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MANAGING ENTERPRISE SYSTEMS POST IMPLEMENTATION THROUGH COMPETENCY CENTERS:
AN INQUIRY INTO ASSEMBLAGE AND EMERGENCE

BY

ARUN ARYAL

A Dissertation Submitted in Partial Fulfillment of the Requirements for the Degree

Of

Doctor of Philosophy

In the Robinson College of Business

Of

Georgia State University

GEORGIA STATE UNIVERSITY
ROBINSON COLLEGE OF BUSINESS

2016

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ACCEPTANCE

This dissertation was prepared under the direction of the *Arun Aryal* Dissertation Committee. It has been approved and accepted by all members of that committee, and it has been accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy in Business Administration in the J. Mack Robinson College of Business of Georgia State University.

Richard Phillips, Dean

DISSERTATION COMMITTEE

Dr. Duane Truex (Chair)

Dr. Lars Mathiassen

Dr. Richard Baskerville

Dr. Redouane El-Amrani (External – NEOMA Business School, France)

ABSTRACT

MANAGING ENTERPRISE SYSTEMS POST IMPLEMENTATION THROUGH COMPETENCY CENTERS: AN INQUIRY INTO ASSEMBLAGE AND EMERGENCE

BY

ARUN ARYAL

DATE

Committee Chair: Dr. Duane Truex

Major Academic Unit: *Computer Information Systems*

Abstract: Enterprise Systems (ESs) are more than a collection of people, technology, processes, and capabilities. The responsibilities of post implementation management of ES lie in the unit called the Competency Center (CC). The CC has a bidirectional relationship with ESs wherein the CC influences the shaping of ESs, and the CC is affected by the dynamic interaction between people, technology, process, and capabilities within the ES. These dynamic interactions keep the CC, fluid and always in-process. The general-use definition of the term “process” as used in the Enterprise Systems literature treats the notion as “repeatable processes” or “replicable processes”. However, arising from comparative case studies in four large organizations, I found that decision making, managing, and governing in the ES are not “replicable processes”, not reifications of structural variations over time when examined through the lens of the Assemblage Theory. Assemblage Theory incorporates the dynamic interplay of two continua: the first, territorialization, deterritorialization, and reterritorialization, and the second, material vs. expression. Although the notion of the terms formation, deformation, and reformation are suitable for understanding the processes these CCs encounter in a broad and general manner, they do not sufficiently describe the not-so-solid, never-quite-finished, always in-process or structuring referred to by Hopper (1996) as “emergent regularities”. In contrast to the notion of stable structures, this dissertation research

adopts the language of Deleuzian assemblage of Territorialization, deterritorialization, and Reterritorialization. Although the four study organizations planned and intended to develop clearly defined competency centers, which would create formalized processes and procedures to manage the post implementation phase, none of the study organizations ever achieved the anticipated stability. Instead, the CCs exhibited the signs of being ‘in-process’ and ‘structuring’. The contribution of this research to the IS field is an understanding of the CCs as processes as opposed to structures and how CCs structuring impact the ESs in organizations.

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Gurur Brahma Gurur Vishnu

Gurur Devo Mahesheswera

Guru Shakshat Parah Brahma

Tasmai Shri Guruve Namah

I start the acknowledgements by roughly translating the above Sanskrit poem. The true meaning of Guru is "one who dispels the darkness of ignorance". Guru, inculcates knowledge, preserves the created knowledge, and gets rid of the ignorance from the students' minds.

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ABBREVIATIONS

List of Abbreviations (in Alphabetical Order)

BI – Business Intelligence

BPC – Business Process Champions

BU – Business Unit

CC – Competency Center

CIO – Chief Information Officer

CFO – Chief Financial Officer

ERP – Enterprise Resource Planning

ES – Enterprise Systems

HG – Home Goods

IaaS – Infrastructure as a Service

IS – Information Systems

RU –Regional University

MRP – Material Resource Planning

MS – Material Supply

PaaS – Platform as a Service

SCM – Supply Chain Management

WoS – Web of Science

CHAPTER 1 - INTRODUCTION

This chapter introduces the research domain of Enterprise Systems Post Implementation, the research perspective informed by Assemblage and Emergence theories, the interpretive research approach, and the key contributions of this research. The research question is reserved until and introduced in Chapter 3, Section 3.3.

1.1 Research Domain

Modern large-scale Information Systems (IS) whether contemporary implementations of Enterprise Resource Planning (ERP) or more recent developments like Business Intelligence (BI) and analysis systems, simply referred to as Enterprise Systems (ES) have become mature and pervasive in contemporary organizations (Rainer et al. 2013). Even with the maturity and pervasiveness of ESs, leveraging these systems to achieve true long-term business value is still problematic because direct causal links between ES implementation and firm value have never been clearly established (Benitez-Amado and Walczuch 2012). Organizations can benefit from ERP systems if these systems are able to integrate well with other systems, and organizational processes (Barki and Pinsonneault 2002). Many organizations have viewed their ES implementations as essentially well-integrated transactional systems whose potential has never been fully realized (Kallinikos 2004). For these ESs to be more than just transactional systems, ones that can capitalize on current and context-rich organizational competency, two things are required: - first, continual development of the knowledge and management frameworks born of the ERP implementation process (Beard and Sumner 2004), and second, transformation of the

1 transactional data created from ERP implementation to decision-making capabilities via BI
2 systems (Chau and Xu 2012).

3 The first issue, the knowledge and management framework arising from ERP implementation, is
4 concerned with the organizational, functional, and technical expertise required for the successful
5 implementation and use of large-scale ES in the post implementation phase via continuous
6 organizational learning during system use (Robey et al. 2002) as well as the managing of intra-
7 organizational contracts and licensing agreements with ES vendors and integration partners
8 (Granebring and Révay 2005). The second issue organizations confront is the lack of connection
9 between transactional data and exploitation of actionable information that facilitates decision-
10 making processes. When companies invest in ESs, they are seeking well-integrated systems with
11 access to current data resources that fosters context-rich organizational decision-making
12 competency. However, integrating systems, process and data while also extracting decision-
13 making value from these systems remains problematic. This is in part because of the growth in
14 data volumes and of an increasingly diverse user community wanting access to customized data
15 presented in personalized ways. Providing such personalized views, which may or may not be
16 resident in centralized repositories, presents challenges to the design and management of ERP
17 systems. Because organizations view ERP applications simply as “transactional systems”
18 (Kalinikos, 2004) for dealing with information and providing reporting for everyday operations,
19 they are therefore not taking advantage of the convergence of ERP and BI. Thus, whether due to
20 the system’s complexity or from a lack of vision or management wherewithal, some firms are
21 unable to access business analytics capabilities that give companies an edge for improving
22 management decisions (Grabski et al. 2011).

1 Developing and advancing organizational knowledge of ES implementations and the integrating
2 of transactional data to BI is further complicated by the dynamic business environments wherein
3 these ESs reside. Factors illustrating this point include the following: a) ES combined with BI,
4 Supply Chain Management (SCM), and Customer Relationship Management (CRM) systems are
5 becoming more inter-organizational (Power 2005); b) technological advancements such as cloud
6 computing, Service Oriented Architecture (SOA), and Software as a Service (SaaS), Platform as
7 a Service (PaaS), and Infrastructure as a Service (IaaS) make it possible for organizations to
8 place some of their business processes outside of their organization and adding yet another layer
9 of key stakeholders (Stanoevska-Slabeva et al. 2009); and c) changing business and technology
10 environments such as Internet of Things (IoT), and increasing attention to ‘big data’; and, d) the
11 continuing need for new ES to integrate well with the legacy ESs to accommodate the evolving
12 organizational strategy and ES use (Cash et al. 2008). Whether an organization implements a
13 new ES or upgrades an existing ES, the new or upgraded ES still need to be integrated with other
14 legacy ESs; many legacy systems do not (and should not) fade away. Given this complex and
15 dynamic business environment, organizations cannot invest in systems that take too long to
16 implement and do not show clear return on investments (He 2004). To reap the maximum benefit
17 from all versions of these ESs, organizations need efficient management strategies. Although IS
18 researchers have been examining ERP and related ES for twenty years, IS research is limited in
19 exploring the post-implementation design, structure, and relevant measures of post-
20 implementation success (Gallagher et al. 2012).

21 As the ES evolves in its use and during its engagement with specific organizational settings, this
22 dissertation research seeks to extend the domain of post implementation research by studying the

1 need for continued improvement, assessment and management of interaction between IT,
2 organizations, and diverse stakeholders.

3 The literature recognizes that the evolution of ESs in use, wherein they become more tightly
4 integrated with BI systems offers substantial decision support benefits (Holsapple and Sena
5 2005). To illustrate the benefit of this trajectory of use, one sees in most traditional settings, data
6 from operational systems such as ERP have to be extracted then processed to upload in the BI
7 system for analytics. In contrast, where ERP and BI systems are more fully integrated, these
8 operational data are readily available for analytics, providing business with significant benefits.
9 Thus, to leverage the convergence of transactional and analytic systems, organizations need to
10 carefully plan and upgrade the current ES (Devadoss and Pan 2007). Maintaining and upgrading
11 ESs demand a broad range of expertise than in-house software (Khoo and Robey 2007).

12 However, like most IS, ESs don't just maintain themselves, let alone evolve on their own. Once
13 implemented, management must affirmatively answer the question of “who should oversee their
14 management and development?” The challenge today for most managers is to optimize on
15 business processes enhancement via successful management of post-Implementation of ES (Galy
16 and Saucedo 2014). A Significant problem during the post implementation phase is that most
17 managers need to integrate these systems into daily use and simultaneously adapt them to handle
18 the business's growing needs (Ross and Vitale 2000). This ability of providing user support now
19 and adapting for future use requires not only technical knowledge but also functional area
20 knowledge in order to address the business requirements adequately and realize the intended
21 benefits of ERP and BI investment (El Amrani et al. 2010). To achieve intended value or
22 business goals, establishment of a business unit called *Competency Center (CC)* was identified as
23 one of the organizational solutions to enhance the convergence between both systems.

Unfortunately, the IS literature offers no generally agreed definition of the term Competency Center (El Amrani and Truex 2015; Eriksen et al. 1999; Gallagher et al. 2012; Granebring and Révay 2005). In the absence of a generally agreed definition, for this research, CC is defined as:

an entity that leverages the ERP and BI investment and provides for a continuous improvement in performance management. This entity defines, executes and supports the ES strategy. CC ensures the robustness and reliability of the ES integration and, at the same time, enables heterogeneous groups of information consumers to use data in a coordinated way to achieve company goals.

The IS research literature offers little practical understanding of how these structures work, how they are maintained and how they evolve over time. For instance, few IS studies (Granebring and Revay 2005; Gallagher et al. 2012) deal with the notion of the Competency Center and none of these studies consider the post-implementation evolution of a Competency Center, specifically their role in optimizing the ERP Implementation and the convergence with BI capabilities. Nor are there studies comparing the post-implementation experience between different organizational units and contexts across diverse firms. ES implementation has been the focus of much research, but, the interaction between IT expertise and organizational competencies during the post-implementation phase continues to challenge IS researchers and perplex the IS management community (Wagner et al. 2010).

1.2 Research Perspective

Two of the most common applied perspectives to frame and explain ES studies in the IS literature are: the “universalistic” and “contingency”(Marciniak et al. 2014). Universalistic

1 perspectives, also known as “best practices”, hold that we can identify a prescribed set of best
2 ways to implement and manage these systems (Raymond and Bergeron 2008) whereas from a
3 contingency perspective, there is no single "best" way to manage a project or to deal with the
4 interaction between IT and organization, but that one must find an appropriate fit using a
5 contingent set of approaches depending on organizational context (Davis 1982).

6 Both perspectives share the notion that one can identify and codify approaches and structures to
7 be developed or copied in ES implementations. From a contingency theory approach, different
8 ways of organizing promote different organizational capabilities (Barki and Pinsonneault 2005).

9 Although contingency approaches do recognize the interaction between the ES and organization,
10 they underestimate the dynamic, subtle and continuous nature of these interactions. Another
11 notion shared by ES studies employing these two approaches is that implementation and use
12 cycles are discrete and segmented (Yu 2005). They assume that there exist stable sets of
13 conditions under which ES can be implemented and managed. These two perspectives presume
14 that best practice solutions or contingent mix-and-match configurations are sufficient to manage
15 ES. However, these perspectives do not recognize that organizations often need to address the
16 implementation, use, and upgrade decisions simultaneously, continuously and in use (Davenport
17 et al. 2004). Such simultaneous and continuous adaptations create real-time, in use ‘emergent
18 regularities’ (Hopper) or assemblages (Deleuze and Guattari 1988). Hence, management would
19 benefit from a dynamic and process-oriented view of implementing and managing ESs via
20 continuous, evolving and organizing units, or the competency centers.

21 To examine the dynamic and emerging nature of the post implementation management of ES,
22 this research is motivated and grounded in *assemblage* (DeLanda 2006; Deleuze and Guattari
23 1988; Deleuze et al. 1987) and *emergence* (Hopper 1996; Truex and Baskerville 1998) theories.

From the assemblage theory perspective, the post implementation phase of ES is not merely a static collection of stakeholders, tools, techniques, procedures, and capabilities. The management structure required can be best described as dynamic interactions between one main “whole”, CC and many different heterogeneous “parts” i.e. stakeholders. Assemblage emphasizes that the “parts” that make up the “whole” are fluid, exchangeable, and can have multiple functions. These components can be “pulled” out of one system and “plugged” into another. The CC is a good example of assemblage because it contains many parts that do not exclusively belong to CC, i.e. a management group, experts, and tools are a part of CC, but are also parts of a larger organization. How these parts interact and give rise to a “fluid” structure that is continually in the emergent stage can be examined in-depth via assemblage and emergence theories. Assemblage is a process-oriented theory that emphasizes the concept of emergence. However, the assemblage theory does not explicitly provide a way to investigate neither the processes nor the emergence. To understand the concept of emergence in a fuller detail, I turn to Hopper (1987) and others (Truex et. al 1998). The processes via which the assemblages are initiated and transformed are examined through *process characteristics* detailed in Process Metaphysics (Rescher 1996).

1.3 Research Approach

Given the pervasive and dynamic nature (ESs cross not only departmental but often the organizational boundaries, such as connecting with Vendor ES) of the post implementation, there are no single solution that can contribute significantly towards managing these systems. However, if organizations are to improve their management of these ESs via CCs, they need to have a comprehensive approach. The advantage of an Assemblage Theory approach is that it treats CCs more holistically by a) encouraging efforts that emerge at multiple levels, as these

emergent processes begin, b) not assuming that these processes are static and identifying the conditions under which these processes evolve, and c) examining the interactions of these emergent processes with the organizational unit. In this dynamic environment of the CC, assemblage theory offers a way of assessing not just one construct but also the whole phenomenon. Organizational phenomenon such as CCs commit to involving all stakeholders, promote post implementation use, and seek to extract an enduring business value. To investigate such dynamic and evolving phenomenon, research projects should be a long-term engagement that involves organizations that have different processes for establishing and managing ES in post implementation settings.

Within the context of post implementation ES management via CC, this dissertation research employs an in-depth case study method. The study organizations were four different large organizations in three different industries. To understand how the CCs are formed and evolved, this research sought to understand the viewpoint of the key stakeholders that were also important decision makers in the CCs. Since case studies allow the researcher to become familiar with the data in its natural setting and the context (Lee 1989), these research provide a deeper understanding of a particular phenomenon (Lee and Baskerville 2003). I chose this research approach to maximize the richness and accuracy of data, transferability of the findings and to identify key concepts that can be examined in details for follow up studies.

1.4 Research Contribution

This research explains how CCs can support the post implementation management of ES in dynamic organizational environments. The research draws on Assemblage and Emergence as a

conceptual lens to inform our understanding of the dynamics of ES management. On a broader level, this research seeks to explain two phenomena that are of great importance to IS researchers interested in management of ES and practitioners that are responsible for managing and maintaining these ESs: 1) Why is it so difficult to manage the ES post implementation, and 2) Why it is so challenging to establish an organizational unit to manage IT and organizational capabilities that extend beyond any one particular ES installment?

While difficult, it is crucial to manage the ESs because investment in BI&A has significantly increased in the past few years, and will likely continue to grow in the coming years (Baur et al. 2014). Gartner's research anticipates that the global BI and Analytics market will grow from \$13.9 billion in 2013 to \$20.8 billion by 2018. Along with the investment in BI, widespread use of these systems across organizational boundaries is also likely to increase. Because of this broader appeal of these ESs, CIOs and CFOs alike are paying attention to how to best manage these systems (Elbashir et al. 2013). There are no universally accepted best practices available for management. According to the Gartner study, top concerns about ESs raised by CFOs are justifying an investment to facilitate analysis and decision making, ongoing monitoring of business performance, and collaboration and knowledge management (Gartner 2013). These concerns can be addressed by successfully establishing a CC. However, CCs are not limited to addressing just these questions. As the ESs evolve, the concerns could and would change as well. Thus, to tackle the current concerns and anticipate and plan for future issues, CCs need to be dynamic and emergent.

1.5 Dissertation Summary

The structure of the dissertation is summarized as below:

- Chapter 1 introduces the research setting, the research approach, and the key contributions of this research.
- Chapter 2 discusses the post implementation of ES by examining how ESs have been developed in organizations, lifecycle of ESs and Role of CC in managing ES.
- Chapter 3 provides an analysis of the issues related to managing post implementation of ESs via Latent Semantic Analysis of the ES literature and practitioner journals. This analysis allows me to identify gaps in current understandings.
- Chapter 4 builds a theoretical foundation for this dissertation by first, examining the IS theories rooted in agency, then, proposing Assemblage as a well-suited dynamic theory, and finally, complimenting assemblage with theories of emergence.
- Chapter 5 describes the philosophical foundations for this research, research settings, and overall research design. The chapter also includes the procedures for data collections and analysis.
- Chapter 6 details within-case process analysis. For all four cases, process characteristics such as quantitative features, thematic nature, relationships, spatiotemporal and change energy are examined in case-by-case basis.
- Chapter 7 analyzes how the processes examined in chapter 6 evolve into assemblages. The cross-case analysis reveal how these assemblages are initiated, territorialized, deterritorialized, and reterritorialized.
- Chapter 8 describes how to manage post implementation ES, contributions to research and practice, limitations and future research directions.

CHAPTER 2 POST IMPLEMENTATION OF ENTERPRISE SYSTEMS

In this chapter, I describe the context of this dissertation research: the post implementation phase of ES. First, I describe key developments in ESs in organization. Next, I discuss the lifecycle of ESs. Subsequently, I discuss the role of CC in managing these ESs.

2.1 Development of Enterprise Systems in Organizations

The challenges of seamless system integration and coordinated decision making via Enterprise systems have gone through many transitions from MRP I, MRP II, and ERP to the current ESs. This section reviews each of these iterations/development in the ES lineage.

Material Requirements Planning I (MRP I)

Material Requirements Planning (MRP) is a software-based solution that manages manufacturing processes by facilitating production planning, scheduling, and inventory control. An MRP system is intended to simultaneously meet three objectives:

1. Ensure materials are available for production and products are available for delivery to customers.
2. Maintain the lowest possible material and product levels in store.
3. Plan manufacturing activities, delivery schedules and purchasing activities.

Data integrity (assurance and maintenance of overall completeness, accuracy, and consistency of data), and system rigidness (MRP is built on strict computer based scheduling processes and are

not flexible enough to adjust to quick changes in the business environment were the two main problems with MRP I systems. There were no easy ways to modify the data after they were entered into the system. If the input data were inaccurate, the output were inaccurate also, resulting in a Garbage In Garbage Out (GIGO) scenario. The systems were also rather basic because, for instance, they assumed that the lead-time for producing any given product was fixed regardless of quantity, i.e. lead-time was the same if a factory was producing one car or hundreds of cars, and did not account for economics of scale, lag times and a host of essential parameters.

Manufacturing Resource Planning II (MRP II)

Manufacturing Resource Planning (MRP II) is a packaged software solution that integrates all manufacturing and related applications, including decision support, material requirements planning (MRP), accounting and distribution. In other words, MRP II adds other applications such as decision support, accounting, distribution to MRP I.

Enterprise Resource Planning (ERP)

Enterprise Resource Planning (ERP) evolved from MRP I and MRP II to tightly integrates various organizational functions such as sales and distribution, material management, production planning, financial and controls, and others using process (organized group of related activity to produce outputs from given inputs) view of the organization. ERP's characteristics such as data driven, process centric, change in terms of technology as well as people, make it a complex ES.

Modern Enterprise Systems

Legacy ESs promised the wider inter and intra organizational process integrations, however, they could not quite deliver on that promise. At best, these legacy ESs provided limited integration

and back office support. With the advancement and emphasis on Customer Relationship Management (CRM), Supply Chain Management (SCM), and Business Intelligence (BI) systems, many enterprise systems today cross not only departmental but organizational boundaries as well. To transition from legacy to modern ES, organizations need to make decisions regarding replacing, upgrading, extending legacy ES. However, due to the size and complicated nature of ES implementation, decisions to replace, upgrade, or extend requires examining the business processes, business development plan, and enterprise architecture as well. As such, these are important and time consuming, and complex organizational engagements.

2.2 Enterprise Systems Lifecycle

In practice, there seems to be no agreement on how to divide ERP endeavors into phases. Some organizations treat ERP is like just another IT project and apply IT Project Management phases in ERP. Adapting the Software Development Life Cycle to ERP, many organizations have adapted to Pre-Implementation, Project Planning, Product Education, Design Configuration, Development and Test, Go-Live and, Post-Implementation phases. Other organizations take the approach that ESs are much more complex and cannot be treated as just a project. These organizations have realized investment and involvement with ESs does not end with simply going-live. To adopt a tool agnostic view of ES lifecycle, I turn to a well-recognized phases proposed by Gartner (2015) that lists the phase as:

- Phase 1. Strategize and Plan
- Phase 2. Architect
- Phase 3. Select
- Phase 4. Deploy

- Phase 5. Operate and Evolve

Gartner's ES Lifecycle approach emphasizes the strategic nature of ES investment and the importance of operations and evolution of ES. There is a distinction between ERP Project phase vs. ERP lifecycle phases. ERP project phases are mostly concerned with a single ERP project as it moves from initiation to operations. ERP lifecycle phases on the other hand also emphasize what happens after the go-live or deploy phase. As Enterprise Software in organizations continues to evolve, the organizations face challenges in implementing new systems, integrating the new systems with the old ones, and extending the use of old systems. It takes a long time to refine the alignment of an organization to the ERP system and to more fully leverage the opportunities offered by the ERP system

2.3 Role of Competency Centers in Managing Enterprise Systems

ES literature is in general agreement that exploiting the significant investment in ERP and BI applications requires developing organizational capabilities to enhance fit between system functionality and business needs (Elbashir et al. 2008). There is also general agreement in the literature that achieving organizational capability is predicated on effectively leveraging multiple knowledge and expertise sources throughout the organization (Bhatt et al. 2005). The key resource is organizational knowledge and how this knowledge is distributed throughout the organization. Newell et al. (2004) have noted that the primary challenge for project teams is how to coordinate and integrate such distributed knowledge in dynamically changing environments. During the post-implementation phase, the challenges are even more pronounced because the support mechanisms established for the project implementation phase (consultants, leadership,

1 project managers, project teams, subject matter specialists, etc.) have already dispersed and
2 moved on to another project. How then should the organizational knowledge and competencies
3 assets brought to bear during the ERP implementation be coordinated and integrated during the
4 post-implementation phase? Organizations attempt to address these concerns by establishing an
5 unit often called Competency Center (El Amrani et al. 2010).

6 Establishing an effective CC is a complex undertaking, but with careful planning and a dedicated
7 team, it can provide a long-lasting impact on the business. Many companies have tried to initiate
8 the creation of CC with different results. For example, Granebring and Revay (2005) described
9 the establishment of a Swedish ERP CC in a consultant firm and outlined the difficult process of
10 putting together functional and technical knowledge. Gallagher et al., (2012) studied the ERP
11 post-implementation support in higher education and examined the process leading to its
12 formation. The positioning and organization of the competency center are decisive as to its
13 ability to energize the Enterprise System and ensure consistency. However, it is yet unclear
14 under which conditions, decentralized or centralized, formal or informal, virtual or traditional
15 approach, a CC is more efficient. Structural theories identify three general models; centralized,
16 decentralized, and the hybrid design (Sambamurthy and Zmud 1999). From a structural
17 perspective, the competency center can be a business unit with a dedicated team, a division of an
18 existing business unit, or a "virtual competency center" made up of people from departments in
19 different corporate units and companies. Gallagher et al. (2012) found two types of the post-
20 implementation support structures: a centralized cross-functional team structure and a distributed
21 ad hoc or hybrid structure. Centralizing a firm's know-how around a complement of professional
22 and technical expertise forms a pool of technical and functional skills. In this case, the

1 competency center plays a key role in keeping experts in a firm and in increasing their functional
2 and technical skills – which significantly reduces the need for external consultants.

3

4 **2.4 Chapter Summary**

5 This chapter described the research context, post implementation ES, for this dissertation. To
6 understand the current state of post implementation of ES, a brief chronological development in
7 ES is presented as well.

CHAPTER 3 - LITERATURE REVIEW

This chapter presents a review of a selection of the ES literature. The chapter begins with a brief narrative analysis of the ES literature, and then presents the results of a content analysis of 103 articles identifying major concepts from the literature. These themes are further synthesized to identify gaps in our understanding of key issues. From this literature review, a research opportunity is identified in Section 3.3.

