

## Searching for Mechanisms of Knowledge Integration in IT Operational Frameworks: The Case of ITIL

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### Abstract

The usage of IT Service Management frameworks such as ITIL has been on the rise. While there has been some research into the benefits that these frameworks provide, there has been no theoretical basis explaining why companies achieve these benefits. Taking a Knowledge-Based View of the firm provides an understanding of why organizations are able to create knowledge when implementing the frameworks. This research helps illustrate how IT Service Management frameworks can help in the knowledge integration process. Implications for practitioners and researchers are also discussed.

**Keywords:** ITIL, IT Infrastructure Library, KBV, Knowledge-Based View

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## INTRODUCTION

In today's dynamic environment managers aim to enhance their competitive advantage. It has been shown that process standardization has a positive impact on process performance and market success (Ramakumar & Cooper 2004; Swaminathan 2001). The usage of process standardization has demonstrated decreased risk, reduced cost, and improved effectiveness and transparency. However, there has been little empirical research on knowing how and why process standardization delivers such benefits (Davenport 2005).

In Information Systems (IS) the use of "best practices" or frameworks has been on the rise. Recent surveys have indicated an increase of implementation of IT Service Management frameworks such as ITIL (IT Infrastructure Library) (Deloitte 2003; IT Governance Institute 2008; Cater-Steel et al. 2006). A survey completed by PricewaterhouseCoopers (2008) concludes that 24% of companies are using the ITIL framework. This figure represents a rise of 54% compared to the same survey completed in 2006.

While there has been some research on the benefits that ITIL provides, the emerging theories of strategic management, such as the knowledge-based view (KBV) of the firm has not been applied as a theoretical basis in such studies.

The KBV argues that the most influential source of the firm is knowledge (Grant 1996b). In this paper, we put forward propositions on the relationship between the theory above mentioned theory and IT Service Management frameworks. The paper explores how these frameworks are able to generate and, more importantly, to apply knowledge and, therefore, create benefits for the business and IT organization.

In this research, we explore the potential of IT Service Management frameworks, specifically ITIL, to facilitate the integration of knowledge. We propose that integrating organizational and individual knowledge concepts can provide insights into how this framework leads to improvement of the IT organization and the firm. This endeavor aims at closing a gap since there has not been any research applying the KBV to IT Service Management frameworks.

The remainder of this paper is organized as follows. Section 2 reviews the relevant academic literature on IT Service Management and ITIL. We then examine the KBV, with emphasis on Grant's (1996b) four mechanisms for integrating specialized knowledge. Finally, we discuss the implications of the findings and conclusions.

## RELATED RESEARCH AND THEORETICAL FOUNDATION

IT Service Management can be defined as "a set of processes that cooperate to ensure the quality of live IT services, according to the levels of service agreed to by the customer" (Young 2004). Conger et al. (2008) add that ITSM "focuses on defining, managing, and delivering IT services to support business goals and customer needs, usually in IT Operations".

There are various concepts of ITSM. Several ITSM frameworks were developed using ITIL as a reference, such as Hewlett-Packard (HP ITSM Reference model), IBM (IT Process Model) and Microsoft's MOF (Bon 2007). The most common approach is the ITIL which is a de facto standard for IT Service Providers (Hochstein, Zarnekow et al. 2005; IT Governance Institute 2008).

ITIL was originally developed in the 1980s by the Central Computer and Telecommunications Agency (CCTA) in Great Britain. The most recent version of ITIL, which

was released in 2007, is ITIL version 3. It consists of five core service life cycle phases. These are (Office of Government Commerce 2007):

*Service Strategy (SeS)* establishes an overall strategy for the organization's planned IT services and IT Service Management practices.

*Service Design (SeD)* designs and develops new or changed services for the introduction into the live environment.

*Service Transition (SeT)* shifts new or changed services into the production environment while controlling the risks of failure and disruption.

*Service Operation (SeO)* performs the day to day operation of the processes which manage the services. This is where performance metrics are gathered as well as reported and where value is realized.

*Continual Service Improvement (CSI)* identifies and implements improvements to the IT services.

