Managing the organizational paradox of isomorphic pressure from ERP systems

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Foreword

For about three months, we talked about writing a thesis. Then it turned out, it was supposed to be a paper. This was a disappointment.

Nevertheless, ERP systems are something in which we both are very interested and thus we soldiered on. This extraordinary journey has indeed been challenging yet equally rewarding. Before you cry havoc, and let slip the dogs of war (i.e. start reading), you might want to brace yourself, and thus be prepared for what is about to strike your cornea. Do not despair, for you stand in the face of deliverance. Even though the following pages might seem abstruse at glance, they are not execrable. In fact, this paragraph is extraneous to what will follow.

On a more serious note, we have learned a lot and had a great time these last months. We also have received a lot of help, support and love. Therefore, we wish to sincerely thank the following people for their contributions:

Thank you Hans for your patience, wisdom and humor. Your input, feedback and ideas have been invaluable, we know it hasn’t been easy!

Thank you to the interviewees, your participation was decisive for the existence of this paper!

Thank you to the mediator of the interviewees (you know who you are ;)!!

Thank you to the rest of our mentoring group, for your input and inspiration!

Finally, thank you to our respective girlfriends, for your patience, understanding and love!

We hope you will enjoy our paper!

Regards

Johnnie & Elias
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PART I

Prologue

This paper takes a rather theoretical stance on a problem the authors would like to describe as objectively real, although not always tangible. The problem identification deals with a distance in both knowledge and organizational relationships between strategists and IT-staff, with regard to the ERP system’s tardiness in relation to the flexibility of rewriting strategies.

The original idea for this paper was to identify where in organizations a mismatch between organizational processes and system logic are most likely to arise over time (box 3 in figure 1). Thus allowing decision makers from both sides in the organization to take the economic lifespan into consideration, before making investments to change the operations of the organization that will also call for an IT project to adapt the ERP system to the new processes.

To do this, a substitute to the commonly used contingency theory was required, that allowed for a project evaluation that included the time dimension we found missing in a vast majority of previous research. Turning to the field of paradox theory, in search for support for the idea of a present value model to evaluate IT investments, it seemed that little or nothing had been done in combination with the field of ERP systems. The scope of the paper therefor was expanded to include an empirical study on paradoxes within the context of ERP systems (box 2 in figure 1).

While preparing this and starting to read up on the paradox literature, aware of the possibility that the scope had outgrown the time frame, it became clear that neither empirical nor theoretical studies had much to contribute with regards to previous research. The scope grew once more, and conducting a theoretical study on paradoxes in the context of ERP systems (box 1 in figure 1) was added to the list.

These steps combined seemed implausible to manage within the given time frame for this thesis, and cuts were made to limit the scope to (box 1) a Theoretical study on tensions. Thus, leaving study 2 & 3 in the presented order aside for now. The choice of words regarding
paradox literature is that the phrase *Relationships of tension* is preferred over using the word *paradox*, and this is due to different methodological considerations which will be discussed in depth in chapter two.

Thus, what follows is a theoretical study on tensions between organization and ERP system logic. Hopefully, this is to be further developed and the aforementioned studies (2 & 3) marked with “X” necessary to provide academics and practitioners with a more sophisticated perspective on IT projects and investments will be conducted in the future.

As such, this thesis makes up the first third of the work necessary to fulfill the aim of the original thesis (3).
1. Introduction

One of the understandings of our modern corporate world is the benefit of *economies of scale*, the inevitable truth that one joint effort stretches further than many separate ones (Light, 2005, ss. 119-121). This is particularly true for the IT development over the last 20-30 years, where the cost of developing the state of the art IT systems of today would be extremely high to the individual company (ibid.). In about the same time the environmental setting for most organizations has gone from a range of a perhaps not stable, but at least an instability defined by volatile demand, to a reality where the whole game can change within a foreseeable future. Competition is no longer just about the *Four P:s of Kotler* (product, price, promotion and place) (Kotler & Armstrong, 2010). Even manufacturing companies have to approach the additional three P:s (people, process and physical evidence) since the servicification of product markets has become more and more prevalent (Kindström & Kowalkowski, 2009). This paper examines the conflict that emerges from the fact that this increasingly dynamic world clearly is incompatible with the inherently static nature of IT systems.

1.1 Three fundamental concepts

Presented in this introductory chapter are three fundamental concepts within three distinct theoretical fields, ERP research with an emphasis on the fundamentals of the ERP systems market and basic characteristics of these systems, technical isomorphism within institutional theory and finally paradox research within contemporary organizational theory. These concepts will be the main topics of this paper and elaborated on in the following chapters. This chapter serves as an introduction to the fields, and arguments are presented as to why research that combines them is relevant.

1.1.1 Evolution of ERP systems

The arrival of *Enterprise Resource Planning systems* (henceforth called ERP systems) in the 1990’s took the business world by storm, and by the year 2000 a major part of the Fortune 500 companies had adopted an ERP system (Kumar & van Hillekersberg, 2000, p. 24). To understand what an ERP system actually is, it is gratifying to turn to the problem it is meant to remedy. Large companies contain extraordinary amounts of information, but sharing this information in a coherent manner between various parts of the company is not easily done. For example, in a large divisionalized organization where purchases are centralized, the business units’ individual purchasing orders must be gathered and consolidated in order to enable the possibility of large volume orders and thereby gain access to discounts. Without an
ERP system to compile this information, collecting it is an enormous task, and making sure the information actually is correct an even bigger one. This example highlights the major issue of fragmented information in large organizations (Davenport, 1998), that has paved the way for ERP systems. They offer a single comprehensive database, connected through different integrated modules used throughout the company. When a change occurs in one module, related information is updated in the database and made available to the rest of the organization as well (Ibid.).

There are several reasons for implementing an ERP system, amongst them being to enable central control over all processes throughout the organization (Davenport, 1998, p. 123). The research area of the implementation of ERP systems has received much, if not the most, attention in the ERP systems research (Addo-Tenkorang & Helo, 2011), partly explained by the scope of these projects. Addo-Tenkorang & Helo (2011) claims that “Often the ERP implementation project is the single biggest project that an organization has ever launched”. It involves a large part of the organization and is oftentimes not limited to impacting only the IT environment of an organization since it often comes with major Business Process Reengineering efforts (Westelius, 2006b).

