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Aligning Organisational Requirements and Enterprise Systems Capabilities: A Longitudinal Case Study

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Abstract

Although participating organisations have extensive accumulated ES implementation experience, many enterprise systems (ES) implementation projects are still problematic. This research examines the concept of “alignment” to gain a deeper understanding of the dynamic process through which organisations match their organisational needs to ES package’s capabilities. We seek to improve our basic understanding of important factors that either inhibit or facilitate this alignment in order to inform further theory development. We are using a longitudinal grounded-theory approach and a critical realist perspective to explore the ES alignment process. This issue is important because ES implementations that reflect alignment should result in improved business processes, thereby helping organisations obtain greater value from their ES.

Keywords

Enterprise systems, implementation, alignment, grounded theory, longitudinal case study, critical realism, process theory.

INTRODUCTION

During the past decade, enterprise systems (ES) have gained momentum as the preferred business solution. They are designed for fast-changing and highly competitive environments in which organisations meet the challenge of achieving benefits through profitable growth, improved decision-making and organisational capability (Howcroft et al. 2004). According to Accenture (2002), many organisations report that achieving an adequate ES return on investment is becoming a major priority. Therefore organisations are making significant investments in ES in the belief that ES can save millions of dollars in organisational expenses and achieve the expected business benefits.

Despite years of experience in implementing and developing ES, the industry still reports stories of high-cost implementations and organisations that are not achieving benefits. In a survey of IT managers responsible for ERP projects, 66% of the respondents considered their ERP system to be their organisations’ most strategic platform (Sweat 1998). Despite such perceived importance, The Conference Board survey on ERP implementations (2001) reports that 40% of projects fail to achieve their expected benefits.

Based on this past experience, practitioners and academics realise that obtaining ES benefits is not as straightforward as initially believed (Howcroft et al. 2004). Rosemann et al. (2004) suggest that one reason why organisations encounter problems when they implement ES is that they fail to understand properly how well an ES package aligns with or fits their organisational requirements. Most organisations adopt ES because of the reputed “best practices” embedded in the package and currently implement those best practices in so-called “vanilla” implementations that is, with little customization of the processes offered. Such implementations have been embraced by numerous client organisations as a way of replacing their old systems, minimising risks associated with in-house development, reducing implementation costs, avoiding negative impacts on systems performance, and encouraging adoption of “best practices” (Soh et al. 2003). Accepting the processes embedded in the package may result in less formal and perhaps less detailed requirements analysis (Rosemann et al. 2005).

In ES implementations, misalignments occur when ES capabilities do not fulfil the requirements of the client organisation. Some workarounds and the need for change management are facts of life of any ES implementation. However, organisations often incur substantial costs that might have been avoided had they chosen a package that better fit their needs. Despite the fact that ES implementations have been prevalent since at least the early 1990s, there has been little research into why organisations are not successful in managing these issues thereby achieving the expected benefits. Given the growing role of ES packages in organisations, there is a need for in-depth, theoretically-grounded work that focuses on the process of alignment between organisational requirements and ES capabilities.

In this study we address the following research problem: “How can alignment between organisational requirements and ES capabilities be understood, explained, and achieved?” The purpose of this research is to gain a deeper understanding of the dynamic process through which client organisations match their needs to ES

package's capabilities, thereby addressing functional gaps. This goal will be achieved through the use of a longitudinal case-study involving a public organisation implementing an ES to improve its end-to-end business processes in order to achieve long-term benefits. We employ grounded theory methods to document and explore the socio-technical processes contributing to the process of alignment. The findings will improve the basic understanding of important factors that either inhibit or facilitate the process of alignment, and help organisations achieve their business benefits.

The paper is organised as follows. First, we review literature on the alignment and implementation of ES. We then present the overall research design, including the philosophical stance we take and the grounded theory methods we use to analyze the data. Next, we describe the research case site and the ES implementation process the organisation is using, followed by our proposed data collection and analysis strategies. Finally, we conclude with the expected contributions of our research to both theory and practice.