3.1 Narrative Analysis of the Literature

The study of ES is a cross-disciplinary area of research comprising of Industrial Engineering, Operations, Computer Science and IS (Rerup Schlichter and Kraemmergaard 2010). Within this broad area, IS researchers have been examining how ES, such as ERP are planned and implemented in organizations to derive business values from exploiting the standardization and integrations of people, processes, and technologies these systems provide(Rajagopal 2002). There have been numerous literature reviews on ES, notable examples are Moon(Moon 2007): (Momoh et al. 2010); (Rerup Schlichter and Kraemmergaard 2010); Addo-Tenkorang & Helo 2011; and Eden et al. 2014. Among these reviews, Moon 2007 and Addo-Tenkorang & Helo 2011 classify journal articles based on these categories: Implementation, ERP exploration and use, Extension, Value, and Trends. Categories in Eden et al.'s study differs in that it adapts categories from Esteves & Bohorquez, (2007) to propose high-level topics of General, Adoption Decision, Acquisition, Implementation, Usage, Evolution, Retirement, and Education (Esteves

and Bohórquez 2007) . Since Moon's review was based on papers published right after the year 2000, it is no surprise that most of those articles examine ERP implementation or exploration/use issues. ES implementation deals with the challenges arising from the introduction of ERP systems into organizations. Implementation research focuses on topics such as software selection, system configuration, implementation related problems associated with the alignment of business and IT, and identifying the critical success factors for ES implementation and use. However, it is somewhat surprising that of the 219 papers published after 2006, 123 (56%) can still be categorized as addressing questions related to ES *Implementation and usage*, both early life cycle issues (Eden et al. 2014)(p43). **In other words, after more than 15 years of the initial wave of ES deployment, the majority of IS research is still examining ES implementation issues versus questions dealing with more mature ES.**

In extant literature reviews, post implementation issues have been sparsely addressed, and where attention is called to post implementation activities at all, these issues have not been clearly identified; nor has anyone explicitly constructed a categorization of post implementation issues. There are a handful of notable exceptions. For instance, Moon 2007 and Addo-Tenkorang & Helo 2011 briefly mention the issue of '*Extension*' where they examined how organizations extend ES adoption beyond baseline ERP towards supply chain management, customer relationship management, and business intelligence (Addo-Tenkorang and Helo 2011; Moon 2007). Eden et al. (2014), propose categories of **post-implementation maintenance, emerging technologies and integration issues**. The remainder of this section first, describes the existing literature on these issues of maintenance, integration, and emergence, and next reexamines the post implementation studies.

1 In existing studies, the term ‘maintenance’ is used generically and is a ‘catch-all’ including
2 issues such as, the importance of negotiation with vendors to manage the software change
3 including upgrades, and roles of managers that influence the organizational decision to perform
4 enterprise system upgrades. Negotiations with vendors are important in maintaining the control
5 of price (who pays?) and scope (what changes?) of the ES (Ng and Gable 2010). Once
6 organizations make the decision to implement large scale ESs, the relationships with the vendors
7 are ‘locked in’. Organizations become dependent on vendors for the ES support, and these
8 vendors could exploit this vulnerability (Khoo & Robey 2007). Since controlling price and scope
9 are not trivial issues, the argument is that managing the maintenance phase should be a priority
10 for the top management (Ng and Gable 2010).

11 The sparse extant literature dealing with post-ERP implementation issues represent an
12 opportunity to investigate an emerging set of questions not immediately predicted from the
13 previous literature dealing with the task of choosing and implementing the ERP. In a survey of
14 their customers, an ES vendor SAP, reports that the average time for the *Project* phase alone is
15 17.8 months¹. Thus, it is not surprising that many ESs take years to transition from the plan to
16 post implementation phase. This timeframe is important because new technologies can emerge
17 which could lead to unplanned adjustments. Adapting to the cloud and security issue, for
18 example. (Loebbecke et al. 2012). Moreover, in this same time span, the organization is also
19 evolving, thus the key players, technologies, processes and organizational goals are all changing
20 in real-time. An organization’s initial intent might be influenced by the technological innovation
21 in the business. For example, with the goal of increasing operational efficiency, an organization
22 initiates an ERP implementation project, which ends up lasting more than two years. By the time

¹ <http://www.asugnews.com/article/panoramas-2013-erp-report-the-good-bad-and-ugly>

1 the initial implementation is completed, the original goal of increasing operational efficiency
2 may no longer be sufficient. Now, the ERP needs to integrate with other systems that may have
3 been introduced in the organization during this implementation period. Organizations may
4 require an existing ES to integrate with new ESs such as Customer Relationship Management
5 (CRM), Supply Chain Management (SCM), and BI. A few studies have suggested that
6 integrating ERP with CRM extends the value of ERP (Hillman Willis and Hillary Willis-Brown
7 2002; Liu et al. 2011).

8 However, integrating ERP with other ES like SCM is a complex process, but the process results
9 in tangible benefits, such as efficient inventory management and intangible benefits, such as
10 reduced paperwork (Bose et al. 2008). Integration issues also examine the need to integrate work
11 processes with the management processes to achieve long-term financial success from the ES
12 implementation (Hitt and DJ Wu 2002). Emergent issues imply that not all issues could be
13 predicted or be prepared for. In post implementation management, the processes should include
14 strategies to deal with emergent changes (Al-Mudimigh et al. 2001).

15 While the studies of emergent technologies have provided some insights into the post
16 implementation phase, they have also raised two concerns. First, with the exception of a few
17 qualitative studies, such as: Khoo & Robey's 2007 and 2012, the categories of 'Maintenance',
18 'Emerging Technology', and 'Integration' were studies as being viewed through technology-
19 centered lenses. Very little is written addressing questions, such as: Who are the major
20 stakeholders? What decisions are made during this post implementation Phase? How are these
21 decisions made? What are the business impacts on an organization? What becomes apparent in
22 this literature review is that more business-centric questions need to be examined fully to

understand fully this under-studied area (Gattiker and Goodhue 2005; Staehr et al. 2012; Wagner and Newell 2007).

Given that the aim of this research is to examine the emergent issues during the post implementation phase, this literature review focuses on the interactions of people, technology, and processes to achieve the business outcomes. This literature review consists of two approaches. First, I synthesize published articles on ES post implementations; second, the research conducts a content analysis/latent semantic analysis of title, abstracts, and keywords of all published articles. The articles were selected by entering the keyword "post implementation" in the Web of Science (WoS) database. Since the results were very inclusive, I further filtered on the "social science" discipline. The resulting set was narrowed to 126 articles. More than half of the articles retrieved were considering the implementation of hardware and infrastructures in medical and other disciplines. Once I filtered out the hardware and equipment implementation articles, 47 articles remained. These 47 articles are listed in column named "Search 1" in Table 3.1.1. During an initial inspection of these 47 articles, I noticed that some post implementation studies such as Robey et al. 2002, Stefanou 2001 and others were missing from this list. Since these articles did not have the keyword "post implementation", these articles were excluded from the WoS search results. To remedy the problem, I searched for all ES articles by entering the keywords "ERP", "ES", "SAP", and "Enterprise Resource Planning" in the WoS database. Since the search term was very inclusive, I then filtered for "social science" discipline. I filtered out research, principally published in computer science and operations research journals, dealing with technically issues, such as optimization, minimizing down-times and supply chains and similar operational issues. Essentially what remained were 103 articles. I downloaded all 103 articles and saved into a folder in a computer. I then conducted a full-text search for "post

1 implementation” in that folder. After reviewing the results, I noticed that 28 articles, in addition
2 to the 47 articles identified by the WoS search, discussed some aspect of post implementation.
3 These 28 articles are listed in ‘Search 2 Count’ column in Table 3.1.1. The outcome of this
4 process is that the 75 articles I have analyzed represent a comprehensive set of articles.

Table 3.1.1. Articles for Literature Analysis				
Abbreviation	Journal Title	Search 1 (WOS Count)	Search 2 (Custom Count)	Total Count
DSS	Decision Support Systems	2	NA	2
EIS	Enterprise Information Systems	1	NA	1
EJIS	European Journal of Information Systems	3	NA	3
IJIM	International Journal of Information Management	3	NA	3
IM	Information & Management	3	NA	3
ISJ	Information Systems Journal	3	2	5
ISM	Information Systems Management	2	NA	2
ITP	Information Technology & People	1	NA	1
JAIS	Journal of the Association for Information Systems	2	1	3
JCIS	Journal of Computer Information Systems	1	NA	1
JGITM	Journal of Global Information Technology Management	1	NA	1
JIT	Journal of Information Technology	3	1	4
JMIS	Journal of Management Information Systems	1	1	2
JOCEC	Journal of Organizational Computing and Electronic Commerce	1	NA	1
JSIS	Journal of Strategic Information Systems	1	5	6
MISQ	MIS Quarterly	3	7	10
OTHER	Conference papers, Book Chapters etc.	11	NA	11
Total		47	28	75

5 A sub-set of these articles have explored how management engagement, vendor involvement,
6 and various user participations impact ESs during post implementation phase. That is, what do
7 managers actually do and how do they impact the post implementation phase of ES? Some

1 studies chronicle that top management intervene to facilitate the customizations of ERP and also
2 assist in alignment of business and technology (Chou and Chang 2008). Other studies point out
3 that in ES assimilation scenarios, mid to low level managers play critical roles (Liu et al. 2011).
4 Vendor involvement is also seen as a key component of ESs (Markus et al. 2000). The study by
5 Wagner et. al (2012) goes even further by suggesting that vendor support throughout the
6 lifecycle is warranted. However, others argue that organizations need to reduce their reliance on
7 vendors and develop their own competency to deal with the integration of ESs (Fryling 2010).
8 When ESs are first implemented, the systems are relatively unfamiliar, and users anticipate
9 problems. A third position is that users' networks are essential in post implementation
10 management. That is, if users perceive problems influence whether or not they can be mitigated,
11 and influences the usability of the system (van Fenema et al. 2007). Users rely on each other and
12 their network to solve the problem by sharing the knowledge, and these networks are always not
13 very direct and often nuanced (Sykes et al. 2014).

14 Other sets of studies examine post implementation phase as a dynamic environment where
15 interactions among stakeholders are emergent, tense and adaptive. For example, while users are
16 getting accustomed to a new system, managerial intervention puts the users and managers at
17 odds with each other creating a tense situation. The interactions among the users and managers
18 go through an adaptive process to ease the tension (Rodon et al. 2011). Examples of this tension
19 and emergent dialog are illustrated by Vasconcelos' 2007 research of "How stakeholders in
20 organizations negotiate meanings by exploring discursive tensions." The research by
21 Vasconcelos highlights how the system is actually used depends on how different business units
22 in universities deal with these tensions (Vasconcelos 2007). Language is not only used in
23 exploring tension, but the discursive reaction to the ES project or implementation impacts the

1 post implementation phase where users legitimize or undermine these installed systems
2 (Shepherd et al. 2009).

3 Maximizing benefits and obtaining continuous improvement from implemented ERP systems
4 have gradually emerged as the second wave of research on ERP (Yu 2005). The notion of
5 benefits or *post-implementation success* is quite perplexing in IS literature. Some studies define
6 success as organizational performance and the financial return on investment in ERP (Ifinedo
7 2007; Sedera et al. 2004). Other studies define success utilizing a framework that combines IT
8 infrastructure, operational and managerial benefits, organizational and strategic benefits (Seddon
9 et al. 2010). In one of the later studies that examine benefits of ES, Staehr et al. (2012) conducted
10 a multi-firm study and concluded that operational and some managerial benefits, such as simple
11 reporting were achieved in a short time. However, the managerial decision-making and strategic
12 benefits occurred very slowly, if at all. Staehr et al. state “although ‘improved management
13 decision-making’ is often claimed as a business benefit of ERP systems, there is little evidence in
14 previous ERP research of it having actually occurred (Staehr et al. 2012).” The impact of ES on
15 organizational performance and financial ROI is not clear. In a study of 50 Chinese firms, after
16 three years of implementation, there was no significant financial performance (Liu et al. 2008).
17 Other studies that reported post implementation success (Kouki et al. 2010; Zhu et al. 2010).
18 were conducted right after the implementation phase and success was measured in terms of
19 whether ERP systems were assimilated in the organizations or not. Thus, the success reported by
20 these studies might not carry over the long term.

21 Other than the uncertainty of the duration of the post implementation phase, interactions among
22 the human and non-human actors are also complex in this phase. Diverse stakeholders occupy
23 different roles in various departments, and capturing and analyzing these dynamic relationships

are challenging. While the post implementation research is inconclusive in many aspects, the literature agrees that post implementation phase is an important one and organizations have to adapt to a long-term view. To guide organizations through this long-term period, some research recommends on creating a support structure. A few notable examples are Skykes et al. (2014), Vasconcelos (2007), and Gantley (2008). Sykes et al. (2014) suggest creating a social network of users to share tacit and system knowledge (Skykes et al. 2014). Another call for creating a support structure where subject matter experts and others can interact throughout the lifecycle of ES (Vasconcelos, 2007) or share knowledge between IT and business units (Gantley 2008). In practice, ES vendors and implementation partners strongly recommend the creation of an organizational structure to guide and govern the ERP implementation and post implementation phases. Often this requirement is built into the service level agreements and contracts. These structures are typically called ‘competency centers’. The definition of the competency center in IS literature is hard to find and often borrowed from practice. For example, Ng & Gable (2010) describe the *vendor-centric* of competency center

SAP has introduced the concepts of ‘customer competency centers’ and offered a comprehensive maintenance support tool ‘solution manager.’ These are likely to become the mainstays of future SAP-related maintenance activities by client organizations. Competency centers are centralized SAP knowledge-bases consisting of people within an organization who are knowledgeable, functional, and technical support staff, with competencies that range from managing the support desk to development and maintenance of releases and patches (Miller, 2004). The purpose of the competency center is to ‘provide coordinated support for enterprise-level business applications that align with an enterprise’s organizational and political constraints (Ng & Gable, 2010).

This definition of the CC is more SAP support and maintenance focused. The definition also highlights that the CCs need to coordinate with IT and business to align the political and other

1 organizational resources. The CC is also seen as a centralized structure where diverse staff such
2 as support staff, technical experts, managers and others interact.

3 As compared to the former vendor-centric definition, there exist vendor-agnostic notions of a
4 *center* that is responsible for managing and governing ES. One such vendor-neutral notion of the
5 center is described by Hewlett Packard (HP) within their organization (HP Whitepaper).

6 *The CoE can be a logical or physical service bureau that provides expertise across*
7 *projects in a shared services model. The function of the CoE is to drive*
8 *standardization of quality products, architecture, and governance policies, and*
9 *processes across the enterprise. The main goal of the CoE is to focus on process and*
10 *efficiency – leveraging a centralized management and automation platform for*
11 *processes, consulting, and support services, as well as delivering leadership and*
12 *advocacy to help the organization improve business outcomes.*

13 The vendor-neutral notion of the CoE mentioned by HP differs in function, composition, and
14 specificity from the SAP-specific CC. The SAP CC was more specific to maintenance and
15 upgrades while HP has a broader vision and goals. The vendor neutral CoE concerns with
16 governance policies and processes across enterprise, contrast to the limiting role maintenance
17 plays in the SAP CC. In SAP CC, the goal is to promote the utilization of ES, but HP goes
18 beyond the usage issue into leadership and advocacy. Both notions of CC and CoE give
19 preference to the centralized structure. In this research, I do not make the distinction between the
20 CC and the CoE. For the purpose of this research, both are “business units” that manage and
21 govern the post implementation phase of the ESs.

22 In this literature review, I have: a) synthesized past literature on ES implementation and post
23 implementation, and b) provided the review on the notion of a business unit, or center, whether it
24 is named CC or CoE, to manage and govern post implementation of ESs. From these two
25 analyses, I draw two conclusions. One, the ES literature is not very clear about this post
26 implementation phase regarding the interaction between many different organizational

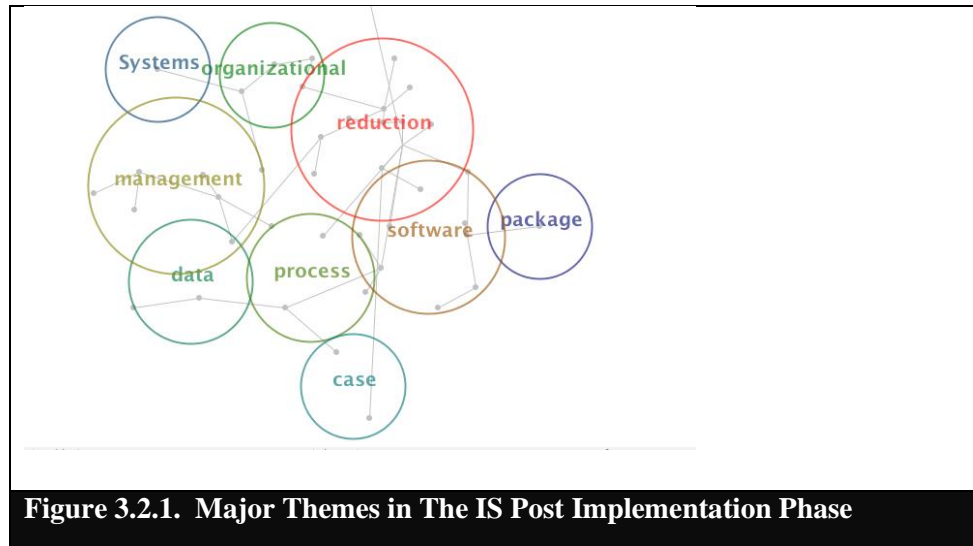
1 stakeholders. Two, in practice, the notion of CC is used in inconsistent ways. To clarify the
2 concepts within the post implementation phase, I then found it necessary to conduct a content
3 analysis/latent semantic analysis of the ES post implementation literature.

5 **3.2 Content Analysis of the Literature**

6 For each of the aforementioned 103 papers, I created a spreadsheet showing basic bibliographic
7 details of the study: title, author names, journal title, and publication year. I also created a
8 consolidated file of abstract, and keywords of all papers.

9 Next, I excluded common “stop words” (and, not, with, or, etc.) as well as words such as “study”,
10 “research” and “results”, and instructed Leximancer, a software for performing content
11 analysis/latent semantic analysis, to merge word variants (e.g., organize, organization, and
12 organizations; also, project, projects, and projected, etc.). Once these parameters for the stop words
13 and merge words were set, I utilized Leximancer to analyze the entire consolidated file, consisting of
14 abstracts, and keywords. Leximancer produced an overall concept map showing what were inside
15 these concepts and how these concepts were related. I then interpreted the overall concept map
16 containing the themes generated by Leximancer. A more complete description of the analysis
17 process, and of how Leximancer works, is described in the Chapter five.

18 After removing the common words that appear in almost all studies such as information, system,
19 technology, approach, research, analysis, and other I re-analyzed the 103 abstract and obtained
20 the high-level concept map below. The major concepts are discussed in turn.



Reduction

Reduction is made up of sub-concepts: Planning, Enterprise, Systems, Implementation, and Project. To examine the relationship between the terms Reduction and its sub-concepts, I performed a “query” function in Leximancer with the combined term, i.e. Reduction + Planning. Based on the query result, I was able to identify that the concept Reduction was mostly related to planning and managing various risks, such as project risk. The examples of reduction include risk reduction (Tian and Xu 2015), reduction in control (Ignatiadis and Nandhakumar 2007), and variability reduction (Cotteleer and Bendoly 2006).

Management

The concept of Management is made up of sub-concepts of organizational, Project, Support, Process, Control, and Integration. To examine the relationship between the terms Management and its sub-concepts, I performed a “query” function in Leximancer with the combined term, i.e. Management + Project. Based on the query result, the concept Management can be classified into the following three categories:

1. Management referring to Top Management, Senior Management
2. Management of resources as in material management, project management
3. A generic term, such as information management, organizational management

Concerning the top management, various studies provided insights on top Management support leading to successful implementations (Akkermans and van Helden 2002; Hirt and Swanson 1999; Howcroft et al. 2004; Lam 2005; Newman and Zhao 2008; Ross 1999). One of the ways management increases the chance of ES success is by providing intrinsic motivations for users (Ke and Wei 2008). The top management needs to be aware that the ES users are not homogeneous, and need to develop specific strategies for these disparate groups to have greater user acceptance (Klaus and Blanton 2010). Managing the post implementation phase by systematically planning for the maintenance of ESs also requires top management involvement (Ng & Gable 2010) and developing knowledge management competencies (Sedera and Gable 2010).

Process

The Leximancer concept, Process, is made up of sub-concepts of Business, Data, Software, Work, and Innovation. To examine this relationship between concept and sub-concepts, I performed a “query” function in Leximancer with the combined term, i.e. Process + Business and others. Based on the query result, I was able to associate the concept of Process to the three main categories of processes: process theory, implementation process, and integration process.

Process theory

The studies belonging to this concept deal with the theoretical aspects of processes, such as work processes, social and behavioral processes rather than the ERP process (such as selection,

implementation, and post implementation). These papers often focus on *process models* ((Newman and Zhao 2008; Robey et al. 2002; Uwizeyemungu and Raymond 2009) or *emergent theory frameworks* (Gosain 2004) to examine the post implementation ESs. The second set of research focused on ERP is outcome of a social process (Wang et al. 2006), behavioral processes (Al-Mudimigh et al. 2001), trust building process (Gefen 2004), and learning process (Robey et al. 2002).

Implementation process

Organizations start with ERP selection and evaluation processes(Stefanou 2001) before embarking on the implementation journey. Another critical question an organization seeking to implement ERP needs to answer is when to reengineer business processes? Whether reengineering prior, during or post implementation (Nandhakumar et al. 2005)? Answers to these questions are not trivial where technology and culture impact the implementation process (Boersma and Kingma 2005). The change is complex, and conflicts over business strategy hinder business processes (Lee and Myers 2004) One way to mitigate the risk caused by change, is to communicate clearly about the business process redesign at pre-implementation and the implementation phases (Nandhakumar et al. 2005). These communications assist with internalizing business processes into standard routines (Lee and Lee 2000).

Integration process

One of the main appeals of the ES is its ability to integrate with other systems to create a unified technology platform. ESs' ability to integrate with other systems depends on the cross functionality fit through the process re-engineering or through the specific choice of ERP modules by organizations (El Amrani et al. 2006). During the integration, the fit of processes

also depends on employee perception. Employee perceptions of work processes are measured via perceived process complexity, perceived process rigidity, and perceived process radicalness during the ES post implementation (Bala and Venkatesh 2013).

3.3 Research Opportunity

This literature review examined extant post implementation research in detail by performing a narrative analysis of post implementation issues and content analysis of ES post implementation articles published in the major IS journals. These techniques helped me identify candidate articles, bound the subject domain, examine the themes of those articles and perform an initial classification of thematic elements that I refined to perform the analysis and synthesis above. As part of this literature review I also compared practical problems of post implementation versus what has been prescribed in the extant research literature.

The narrative analysis revealed maintenance, emergent issues, and integration concerns as the main issues discussed in post implementation literature. Emergent issues discussed in ES literature are mostly related to managing ad-hoc interactions that arise from the ERP implementation team's need for cross-functional coordination(Gosain et al. 2005) or a project team's ability to handle unanticipated changes (Al-Mudimigh et al. 2001). The dynamic ad-hoc coordination and unanticipated changes are important concepts in post implementation settings. As the project team transitions from implementation to post implementation, they still need to manage the existing relationship (i.e. with the project team) as well as foster newer relationships (different BU and support staff, for example).

1 The textual analysis² highlighted the importance of managing process-centric issues in post
2 implementation management. The management ‘unit’ responsible for ES are often called
3 Competency Centers (CCs). Practitioner magazines and academic research alike treat the CCs as
4 a solid structure. However, due to the process-centric and emergent nature of technologies and
5 the people involved, CCs represent an in-process and emergent *organizing form*. As described in
6 this and previous chapters, managing ES in post implementation settings is highly complex and
7 very dynamic.

8 Against that backdrop, this research will contribute to the discourse by exploring a largely
9 unstudied but important concern that is inconsistently applied in practice and largely ignored in
10 the research literature. That is, the role of the competency center in managing post
11 implementation ES. While the ES literature has provided significant insights into the
12 implementation phase and change management in general (Markus 2004; Markus et al. 2000;
13 Robey et al. 2002; Wagner et al. 2012), our knowledge of how dedicated organizational units
14 such as CC manage ES post implementation is still quite limited. CCs can play an important role
15 in post implementation by facilitating the management of technical, administrative, and financial
16 components within the ES with internal and external stakeholders. Unfortunately, the current
17 research in ES such as BI&A systems mostly focus on technical issues on the statistical analytics
18 techniques and challenges, but little attention is paid on how these systems can be better
19 managed to achieve business value for organizations. Therefore, contributing to the ES literature,
20 this study’s main research question is:

² The ‘textual analysis’ in this dissertation consisted of content analysis based on the theory and empirical techniques of latent semantic analysis. The theory and techniques are discussed in detail in chapter five below.

- 1 **RQ: How are Competency Centers implicated in post implementation of Enterprise**
- 2 **Systems?**
- 3

CHAPTER 4 - THEORETICAL FOUNDATIONS

This chapter begins with a brief description of the role of theory in interpretative research and its applications in IS research. In the subsequent sections, I first, differentiate assemblage theories from other candidate theories developed by Latour, Bourdieu, and Giddens and place assemblage in the context of process metaphysics and one process theory from the domain of linguistics, Hopper's Emergent Grammar's. Next, I describe key concepts of assemblage and provide a basis for why these complimentary sets of theories support a comprehensive explanation of the phenomenon under study

4.1 Role of Theory and its Applications in IS Research

In interpretive research, a theoretical lens is essential for examining and construing a complex social phenomenon of interest, or in making sense of the shared meanings created by human actors (Walsham 2006). This notion of social phenomenon is further explained by Schwandt (1994):

“understanding the complex world of lived experience from the point of view of those who live it. This goal is variously spoken of as an abiding concern for the life world, for the emic point of view, for understanding meaning, for grasping the actor's definition of a situation, for Verstehen. The world of lived reality and situation-specific meanings that constitute the general object of investigation is thought to be constructed by social actors (Schwandt) 1994, p. 118).”

Consistent with this interpretative research mandate, this research is framed by Deleuze and Guattari's Assemblage Theory, a process theory rooted in the ongoing discourse on the nature of

1 human and organizational agency. The notion or concept of “agency” in IS concerns “the study
2 of actions and their effects, and the relation of particular consequences to particular agents and
3 their actions – hence, agency(Rose et al. 2005).” In this research, the human and non-human
4 agencies of CC are also examined through the theoretical lenses of *assemblage*. The adaptation
5 of assemblage theory in this research is appropriate for three reasons – 1) the context of the
6 organizational activities, 2) fit of the theory to the phenomenon and 3) methods that may be
7 brought to bear to study the phenomena. Truex, Holmstrom and Keil (2005) recommend that
8 before adapting a theory for IS research, researchers need to consider fit, context, and research
9 methods. First, the *theoretical fit* describes how well-suited the theory is in explaining and
10 interpreting the object of the study. Second, *context* refers to the previous usage of the theory,
11 and assumptions about the constructs. Third, *research methods* should explain how the chosen
12 theory impacts the research method deployed to collect and interpret data (Truex et al. 2006).
13 Before describing Assemblage Theory in detail, in the section below, I summarize how this
14 research follows these recommendations.

