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Abstract
The key challenge for an organisation implementing and using an ERP system is to understand and enact new business processes inscribed in ERP; and thus, undergo a profound organisational change. As continuation of a previous study, this paper provides a summary of the results of the previous study as a background, followed by details of a proposed research methodology for a longitudinal case study. Results from the previous study have shown frustration and struggle of the staff and management of the case study organisation about the implementation of the SAP on the go-live day. The focus of the current study is to provide detailed description of a proposed research methodology that facilitates further understanding of the ERP post-implementation phase using the organisational learning, enactment and the Community of Practice as the theoretical lens for a future empirical research.

Keywords: ERP post-implementation, IS enactment, Organisational Learning, Enterprise Systems

1 Introduction

Researchers and managers who are keen to justify return on IS investment should be focusing on technology-in-practice (use) rather on technology. The reason is that technology per se cannot affect workers' productivity but its use can (Orilkowski, 2000). On the other hand, many scholars have noticed that formal teaching programs for increasing organisational learning might be resisted because the actual improvement is through learning that is disconnected to the formal training efforts; and knowledge barriers are overcome through learning that emerges from the social context of the work (Robey et al., 2000). Adopters of the IT prefer to learn from trusted colleagues who understand the relevant details of the work as practiced. This type of learning is situated in practice rather than conveyed through formal means. Wenger (1998) used the term 'situated learning' to describe the view that 'learning is an integral and inseparable aspect of social practice'. Situated learning may provide benefits to the organisation that are unattainable through other means. The relevant network of participants who share the same enterprise—that is, a 'community of practice'—may be effective in overcoming barriers to learning a particular application of IT (Brown and Duguid 1991; Lave 1991; Lave 1993; Lave and Wenger 1991; Marabelli et al. 2013; Robey et al. 2000; Robey et al. 2002).

In the previous phase of the study (Chadhar and Daneshgar 2016) , several interviews were held with company's top and middle management, as well as with general staff in order to evaluate the above argument. Results of those interviews revealed that staff struggled to comprehend SAP systems and its embedded business processes. Furthermore, the analysis showed that the training provided by the technology provider (SAP) was inadequate and irrelevant to the actual work practices. As a result, staff struggled to accomplish their daily tasks that in turn, made them feel insecure and isolated. This situation led different staff, known as 'champions', to take an initiative to address their colleagues' concerns about the SAP and its embedded business processes. The current study uses Argyris and Schön's (1978) theory of organisational learning modified by (Snell and Chak 1998) infused with analysis of Community of Practices (CoPs) (Lave and Wenger 1991; Wenger 2000; Wenger et al. 2002) as its theoretical lens. Based in this perspective, the current study argues that the emergence and institutionalisation of CoPs are the key mechanisms that can enable and instigate SAP enactment as single- and double-loop learning processes. Grounded in the empirical findings of phase 1, a new model of an emerging process of ERP enactment is developed for future examination. This model posits a relation between gradual SAP-enabled organisation performance, and ongoing practice-based 'learning by doing' in an emerging CoP mutually intertwined with single- and double-loop organisational learning.

2 Literature Review

In this Section, we discuss IS enactment perspective along with various organisational learning approaches adopted for ERP implementation in general, and Situated Learning, in particular. These reviews constitute foundation for synthesizing the theoretical model of the current study.

2.1 Information Systems Enactment

The enactment perspective focuses on how people use a technology. This perspective studies the evolution of work practices rather than cognitions or norms. Researchers argue that social construction emerges during the course of people's encounters with a technology as they use it in the conduct of their everyday work. The three major attributes of the enactment process are: (i) the role of developer and consultant, (ii) emergent structure, and (iii) practice perceptive. According to enactment process, developers and consultants can have some influence on social order enacted as a result of people usage of technology (Leonardi and Barley 2010; Orlikowski 2000). In addition, this process considers that the structures are not static but emerge over time, and can change as people enact with the technology. As such, structures are not given but rather emerge over time as forms of use and social relations sediment into place and become institutionalized. Finally, this process targets "practice" view, which explains how people actually use the technology.

One form of enactment is characterised in terms of applications. It represents a situation where users tend to use technology to refine their existing practices. A study by Orilkowski (2000) found that applications involve user drawing on existence institutional, interpretive and technology conditions

with the passage of time and their reproduction in advanced or improved form. Next, users alter their existing practices that leads to status-quo transformation and substantial changes in technology artefact. Furthermore, at this stage subject matter experts tend to experiment and explore new ways using technology in practice.

2.2 Enterprise Resource Planning, Organisational learning, and Situated Learning

ERP researchers have suggested that success or failure of an ERP implementation is rarely tied to the features of the ERP system itself, but rather is often associated with the job or processes of re-engineering that typically accompany such systems (Davenport 2000; Morris and Venkatesh 2010; Peppard and Ward 2005). Organisational learning is considered one such mechanism that can help in advancing the understanding of ERP implementation and use, and thus lead to achieving the anticipated benefits.