The first iterations of what we today know as ERP systems started appearing around the early 1960s. Companies started making use of the potential that computers offered in increasing efficiency in administrative tasks (Hedman, Nilsson, & Westelius, 2009, p. 146). These systems were developed in house, individually for each company (Andersen, 1994, p. 40). This of course meant that each company had to reinvent the wheel for themselves, leaving room for a market offering a more efficient solution.

During the 1970´s this gap in the market was leveraged and pre-designed IT-solutions, termed packaged software or standard application packages, were made available by companies dedicated to the development of IT systems (Dexner, 1995, p. 11). These early systems were not all-encompassing but instead targeted specific functions within the company, and their impact on the organization as a whole was limited (ibid). The earliest versions of these packaged softwares were tools used in accounting and HR-functions (Hedman, Nilsson, & Westelius, 2009, pp. 146-147).

With the arrival of the internet in the 1990´s companies gained access to a global marketplace, with the implication that information was now available on a global scale. A new idea emerged that the standard application packages should be expanded to a companywide level
(Dexner, 1995), meaning that the standard application packages would be integrated with each other within the organization. This idea came partly from the fact that implementations of standard application packages were not always successful and partly from the promise of increased efficiency that a fully integrated system entailed (Davenport, 1998). These fully integrated systems came to be known as ERP systems. Consequently an ERP system is little more than a large gathering of standard application packages (Hedman, Nilsson, & Westelius, 2009). However, unlike the old packaged software, the different components of an ERP system are fully integrated with each other and connected on a companywide level. As such, the impact on the organizations in which they are implemented is significant (Hedman, Nilsson, & Westelius, 2009, p. 17).

This impact, combined with the sheer complexity of a system containing all the information within a company, means that selecting a suitable ERP system is time consuming and tedious (Wei, Chien, & Wang, 2005). Once selected, the implementation of the ERP system is a far from trivial task. It is a major investment of both time and resources with no guarantee of a successful outcome (Light, 2005). Numerous writings address the issue of implementing an ERP system and suggest methods to minimize the friction between system and organization (Wei, Chien, & Wang, 2005; Benders, Batenburg, & van der Blonk, 2006; Light, 2005; Scapens & Jazayeri, 2003). These implementations have in fact proved so complex that Davenport (1998) estimated that around the turn of the millennia, the expenditures on ERP systems consultants matched the expenditure on the ERP systems themselves. Moreover, even if the technical obstacles were to be overcome, the project management of making ongoing development in an implementation project often constitutes a great challenge alone (Westelius, 2006b; Avital & Vandenbosch, 2000).

The need for competence in these implementation projects has driven the state of the IT market from a point where organizations often developed their own systems, specifically developed for their needs, to where we are today, a market with a limited number of suppliers for extremely complex ERP systems. Each of these systems are niched to certain industries and contain pre-set combinations which can be altered to suit the individual customer (Hedman, Nilsson, & Westelius, 2009, pp. 55 - 58). This comes at the cost of flexibility, causing potential conflict between the built in logic of the ERP system and the logic of the business itself (Davenport, 1998, p. 123).
In summary, the market for ERP system suppliers has grown to be an approximately 19 billion euro industry\(^1\) (2013). It has become something that resembles a *Winner takes all market* (Fischbacher & Thöni, 2007, pp. 151-152) where only a few suppliers share each (geographic) market for the biggest systems and customers. According to Hedman et.al (2009), the outcome of the ERP system industry, like many other manufacturing industries, can be seen as a “mass customized product”. I.e. developed for several customers with different needs, but still quite capable of satisfying individual demands (Hedman, Nilsson, & Westelius, 2009, p. 59). This market structure for ERP systems has led many companies (adopters of ERP systems) in similar markets to adopt the same ERP system. This means that companies are being forced into predesigned processes by the ERP, becoming more alike and having more difficulty in creating a competitive advantage. This phenomena is described by Benders et.al (2006) as *technical isomorphism*.

1.1.1 The concept of isomorphism

As described above, the tendency for ERP systems is to strive for standardization. This is in many ways an intentional choice based on technical preconditions. However, the concept of isomorphism stretches further and addresses the often unintended consequences of various types of external pressure. However, it is necessary to introduce the wider concept of isomorphism and gradually narrow it down to the definition of *technical isomorphism* (Benders, Batenburg, & van der Blonk, 2006) that this paper mainly deals with.

Isomorphism as a term is derived from the ancient Greek: *Isos* (equal) and *morphe* (shape)\(^2\). One of the best ways to really grasp the concept is to turn to the holy grail of isomorphism literature, *The Iron Cage Revisited* by DiMaggio and Powell (1983), who reacted to the common question amongst researchers of *why organizations differ*, and asked instead “why there is such startling homogeneity of organizational forms and practices” (DiMaggio & Powell, 1983, p. 148). Perhaps the most accessible definition was presented by Hawley in 1968, that “isomorphism is a constraining process that forces one unit in a population to resemble other units that face the same set of environmental conditions” (DiMaggio & Powell, 1983, p. 149). Leaving the history previous to this aside, they also argue that “organizational actors making rational decisions construct around themselves an environment


that constrains their ability to change further in later years” (DiMaggio & Powell, 1983, p. 148).

The institutional isomorphism according to DiMaggio and Powell derives from three mechanisms that drives this isomorphic change; coercive-, mimetic- and normative isomorphism. Together they provide an explanation for how accounting- and environmental regulations etc. pushes organizations to change in the same direction in order to maintain and/or create legitimacy and how the common response to uncertainties is to mimic other, more successful organizations.

The concept of isomorphism according to DiMaggio and Powell is defined as both a state and a process. In this paper though, it is defined as a process. Not as an ongoing isomorphic change process, but rather a constant pressure that holds change back and drives change in a specific direction. What is examined in this paper are the consequences of isomorphic pressure from ERP systems. This isomorphic pressure stems from the fact that ERP systems do not change over time unless they are actively altered. This is different from most of an organizations preconditions like their environment regarding external forces (Porter, 1979) or the thoughts of contingency theory that claim that an organization must adapt to the environmental setting and find a strategic fit for each current situation (Nilsson & Rapp, 2004, pp. 19-21).

