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Abstract

The paper examines how the upward and downward strategic influences of the head of the BI unit in the case organization have evolved over time and the BI perspective became legitimate in the organization. The analysis covers a decade long period of time. We engaged in an Action Research (AR) inquiry where the change process was explored through the first-hand experiences of one of the co-authors. The model of the strategic agency of middle managers was applied in the analysis. We analyse the evolution as well as the enablers and constraints of the strategic agency of the head of the BI unit in the case organisation and identify the type of strategic agency exhibited in the case.

Keywords

Business intelligence (BI), business analytics, strategy, strategic renewal, action research (AR)

INTRODUCTION

Contemporary organizations are facing an ever changing and challenging competitive environment, forcing them to explore different ways to remain competitive. They need to make strategic decisions and take action that can be considered entrepreneurial (Lyon et al. 2000). While a strategy-making process used to be a prime responsibility of senior managers, there is an increased recognition that innovative ideas for strategy making could stem bottom-up from the middle management. The strategic agency of middle managers is, however, a complex issue since innovative ideas are both destructive and constructive and introduce uncertainty to institutions (Beckert 1999; Floyd and Wooldridge 1992). In organisational contexts there are both enablers and constraints for middle managers' strategic agency (Beckert 1999; Floyd and Wooldridge 1992).

Organisational innovations are often a combination of process improvements and application of novel technology, such as Business Analytics applications. Recent industry reports confirm a very strong link between an organisation's competitive position and its capabilities to use Business Intelligence/Business Analytics applications. For example, in a world-wide survey of nearly 3000 executives, managers and analysts from more than 30 industries and 100 countries, LaValle et al. (2011, p.23) found out that "organisations that strongly agreed that the use of business information and analytics differentiate them within their industry were twice as likely to be top performers as lower performers" (p.23). Another influential report offers similar findings. "Increased competition and the recognition of the value of corporate data and information seem to have underlined the need for leveraging BI." (Luftman and Ben-Zvi 2010, p.54). Therefore, "organisational leaders want analytics to exploit their growing data and survey computational power to get smart, and get innovative, in ways they never could before" (LaValle et al. 2011, p.23).

Business intelligence (BI) can be defined as "an umbrella term that is commonly used to describe the technologies, applications and processes for gathering, storing, accessing, and analyzing data to help business users make better decisions." (Wixom and Watson 2010, p.14). In the organisational context, business intelligence can be seen as "a strategic approach for systematically targeting, tracking, communicating and transforming relevant weak signs into actionable information on which strategic decision-making is based" (Rouibah and Ould-ali 2002, p. 133). The term BI is sometimes misinterpreted to mean "business reporting" or

"BI technology" and as such different from more advanced applications of analytical tools often termed "Business Analytics". We adopt a broader view of BI, as recommended by Wixom and Watson (2010), and consider Business Analytics to be one type of BI applications or as Eckerson (2004) suggests one of the levels of BI tool evolutions (with BI-enabled reporting being at level 1). As technology is becoming more widespread and organisational applications of BI become more mature, organisations are turning their attention towards business related issues. "The fact is, BI technology is now at a maturity stage… Business intelligence, the management capability, needs to replace the BI technology." (Bertram 2010, p.12). Thus, the ultimate goal in utilizing business intelligence applications and processes is a "BI-based organization" (Watson 2009b; Wixom and Watson 2010), here termed "analytics-based" organisation.

In order to better know the customers, complex analysis of customer-related data, integrated across functional or even organisational boundaries, becomes critical and only possible to achieve effectively with the use of BI tools. Operational BI is now bringing powerful analytical tools from the back office and designated knowledge workers to the front office turning customer facing-employees into a new type of knowledge workers (Imhoff 2006). "Fifteen years ago, BI and enterprise systems were the domain of the technical elite. … Now firms strive for information democracy, all levels of the organisation are using business intelligence." (Conway and Vasseur 2010, p.37). As many types of decision makers are now given access to powerful decision making tools and are able to turn their insights into actions, BI applications are increasingly seen as transformational (Gartner 2009). BI changes how people do their work and which processes are used (Watson 2008).

BI technology is now enabling organisations to trace and better understand the impact of their decisions not only horizontally across business processes, but also along various vertical information flows from the operational level all the way up to the strategy. "Senior executives want businesses run on data-driven decisions" (LaValle et al. 2011, p.23). When various weak signals from the customers are identified and analysed, the outcomes could lead to business strategy being adjusted accordingly (Rouibah and Ould-ali 2002). Therefore, enterprise-wide applications of BI enable organisations to transform their strategies, even the process of strategy making. More precisely, the traditional top-down approach to strategy development and execution could be transformed into a more agile BI-enabled sense-and-respond approach (McNurlin and Sprague 2009). BI is now seen to play a critical role in ensuring the agility of the entire organization (Watson and Wixom 2007). BI can be used to sense when changes are occurring, such as changes in the demand for products or difficulties in the supply chain. BI can also help the enterprise respond to changing environments such as meeting reporting requirements on new government regulations or alerting the sales force about products that are temporarily out of stock (Watson and Wixom 2007).