PRIOR RESEARCH

There has been little empirical work conducted to date on the alignment process. Prior research on alignment-related issues has focused on 1) providing solutions to misalignments (Sia and Soh 2002; Soh et al. 2003) and 2) conceptualising the alignment process as a requirements determination process (Rosemann et al. 2004) and 3) providing insights into alignment from the perspective of ES consultants (Rosemann et al. 2005). Here we present a summary of this research and its shortcomings that lead to our current study.

One research stream that is related to alignment identifies possible misfits in ES implementations and ways of overcoming them (Sia and Soh 2002; Soh et al. 2003). From a theoretical perspective, Sia and Soh (2002) developed a framework to characterise the severity of misfits. However, the framework adopted a software application perspective, classifying misfits into data, process, and output categories. These types of alignment issues are under the control of organisations via the choices they make about tailoring and configuring the ES during implementation. The framework does not identify the underlying rationale that leads to manifested misfits. In an attempt to conceptualise the underlying forces that give rise to misalignments, Soh et al. (2003) propose a topology of misalignments that identifies opposing forces arising in ERP implementations. This framework takes an organisational change perspective and identifies sources of misalignments. As the authors conclude, the framework enables related change management issues to be properly planned for, rather than aiding in the achievement of alignment.

Hence this research addresses misfits, which can be solved using low-level software-related solutions or improved change management. It does not investigate the alignment process from a more holistic perspective that includes, for example, organisational context, structures, participating agents, and technological perspectives. It therefore addresses factors that are extrinsic rather than intrinsic to the alignment process itself.

A second research stream related to alignment attempted to address intrinsic rather than extrinsic alignment issues by suggesting that ES implementation is an evolutionary process in which there is continual adaptation of the client's organisational requirements in the context of what is available in the ES software package (Rosemann et al. 2004). Reaching the final set of requirements follows an evolutionary process that starts from an initial set of organisational requirements and ends with a final and revised set of organisational requirements based on the functionalities and capabilities provided in the selected ES package. Organisations face difficulties matching their requirements with the ES capabilities because some requirements may not be supported by the package, or the package provides capabilities that do not fit the organisational business practices, leading to misfits that require workarounds. Misfits that remain after the go-live date are treated in a similar way to extensions of the ES capabilities directly following implementation, and/or via system upgrades. In this situation, modification of organisational requirements should be monitored in the usual way by considering costs and an on-going benefits realisation practice.

Based on preliminary investigations with ES consultants, Rosemann et al. (2005) concluded that vanilla implementations are currently the de facto standard for ES implementations. When specific business processes do not add to an organisation's net worth, vanilla implementations adopt relevant processes embedded in the package rather than insisting on replicating the existing processes. Some government agencies may still seek customised implementations (see Rosemann et al. 2005), although that, too, is changing as will become evident in the case study reported here. Customised implementations typically involve a more formal selection process and the specification of detailed requirements. While Rosemann et al.'s research sheds some light on the implementation process, the ES selection and implementation processes need to be addressed in-depth.

In this study, we investigate an ES implementation from the perspective of both the client's requirements and the capabilities of the ES package. In examining an ES implementation over time, we will have the opportunity to understand the alignment of organisational requirements with package capabilities. This allows us to develop a more complete view of the alignment process and to develop a theory and methodology that will help client organisations and ES consultants/vendors to prevent and/or mitigate misalignments.

RESEARCH DESIGN

The choice of research design and methods is driven by our research question and rooted in our assumptions about the way we view reality and how we contribute to human knowledge (Crotty 1998). In the following sections we address the philosophical position underpinning our research question, followed by the research approach, and a brief overview of the research site.

Philosophical Position

Walsham (1995) encourages IS case study researchers to reflect on their philosophical and theoretical position, when conducting and reporting their work. Here we examine the philosophical and theoretical assumptions of this study and present an appropriate research methodology.

We propose critical realism as our theoretical and philosophical perspective. Critical realism, a relatively new philosophy (Bhaskar 1978), examines social phenomena using an objective ontology (Bhaskar 1978). An objective ontology assumes that the person (researcher) and reality are separate. Social objects and phenomena such as things, structures, events and their mechanisms, language, decisions, and conflicts exist objectively in the world, independent of their observers. By contrast, a subjective ontology assumes they are inseparable. Studying social phenomena using objective ontology is appropriate because it implies we may all believe that it is the truth in the sense that it is untouched by human intervention (Farmer and Gruba 2004). We believe there are significant advantages to examining *objective knowledge*.