With regards to ERP systems, this has a streak of isomorphism when the alignment of organizational processes to the systems built in logic has to be fitted. Benders et.al (2006) asked whether the technology or the organization contributes with most change and flexibility in this alignment. In cases when the vendors cannot or will not comply with the organizations requests, they must choose between giving up the idea of using the full capability of the ERP system, or give in to the limitations of technology and adapt to the embedded processes. Thus, homogeneity amongst ERP system adopting organizations is enforced, propelled by the fact that these organizations are using the same ERP system (Benders, Batenburg, & van der Blonk, 2006). The idea that fit between system and organization needs to be achieved is similar to the reasoning in organizational literature on contingency theory that argues the need for alignment between strategy, environment and internal processes (Nilsson & Rapp, 2004).

1.1.2 Organizing change with technical isomorphism in mind

The classic body of work on contingency theory contends that tension in an organization is most effectively handled when internal fit and external alignment has been achieved.
Essentially, this means that for any given situation there is a best way of organizing (Scott, 1981). This platform of fit and alignment then serves as the basis for selecting among competing demands (Smith & Lewis, 2011).

This is usually how ERP systems are selected and then implemented. A discussion of which system best suits the organization and what changes that have to be made in both organization and system in order to achieve fit (Benders, Batenburg, & van der Blonk, 2006). With this logic, whenever tension between system and organization arises a choice should then be made as to how and which of the two that needs altering in order to relieve the tension (Sia & Soh, 2007). Since the emergence of ERP systems in the mid 1990’s, much has been written on the subject, usually with a focus on the implementation of the ERP systems and subsequent fit between the system and the organization into which it is implemented (Addo-Tenkorang & Helo, 2011; Benders, Batenburg, & van der Blonk, 2006; Davenport, 1998). However, very little effort has been made to study ERP systems in combination with another field of organizational theory, which has garnered much attention over the last twenty years, namely paradox research.

In the 1980’s an alternative to contingency theory emerged, contending that tensions within an organization are not solely caused by misfits that can be dealt with through organizational efforts (Smith & Lewis, 2011). Sometimes the tensions are instead caused by the fact that there are elements within an organization that contradict each other, whilst individually being essential to the organization. As such, the tensions caused by these contradictory elements will cause tensions over time (Poole & van de Ven, 1989). These competing elements constitute paradoxes that exist in the organization and that, according to a paradox view but unlike the logic presented by contingency theory, both require attention in order to ensure long term sustainability in an organization (Smith, 2015). In this sense, a paradox is separated from related concepts as dilemmas. A dilemma presents an either/or choice which, once a choice has been made, is resolved. In contrast to this a paradox instead poses a both/and type of problem and is something the organization cannot move past by choosing one over the other (Smith & Lewis, 2011). Furthermore, paradoxes and paradoxical relationships can exist within an organization without creating tension. That is, the way the organization and its environment operates causes the paradox to be rendered latent. However, as change occurs within and outside of the organization, these paradoxical relationships can surface and once again cause tension, being rendered salient (Ibid.)
Since the 1980’s there has been much written about tension within the fields of organizing and organizations. Smith & Lewis (2011) give several examples of causes of tension in an organization including collaboration/control, individual/collective, exploration/exploitation and profit/social-responsibility. Another paradoxical relationship can be distinguished in the relationship between an ERP system, that is all but easy to change and reconfigure (Davenport, 1998), and the fact that organizations and the environment in which they operate are considered to be changing at an increasing pace (Smith & Lewis, 2011). An argument can therefore be made that the paradox presented by technical isomorphism versus dynamic environment belongs on the list. This will be focal point of this paper, to apply a paradox perspective to this relationship and lay the groundwork for a framework that allows for examining where in an organization these tensions manifest themselves over time.
To avoid misconceptions about what an ERP system really is and how it works, this vignette will strive to clarify this in a less academic manner. Thus, it is to be considered a guide on how to look upon the problems that are examined and discussed in this paper.

So, to the case. Why do companies want an ERP system? To begin with, it enables sharing information in real-time. This makes it possible for a controller to collect and analyze warehouse-, logistic- or sales data from all business units spread all over the world with a minimal time lag. Which in turn enables way more up to date decision making for the managers.

Also, processes such as purchasing allows automatization to a high degree in form of approval of the invoice review process by letting the system compare the purchase orders with invoices and delivery orders. If no discrepancies are detected the invoice can run through the system and be paid in time automatically by an integration between the ERP system and the bank. This may sound like a minor issue, but at huge companies overdue payments are a noticeable cost due to long chains of command regarding purchases, leaving a lot of people involved with what appears to be rather simple processes.

Logistics also has a lot to win by making it possible to track deliveries on a detailed level, which otherwise would be lost in the hands of the one holding the package at each given time from the point where it leaves the sender until it has reached its final destination. If the delivery runs late or gets lost it is extremely difficult and time demanding to track it down manually.

In other words, many of the things we take for granted in our everyday life is possible thanks to these systems. Like being able to pick up a package that the post office staff actually finds in less than a minute, or coordinating projects including experts from all over the world.

More or less every action taken in an organization is registered in the ERP system. Accounting is often considered the core operation, and was the main argument when the systems started to be developed. Today sharing information about sales processes, logistics, production capabilities and project planning also are important features, making the number of information transactions considerably greater than before. Also, the modern view on supply chain management has increased the need for integration between systems even outside of the own organization.

In summary, everything that happens, leaves a mark in the system. It provides top management with the possibility for endless amount of information and enables way more efficient ways of working than doing everything manually.
1.2 Problem identification

The introduction presents the fundamentals within the three distinct yet interrelated fields of ERP systems, organizational paradoxes and isomorphism. The impact from an ERP on an organization is great (Benders et al., 2006; Davenport, 1998; Addo-Tenkorang & Helo, 2011), and scholars have dedicated much effort to develop methods for increasing fit between ERP and organization. Most of these methods assume that there is a best way of organizing that will maximize the fit between ERP and organization. When reviewing existing ERP literature, it appears as if though most researchers fail to take into account the perspective from which they view organizational tensions and organizational fit, and by default take a view based on contingency theory. That is, the focus is usually on what decisions and actions that are needed to achieve said fit, much in the same way that contingency theory stresses the importance of achieving internal and external fit.