This paper describes a decade long transformational journey of a very complex retail organisation from exploiting user managed BI applications into an analytics-based organisation with enterprise-wide information management. We engaged in an action research (AR) inquiry, where one of the research team members actively followed both the initiation of the organizational transformation and the evolution of the role of the BI unit during a period of ten years. The organisational transformation is described as two action learning cycles describing how strategy-mandated (i.e. prescribed) BI was gradually transformed into BI-enabled strategy co-creation. The AR intervention is described in detail and it is reflected upon from different perspectives enabling the researchers to draw conclusions about the lessons learned and their implications for BI research and practice. Reflecting on the AR intervention, our goal is to understand the transformational aspects of the more widespread use of BI with regard to the organisational approach to strategy making. We explore how the strategic influence of BI has evolved over time. This is done by utilising the concept of strategic agency (Floyd and Wooldridge 1992) for analysing the evolution and the enablers and constraints of strategic agency of the head of the BI unit in the case organisation.

The paper is organized as follows. Section two briefly reviews the related literature on business intelligence, strategic agency and strategic renewal. Section three describes the theoretical foundation for analysing strategic agency. The research approach is described in section four. Section five presents the action research cycles while section six discusses the results and outlines lessons learned. Conclusions are drawn in the last section.

RELATED LITERATURE

Business Intelligence

Bertram (2010) argues that BI - the technology - should be replaced by BI - the management capability - and puts forward the so-called 4P framework consisting of the following four components: (1) Performance: Setting up an enterprise-wide performance metrics framework; (2) People: Development of core business competencies within your business; (3) Process: Embedding the use of information into and around business processes; and (4) Platform: Creating core BI capabilities. Previous research by (Marjanovic, 2010) proposes to extend the above BI management capability framework with the fifth capability component – BI strategy. Thus, BI strategy needs to be fully aligned with the overall business strategy, defining goals and objectives that in turn will be

used to define the Performance component of the above framework. The same research also argues that in order to achieve a high level of BI management capability, all five components (strategy, performance, people, process, and platform) need to be fully intertwined, as they continue to co-evolve. LaValle et al. (2011) defines three levels of analytical capability representing the three stages of analytical adoption, based on a worldwide survey of more than 3000 participants from more than 30 industries. These levels are aspirational, experienced, and transformed. The aspirational companies display "limited use of insights to guide future strategies or day-to-day operations". The experienced companies show "growing use of insights to guide future strategies, but still limited use of insights to guide day-to-day operations". The transformed companies show the highest level of analytical capability, especially in relation to their strategy and operations. "Almost all use insights to guide future strategies and most use insights to guide day to day operations" (LaValle et al. 2011, p.24).

While the business-related BI research is still emerging (Wixom and Watson 2010), an increasing number of papers have recently focused on business rather than technology aspects of organisational BI implementation. Prior research on Critical Success Factors (CSF) for BI implementation and organisational adoption (Gonzales 2009; Hawking and Sellitto 2010; Wixom and Watson 2001; Yeoh and Kornis 2010) confirms the importance of business aspects. The in-depth analysis of these papers identifies several common CSFs such as executive sponsorship (or senior stewardship), the need to lead the project from the business side, full alignment with business objectives, management of organisational resistance, well-defined project scope, effective project teams, user involvement during implementation as well as various technical issues including BI architecture and user-friendly BI tools. In combination, these findings provide valuable insights for our study, as discussed later in the paper. Previous research also confirms that analytics-based organisations call for a better alignment between technology and business. "For BI to be truly effective, the people who deliver BI (a group that includes many people with IT backgrounds) must understand the business, strive to align BI with business strategies, understand business processes, discover information requirements, build and maintain a decision support infrastructure, and train and support users" (Watson 2009a, p.4). Our study focuses on the technology/business alignment in the context of strategy making.

Entrepreneurial Behaviour and Strategic Renewal

To stay competitive organisations, or teams within an organisation, may take entrepreneurial orientation to their strategic planning which means "behaviours that can be described as aggressive, innovative, proactive, risk taking, or autonomy seeking" (Lyon et al. 2000, p.1056). It is thus behaviour directed towards gaining an advantage over one's competitors. The last type of behaviour, autonomy seeking, however, is related to behaviour within an organisation and "refers to actions undertaken by individual or teams intended to establish a new business concept, idea, or vision" (Lyon et al. 2000, p.1056).