Critical realism, as the philosophical basis for research supports stratifying the reality into three different levels: the “empirical” (experiences and events observable by human beings; e.g., witnessing the requirements gathering workshops), the “actual” (events, whether observed or not, generated by mechanisms that exist in time and space; e.g., gathering requirements occurs whether or not we can observe them), and the “real” (processes, structures, causal mechanisms and their powers/properties that generate events and exist independently of human beings; e.g., organisations try to align their requirements to an ES package) (Collier 1994). In a critical realist examination, the objects of enquiry are the deep structures, mechanisms, and events/effects hidden in social phenomena (Dobson 2001). A critical realist researcher adopts a “retroductive strategy”: research begins in the “actual” level of reality, with observed connections between phenomena, and tries to explain why such connections occur. Then it proposes the existence of “real” structures and mechanisms; that is if they existed, they would explain the connections or relationships. Finally, it exhibits the existence and operation of these structures and mechanisms (Collier 1994). Through such a process of investigation, critical realism provides “an on-going process of explanation” (Dobson 2001). As a result, critical realist theories are exploratory and explanatory rather than predictive; that is, a theory based on critical realism identifies mechanisms that lead to events so that we can explain the phenomena under analysis but not so that we can predict what will happen.

Comparison with Other Approaches

Given the importance of information technology in our life at different levels, for example, individuals, teams, organisations, countries, and society, studies that analyse information technology and organisational interactions, have typically focused on the structure-agency relationship. These studies have employed perspectives for analysing the technology-organisation relationship such as, Structuration Theory (ST) or Actor Network Theory (ANT). These perspectives use a subjective ontology. We examine each of these theories as the basis for justifying our use of a critical realist lens in our study. We suggest that using an objective ontology, a critical realist research acknowledges the material aspects of technology and overcome some of the problems associated with ST and ANT.

ST is often used in interpretive studies, where attention is focused on the actions and interactions of individuals (human agency). As Giddens (1984) suggested, structure and agency cannot be separated; thus ST does not allow for the separate investigation of the properties of structures and agents: there is no structure without an agent. Critical realism assumes that structures must logically exist prior to actions being taken (Archer 1995); that is, structures may arise from past activities and actions, and cannot be attributed to the current agents. Critical realism sees structures as referring to actual forms of social organisations, “as real entities with their own powers, tendencies and potentials” (Archer 1995). Such structures have their own properties and might affect agents acting within the system. At the same time, agents are able to act upon and transform social structures.

Contrasting to ST, critical realism argues for the consideration of both structure and agency, specifically bringing time dependency into account, explaining that structure and agency can only be linked by examining the interplay between them over time. This view contrast to Giddens’ view and permits the investigation of the interplay between structure and agency over time (Dobson 2001).

While Bhaskar and Archer focus on social structures and not on technology, Dobson (2001) suggests that their arguments can be extended to include technology, “as one aspect of the structure conditions agents encounter”.

Orlikowski (1992) argued that technology should “be considered as one kind of structural property of organisations developing or using technology. That is technology is an instantiation of some rules and resources constituting the structure of an organisation.” From a critical realist perspective, perceiving technology a structure, it is more appropriate to examine the impacts of technology on organisational environment. Such a perception implies technology has its own properties, and cannot be represented only as “rules and resources” (e.g., ES packages play a structural role on organisation’s members through a change management process). Together with the distinction between structure and agency, the later permits us to look at the effect of technology on organisational phenomena, thus, acknowledging the materiality of technology.

ANT focuses on a network of social and technical components that are treated inseparable. It explores the homogeneity of a network and how actor-networks get formed, hold together, or fall apart. The problem with ANT is that it considers the technology at the same level as the individual agents or actors. It views them all, as participants in a network of diverse components. ANT is criticised for treating technology and human actors symmetrically and for being descriptive rather than explanatory (Howcroft et al. 2004). By treating all actors symmetrically, the voice of human actors is decreased (Mutch 2002), whilst the voice of technology (non-human actor) is increased. In ANT, through a process of negotiation between the actors, “the interest of the network members become aligned, and as the network progresses, these aligned interests can become inscribed into technological artifacts” (Howcroft et al, 2004). That is when a network achieves stability these inscriptions become irreversible and the technology stops being open to transformation.

