AN EXAMINATION OF THE POST-IMPLEMENTATION ROLE OF COMPETENCY CENTER IN ERP AND BI: INTERNATIONAL / CROSS CULTURAL INVESTIGATION

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Abstract: This study in progress paper describes a research program studying the role of ERP and BI competency centers (CC) in a range of firms from six countries in Europe, North America and Austral-Asia. The goal of this research is to understand the relative contribution of CC in improving IS and business unit performance and to map structures and models of extant successful competency centers worldwide. We deploy a mixed-method design combining qualitative and quantitative approaches appropriate to descriptive and exploratory research.

Keywords: ERP and BI competency centers, post-implementation, International program research
Introduction and problem statement

ERP systems\(^1\) are expected to reduce costs by improving efficiency through computerization and enhance decision-making by providing accurate and timely enterprise-wide information (Gattiker, Goodhue, 2005). It is not feasible to make strategic business decisions based on data analysis directly from within the typical ERP implementation because the sheer volume of data and computational requirements for its analysis running a business intelligence (BI) analytical tool on the same system would slow down the ERP and hamper the day-to-day work. So a layer of BI tools needs to be implemented in the post ERP implementation stage to be able to process the volumes of data captured by the ERP. Yet, when many organizations begin the implementation of ERP systems they do not expect to have to invest in future BI solutions to leverage their ERP investments (Elbashir et al., 2008; Gibson et al., 2004). So, while designing the ERP implementation project, this is generally overlooked.

To reap benefits from the ERP and BI systems once the implementation consultants leave the project site knowledge transfer from consultants to users/sponsors is important. During the implementation IT and problem domain competences reside, in the form of work-related knowledge, skills, and abilities, in the network of the collective team members (Nordhaug, Gronhaug 1994). Hence, to be better equipped to support the system, organizational and IT capability should be tapped by integrating the individually held competencies of diverse teams and team members (Grant 1996). The Competency Center (CC) is a means by which company’s can capture this organizationally distributed knowledge. The CC plays a crucial role in stabilizing the organization and consolidating informational integration capacities associated with successful ERP and BI project implementation. The CC serves as a learning and communications center allowing the sharing and redeployment of knowledge and skills transfer thus facilitating the ERP and BI appropriation by business units and user communities – a necessary condition for organizational stability (Azan, Beldi ; 2009). The proximity with users thus helps avoid critical post-implementation consequences. The CC becomes a site for in-house deliberation and a legitimizing tool such that the new enterprise system is more readily accepted. For the purposes of this research when we refer to CC hereafter we are specifically referencing the competency centers associated with the ERP and BI applications development and management within the firm.

The convergence of ERP and BI systems is considered crucial so BI is frequently tightly coupled with the ERP systems (Elbashir et al., 2008; Zhao and Zhang; 2008) But even once ERP and BI systems have been implemented, unless proper organizational governance and technical support structures are in place, firms may only see limited benefits from these systems. Such governance structures are a key factor to success but the CC as part of the governance structure is less apparent and is underestimated by many firms (Arnold, 2006; Nicolaou, 2004; Meyssonnier, Pourtier, 2004; Erikse n et al., 1999). In our literature, with a few exceptions, the role played by the CC in integrating ERP systems has been largely ignored (Pellegrin-Boucher, Gueguen, 2005). This research program is motivated by the significant gap in research studying the post-implementation phase of large complex ERP and BI implementations. Research questions include: How do CCs contribute to longer-term acceptance and stability? How do ERP, BI and CC, in interaction with the firm’s core activities, contribute to the development of collective intelligence? How and to what extent does the operational performance of departments using ERP modules and/or decision platforms improve when a CC type structure is successfully adopted? These issues, all exploring the role of ERP and BI CC in the improvement of the organizational context and their indirect impact on firm performance, will be addressed in extended field studies in firms domiciled in six countries on three continents. The project, now in its organizational and planning stages, is expected to be launched in the second quarter of 2011.