This is a recurring problem in ERP literature and a majority of past and present writings focus on the question of whether to adapt the system or the organization to one another in order to minimize tensions and maximize fit. As Smith & Lewis (2011) denotes however, actors often impose an either/or choice to resolve tensions rather than accept them as a both/and issues, and this is often the approach used by scholars when studying ERP systems.

This becomes a problem since an ERP system is not a one and done venture for an organization. What might be a near perfect fit just after the implementation will not remain so. An ERP system is not implemented and then forgotten, it will continue to exert isomorphic pressure continuously as the organization changes due to external circumstances (Hedman, Nilsson, & Westelius, 2009).

The problem is that the ERP system, once implemented, is a static element in the organization, while the organization must continuously adapt to the dynamic environment of the external factors. As illustrated in figure 2, the ERP system causes a misfit at the point of go-live due to the fact that these projects seldom are perfect at this point in time, and requires ironing out bugs and

![Figure 2. Illustration of ERP misfit](image-url)
alignment missed in the planning of the project. In the period following the go-live, the system will be continually customized and alignment and fit improves (Gattiker & Goodhue, 2005). Over time though, the organization most likely will need change, but the system will remain the same with no regard to organizational needs, unless explicitly addressed and dealt with.

This is where isomorphism comes into play since the system prevents the organization from changing the way it needs to (Benders et.al, 2006). In essence, what happens is that the need for fit between system and organization becomes the guide for the strategic evolution of the organization rather than the environment. Here, a paradox perspective appears to have much to offer for both practitioners and researchers since it shifts the discussion from fit, to making sure that the elements involved in causing the organizational tensions are all given attention over time. Such a perspective would help create a more nuanced discussion regarding ERP systems in a post-implementation era and could allow researchers the opportunity to move away from the discussion of fit and instead focus on finding methods for an ERP-environment that allows for a more flexible organization. A first step in such research would be to identify elements in the organization and the ERP system that have a relationship of tension (RoT) to each other and as such could benefit from being examined with a paradox perspective.

Stating the problem

The focus on saving costs in an ERP system implementation drives standardization in order to maintain fit. This standardization means that the ERP system will shape the organization over time, and limit its flexibility by exerting isomorphic pressure. A paradox perspective would help to combat this since it includes thinking about organizational tensions in a wider time frame than contingency theory (Smith & Lewis, 2011). In order to establish the credibility of such a perspective, a reasonable start would be to examine organizational tensions that arise in a post-implementation era with a paradox view, as well as discuss literature on paradoxes and isomorphism together.

1.2.1 Paper aim & research questions

The aim of this paper is to identify and classify organizational Relationships of Tension.

Research questions

- What organizational tensions related to ERP systems can be seen in an organization?
- What classes of paradoxes do they belong to?
First off, understand that even though an ERP system might be considered to be an off the shelf product much like the usual programs you have installed on your own computer (MS Office etc.), it is extremely rare that an implementation project is that straightforward (it really never is). Using it as is would require the company to change all their processes and adopt the pre-set ones that the system supplier designed the system for. These pre-set processes are not one single set that allows no variance, they do however at least force the organization into a certain framework, or a limited number of alternatives for how to organize and get things done. Instead, almost all implementations begin with a more or less thorough pre-study to decide on how to change and configure the system so that it fits the needs of the organization before the actual implementation and coding gets done.

In theory this might not sound as a very big deal. In reality though, executing these pre-studies can be quite demanding. Each process that is to be automatized or supported by or even just registered in the system has to be mapped out in a detailed flow chart. The roles have to be set and substitutes appointed, authorizations and limitations for each role decided on and thought through to make sure that each role has access to the parts of the system they need, but is prohibited to change or see other parts that could make a mess if faulty altered or that contains sensitive information. In a huge organization that has 20-30 thousand users this is an exhaustive process, but important none the less.

Thus, almost all implementation projects include a number of modifications in the (source) code to adapt the system to the organizational needs and business processes. Also, the ERP system seldom is a stand-alone solution, but is integrated with a number of other systems. For example, the IT-architecture of Stockholm County Council included as many as 243 different IT-systems (in 2008) that were integrated via an integration hub ran by as many as 32 full time employees. This of course is an extreme case, and most companies have far less systems to deal with. Point is though, the problem is not only to build a ERP system that does what you want it to, the information input often comes from many other systems that has to be thought of as a part of the whole solution.

And this is where it all really becomes as complicated as complex. If something changes in one part of the ERP system, or even another system integrated to it, it has consequences later in the process. Thus, creative minds that finds new processes that works just fine locally still messes with the master data analyzed later on by central functions. In turn, these analysts might not know what data they are looking at, making the holistic view blurry and disables opportunities to improve overall efficiency for the whole organization. This leads, if explained with a rather simplified model, to a situation where the complexity increases exponentially with each new workflow/process or integrated system added to the ERP solution.

Also, it is hard enough to maintain the flow charts over the processes ran by the system up to date. But the real tricky part is to make sure that users in Sweden, Spain and China use it in the same way, without finding these loop holes to make their own department run more smoothly at the cost of master data used by top management.

Ps. Read more on master data in vignette 4.
1.3 Paper overview

Due to the fact that this paper is rather unorthodox in terms of structure and logic, this section aims to prepare the reader for what is about to come. This is done by first presenting a brief summary of the content, followed by an attempt to explain the paper logic.

**Paper content**

What this paper does more than anything is to point at a gap in the ERP research and give arguments for why it can be of interest to both scholars, ERP systems adopters and ERP systems consultants that this gap is explored in future research. The paper is mainly written for researchers and practitioners, but also business students with limited knowledge of ERP systems.

In order to write this in an accessible, yet academically correct manner then, a traditional paper structure has been discarded in favor of a paper logic that favors continuous discussion, interspersed with vignettes. These vignettes are written in a less formal manner and were born out of necessity since conveying what an ERP system actually is, in an academically correct manner, has proven problematic. They are not considered a part of the core paper structure and are therefore not included in the table of contents, instead they are placed where considered appropriate and necessary.