15 The first recommendation concerns the fit between the theory and a phenomenon of interest.
16 Research in the IS field examines more than just the technological system alone, or just the
17 social system alone, or even the two ensembles side by side. Rather, it investigates the composite
18 socio-technical phenomenon that emerges when the two interact(Lee 2001). CCs embody socio-
19 technical phenomenon suitable for examination via an assemblage perspective that
20 systematically analyzes the intertwined and complex social and technical (material) aspects.
21 Assemblage, like that of other theories addressing power, social agreements, the reproduction of
22 norms, social order and structures (e.g., Bourdieu 1987, Giddens 1984, and Latour 1996)

requires translation and instantiation to move it from the realm of ‘grand theory of society’ to the realm of practical applied principles informing practical organizational research.

4.2 IS Theories Rooted in Agency

I considered four candidate theories sometimes used to investigate socio-technical phenomenon such as CC (*c.f.*, Table 4.2.1). These were considered because each of these theories purport to address issues of human and machine agency, and issues such as materiality, embeddedness, and the interaction between the macro and micro levels of organizational units. The purpose of the comparison is to illustrate why the assemblage theory is a better fit for this dissertation research. The shortcomings column addresses the limitation the theory presents in examining CCs, and is not a criticism of the theories themselves.

Table 4.2.1. Agency Theories

Theory	References	Brief Description	Use and Limitations vis a vis CCs
Ensemble	(Orlikowski and Iacono 2001)	Classifying IT artifacts into development project, production network, embedded systems, structures	More of a taxonomy than fully developed theory. Emphasis on solid structures. Not used in this dissertation.
Bourdieu’s Field Theory	(Bourdieu 1986)	How two or more field interact with matter	While social fields and people are interdependent, <i>Fields</i> connotes the rigidity or stability and defined boundaries. Not used in this dissertation.
Structuration	(Giddens 1984)	Macro level explanation such as social forces and micro-level activities and how they interact with one another to create social reality	Focus on structure and not used in this dissertation.
Actor Network Theory	(Latour 2011; Latour and Porter 1996)	The collections of people, objects organizations (actors or actants) are social and technical parts and there are no inherent differences between the two.	Too symmetric of a relationship between the technical and human agency. Not used in this dissertation.

Process Theory based on Process Metaphysics	(Rescher 1996)	<i>Process</i> assumes that the reality of material objects is “ultimately comprised of energy that is in an ongoing state of flux and motion	Process characteristics derived from process metaphysics provide complimentary analysis to the Assemblage.
Emergence Theory	(Hopper 1996)	Emergence is spreading of systematicity, never fully formed always ‘in-process’.	Emergence Theory provides linguistic concepts and terminology to examine, analyze and describe assemblage. These linguistic elements are embedded within the analyses of Process Characteristics and Assemblage.

Ensemble

In his *Science in Action*(Latour 1987), Latour proposes that “machines” are created by or developed from “systems of alliances” or the interaction between people and technology. Orlikowski and Iacono (2001), in their seminal work, combine Latour’s theorization of how technology come to be (concerns with development of technology) with Kling and Sachi’s (1982) theorization of how technology come to be used (concerns with how technology is used(Kling and Scacchi 1982)). Orlikowski and Iacono (2001) divide the high level construct “ensemble” into four different categories:

1. technology as a development project,
2. technology as a production network,
3. technology as embedded systems, and
4. technology as structure.

The *ensemble concept* has some common concepts with assemblage theory, such as emergence and socio-technical aspects of systems. The notion of an ‘*ensemble*’ is helpful in classifying IT artifacts. However, the notion of *ensemble* does not examine the complex interplay of systems and components that are within the system. As such, *ensemble* is more of a taxonomy than a fully developed theory.

Bourdieu's Field Theory

The Field Theory has been in use in Physics as well as in the Social Science disciplines. In Physics, Field Theory examines how two or more physical fields interact with matter (Bourdieu 1986). In the Social Sciences, Field Theory examines how individuals create social fields, and how these social fields impact individuals; especially those the environments in which competition between individuals and between groups takes place, such as markets, academic disciplines, or musical genres. Bourdieu suggests that society cannot be analyzed solely in terms of economic classes and ideologies, and much of his work concerns the interdependent role of educational and cultural factors. Instead of analyzing societies in terms of economic classes alone—choosing instead to identify several different types of ‘capital’—Bourdieu uses the concept of ‘*the field*’ to denote a social arena in which people maneuver and struggle in pursuit of desirable resources. Sterne (2003), while discussing field theory, states:

These relations of power and forms of agency are in constant flux, and are themselves struggled over: the relations in a field change over time, as does the specific form of capital in that field. ‘Fields’ and forms of ‘capital’ are not once and forever fixed (as they would be in a classic structuralist model.(Sterne 2003).

The “power” and “form of agency” are flux within a field, but at any given time, these constructs, power and forms of agency can identify a field. Because ‘the field’ is construct-driven, comprised of *capital or pattern of social relations*, once all these constructs are identified within a field, the focus shifts towards a somewhat fixed structure view of the field(Martin 2003). This relative ‘fixedness’ led me to investigate for a better theoretical fit.

Actor Network Theories (Latour) and Structuration (Giddens)

Actor-network theory (ANT), is an “approach to social theory” that includes and admits objects (e.g., technologies) to human and organizational social networks, (Callon 1999; Latour 1987) and considers the *agency* of any member of the network. These collections of people, objects,

1 and organizations are referred to as actors or *actants*. Hence, the network in ANT is a
2 heterogeneous network that contains social and technical parts. Moreover, according to Latour
3 (1987), there are no inherent differences between the social and material.

4 Giddens' Theory of Structuration notes that social life is not just a combination of random
5 individual acts simply determined by social forces. These “macro” level explanations, i.e. social
6 forces, and micro-level activities i.e. individual acts interact with one another. These social
7 phenomena cannot be explained entirely nor solely either as 'micro'-level activities or as 'macro'-
8 level explanations. Instead, Giddens suggests, human agency and social structure are *in a*
9 *relationship* with each other, and it is the repetition of the acts of individual agents, *recursivity*
10 that reproduces the structure implying that there is a social structure - traditions, institutions,
11 moral codes, and established ways of doing things. These structures are dynamic and can be
12 changed when people start to understand them, ignore them, replace them, or reproduce them
13 differently (Feldman and Orlikowski 2011).

14 Rose et al. (2005) critique both Latour and Giddens' positions, arguing that both the
15 structuration and actor-network perspectives are fundamentally lacking in the following ways:
16 Structuration theory disproportionately privileges human agency and discounts technological
17 agency, and ANT treats human and technological agency equivalently, “are seen to go too far in
18 their assumptions of symmetry, and thus as not accounting adequately for differences between
19 humans and machines (Rose et al 2005)”

20 The three theories discussed so far –Ensemble, ANT and Structuration–emphasize and privilege
21 “structure” and equilibrium seeking mechanisms. While CCs are a structure, they are much
22 more fluid. Therefore, rather than treating the Cs as stable structures, it occurred to me that

understanding CCs through a process theoretic lens might provide a deeper understanding.
Deleuzian theory of assemblage is specifically suited for such an analysis.

Process Theory: Concepts from Process Metaphysics (Rescher 1996)

Assemblage is the study of a *process*. From ontological and epistemological perspectives, *process* researchers assume that the reality of material objects is “ultimately comprised of energy that is in an ongoing state of flux and motion. All those supposedly constant things that seem to maintain a continuous identity through the vicissitudes of time and change are, in fact, little more than loci of comparative (and transitory) stability within a manifold of continual change (Rescher, 1996, p. 28).” Stated differently, material and non-material “things” undergo changes all the time, and are better understood as a *process* by examining them in terms of time and change, force, power, contingency, and emergence (Rescher, 1996 p. 31). (*c.f.*, table 4.4.1 for brief descriptions of these process elements.) Adopting this process theoretic lens means that, for the purpose of this dissertation research, the *Competency Center (CC)* is studied as an entity constantly forming, reforming, or deforming – it is never fully fixed, permanent and stable. The CC emerges in real-time while in-use via the transactional nature of its use. Because CCs, like all organizational systems, arise from discursive interactions, and are conducted described via language (e.g., texts), so, an emergent theoretic perspective from the field of linguistics and rhetoric could help inform my understanding and analyzing the two axes of assemblage, *i.e.*, territorialization–deterritorialization, and material–expressive – as forms of organizational discourse.

Table 4.4.1. Process categories adapted from Rescher (1996)

Process Characteristics	Brief Description	Mapping to Research Data
Quantitative features	Answers the <i>easily measured</i> questions, such as: What sort? What kind? How many?	In CC, what are the systems (ERP, BI, and analytics)? How many people?
Thematic Nature	Pattern of actions	Central concepts that are important in CC, mapped to Leximancer concepts.
Relationships	How different levels (macro and micro) are related?	CC's connectedness with different departments and to organizations.
Spatiotemporal	Conditions, locations, time	Where is CC located, What are the conditions under which CCs are formed?
Force/Energy/Change	Temporal structure unfolding over time	Once CC is formed, how it evolves? What gives identity to CCs? What transforms it?

Emergence Theory (Hopper 1996):

In the realm of linguistics, Paul Hopper has developed a fuller Theory of Emergence, and emergent grammars (traditionally treated as structures) (1987; 1988). Hopper's notions have been further transported to the domain of IS and information systems development (ISD) by Truex et al., (1998); Truex & Baskeville (1998); and Chae & Poole (2005) who study these systems as linguistically formed and modified entities. In this body of work, the notion of emergence takes the adjective 'emergent' seriously as a continual movement towards structure, a kind-of postponement or 'deferral' of structure, a view of structure as being always provisional, always negotiable, and as epiphenomenal, that is, at least as much an effect as a cause. As Bybee and Hopper (2001) describe:

The notion of emergent structure has become important in various branches of the sciences in the last two decades. The basic idea is that what may appear to be coherent structure created according to some underlying design may in fact be the result of multiple applications or interactions of simple mechanisms that operate according to

1 *local principles and create seemingly well-planned structure as a consequence. (Bybee*
2 *and Hopper 2001)*

3 A structure that is emergent is not an overarching set of abstract principles, but more a question
4 of a spreading of systematicity, never fully formed always ‘in-process’, hence ‘emergent’. An
5 emergent structure or emergent system is like a story that is in the process of being told, being
6 embellished and reinterpreted with each telling. It is a living artifact, never finished and never
7 fully structured, hence in emergence theory ‘structures’ are referred to as emergent regularities
8 vs. finished structures. For Hopper emergent systems are not abstract entities, but are instances
9 of structuring-in-process taking place in real time, in the linguistic transactions of negotiating
10 understanding and meaning, while encountering and solving real-life interactive problems. These
11 emergent systems are products of transactional interaction, sensemaking and negotiation of the
12 meanings of other assemblages – typically through the vehicle of *language-in-use*.

13 Other *a priori* views of structure often go hand in hand with exclusively cognitive perspectives
14 that attribute structure to individual mental faculties without reference to the social and
15 pragmatic conditions that enable these faculties in the first place. In other words, the world as it
16 is encountered must fit pre-existent models (grammars or architectures) in contrast to the
17 emergent perspectives according to which the model is adjusted constantly in real time.

18 However, emergent theory tries to describe this process in terms that reflects its transitoriness
19 and lack of intrinsic stability, the emergence theoretical perspective does not actively seek fixed
20 units of analysis rather it seeks recurrent patterns that create movement toward a structure.

21 Emergence also seeks to offer a fuller exploration of the role of materiality and contextual
22 constraints within the organizing process. Emergence theory does not view organizational
23 emergence as a primarily rational and consensual process, but as occasions of discourse
24 understood to be power-laden, disputed and subject to unpredictable outcomes.

1 In a Deleuzian approach, consistency and coherence are not qualities that precede assemblages,
2 rather they are emergent properties that do or do not arise from assemblage – i.e., they are not
3 fixed units of analysis. Assemblage is an emergent property formed by processes of multiple
4 interactions among its components- material and expressive. The concepts from Paul Hopper’s
5 emergent grammar provide a way to analyze, understand and describe these interactions within
6 the assemblage.

8 **4.3 Deleuzian Assemblage Theory**

9 In English, the term ‘Assemblage Theory’ is really a rough approximation and translation of the
10 of Deleuzian concepts from the original French. In the English dictionary the word ‘*assemblage*’
11 *is defined simply* as “collection or gathering of things or people, a machine or object made of
12 pieces fitted together, a work of art made by grouping found or unrelated objects (Webster
13 2016).” However the translated word “*assemblage*” derives from the French concept and French
14 word, ***agencement***, a word coined by Deleuze and Guattari (Deleuze and Guattari 1987) by
15 combining two French terms *agencer* and *agence*. In French, *Agencer* means to arrange or to fit
16 together, an arrangement, a configuration or a layout. *Agence* refers to a particular kind of an
17 agency – one without any inherently fixed properties. Thus, *agencement*, or *Assemblage in*
18 *English* refers to the fitting together of the dynamic component parts in a “fluid” agency. It is an
19 agency where the roles, boundaries, responsibilities of agents/actors are continuous versus
20 discrete. Callon and Caliskan(2005) describe a relationship between agency and *agencement* as:

21 *Depending on the nature of the arrangements, of the framing and attribution devices, we*
22 *can consider agencies reduced to adaptive behaviors, reflexive agencies, calculative or*
23 *non-calculative agencies, or disinterested or selfish ones, that may be either collective or*
24 *individual ... (Re)configuring an agency means (re)configuring the socio-technical*

1 *agencements constituting it, which requires material, textual and other investments*
2 *(Callon and Caliskan 2005) p. 24-25.*

3 Thus, agencement is a more active, dynamic, and non-deterministic notion as compared to the
4 simple English dictionary definition of Assemblage as a “collection of things or people”.
5 Therefore, in this dissertation, when I refer to English translated concept, the “Theory of
6 *assemblage*”, I am referring to the fuller understanding of the original French term *agencement*.

7 The *Assemblage (agencement)* emphasizes the complex interactions between the “whole” and
8 “parts” that make the whole. Although characterized slightly differently by different theorists, in
9 *assemblage*, “parts” that make the “whole” are fluid, exchangeable, and can have multiple
10 functions, e.g., components can be “pulled” out of one system, “plugged” into another. For
11 Allan, these “wholes” are a heterogeneous collection of parts but are never “a coherent or a
12 complete whole (Allan, 2011).” While Delanda (2006) sees the assemblage as a whole consisting
13 of many *component parts* and “component part of an assemblage may be detached from it and
14 plugged into a different assemblage in which its interactions are different (Delanda, 2006, p.10-
15 11) ”. The common thread seems to be that **the *assemblage* is more than the collection of its**
16 **component parts. It is a collection of parts that continuously adapt and readjust to each**
17 **other.** For example, organizations are not seamless collections of departments, and departments
18 are not seamless collections of employees and their roles. Interactions that occur between the
19 organization and its departments as well as departments and employees are more dynamic and
20 complex. The notion of “*whole*” being more than a collection of its “*component parts*” is
21 described by Allan (2011).

22 *A UK region like the South East of England, for instance, is made up of bits and pieces of*
23 *state authority, sections of business and any number of partnerships and agencies*
24 *engaged in a ‘politics of scale’ exercise to fix resources and stabilize a geographical*
25 *definition of the region to their advantage. The sense in which there is a regional*

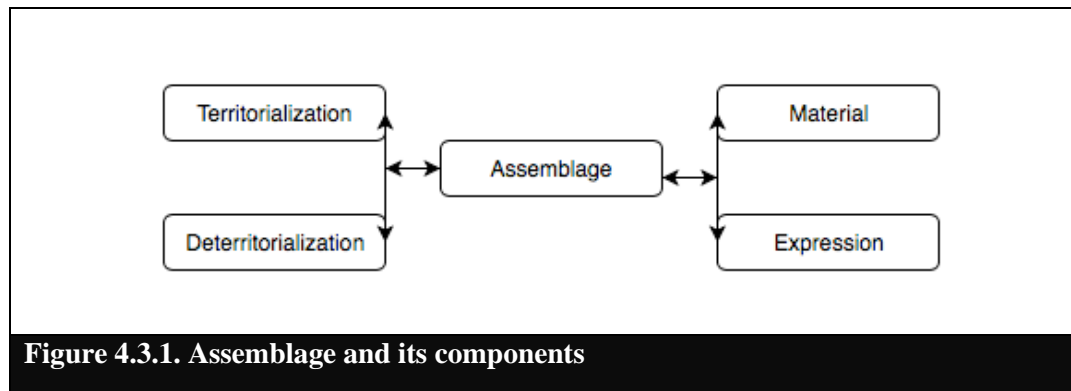
1 *‘assemblage’, however, rather than a geographically tiered hierarchy of decision-*
2 *making, lies with the tangle of interactions between part-private, part- public agencies,*
3 *as well as parts of central, regional and local government ‘lodged’ in the region. The*
4 *interplay of forces between these diverse actors is precisely what makes different kinds of*
5 *regional government possible, but crucially this does not mean to say that the*
6 *arrangement is itself institutionally coherent or without tension.*

7 Allan’s example of a region as an assemblage illustrates that a collection of component parts
8 does not constitute a “coherent whole”. Another example comes from Epp and Velagaleti (2014)
9 discussing the outsourcing of aging parents’ care where, “heterogeneous components such as
10 cultural discourses, experienced tensions, minimizing strategies, resource capacities, and
11 dynamic resources mix to explain how families make sense of choices about outsourcing care
12 (Epp and Velagaleti 2014).” Whether it is a parent care unit, geographical area, or an
13 organization in general, the *assemblage* perspective provides a holistic inquiry into the fluidity
14 and multiple and complex functionalities of these structures. Applying these ideas of *component*
15 *parts* and *a whole* to this dissertation research and its object of inquiry, competency centers,
16 helps us understand that CCs are a collection of heterogeneous parts, such as: employees from
17 different business units, rules and regulations loosely binding these employees, various resources
18 (such as money, energy, time), and infrastructures (such as technology, software, hardware, data
19 collection). While a collection of these parts may identify CCs, they do not explain or define
20 CCs nor their behaviors.

21 **Assemblage: Primary Concepts**

22 The prior section described assemblage as an emergent and “heterogeneous collection of parts
23 without a coherent whole (Delanda 2006).” In the following sections, I explore the interplay of
24 four primary concepts that interact with each other to create an assemblage. These primary
25 constructs are members of two continua. The first is the *material* and *expressive* continuum, and

the second is the *territorialization* and *deterritorialization* continuum (c.f., Figure 4.3.1) (Deleuze and Guattari, 1987, p 88). The *assemblage* is the embodiment of the interaction of these two continua at any given moment in time; that is, a kind of snapshot of engagement captured in time.



The Material-Expressive continuum.

Deleuze and Guattari (1987) describe ‘Material’ as “mechanic assemblage of bodies” and ‘Expression’ as “collective assemblage of enunciation” and present “ship-machine”, “castle-machine”, “hotel-machine” as examples of the material end of the continuum and “death sentences”, “judgments” “law” as examples of the expression ends of the continuum. Other researchers (Allen 2011; DeLanda 2006) have described the *material* as physical objects or logical *things* with which people interact, e.g., such as telephone, city buildings, regions. The material applied to the CC would include information system (ERP modules, e-business platform, Supply Chain Management (SCM) applications, BI analytics), a department (Marketing, Finance, IT department), a legal system and the like. The *expression* represents the responses that people have to the material. For example, a driver sees a stoplight and stops, or sees a police car when driving and reduces speed. In an ES scenario, if an ERP software displays

1 an error message, an expert user might be able to interpret it and take an appropriate action,
2 whereas a novice user might exit out of the current screen or click ‘buttons’ at random. Closing
3 out the current screen or interpreting an error message is a reaction to a material (error message
4 in the system). Both the material constructs and many expressive behaviors are described in
5 formal and informal linguistics artifacts, e.g., laws, employment manuals, ES operations manuals
6 and in social norms transmitted by word of mouth. Within an ES, one example of a linguistic
7 artifact might be a memo from a vendor, indicating that the support for their product is ending.
8 This material, a linguistic artifact, will create reactions (expressions) to diverse stakeholders. For
9 an operations manager, this artifact noting that the support for product might be ending, could be
10 a cause of concern. For employees that were dissatisfied with the product to begin with, could be
11 a cause of relief.

12 The CCs that are in charge of maintaining, upgrading, and extending these ESs, have to
13 understand the importance of these materials and how diverse stakeholders would react
14 (expression) to these materials.

15 **The Territorializing vs. De-territorializing continuum.**

16 Territorialization and de-territorialization continuum refers to continuous, fluid process concepts
17 via which assemblages are formed, deformed and reformed. Territorialization refers to actions
18 that are oriented towards maintaining and reifying existing structures; making structures more
19 rigid and concrete. De-territorialization is taking out a ‘component part’ from the ‘whole’ and
20 *changing* the assemblage. Deleuze and Guattari illustrated the idea of territorialization and de-
21 territorialization through the example of capitalism in their seminal work titled, *Capitalism and*
22 *schizophrenia* (Deleuze et al. 1987):

1 *Capitalism's initial undetermined flows were of course wealth in liquid form (money*
2 *rather than land) and labor-power, such as the mass of serfs that had been forcibly*
3 *"freed" from its previous determination as peasant labor by the Enclosure Acts. This*
4 *process of "de-territorialization" -- detaching labor-power from means of production so*
5 *that it becomes indeterminate "labor-power in general" -- is accompanied by a process of*
6 *"re-territorialization" which re-attaches former peasants to new means of production:*
7 *the looms of the nascent textile industry. Many other axioms have since been added,*
8 *needless to say, in the course of capitalist development: technologies of production, of*
9 *demand-stimulation and taste-management, and so forth. These processes of detaching*
10 *and re-attaching indeterminate labor-power to means of production that are in constant*
11 *technological flux themselves constitute the basic rhythms of capitalist development,*
12 *according to Deleuze-Guattari. Holland (1998) (quoting Anti-Oedipus 257-60)*

13 In the realm of IS, the term ‘electronic concrete’ refers to how some systems lock users into one
14 way of doing things. Deterritorializing references forces and actions that are oriented towards
15 destabilizing the original formation or territorialization. Territorialization and deterritorialization
16 are transactional dynamic forces that take place in everyday activity and sensemaking. Alter’s
17 “Theory of Workarounds” deals with precisely this concept (Alter 2014). In the post
18 implementation ES, the formation of a core team can be an example of territorialization.
19 However, if that team is not given any ‘real’ authority, the team could not function very well and
20 could dissolve, thus de-territorializing. Deterritorialization should not automatically be equated
21 with a negative element. In many cases, deterritorialization is helpful to transform the use of an
22 ERP system from a local specialization to a cross-functional integration. For example, an
23 organization may employ some key ‘core groups’ to manage ERP integration issues, but, if the
24 group structure (territorialization component) is too rigid or unsupportive from the perspective of
25 the different stakeholders, these key users might by-pass the established core group and seek
26 assistance from their coworkers or other sources. This bypassing one group for another is an
27 example of de-territorialization since it destabilizes the ‘assemblage’ of the core groups.
28 However, this deterritorialization, a kind of ‘workaround’ is not necessarily an ‘undesired’
29 outcome.

4.4 Application of Assemblage in this Dissertation

Because the current ES literature, is unclear about how the manner and processes by which CCs acquire their emergent structure (Gallagher et al., 2012; EL Amrani et al., 2012; Granebring & Revay, 2005), I apply assemblage notions to the study of CCs. According to Assemblage Theory, a phenomenon stays in flux due to the dynamic interactions between the material and expression. These interactions are responsible for creating environments where territorialization, deterritorialization and reterritorialization occur.

However, assemblage theory itself does not provide specific techniques or analytic methods by which to conduct a deeper examination of these processes. In order to apply assemblage theory, I turn to *process metaphysics* and emergence theories to recommend ways to proceed using a combination of within-case and between-case analyses. The operationalization details of these analysis methods are described in the chapter five, section seven.

CHAPTER 5 - RESEARCH METHODOLOGY

In this chapter, I discuss the overall research methodology used to investigate how CCs manage post implementation ES. First, I describe the philosophical foundation, rationale and research strategies for conducting interpretive case study. Next, I depict research setting and organization. Finally, I evaluate the research process in terms of the data collection and data analysis procedures.

5.1 Philosophical Foundation

This dissertation is guided by the *interpretive* research approach, which assumes that access to reality is through social constructions, such as language, consciousness, shared meanings, and instruments (Myers 2009). Interpretive methods, in contrast to the assumptions of positivist approaches, start from the ontological position that our knowledge of reality, including the domain of human action, is a social construction where there is no objective reality to be discovered by researchers and replicated by others.(Myers 2009). The ontological perspectives of interpretive research attempt to answer *how are these subjective social realities captured and provide insights?* In interpretive research, researchers attempt to understand phenomena by accessing the meanings participants assign to them (Walsham 1995; Walsham 2006). An interpretive ontology also takes a holistic perspective that perceives “everything and everyone” as interconnected. This connectedness, or shared reality, which is seen to be socially constructed, and cannot be understood through empirical quantitative analysis because there are no predefined

1 sets of independent and dependent variables that can help us understand the shared and socially-
2 constructed reality that is understood through the meanings that people assign to these shared
3 ideas, objects, and communications (Orlikowski and Baroudi 1991). Organizational competency
4 centers are well suited for interpretive inquiry specifically because the concept of “*center*” in the
5 *competency center* itself is a social construct. There is no distinguished physical location known
6 in the organization as a “competency center”. It is a collection of people, *organizing* their
7 understanding of roles and responsibilities.

8 The research design used in this dissertation incorporates multi-site, longitudinal, in-depth
9 qualitative case studies conducted at four different large organizations in three different
10 industries. To understand how the CCs are formed and evolved, I sought to understand the
11 viewpoint of the key stakeholders; they are important decision makers in forming and shaping
12 the CC. Since case studies allow the researcher to become familiar with the data in its natural
13 setting and context (Lee 1989) and allow for a deeper understanding of a particular phenomenon
14 (Lee and Baskerville 2003), I chose the case approach to maximize the richness and accuracy of
15 data, transferability of the findings and to identify central concepts and variables. While premier
16 IS journals routinely publish qualitative research, the numbers have been “disproportionally
17 low”, compared to a quantitative research (Conboy et al. 2012). In MIS Quarterly editorial,
18 Sarker et al. 2013 mention that there is a lack of cohesive logic and method for conducting a
19 qualitative research study. Almost half of (49%) published qualitative research use the very
20 generic label of “case study” (p. x) and do not specify methodological guidelines (p. xi) (Sarker et
21 al. 2013). To avoid this criticism and to be clear about my method, I want to make it clear that
22 ***this dissertation research is an interpretive qualitative process study.*** Secondly, I also want to
23 illustrate why I adopted interpretive research (summarized in 5.2.1) and how I conducted the

study (summarize in Table 5.3.1). Finally, once I discuss the *why* and the *how*, I illustrate the iterative process of data/text coding as well as utilizing the content analysis/latent semantic analysis approach to uncover the concepts to be further understood, analyzed and interpreted (described in details in the later section).