Battilana (2006) looked at the entrepreneurial behaviour of organisational agents from the institutional perspective and defined institutional entrepreneurs as individuals who "somehow break with the rules and practices associated with the dominant institutional logic and thereby develop alternative rules and practices" (p. 657). According to the institutional view, change is normally caused by some external shocks. Battilana argued that institutional change endogenously is controversial because the "actors who are supposed to be institutionally embedded" would have to "distance themselves from institutional pressures and act strategically" (Battilana 2006, p.654). She concluded that whether an individual is able (or allowed) or willing to act as institutional entrepreneur is affected by his/her formal position as well as by the position in informal networks in the organisation (Battilana 2006). Kuratko et al. (2005) considered the strategic renewal of organisations and corporate entrepreneurship, and in particular the middle managers' entrepreneurial behaviour in their research. They defined the role of middle managers in entrepreneurial behaviour as follows: "middle-level managers endorse, refine, and shepherd entrepreneurial opportunities and identify, acquire, and deploy resources needed to pursue those opportunities" (Kuratko et al. 2005, p.705). They proposed that various organisational antecedents as well as behaviour-outcome considerations both at individual and organisational levels affect middle-level managers' entrepreneurial behaviour (Kuratko et al. 2005).

Mantere (2008) argued that the strategic agency of middle managers is the basis for strategic renewal. He defined strategic agency as "individual's capacity to have a perceived effect upon the individual's own work on an issue the individual regards as beneficial to the interests of his or her organisation" (p. 298). Mantere took the four middle manager role expectations (championing alternatives, synthesising information, facilitating adaptability, and implementing deliberate strategy) by Floyd and Wooldridge (1992) as a starting point and presented enablers for these role expectations. He concluded that reciprocal action by top management is needed to fulfil these role expectations; for example, top management needs to be responsive to synthesized information provided by the middle manager so that this role expectation could be fulfilled (Mantere 2008). Moreover, he emphasized having a dialogical view on the strategy process and assigning of legitimacy by top managers to middle managers, to enable middle managers' strategic agency (Mantere 2008). Beckert (1999) defined strategic agency as "planned persuasion of ends (profit) based on a rational assessment of available means and strategic

conditions" (p. 778). He took the institutional perspective in his research and emphasised that to make strategic agency possible it is crucial to form expectations of others' behaviour in the organisation (Beckert 1999). Moreover, he maintained that institutions have both enabling and constraining qualities for strategic agency (Beckert 1999).

Researchers have found that middle managers do have an influence in the strategy process and, more importantly, that there is a relationship between middle manager involvement and firm performance (Floyd and Wooldridge 1994). Moreover, the effect on the organisational performance is likely to depend on the level of knowledge that the middle managers have (Floyd and Wooldridge 1997). Thus, the middle manager perspective is highly important because of its practical relevance and it has also been identified as one of the main areas in strategy process research (Hutzschenreuter and Kleindienst 2006).

THEORETICAL FOUNDATIONS FOR ANALYSING STRATEGIC AGENCY

We apply the concept of strategic agency (Floyd and Wooldridge 1992) to reflect on the evolution of strategic agency, and for analysing the enablers and constraints of strategic agency, of the head of the BI unit in the case organisation. According to the model, middle managers can take actions that have either upward or downward influence. Furthermore, strategic ideas can be divergent or integrative. Thus, four types of middle management involvement can be defined (adapted from Floyd and Wooldridge (1992)):

1.   Championing alternatives. Middle managers present persistently and persuasively strategic options to upper management. The direction of influence is thus upward. From the cognitive perspective the presented strategic ideas are divergent.

2.   Synthesizing information. Middle managers interpret and evaluate information to affect top management perceptions. The direction of the influence is upward and it is integrative from the cognitive perspective.

3.   Facilitating adaptability. Middle managers foster flexible organisational arrangements, even apart from the plans embedded in deliberate strategy. The direction of the influence is towards lower levels in the organisation, i.e. downward. From the cognitive perspective the influence and the promoted ideas or approaches are divergent.

4.   Implementing deliberate strategy. Middle managers work to align organisational action with strategic intentions of top management. The direction of the influence is downward and it is integrative from the cognitive perspective.

It should be noted that the four roles combine synergistically into patterns of involvement (Floyd and Wooldridge 1992). The model describes both the behavioural and cognitive aspects (Floyd and Wooldridge 1992) of middle managers' strategic influence. Hence, we see it as applicable for analysing the evolution of the strategic influence of the BI unit and its responsible middle manager in our study.

METHODOLOGY

Action research (AR) (Baskerville and Myers 2004; Lau 1999) was chosen as the main research approach in this study. AR was deemed by the researchers to be the most appropriate as it aims to solve current practical problems and, simultaneously, to expand scientific knowledge (Baskerville and Myers 2004). Although there are several ways to define and conduct AR, it is typically conducted through a set of action learning cycles (Bradbury and Reason 2003; Lau 1999). In this research we adopted the AR cycle by Susman and Evered (1978) that is widely used to report AR studies. The AR cycle includes five phases: diagnosing, action planning, action taking, evaluating, and reflecting (specifying learning). Most importantly, in any AR project, research is highly intertwined with practice through the in-situ work of practitioners themselves, who could be researchers themselves or working closely with the researchers. Therefore, AR is conducted through active participation, rather than observation. In the Discussion section of the paper, the AR intervention is reflected upon particularly from the perspective of the evolution of the strategic influence of the BI unit and the strategic agency of the head of the BI unit.