Boudreau and Robey et al. (2002) recommended to have research directed towards user's action in post-implementation phase of the ERP system with the objective of comprehending the process of learning that follows systems learning. However, more recent ERP literature reviews (Botta-Genoulaz 2005; Esteves and Bohorquez 2007; Esteves and Pastor 2001; Grabski et al. 2011; Jacobs and Bendoly 2003; Moon 2007) have indicated that the majority of ERP research focus on ERP selection, success factors, and the economic effects of the implementation, but seldom on understanding the learning processes involved in ERP implementation. This identifies a definite research gap and a rationale for investigating ERP use and learning in the current study.

Other studies suggested that organisational learning could support the achievement of benefits. These studies not only acknowledged the importance of organisational learning for ERP implementation but also emphasised the importance of future research to explore how organisational learning and ERP implementation co-emerge. Although these studies contributed towards the literature in organisational learning, they did not provide any detailed explanation on what inhibits and triggers organisational learning emerging during ERP implementation. Wang and Ramiller (2009) attempted to explain this process of organisational learning emergence; however, they did not study the actual users of the system but rather used trade journals as their primary source of the data. Although the writers of the above trade journals can shed some light on the process, they do not represent the views of the participants in this phenomenon, which are necessary to comprehend the organisational learning process fully. Moreover, studies in these trade journal provided some insight into the co-evolving organisational learning and CoPs; however, they did not explain this process in detail. Therefore, it becomes evident that the area of organisational learning is under-researched, and studies in real-life contexts with theoretical foundations are required to fill the gaps in the literature; hence the current research undertaking.

Pentland (1995) suggested: "Moving beyond the anthropomorphic metaphor of organisations as individual cognisors, and start to comprehend the social and situated character of learning ....". Thus, users of IT are likely to learn about new technologies through learning that is situated in practice rather than learning from formal training programs.

Brown and Duguid (1991) on the other hand, argued that in order to enhance working, learning, and innovating, an organisation must transform itself into communities of practice (CoP). To this end, the organisation has to acknowledge and appreciate CoP and start to view the learning process beyond the traditional 'canonical abstraction of the practice' to the comprehensive and detailed oriented based on both formal and informal paradox. The importance of CoP stems from the realisation that knowledge is not disjointed from its context (Pan and Leidner 2003).

3 Background of Study: Phase 1

This section provides a description of the case study organisation as well as a summary of the results obtained from the previous phase of the current study that are expected to lead to the identification of the problems and challenges the staff in the case study organisation had faced initially. Section 3.1

introduces the case study organisation and Section 3.2 demonstrates evolution of learning in the case study organisation in the previous phase (called Phase 1). The current study is a preliminary investigation before embarking on the future empirical research as the final phase. By relying on the results obtained in Phase 1, the current study also provides a research methodology for understanding how the staff in Bravo managed to overcome problems and challenges they faced in phase 1. The authors' plan for such future study is to rely on theoretical foundations of *IS enactment* and *Organisational Learning* to demonstrate the evolutionary path that the staff in Bravo went through to overcome their problems and issues with the new ERP during the Phase 1. Details of this proposed research methodology is shown in Section 4.

3.1 Case Study Organisation

The main selection criteria for the case organisation was that the latter had to have a successful case of SAP implementation coupled with actors who contributed towards this success. Bravo Australia was selected for the current study, which is a large IT company in Australia. Moreover, Bravo was selected because of its IT strategy and innovative use of SAP to undertake transformation of its business processes. It was noted that the top management claimed to have a successful implementation in terms of completing the SAP project within the scheduled time; however, the inside story from middle management and operational users was different. This provided the rationale for investigating the SAP project in detail by exploring the related issues and strategies adopted.

Combining various business processes into a single version of the reality is never easy—but for Bravo Australia, it was simply impossible. The project was built around SAP ERP 6.0 and guided by SAP best practices as well as Bravo internal project management expertise and capabilities. There were almost five different systems running at the same time after the merger of the three organisations. There were many issues with the legacy systems, which provided the rationale to implement new SAP systems. For example:

- Past business mergers, as explained before, had led to overlap in many business processes, which caused data duplication.
- Lack of system continuity was hindering running competency and leading duplication of effort.
- There was an emerging need to consolidate business processes around a single and efficient ES environment.
- An expandable platform for implementing additional functionality in the future was required.