There are two main objectives of ITIL. The first is the introduction and the enhancement of customer orientation and service orientation (Buchsein et al. 2008). The second objective is the increased effectiveness in implementing business requirements, on the one hand, and increased efficiency in providing IT services on the other hand (Köhler 2007). The latter is achieved by describing the task fulfilment within the IT organization as process-oriented.

There have been a few studies on the benefits provided by the implementation of ITIL. Potgieter et al. (2005) completed research the effect of the implementation of ITIL on customer satisfaction and service quality. The researchers concluded that, on the research site, a large service unit of ICT in South Africa, there is a direct correlation between customer satisfaction, service quality and the use of ITIL. Spremic et al. (2008) monitored an IT Service provider in Croatia and applied various Key Performance Indicator (KPI) metrics before and after the implementation of various processes of ITIL. The study concludes that the IT service provider underwent improvements which may be attributable to the implementation of ITIL.

In the analysis of their six case studies, Hochstein et al. (2005) list four benefits: improvement of quality of IT services, efficiency and optimization of processes, transparency and comparability through process documentation and process monitoring. The researchers also consider the financial aspects of the implementation of ITSM. Marrone et al. (2010) conclude that the number of realized benefits due to the implementation of ITIL increases as the maturity of the implementation escalates.

## **KNOWLEDGE-BASED VIEW OF THE FIRM**

Knowledge represents “the meaningful links people make in their minds between information and application in action in a specific context” (Dixon 2000). Knowledge is a factor that has a significant impact on productivity, innovation, and product development, for instance (Spender 1996). While there are arguments about the correct definition of knowledge, for this research the definition above suffices. Strategically, knowledge is considered to be the most valuable asset of companies, and interest in knowledge is therefore increasing (Drucker 1994).

Grant (1996b) proposed the knowledge-based view of the firm (KBV), also known as the knowledge-based theory, using the resource-based view as a foundation. KBV is grounded in the strategic management literature and advances the resource-based view of the firm (RBV), firstly supported by Penrose (1959) and expanded by researchers such as Wernerfelt (1984), Barney (1991) and Corner (1991).

RBV refers to internal analysis and resources such as physical (e.g. machines, plant, etc.), human (e.g. know-how) and organisational capital (e.g. the firm's reputation) (Barney (1991). RBV regards an organization as internal and static, however, little dynamic. Managerial skills are considered to be the main resource as they carry the power to allocate resources. This and the decision-making process constitute the weakness of RBV. It does not imply enough learning and innovation of the whole firm; neither does it look at interfaces between individuals.

Promoters of KBV admit a gap in the resource-based perspective. Even though RBV sees knowledge as a generic source for sustainable competitiveness it fails to realise the different abilities of KBV. An enterprise is competitive if it combines different knowledge streams, applies these to certain tasks, integrates specialized knowledge of individuals and allows for new knowledge (Conner & Prahalad 1996; Grant 1996b; Grant 1996a; Sabherwal & Becerra-Fernandez 2003). RBV goes along well with knowledge companies which have human competence as a foundation of the business. KVB acknowledges the significance of human resources, competences and intellectual capital for competitiveness.

Knowledge should be distinguished from other resources due to its several dimensions (Kaplan & Norton 2001). Sveiby (2001) recognises knowledge as dynamic, personal and clearly different to data and information. Studies in knowledge management claim different characteristics of knowledge, such as tacit and explicit knowledge (Polanyi 1966). Explicit knowledge can be codified, articulated and transmitted to others through formal language or communication systems. Tacit knowledge is difficult to transfer and involves both cognitive and technical elements. The interaction of the two types of knowledge results in new knowledge (Nonaka & Takeuchi 1995).

According to Nonaka (1994), knowledge creation is a continuous process of spiralling interaction between explicit and tacit knowledge. It involves four different patterns of interaction which are socialization (tacit to tacit), externalization (tacit to explicit), combination (explicit to explicit), and internalization (explicit to tacit).

Grant (1997) states that knowledge is a strategically valuable input in production. According to him, tacit knowledge is integrated widely in an organisation and replicated internally. The ability to manage and organize procedures in a way that facilitates the generation and application of knowledge within the organization allows for a sustainable competitive advantage (Roos & Von Krogh 1999; Nonaka & Takeuchi 1995). Competitiveness is explained via knowledge creation, knowledge configurations and knowledge sharing. Based on the modes of knowledge conversion, Alavi and Leiner (2001) develop a framework of knowledge management processes that regard organizations as social collectives and "knowledge systems".