By distinguishing between structure and agency, critical realism overcomes the problems with ANT. Critical realism allows for the investigation of how agency and structure impact on each other, avoiding the tendency of treating human and non-human actors the same. Rather than being only a player within organisational phenomena, technology can evolve and influence the organisational environment, including both structure and actors, thus acknowledging the materiality of technology. Another problem with ANT is that investigating only the social actions inside the network ignores the outside context of the social actions, specifically the relationships that constitute structure and constrain agency (Reed 1997). By contrast, critical realism goes beyond, and looks into all levels of reality, thus acknowledging the context of the social actions.

Consequently, by taking a critical realist perspective in analysing the technology-organisation relationship we address many of the issues raised with regard to other perspectives; for example: 1) we acknowledge the materiality of technology; 2) we do not view technology as being equivalent to a human from the viewpoint of initiating actions; 3) we incorporate the context; and 4) we go beyond description, providing explanations for the phenomena under investigation.

Research Approach

This study examines the implementation process of an ES in a public organisation. Because the implementation of such a system is a lengthy process, it usually takes a period of at least one year up to several years to complete. To capture a complete and accurate picture of the alignment process, we engage in a longitudinal case study. Further, we use grounded theory methods for data collection and analysis.

Yin (1994) recommends case study research 1) to investigate real-life phenomena when the boundaries between the phenomenon and the context are not clearly evident; 2) to study “*how*” and “*why*” questions; 3) to conduct a study in which multiple sources of evidence are needed; and 4) for exploratory research that tries to understand how a process unfolds (Yin 1994), in our case the process of alignment of organisational requirements with ES package capabilities. Hence a case study approach is appropriate to address our research question.

Longitudinal case studies are used when the investigated phenomena, and their impacts, are dynamic in nature, evolve over time, and produce effects that can be better observed over time (Benbasat et al. 1987). The longer the phenomenon is under investigation, the greater chances that patterns, continuities, and discontinuities will be identified, adding depth to our understanding of the explored phenomenon (Weick 1995). Because of the changing nature of organisational requirements over time (Rosemann et al. 2004), we are conducting a longitudinal case study of an ES implementation.

Grounded theory methods

Data collection and analysis will use grounded theory methods (Strauss and Corbin 1998). The choice of data collection and analysis methods is based on our research problem: our objective is to gain a deeper understanding of the dynamic process through which organisations match ES package’s capabilities with their organisational needs, specifically, identifying factors that facilitate or inhibit this process. Grounded theory methods are particularly suited for our research because we are seeking to uncover factors that arise from a complex process of social structures, actors, technology, their relationships and actions. These methods allow for the discovery of descriptive and explanatory theories that arise from empirical observation; in this case, then, the literature is less involved than in other many types of studies (Strauss and Corbin 1998). Grounded theory methods are qualitative

in nature and use techniques of induction and verification to uncover rich information that can be used to develop or elaborate a theory about the phenomenon under investigation (Schwandt 1997).

From a philosophical perspective, grounded theory methods are based on an objective ontology. Glaser (2002) explains that “grounded theory researchers generate a theory by applying grounded theory procedures and constant comparative methods to discover the latent patterns in the multiple participants' words, actions, and such.” Glaser adds that “the carefulness of the grounded theory methods generate theory as objective as humanly possible, because grounded theory is about building concepts, and not about the accuracy of a story-telling or narration.” By using a critical realist lens, we look for deep mechanisms that lead to events to go beyond description and build explanations specific to our investigation.

In contrast with Glaser and Strauss (1967), we take a more active role in our research enquiry by following Strauss and Corbin’s approach (1998). Strauss and Corbin propose a systematic approach to data collection and analysis. They suggest that the researcher may take a more active and provocative role in data gathering and research enquiry than Glaser and Strauss did originally (1967) and propose using more systematic and descriptive procedures and techniques. In fact, they go even further by proposing gathering data using preconceived questions, categories, and hypotheses and using grounded theory not only for generating new theory, but also for elaborating or modifying an existing theory (Charmaz 2000).