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\(^1\) In this paper we have defined ERP systems to be commercial software systems that automate and integrate most of a company’s business processes making integrated data accessible to the entire enterprise (Gattiker, Goodhue 2005). BI has evolved different styles during the past decade: enterprise reporting, cube analysis, ad hoc query and analysis, statistical analysis and data mining, alerting and report delivery.
1- ERP, BI and Competency Centers and the improvement of IS business unit performances

Where ERP offers enterprise-wide data consistency and systemic integration, BI describes a set of concepts and methods to support and improve managerial decision making by using fact-based support systems use-able by all levels of management (Olszak, &Ziemba, 2003).

ERP and BI systems are not expected to produce identical benefits, from implementation to implementation because post-implementation situations vary widely from one firm to another. On the one hand, some firms manage to stabilize their operational procedures and operations and come to organizational terms without significant problems. Other firms, despite the grandiose objectives, struggle – having gotten trapped in a transformation stage and are not able to reach the desired levels of performance. The expected benefits are not always realized thus weakening and destabilizing the firm – at least in the short-run (Truex, 2001). Studies report a drop in performances and productivity during the first few months of use (Shang, Seddon, 2007; Davenport et al., 2004) illustrating the difficult task of sustaining the cross-functional processes integrated in ERP systems.

When the dust settles in successful implementations, studies suggest that BI applications contribute to improving quality of decision-making in running promotional campaigns, anticipating sales and customer behaviors, creating loyalty policies and investigating anomalies and frauds (Olszak, Ziemba, 2006; Nicolaou, Bhattacharya, 2008; Romero et al., 2005).

In the early 1990s, most firms lacked resources and expertise in-house to implement and/or configure ERP solutions. As a response to the complexity and challenges encountered during ERP implementation, large firms evolved in-house support structures called a “Competency Center” (Granebring, Revay, 2005; Eriksen et al., 1999). This new structure, made up of the firm’s own technical and functional/business experts, is closely tied to the management of the ERP life cycle. The primary objective of the CC organization is to ensure that ES are successfully integrated into the firm and guaranteeing smooth running and follow-up over time (configuration, maintenance, upgrading, data migration, etc.). A feature of this evolution has been increased focus on BI and their integration with ERP and other ES (Zhao, Zhang; 2008). Another core value the CC brings is the continuous adaptation of ERP and BI systems to changes in their organization (Rikhardsson, Kræmmergaard, 2006) thus assuring that the evolution of business systems matches the evolution of the firm. Nicolaou and Bhattacharya (2008) have shown that firms who has been attentive to and kept abreast of organizational and systems changes early in the post-implementation stage recorded higher performance differentials than firms that had delayed the continuous improvement of the ERP and BI systems portfolio.

Centralizing a firm’s know-how around a dual professional and technical expertise forms a pool of technical and functional skills. It thus fosters the collective capitalization of knowledge and global expertise around ERP, making it possible to extract best practices and reusable know-how there from. In this case, the CC plays a key role in keeping experts in a firm and in increasing their functional and technical skills – which significantly reduces the need of external consultants. We also know that, in an ERP environment, management of IS integration is strategic for guaranteeing a stable organization. Developments may result from a professional request, regulatory changes or technological progress. To support these developments alongside transformations in the firm, the CC in this regard acts as an advisor to the core departments and particularly decides on the different requests for specific developments that could considerably hamper assimilation of the ERP by users. It thus becomes the main contact point for the different partners of IS projects. The CC is able to ensure that the changes take place smoothly, thereby reducing friction and resistance within the organization. In the long-term, the ability to make use of both functional and technical skills for analysis and implementation develops a stabilizing “memory” effect for the organization.

The positioning and organization of the CC are decisive as to its ability to energize the IS and ensure its consistency. The ERP and BI CC organization highly depends on corporate culture. In practice, firms have implemented different organizational configuration for managing CC (Meyssonnier, Pourtier, 2004). Dedicated CC is often the prerogative of large firms, due to the explicit high cost of setting them up. SMEs do not have
such structure in the strict sense of the term. They rely either on key users who have participated in the project or on the skills of an IT consultancy firm, generally the one that was tasked with implementing the ERP. Based on a study of 23 firms having set up a structured CC, Sarfati (2004) shows that half (50%) of those having adopted SAP had a centralized CC attached to the CIO. In the other half, we note a structure where responsibility is split between the CIO and core business (37%), whereas in only 13% are the CC attached exclusively to core business.