5.2 Rationale for Interpretive Research

In contrast to quantitative studies where the objective is to isolate variables and test hypotheses, qualitative studies aim to examine the broad range of interconnected processes or cause that explores social or human problems and “builds a complex, holistic picture, analyze reports, detailed views of informants, and conducts the study in a natural settings (Creswell 2013).”

Apart from their objectives, qualitative studies also contrast with quantitative in research design, research analysis and research evaluation. Table 5.3.1 illustrates these differences and describes why this dissertation is suited for interpretive qualitative approach.

Table 5.2.1. Positivist Research Vs. Interpretive Research Approach (Adapted from(Schwartz-Shea and Yanow 2013))		
Positivist Research Methodology	Interpretive Research Methodology	WHY? My Justification for Interpretive Methodology for This Research
Research Orientation		
Measurement; Generalizability; Prediction; Mechanical causality	Meaning-making; Contextuality; Explanatory description; Constitutive causality	The objective of this dissertation is to examine under what contexts different forms or governance structures emerge and evolve. Field study in an organization where data governance initiatives have just started provides an excellent opportunity to seek meaning of these structures.
Research Design Elements		

<p>Deductive logic of inquiry; inductive logic as precursor or deductive inquiry</p> <p>Clarity of model</p> <p>Fixed, a priori design</p> <p>Participants = subjects, informants; Researcher = SME</p>	<p>Abductive logic of inquiry; iterative, recursive</p> <p>Dynamic flexibility in implementing of design as learning occurs</p> <p>Participants = agents with valued, evolving, and in-process local knowledge; researchers = experts in processes of inquiry</p> <p>Research as “world-making”</p>	<p>I propose a longitudinal study so that what I learn from the field can be applied to modify the research design and ask more focused follow up questions.</p> <p>Participants for this study have inside knowledge of the organizational processes; they are experts in their respective fields.</p>
Research Process		
<p>Theories→Concepts→hypothesis→variables</p> <p>testing hypothesis</p>	<p>Educated provisional and contingent sense-making; start with prior knowledge > the hermeneutic circle - spiral</p> <p>Investigating</p> <p>Active learning in the field</p>	<p>Based on the prior knowledge from IS literature, initial focus was on formal vs. informal governance structure. After the initial interviews, I became aware that while forming a governing structure there was no clear distinction between formal and informal. With this new insight, I modify the research design to examine the “emergent processes” rather than the types of governing structures.</p>
Data Collection and Reduction Process		
<p>Sampling;</p> <p>a priori concept formation;</p> <p>operationalization of concepts</p>	<p>Mapping for exposure and intertextuality (exposure for multiple interpretations; intertextuality = meaning behind the text; active sense-making through multiple of data sources; “thickness” of interpretation)</p> <p>Bottom-up concept development (learning); Exploration of concept ; Revise design as needed</p>	<p>In Study 1, the notion of BICC is more of a “fluid concept” than a solid structure. The research aims to uncover the how and why the structure of BICC emerge and evolve. In-depth interviews and immersion in the field will help to generate “thick descriptions”. Data generated from the field will be further useful to revise the follow up questions as well as the research design if necessary.</p>
Analysis of Evidence		
<p>Falsifiability</p>	<p>Hermeneutic sensibility; coherence, logic of arguments</p>	
Evaluative Standards		

Validity, reliability, replicability Objectivity	Trustworthiness (credibility, transferability, dependability, confirmability (Guba 1981) Systematicity Reflexivity, transparency; engagement with positionality	Credibility- familiar with the research context, organizations, and participants. Iterative design, debriefing sessions to be more “reflective”. Transferability: transferring data to meaningful context. Context is established through “thick descriptions.” Confirmability – Perspective of “audit trail” is applied to achieve confirmability. All research notes, transcripts, analysis are managed in a systematic way (systematicity). Details of trustworthiness is described in appendix 8.4
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5.3 Research Strategies

Many well-cited research articles and books on how to do qualitative research, such as (Yin, 2003, Eisenhardt 1999) and others reveal that qualitative research starts with the research design strategy, proceeds towards data collection and fieldwork strategies, and finally specifies data analysis strategies. Adapting from Woodside 2010, the table below identifies main themes from these strategies for qualitative study. The table also lists how these respective themes are adopted and used in this dissertation research. (*c.f.*, Table 5.3.1).

Table 5.3.1. Qualitative Research Strategies (adapted from (Woodside 2010))

Strategies	Description	Example from this Research
Design Strategies		
<i>Naturalistic Inquiry</i>	Studying real-world situations as they unfold naturally; non-manipulative and non-controlling; openness to whatever emerges (lack of predetermined constraints on findings).	Observations and interviews while the processes of establishing data governance structure are ongoing.
<i>Emergent design flexibility</i>	Openness to adapting inquiry as understanding deepens and/or situations to change; the researcher avoids	Starting with a flexible interpretive study design and the aim is on the

	getting locked into rigid designs that eliminate responsiveness and pursues new paths of discovery as they emerge.	learning rather than “theory testing.”
<i>Purposeful sampling</i>	Cases for study (e.g., people, organizations, communities, cultures, events, critical incidences) are selected because they are “information rich” and illuminative, that is, they offer useful manifestations of the phenomenon of interest; sampling, then, is aimed at insight about the phenomenon, not empirical generalization from a sample to a population.	For study 1, interview participants that are experts in the area are carefully selected. For study 2, this research aims to study the emergent phenomena.
Data-Collection/Fieldwork Strategies		
<i>Qualitative data</i>	Observations that yield detailed, thick descriptions; inquiry in depth; interviews that capture direct quotations about people’s personal perspectives and experiences; case studies; careful document review.	In-depth interviews and observations in the field during the formation of data governance seek to produce thick description.
<i>Personal experience and engagement</i>	The researcher has direct contact with and gets close to the people, situation, and phenomenon under study; the researcher’s personal experiences and insights are an important part of the inquiry and critical to understanding the phenomenon.	For study 1, all of the participants were available for many follow-up interviews. For study 2, I have a direct contact with high-level executives and key stakeholders.
<i>Empathic neutrality and mindfulness</i>	An empathic stance in interviewing seeks vicarious understanding without judgment (neutrality) by showing openness, sensitivity, respect, awareness, and responsiveness; in observation it means being fully present (mindfulness).	Willingness of participants to be available for interviews for multiples of rounds suggest that as an interviewer, I was respectful and aware of the participant’s situations.
<i>Dynamic systems</i>	Attention to process; assumes change as ongoing whether focus is on an individual, an organization, a community, or an entire culture; therefore, mindful of and attentive to system and situation dynamics.	It is possible for organizational change could occur, for example, one of the key participants may leave the organization. I will pay careful attention to all of the emerging issues.
Data Analysis Strategies		
<i>Inductive analysis and creative synthesis</i>	Immersion in the details and specifics of the data to discover important patterns, themes, and interrelationships; begins by exploring, then confirming, guided by analytical principles rather than rules, ends with a creative synthesis.	Longitudinal case study allows me time to immerse in the research settings. Careful observations and in-depth interviews will be analyzed using multiple methods (explained in details in the analysis section.)

<i>Holistic perspective</i>	The whole phenomenon under study is understood as a complex system that is more than the sum of its parts; focus on complex interdependencies and system dynamics that cannot meaningfully be reduced to a few discrete variables and linear, cause- effect relationships.	Interview will be based on multiple levels of employees in organizations.
<i>Context sensitivity</i>	Places findings in a social, historical, and temporal context.	Studying a formation of governance structure “as it happens”.
<i>Voice, perspective, and reflexivity</i>	The qualitative analyst owns and is reflective about her or his own voice and perspective; a credible voice conveys authenticity and trustworthiness; complete objectivity being impossible and pure subjectivity undermining credibility, the researcher’s focus becomes balance.	The researcher self-reflection notes will be incorporated throughout the analysis process. Refer to the observation notes in the appendix.

5.4 Research Settings

Site Selection rationale and IRB protocol

The sample selection required that the study sites would only include firms that were relatively mature in their use of ERP systems and were not organizations just completing or recovering from the implementation of a new ERP. Accordingly, I limited the sample to firms with operational ERPs or other ESs for more than five years and which were dealing with post-implementation and BI integrations issues, or firms that had made a transition to more comprehensive use of these systems.

Once the candidate organizations and informant types were identified, I submitted to Georgia State Universities Internal Review Board (IRB) approval process to comply with all the research protocols for conducting research involving human subjects. GSU IRB approval was granted in March 2, 2012 and data collection began the following month. IRB approvals are granted in an annual basis, since the data were collected over three-year period, I renewed the IRB protocol with GSU each year after 2012.

1 The sampling was opportunistic in the sense that organizations participating in the study are
2 headquartered in the US Southeastern region. Via my own academic and professional
3 affiliations, I attended the America's SAP User Group (ASUG) Atlanta chapter, a prominent user
4 group for technical and business users of SAP, through which I developed business contacts with
5 perspective organizations and requested site access. As I made connections with ERP manager-
6 users, many of whom were members of other ERP user groups and industry related associations,
7 other potential sites were suggested to me by those interviewed. This created a 'snowballing'
8 aspect of the sampling approach (Miles and Huberman 1994). Seven organizations signed on
9 and participated in the interview process. For this dissertation, however, only four prominent
10 organizations, two in public higher education and two large fortune 100 organization were
11 selected as the focus of this dissertation analysis (Figure 5.4.1)

12 Before starting the data collection, I obtained the signed copies of IRB protocol that protects the
13 anonymity of the informants, highlights the role of the researchers and confirms the willingness
14 of the participants to share data and to permit observation. The protocol also specifies that the
15 participating organizations have access to the key findings, recommendations, and other research
16 reports. Both the participants and the researchers, prior to the start of data collection, signed the
17 protocol. Details of the data collection and analysis procedures are provided section 5.7.

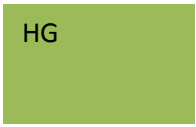
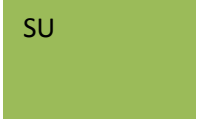
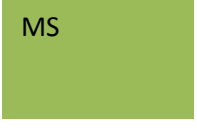
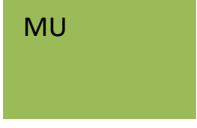
	Vendor-Led & Formal	Vendor Neutral & Informal
Established	 Context = Fortune 100	 Context = Education
Abandoned	 Context = Fortune 100	 Context = Education

Figure 5.4.1. Multiple Case Study Design Based on Yin (2003)

- 1 HG=Home Goods; MS=Material Supply; RU= Regional University; MU= Metropolitan
- 2 University (Descriptions of these sites are listed in 4.4). Successful = functioning CCs;
- 3 Abandoned = Non functioning or defunct CCs.

4

5 5.5 Research Design

- 6 In earlier sections, I described the rationale or goals for the qualitative study and strategies to
- 7 achieve those goals. The process of my dissertation research is summarized in the Figure 5.5.1.

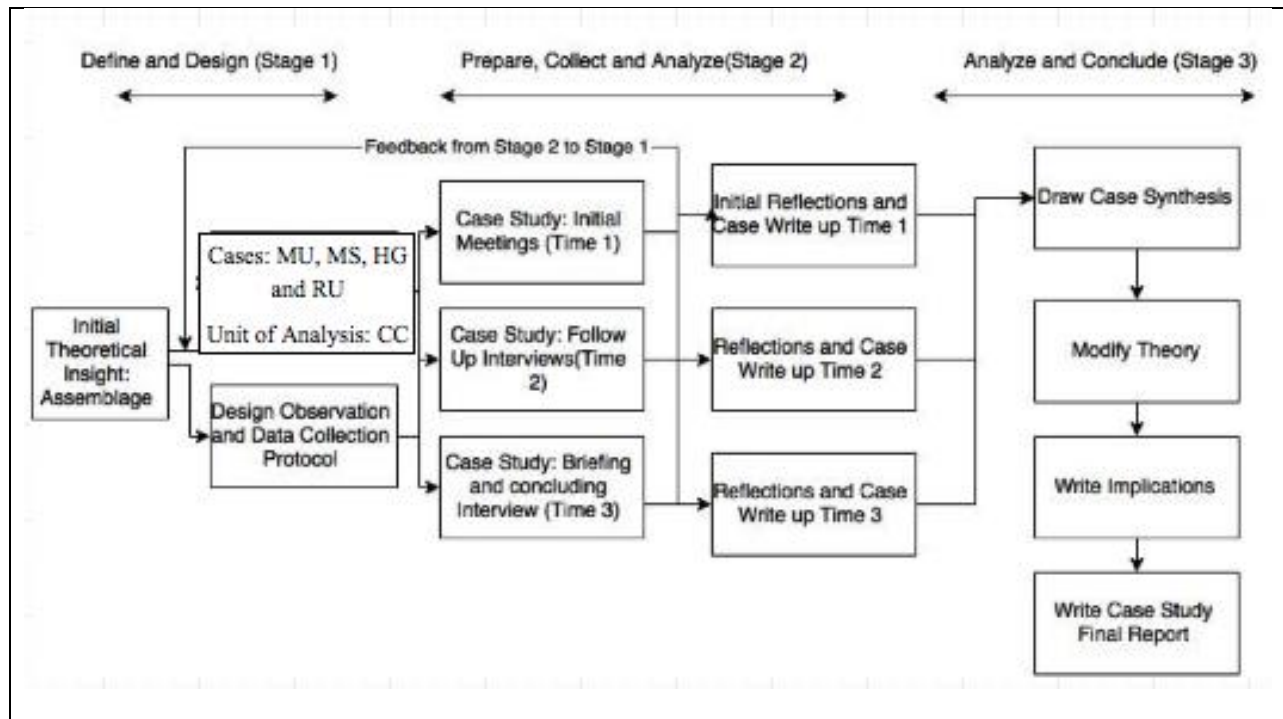


Figure 5.5.1. Research Process Design adapted from Yin (2003)

1

2 **5.6 Case Study Organizations**

3 In this section, I introduce the four study organizations and describe the stage of development of
4 their ES when I began this study.

5 **Material Supply (MS)**

6 MS is a home improvement and supplies store chain selling tools, construction products and
7 services. It was formed in the late 1970s in the southeastern part of the US with one store, and
8 within a year it opened four other stores. Within a decade, MS surpassed sales of one billion
9 dollars and carried more than 30,000 products in each store. During the 1990s, MS continued to
10 grow and reached sales of over \$20 billion, making MS one of the fastest growing retailers in the
11 world.

1 By the mid-2000s, MS had grown into a Fortune 100 company. It had stores in all 50 states in
2 the US, Canada, South America, and China. MS has more than 2100 stores and more than
3 300,000 people employees worldwide. During the mid-2000s when MS was experiencing a
4 tremendous growth, the technical platforms with homegrown legacy systems were in need of
5 replacement. MS had initially selected Lawson as an ERP System, but later dropped it in favor
6 of SAP. The partnership with SAP was announced with great fanfare in one of the annual
7 industry meeting called SAPPHIRE, where diverse stakeholders from the SAP ecosystem gather.

8 The partnership was seen as a “win-win” because prior to MS, SAP did not have a great foothold
9 into the large retail industry; MS also gained expertise from a leading enterprise software vendor.
10 SAP would contribute to MS’s multi-year strategy to implement standardized systems and
11 platforms and build a robust IT infrastructure. The CIO of MS indicated that MS wanted the very
12 best technology available to bring new solution that will provide better choices and services to
13 their customers. What the CIO meant is that while MS is a large retailer, integrating the whole
14 supply chain within SAP will enable each store to carry unique products and provide services for
15 that specific market.

16 MS invested in building a solid “center of excellence” with people from inside MS, SAP and
17 consulting partners to help manage the implementation and post implementation of ERP. After
18 initial success in implementing SAP in MS’ Canada market, MS tried to replicate that success in
19 the US market. However, that effort in the US, despite getting help from SAP, and various
20 integration partners, resulted in a failure and a retreat from a full integration of stores and
21 company-wide implementation of SAP. Within a few years of the US implementation, the entire
22 “center of excellence” was dissolved and the enterprise systems were replaced once again with

homegrown systems. This case retrospectively examines the initial formation, evolution and eventual dissolvent of the “center of excellence” in MS.

I began the study of this organization after the initial “center of excellence” was discontinued and the major mid to upper management employees were reassigned to different business units, or employees had left the organizations.

Metropolitan University (MU)

MU is a large urban university in the southeastern US with the student population of more than 30,000 and more than 4000 faculty members. To support the technology needs of the students and faculties, MU has very diverse and complex technology platforms across the campus where large volumes of diverse forms of data reside in various platforms and increasing very rapidly every year. The primary department responsible for technology at MU is Technology Support (TS), headed by a Chief Technology Officer (CTO). TS supports emails and storage, network infrastructures, classroom technologies and IT security. However, other departments such as financial (payroll), financial aid (student financial aid), auxiliary department, and registrar also have a variety of large volumes of mission-critical data. Moreover, MU has more than 15 major schools including school of business, school of law, and school of education. These major schools have segregated data and IS to support their unique business requirements. For example, the School of Law is mandated to have a system integrated with the State Bar Associations. Similarly, the School of Education has to provide reports to the State Education Board. In this case, the School of Education does not want a system that generates unique reports to the State Education Board to be integrated with the main IT systems that are implemented university-wide.

1 Around 2012, a grant for a data analytics program was initiated to improve student graduation
2 rates. A student retention model was built that identified at-risk students, and key stakeholders
3 identified to provide appropriate intervention in order to increase student retention and
4 graduation. While this particular grant program was successful, MU saw an opportunity to do
5 much more. New positions such as Chief Data Officer (CDO) and Chief Innovation Officer
6 (CIO) were created to further the analytics agenda. Currently, there are formal and informal
7 meetings ongoing within different departments throughout the school to establish a governance
8 structure to support this agenda. This dissertation research starts with the observations of these
9 meetings and followed up with three rounds of interviews with six key stakeholders.

10 **Home Goods (HG)**

11 Home Goods (HG), headquartered in a major city in the southeastern United States, is an
12 internationally known, publicly traded company with brand recognition. HG produces a
13 portfolio of residential and commercial products, such as decoration, storage, waste
14 management, and tools among many others. HG was founded in the 1900s as a manufacturer of a
15 single *decoration* product mostly supplying to then super retailer- Woolworth. HG sees itself as a
16 technology and product improvement driven company. Within a few years of its existence, HG
17 invested heavily in manufacturing technology and focused its efforts in producing better quality
18 products. The partnership with Woolworth allowed HG to push its product nationwide.
19 Until the mid-1960s, HGs growth was organic. After the mid-1960s, HG began to focus on an
20 expansion by acquisition philosophy to build a broad-range, multi products company, and went
21 public in the early 1970s. Experiencing rapid growth in the 1970s, HG continued its growth by
22 acquisition strategy in the 1980s and 1990s when it acquired even more diverse companies. The
23 largest merger in HG's history remains the late 1990s acquisition of another large producer of

home products for close to \$6 billion dollars, which more than doubled the company's size. With its large portfolio of products, HG seeks to get a better advantage when dealing with big box stores. HG is still growing with international operations in Latin America, Europe, China and India, and HG's portfolio of product is growing as well. The specific challenges to Enterprise Systems in HG are twofold: first, it needs the ability to quickly implement, deploy, and utilize new systems; second, the newly deployed system needs to integrate with other existing systems and leverage it for data analytics. To set the groundwork for the analytics solutions, HG upgraded its data warehouse and completed a successful SAP NetWeaver BW 7.1 rollout with its largest business unit. The implementation affected 27 sites and a large portion of the more than 4,000 SAP users at the company. After the SAP NetWeaver BW implementation, the foundation is established for company-wide projects involving reporting and analytics. The company has about 1,400 active SAP users who run at least one report every 30 days, while others run weekly or daily reports. Out of those users, approximately 400 are using SAP Business Objects BI tools. This dissertation starts by examining HG's established "competency center" and during HG's large scale initiatives in deploying large ESs and continually utilize for BI and analytics.

Regional University (RU)

Regional University (RU) started out as a junior college in the early 1960s, but now is the third largest university in a southeastern state, located outside of a major metropolitan city. RU offers more than 100 undergraduate and graduate degrees, including a doctoral program. Most students at RU come from the surrounding population, however, the university also enrolls students from more than 120 different countries.

In the 1970s and 1980s new buildings were added and the curriculum expanded to accommodate

expanding undergraduate degrees, graduate programs, and student enrollment. RU also grew via mergers and consolidations. One example of such growth is RU's merger with a mid-size engineering school. With its increasing enrollment, a commitment to high academic standards, and a growing array of excellent academic programs, enterprise systems in RU are continually evolving. One of the challenges for integration and utilization of these enterprise resources are collaboration across different departments. To meet these challenges, RU has established an "Enterprise Systems and Services" department. Within this department, an informal committee acts as a "center of excellence". This dissertation seeks to gain insight as this informal unit evolves to meet the new challenges.

5.7 Data Collection Procedures

Table 5.7.1. Study Organizations and Informants			
Organization	Participants	1st round	2nd round
Case 1 Home Goods (HG): Global Producer and marketer of consumer and commercial portfolio of products. HG has successfully implemented SAP modules and performed BI and Analytics functions via SAP HANA. HG was established more than 75 years ago. Through many acquisitions, HG has seen significant growth in the last 25 years.	Director of IT, Division Finance VP	April 2012	April 2013
Case 2 Regional University (RU): Major southeastern university with student population of more than 24,000. While established more than a 100 years ago, student population has increased from 18,000 to 24,000 in the last 20 years.	CIO, Director of ES	April 2012	March 2013
Case 3 Material Supply (MS): Established in 1970s, MS started out as a small store. Now MS has more than 2,500 locations in North America and is larger still with its international operations. It was an SAP 'Lighthouse Partner' and its implementation project was one of the largest and most	Director of IT Senior Project Manager	April 2012	April 2013

celebrated SAP project success worldwide in this business sector, having implemented SAP in more than 300 stores in one non-US setting.			
MU: Major southeastern university with student population of more than 30,000. Major initiatives in the past few years to boost the student graduation rate using data analytics have put the spotlight on data governance and analytics issues.	Chief Data Officer, Several Departmental Reps.	December 2012	March 2014

The semi-structured interview questions used in this research were designed to solicit the participants' recollection of the formation and evolution of CC in their own words without "guiding" them. When offered additional evidence, in the form of diagrams, policy documents, and organograms were also collected. Where possible, these data were augmented by publicly available documents. The publicly available documents included white papers published by the study organizations and professional publications such as *CIO* and *BusinessWeek*. These publicly available documents presented two problems; first, these documents clearly identified the study organizations. As a result, I had to spend considerable time anonymizing these documents. Second, I use the previously published articles, and then there would be a danger that I would reveal the study organizations in my citing those sources. To avoid these problems of citation and anonymity, I asked clarifying questions to the study participants. The participants provided either written responses via email or phone calls. For this research, I have used the direct documentations provided by the participants. The transcriptions have been annotated and enriched by referencing these additional data. The annotated notes and transcripts were refined through the further discussions with study informants.

Observation: Personal interviews and internal documents were the main sources of data.

Secondary data came from observations made on-site and from the review of secondary sources.

Interviews were recorded for later transcription, and I kept extensive notes.

Interviews: Mason (2002) suggests that interview questions should be restricted to specific questions; however, the questions should not be rigid. Following Mason's guideline, a semi-structured questionnaire based on research framework was created before the first entry into the research site.

Secondary data: Secondary data were mostly in the form of documents, such as archival company documents regarding IS, vendor presentations, and other similar documents. Email communications with collaborators, competitors, vendors, and customers were also served as a source of secondary data. If a company had internal message boards where employees participated (as in the case for MU), were also a secondary data (Kozinets 2002). These secondary data provided a contextual background as well as to serve as a starting point for this study. Currently, I have collected more than 3000 pages of these secondary data. For this dissertation research, I have only analyzed the documents that were directly produced via written response or verbally commented via phone calls. Reviewing the rest of these data might present a new research direction as well.

Digital audio recording and transcription: Prior to any audio recording, I read the consent form to the participants and had them sign it. For the data recording, I found smartphones to be the most effective devices. From my observations, when using digital recorders or other recording devices, some of the participants became more aware of the device and seemed more reserved. However, a smartphone seemed to naturally belong in the table and participants seemed more relaxed and willing to open up. Based on this observation, I used a smartphone as the primary recording device, and the interview data were immediately uploaded into the cloud provider dropbox.com for storage and safekeeping.

Hand written Notes: Handwritten accounts of participant observations, discussions and interviews were documented in the researcher's notebook.

Computer/Tablet Notes: Where possible, I used a small laptop computer or a tablet device for note taking. There are two major advantages of using a tablet device. First, it is easier to transfer the data to a qualitative research analysis tools such as nVivo. Second, the built-in microphone in the tablet can be used as a backup recording device.

5.8 Data Analysis Procedures: Within-case and Cross-case analyses

Cases are examined as using within-case and cross-case techniques. The textual material was subjected to multiple forms of analysis: axial coding, latent semantic analysis and classical content analysis.

The 'within-case' analysis utilizes the theoretical concepts from process metaphysics, while the cross-case analysis is analyzed via assemblage theory. The within-case analysis is a preparatory step for the cross-case analyses. The primary purpose of within-case analysis is to become intimately familiar with the data and with each case as a stand-alone entity. Furthermore, the within-case analysis identified key process elements, and data patterns from each case, thus providing a solid foundation for the cross-case analysis. Once the key processes were identified, they were examined via the concepts from assemblage theory in the cross-case analysis. The purpose of conducting the cross-case analysis was to identify and investigate similarities and differences between the cases along two dimensions: vendor neutral vs. vendor-led CCs and established functioning CCs vs. abandoned or nonfunctioning CCs.

1 A generic depiction of my data analysis approach diagrammed as a three-staged, multi-method
2 approach is found in Figure 5.8.1. This approach allowed for a kind of triangulation and
3 facilitated further analysis of the discovered categories. My initial coding during T₁ was informed
4 by my research questions and the concepts from assemblage theory. Thus I did not take a
5 Grounded Theory approach in this analysis. However, when issues were found to emerge from
6 the data they were not ignored. The richer, ongoing interpretation was folded into my analysis.
7 The definitions of the concepts from Assemblage Theory were the focus of my early analysis.
8 Having established an initial set of broad categories of assemblages, I further drilled down
9 during the second stage, T₂, of coding using latent semantic analysis. With the aid of a software
10 tool, Leximancer, I identified common themes and idioms arising in the respondent's narratives.
11 The third stage, T₃ is a synthesis and re-examination of the data (See Fig. 11).