Knowledge-based resources have proved to be of social complexity and are neither imitable nor replaceable (Patton 2007). KBV supporters state that having diverse levels of knowledge and competence renders the companies more competitive and allows for better performance. Also, different parts of a company support and execute the company's knowledge: these are organisational scheme and policy, processes, documents, systems and the company's personnel.

## INTEGRATION MECHANISMS

According to KBV, the firm exists to generate conditions that can integrate the specialized knowledge of multiple individuals (Grant 1996b). Grant (1996b) identifies four integration mechanisms which are Rules and Directives, Sequencing, Routines, Group Problem

Solving and Decision Making. These mechanisms are to be supported by a base of common knowledge. These mechanisms economize communication and coordination. Each of these mechanisms is explained further:

*Rules and Directives:* As expressed by Van de Ven et al. (1976) *Rules and Directives* alludes to “impersonal” approaches for coordination that entail “plans, schedules, forecast, rules, procedures and policies, as well as information and communication systems”. Aside from minimizing the need for communication, these mechanisms assist the transfer of tacit to explicit knowledge by acting like codification devices. Grant (1996b) argues that “Rules may be viewed as *standards* which regulate the interaction between individuals” (emphasis added). This informal communication helps specialists in one area of knowledge to create standards which can be followed by non-specialist (Demsetz 1988).

*Sequencing:* refers to allocation of tasks to members who have the appropriate knowledge of it. Therefore, activities are organized in time-patterned sequences which minimize the need for ongoing coordination. Therefore, the specialist’s participation occurs separately in a pre-assigned period of time.

*Routines:* as defined by Winter (1986) are a “relatively complex pattern of behaviour ... triggered by a small number of initiating signals or choices and functioning as a recognizable unit in a relatively automatic fashion”. In this way, individuals only need to understand their role in the routine in order to realize specialized knowledge in a coordinated way. They are able to support, without the need of *Rules and Directives*, relatively complex behaviours and interactions between individuals. March and Simon (1958) “regard a set of activities as routinized to the extent that choice has been simplified by the development of a fixed response to a defined stimuli”. Individuals are, consequently, able to integrate their specialized knowledge without the need of communicating that knowledge.

*Group problem solving and decision making:* relies on methods which are nonstandard, high-communication methods. It allows for the combination of knowledge which was previously dispersed over various individuals in order to solve a problem or make a decision.

The first three mechanisms aim for efficiency of integration by avoiding the cost of communication and learning. The fourth may require integration through more personal and communication-intensive manners.

All methods of knowledge interaction need to be supported by a base of existent *Common Knowledge* (Grant 1996b). Four forms of common knowledge are common language between organizational members, commonalities in the individual’s specialized knowledge, shared meaning and understanding among individuals, and recognition of individual domains.

## INTEGRATION MECHANISM IN IT SERVICE MANAGEMENT FRAMEWORKS

Particularly in the service industry, the primary source of competitive advantage is the continuous process of knowledge creation (Nonaka & Takeuchi 1995; Colurcio 2009). The growth of a firm is not sustainable without continuous redevelopment of knowledge based resources and capabilities because the organization would be less able to discover new business opportunities (Saarenketo et al. 2009). In the majority of the organizations, specialized knowledge is dispersed across various organization members, which causes a problem (Tsoukas 1996).

By using the findings of academic case studies and surveys completed on the benefits of the implementation of ITIL and CobiT, as well as the guidelines written on these frameworks, we are able to create connections between the four mechanisms of integration of knowledge and the findings. Results are as follows:

*Rules and Directives:* ITIL provides descriptions of a number of important IT practices, through comprehensive checklists, tasks and procedures and responsibilities aimed at the IT Organization (Bon 2007). Historically, ITIL was developed to establish a standard approach for efficiency and effectiveness. In their survey, Marrone et al. (2010) include that one of the benefits is the “Adoption of a common IT process methodology”. We propose that it has an impact on the area of *Rules and Directives*, as it aims at developing set procedures inside the organization to improve its efficiency. This framework helps by converting tacit knowledge into explicit knowledge. It is through the creation of the procedures, following the ITIL guidelines, that companies are able to standardize and integrate their knowledge.