In this research project, the role of an AR researcher/practitioner was taken by one of the research team members, who has been actively following the development of the described AR interventions of the case company. This researcher has been working as retail BI-expert for over a decade and is widely networked within retail industry including the case company.

His main responsibilities have included the development of the enterprise-wide information management processes, with the main objective to improve business processes through more effective data analysis and use. In addition to his domain expertise, this team member has also undertaken domain-related further studies that have enabled him to reflect on his own organisational context and directly apply the acquired scientific

knowledge to his daily work. He has gradually assumed the role of the organizational BI champion (Howell and Higgins 1990), leading organisational activities towards his vision of the future state of the BI activities - the vision that was grounded in the current scientific knowledge of the latest practices in this discipline. In addition to his deep and detailed experiential knowledge, this member of the research team has through his network had access to the abundant documentation and memos on the transformation process and the related drivers, enablers, and challenges.

Two of the other three researchers have followed the case company's BI-initiatives since spring 2007. Although they have not been directly involved in the transformation process, they have had on-going discussions with the BI-experts, including formal interviews. The fourth researcher provided theoretical grounding for this research and support for data analysis, seeking to help the research team to better understand the transformational journey of the organisation in the context of the current development in BI and related fields, providing an independent perspective. All findings were further discussed and verified with the case organisation to ensure their accuracy and validity. The following sections describe the case organisation and the main cycles conducted in this AR research.

BUSINESS INTELLIGENCE IMPLEMENTATION

In this section, we describe the two cycles of the AR intervention conducted for transforming the organization into a BI-oriented one. Each AR cycle phase is described through four steps: diagnosing, action planning, action taking, evaluating, and reflecting (specifying learning), as suggested by Susman and Evered (1978). The case company is a European grocery retailer operating over 1000 stores. The store network consists of various store types, covering all segments from convenience stores to hypermarkets. The company follows value beyond price strategy aiming to offer best products and services for its customers. It also runs a wide customer loyalty program. The AR intervention was carried out between 2001 and 2010. The first cycle titled "From data to information and from Independence to Contradiction" lasted five years from 2001 to 2005. It was followed by the second AR cycle titled "Advanced BI – From Contradiction to Cooperation". It began immediately after the first cycle in 2005 and was finished in 2010.

AR Cycle 1 – From Data to Information and from Independence to Contradiction

Diagnosing. At the start of our research in 2001, the main task of the business development unit, here the BI unit, was to gather and analyse sales and market data to help the business units in their decision making by providing understanding on what customers buy. Almost all organizations in the retail value chain used the same external data entity on the retail market in the case country. This data was integrated with the internal data in the Cognos cubes by using Microsoft Access database and analysed using standard Microsoft Office tools such as Excel and Visual Basic. The technology was simple and easy to use. It required lots of "manual work" that, on the other hand, enabled agility. The models produced were quite advanced and widely used in business management. The information gained was rich, intelligent, holistic, and invaluable for decision making. The BI unit was part of the business domain and with practically no interdependencies with the IT organization. The BI-expert together with a process specialist, both BI-enthusiasts, developed the information management activities in a way that could be called as "end-user" development.

By 2003, the BI-expert together with the BI-oriented IT-specialist from the IT-department had realized the huge possibilities that the data available on customers and the business as a whole offered for business management. They started to plan new BI processes and explore new data mining technologies that they thought would raise information management to a new level. In the same year, the situation changed suddenly. First, the IT department had also become convinced about the need for high quality information for winning the market competition. Some SAP applications had already been implemented in the organization. Now the IT department decided to start a project for implementing SAP BW (Business Warehouse) application for information management to replace the "old-fashioned" Microsoft Office tools. Second, a traditional IT-policy was adopted in the organization. The BI unit's rights to access and enrich all the necessary data were limited, nor could they freely choose the tools they saw the most appropriate for their duties. Finally, the IT-specialist was promoted and left the collaboration, leaving the BI-expert alone to reach his vision of advanced BI-processes and management by information.

Action planning. In 2003, the IT department's official BI-project was on-going and the BI-expert was the BI unit's representative in the project. One way to promote BI emerged through the official BI-project. There was a service provider involved in the project who also often consulted the BI-experts in the BI unit unofficially. Acting as the third party in the official IT-project, he also helped to enhance BI thinking in the organization resulting into a better picture of opportunities of enhanced data and data mining technologies. The business managers were unsatisfied with the current situation. SAP BW development was slow, the tools and reports were complicated to use, and the benefits were felt to be only modest. Change resistance in the business lines

was significant and "they would not change if they don't have to". Hence, SAP BW was not widely accepted and the mangers used the Excel-based tools as long as they were available.