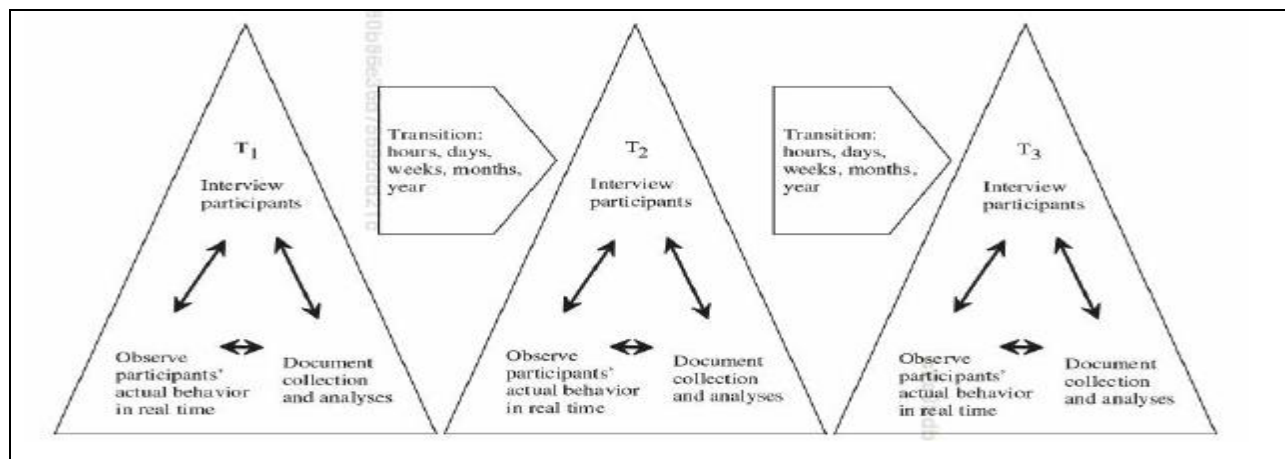


Figure 5.8.1. Iterative data collection and analysis method (Adapted from (Woodside 2010))

12

13 **Overview of the Analysis Method:** I conducted the Interviews later transcribed, cleaned, and
14 annotated the MS Word files. The annotation is a basis for manual concepts coding and assists in
15 later validation of the machine coding and the synthesis of discovered concepts. The data
16 processing was divided into three parts: coding procedures (sorting), data reduction techniques

(categorizing), and drawing conclusions (mapping). Coding procedures dealt with strategies to handle the semi-structured interview data as well as the more open-ended interviews and documents. Interviews were coded using “Open Coding (Glaser and Strauss 1971)”, which enables the examination, comparison, conceptualization, and categorization of data. I mapped the results of the open coding concepts to the theoretical concepts of *Assemblage*. The Analysis also deployed software machine coding, using both Leximancer, and nVivo. I utilized nVivo as the main research database that contains all research related files, such as recording, manual coding, interview notes, and secondary text documents. Leximancer’s latent semantic analysis generated themes, and interpretations of those themes provided further insights, which might otherwise have been missed (Crofts and Bisman 2010). The technique is described more fully below.

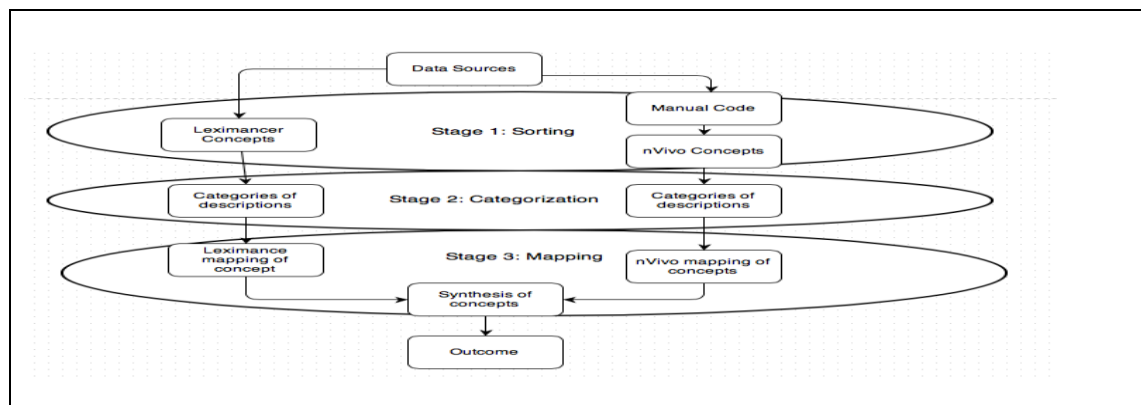


Figure 5.8.2. Overall Data Analysis Process utilizing Leximancer and nVivo (Adapted from (Penn-Edwards 2010))

Content Analysis

Content analysis is a method for extracting the contextual meanings and concepts from text documents. I performed a specific type of content analysis called *Latent Semantic Analysis (LSA)*. The first step in LSA is to read an input text file. In doing so, the researcher typically

transforms words that contain many spelling variants (e.g., organize, organization, organizing, etc.) into “word stems” – so that various grammatical and spelling variations are recognized as having the same meaning. The second step is the creation of a document matrix-vector – which is comprised of two elements: words and documents being analyzed (see Figure 5.8.3). Documents are anything with a “semantic structure” that an analyst seeks to interpret. For example, documents may be abstracts from research papers, blog posts, or advertising copy.

Word frequency		Documents			
		D1	D2	D3 . . .	D _N
	Word 1	1	0	1	0
	Word 2	0	1	1	0
	..				
	Word _N	1	0	1	0

Figure 5.8.3. Document Matrix

The third step in LSA is dimension reduction. The document matrix yields a large vector that needs to be reduced to smaller sets of meaningful concepts. One of the simplest and powerful dimension reduction approaches is Singular Value Decomposition (SVD). SVD is based on linear algebra, details of which are explained in earlier studies (Landauer et al. 1998; Martin and Berry 2007). SVD finds the obvious patterns and trends within the document matrix by analyzing which words frequently appear in specific documents (frequency count), as well as other words that often appear nearby (known as *co-occurrences*). These patterns are then presented as concepts.

While there are many available software tools for performing LSA, a popular and recognized tool within the IS and computer science literature is *Leximancer*. Several IS studies employing this toolset

1 have recently appeared (Crawford and Hasan 2006; Debusse and Lawley 2009; Mindel and
2 Mathiassen 2015; Ridley and Young 2012). In Leximancer, concepts are identified via words that are
3 weighted according to how frequently they occur within two-sentence “chunks” of text containing the
4 focal concept, compared to how frequently they occur elsewhere. The concepts then are clustered into
5 higher-level themes. The themes are comprised of concepts that appear together often in the same
6 chunks of texts. Leximancer provides results in the form of “overall” visual maps, where the analyst
7 can view the concepts, sub-concepts (keywords used in creating a concept), or themes (see Figure
8 5.8.4). Once the initial overall map is created, the analyst can change the theme size to adjust the
9 grouping of concepts on the map. For example, in order to select fewer but broader themes, or
10 conversely, to drill down into more detailed themes, the analyst has the ability to select the
11 desired level of granularity.

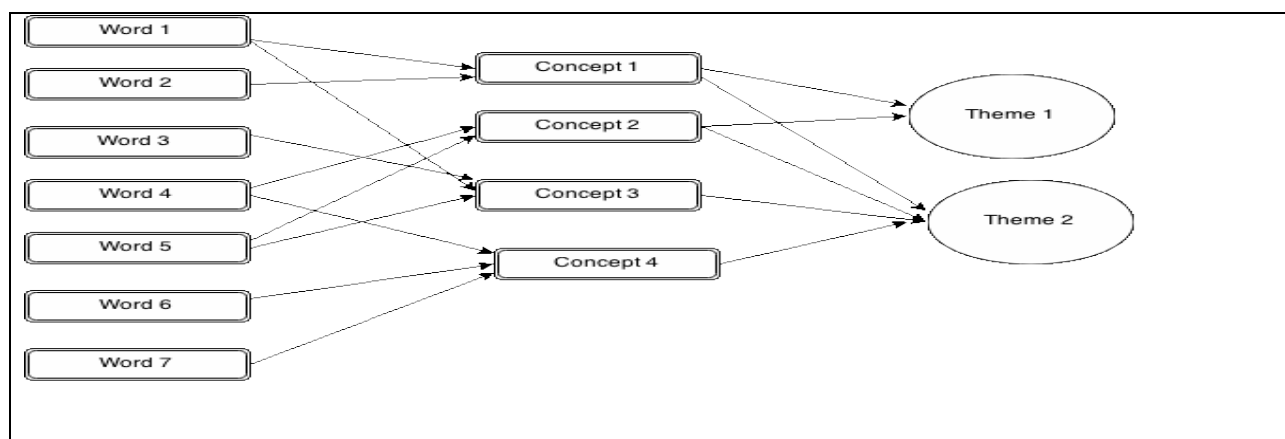


Figure 5.8.4. Leximancer processing: transforming words to themes

12

13 Leximancer produces visual diagrams, with certain key terms appearing in different-sized
14 circles. Not only is the size of the key term important, but the color of the circle encasing it is
15 important as well. Specifically, the “hot” colors (hues including red, orange, and yellow)
16 depict that the theme has a stronger relationship with the concepts (many or similar concepts

1 clustering to make a theme).

2 The strength of Leximancer is not merely the identification of concept tokens and patterns,
3 but in its ability to query, retrieve and further drill down into the texts. During this process, it
4 helps in identifying and excluding from the analysis extraneous terms and false concepts. Of
5 course this is an iterative and human guided process, and the researcher, like a pilot using fly-
6 by-wire guided avionics, manages the entire research process system-machine and manual-
7 and is responsible for the interpretation and sense-making of these analyses.

9 **5.9 Roles of the Researcher**

10 One of the primary tasks of the research is to devise a data collection procedure (Denzin and
11 Lincoln 2011). In qualitative research, data is mediated through the researcher, and analysis is
12 bound up with explaining, coding, categorizing, and writing about that data; in contrast to
13 quantitative research where data are collected through inventories, questionnaires, or machines
14 (Alvesson and Sköldbberg 2009). Since a researcher is an integral part of the data, the role of the
15 researcher, specifically personal values, assumptions and biases, need to be identified at the
16 outset of the study (Maxwell 2012).

17 Following Maxwell's guidelines, I want to clarify my own motivations, biases and experiences
18 as they relate to this research. I served as a technology consultant, mainly dealing with large
19 systems integrations. I have worked in small and large organizations across different industry
20 segments. I am also a member of many professional organizations such as the Organization for
21 Data Professionals and Americas SAP User Group (ASGU), Atlanta chapter. The complex and
22 sometime chaotic environments of organizations have always fascinated me. I seek "rationale"

1 from this chaos; the possibility of studying complex issues in a real business environment
2 motivates me. While this eagerness may seem like a negative researcher trait, I believe that these
3 experiences enhance my awareness, knowledge, and sensitivity to the issues being addressed in
4 this study and have assisted me in working with the key participants. If I can make no claim to
5 “objectivity”, I can warrant that a set of formal and transparent sets of procedures for data
6 collection and analysis are at the heart of this research. I devised a systematic way of collecting,
7 coding, analyzing, and presenting research data. In the process, I provide readers the ability to
8 interrogate the research data, analysis process, and the research findings. These efforts should
9 help the reader to trust the efficacy of this research and rationale behind my findings.

10 The researchers’ role has also been described as etic (outsider observer) or emic (insider
11 participant). There are variations of this, for example, in Walsham and Sahay study, researchers
12 initially started out as outside observers, but as the research progressed their role became more
13 insider participants (Walsham and Sahay 1999). In these study organization, I remained an
14 outside observer.

16 **5.10 Chapter Summary**

17 This chapter describes the set of ontological and epistemological assumptions underlying this
18 dissertation. This dissertation is guided by the *interpretive* research approach, which assumes
19 that access to reality is through social constructions such as language, consciousness, shared
20 meanings, and instruments. Interpretive research has its own logic and design, and this chapter
21 illustrates *why* I adopted the interpretive research approach and *how* I conducted the research.
22 Research were carried out in four large organizations over a three-year period. The bulk of the

- 1 data for the research were participant interviews and documents. Transcripts from the interviews
- 2 were coded in nVivo as well as utilizing the latent semantic analysis approach to uncover the
- 3 concepts.

CHAPTER 6 – WITHIN-CASE PROCESS ANALYSIS

In this section, I describe a two-pronged approach to the data analysis. First, in a linear case-by-case basis, I describe the CC structure for each of our cases, paying attention to how they are situated ('becoming') within in each organization as well as identify the links the CC has to various business units. Second, data are mapped to the five process-characteristics of 1) quantitative features, 2) thematic nature, 3) relationship, 4) spatiotemporal, and 5) force, energy and change. The process characteristics mapping allows and analysis of a CC not as a fixed organization, but as an organizing unit ever in the process of becoming but never fully fixed. The emphasis of organizing vs. organization implies that CCs are in-process and emergent units. The primary objective of this within-case analysis is to illustrate that these CCs are not defined stable structures, but always in-process emergent organizing constituents.

6.1 Home Goods (HG)

HG operates in a formal CC environment where the CC has a clear vision, and there are established positions and career paths within CC for employees. The CC was created through a formal chartering process initiated by the CIO and CEO. The founding principle behind the CC was that it would govern deployment, development, and support. The clear goal for HG's CC is to consolidate to a single instance of SAP throughout the organization and achieve a team composition within the CC including more business people than IT. In this organization, membership in the CC is seen to be career enhancing and is a sought-out posting. In choosing

1 CC members there exists a formal application and interviews process aimed at recruiting talented
2 people having business savvy.

3 *“While some departments or even countries [departments operating in the foreign*
4 *countries] are in development mode, others are in post-implementation use mode, CC*
5 *manages both environments. Our goal from the get goes was to get business on SAP. Get*
6 *people into one common platform.” (KR-Director of IT)*

7 Once people are recruited into CC, they are referred to as “business process champions” and
8 these employees go back to their respective departments and carry out the agenda for the CC and
9 represent their unit to the CC. It is like being in dual Ambassadorial roles.

10 *“Prospective members are nominated from the departments, interviewed and selected*
11 *based on the fit. There are separate career paths for the employees. These employees are*
12 *crucial to the success of CC, essentially they are the “bridge” between the department*
13 *and CC. In our CC, we have mostly business and some IT people in CC: between 300-*
14 *500 members.” (KR – Director of IT)*

15 The CC established clear guidelines for applications integration as well. Once the corporate
16 decision was made to have a single instance of SAP running across the organizations, employees
17 were encouraged not to deviate from SAP.

18 *“KR [director of CC] and his Boss and the organization says we are going SAP and*
19 *anything which deviates from SAP is not necessarily a rogue application, but needs to be*
20 *very well vetted.” (MM – Finance VP)*

21 In this formal structure where the goals of the CC are clear, there are established roles and
22 responsibilities for employees. However, the successes of the CC arise not merely from the
23 structure but the interaction between different BU and informal relationships employees’ form.
24 For example, according to MM, the Finance VP, *“We rely on relationship these business process*
25 *champions have within their department to promote the cause for CC, which is one of the*
26 *reasons, we insisted on having more business people in CC than IT people. For the big job, we*
27 *do have to go through a formal process. However, RJ has established enough credential to get*
28 *many things done just by having gentleman’s agreement.”*

1 The next section proceeds with analyzing the process characteristics of CC in HG.

2 **Process Characteristics**

3 Quantitative features:

4 Measurable features of the CC in HG include the number of SAP modules, numbers of BI
5 systems implemented, and types and number of members. HG has all SAP modules
6 implemented:

- 7 1. Financial Modules: Financial Accounting (FI), Controlling (CO), Investment
8 Management (IM), Treasury (TR), Enterprise Control (EC).
- 9 2. Logistics Modules: Material Management (MM), Sales & Distribution (SD), Production,
10 Planning & Control (PP), Product Data Management (PDM), Quality Management (QM),
11 Plant Maintenance (PM), Service Management(SM), Project Systems (PS)
- 12 3. Human resource management Module: Personnel Management, Organizational
13 Management, Payroll Accounting, Time Management, Personnel Development, Training
14 & Event Management
- 15 4. Cross Application Module: Workflow (WF), SAP Office.

16 In addition to all SAP modules, HG utilizes SAP BW as their BI platform for the entire
17 organization. The CC comprised of business and IT personnel fluctuates between 300-500
18 members. Initial implementation project started in 2006 and go-live 2007.

19 Themes

20 The thematic nature of the HG CC as derived from the Leximancer analysis of concepts is shown
21 in figure 6.1.1. Main concepts emerging in the HG are: Business, System, Time, and followed by
22 Data and, BI and BI-like systems.

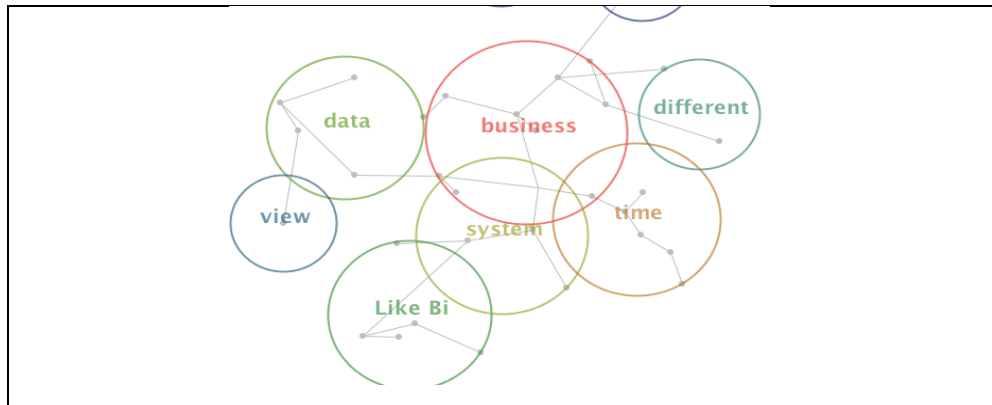


Figure 6.1.1. Concept-Map from Content Analysis of HG Transcripts and Documents

- 1 The concepts described in the Figure 6.1.1, are comprised of several key sub-concepts. Table
- 2 6.1.1 lists theses sub-concepts.

Table 6.1.1. Themes Derived from the Content Analysis - HG

Themes	Sub concepts	Example
Business	Organization, information, people, project, use	"A business analyst is a person who is in the IT organization, who understands the business. Simple, he understands business."
System	Information, training, organization	"How do we manage enterprise systems in organization?" "Make them ready for the new system. Make sure training we provide is working."
Time	Report, project, use, upgrade	"Zero down time" "Timely report" "Time to upgrade"
Data	Center, company, structure	"We don't want to be a data center" "We are 6 billion dollar company with 15 terabytes and growing data"
BI	Data, analytics, people	"As soon as SAP went in, we started to get BI and analytics out of it."

- 3 *Business* is used in many overlapping contexts. In some instances, the theme of business relates
- 4 to the business analyst (people), in other words, it is in the organizational context.
- 5 Overlapping of the concepts *business* and *Systems* implies that they share some common sub-
- 6 concepts. The sense of *Time* is not just chronological; it is used as a phase as in "upgrade time",

or to indicate urgency, a “timely report”. *Data* are used in contrasting ways, on the one hand, operational or maintenance of *Data* are trivialized indicated by the quote “We don’t want to be a data center”, on the other hand, *Data* is a how a company is described, “We are 6-billion-dollar company with 15 terabytes and growing data.”

Spatiotemporal

The spatiotemporal aspect of the CC deals with issues such as the location of CC and conditions under which CCs are formed as well as CCs during different phases i.e. implementation and post implementation. The CC in HG is formed under the authority of the CIO, but the general agreement is formed between the CIO and CEO, more formal and informal arrangements with the CIO, technical leads and other departments such as Sales, are also formed. The importance of the CC is indicated by its inclusion in the charted between the CEO and CIO. However, it is not a “heavy handed” approach as MS allowed the respective department to manage the operationalization of the CC.

“CIO and CEO put it in the charter to have a single instance of SAP. Competency Center is under the charge of CIO.” (RK1)

Once the CC is established, it remains intact during the implementation and post implementation phases.

“CC has responsibilities for both project phase and support phase. It’s easy to say I am not going to support you anymore because I am in a project mode. You still have to provide support.” (RK)

Relationship

Leximancr analysis revealed that concepts of business, systems, time and data are closely related (refer to the theme Figure 6.1.1). In this section, I analyze the relationship of people inside the CC, the relationship of the CC with other business units, and relationship of the CC with the

Vendors. In HG, both the business and IT employees work side by side, fostering the collaborative relationship inside the CC. This collaboration is promoted by upper management as evident by the charter created by the CEO and CIO. The upper management directive alone cannot accomplish the goal of collaboration; CC then has to carry out that “mandate” by creating several alliances with other departments.

“The result paramount to everyone in the C-staff, good information and timely information... We crafted a document, as here is a list of priorities, here is a list of activities. And that document is shared between the Chief Sales Officer and the Chief Information Office. They agree on that and say Ok, yeah that makes sense, now we have work to do. We got to put teeth into it by creating a living breathing constitution that will change quite frequently.” (Steve)

Force, energy and change

The key stakeholders that give identity to CC are known as Business Process Champions (BPCs). These BPCs create and maintain a continuous relationship between IT and the business units.

“We have key people know as business process champions. These are people within the business who report into the business, but they are ours kind of IT champions into the business.”

BPCs not only create an outward link from CC to the business units but also set up and maintain links to upper managements and CIO in the organization.

“They (BPCs) will be always connected to our systems and they will know when there is a problem in the system. So that is the first kind of contact for the business people, they will contact the BPC or the business process champions who then contacts the CIO group.”

The above quote further reaffirms that MS left the operational decisions to the business and IT units. IT together with business unites created the procedures for handling any systems issues that arises in their respective units.

Responsibilities for BPCs change or evolve as the ES moves from a project phase to implementation and post implementation.

“When they are in the project mode they are assigned to the IT side. Once the project mode is done and they are running on their own they go back to the business. They are business people for the project. The payment comes from the IT side. After the project they go back to the business.”

Despite formal procedures to establish and run the CC, it is constantly evolving at HG. The CC in project phase is different than in implementation phase and different than in post implementation and maintenance phases.

Summary of HG Process Analysis: At first, the CC in HG seemed to operate in a formal environment with the formal initiation processes and with established clear goals. HG had formal vetting procedures to enroll and promote ES human resources. However, these formal procedures were not strictly adhered in practice; informal relationships were important factors in getting “many things done by just gentlemen’s’ agreement”. The managers that were responsible for running the CCs had other “official jobs”, for example, KR was the director of technology. The fluidity of the environment is highlighted by the fact that our informant realized that rules that govern CC must be a frequently changing, a “living Constitution”.

6.2 Regional University (RU)

RU operates in a semi-formal CC environment where there are established positions within the CC; however, the interactions among different actors are not clearly defined or regulated. The initial attempt to create a more formal and permanent CC was unsuccessful. After careful evaluation, upper management noticed that a well-formalized process stifled creativity and innovation.

1 *“Because when we were looking at trying to get a formal governance structure, we got a*
2 *pushback from all over the campus. That’s exactly the reason we had those informal*
3 *structures are in place and people felt threatened because we were trying to formalize.”*
4 *(DW – Director of ES)*

5 Committees are transactional units, existing only as long as it needed to get the work done.

6 However, the learning and social relationships developed during these transactions endures and
7 inform further evolution of the CC.

8 RU has one main IT department responsible for university-wide IT infrastructure, application
9 and services and each college has its own separate smaller IT department. Each of the IT
10 departments in the organization is entrusted to collaborate and form partnerships as needed to
11 facilitate effective and efficient operations and find appropriate resolutions as issues arise. These
12 relationships are recognized, even called ‘committees’ locally, but are temporal, coming and
13 going, as circumstances demand. As the CIO of RU explains this phenomenon:

14 *“Because we built informal relationships one to another within the organization, I don’t*
15 *feel like I need an SLA with DW (Director of ES) to get the things done and I hope DW*
16 *feels the same way about me.” (DE – CIO)*

17 This semi-formal environment permits dynamic CCs to be created, evolve, and/or disbanded as
18 necessary. An example is the relationship established between Enterprise Systems & Services
19 (ESS) and Enterprise Information Management (EIM). ESS is the IT department responsible for
20 supporting the ERP and other administrative systems within the organization. EIM is responsible
21 for BI system and fulfilling the reporting requirements from the various systems. As technology
22 emerged within the organization, the need to collaborate was recognized which afforded the
23 opportunity for ESS and EIM to engage the management teams from both areas in an open forum
24 to discuss ideas, upcoming changes, and new initiatives. Meetings are tentatively scheduled each
25 month but the decision to meet depends on the current situation or projects underway.

1 *“Beginning of each year we call a meeting called Management by Objectives for all our*
2 *employees and one of the things that I wanted to implement is that all assistant directors*
3 *regularly meet and exchange ideas.” (DE – CIO)*

4 While this initiative is an example of a formal approach arising from a high-level meeting, but
5 how the initiative is finally implemented is not formal at all.

6 *“One of the assistant directors, Assistant Director of the Web group reaches out to all the*
7 *different people that are involved in the web development across the campus and pull out*
8 *those people together as a group. He has taken a pretty unique approach, he calls it is*
9 *Donuts and Development. Quite simply, it is a meeting to discuss issues while eating*
10 *donuts. He pulls those people together on a regular basis and gets into a collaborative*
11 *project or pull together or works with us (CC).” (DW – Director of ES)*
12

13 Another example of a semi-formal CC is the establishment of a Project Management (PM) office
14 within ESS. There are three other IT groups within the organization in addition to ESS. Each of
15 these IT groups has differing responsibilities ranging from supporting the campus network and
16 infrastructure to assisting with the research computing needs of the academic departments. This
17 semi-formal CC was formed to provide project management planning and services across the IT
18 division through the ESS department.

19 The PM office within the ESS substitutes for a formal Project Management Office (PMO) for the
20 entire organization and provides support for major IT division projects. This center also
21 facilitates project manager meetings across departments to aid in sharing IT project-related
22 information throughout the organization.

23 *“The advantage of having the flexibility to have informal CC without having to seek*
24 *formal governance approval greatly enhances the organization’s ability to distribute*
25 *information more readily and respond to issues more rapidly. The semi-formal*
26 *competency center structure is well suited to our organizational culture and works well*
27 *in our environment.” (DW– Director of ES)*

The compromise between the formal and informal CC results in a semi-formal CC. The directors felt that while this semi-formal CC was not originally intended, it allows RU to be more flexible or agile.