2- ERP and BI Competency Centers and the improvement of a firm’s decisional IS

Having implemented ERP, companies often find BI Projects to be the next logical step in using the data captured in the ERP (Zhao and Zhang; 2008; Brignall, Ballantine, 2004; Rikhardsson et al., 2005). In identifying CIO priorities, the Gartner Group (2008) found BI as essential in linking the managerial decision-making capacities between internal (business units) and external (clients/business partners) needs. Even so, in general BI investments have been sporadic and uncoordinated in most firms – often in a dispersed fashion across the different departments. Historically it has been finance departments which implemented and used BI applications for reporting and consolidation operations. Other departments – sales, marketing, purchasing, and logistics – follow later in recognizing the need for BI applications. System usage is changing as well, by focusing more and more on the analysis of cross-functional process performance as well as intra unit performance. Unfortunately, as currently implemented, many BI systems are limited to intra unit performance. But, when properly configured and implemented, cross-functional platforms BI can provide tools for measuring cross-organizational performance. This appears to be the next stage of BI market development (Gartner, 2008).

Achieving collective intelligence and bringing a cross-functional process management systems to fruition requires organizational, managerial and information systems changes. The CC is one of the solutions to achieving these cross-functional goals. Until recently, firms have constructed their decisional IS through investments in several tools obtained from several suppliers: multidimensional databases, ad-hoc analytical tools, data integration tools, software packages for budget drafting and planning, and so on. There has been a poor match between the firm’s needs and what the market have been able to provide in terms of wholly integrative cross-functional tool suites. Most solutions have been kludgey--stitching applications together with middle-ware. Rationalizing and using those investments intelligently and creatively requires collective meaning construction of both the data and the processes. CC’s can provide the cross functional structure - the forum and decision-making tools - to enable such organizational sense-making and greater organizational stability.

3- Research Design

This paper describes the initial stages of a large international field research project seeking to better understand the evolution and maturity of particular ES - ERP, BI and CC structures. The research is slated to study both technical and organizational issues. Based on the enterprise architecture maturity stages model (Ross et al., 2006) that we adapt herein, we position CC in the middle of the four stages. The transition from one stage to the next is difficult, time consuming and requires organizational as well as a technical change. Our proposition is that in adopting CC structures, firms can better make a move from a stage one focus through standardized technology, via the adoption of enterprise integration technologies and process standards to the optimized core stage.

2 Based on a survey of 1,400 CEOs, the Gartner Group projected BI revenue to reach $3 billion in 2009 (Gartner 2006). According to an IBM Global CIO study, the collective voice of more than 2,500 chief information officers (CIOs) worldwide points to business intelligence and analytics as the top visionary plan for enhancing their enterprises' competitiveness (IBM 2009).
The general focus of this research program will be the relative contribution of CC in improving IS and business unit performance. Our objective is to discover, describe and understand the role of the CC as a technical and organizational support system in resolving operating anomalies detected in the ERP post-project stage and stabilization of the organization. CC is part of a continuous improvement approach and provides solutions for improving the level of use and operation of a firm’s IS. The primary focus in this research program is to enhance our understanding of the CC structure. The common themes driving our research propositions and questions are as follows:

- Are competency centers relevant to ES integration and adopted by firms? Does firm size matter?
- By what processes do CC’s get formed? At which stage of ERP / BI implementation do they form? What are the skill sets required in team members? What are the primary activities of this structure?
- Which firm organization units and personnel are critical in leading CC formation? Are they part of CIO or of Business Units? Who ‘owns’ the CC? Who is responsible for running the day to day operations? How are they funded?
- What are the CC governance structures? Are they typical CC structures or do they vary by organization and cultural type?
- Is it better to have CCs that have relatively stable staffing, or are virtual teams including employees in several business units and IT organizations the preferred structure?
- Does the existence of a dual professional and technical competency structure help in reducing IS governance and management deficit?
- Does the adoption of CC eventually transform IS governance and management?
- How does CC strategy help to advance and promote the effective use of ERP and BI within the organization?
- How do CCs act to resolve integration problems (both technical and business issues) across business units and work around constraints?
- Does the existence of CC Increase user satisfaction?