Action taking. In 2004 something had to be done to change the business processes more rapidly. The BI-expert studied in the university and reflected the theories on the processes and practices in the case organization. He managed to develop a "framework for BI" for the organization. He presented his ideas to top management to propagate the BI ideology. As the result, he got the full support of two vice-presidents in two business lines for starting a data mining pilot project in these lines independently from the IT department. A BI team, consisting of the representatives of the key business units and the BI unit, was formed and it reported directly to the two vice-presidents. SAP BW contained a data mining tool, and the BI-expert worked in close cooperation with the SAP data mining product manager until he left the project after one year's time. Soon after that, SAP quit active development of the data mining tool and the product manager left the company. The direct link to the experts of the solution provider was lost.

Hence, parallel to the IT-unit's SAP BW-initiative, an informal shadow organization, a community of practice was formed inside the organization. Its objective was to improve the state of BI and to realize the vision of advanced BI-processes and management by information. The BI-expert together with some business managers started to develop pilot BI-processes to improve certain business processes or streams with data mining tools as the key enabling technology. The new processes were often developed for one key person involved in or responsible for the business stream in question. These pioneers tested and piloted the new processes. Only then were they introduced to operational and middle managers to show their advantages and effectiveness. The pioneers often were young people coming from a university. They acted as "shakers" or change agents, who challenged the current processes and attempted to promote the change toward more efficient and effective BI-processes. The BI-expert acted as the organizational champion throughout this change. He first worked alone and then gradually was allowed to hire additional BI-specialists to the BI unit. The pilot processes were completely the responsibility of the BI unit in the business domain. The IT unit was not involved in the pilot development. Thus, within the limits of their resources, the developers were quite free to ideate, innovate, and create new models for BI and management by information together with business process representatives. Some BI-processes were also integrated with external stakeholders such as suppliers.

Evaluating. In 2005, the first BI-processes developed in the pilot initiative were later on implemented for wider use after the business managers had accepted the change. Yet, the contradiction between technology and information returned after the implementation. In IT, BI and especially data mining based actions were still perceived as a threat for stable IT operations. The needs and demands for BI operations were not a part of the standard IT operations. Nor was there any connection between strategy and information, the ultimate goal of BI.

Reflecting (specifying learning). Business process change was conducted through small victories, stream by stream, navigating the change resistance in the business lines and with the IT department, where BI demands were seen as a threat for the standardized IT development and production. The pilot was the responsibility of the BI unit in the business domain and out of the direct control of the IT-department. Yet, the shadow organization had to find ways to sell the BI-processes to the business managers and to work around the IT-rules and control to accomplish their vision. The BI unit, and especially the BI-expert, were struggling to propagate their BI-vision throughout the organization. The determination of the BI-expert and his vision resulted in the design of a BI-framework that turned out to be one of the key drivers for the business change, as it provided a common language for a dialog among a wider and wider community. Data mining technology was the key enabler of the new BI-processes. Top management support was necessary to start the pilot initiative and to get the vital personnel and technology resources. Yet, the social network both within and outside the organization was of utmost importance for the realization of the vision of advanced BI-processes and management by information. External expert networks helped to find the best technologies and practices as well as the latest knowledge on BI. The internal social network with the organizational champion, sponsors, and pioneers or change agents, in turn, was essential for developing the pilot BI-processes and sustaining the confidence in the vision despite the setbacks.

From the behavioural perspective, the strategic influence of the information unit and the BI-expert was downward, towards the business lines, and their approach with pilot BI-processes and the shadow organization divergent. Simultaneously, however, they tried to convince the top management of the benefits of BI and management by information, i.e. influence upwards in the organizational hierarchy, thus taking an integrative approach.

AR Cycle 2 – Advanced BI - From Contradiction to Cooperation

Diagnosing. In 2005, the organization was renewed and the two vice-presidents were not any more in the position to sponsor the pilot initiative. This change resulted in "a step backwards" as the IT department eventually took over the control of the implemented BI-processes and also tried to control the new streams under

development. Some pioneers became frustrated with the slow progress that resulted in the halt of the stream in question. Yet, the implemented BI-business processes were effective and significantly improved the decision making, leading to a demonstrable competitive advantage. Some of these streams were taken over by the IT-department and an official project for their implementation was established. This success increased the awareness of the BI unit and its expertise and, little by little, gave the unit a slightly increased degree of freedom to operate independently. At the same time, the amount of internal and external rich data continued to increase, along with organisational IT capacity for data analysis.