Process Characteristics

Quantitative features:

At RU, the CC includes Enterprise Systems & Services (ESS) supporting the development and support enterprise level applications such as the Student Information System, the campus scheduling system, the campus document repository, the student housing portal, and the university website. The ESS is supported via various platforms such as Banner, Oracle-PeopleSoft, ADP, SAS business analysis. RU does not have tight integration of BI and Analytics systems with ERP and other operational systems. Data from these operational systems are often extracted in SAS and used for BI and analytics. ESS is comprised of five main divisions: project management (PM), Database Administration (DBA), Webgroup (WG), Application Development (AppDev), and Application Support (AppSupport). The CC is responsible for the organizational management of hardware and software service, IT security and Audit, web and client serve application service.

Themes

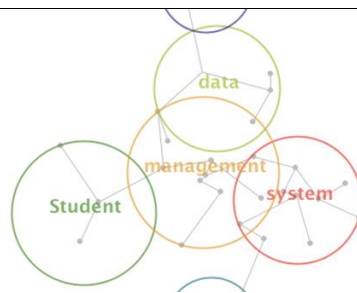


Figure 6.2.1. Concept-Map from Content Analysis of RU Transcript and Documents

- 1 Themes derived from the Leximancer analysis of transcripts and documents at RU are Student,
- 2 System, Management, and Data.

Table 6.2.1. Themes Derived from Leximancer Analysis - RU

Themes	Sub concepts	Example
Student	project, decision, structure	“Student Information systems”, “BI reporting on student”
System	Student, payroll, university	“university system”, “payroll system” “when the student advising system went live, we implemented more BI capabilities”
Management	project, information, structure, governance	“Even without the governance structure in place, ES management works well in RU”; “project management”
Data	level, physical, structure	“SAS is a meta-data server in between the between the physical data structures and the physical BI system”

- 3
- 4 The theme *Student* is one of the main themes from the RU Leximancer analysis. *Student* is
- 5 described as a central stakeholder for these enterprise systems such as the “student information
- 6 system” or the “BI systems” for students. The *Management* theme generally describes the
- 7 following two aspects: the act of managing projects and information, and management as it
- 8 relates to the organizational guidance, and unit (governance structure). The *Data* seem to
- 9 emphasize the design, implementation, and management of data within specific systems.

10 Spatiotemporal

- 11 The space time aspect of CC deals with issues such as the location of the CC and the conditions
- 12 under which these CCs are formed, as well as the evolution of CCs during different phases i.e.
- 13 implementation and post implementation. In RU, CCs are formed within a permanent structure
- 14 of the organization, Enterprise Systems Services (ESS).

1 *“We all said to ourselves; why not build that (CC) right into the organization as a*
2 *permanent structure.” (ED-CIO)*
3

4 While that (CC) structure might be seen as a permanent unit by these participants, they struggled
5 to provide a description of this structure.

6 *“We don’t have a formalized name for it. I think Eric was meaning when he said that*
7 *types of things that will normally take place in a designated competency center if we had*
8 *it were actually taking place out here” (WD-Director of the CC)*

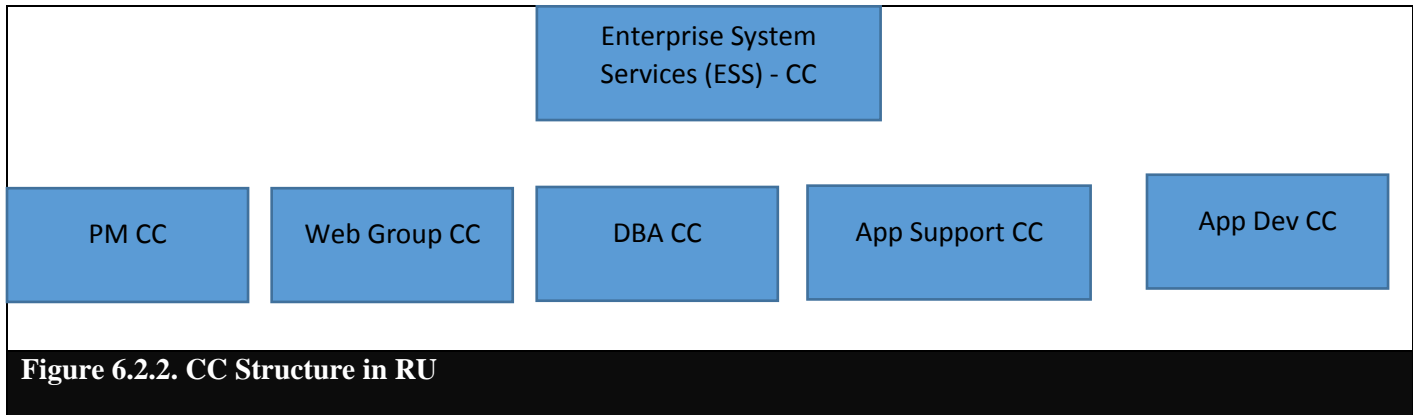
9 The participants tried to define CC via its purpose (“things that will normally take place in a
10 designated CC”). However, this purpose for the CC depended on the spatiotemporal settings
11 such as: when the Board of Regents (BOR) hands them the mandate (“when the decision was
12 made for us”), when ESS are providing support to the university units, or when the CC need to
13 provide reporting back to BOR. There seems to be too many competing settings so RU had to opt
14 for a more general definition to allow for the flexibility.

15 *“ADP was just dropped on us. We were not in a position. It was a surprise for all of us if*
16 *I recall correctly, that was a shock. We had just made all of these adjustments, changes*
17 *to get into ORACLE and PeopleSoft, and then all of sudden, Wham!! Somebody at the*
18 *Board of Regents completely up-ended this.” (WD-Director)*

19 Even when the CC is described as a “permanent” structure, that perception of permanency seems
20 to be shifting when examined through the spatiotemporal lens.

21 Relationship

22 In this section, I analyze the followings: relationship of people inside the CC, the relationship of
23 the CC with other college units, and relationship of CC with the BOR. In RU, there are only five
24 dedicated employees in the CC within ESS. These key employees are selected based on their
25 “overlapping interactions” with the other business units. Five subgroups of CCs are also created
26 under the main ESS CC. These five subgroups of CCs collaborate with others. The CC
27 representation in RU is depicted below.



1
2 *“What we are trying to do is build multiple competency centers around the different*
3 *areas on the campus so we make sure that we are maintaining the campus as it exists*
4 *(WD).”*

5 In this multiple CCs settings, one member from each of the “sub” CCs is also an active member
6 of the main CC. This arrangement creates the relational links between the ESS-CC and other sub
7 CCs.

8 Force, energy and change

9 The key stakeholders that were instrumental in the formation of the CC in RU were the CEO,
10 CIO and a few upper-level IT managers that report directly to the CIO. The relationship between
11 the the CIO and ESS director was key to forming the CC. In the “formal” structure of this CC,
12 the relationship between these key individuals is quite informal.

13 *“Because we built informal relationships within the organization, I don’t feel like I need*
14 *an SLA with WB to get the things done. And, I hope WB feels the same way about me.*
15 *(ED)”*

16

17 To foster this informal and cohesive working environment, RU promotes people who have
18 overlapping interactions with other units into the CC. This informal and friendly work
19 environment is noticed by other units around the campus.

20 *“VP of Operations and CIO approached my boss about getting a formal PMO office*
21 *place and set it up duplicating what we have in ESS-CC. Within my department I have a*

1 *project management group and I have encouraged them and they have started up regular*
2 *monthly or bi-monthly meetings with different project managers around the campus.*
3 *(WD)”*
4

5 Adding another unit i.e. operations, represent a significant change in the RU CC. The upper
6 management at the ESS-CC relies on people to create and maintain these informal relationships
7 to foster the growth of the CC.

8 **Summary of RU process analysis:** The research participants described that the RU’s CC
9 operates in a semi-formal environment where positions within the CC are established but not
10 well-defined, and wherein the interactions were not regulated. However, the CC was not
11 “planned” to be an informal entity, rather it was born out of the rejection of a previous formal
12 structure. The original desire was to recreate a formal structure. This desire to adhere the
13 protocols idea of a formal structure is always present in the RU CC. This desire is highlighted by
14 the fact that while research participants stressed the importance of informal and relationship
15 aspects of CC, these informal interactions and relationship building activities always occurred
16 within clear formal conventions such as monthly meetings and other established interactions
17 between other BUs.

19 **6.3 Material Supply (MS)**

20 The project that initiated the CC in MS was slated to be SAP’s single biggest implementation in
21 the retailing industry worldwide. At the time, although SAP was the market leader in ERP
22 software, SAP did not have a strong market-leading presence in the retailing industry. Hence,
23 SAP had a vested interest in making the collaboration a success. In fact, they named this firm a
24 ‘Lighthouse Partner’ and provided unprecedented support from the headquarters in Germany

(SAP AG) and the US region (SAP US). In this relationship where both organizations had high motivations to make it a clear success, at the same time, both organizations were new to each other. Thus, MS preferred to operate in a formal and canonical CC environment.

“We were going to get ERP to one shot implement processes here, now this is going to become 80% of our development as a company. It’s going to be SAP, so we want to have a CC” - CH

“SAP led the initial structure and ideas were how to move beyond project team and be sustainable as a support structure. In that structure we had few people from SAP and we also had consultants.” (DT - Director of IT)

Given the sheer scope of the project, MS did not have enough internal expertise; thus, it relied on SAP and consultants to fill many roles within the CC, which numbered over 600 people during the height of the implementation. While the project team implemented the ERP, during post-implementation, most of the CC employees went back to their previous positions and the CC team shrunk to fewer than 50 people responsible for all ERP support, bug fixes, updates and new initiatives.

“We had a big CC, there were a lot of contracts we took on. We had more than 600 people out of which 150 were contractors. I managed like half the development for that and my counterpart managed the other half.” – CH

Once MS was familiar with the CC, MS tried to recruit more people from within the organization and reduce the reliance on consultants. The size and composition of the CC kept fluctuating. At the same time, some consultants were offered jobs and brought into the firm, but these hires did not know the business from the inside out. Not only was the structure of the CC emerging, but the relationship between players was quite dynamic as well.

“Key individuals were taken out of the business verticals. These people were well trained, usually came from consultancies and knew how to work with finance and end users. When this project moved into post production and they (cc employees) disseminated back out to their verticals and reported in.” (HC- Senior PM)

When the implementation project was complete, employees went back to their business units or left to work on other ERP implementation projects. The result was a breaking of the desired “link” between the CC and the business units.

Process Characteristics

Quantitative features:

At MS, implementation of the Financial modules of SAP (FI) began in 2000 with a 2001 go-live. Financial Modules include Financial Accounting (FI), Controlling (CO), Investment Management (IM), Treasury (TR), and Enterprise Control (EC).

In addition to all SAP modules, MS utilizes the followings: CRM solutions with Siebel, Teradata, Micro Strategy and several custom developed systems. The CC staff, numbering over 600, are principally drawn from the business, the IT function, and from the consulting partners. From the sample group of the organization, MS is the largest in terms of gross revenue and number of people employed.

Themes

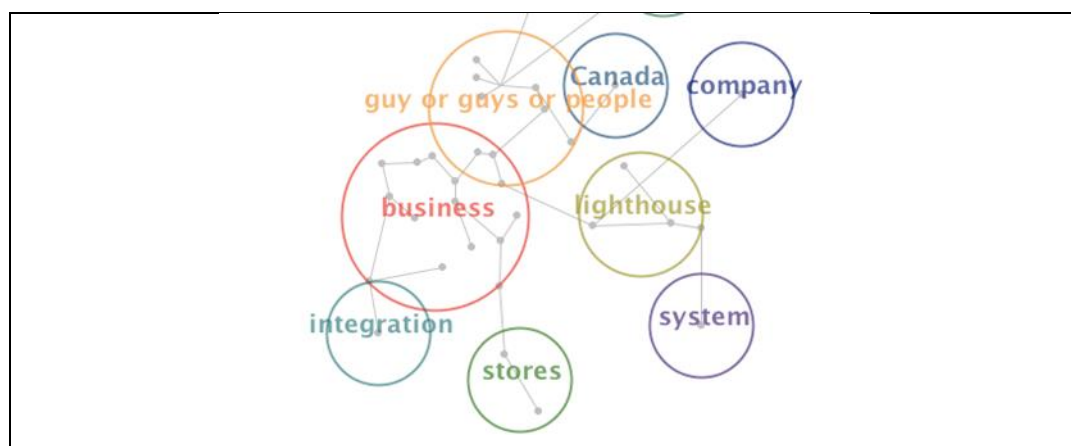


Figure 6.3.1. Concept-Map from Content Analysis of MS Transcript and Documents

- 1 The primary themes derived from the Leximancer analysis are: Business, People, Canada,
- 2 Lighthouse.

Table 6.3.1. Themes Derived from Leximancer Analysis - MS

Themes	Sub concepts	Example
Business	Model, level, project, different	“The configuration teams are kind of like hybrid. They are hybrid business because in a lot of model they would be considered business, but they are configurators because they could only configure the system.”
People	formal, informal, enterprise	“We have an informal structure, but there is formal structure has been standardized over years because they have people who have worked together for 16-18 years because they inherited this from the predecessor.”
Canada	store, center, team	Initial center was just for Canada to support the stores there.
Lighthouse	Replacement, time, system	“Merchandising system was written in the early ‘90s. So the CIO knew rightly that we cannot continue to live on that merchandising system and compete. The quickest way he saw to overcoming that was to replace with a world class ERP like SAP. So we then became a lighthouse account for SAP.”

- 3
- 4 The *Business* is described as reference to phrases such as the “business model” or the “business
- 5 configuration”. *Business* is also described as the collection of people as in “people who have
- 6 worked together” in the business. The *People* theme is comprised of other terms such as *guy*,
- 7 *guys*, and *employees*, and describes the relationship types (formal or informal) and types of
- 8 employees such as contractors, vendors and partners. The starting point for the CC for MS was in
- 9 Canada where more than 300 stores were implementing the SAP ERP. Thus, the theme *Canada*
- 10 is a prominent theme with connections to such words as *center* (“Competency Center in
- 11 Canada”) or *stores* (Canadian Stores). Finally, the *Lighthouse* signifies the importance of the
- 12 partnership MS has with SAP in an effort to replace its legacy system with the new ERP system.
- 13 Spatiotemporal

1 The Space time aspects of the CC in MS deal with issues such as the geo political location of the
2 CC and conditions under which these CCs are formed as well as an evolution of CCs in different
3 geographic locations such as Argentina, Mexico, Canada, and the USs.

4 In MS, the CCs are formed under the authority of the CIO in collaboration with the key business
5 units and the vendor (SAP). MS's Initial SAP implementations of limited modules in Argentina
6 and Mexico were successful. MS wanted to replicate this success in Canada on a much bigger
7 scale (for example, MS had only handful of stores in Argentina and Mexico but over 300 in
8 Canada). MS with the help from SAP formed the CC just before implementing SAP in Canada.

9 *"SAP Led to the initial structure that reports directly to the CIO. How do you move from*
10 *a project his big to a sustainable support team? While Canada had a large project team,*
11 *Argentina and Mexico were in post-production and had slimmed down version of the*
12 *project team to support them.' TD*

13
14 With the newly formed CC in charge of the implementation of SAP modules in Canada, those
15 implementations were successful. The participants attributed the success to their previous
16 experience in Argentina and Mexico.

17 *"What we were doing in Argentina was more of an experiment. Then we were going to do*
18 *pilot into Canada and eventually US." CH*

19
20 However, MS could not replicate the success in Canada in the US.

21 *"We were a lighthouse partner, we were at the bleeding edge with that whole SAP Suite.*
22 *Implementation in the US was under-estimated. **It was a failure.** When you sign up for*
23 *bleeding edge, you can't decide later that I'm going to stop investing because you are on*
24 *that edge. You got to wait till that software meet you in. So that's another thing to*
25 *consider as far as operational costs...when you go aggressive in the version....in the*
26 *functionality this new....there is an operating tail that accompanies that if you didn't*
27 *make subsequent decisions to lower your investment, you fall off the cliff." (CH)*

28 From an interpretive research perspective, it is interesting that *space* is not limited to the physical
29 space. In the case of MS, the physical space of Argentina, Canada, and the US represent different
30 *phases* of experiment, pilot, and full implementation respectively. The *Metaphorical* spaces

mentioned by the participants such as cliff and edge represent the firm's position in the system development curve.

Relationship

In this section, I analyze the followings: relationships of different stakeholders, headquarters upper management, consultants, and vendors. In MS, there were over 600 employees in the CC. These key employees were selected from different business units, outsourced partners, implementation partners, and from the vendors.

"Basically the way that they were structured, and I still believe that it is the right way to do is key individuals were taken out of the business verticals." (TD)

"These people were well trained, usually came from consultancies and knew how to work with finance and end users," (CH)

"We worked on the various projects over the years together and tried to make sure that we were working together to make sure that the projects were being successful and trying to push architecture as much as we can, but because we didn't work in the same organization, so it's definitely an informal relationship. We trusted each other. We knew what the goals of each other were and so we worked together." (JD)

The employees selected from different business units joined the CC for a period and went back to their respective business units, creating the link between the CC and the business units. However, once out of the CC and into their BU, these employees did not have any formal obligations to further the CC's agenda. Thus, the links created by the flow of employees in and out of the CC were not fostered or furthered.

To go backwards to '90s when I learned SAP with the castles metaphors. The individual castles throwing the fireballs over the walls. Basically those are your functional areas. MS, in the business area, still lives by that model and, you know, for an SAP CC model, you can't live that way. If you can't get past the fact that that you in finance and that you in merchandising have to work together and your castle gates have to be opened." (TD)

1 Force, energy and change

2 The key stakeholders instrumental in the formation of the CC in MS were the CEO, CIO and a
3 few upper-level IT managers that report directly to the CIO. The background story on ES
4 selection process illustrates the rapidly changing business decision making process in MS.
5 Initially MS were not clear on SAP solutions. Traditionally, MS always purchased systems and
6 heavily customized to fit the need of the organization. The notion of “best of breed” promoted by
7 SAP was unfamiliar to MS.

8 *“We were not looking for an ERP system. We were looking for a financial system. We*
9 *were looking more for ledger and matching. That's really what the focus was. There's*
10 *kind of mention I think in that true and we looked at some of BAAN. We were primarily*
11 *an IBM shop - big main frame. That's what we are looking for. We settled on*
12 *Lawson. We signed contract with Lawson. We ended up breaking the contract with*
13 *Lawson.” (TD)*
14

15 MS found itself in the middle of a tension filled organizational drama where the tie with a long
16 time partner had to be severed and an association with a new vendor needed to be formed
17 quickly. When MS identified SAP was the vendor of choice, the CC in MS began strengthening
18 this hastily forged new relationship by promoting SAP in MS, and communicating business
19 knowledge to SAP and the implementation team. However, SAP methodology was quite
20 challenging to MS and met with some resistance. Lack of business experience of the consultants
21 was another force that contributed to the change in the CC.

22 *“It had some false starts in there too. A lot of these SAP things you're two steps forward,*
23 *three steps back.” (CH)*

24 The negative energy of the frustration is apparent in the research participant as he describes the
25 missteps with SAP within MS.

Summary of the MS process analysis: The research participants described MS's CC as rooted in a strong formal structure. Initially, in MS, both the upper management and the ES vendor, shared a common interest in and motivation for creating a formal structure. However, the MS-CC could not sustain a formal structure and stability for any length of time for the following two reasons. First, in their CC MS had a large number of employees entering and exiting the CC, and could not establish a lasting and effective long-term formal or informal relationship with BUs. Further, the effort to establish formal processes and procedures were met with strong resistance from the seasoned mid to upper-level managers who were accustomed to the informal communications and reporting practices. Second, MS did not triage and retire many of the old, beloved but home-grown IS applications. MS was forcing the CC to support too many disparate systems thus creating loyalty factions within the CC. These two factors were significant in changing the shape of the CC from its intended formal structure. The informal relationships and practices were so strong in MS that the CC eventually abandoned the SAP conceived and collaborated CC in favor of creating its own CC specifically asked to manage homegrown systems.

6.4 Metropolitan University (MU)

MU operates in a semi-formal CC environment. This semi-formal environment is different than the CC in RU. Recall, that in RU formation of the CC was formal, but the *positions* and the *interaction among various actors* were informal. In MU, there is no identifiable and defined CC; however, stakeholders from student information systems (Banner), Payroll (ADP/PeopleSoft), Finance and auxiliary department have created a "committee" that can be called as a *phantom CC*.

1 The journey towards creating the CC in MU begins with the need to fill the mandate from the
2 Board of Regents (BOR), the governing body for all state colleges and universities. The BOR
3 required state colleges and universities to implement a system to collect financial and student
4 data from all these public schools.

5 *“The Board of Regents many years ago decided that what they wanted was a mechanism*
6 *by which they could report to their superiors. So obviously they needed something that*
7 *amalgamated data from 34 or 35 schools. At that time everyone had their own systems.*
8 *So it was a nightmare, they collected flat files and put them all together and built their*
9 *data structure. They used that for reporting. Well they did a number of translations, they*
10 *are ETL, Extract Transform and Load was heavy on the ‘T’ and it meant that they had*
11 *some different rules and so their numbers would be off slightly from ours. The Board then*
12 *decided to invest in the Banner and the PeopleSoft.” - CG*
13

14 Implementing these systems and providing the reports back to the BOR became challenging for
15 MU for the following two reasons: the BOR’s general view of MU as a singular entity, and the
16 exclusion of important stakeholders in the selection process of these particular systems. First,
17 from the BOR’s perspectives, schools including MU are a singular entity and BOR expects the
18 consolidated report from these schools to be comprehensive and cohesive. However, within one
19 university, there are many schools such as Nursing, Business, Law, Education, and others. These
20 schools are operated in a more autonomous manner.

21 *“A good example is the College of Education. They maintained a number of these*
22 *shadow systems. That's the kind of stuff we don't like to see. We were disappointed that*
23 *they felt the need to do that. However, I recently learned something that actually raised*
24 *them up in my esteem somewhat. They kept a lot of data in Excel spreadsheets. I thought*
25 *that's terrible. Why would you do that? You have Banner, a huge transactional system*
26 *with a complex data structure. Put it in there. It turns out, they were actually mandated,*
27 *there's that word again, the mandated. The Georgia Department of Education gave every*
28 *single teacher education program in the state a set of these Excel spreadsheets.” CG*
29

30 Second, BOR’s decision to select these particular systems was met with some confusion from the
31 MU stakeholders because MU were under the impression that the systems would be selected for

1 the *efficiency* and *integration* not for being the “best of breed”. The research participant CG
2 quipped, “***Best of breed is quite dangerous if that breed is a Pitbull.***”

3 Once that system is implemented, the group maintained its relationship to each other and formed
4 an informal relationship. Even in this informal relationship, the communication process and other
5 processes such as RFP remained formal.

6 *“We do have and if you go over to the IT side, we are very structured. This is not in just*
7 *dealing with spectrum, together with IT, in order to get through, you have to first, you*
8 *submit your, what do they call it, project, proposal, whatever it is, and it goes through the*
9 *approval process of the committee and there it gets ranked, and all those things as far as*
10 *what order, what they consider as important, and then that's how it works based on the*
11 *importance set by the committee.” (BSP)*
12

13 Even with this formal process in place, decisions are facilitated via informal relationships
14 between employees. The participant, EJ describes, “*Relationships to other employee matters.*
15 *You have the official organizational chart and process on paper, **but sometimes, you know who***
16 *to call.*”

17 In MU, the infrastructure, IT services, and desktop application issues are the responsibility of the
18 main IT department. In addition to the main IT department, several colleges within MU have
19 their separate and smaller IT departments. Each of the IT departments in the organization is
20 entrusted to collaborate and form partnerships as needed to facilitate effective and efficient
21 operations and find appropriate resolutions as issues arise.

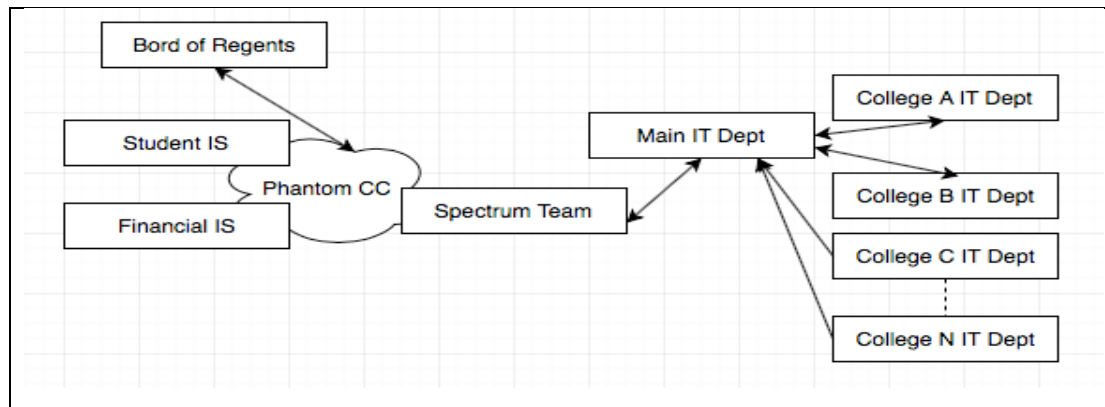


Figure 6.4.1. The Competency Center in MU

The BOR requires MU to provide reports from Student IS and Financial IS. The responsibility of providing reports falls on the upper management within the Student IS department, the Financial IS department and sometimes the Spectrum team. Stakeholders from these three departments often create an ad-hoc CC team, named *Phantom CC*. The Functional People in the phantom CC are enrolled from Student IS and Financial IS, while technical people are enrolled from the Spectrum team. This phantom CC is responsible for connecting with the BOR and other business units in MU.

Process Characteristics

Quantitative features:

The suite of Enterprise Systems in MU consists of Banner, ADP, PeopleSoft, and MU Mart (pseudo name). Banner is an ERP system for educational institutions that assists colleges and universities in recording and maintaining data for their students, employees, alumni, and donors. Banner is an Enterprise Resource Planning (ERP) System that runs on an integrated database system. Banner ERP software solutions consist of five modules: Banner Student, Banner Finance, Banner Human Resources, Banner Financial Aid, and Banner Advancement. MU has implemented only the Banner Student module. The responsibility of maintaining Banner

lies with multiple business units, for example, software and hardware are supported by the Main IT, and the reporting capabilities are developed and deployed by the Spectrum team.

