other words are covered by four main decision areas and it is widely acknowledged that each of these areas significantly influences the performance of inventory systems (cf. Safizadeh and Ritzman, 1997; Giannoccar and Pontrandolfo, 2002; Kisperska-Morron, 2003; Jammernegg and Reiner, 2006). Additionally, there are some strong indications that also the interdependence and the degree of fit between these areas highly affect the outcomes of the inventory systems (De Vries, 2005). Inventory systems therefore, are generally considered to be of a multidimensional nature encompassing a complex set of elements that needs to be taken into account during the design and implementation process.

Nowadays, companies are depending more and more on Information Technology for operational, tactical and strategical decision-making processes (Markus et al., 2000; Dezdar and Sulaiman, 2009). Over the last fifteen years, many organisations have made significant investments in integrated information systems and recent studies indicate that improved communication, stronger inter-functional coordination and an accurate and timely exchange of information can be accomplished through these systems (Kallinikos, 2004; Golden and Powell, 2004; Danese and Romano, 2004). Clearly, this also accounts for inventory management systems. For inventory management systems to be relevant to decision-makers, the information and exchange of data must be accurate, complete, relevant and timely (Mandal and Gunasekaran, 2002). It is also for this reason why many companies have decided to implement Inventory Management Systems. Moreover, there seems to be a general consensus amongst scholars that information technology can contribute significantly to achieving better decision-making processes and improved coordination across various business functional areas related to the inventory system (Klaus et al., 2000; Danese and Romano, 2004).

From studies in the area of Information Systems and Information Technology it is widely acknowledged that the implementation of information systems requires a careful design and implementation strategy (Bozarth, 2006; Dezdar and Sulaiman, 2009). Additionally, studies in this field indicate that the implementation of computerised information systems is not just a technical but also an organisational change process (Coakes and Elliman, 1999; Akkermans and Helden, 2002; Boonstra and Govers, 2009). Noticeably, these findings also seem to be valid for Inventory Management Systems. Recent research shows that the outcomes of projects in the area of inventory management often is heavily influenced by the stakeholders involved (De Vries, 2009) and it is for this reason why in this study, a stakeholder perspective is adopted when assessing the design and implementation process of Inventory Management Systems.

2.2. Interest and power of stakeholders

The design and implementation of Inventory Management Systems often is highly affected by different stakeholders. In practice Sales representatives, Production employees, ICT-specialists, Logistical planners and warehouse managers are heavily involved in the process of shaping and implementing Inventory Management Systems. However, each of the parties may have different perceptions of the outcomes of projects in this area and there are some strong indications that these outcomes are heavily shaped by the expectations and the perceptions of the stakeholders.

The level of the stakeholders' interests in the Inventory Management System can vary from high to low, which often relates to the individual interests of the stakeholder as well as to the business process the stakeholder is accountable for. Improved decision-making, which is supported by the inventory management system for example, will enhance a positive attitude of individual stakeholders when adopting the inventory management system. Increased transparency of inventory-related information at the other hand, can easily lead to conflicting interests of stakeholders. From literature it is well-known for instance that opposing interests at the production-sales interface on safety stocks and replenishment levels often is closely linked to the information system being used (Konijnendijk, 1993).

In practice, the attitude of stakeholders towards an inventory management also depends on the power they posses to influence the implementation and usage of the system. In this article, we follow Buchanan and Badham (1999) by defining power as the capacity to exert the will over others in order to realise certain intended benefits. Stakeholders may possess different sources of power to urge other stakeholders to act in a certain way during the process of designing and implementing an inventory management system. Various authors have addressed different sources of power, which enable stakeholders to influence other stakeholders (Mintzberg, 1983; Pfeffer, 1993; Morgan, 2000). In our empirical study we focused on knowledge, the formal authority and legitimacy, and the available financial (or other resources) as important sources of power of stakeholders.

2.3. The influence of power and interest on inventory management systems

Starting from the concepts presented above a conceptual model has been derived from literature. Fig. 1 summarises on an aggregated level the potential influence of power and interest on the shaping, implementation and usage of inventory management systems. The conceptual model depicted in Fig. 1 consists of four main parts. First is the network of stakeholders involved in designing and implementing the inventory management system. In line with the arguments presented above, each member of this