Action planning. The BI champion did not want to give up his vision now. Many business processes still needed to be transformed into BI-processes and the link between information and strategy was missing. The mind-set had to be changed from silo thinking to optimizing the whole throughout the organization. It became clear that understanding is the key to success when competing with quality and service, instead of price only. Information must have an impact on the whole organization and also on the business models. In addition to what customers did buy, the organization developed its ability to know what they did not buy. The benefits of the implemented BI-processes were evident, so they could be used as references and the business people involved as messengers in promoting the change. Yet, new sponsors among the top management and new partners among operational and middle managers in the business units were a necessary prerequisite for promoting the change. Eventually the original Excel and Visual Basic based tools went out of use and there was a time when all decisions based mostly on experience, not information.

Action taking. The BI champion continued to actively propagate BI-thinking. He gave presentations on BI, management by information, and the BI framework both internally and externally, participated in conferences, and was actively involved in BI-related social networks. Finally in 2007, he managed to convince the top management of the importance of management by information and of the strategic significance of information gained from rich data. Official contacts with the top management were established and the pilot again had sponsors. The BI champion also established close contacts with two members of the executive group who acted as his mentors. BI-processes for new business streams were continuously developed and implemented. Little by little, BI mind-set became an essential part of every operation and decision making. The contradiction between IT and BI vanished and now they support each other and work in close cooperation, striving towards the common goal of the organization being the number one in the retail market in all fields of its operation.

Evaluating. In 2010, after almost ten years of development, the BI environment reached a mature stage. The BI unit reached an established position at the highest level of the company hierarchy in the business domain. Thus, the BI unit now has direct official contacts with the top management and actively participates in the strategy processes. It is the biggest unit of its department and still growing. The BI-champion is now a director and a member of the executive group. The unit operates throughout all the business lines, independent from them or the IT-department. It acts as an internal consultant towards the business units and towards the IT-department in the fields of its expertise. Information experts have a licence to provoke and challenge as their ability to scan everything is generally known and acknowledged. The pilot organization is still used when necessary to develop and show how things could be if information were used more efficiently in management and it would be linked to strategy.

Reflecting (specifying learning). BI must be an essential and self-evident part of each and every business function. The whole organization from operational to strategic level must adopt the BI mind-set. When information is embedded in the business processes, there is no need for separate tools for the business people. The BI unit must be independent but close to both business and IT and high enough in the organizational hierarchy to have the authority needed to operate throughout the organization. The contradiction between BI and IT should be replaced by close cooperation and acknowledging the expertise of both parties. The role of BI and the BI unit must be strategic and the head of the BI unit should belong to the top management. The task of the unit and its personnel, especially its director, is to work in close collaboration with the top management and bring forth new divergent ideas for strategic renewal and transformation. Strategy and information must be intertwined to achieve the ultimate goal of BI, an analytics-based organisation.

DISCUSSION

Our interpretation of the evolution of the strategic influence of the BI unit and the strategic agency of the head of the BI unit is described through three phases presented in Table 1 and discussed below. The analysis and the evolutionary stages are based on the model of middle managers' strategic agency by Floyd and Wooldridge (1992). Moreover, we identify the enablers and constraints for strategic agency as well as the role of BI in each evolutionary phase. It should be noted that the agency types are not mutually exclusive and the purpose here is to describe, what the main type of the strategic influence was in each stage as we attempt to portray the evolution of the strategic agency. In addition, the stages should not be seen as clear-cut but rather as overlapping.

Phase 1: Facilitating Adaptability, Divergent Downward Influence (Moving from AR Cycle 1 to 2)

In this first phase, the members of the BI shadow community and the head of the BI unit were working with different business units to develop small scale process innovations and to demonstrate how things could be done more effectively with the help of BI. The role of BI was seen as a tool, but simultaneously the understanding of BI's innovative capabilities was becoming more widespread in the organisation. Thus, the strategic influence of the director of the BI unit was downward and divergent as he propagated the idea of BI's innovative capabilities in the lower levels in the organisation. The strategic agency was enabled by the work of the BI shadow organisation and by showing the efficiency gains generated by the use of BI. In this phase the strategic agency was constrained by the lack of support from the IT department, lack of top management support and inadequacy of the technological solutions.

Phase 2: Synthesizing Information, Integrative Upward Influence (AR Cycle 2)

In phase 2 BI became more widespread in the organisation and it was seen as a legitimate approach for process innovations. The strategic influence of the head of the BI unit changed into upward integrative influence while he communicated the idea of "management by information" and the capabilities of BI to top management. However, although their awareness was heightened, the support from top management was not consistent yet and this constrained the strategic agency. BI technology was, however, on a good level and this as well as the work of the boundary spanning enthusiasts of the BI shadow community were enablers for the agency.

Phase 3: Championing Alternatives, Divergent Upward Influence (AR Cycle 2)

In the final phase BI has unreserved top management support and the head of the BI unit presents strategic ideas and alternatives to top management. Thus, the type of the strategic agency is upward divergent. BI is seen as a strategic transformer since it provides capabilities for strategic renewal. Also, the support from the IT department is well established. Moreover, the BI unit has a legitimate and formal position in the organisational hierarchy which is an important enabler of strategic agency. Basically, the only constraint for the strategic agency in this final stage is the availability of resources for the BI unit.