The Spectrum team is responsible for the support and maintenance of three web-based administrative software applications, **PeopleSoft** Financials (version 9.2), **ADP** (Human Resources Management System) and **MU Mart** (e-procurement system). The purpose of these applications is to enhance the University's business processes, utilize BI functionalities by providing summarized and detailed data that is easily accessible through queries and reports, and maintain a reliable and secure database.

The Financials System, better known as 'Spectrum Plus', consists of the General Ledger, Commitment Control, Accounts Payables, Asset Management and Purchasing modules. ADP (Automated Data Processing) is comprised of Employee Self Service (ESS), EV5, and eTime applications and MU Mart consists of Higher Markets and Total Supplier Management.

Themes

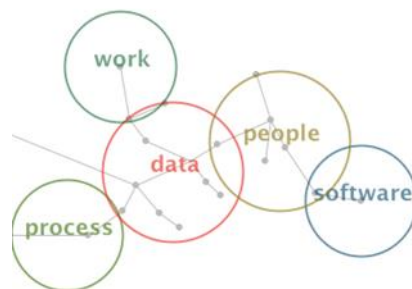


Figure 6.4.2. Concept-Map from Content Analysis of MU Transcript and Documents

Themes derived from the Leximancer analysis are Data, People, Process, and Work.

Table 6.4.1. Themes Derived from Leximancer Analysis - MU

Themes	Sub concepts	Example
Data	Use, information, enterprise, silo	“We long have recognized the fact that data or information both data is the building block from which information is constructed and that’s essentially what our office does.”
People	Use, unit, information	BOR said, “I’m happy because the people at the MU gave me a daily download of data that I can use” and I’m thinking okay, but that is still only a snapshot of a data and might not be useful in providing information BOR needs”
ETL	Course, conversion, system	“ When you understand data structure, and clearly understood the policies, the course of data conversion in the new ERP system becomes possible”
Work	Enterprise, silo, data	So as long as things work well within the confines of that silo, they’re happy. We, however, have the enterprise wide view of the data, so we look into each of those silos and we pull data out of it.

1 *Data*, one of the main themes, is described as a connector of these other three concepts. In other
2 words, data connects the *people* with the *processes*, the *people*, and the *work* and so on. The
3 *Data-centric* approach of MU CC is highlighted by examples in the table 6.4.1 where the
4 concept of *data* is presented in three of the four examples. The theme *People* refers to the
5 different stakeholders in the organization. Compared to RU where *Data* seems to emphasize the
6 design, implementation, and management of data within specific systems, in MU, the *Data* is
7 used to connote two notions. One, *Data* is utilized in an ambitious vision of “breaking the silos”;
8 second, *Data* at other times, is described in a more procedural manner, i.e. *data conversion*. The
9 final theme, *Work* is related to the theme of *data* and *people*. The *Work* combined with *people*
10 describes the job functions of the stakeholders; the *work* combined with the *data* describes the
11 transformation of the data from mere numbers and figures into *information*.

12 Spatiotemporal

13 Spatiotemporal aspects of the MU’s CC deal with issues such as the location of the CC and
14 conditions under which these CCs are formed and evolved during different phases i.e.
15 implementation and post implementation. Contrast to RU, where the CCs were considered to be

1 a permanent structure reporting to the CIO, in MU, there is no permanent CC structure. The
2 *phantom* CC is formed to create a reporting link between the BOR and the MU.

3 *“There’s some communication as we think laterally, but eventually it’s going to come,*
4 *and a lot of what you do is mandated from the top anyway by the Board of Regents which*
5 *makes sense from the financial management side of course.” (BSP)*
6

7 MU like RU was unsuccessful in creating a permanent unit. The BOR initially considered
8 creating a permanent structure that the upper-level managers were in favor of. However, the
9 BOR did not go through the implementation of a permanent governance unit. Instead, the BOR
10 chose to focus the issue of governance around the notion of *data governance*.

11 *“The Board of Regents has come out with an IT model and there is a section on*
12 *governance. They had one. It disappeared. I complained because I got a new hat a couple*
13 *of years ago. About that they added the chief data officer to my title, which doesn't really*
14 *mean anything yet and I wanted the documentation or the policy from the Board of*
15 *Regents defining what is the role of a chief data officer.” CG*
16

17 This “committee based” and structure-less CC, depicted as phantom CC in MU, floats between
18 the different business units, depending and the BOR. The CC location also depends on the
19 project type and reporting requirements from the BOR. As described in the quote above, even the
20 senior managers were moved around in the organization. Even with the titles, clear roles and
21 responsibilities were not defined, thus this CC remained very fluid.

22 Relationship

23 In this section, I analyze the followings relationships: relationship of people inside the CC,
24 relationship of the CC with other college units, and the relationship of CC with the BOR. In MU,
25 there are only four to five dedicated employees in the CC. In contrast to RU, these four to five
26 people form an informal CC group, but their main job functions are in their respective business
27 units. These key employees are selected based on their experience, seniority, and familiarity with

1 the BOR. Other as-needed people are sometimes recruited with a formal request, but often
2 informally based on the prior existing relationship with the current CC group.

3 *“Most of the job we need to do right now is through formal process. It’s the formal RFP*
4 *process for the state of XX and my gosh, it is difficult. I would have from infrastructure*
5 *point of view, I’d have to get cooperation from them probably get some sort of, what they*
6 *call it, the service agreement, service level agreement, SLA.” (EJ)*

7 Even with the formal relationship of the CC with other business units and with the BOR,
8 sometimes even the important and impactful decisions such as selection of the ES could be based
9 on the informal relationship among stakeholders.

10 *“The person at the Board of Regions was looking for at least one R1 to adopt it, to test it*
11 ***and that person happened to be married to our VP**, who would be the one to make the*
12 *decision, so there you go. Georgia State volunteered to be the R1 institution.” (CG)*
13

14 Relationships, formal and informal, matter in shaping the CC. In this phantom CCs setting, CCs
15 are created as needed basis. While formal interactions exist, informal interactions are important
16 to the CC.

17 Force, energy and change

18 The force or energy that impacts the CC, directly and indirectly, is the BOR’s political actions.
19 The research participants expressed the frustration with BOR and their treatment towards the
20 MU.

21 *“One of my observations is that MU is the 600-pound gorilla. The Flagship University of*
22 *the State is the 800-pound gorilla in the system. They’re big enough so that they say, “No.*
23 *We’re not going to do that because our system would collapse.” We’re just big enough so*
24 *that it makes it difficult, but we’re not big enough to say we refuse to play by those rules.”*
25

26 *“Until we complained about the fact that we did not necessarily like the structure of*
27 *PeopleSoft and the Board of Regents, just to show us that it could be worse, made us go*
28 *to ADP. And we have learned our lesson.” (CG)*
29

1 *Playing by those rules* means that MU has no control over the selection of the ESs, but have to
2 implement and support them regardless. To best handle the implementation and post
3 implementation issues of ESs, MU depends on the CC created from the people from functional
4 and technical sides within MU.

5 *“Spectrum would be, that’s what I call them, they’re the technical, the functional, in*
6 *between, the middle of the road, whatever you call the term, but the best part about it is*
7 *they know a lot of what we need” (BSP)*
8

9 *“For some more technical issues we need to collaborate with the MainIT” (EJ)*
10

11 This collaboration and composition of the CC are changed when the mistrust of the partner
12 emerges. The financial IS team and the Spectrum groups have a great working relationship.
13 These groups have shared resources including some key IT skill personnel. The group fears that
14 the MainIT might attract these key skilled people from the CC.

15 *“Because S. was technical and that’s why he’s a key to my organization. We have to be*
16 *careful in the Spectrum group that we don’t get positioned titles that sounds too technical*
17 *because if you do, then MainIT wants to take them away.” (EJ)*
18

19 The initial enthusiasm for the ES Implementation, Banner, in this case, is changed to eventual
20 begrudging acceptance.

21 **Summary of MU process analysis:** The research participants in MU were unable to describe
22 any recognizable form of a CC, formal or informal. However they were able to describe extant
23 sets of standard operating procedures and protocols. They were also able to provide an historical
24 account of previous attempts to create something like a CC The foundations for that CC were
25 set by the formal procedures from BOR. From whom the goals and responsibilities were made
26 clear (to provide the consolidated report from MU). However, BUs within MU were not
27 consistently nor universally mandated to support these system-wide and top-down reporting

requirements. Thus, the original structure of the CC dissolved quickly. In its place a “phantom” CC emerged, one formed by former CC members drawn from different BUs. It was ‘phantom’ because its identify and function was known only to those within it informal makeup. The new ‘phantom’ CC dealt with diverse issues, typically oriented towards data governance, but often lacked a clear vision and formal leadership. Many decisions are made with through the strength of personal relationships and connections and not through the formal mandates and rules of a CC.

6.5 Chapter Summary

The purpose of this within-case analysis is to understand the processes these organizations go through while establishing and maintaining the CCs. This analysis is also served to organized and prepare for the data and concept coding and to better enable the cross-case analysis.

The results of the four within-case case analyses suggest that these CCs are in fact always in-process or emergent organizing units. All four organizations in our study went through frequent changes regardless of their original goals and structures. Although MS, MU, and HG had clear goals and a vision for the CC during the initiation phase, these goals were quickly transformed into other goals. Thus the within-case analysis from this chapter supports the notion that none of the CCs show characteristics of stable organizational units.

Chapter 7– CROSS-CASE ASSEMBLAGE ANALYSIS

This chapter further analyzes details from in the within-case process analysis to allow for a theoretical replication by comparing these cases. The first explains the cross-case analysis process. The second section compares the concepts of Assemblage Theory themes directly against all four cases and presents a summary of the cross-case findings. Then, the chapter proceeds to contrast the initiation, territorialization, deterritorialization, and reterritorialization processes between the abandoned CCs and successful CCs.

7.1 Cross-Case Comparison

In Chapter 6, the *within-case process analysis*: a) described each case, and b) examined the process characteristics based on the *Process Metaphysics* and provided the foundation and the data sources, for the cross-case analysis thorough the lens of Assemblage Theory. The details of each case were assigned codes based on process characteristics. These codes, PC1 – PC 5, as discussed in chapter 4, are summarized and described in Table 7.1.1 following.

Table 7.1.1 Coding the Within Case Process Data		
Process Characteristics	Brief Description of the Characteristic (c.f., Chapter 4)	Assigned Code
Quantitative features	<i>Answers the easily measured questions such as: What sort? What kind? How many?</i> It maps to the within-case analysis that answers the questions such as: In CC, what are the systems (ERP, BI, and analytics)? How many people?	[PC1]
Thematic Nature	<i>Pattern of actions.</i> IT maps to Central concepts that are important in CC, mapped to Leximancer concepts.	[PC2]
Relationships	<i>How different levels (macro and micro) are related?</i> It maps to CC's	[PC3]

	connectedness with different departments and to organizations.	
Spatiotemporal	<i>Conditions, locations, time.</i> It maps to research data that answers: Where is CC located, What are the conditions under which CCs are formed?	[PC4]
Force/Energy/Change	<i>Temporal structure unfolding over time.</i> It maps to research data that answers: Once CC is formed, how it evolves? What gives identity to CCs? What transforms it?	[PC 5]

1

- 2 The coding of the within-case details were the basis for cross-case comparisons. The cross-case
3 comparisons are summarized in Table 7.1.2.

Table 7.1.2 Cross Case Comparisons				
Concepts	HG	RU	MU	MS
Territorialization “Formation” process	Boundaries are formed [PC4] with formal roles and responsibilities [PC2]. Even the IS applications were “vetted”. One common platform [PC1]	Fluid boundaries [PC4], key people invited to CC but no permanent residency in CC, relied on informal relationship [PC3] Key stakeholder involvement [PC5]	Large ES was handed by BOR, MU needed a reporting structure to maintain the relationship with BOR [PC3] Spectrum Team [PC1]	Largest implementation of Retail [PC1] Clear boundaries. People were nominated from the BUs to be in the CC. People were either in CC or BU. Not enough strong “links” between the CC and BU. [PC3]
De-Territorialization “Deformation process”	Dual ambassador role: even in the CC, people maintain their BU roles (and vice versa) creating strong and flexible links between the CC and BU [PC3]	“Overlapping interactions”, create meaningful relationship through informal meetings [PC3]	Many powerful schools within the university create parallel IT departments. [PC4]. Trying to create relationship through meetings are not successful. [PC3]	Established relationship in the department. Not a strong tie to the CC. [PC3]. Political pressure to “justify SAP”[PC4]
Reterritorialization “Reformation process”	Seamless transaction between Microsoft Excel and SAP BI. [PC5]	Replicating the central CC into several smaller CC is not quite successful. [PC5]	Trying to rally around the data governance and create links to other schools thought the CC [PC3] Political actions by departments [PC5]	Employees’ social relationships with the previous employee. [PC 4] Most modules are now homegrown. [PC5]

Materials (e.g., ERP, BI, Resources, proximity relationships among resources)	Nominated from department, then interviewed to be in CC [PC4]	People who were “Overlap in interaction” [PC3]	A central unit called SPECTRUM responsible for connecting schools.	Key individuals from different BU and Outsourced partner - SAP, Latin America Group, Canada Group [PC4]
Expressions: (e.g., Symbolic and non symbolic, agendas, goals, mission)	A single instance of SAP (PC1), provide common platform, clear career incentives [PC3]	Manage competencies in different BU, camaraderie [PC3]	Community of Interest. Weekly gathering of likeminded people to promote ES and discuss other IT issues. [PC3]	Original intent of ERP financial system replacement [PC1] Hero’s welcome [PC3]

1

2 From examining the cells in Table 7.1.2, I could not single out any dominant process
3 characteristic responsible for territorialization. Instead, organizations territorialized through
4 many different characteristics, for instance, HG was territorialized by PC 2 (Thematic Nature),
5 PC4 (Spatiotemporal) and PC1 (Quantitative Features). The Spatiotemporal issues included
6 drawing the boundaries, and the Quantitative features dealt with creating prominent ES for the
7 whole organization. In territorialization, these study organizations were trying to design or create
8 as CC. The decision parameters included creating boundaries, membership rules, and protocols
9 of interaction. The IS literature proposes three general models to guide such organizational
10 design: centralized, decentralized, and the hybrid models each varying according to the degree of
11 control over the management of resources (Sambamurthy and Zmud 1999). In all four study
12 organizations attempted to create an identifiable structure. These organizations either were not
13 able to draw clear boundaries (MU and MS) or, even when the initial boundary was clear as in
14 the case for RU, the structure was not stable. The research suggests these CCs never achieved
15 stability long enough to be identified as a “structure”.

1 One of the central themes I observed was that changes to initial CCs, deterritorialization, mostly
2 resulted from the process characteristic of *Relationship* [PC 4] in all four cases. I note that as an
3 interesting observation because the result suggests that organizations try to “form” CCs focusing
4 on many different aspects, such as providing a better platform, creating a central resource for the
5 enterprise; however, these CCs change their initial form because of the relationship issues. The
6 ES literature suggests that relationships are managed via formal and informal practices (Sykes et
7 al. 2014; Vasconcelos 2007). While the cases I examined concur on emphasizing relationships,
8 they do not fall into formal vs. informal categories. This research shows that CCs were fluid in
9 adapting to either the formal or informal relationships.

10 The analysis further suggests that the technology and technological issues were one of the
11 reasons for the formations of these assemblages. However, technology quickly faded into the
12 background, and were the least volatile feature of the assemblages. Even the in the assemblage
13 concept *material*, where wherein technology might be expected to be quite prominent, social
14 aspects were far more prominent. As an example, MS’s material resources were SAP, its
15 Canadian group, and its business units (BU). I expected these important material resources to be
16 prominent part of the assemblage. However, in the analysis, more than the material elements
17 themselves, the relationship between these parts – the social aspect – are the most pronounced
18 feature in the assemblage.

19 The result of relationship dominating the material, can be explained by reference to two sets of
20 ES studies conducted during or immediately following ES implementation projects. The first
21 study set examined the technical challenges of user acceptance (Brown et al. 2002), and user
22 involvement and adoption (Wagner and Newell 2007). These suggest that during and
23 immediately ES implementation *Material* aspects are dominant. The second set of studies

suggests that once the technical issues are stabilized during post implementation, the organizations start to focus on management challenges(Pan et al. 2007), and ES assimilation(Liang et al. 2007). These finding are supported in my study; but with one key difference. Namely, there are no progress away from technology issues. For even when, the CCs are paying attention to IT issues, they are always in the context of the cross-functional interactions between users and different departments.

I interpret the summary of the initial observation as CCs are not created to “solve” one or few select management issues, but must deal with emergent issues created by ES assemblages as they territorializing, deterritorializing and reterritorializing processes. The research design (Figure 5.4.1), discussed and developed in chapter five of this dissertation, calls for theoretical replication comparing established CCs versus abandoned CCs, and vendor-driven versus vendor-independent CCs.

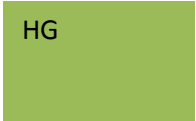
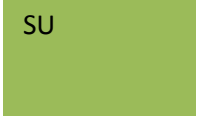
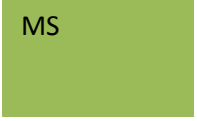
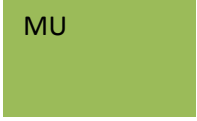
	Vendor-Led & Formal	Vendor-Neutral & Informal
Established	 Context = Fortune 100	 Context = Education
Abandoned	 Context = Fortune 100	 Context = Education

Figure 5.4.1. Multiple Case Study Design Based on Yin (2003)

HG=Home Goods; MS=Material Supply; RU= Regional University; MU= Metropolitan University (Descriptions of these sites are listed in 4.4).

To take advantage of the theoretical replication research design, I carefully contrasted between two groups of CCs, one that were successful vs. ones that were abandoned. I examined how

participants from these two groups, success vs. abandoned, interpreted the initiation and evolution processes, paying particular attention to the fluid boundaries of CCs, the dynamic relationships between its diverse stakeholders, and the emergent interactions of material and expression continuum. The following sections are the cross-case analysis of the assemblage processes organized in precondition for territorialization, territorialization, deterritorialization, and reterritorialization.

7.2 Preconditions of Territorialization: the Creation of Assemblages:

Organizations seeking to initiate CCs, do not always based on the organizational strategies for ES or begin with predetermined planning. Many CCs are organic by-products of the dynamic relationships between the employees of the organization and the resources from within and without of the organization– e.g., vendors and contractors. This section analyzes how do successful CCs differ from the abandoned CCs in initiating phase?

Abandoned – CCs: MS and MU: MS initially selected ERP_X as a vendor and its software implementation partner for a financial module replacement. Because the ERP_X revealed (boasted) confidential contract details in a press release, MS terminated the contract the very next day. What this illustrates is how even carefully planned tactical decisions, i.e., initiating a vendor relationship and beginnings of a CC, can go awry and lead to almost ad-hoc outcomes. TD described such circumstances at MS:

We settled on ERP_X (pseudo name). We signed contract with ERP_X. We ended up breaking the contract with ERP_X because they put out a press release on what the software was sold for. You never do that. Within a day, that contract was null and void. There were some other political undertones and ramifications going on at the same time in that we were also starting to begin to look at international business. ERP_X did not

1 *have any international capability. Then all of a sudden it was we are going into Chile*
2 *and Argentina. We are not going to go with ERP_X. Now we've got to find someone, we*
3 *have to do it quick. So it is basically a conversation between Rob (pseudo name) and I*
4 *and it was - listen, just focus on PeopleSoft or SAP. (TD)*
5

6 The literature talks about the trust relationship between firms and vendors, reliance on ES
7 vendors. (Keil and Tiwana 2006) (Lander et al. 2004), and vendors overestimating the ES
8 capabilities they can provide (Markus et al. 2000) . These points are supported in this research
9 but of particular interest, for example, in the case of MS, all three of these issues are present–,
10 over reliance, vendor overestimation, and distrust. Initially, mistrust with ERP_X, as described
11 by TD above, led towards establishing an unplanned relationship with SAP in its place through
12 the vehicle of previously existing social relationships. Once MS realized the capabilities of SAP
13 ERP, the focus shifted from just replacing the financial system to implementing other ERP
14 modules as well – an overestimation of SAP's capabilities for a retailing giant. To navigate
15 through the installation and post implementation of these modules, SAP suggested that MS
16 establish a formal CC. Since MS was unfamiliar with the CC, it relied on its now vendor-partner
17 SAP to provide the support for the CC creation. This illustrates the evolution of both the
18 relationship and the CC entity. This overreliance on SAP ultimately destabilized the CC
19 (analyzed in the next section in detail).

20 MU initiated the CC to fulfill the reporting requirements from the Board of Regents by creating a
21 committee of upper management from different University academic and administrative
22 departments. However, what these upper managements realized that different academic units in
23 the same university do not share the same reporting responsibilities.

24 The Board of Regions decided that they wanted a central repository for reports that they
25 can provide to their superiors. They invited 34-35 schools within the university to create
26 a committee to accomplish the task of providing reports. But, schools had different

1 reporting requirements. Law School for example had very little to report to the board,
2 they reported more to the bar association. Similarly, the nursing school and others. So,
3 this committee thing did not happen. CG

4 In MU, the idea to create a CC like structure was a strategic one. However, this strategic vision
5 was not operationalized because, once upper management realized that they did not have to
6 comply with the BOR requirements, they had no incentives to participate in the CC creation
7 process.

8 **Successful CCs:** HG AND RU – The research participants from HG described its CC initiation
9 as carefully planned and a strategic activity. However, CC initiation at HG received unexpected
10 benefit from involving former employees from MS's CC. This signifies how strong social
11 relationships impact the outcomes of CC formation. For instance, at HG, the business goals for
12 the CC were: streamlining the implementation process, consolidating ESs on single instance of
13 SAP and integrating with BI. So conceptually they began ahead of MS not because of the
14 strength of their plan or the strength of SAP's template CC structure, but rather because of the
15 preexisting social connections.

16 CH from MS describes how MS's loss was HG's gain:

17 We hired top-level talents. We had skilled developers, application integrators, and great
18 leadership. But when we scaled back on the SAP development, most of the talents went
19 to HG. (CH)

20 Although the initial conceptualization of the CC was via a formal process of negotiation between
21 the CEO and the CIO, the actual realization of the CC was a function of informal social
22 relationships.

23 At RU, upper management teams, when visiting a partner organization, came to realize the
24 benefits of creating a support structure for their own ES. This realization caused them to start
25 planning for the creation the CC. The planning stage at RU moved rapidly because upper

management team was able to capitalize on the social relationships among its members and bypass the formal process.

I don't feel like I need an SLA with WB to get the things done. And, I hope WB feels the same way about me. (ED)

RU, in contrast to MS and HG, the activities leading to CC initiation were non-vendor led, but still subject to the forces of social interaction.

Summary of the Preconditions for territorialization: In MS both the vendor and client had collaboration and mutual interest to guide it through creation of the CC. However, MS struggled in the initiation phase to gain momentum and to establish the CC. In vendor-neutral settings, a serendipitous act, a visit to a partner, sparked an interest for RU and initiation phase moved rapidly. It is interesting to note that with all the resources available and despite the vested interest from diverse stakeholders, MS struggled and stumbled in the initiation phase. In RU, with limited resources and structures, initiation of the CC was successful whereas with MS, despite its relative maturity, experience, intentions and resources the process faltered and almost failed.

The initiation for CCs varied by degree of formalization, in RU implemented more structured approach by keeping the CC within the permanent structure of the organization. In MU, an ad hoc committee was responsible for initiating the CC. This ad-hoc nature of the committee kept the CC more fluid and not part of any permanent organizational structure. This suggests that in the self-developed settings, initiation process contains some type of formal procedure to gain initial momentum. In vendor-led settings, vendors have vested interested to drive the CC initiation. In any event there seems to be no advantage to one approach or another to other because the CCs did not stay static.

7.3 Territorialization of Assemblages: Shaping the CCs

Abandoned CCs: Realizing the need for additional implementation support, MS selects the large consulting company as the implementation and support partner. Selection of the implementation partner was one of the biggest factors in the territorializing process for MS. This is because implementation partner, introduced their own established methods of implementing ESs to MS, they augmented the MS staff with outsourced talents, and provided strong recommendation to create a solid support structure for managing post implementation ES.

In MU, the different schools such as the Business schools, the Law school, and the Education school have strong political influences and employees are territorialized in their own schools. For example, the BOR mandates ES to be integrated across all schools. The individual schools comply with this mandate by integrating with the ‘central’ ES, however, still run parallel systems, often as a display of dissention or political will. This strong political power creates territorializing silos of IT capacities.

Successful CCs: HG’s CC environment reflects a balanced relationship between rigidity and fluidity. For instance, IS applications were carefully vetted as to how they will interact with extant ESs, people are vetted for CC membership, and roles and responsibilities of CC members are clear. Such seemingly clear and tight boundary conditions would suggest rigidity, but business process champions / dual ambassadors served a bridging function and create bilateral linkages – CC to business units (BU). Regarding application vetting, in HG, the decisions regarding the purpose and types of modules, and implementation strategies that emerge in planning state are territorialized in the incubation period. HG employed a “vanilla” implementation strategy where customization of ERPs is minimized. The incubation period is a two to three-week long time period, when only a limited number of transactions are permitted to

1 the newly installed system while substantial transactions are routed to a contingent system. Over
2 time, the transactions are increased to the incubated system and reduced from the contingent
3 system. For HG, BI systems and ERP go hand in hand, are co-developed and are implemented at
4 the same time.

5 In RU, the CC is a connected business unit and, in a sense, created a cross-functional culture that
6 can be of assistance and collaboration to everyone who has access to ERP and BI applications.
7 The CC provides the mechanism for enabling dialogue among people, groups, functions and
8 business units to collaborate easily, thus, helping managers to organize their post-implementation
9 use. This collaborative optimization of ERP and BI becomes a catalyst of the process of
10 territorialization. At RU, the CC is acting as a hub between IT and business sides. The linking of
11 IT and business is the result of recognizing that technical integration and organizational
12 integration are the faces of the same piece and need to be managed as an assemblage.

13 **Summary of Territorialization:** In this phase, the actions or events that are present in the
14 initiation phase start to settle and create fluid boundaries, territorialize. RU, informal starting point
15 starts to take formal shape. In this phase, the boundaries of ES expanding, such as inclusions of
16 many disparate applications for CCs in MS, and emergent processes influencing the relationship
17 between stakeholders, i.e. a vendor becoming a partner in HG.

18 Both, HG and MS to create CC as an organizational or support structure for ES post
19 implementations. However, the results are quite different for these two organizations. For MS,
20 the mistrust of vendor territorialized via over reliance on them. In HG, collaboration with ES
21 vendor the reach and breadth of ES continues to grow.