*Figure 3 - Paper content*

- Argues for the necessity of this thesis and introduces the different subject areas
- Formulates a problem identification and paper aim
- Presents the methodology and research strategy
- Literature review to motivate the research questions, and present previous research in the field
- Building the toolbox - Presentation and further development of existing theories
- This final part is what is closest to an analysis, conclusions and contributions etc. would be with a more traditional paper structure
- What is presented in Part II is woven together and discussed, and also answers the research questions

The rest of the paper is divided into three separate parts with their own themes and key points. Part I is made up of the introduction and the methodology. This part serves as an introduction to the reader as to what topics will be tackled and makes arguments as to why the rest of the
paper is motivated. It is concluded with the chapter on methodology and the choices on design and strategy used in the writing of this paper. Following this is part two, which contains the bulk of this paper with regards data, both theoretical and empirical. It starts off with presenting a literature review of the ERP field that was conducted, as well as present its key findings. Following this is an expanded discussion on isomorphism, and the importance of it cannot be stressed enough, since it constitutes the explanation for the problem defined in the problem identification and that this paper is concerned with. Next is a presentation of paradox literature which is later used in part three to examine the findings of the literature review. Part two is concluded with a presentation of empirical data.

The final part of the paper is part three, in which collected data and the presented theories are examined in conjunction. The first chapter of part three begins with combining the paradox literature introduced in part two with the results of the interviews that were carried out in order to evaluate both the theoretical data found in the literature review as well as the empirical data gathered from the interviews. The paper is concluded with a discussion chapter where the implications of the findings are discussed, contributions are summarized and future research is suggested.

**Paper logic**

The most difficult task for the authors of this paper was to find a place in the paper logic for a more thorough discussion on isomorphism, since it comes in to play in all aspects of the core problem. Hence, part two was the most appropriate location since it is purely theoretical, even though the chapter on isomorphism differs from the rest of part two in that it includes an analytical discussion. A distinction is made in that the analytical discussion on isomorphism in part two is there to provide the theoretical foundation necessary for part three. Also, it is beneficial for a reader who is previously unacquainted with the theoretical fields of this thesis to be provided with an in-depth discussion on isomorphism, since it is the driver for the core problem of this thesis. Having an analytical discussion on isomorphism in part two also allowed for the concept to be leveraged in part three, where isomorphism is combined with other theoretical fields. Thus, the best available structure was to include it in both part two and three.

Otherwise the thesis logic is rather straight forward. First an introduction of the problem and the paper aim, then a presentation on methodology, then theoretical and empirical data is presented and ultimately examined in conjunction.
This somewhat unorthodox structure is chosen because of how the different themes correlate which each other. To discuss the different concepts repeatedly throughout the thesis is key to continuously get closer to the final contribution. Important to the reader though is to keep in mind what role these different concepts play in this thesis. All three concepts are recurrently discussed, and it is beneficial for the reader to get an overview in order to grasp of how these concepts correlate. This is illustrated in Figure 4, that shows how the ERP systems constitutes the root of the problem examined, how isomorphism provides an explanation to why this happens and how theories from paradox literature are presented as a potential solution to the problem. The structure of the paper is laid out so that these concepts will be discussed continuously and their meaning and importance as well as the way they intertwine should be increasingly clear while reading the thesis.

*Figure 4 – Logic of correlation between the presented concepts*

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**ERP systems**
These parts constitutes *the root of the problem* [in relation to company strategies] in this thesis.

**Isomorphism**
The concept of isomorphism provides an *explanation* to why ERP systems becomes complicated with regard to strategies.

**Paradoxes**
The thesis later suggests a potential *solution* to this problem by combining the concept of paradox theory with the ERP field.
2. Methodology

The intersection between ERP systems research, isomorphism and paradox literature will be the area of study in this paper and the merits of applying a paradox perspective instead of discussing fit will be examined. In order to do this, a literature review of recent ERP writings was conducted to determine what sources of tension that can be found in an organization that are the reason for customizing ERP systems in the post-implementation era. These sources were then examined with the help of paradox literature in order to identify elements within ERP systems and organizations that qualify for the criterions of a paradox perspective.

Since the aim of the paper is to establish a theoretical understanding of how the fields of ERP systems research and paradox research relate to each other, a literature review is a useful tool (Friberg et.al, 2012). Typical for such a review is that it goes beyond describing the different theories individually an instead attempts to merge the results into an integrative overview. In this paper the overview consists of gathering what the ERP literature says about post-implementation customization and what problems and issues that relate to this as well as discuss technical isomorphism in conjunction with paradox literature.

This methodology chapter begins with discussing ontological and epistemological stances and then presents the methodology for collecting empirical data. It concludes with a presentation of the methodology used for the literature review. The reasons for choosing this order is that it helps the reader relate to the findings in the literature review more easily.

2.1 Ontological and epistemological considerations

First off, it is important to discuss the ontological and epistemological perspectives used in this paper. This is a good starting point since isomorphism and organizational paradoxes are intangible, and have not been studied in combination with ERP systems before in any larger extent. Fleetwood (2005) claims that if the ontological standpoint is ambiguous then the resulting theory and practice will be much likelier to be ambiguous as well. Since paradoxes and isomorphism are abstract and hard to grasp phenomenon they run the risk of becoming confusing and ambiguous when combined, if their ontological standpoint is not clarified early on.

2.1.1 Ontological considerations

Ontology relates to the matters of reality and whether or not there is a reality external to the actors involved in it, or if it is just a social construction from social interactions. An objective
ontological stance relates to the former and a subjective ontological stance is more in line with the latter (Bryman & Bell, 2011, pp. 20-23). What follows below is an ontological discussion of the different theoretical fields that are central to this paper, the ontological nature of ERP systems, organizations in general and isomorphism.