Table 1. Evolution of the strategic influence of BI and the strategic agency of the head of the BI unit

Phase	Enablers for agency	Constraints for agency	Role of BI	Type of agency	Strategic Influence	Role of the head of BI unit
1	Shadow community explored new BI applications Realised efficiency gains in processes	Lack of IT support Lack of top management support	Tool	Facilitating adaptability	Divergent downward	Propagating small scale BI innovations
2	Mature technology BI enthusiasts as boundary spanners BI has legitimate status	Limited top management support	Innovation enabler	Synthesizing information	Integrative upward	Developing and communicating the BI framework
3	Top management support IT Support Formal position of the BI unit with company-wide influence	Resource constraints limiting further growth of the BI unit	Strategic transformer	Championing alternatives	Divergent upward	Actively participating in strategy design and implementation

Lessons Learnt

Our study demonstrates well the importance of middle managers for the strategic renewal of organisations. In the case organisation, top management developed an organisational vision of BI and proceeded to mandate it. However, the BI unit and its head implemented the vision in a totally different way because they were much more aware of the capabilities offered by this technology and therefore could envisage future opportunities. Refusing to settle for less, they gradually formed a shadow community of organisational "entrepreneurs" interested in innovative applications of BI. Their chosen method of influence was to start working with business managers showing how things could be done in a more effective way. The main targets of their innovations were organisation's core business processes and BI-enabled efficiency improvements. This created a basis for strategic renewal that later became legitimate in the organisation.

The importance of the reciprocal action by top management to fulfil the role expectations of strategic agency (Mantere 2008) was also clearly evident in our study. At the moment role expectations are clear and there is a reciprocal relationship between top management and the head of the BI unit. Furthermore, the BI unit has a formal position in the organisation that places it into a boundary spanning position in the organisational structure. This is an important enabler for strategic agency, as stated by Floyd and Wooldridge (1997). Moreover, as stated by Floyd and Wooldridge (1997), the most knowledgeable managers are likely to impact corporate strategic renewal. This was evident also in our case since the head of the BI unit put great emphasis on developing himself and acquiring new knowledge about BI.

All these findings become even more important for the organisations where more traditional approaches to business process improvement often go hand-in-hand with organisational restructuring, resulting in flattened organisations with the roles of middle-management being the first to disappear. Yet, given the right tools such as BI, they become very important agents of organisational innovation. At the same time, the same tools and their application become the key enablers of the upward strategic influence.

CONCLUSIONS

A mature analytics-based organisation facilitates the interaction between BI and organisational strategy, which can be considered an additional management capability (Bertram 2010). This capability could help organisations find those innovative solutions that make a difference in the market place and provide a competitive edge over the competitors. Our study also confirms previous findings by Watson (2008) about the critical importance of BI/business alignment, not only in the context of operational applications of BI but also in relation to the strategy-making process. Practitioners should find the role of the shadow BI-community interesting. Often these types of communities-of-practice may be found as "deviant" by the organisation. Yet, it is important to realise the creative power that these communities may have. Harnessing this creativity could be a key competitive advantage for modern organisations. The shadow type unofficial organisation has an important role for pushing the change, especially in the companies where the organisational culture does not fully support analytics-based management and change.

There are some limitations to the study that need to be mentioned. First, we analysed only a single case. However, the results are likely to be valid in similar situations. Second, in the present study, our perspective when analysing the evolution of the strategic influence of BI was that of the head of the BI unit. In the future, it would be interesting to take a wider perspective to study the effect that BI has potentially had on the organisational strategy making process on the whole. The innovative capability of the intra- and inter-organisational BI-community would be another interesting avenue for future research.

REFERENCES

Baskerville, R., and Myers, M.D. 2004. "Special Issue on Action Research in Information Systems: Making Is Research Relevant to Practice," *MIS Quarterly* (28:3), pp 329-335.

Battilana, J. 2006. "Agency and Institutions: The Enabling Role of Individuals' Social Position," *Organization* (13:5), September 1, 2006, pp 653-676.

Beckert, J. 1999. "Agency, Entrepreneurs, and Institutional Change. The Role of Strategic Choice and Institutionalized Practices in Organizations," *Organization Studies* (20:5), September 1, 1999, pp 777-799.

Bertram, I. 2010. ""the Next Stage" Managing Information Strategies," *MIS Australia*:05.2010).

Bradbury, H., and Reason, P. 2003. "Action Research an Opportunity for Revitalizing Research Purpose and Practices," *Qualitative Social Work* (2:2), pp 155-175.

Conway, M., and Vasseur, G. 2010. "The New Imperative for Business Schools," *TDWI's Best of BI 2009* (7), pp 37-39.