7.4 Deterritorialization of Assemblages: CCs Ever in Process

Abandoned CCs: In MS, the SAP implementation went well, and post-implementation was underway and progressing nicely in its Canadian operations; stakeholders rallied around and collaborated. Then the expected “hero’s welcome” following the Canadian implementation success turned into a unpleasant competition between the team from the Canadian implementation team and the US headquarters team. From the US upper management perspectives, the value of centralized SAP was not there. Instead of being complemented on a very successful implementation, the Canadian management teams were placed in a very defensive position to provide answers to the questions, such as: “*what have you done for me?*” Here, *Me* refers to the US head office. “*Where are the Metrics?*” “*I don’t care about SAP*”. In the US, the upper management team involved with Canadian rollout never expected the rude awakening they experienced in the US.

We all came out of this project on a high. This is a multi-year several-hundred-million-dollar project. It was very successful. I mean, not overstating it, we were hailed as heroes in Canada and then when that was over, he [CIO] couldn't care about what you did. (TD)

As the research participant stated, “*BB (CIO) was a very strategic leader and he had a very good vision. I think he underestimated some of the **backstabbing that would go on at those executive levels.***” As a result, the previously successful and ‘stable’ or working assemblage began to deterritorialize, as the employees retreated into their own silos and comfort zones, and instead of trying to promote ES throughout the departments, they retreated to a defensive mode and started to justify the SAP. When the CEO and CFO asked the price tag for implementing SAP in the US similar to Canada, however, the ERP requirement for the US had already expanding far beyond the scope of the ERP installment in Canada. The requirement for a new system, suddenly became a “wish list” and ultimately far too expensive to develop:

1 *“The folks and the individuals that were responsible for determining the requirement lost*
2 *sight of their mission. Instead of, what they did was basically, What's my wish list? And*
3 *that's why they came up with a 1.2 billion amount for the US implementation.” (CH)*

4 The “wish list” mentioned by CH is the concept of *scope creep*, a negative phenomenon in
5 project management where the requirements continue to grow (Meredith and Mantel Jr 2011).

6 The scope creep having negative effect on the ERP projects are supported in ES (Chen et al.
7 2009) The findings from the research data shows the far reaching effect this scope creep has on
8 the CC for MS. Rather than focusing on the boundary limits of what was implemented in
9 Canada, in the US expectations reached an unmanageable level as the collaborative culture of
10 *“we did great stuff in Canada together”* turned into a deterritorializing, *“every man for*
11 *themselves.”* The height of De-territorialization at MS was marked by a mass exodus MS.

12 In MU’s CC, there was too much distance between the BU silos. Member attended formal CC
13 meetings but would not collaborate, but instead clung to established BU loyalties and feared the
14 role of the main IT. The CC and the central IT had collaborated on some projects and had
15 established a formal relationship. However, CC members did not establish the trusting
16 relationship. The Research participant EJ explained:

17 *“Most of the job we need to do right now is through formal process. It's the formal RFP process*
18 *for the state and my gosh, it is difficult.” “Because S. was technical and that's why he's a key*
19 *to my organization. We have to be careful in the Spectrum group that we don't get*
20 *positioned titles that sounds too technical because if you do, then MainIT wants to take*
21 *them away.” (EJ)*

22 I interpreted the above quote as MU CC’s view that the formal procedures were a hindrance. The
23 CC also feared internal employee transfer causing deterritorialization.

24 **Successful CCs:** the RUs CC deterritorialized through the social connections relationship
25 developed over coffee and donuts shared by inviting key employees from different departments.
26 In these meetings people felt comfortable to share ideas and did not feel “pressured” to

1 participate and present formal solutions. These meeting became informal brainstorming
2 opportunities. Once the information social connections were established people became more
3 active participants in the CC.

4 Deterritorializing in the HG CC happened around the notion of job responsibilities. In the
5 respective business units, employees have specific job titles and responsibilities, such as, “IT
6 Project Manager”, “Business Analyst”, “Configuration experts”, “ABAP Programmer” and so on
7 have specific job functions associated with them. When employees join CCs, employees’ roles
8 are transferred into an unfamiliar term of “business process champions” or “super users”. In HG,
9 these business process champions create a fluid relationship with their respective business units
10 and further the agenda of the CC. This findings supported by Rose et al. (2013) study where
11 “super users” recruited from different business units were instrumental in fostering the ES use
12 (Rose and Schlichter 2013).

13 **Summary of Deterritorialization:** Deterritorialization is not inherently negative process; there
14 are transitioning processes situated between territorialization and reterritorialization. For
15 instance, on the one hand, in the case of MS, this deterritorializing process turned out to be a
16 negative one while, on the other hand, HG benefited when ES employees were deterritorialized
17 from their BUs into the CC, thus creating cross-functional social relationships and fostering
18 knowledge sharing mechanisms within the CC. Whereas at MS this was a function of internal
19 political rivalries, at HG, astute managers fostered and capitalized on their understanding of how
20 employees actually aspired to become pare or the CC.

21 In this phase, the actions or events that are present in the territorialization process further evolves
22 due to the emergent interactions between the stakeholders and technology. For MS, the success
23 of the Canada roll-out and the initial creation of the CC in Canada were not replicated in the US

operations. Instead, stakeholders' disagreement on the vision of the ES and role of the CC destabilized the CC. In other organizations deterritorialization of CCs have positive effects. In HG, people from different BU enter the CC and create dual ambassador role. In RU, people form social relationships and connections that lead to a greater collaboration. Whether CCs were struggling or performing, they continue to evolve.

7.5 Reterritorialization of the Assemblages: Reshaping the CCs

Abandoned CCs: In MS, Employee reterritorialization began with the CC employees going back to their original jobs. This departure from the CC mostly had three common outcomes: First, employees go back to their respective departments with new responsibilities and create a link to the CC or become evangelists for the CC. Second possibility is that the CC employees go to their job disgruntle, are not welcomed back. Finally, the third possibility, these CC employees go to different firm with a better job. The CC employees were territorialized by forming a strong group with a clear purpose of implementing SAP during the ES implementation in Canada, deterritorialized by this dismantling of the Canadian team and abandoning the clear purpose of implementing SAP and instead focusing on the “numbers”, are finally reterritorialized by a few employees joining a different firm. However, some key members from the new management team maintained loyalty to the old bosses. The employees maintained relationship and often sought technical and managerial advices from the old colleagues. Thus the social relationship that impacted the CC reached far beyond the organizational boundaries. During the research process, I discovered that many of the people who were part of the successful CC creation in HG were part of the CC in MS.

1 The MU CC is was not able to take shape and stay mostly structure-less CC. The Despite the top
2 down mandate from the BOR, not all BUs followed those mandate. The formal CC created to
3 support the reporting requirement dissolved. However, some key members from this dissolved
4 CC continued to work together by creating a “phantom” CC. This newly formed CC shifted their
5 focus towards the data governance. The interview participant CG described that many of the
6 employee were not able create dual link.

7 So as long as things work well within the confines of that silo, they’re [employees]
8 happy. We, however, have the enterprise wide view of the data, so we look into each of
9 those silos and we pull data out of it. (CG)

10 The renewed goal of the CC was not on creating dual role but trying to integrate these silos via
11 providing common tools and technology to manage core data for the enterprise.

12 **Successful CCs:** In RU, the CC reterritorialized into smaller CCs in other BUs. When CC
13 employees realized that informal but somewhat “regulated” way of collaborating between the
14 departments were effective. These CC employees at their respective BUs tried to replicate this
15 model. RU faced the similar challenges as MU in terms of the business silos. While MU were
16 not able to overcome the problem of silo, RU tried to address it by creating thse “mini” CCs. The
17 research participant WD explains:

18 *“What we are trying to do is build multiple competency centers around the different*
19 *areas on the campus so we make sure that we are maintaining the campus as it exists*
20 *(WD)*

21 In RU, the CC not only acknowledge the silos exist, but understand that it might be important to
22 preserve these silos.

23 Each In HG reterritorializationr occurred when the CC continued to adapt and respond to the
24 need of different BUs. At HG, any system that is not directly rolled out with the institutionally
25 adopted SAP and the companion SAP BI was considered to be a “rogue application”. When the

CC territorialized around the “preferred” platform SAP, many of the widely used applications such as MS Excel were classified as “rouge” and its use were discouraged. However, business units resisted. Historically many business units had created many departmental level applications with the “familiar” Microsoft Excel. To follow the recommendation for the CC that SAP BI be used, BUs would take data from SAP and other sources and later and transfer data back to the SAP BI for corporate use. Several business units created workarounds from the firm’s canonical adopted SAP implementation; they continued to use the “rogue” applications.

Deterritorialization caused by the workarounds of Microsoft Excel use was persistent; there was concerted organizational pushback. Although this went against the CC’s vision of the data being “single version of the truth” ultimately HG had to provide a way for users to use Microsoft Excel and still be connected to the main SAP system (Reterritorialization). HG’s solution was to transition from using SP BI as the sole front end and main analytical tool, they provided an SAP-to-Excel connector tool to a) appease the users and b) maintain data integrity and concurrency.

Figure 7.5.1 following illustrates an example of a excel in exile, an underground tool, and the post compromise solution allowing business units to build upon ‘certified’ data sources.

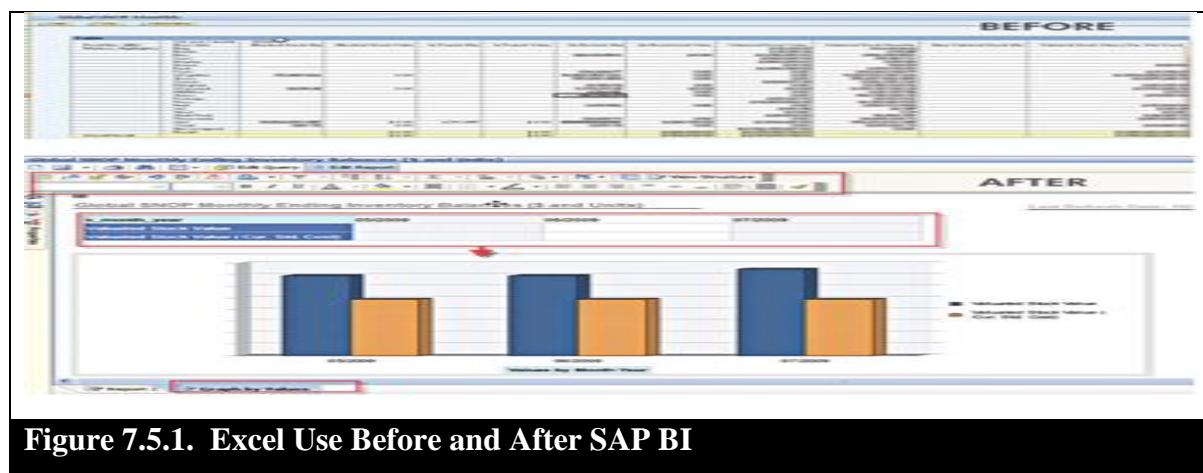


Figure 7.5.1. Excel Use Before and After SAP BI

Summary of Reterritorialization: People (vendor, managers, employees), technology and processes go through deterritorializing process and end up receiving somewhat temporary stability. This period of temporary stability can be classified as reterritorializing process. In MS, vendors were driven out of the organizations. While, HG embraced these vendors. MS reterritorialized by creating their own home grown ES and CC. HG collaborated with ES vendor to evolve theirs. The adaptability in reterritorializing phase is exemplified by HG finally including previously banished Excel applications in the ES suite. In RU, many different BU create their own version of the CC. Reterritorializing in MU is continued via attempt to loosely connect different BUs to the data governance group.

While trying to manage these post implementation ESs, organizations often ignored or underestimated the dynamic social relationship emerging between diverse stakeholders. From these interactions, vendors emerged as possible partners, consultants became the bridge to additional resources, and employees as dual role ambassador or CC evangelists. These emergent relationships kept the CC in a flux forcing it to change in real time.

CHAPTER 8 - DISCUSSION & CONCLUSIONS

This chapter discusses the contributions this research makes to the ES post-implementation management, to the practice of managing CCs, and to methods for analyzing process research. The chapter concludes by identifying the limitations of this research and finally providing insights for further research opportunities.

8.1 Contribution to Knowledge: CCs are *Emergent Processes and Not Structures*

This thesis contributes to the knowledge by advancing our understanding that CCs are not fixed organizational units; CCs are not structures; CCs are not even repeatable processes; Instead, CCs are structuring and in-process entities.

CCs are not fixed organizational units: Compared to other organizational departments, such as Accounting, Finance, IT, and Operations, CCs are not treated as an organizational unit because CCs: lack broader organizational visibility, do not have clearly defined positions, roles, and responsibilities, and unclear budget allocations. Regarding organizational visibility, while a CC is termed "center", it lacks any specific physical location within the organization. Only the CCs in HG and MS had a few defined roles, such as business process champions (BPC), for CC member. One informant described one of the central roles for BPCs as being a dual ambassador, however, the other participants were not clear what exactly the dual ambassadors were supposed to do or who they reported to. Even in the most established of CCs, the HG-CC, the senior managers responsible for running the CCs had other full-time job titles with clearly defined roles and responsibilities. Regarding the budget, there were no clear defined source of funding the CCs. For example, HG created the CC via a formal charter, but the research participants were unclear on how the CC was funded annually. The participants described that sometimes the CC was

1 funded by formal processes and other times through personal connections between the CC members and
2 other BUs.

3 CCs are not structures: Among the many possible structures within organizations, two of the most
4 prominent are the contract structures (Argyres and Myers 2007) and the reporting structure (Banker et al.
5 2011). The common features shared by organizational units include, establishing lines of authority and
6 communication, and assigning and managing roles and responsibilities. The structure in organizations can
7 be classified as centralized, decentralized or hybrid (Weill and Ross 2005). The study organizations hoped
8 that CCs would provide a structure to integrate, manage and enhance its existing ES resources. However,
9 in this research, participants were, in the end, unclear on which CC structure, decentralized or centralized,
10 or on what relationship, formal or informal, was going to be more appropriate for them. The study firms
11 were also unclear on roles and responsibilities for the employees in these CCs. HG hoped that these
12 “Business Process Champions” would end up becoming a bridge between the CC and their respective
13 units. However, HG did not have a means to check whether these BPC, in fact, were successful in
14 creating these bridges. In MU, employees were sourced from different departments, but they had no clear
15 requirements to perform any tasks. Simply stated, the CCs failed to demonstrate characteristics of
16 organizational structures.

17 CCs are not repeatable processes: CCs are examples of in-process structuring, they are not repeatable
18 processes in themselves. Organizational Change Management literature suggests that ES are managed via
19 process management procedures that include mapping the process, improving the process and adhering to
20 the improved processes (Benner et al. 2001). This continuous mapping and improving creates “repeatable
21 processes” (Mukherjee et al. 1998). Organizations that prefer repeatable processes can turn to ISO 9000
22 or CMMI maturity model for guidance. While ISO 9000 and CMMI maturity model operate at the firm
23 level, at the ES software level, ES vendors propose standard “industry best” practices or processes. Since
24 the CCs operate at the organizational and application level, both adhering to repeatable processes, the
25 research participants sought to create these CCs as repeatable processes as well. However, the CCs go
26 through constant territorialization, deterritorialization and reterritorialization processes, and are not

1 created with repeatable processes. In other words, if an organization can establish a CC following some
2 processes, the same processes in subsequent attempts will not provide the same result. MS's Canadian CC
3 were hugely successful, however, trying to replicate that in the US turned out to be a disaster. RU and HG
4 are successful in running CCs, but only through many informal interactions and relationships. In HG, the
5 director of IT has established links and "gets things done" based on his credibility. In RU, upper
6 managers trust each other and do not go through a formal procedure like RFPs for most tasks related to
7 the CC.

8 CCs are structuring and in-process entities: Common to the four cases in this research, the organization
9 sought to apply formalized and structured mechanisms to manage stakeholders and technologies. The
10 formalized mechanisms included: managing vendors via strict selection processes and contracts, and
11 managing employees by assigning specific roles and responsibilities, and managing technology by
12 screening for integration with the ES, attempting to standardize around a single industry-leading software
13 product, applying best of breed solutions, and establishing partnerships with experienced configuration
14 partners. However, in all four cases, these formalized mechanisms were not sufficient, and the CC had to
15 account for emerging issues and to develop relationship-based mechanisms to manage post-
16 implementation ES.

17 RU initially tried to install CC as a formal organizational unit and quickly got pushback. MS's
18 CC was never stable enough to assume a formal shape. MU as an organization operated in a very
19 formal environment, yet, the crucial decisions such as selection of the ESs were based on
20 informal connections. All four cases demonstrated that CCs relied on personal relationships
21 inside and outside of the organization. In MS, CC employees would seek advice from their
22 former colleagues and RU relied on relationships among its CC employees to manage the ESs.
23 The informal relationships were fostered under the somewhat formal environment of routine
24 meetings and interactions. In HG, many aspects of CC were formalized from the CC goals, to
25 hiring, and promoting employees. However, these formal procedures were balanced out by upper

management building informal relationships and CC employees building a “bridge” to their respective BUs.

The contributions of this research are significant for the following two reasons:

Firstly, our understanding of entities created to manage ESs, such as CCs are based on treating these entities as established organizational units or solid structures. This research explores and provides empirical evidence of these entities being in-process and fluid. This new insight that CCs are more “process” than “things” requires new ideas to understand how these entities emerge and evolve. Thus far in IS, the evolution of entities is described in terms of maturity models (e.g. (Paulk 1993; Team 2002). Process and processes, as described in this research, are different than notions typically associated with maturity models or maturity stage process models, because maturity models are mostly *staged-models* where organizations move through the discrete stages systematically and wherein the stages are conceived as complete units of activity.

Secondly, this dissertation research provides insights into how organizational knowledge and competencies assets brought to bear during the ERP implementation be coordinated and integrated during the post-implementation phase. The analyses revealed that rather than taking a structural design focus for the CCs, organizations would benefit more from putting emphasis on processes that reflect the changing ES strategies, and are agile enough to handle emergent issues. CCs can achieve these goals when conceptualized not as ‘any other’ business unit, but when recognized to be organic entities that experience continuous transitions between territorialization, deterritorialization, and reterritorialization. In simple terms, the focus should be on what the CC does rather than on what the CC is.

8.2 Contribution to Method: Analyzing Assemblage Theory via Process

Characteristics

The conundrum of using grand social theories to conduct organizational level research was discussed in Chapter Four. There are three main issues with applying Assemblage Theory: the first, capturing and describing such an ephemeral phenomenon, the second, difficulty in isolating the unit of observation, and the third, establishing unit and methods of analysis.

To address the first concern of describing and detailing assemblage, this research is guided by the emergence theory. By following the ‘structuring’ and emerging patterns, this research follows and details the CCs as they territorialize, deterritorialize and reterritorialize.

Applying the notions of units of observation, and method of analysis to Assemblage Theory is challenging precisely because these assemblages are not fixed entities. Any description is going to be a temporally frozen snapshot in time. To overcome these challenges, I first conceptualized assemblage as a *process*. Once conceptualized as a process, I used process characteristics to capture (freeze frame) and analyze these assemblages, and then repeat that process examining different slices of process elements. Thus, a contribution of this research is establishing the close connection between assemblages and process characteristics, and in creating a means to capture this phenomenon. Utilizing these process characteristics allows for systematic procedures for data analysis, while staying true to the dynamic nature of the assemblage theory. In short, this research provides a way to operationalize the assemblages.

8.3 Contribution to Practice

The three most significant contributions to the practice of this research are: conceptualizing CCs as processes, fostering relationships, and managing the fluid boundary of these CCs.

First implication, upper management should conceptualize a CC as a process versus a stable organizational unit. All four of the study firms struggled with establishing CCs as a formal structure or fixed organizational units. Later, these organizations resorted to evolve this structure into more relationship based entities. Organizations can save time and effort by realizing that CCs are relationship based, in-process entities, thus, not forcing the shackles of traditional structures around the CCs. Instead, CCs should balance formal structures with informal relationship building activities.

The second implication, like any other IS investment in organizations, justifications for CCs should be based on business cases. However, the business cases for CCs should focus less on the traditional matrix and more on the relationship. Since the conventional matrix is based on ROI expectations from structures and solid entities, they are not quite a suitable measurement for fluid processes. These research participants provided insight that relationships matter to the CC employees. These relationships are even more important when the initial formation of the CC starts to evolve (deterritorialize).

The third implication is managers should understand that ES has fluid boundaries. The roles and responsibilities of the people involved are dynamically evolving. The vendor could become a partner or an employee; and an employee could become a consultant. In these emergent environments, social interaction in CCs greatly influence the ES use, adoption, and growth. The results of this research suggests that rather than conceiving of the CC as a stage model,

managers, by understanding assemblage notions, should focus less on achieving structural milestones. They should instead focus on the chief determinant of CC competency of relationship building or enabling. Social interactions can be fostered by ‘disregarding’ the checklists, and by being more agile to deal with emerging issues of the CC members.

8.4 Limitations

There are several limitations to this dissertation research. The first limitation arises from the fact that the study informants were all top-level managers for this research. The perspectives of mid to lower level employees and their activities described in this dissertation research are from the experiences and recollections of the informant upper-level managers. Accordingly, a kind of hierarchical bias is possible. However, the research protocols that protect the identity of all informants, and access to organizational detail and candor in the interviews suggest that little was held back. The informants may have had selective memory, forgetting important details or may have been reluctant to share certain sensitive and critical details. To compensate for this, I triangulated the interview data with published white papers, newspaper articles, blogs and discussion boards whenever possible. The purpose of the triangulation was concerned less with “fact checking” and more with understanding CCs in more comprehensive manner. There were, multiple informants for each organization, and the same questions were asked of each informant in the organization allowing for a kind of ‘validity’ check of recalled events. I asked clarifying questions via emails, phone interviews, and follow up in-person interviews. In many instances, the participants provided more details and clarified comments during the follow-up interviews.

1 The second limitation is that all of the CCs in this study, were located within a metropolitan area
2 in the southeastern US. The reterritorialization from one study organization to another one could
3 be attributed to their geographical proximity. However, these study organizations conducted
4 nationwide search for many of their upper level managements. In fact, some of the upper
5 management for HG were recruited out of the ES vendor organization that was from the other
6 side of the US.

7 The third limitation relates to the challenge associated with joining any process mid-stream- in
8 this case Territorialization – deterritorialization cycle. What is seen as a kind of
9 Territorialization or deterritorialization processes may be a function of when ‘you’ enter the
10 organization. One man’s territorialization is another’s deterritorialization. For example, when the
11 CC employees were abandoning HG, it was a reterritorializing process for the HG CC, however,
12 from these employees’ perspective, this was a reterritorializing process for them to enter different
13 organizations.

14 The last limitation of this research, is that this is an empirical, qualitative study drawn from a
15 sample of four organizations. Accordingly, all the usual cautionary caveats associated with case
16 study research apply to this dissertation.

18 **8.5 Future Research**

19 This research represents a starting point wherein the post implementation ESs are viewed as
20 assemblages of users, vendors, technologies, and capabilities. Further refinement and extension
21 of the assemblage concepts are needed to understand this phenomenon more completely. This
22 work operationalizes the assemblage theoretical concepts, process characteristics and uses

analytical methods of content analysis/latent semantic analysis. Further refinement of this operationalization is needed to make the analysis process more accessible to diverse researchers. In future research, further analysis of underlying smaller sub-assemblages of users, vendors, technologies, and capabilities could provide further insight.

Moreover, I have only analyzed part of the data from four of the seven study organizations. During this research, more than 3000 pages of documents were collected. This research only analyzed a subset of white papers directly relating to the organizational CCs in this research; a great deal of data remains to be mined. The remaining documents yet to be analyzed include, presentations made by vendors, project presentations from the project managers, top executive briefings to the CCs, CTO and CIO presentations, newspaper reporting, and detailed roadmaps towards creating CCs. I plan to continue working with the collected data to develop research portfolio further and refine the assemblage concepts. One of the future study could also focus on understanding the impacts of CCs by providing a more precise and concrete measure.

8.6 Conclusions

In chapter one, Introduction, I posited two central points. First, that Enterprise Systems are more than a collection of people, technology, processes and capabilities. Second, that responsibilities of post implementation management and governance of ES lies in the unit called Competency Center (CC). This CC is influenced by the dynamic interactions among people, technology, process and capabilities. Moreover, these dynamic interactions among diverse human and non-human actors from within and outside of the organizations keep these CCs fluid and always in-process. I also made the distinction between the notion of 'process' as used in a common parlance and the more nuanced idea of '*in-process*', central to Process Metaphysics (Rescher

1996). Differences between the ‘general use’ term and the more specific metaphysical notion of the term ‘process’ is described and examined in chapters 3-5. This distinction is central to this research because I contend that the general-use definition of the term process used in Enterprise Systems is oriented towards defining and examining “repeatable processes”, such as sales process, inventory process, and so on. ES software and vendors promote a similar repeatable process for decision-making process, managing process, and governing process. However, from the case analysis, I found that decision-making, managing, and governing in the ES are not “replicable processes” or reifications of structural variations over time, due to the dynamic interactions of various stakeholders. Thus, wherein practice and in the IS literature, processes are treated as stable, structural units, the phenomena I studied were the in process and structuring activities.

For example, the four cases described in this dissertation research planned and intended to develop clearly defined business units called competency centers, which would create formalized processes and procedures to manage the post implementation phase. Despite the efforts to solidify these CCs, none of these organizations ever achieved the anticipated stability. Instead, these CCs exhibited signs of being ‘in-process’ and ‘structuring’.

Assemblage theory consists of two continua: the first, territorialization \leftrightarrow deterritorialization, and reterritorialization, and the second, interaction between material \leftrightarrow versus \rightarrow expression. In general terms, Territorialization, deterritorialization, and reterritorialization suggest continuous processes transitioning through formation, deformation and reformation progressions. The connotation of formation, deformation, and reformation implies that each of these processes is identifiable and solid. While the simple idea of formation, deformation, and reformation are suitable in understanding the processes these CCs go through in a broad and general manner,

1 they do not sufficiently describe these not-so-solid, never-quite-finished, always in-process or
2 structuring referred to by Hopper (1996) as ‘*emergent regularities*’. To contrast with the notion
3 of stable structures, this dissertation research adopts the language of Deleuzian assemblage of
4 Territorialization, deterritorialization, and Reterritorialization instead of formation, deformation,
5 and reformation to indicate the fluid nature of these *dynamic formation*.

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