**ERP Systems**

Since an ERP system is integrated within all of an organization there is need for conceptual clarity when discussing its impact on the organization. The ERP articles used in this paper as a whole tend to adopt a more objective ontological stance when discussing fit and alignment rather than consider these issues to be a product of social interactions. Not much of the research discusses the perception amongst the users regarding the systems themselves or how well they fit into the organization, which would indicate a more subjective stance. Though not explicitly mentioned in these articles, their ontological stance can be described with what (Fleetwood, 2005) calls *causal efficacy*. This term is used to describe something as being real if it has an effect on behavior or otherwise makes a difference and is usually how ERP systems are described in the literature. Another clarification regarding terminology is also required. In the ERP systems literature the terms *function* and *process* are used interchangeably but usually refer to accounting, purchasing etc. Since this paper is mainly aimed at researchers and practitioners, as well as business students, a distinction is made between the two terms in that a function contains processes and not vice-versa.

**Organizations**

Organizations in the context of the literature used for this paper are usually described with an ontologically objective stance, mainly within the ERP literature much in the same way that ERP systems themselves are described. With regards to organizations in general they are, in the context of this paper, considered to be entities that exist in their own right, in a reality external from the individuals acting within the context of the organization (Bryman & Bell, 2011, pp. 20-23), which is more of an objective stance, much like the one taken on ERP systems. As a result of this the processes and functions that make up the organization are also considered to exist in an objective reality. This is important since there is a large difference when discussing fit, misfit and tensions between an organization and an ERP system if the misfits or tensions are simply perceived as such by the ERP system users or if there is an objective misfit in an objective reality.
Isomorphism

The stance adopted by the authors in this paper is that isomorphism exists in a reality external to social constructions and acts as a force that constantly exerts pressure on organizations whether or not the individuals in the organizations are aware of it, which is typical for an objectively oriented ontological stance. To illustrate this, consider a tree falling in the woods and the question of whether or not it makes a sound even if no one is around to hear it. In this thesis it does!

There are however differences is the degree of tangibility, where two types are more abstract than the other two. This will be declared for as each type are presented in chapter four, as it does have an impact on the ontological discussion (Fleetwood, 2005)

2.1.2 Epistemological considerations

The epistemological stance of a researcher describes whether or not he or she believes it is possible to study something in a neutral manner (Cassell & Symon, 2004). An objective stance claims that this is possible whereas a subjective stance claims that there is no such thing as unmediated, and thereby neutral, collection of data (Fleetwood, 2005). The consequence of this is that epistemology describes what the researcher thinks is possible to know about the world and whether or not incontestable truths exist (Bryman & Bell, 2008, p. 14). Since this paper explores the potential of applying a way of thinking on organizational tensions to ERP systems in a novel manner, the epistemological stance becomes very important for the value of its contributions. Much of its value is derived from replacing a contingency based view of organizations with a paradox view. However it does not seek to challenge or replace contingency theory with regards to ERP systems research. Instead, what is sought is an alternative way of thinking about the long term evolution of an ERP system in an organization and here a paradox view does have advantages over contingency theory.

Another important matter to discuss is how the findings of this paper are to be regarded. Since paradox literature is used to examine tensions between organizations and ERP systems, it might seem logical to conclude that the findings point towards the existence (or non-existence) of paradoxes related to ERP system. However, this paper does not go as far as to claim that these paradoxes exist (or do not exist), but rather attempts to determine if there are tensions in an organization that seem to be valid for discussing and studying from a paradox point of view. This is the reason that the term Relationships of Tension (RoT) is used
notoriously throughout the paper instead of paradoxes, because this paper does not claim that there are any paradoxes, but examines the value of using a paradox perspective.

2.2 Overall research strategy

The problem identification of this paper draws upon existing literature and theories. As such the workflow consisted of first reviewing the literature within the field of ERP systems in order to determine to what extent the areas central to the aim of this paper had been studied (Friberg, 2012). The results were then compiled, and by leveraging some of the main writings in the field of paradox research, paradoxical relationships between ERP systems and organizations were proposed synthesized. Through the collection of empirical data they were examined and either altered, confirmed or denied (Ibid.). That is not to say confirmed as being an incontestable truth or fact, but rather as being a perspective worth pursuing in future research.

Data collection methodology

2.2.1 Research approach – A deductive and qualitative study

The problems and phenomena described in the previous sections are, in the context of this paper, viewed as real and actual problems existing in an objective reality. That is, the problem itself is not identified in relation to how it is described or experienced by an individual. Instead this is something which can be described by multiple sources with different viewpoints, leading in turn to the true causes and attributes of the problem being unveiled (Bryman & Bell, 2011, pp. 11-14).

This paper makes use of existing theories in order to examine a specific problem. Thus a deductive approach is preferred over an inductive one (Ibid.). With this in mind, a qualitative study was chosen even though a deductive approach is usually combined with a quantitative approach. A qualitative approach was deemed necessary in order to best capture the essence of the issue at hand. The advantage of a qualitative approach over a quantitative one is that it allows the researcher a greater potential for gaining a deeper understanding of the problem at hand. Usually qualitative research is reserved for building theories from empirical observations but qualitative data can also be used for testing theories (Ibid.). Since access to previous research regarding this particular issue was limited, it was deemed important to allow interview subjects a wider range of freedom in their answer. A quantitative approach would mean using a fully structured interview format, thus imposing stricter definitions and
limiting possible answers in order to facilitate the coding of variables (Bryman & Bell, 2011, pp. 200-204).

2.2.2 Research design – Cross-sectional

In order to answer the research questions it was necessary to allow each person to speak freely about their experiences. Since there is little previous research done on the subject, it was important that the input from the interviewee came in the form of experiences, rather than asking them to perform analysis of their own. The amount of detail required in gathering this data motivated a multiple-case study design (Flyvbjerg, 2006). Each interview person would then be treated as an individual case. This would then allow greater exploration of each person’s own experiences. However, it is not the cases themselves that are the main focal point but rather producing generalizable findings. Therefore the research design overall came to be considered to be cross-sectional (Bryman & Bell, 2011, pp. 53-57).

The selection of cases should be based upon where the potential to learn is the greatest (Bryman & Bell, 2011, p. 60). The selection of interview subjects was based upon this criteria. Therefore the subjects were not be selected based upon a specific role within the organization, but rather based upon the extent of their knowledge of the organizations IT-systems and their involvement in strategical decision making regarding the organization and the IT-systems. The organizations themselves were also important since they needed to possess characteristics that made large scale use of ERP systems. These characteristics were based on literature.