Following the appointment of a new CEO, Bravo Australia began a transformational review of its business and technology infrastructure that would lead to the integration of these different systems within one system. Standardising the business operations on one of the existing platforms was initially discussed, but holding onto those legacy systems would perpetuate previous, insufficient processes. 'SAP, which offered a full variety of enterprise applications supported by best practices to lead implementation, quickly became the favoured platform', explained the project manager. Bravo's consulting partnership with SAP was another reason to choose SAP for in-house implementation. Moreover, Bravo's internal expertise due to SAP's years of experience, encapsulated within a formal best practice offering, was a major factor in Bravo's eventual decision. Following were the key emphases of the implementation:

- Implementation was to be completed in nine months.
- Rollout was supported with online training.
- Special governance structure was introduced to buy in 3,000 users.

3.2 Summary of Results of Phase 1: Struggling with SAP

Phase 1 has already completed and the current study constitutes the second phase of the study. Phase 1 started on the go-live day and lasted over five months. Results from this phase represent the staff's

initial struggle to comprehend and use SAP and its embedded business processes. This phase explains the dialectics of struggle, which were technical-, business processes-, and training-oriented. Finally, this phase highlights a disagreement between staff and top management about the relevance and adequacy of the training. Below is a summary of the results obtained from this phase. For further details about this phase refer to (Chadhar and Daneshgar 2016).

Bravo staff initial struggle with SAP started with the day live, as many staff were unable to log on to the new SAP. Staff had anticipated completing their old routine tasks using SAP and, to do so, they were required to have an understanding of the system functionalities as well as its business processes. However, staff realised they had neither of these two prerequisites, as they said:

> *I used to use the old system very well too and I knew it back to front or as well as I could learn it. I could do it with my eyes closed after a while. Then all of a sudden, you are faced with a new system; not only have you to learn how that system works but also the processes. (Interview: business service officer 1)*

> *We had too many people running around trying to set up projects and didn't have a clue what they were doing but doing the completely wrong thing. It was a complete nightmare. (Interview: business service officer 2)*

Bravo staff failed to comprehend how an out-of-box system could match their requirements. 'Why do we need SAP?' was a common argument of the staff, and some of the SAP requirements, such as 'accounting knowledge', 'cross-functional knowledge', 'integrated process' and 'inflexible processes', strengthened their arguments:

In the old system, there was no link between [the] three processes: the sales document, the actual invoice of the customer, then any invoice from contractor for the outside company. There was no link between those three pieces of the information in the old system (Interview: business analyst). In SAP somehow, any user, in the way we implemented it, must have a minimum accounting knowledge to be able to use it properly. (Interview: business service officer 1)

Staff's lack of understanding of SAP terminologies, functionalities and embedded business processes had various consequences in the form of resistance and job security. First, a business analyst noted that staff lost confidence in SAP and had the impression that it would soon be considered a failure and they would resume working with legacy systems. According to the project manager, the concerns added to the staff worries, and gave the impression that the new system would not be successful; as a result, they were not keen to learn the new system and kept on using the old methods to complete their routine works. He further elaborated that staff were used to the legacy system and the SAP required them to adopt new procedures and learn new systems.

Such resistance was also evident from staff usage of applications or tools such as MS-Access and Excel other than SAP to accomplish their routine activities. This resistance and the lack of comprehension of the SAP and its embedded business processes had a negative effect on job performance. It was evident from the frequent failure to input correct and complete data, which resulted in invoice duplication and invalid data entries.

Consequently, staff lost confidence and started to feel insecure about their jobs because of their inability to perform tasks as per expectations with the SAP. These are normally anticipated with any IS implementation and, the Bravo project team provided on-the-job training for smooth transition of the smooth transition. It was designed and delivered by external trainers who had over 10 years of experience with SAP implementation. They worked closely with the processes' owners to design the training content, and it is important to reiterate that the staff were not involved in the training nor in needs analysis processes. The training was delivered three to four months before going live with SAP. At the same time, the customisation of SAP was also in progress. As a result, staff ended up using a different version of the system than the one on which they were trained. In addition, some of the staff found the training 'simple', 'too early' and 'irrelevant' to their routine tasks:

> *We did have a very simple training session in September before we went live. It was too early and everyone forgot as soon as they left. (Interview: business support officer 1)*

> *We did not understand the connection between the training that we were given and the actual usage of the SAP as it was irrelevant and too simple. (Interview: senior system analyst)*

> *Sometimes you tend to think that it would have better if they had given us training a lot closer when the system [SAP] went live'. (Interview: business officer PSG)*