*Sequencing:* Particularly ITIL v3 approaches service management from the life cycle aspect of service. “The service life cycle is an organizational model providing insight into: the way service management is structured, the way the various components are linked to each other. The impact that changes in one component will have on other system components and on the entire system. ... [ITIL] focuses on the service life cycle, and the way service management components are linked” (Bon 2007). Based on this, we propose that ITIL, having a sequential structure, is able to integrate specialized knowledge of the organization without the necessity of communicating that knowledge. This way companies are able to economize on communication while still being able to integrate specialized knowledge.

*Routines:* In a survey carried out by Cater-Steel et al. (2009), they assert that, for ITIL, one of the top benefits of implementing the framework is that the roles and responsibilities are clarified. ITIL uses the RACI Model (Responsible, Accountable, Consulted and Informed) to help define their roles and responsibilities (Bon 2007). Through the establishment of clear roles in the organization, specialists are able to generate specialized knowledge in a coordinated way.

*Group problem solving and decision making:* ITIL recommends the creation of various groups, such as the IT Steering Group and the Support Group. The Steering Group is a formal group which is responsible for ensuring the alignment of the business and IT service provider strategies and plans. The Support Group is a group of specialists with technical skills and is responsible for providing technical support needed by all IT service management processes (Bon 2007). These are two examples of groups, proposed in the ITIL framework, which are responsible for decision making and problem solving.

As previously expressed, all of these integration mechanisms of knowledge depend on the existence of common knowledge. In the case studies completed by Cater-Steel et al. (2008) they cite a manager stating that “Standardization makes us more efficient and using common language, you get benefits out of using the same tools”. Findings from the case studies conducted by Hochstein et al. (2005) state that due to the implementation of ITIL commonalities exist in the processes of the various support centers. In their example, processes in support centers in China were identical to those in the USA.

We can observe from various case studies that ITIL provides a common language which is the foundation, needed to support the knowledge interaction. From this basis, for all of the four integration mechanisms of knowledge, we can see that the implementation of ITIL is able to have a considerable impact in these areas.

## CONCLUSION

Knowledge lowers the possibility of external imitation. Lasting improvements can be created through the expansion of the knowledge base used (Rivkin 2001). Previous studies have suggested various benefits achievable through the implementation of IT Service Management frameworks. However, theoretical development remains fragmented, and there has been no research on the factors that lead to these benefits. This study is an effort to add the effect of knowledge determinants to the impact that these frameworks have, not only on the IT organization, but also on the firm.

It is understood that frameworks as “best practices” contain knowledge which reflects the cumulative experience of hundreds of individuals and organizations around the world (Spafford, 2003). Based on Nonaka’s (1994) modes of knowledge conversion, when these frameworks are implemented in the organization, new knowledge is created from the combination of the knowledge contained in the organization and the implementation of the framework.

At the same time, IT Service Management frameworks, such as ITIL, provide policies, procedures and tools that are inherently useful as enablers of knowledge generation and application. Therefore, these frameworks are able to have a positive influence on knowledge transfer. These frameworks influence the IT organization’s resources and capabilities, and ultimately lead to improvement of a firm’s competitive advantages.

Further research should develop and test a model which would show and prove the relations between the creation of benefits due to the implementation of such frameworks and the improvements achieved through knowledge integration. Of interest is to see if improvements are due to the knowledge integration that organizations receive benefits or if it is due to the implementation of “best practice” frameworks.

In this study, we have made contributions to both research and practice. For researchers, we have applied a new theory in the realm of IT Service Management frameworks. We have proposed that the four integration mechanisms of knowledge, inside the KBV, may be influenced by IT Service Management frameworks. Using this theory, the research also sheds light on why companies implementing IT Service Management frameworks are able to realize benefits through their implementation. As well, it suggests that if upcoming IT frameworks are able to guide the organizational transformation of knowledge there is a reasonable possibility that the implementation of the framework will positively affect the organization. Contributions to practitioners include the understanding of the benefits deriving from transforming the organizational knowledge from tacit to explicit, as well as by the implementation of the “best practice”.

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