As is typical for a cross-sectional design, the data was collected at a single point in time (Mann, 2003). This was also a necessity given the time available for the writing of this paper and was the main reason for not choosing a longitudinal research design. A longitudinal study of one or several companies would allow a researcher to observe the phenomenon of tensions arising between organizations and ERP systems first hand, instead of relying of the accounts of others through interviews. In choosing a cross-sectional design it is imperative to address the issue of causality (Bryman & Bell, 2011, pp. 53-57). Since the data is collected more or less simultaneously it can be difficulty to establish the direction of causality. This will instead be achieved by drawing on the isomorphism literature, which helps to explain how and why the organization changes the way it does and how this relates to (the lack of) change in the ERP.
2.2.3 Empirical data selection

In order to gather the necessary data it was important that a range of possible sources were examined and discussed. Possible choices included gathering data from key personnel at the ERP-vendors, the end-user companies or customers and suppliers of the end users.

Since we were primarily interested in organizations that were the most likely to suffer from the negative consequences of isomorphism, the objective was initially to study companies that were customer centric and decentralized with regard to decision making. The major question was whether or not there would be sufficient insight amongst the studied firms with regards to the question of fit between system and organization. An alternative route was offered were ERP consultants with experience from ERP projects in firms that possessed the necessary characteristics described by Kowalkowski & Kindström (2011) would be interviewed about their experiences. Interviewing both key personnel at firms who had adopted ERP systems as well as ERP consultants was seen as the ideal outcome.

The first selection of ERP adopting firms was based on the previous research made in Kowalkowski & Kindström (2011). The firms selected in that study had to possess three primary characteristics:

1. The firm pursues differentiation strategies through services;
2. The total sample of firms should include all three forms of organizational arrangements; and
3. Access to key informants was provided

These criteria constituted a good starting point for our selection (even though the 2\textsuperscript{nd} one is specific for that research specifically). They include differentiation strategies and most likely customer centricity and they are all big companies that were likely to have well developed IT-structures and strategies. The seven firms identified by Kowalkowski and Kindstrom (2011) are the following:

1. AGA
2. Husqvarna
3. ITT Water & Wastewater
4. Metso Fiber
5. Metso Mining and Construction Technology (Metso MCT)
6. Toyota Material Handling Europe (TMHE)
7. Volvo Trucks
As it turned out though, access to these companies was very difficult to obtain. Finding key personnel with the necessary insight into both IT and strategical decisions, with time and willingness to help out, turned out to be challenging. In the end the secondary approach of interviewing ERP consultants proved to be the only feasible solution.

The result was that three interviews were conducted with ERP consultants possessing a wealth of experience from different ERP projects.

2.2.4 Empirical data collection through interviews

Data was collected through the use of semi-structured interviews conducted via telephone. This proved to be the only viable option, since much time had already been dedicated to gaining access the aforementioned companies. The alternative, on-site interviews, was dismissed because it was too inefficient. There were of course certain drawbacks when comparing this method with purely on-site interviews, nuances in the answers that might not be picked up on by the researcher over the phone that could have yielded interesting and important answers (Tracy, 2013, p. 163). This in turn would have a negative impact on the validity of the data. Even so, the extra effort of conducting on-site interviews was not motivated by these drawbacks. The choice of telephone interviews was also strengthened by the fact that there can be several advantages to choosing a mediated interview format. Mainly that it allows the interview subject to choose the location of the interview for themselves. This can in turn help them relax and feel comfortable during the course of the interview (Ibid.).

Since there is little research to build the interview questions from, and the aim was to have the interview subjects draw on as much of their experience as possible, it was important to find a balance between allowing the subject to speak freely while still keeping the discussion centered on the subject matter. A semi-structured interview format is considered appropriate for these needs (Bryman & Bell, 2011, pp. 467-488) and was thus chosen as the format for the interviews in combination with asking open-ended questions to yield richer answers (Ibid.). The interview-guide used was based on the literature studied in this paper and most of them were related to the RoT’s identified in chapter 3. In order to help process the raw empirical data the interviews were recorded and transcribed.

2.2.5 Method for the literature review

In order to produce a comprehensive and reliable literature review, the method for the review was inspired by a previous study by Addo-Tenkorang & Helo (2011). In their study, Addo-Tenkorang and Helo cover five years of ERP related research and in it provide a useful
framework for classifying ERP articles. The upside of using the same framework as a previous study is that it allows for a direct comparison with previously categorized articles. This in turn made it easier to get a grasp of how ERP research has evolved over a ten year period while only requiring a new review over the last five years. It also gives a sense of how the field has matured and evolved in terms of research direction and emphasis over the two periods, which is a contribution in itself (Friberg et.al, 2012).

The study by Addo-Tenkorang & Helo (2011) involved a few key steps. The overall methodology can be divided into two parts, searching and sorting. The searching part included three main sequences. The first one was the method for which to search for ERP articles. The method chosen was simple and involved searching for articles with Enterprise Resource Planning or ERP in the title. Second, several databases were searched and a software called Harzing Publish or Perish was used as it allowed for sorting options, such as by number of citations and citations per year, that were found to be lacking in other browser based search engines. The advantage in using the software is that it is directly linked to the Google Scholar database and thus provides a wide range of articles. Finally, in order to prevent the body of articles to be reviewed from become overwhelmingly massive, Addo-Tenkorang and Helo employed three criterion that each reviewed article had to fulfill. The first criteria was that the article should be published within a peer-reviewed journal, which is supported by Friberg et.al (2012) as being one of the main sources of articles in a literature review. Second, the article should contain either the phrase “ERP” or “Enterprise Resource Planning” in the title. The third was a cut-off publish date in order to clearly define the boundaries of the review.

This was deemed an efficient method and the approach was adopted with slight modifications. The same search terms were used and the same software. However instead of spending large amounts of time searching through a large number of different databases, the results from Addo-Tenkorang & Helo (2011) were leveraged to directly find relevant articles. The primary source of articles used in the literature review for this paper was as such gathered from the journals listed in their review. The authors provided a comprehensive table, listing each journal that had published an article which had been reviewed by the authors and how many articles were published in each. This provided a good starting point for where to search and

3 http://www.harzing.com/resources/publish-or-perish
find the most relevant material. Following and modifying the study resulted in the following search algorithm presented in Table 1.