Because we started with some preconceived ideas for deriving organisational requirements and how client organisations align their needs to ES capabilities (Rosemann et al. 2004), we believe Strauss and Corbin’s approach fits our context better. This approach will allow us to achieve rigour during our data collection and analysis steps.

Introduction to the Case Site

Our relationships with the business community led us to examine a local government body, Progressive-City City Council (a pseudonym), that was about to start the ES package selection process. Progressive-City (PC) is experiencing significant development and therefore population growth based on its strong technology, manufacturing, and education base. PC is engaging in innovative ventures that include a business and technology emphasis at the two university campuses, a developing aerospace precinct, and a new state-of-the-art industrial estate. Tourism in the area is expected to experience continued growth with its world class museum, art gallery, various festivals, parks, and wineries within the city precinct. As a result, PC is already internationally recognised and is experiencing considerable interest in terms of trade and investment. It currently exports its products to several overseas countries. Because of these initiatives, the population is expected to exceed 300,000 by 2026, up from 140,000 in 2006. PCC has over 1,200 employees who deliver an extensive set of services to the community. Table 1 presents these services and the internal units that support them.

Services Provided	Organisational Units
<p>Management and use of land activities, assessment and regulation of health services and promotion, animal management, management of cemeteries, provision of community and cultural services, provision of library and information services, development and delivery of sport and recreation programs and infrastructure, promotion and education of sporting participation, promotion of community pride within the city, delivery of a safe city program, planning, maintenance, rehabilitation of roads and drainage systems, roads and traffic improvements, delivery of water supply and sewerage services, disaster planning, planning and development of natural and built environment, management of water catchments' areas.</p>	<p>Internal provider units:</p> <ul style="list-style-type: none"> • Corporate Services, Facilities, Finance, Fleet Services, and Information Technology, Roads and Drainage <p>Departments and their businesses:</p> <ul style="list-style-type: none"> • Arts, Community and Cultural Services • Business Units and Library Services • Works • Conservation, Parks and Sport • Planning, Development and Environment • Customer Relations • Economic Development • City Management and Finance • Health and Regulation

Table 1: PCC Services and Organisational Units

CASE STUDY TO DATE

In this section we report on PCC’s ES acquisition process and the current progress on our data collection and analysis. We then present data analysis strategies we plan to employ in this study.

ES Acquisition Process at PC Council

In 2005, PCC and PC community prepared a Community Roadmap, that outlined a series of strategies and actions to ensure they could meet the needs of the growing community. The Roadmap was comprehensive,

focusing on six major themes: natural environment, growth management, strong and diverse economy, community spirit and wellbeing, infrastructure and services, integrated transport and movement.

Major problems with PCC's existing systems, infrastructure, and business processes include: the outdated and disparate nature of information management across Council, which utilises over 500 systems and spreadsheets; the core council system is over 18 years old and meets an estimated 20-25% of its business needs; there is limited opportunity for information integration, analysis, business reporting, and for aligning business processes to ensure they are well supported by a robust information systems and technology infrastructure.

In seeking a replacement systems solution, PCC sought the services of an implementation partner who suggested that they needed an ES. At the beginning of 2005, the implementation partner developed an information architecture to determine application requirements. As the foundation for meeting the needs of the growing community, PCC decided in November 2005 to engage in a multi-phase, multi-year Business Transformation Program (BTP) with an ES at the core, and supported by a number of other "lines of business" applications. The BTP established an ES project team that combines PCC and implementation partner expertise, and includes a change management manager, a business process manager, a benefits realisation manager, nine business analysts and other supporting staff, including technical specialists.

The ES solution will consist of five major modules currently supported by the 18-year old system and perceived as critical to the organisation: finance, human resources (HR) and payroll, asset management (AM), supply chain management (SCM) and customer relationship management (CRM). The implementation is to take place in two steps with Finance, HR and Payroll and SCM to go live on 1st July 2007, followed by AM and CRM by the end of 2007. Figure 1 presents the timeline for the ES project and the major phases and sub-phases.