Eckerson, W. 2004. "Gauge Your Data Warehouse Maturity," *DM Review*:51), pp 34-37.

Floyd, S.W., and Wooldridge, B. 1992. "Middle Management Involvement in Strategy and Its Association with Strategic Type: A Research Note," *Strategic Management Journal* (13:S1), pp 153-167.

Floyd, S.W., and Wooldridge, B. 1994. "Dinosaurs or Dynamos? Recognizing Middle Management's Strategic Role," *Academy of Management Executive* (8:4), pp 47-57.

Floyd, S.W., and Wooldridge, B. 1997. "Middle Management's Strategic Influence and Organizational Performance," *Journal of Management Studies* (34:3), pp 465-485.

Gartner. 2009. "Business Intelligence Ranked Top Technology Priority by Cios for Fourth Year in a Row." from http://www.gartner.com/it/page. jsp?id=888412

Gonzales, M. 2009. "Success Factors for Business Intelligence and Data Warehousing Maturity and Competitive Advantage," *Business Intelligence Journal* (2:1), pp 22-29.

Hawking, P., and Sellitto, C. 2010. "Business Intelligence (BI) Success Factors," *ACIS 21*, Brisbane: AIS.

Howell, J.M., and Higgins, C.A. 1990. "Champions of Technological Innovation," *Administrative Science Quarterly* (35:2), pp 317-341.

Hutzschenreuter, T., and Kleindienst, I. 2006. "Strategy-Process Research: What Have We Learned and What Is Still to Be Explored," *Journal of Management* (32:5), October 1, 2006, pp 673-720.

Imhoff, C. 2006. "Operational Business Intelligence," in: *Teradata Magazine*. pp. 16-18.

Kuratko, D.F., Ireland, R.D., Covin, J.G., and Hornsby, J.S. 2005. "A Model of Middle-Level Managers' Entrepreneurial Behavior," *Entrepreneurship Theory and Practice* (29:6), pp 699-716.

Lau, F. 1999. "Toward a Framework for Action Research in Information Systems Studies," *Information Technology & People* (12:2), pp 148-175.

LaValle, S., Lesser, E., Shockley, R., Hopkins, M., S., and Kruschwitz, N. 2011. "Special Report: Analytics and New Path to Value," *MIT Sloan Management Review*:Winter 2011), pp 22-32.

Luftman, J., and Ben-Zvi, T. 2010. "Key Issues for It Executives 2009: Difficult Economy's Impact on It," *MISQ Executive* (10:1), pp 49-59.

Lyon, D.W., Lumpkin, G.T., and Dess, G.G. 2000. "Enhancing Entrepreneurial Orientation Research: Operationalizing and Measuring a Key Strategic Decision Making Process," *Journal of Management* (26:5), October 1, 2000, pp 1055-1085.

Mantere, S. 2008. "Role Expectations and Middle Manager Strategic Agency," *Journal of Management Studies* (45:2), pp 294-316.

Marjanovic, O. 2010. "Business Value Creation through Business Process Management and Operational Business Intelligence Integration", *Hawaii International Conference on System Sciences HICSS-43*, Koloa, Kauai, Hawaii, United States: IEEE.

McNurlin, B.C., and Sprague, R.H.J. 2009. *Information Systems Management in Practice*, (8 ed.). Upper Saddle River, New Jersey Pearson Education, Inc.

Rouibah, K., and Ould-ali, S. 2002. "Puzzle: A Concept and Prototype for Linking Business Intelligence to Business Strategy," *The Journal of Strategic Information Systems* (11:2), pp 133-152.

Susman, G.I., and Evered, R.D. 1978. "An Assessment of the Scientific Merits of Action Research," *Administrative Science Quarterly* (23:4), pp 582-603.

Watson, H.J. 2008. "Why Some Firms' Bi Efforts Lag," *Business Intelligence Journal*:Summer 2008), pp 4-7.

Watson, H.J. 2009a. "Bridging the It/Business Culture Chasm," *Business Intelligence Journal*:March 2009), pp 4-7.

Watson, H.J. 2009b. "Tutorial: Business Intelligence – Past, Present, and Future," *Communications of the Association for Information Systems* (25:39).

Watson, H.J., and Wixom, B.H. 2007. "Enterprise Agility and Mature Bi Capabilities," *Business Intelligence Journal*:Summer 2007), pp 4-6.

Wixom, B., and Watson, H. 2010. "The Bi-Based Organisation," *International Journal of Business Intelligence Research* (1:1), pp 13-28.

Wixom, B.H., and Watson, H.J. 2001. "An Empirical Investigation of the Factors Affecting Data Warehousing Success," *MIS Quarterly* (25:1), pp 17-41.

Yeoh, W., and Kornis, A. 2010. "Critical Success Factors for Business Intelligence Systems," *Journal of Computer Information Systems* (50:3), pp 23-32.

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