We intend to identify different skills and competencies (technical and functional business knowledge) within the CC structure. We also clarify the nature and the role of actions and interventions taken to manage misalignment between technology projects and business needs.
The second focus of this research program is the evaluation of the contribution that CC makes to a firm’s improvement performance. We intend to understand how firms and management see and measure the CC’s contribution to the improvement of business unit and of firm performance respectively. This requires learning how senior management evaluation CC performance in line with the company’s strategic objectives. The common themes driving our research propositions and questions are as follows:

- Do CCs provide linking mechanisms between the IT function and business units? Do they contribute to increased levels of organizational stability?
- Do CCs enable better business insight and collaboration? How do CCs add value to business units?
- Does the operational performance of business units improve with the creation of a CC?
- Is the CC essential to an Enterprise's BI strategy?
- What are the different types of decisions made within the CC? Are there any conflicts between CC and business? What is the nature of the conflict?
- How do ERP and BI CC, in interaction with the firm’s core activities and contribute to the development of collective intelligence?

4- Planned research approach, venues and schedule

The comparative multi-national dimension of this program arises from the both the composition of the principle investigators and research team members and the fact that firms in six countries will be participating in the investigation. Firms are being drawn from the retailing, transportation, manufacturing and service sectors. The diversity of sample and national setting will allow the opportunity to test the ERP-BI integration approaches proposed in the literature with those being used in practice. The descriptive component of the research will be in the form of rich case descriptions and interview data with managers and members of CCs where extant. We expect to develop a taxonomy of these models form the data and to compare that against the typologies as given in the literature.

The academic research partners are working in France, United States, Ireland, Sweden, Austria, and Morocco. The complex nature of the phenomena and the importance of organization contextual factors suggest that we deploy a mixed-method design combining qualitative and quantitative approaches (Gable, 1994). Our inductive methodological positioning is appropriate to descriptive and discovery research.

This research design will use a convenience sampling made up of only firms having both deployed ERP and BI applications, either inside or outside the ERP, but who may, or may not, have adopted CCs. Ideally we will examine 15 firms per cell. Data collection will involve on-site observation, structured and semi-structured interviews and document collection plus traditional survey distribution in use communities. We will conduct semi-structured interviews (60 or more interviews) based on an interview template developed beforehand by the working team and pretested in a Delphi experiment in several settings. These interviews will be held with stakeholders involved in managing ERP and BI CC as well as users holding different levels of responsibility and roles within the firm. The interviews will be conducted by senior members of the research team who will be assisted by a doctoral student working in the ERP and BI field. Data analysis will be both qualitative and quantitative. The qualitative data analysis will include: protocol analysis, mnemonic coding, latent semantic analysis and content analysis. From the field studies and data analysis will generate multiple in-depth cases from firms selected on the basis of three criteria: 1) Firm size - we seek a range of firm sizes; 2) IS integration scope - we seek ERP system implementation with at least 4 modules from the same vendor (SAP, Oracle, etc.), installed and effectively used for 3 years, and; 3) Business Intelligence decisional applications integrated within and/or outside of the ERP scope. These applications should have been implemented and effectively used by the departments for 12 months.

Conclusion

The relatively limited number of research projects on CCs shows that the implications of this new structure are inadequately studied. This international research program is dedicated to giving a first perspective on the
existence and effectiveness of CCs. The comparison of firms in multiple international settings should enhance understanding, provide a test of extant typologies and normative models of ERU and ES adoption and facilitate the transfer of knowledge from one context to another. To make a contribution, we have assembled a formal organization between the academic research partners and have sought and received initial planning funding in order to begin the project in first quarter of 2011. Progress meetings will be organized for team members to take stock of the data obtained thus far. The next challenges will concern the operationalization of the research design.

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