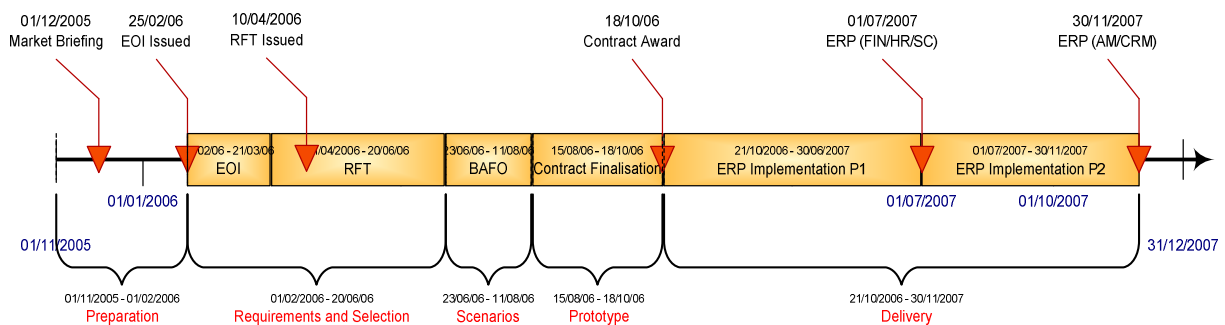


Figure 1: The ES Implementation Timeline

We report here on the acquisition process, which will end with the awarding of a contract on 18th October 2006. This stage consists of Requirements and Selection, Scenarios, and Prototype.

Prior to Requirements and Selection, PCC conducted a market briefing, which approximately 20 vendors and consultants attended. The market viewed PCC as an attractive medium-large customer, while PCC identified key vendors offering attractive solutions with different strengths. The first sub-phase of Requirements and Selection was the expression of interest (EOI), which was issued for the lines of business applications as well as the ES. This document, written by implementation partner, was 30 pages in length and generated interest from 10 consultant/vendor teams.

The major activity during Requirements and Selection was to determine the initial requirements for the ES. Business areas were divided into five functional reference groups (FRGs) corresponding to the five modules to be implemented, and one technical reference group. The process started with a series of workshops in the five functional areas, which involved business representatives and project team members (i.e., business analysts). The participants were provided with a set of generic, vendor-based ES functionality templates for each of the five major modules. This approach was used in the hope that it would mitigate the time pressure resulting from the ambitious schedule. Further, the business representatives could become familiar with the ES capabilities available in today's packages. Three rounds of workshops were held with three levels of business representatives, from process owners to power and light users. The participants ranked functionality relevant to PCC as mandatory, highly desirable, desirable, and nice to have. An overall weighting was also calculated for each of the five functional areas. In the final step, a senior management panel decided on the final weightings of the five modules. The outcome of this exercise was used as the basis for preparing the Request For Tender (RFT) document that was sent to vendors for assessment. The ES vendors/consultants were given two weeks to respond.

As part of the RFT response process, the vendors/consultants mapped the capabilities of the system they were proposing into the initial set of functional requirements in the form of the annotated templates. Their response to each requirement took the form of: core supported, not supported, supported with 3rd party, supported but not

priced, supported in a future release, or further customisation required. The result was a matrix that displayed the importance of the requirements and the corresponding system's capabilities. Three vendor/consultant pairs responded to the RFT and all were invited to develop demonstrations of their software.

While the vendors/consultants were responding to the RFT, the internal team engaged in the second major sub-phase of the acquisition process, building Scenarios. The starting point was a number of artefacts from the development of the information architecture based on a SWOT analysis (strengths, weaknesses, opportunities, and threats) designed to determine the potential benefits of a systems implementation for PCC. Scenarios allow vendors to demonstrate their software, particularly those aspects that the organisation uses frequently, those that are quite complex, and those from which they derive value. The FRGs developed scenarios for each major module by focusing on mandatory and highly desirable functionalities in each area. Approximately 1,100 scenarios were developed, the majority of which were at the operational level, such as: master file record management for product code, vendor, customer, creation of contracts and requisitions, and so on.