Along with these reservations about training, some of the staff were not happy with the trainers' knowledge and expertise. For instance, a business analyst found the trainers' SAP knowledge sound; however, she was not convinced about their expertise on Bravo's business operations. She elaborated her claim by saying that the trainers were able to answer SAP-related queries but could not answer questions about Bravo's business operations. To rectify the issue of users' lack of understanding and usage of the new system, formal workshops were arranged for the staff, but staff still believed that support designers did not understand Bravo's processes and thus the support provided by the system was not completely helpful. However, the project manager and chief information officer (CIO) considered the training program comprehensive, and delivered by experienced consultants. The program manager regarded staff reservations as their 'laziness' preventing them from learning the system. This disagreement about the adequacy and relevance of the training among the staff led to the latter feeling frustrated and isolated:

> *Frustration was all over us ... as some of the staff was under stressed due to fear of job loss. We did not know where to go and how to solve problem. We felt like that's enough and that was the case for the first few months. It was not the case with me only but everyone was in the same boat. Therefore, whenever we met, we shared [our] problems and did not know what to do about them and we felt isolated as if no one understood our pain. (Interview: business analyst)*

In short, this phase highlights how staff struggled to understand and use SAP and its embedded business processes. Second, it explains the reasons for this struggle. These include: (i) the staff found the SAP terminology and functionalities unfamiliar and complicated; (ii) the SAP business processes were 'interlinked' and 'disciplined', and staff considered that their comprehension required 'accounting knowledge' and 'cross-functional knowledge', and (iii) the staff considered the training 'too early', 'too simple', 'irrelevant' and delivered by a trainer who lacked knowledge of Bravo's business operations. Finally, this phase explained that the top management rejected staff's views about training inadequacy and irrelevance that led to staff isolation and frustration. The next phase considers the way staff were able to overcome such isolation and frustration. The next section proposes a proposed research methodology for a future research that tackle the above issue.

4 Proposed Research Methodology

The overall focus of the current study is to better understand the SAP post-implementation phase comprising strategies and incidents after going live with SAP. Therefore, data had to be collected after SAP went live (Phase 1). For the Phase 2, the current study, we provide required research and methodological foundation for a future empirical research (Phase 3) collecting relevant data through various techniques including interviews and observations as the primary data. The secondary data will also be collected through reviewing Bravo documents as well as the consulting firm that was responsible for Change Management (CM) activities. This may include data related to the communication, training, and post-implementation support. The researchers are to work with some of the project team members to obtain some background information about the SAP project in Bravo. Semi-structured interviews will be conducted in Bravo with staff, from high-level managers through to employees at the clerical level, as well as the project consultants from the consulting firm.

The next step of the proposed research methodology is data analysis. After the transcription of the data, the latter will be checked with the interviewees, and then all transcripts and relevant documents will be inputted to the NVivo software, which is a qualitative data analysis software provided by QSR International (Bazeley and Jackson 2013). For the data analysis, the thematic analysis will be adopted for identifying themes and concepts within the data (Ezzy 2002).

In the next cycle of the data analysis step is theory-based analysis. Interpretive researchers often use an underlying theory for generating and analysing research data (Walsham 1993; Walsham 1995; Walsham 2006). In the light of the coding and general comprehension of the situation, we intend to use the theoretical lens of organisational learning and Community of Practice (CoP) as detailed in the current paper, in order to guide further analysis. Under the theories of organisational leaning and CoP, relevant

themes such as zero-level learning, single-loop learning, double-loop learning, and CoP will be selected. The themes that surface from the theory-based analysis will be transferred into the NVivo database through 'tree nodes'. Essentially, this will allow the nodes to be linked together in a tree form.

The above two cycles of data analysis can be viewed as two-level generalisation (Lee and Baskerville 2003), which is based on Yin (2009) two-level interference model explaining the process of generalising from data to theory. For the first-level generalisation, the interviews will be interpreted from the point of view of the interviewees, who are the key actors in the SAP implementation and use. These interviewees are expected to narrate their stories of SAP adoption and use in the organisation, and then explain how the SAP can potentially change their work patterns and how they cope with issues surrounding effectively SAP use. For the second-level generalisation, the description of the 'story' will be interpreted from the researchers' perspective through the lens of organisational learning and CoPs. The most desire outcome of the above cycles of analysis is to achieve new theoretical comprehension of SAP implementation implying co-emergence of organisational learning and CoPs. The execution of this proposed research methodology constitutes the last phase of the study, which is the subject of the authors' future work. We are expecting that the current study will facilitate better understanding of post implementation of the IS in general, and ERP in particular.

5 Future Work

This study provided foundation for a full blown empirical study for understanding how the staff in Bravo overcame problems and challenges they had faced during the post implementation of an ERP system, the latter being the subject of the previous phase of the current study. The current study continues the previous phase by (i) proposing a review of the relevant literature on IS enactment as well as situated learning theory under the organisational learning theoretical perspective, (ii) a summary of the empirical results of the previous phase, and (iii) a proposed research methodology for a future empirical research for understanding how the staff in Bravo overcame various challenges they had phased during the post implementation phase of the ERP in Bravo.

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