Three vendor/consultant pairs responded to the RFT. Formal scoring of the proposals revealed few differences in functionality among the three proposed packages. All respondents were given two weeks to prepare demonstrations of the business scenarios. The FRG business representatives evaluated the vendors during the demonstration sessions. The evaluation and selection of the vendor also considered other factors, such as overall integration of the solution, technical factors, financial viability, architectural alignment, complexity, completeness, consistency, confidence and ease of use.

At the end of Scenarios, the project will move into the Prototype sub-phase. At this time, PC City Council is evaluating the vendors and the best and final offer (BAFO) will be made to the selected vendor on 11th August, 2006. During Prototype, the selected vendor will build a small prototype and, if effective, the contract will be finalised. The project then moves into the final project phase of physical implementation of the solution.

Current Progress on Data Collection and Analysis

Here we present first our data collection strategies and then our data analysis strategies. We will share findings to date and more in-depth insights from this study should this paper be accepted for the ACIS conference.

Consistent with grounded theory methods, data collection and analysis occur iteratively. Yin (1994) identifies several sources of qualitative evidence in case research including interviews, documentation, observations, and physical artifacts. In addressing validity and reliability of research outcomes as indicated by Yin (1994), in the next sections of this paper, we provide a description of data sources and the analysis we propose in order to ensure the reliability and validity of our findings.

Data Collection

The techniques we use to collect data are based on observations, interviews, document analysis, formal and informal discussions, training sessions, meetings and attendances at workshops. Observations are possible because the researcher is spending one day every week at the case site, from January 2006 until the end of 2007 (see Figure 1), and has access to the implementation team members and associated meetings. We started collecting data at the Requirements and Selection phase and will continue until shortly after the ES go-live. This timeframe will ensure we capture potential post-implementation gaps and the way the organisation addresses them.

To date we have conducted semi-structured interviews with business stakeholders and project team members before and after the requirements gathering and scenario development sub-phases of the project. The interview protocols were structured so as to ensure we captured various aspects of the entire process under investigation: the social structures of organisation, its context, strategy, key players (actors) and roles, without minimising the role of technology as part of the structure.

Because we are following Strauss and Corbin's (1998) approach, we developed preconceived questions as part of our interview protocols. These questions were derived from previous research and tailored to the two sub-phases of the project. We attended important meetings and workshops during requirements gathering and scenario development, and gained access to project documents related to these sub-phases of the project. In addition, we engaged in informal conversations with project team members and business representatives during our visits on site as well as during meetings and workshops. We ensured that our key informants and data sources were representative of the project and that they provided an objective view of the process under investigation.

During the Scenario phase, we accessed the final scenario documents so that we could determine how PCC monitored the requirements being addressed and demonstrated by the vendors' ES packages. We attended a number of demonstration sessions performed by the three selected consultant/vendors teams. We had informal discussions with members from the FRGs to gain insights into the evaluation process.

Data Analysis Strategies

In qualitative methods, including case studies, coding represents an important tool to support researchers during the analysis. More specifically, the central task of data analysis in developing grounded theory focuses on: (1) identifying concepts and sub-concepts (open coding); (2) linking sub-concepts to concepts (axial coding); (3) integrating and refining the theory (selective coding); (4) bringing process (i.e., dynamic and evolving nature or actions and interactions) into the analysis (coding for process); and (5) sampling events and incidents based on the concept of making comparisons (theoretical sampling) until all categories are saturated (theoretical saturation).

Field notes and interviews are transcribed and coded as soon as possible following receipt of the transcription. Since the analysis is exploratory in nature, it is important to have an early analysis to identify descriptive concepts within the data and to uncover ways in which these concepts are linked to each other. This process is important because it helps us to develop and formulate new questions for future interviews and to identify who we need to speak to ensure appropriate theoretical sampling (Strauss and Corbin 1998). To track the interviews and field data, as coding progresses, codes are organised into trees, and a hierarchical structure is developed using NVIVO software package.

We plan to use Langley's strategies for theorising from process data in our study of the alignment process (Langley 1999). We believe that theorising from process data is appropriate to our research because we aim to understand patterns and mechanisms in events, which is the key to developing "process" theory (Langley 1999). Because we analyse the structure-agency relationship from a critical realist perspective, we expect these strategies allow us to understand the process of alignment and the changing nature of organisational requirements process over time.

Process research deals with the evolution of relationships among people or with the way agents interpret and react to events. Process phenomena have a "fluid character that extends over both time and space" (Langley 1999). This aspect of process phenomena leads to the consideration of multiple levels of analysis that are difficult to separate from one another. These levels of analysis lead to a complex sense-making process. The researcher attempts to document as completely as possible the sequence of events relevant to the processes under investigation. Langley (1999) acknowledged the complexity in building process theory and developed seven strategies for theorising from process data (see Figure 2).

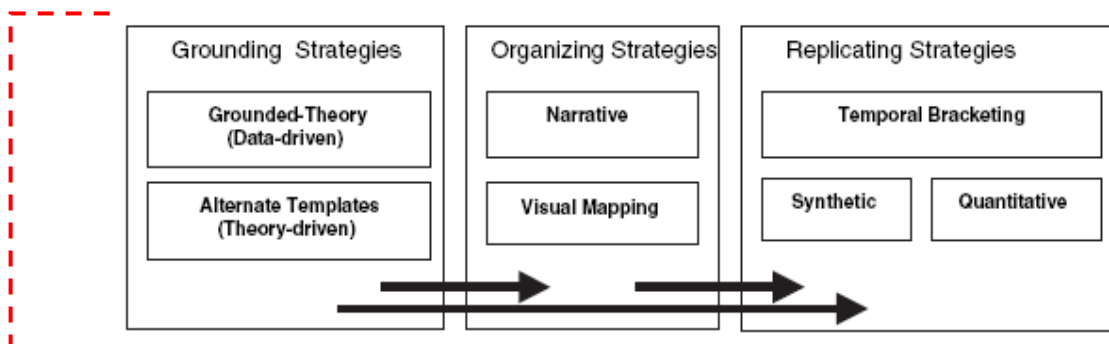


Figure 2: Langley's seven strategies for theorising from process data

We argue that Langley's grounded, narrative, and visual mapping strategies are appropriate for data analysis in the current research. **Grounding strategies** are either inductive (*grounded theory*) or deductive (*alternate templates*), and involve the systematic comparison of data to gradually construct an explanation of an observed phenomenon. *Grounded theory strategies* are appropriate because they focus on the context of the process and make sense of meanings and patterns from process data.

Organising strategies, specifically *narrative* and *visual mapping*, represent two different ways of describing and structuring process data in a systematic form. *Narrative strategies* can be used as an autonomous analytical tool to analyse the sequences of different phases and establish links between them, and as the main product of the research (Langley 1999). They are appropriate to our analysis because they focus on the context and time of the process and make sense of stories, meanings, and mechanisms from process data. *Visual mapping strategies* are often seen as an intermediate step between the raw empirical material and abstract conceptualization. In order to elaborate more general theories or more generalisable patterns, such strategies focus on events and their sequence and make sense of patterns derived from process data.

Replicating strategies are ways of breaking down the data for replication of theoretical propositions. Because our research focuses on explanation not testing propositions or prediction, replicating strategies are not suitable for our analysis.

EXPECTED CONTRIBUTIONS

This research-in-progress focuses on the dynamic process of alignment through which a client organisation matches its organisational requirements to ES package capabilities, and how the functional gaps are addressed. The contributions of this study are two fold. From a theoretical perspective, the expected contributions will be a theory that presents a basic understanding of important concepts that either inhibit or facilitate the process of alignment. From a practical perspective, the findings will help participating organisations to address misalignments in ES implementations, to improve their business practices, and to obtain greater value from their ES investments.

This study will pursue data collection and analysis throughout the Prototype and Delivery phases of the project. We will engage in on-going data analysis at the beginning and end of each phase of the project to ensure the continuity of the whole process. Simultaneously, we will pursue data analysis and develop insights from this study to be shared at ACIS should this paper be accepted.

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