Step three was a result of many of the journals having similar names but different publishers (i.e. International Journal of Management Information Systems vs. Journal of Management Information Systems). This step was then necessary in order to prevent the same article from being included twice, possibly skewering the results.

<table>
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<th>No.</th>
<th>Step</th>
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<tbody>
<tr>
<td>1</td>
<td>Select journal</td>
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<td>2</td>
<td>Select search term</td>
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<td>3</td>
<td>Select article</td>
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<td>4</td>
<td>Correct publisher?</td>
</tr>
<tr>
<td>5</td>
<td>If yes then include, if no then do not include</td>
</tr>
<tr>
<td>6</td>
<td>All articles processed for search term?</td>
</tr>
<tr>
<td>7</td>
<td>If yes, then select search term (2), if no then select article (3)</td>
</tr>
<tr>
<td>8</td>
<td>All search terms processed for journal?</td>
</tr>
<tr>
<td>9</td>
<td>If yes, then select journal (1), if no then select search term (2)</td>
</tr>
</tbody>
</table>

*Table 1. Search algorithm for the literature review.*

In the sorting part of their study, Addo-Tenkorang & Helo (2011) used a series of categories and sub-categories based on previous literature to classify and sort the reviewed articles. The same approach was adopted for this paper however since its primary purpose was not to provide a comprehensive literature review the sub-categorization was not included. The sorting part of the review for this paper was done by sorting all of the included articles using the same six categories as Addo-Tenkorang & Helo (2011) did.

- Implementation
- Exploration
- Value
- Trends
- Extension
- Education/training
In order to classify an article its abstract was read as well as the key words given by the author for each article. The articles were then sorted by category and the number of articles in each category was summarized in a chart as recommended by Friberg et.al (2012) in order to produce data comparable to that of Addo-Tenkorang & Helo (2011). In order to establish the main themes of each category, frequently recurring key words were noted. The articles were processed by journal, meaning all included articles published in a specific journal were reviewed at the same time before moving on the next journal. Since many of the articles include case studies of implementations and implementation frameworks, and explicitly state this in the articles title, they were not reviewed on more than a title level. This allowed for further optimization of the sorting process, saving large amounts of time. The drawbacks of this decision were of course considered and the risk of wrongly categorizing an article was weighed against the time saved. Ultimately the risk was deemed small enough to motivate this decision. The sorting part of the literature review can be summarized in Table 2.

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<tr>
<td>1</td>
<td>Select journal</td>
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<tr>
<td>2</td>
<td>Select article</td>
</tr>
<tr>
<td>3</td>
<td>Title explicitly dealing with implementation?</td>
</tr>
<tr>
<td>4</td>
<td>If yes then categorize (8), if no then read abstract (5)</td>
</tr>
<tr>
<td>5</td>
<td>Read abstract and key words</td>
</tr>
<tr>
<td>6</td>
<td>Article relevant for this paper?</td>
</tr>
<tr>
<td>7</td>
<td>If yes then mark for thorough review and categorize (8), if no then categorize (8)</td>
</tr>
<tr>
<td>8</td>
<td>Categorize</td>
</tr>
<tr>
<td>9</td>
<td>All articles processed for journal?</td>
</tr>
<tr>
<td>10</td>
<td>If yes then select journal (1), if no then select article (2)</td>
</tr>
</tbody>
</table>

*Table 2. Sorting algorithm for the literature review.*

When the searching and sorting parts of the review were concluded the results were then reviewed from both a qualitative and a quantitative standpoint. The quantitative standpoint meant simply comparing the proportion of articles in each category in the periods 2005-2010 and 2011-2016. This was allowed for conclusions as to the evolution of the ERP research
field. The qualitative standpoint meant that the articles marked for more a thorough review were then read. Those deemed relevant to the aim of this paper were then used as the basis for the framework developed in this paper.

An example to illustrate the above process: The journal *Enterprise Information Systems* (EIS) was selected and its name was entered into the *Journal* search field. The search term *ERP* was then entered into the *title* search field. The search was then limited to articles published between 2011-2016 and the *search* button was pressed. This yielded around 30 results. Looking at the first article, *Implication of Knowledge Transfer on Task Performance in ERP System Usage*, the publisher was the company *IGI* which is the publisher of *International Journal of Enterprise Information Management*, which was not the journal currently being examined. As such the article was discarded and the second item, *Linking customisation of ERP systems to support effort: an empirical study* (Koch & Mitteregger, 2016), was selected instead. This one had *Emerald Insight* listed as publisher which was correct and the article was marked for sorting. This processes was then reiterated for both search terms and then the next journal was selected.

In the sorting part each journal was then processed and when the turn came to sort articles from EIS and the article by Koch & Mitteregger (2016) eventually came up. The articles title did not indicate an exclusive focus on implementation and so its abstract was read. From the abstract and the articles key words it was determined that it was relevant for the aim of the paper and the article was downloaded and saved for a more thorough review later on.

2.3 Research quality

As is inevitable when writing a paper with a limited time frame, the research and writing of this paper contains a series of compromises that had to be made in order to ensure completion within the time available. Below follows a discussion of how these compromises may have impacted various quality aspects of this paper as well as what implications for the end result followed.

2.3.1 Reliability

In order to ensure the reliability of the studies in this thesis an exhaustive description of the methods for collection of both the empirical and theoretical studies is provided. This was important in order to allow future research to build upon this one (Bryman & Bell, 2011, pp. 393-399). To further strengthen the credibility of the findings, all interviews were recorded and then transcribed. The same interview guide was used for all of the interviews, however it
was slightly modified after the first interview in order to help yield better results. This could potentially have a negative effect on reliability (Ibid.). However the changes did not mean changing the central topics discussed in the interview, but rather rephrasing questions and changing the order in which they were asked. This was done since all of the interview subjects were more comfortable discussing the implementation phase of ERP system projects rather than latter stages of the ERP life cycle. Since Bryman & Bell (2011) stresses the importance of allowing interview subjects to answer questions they feel more comfortable with early on and then later asking more difficult and/or controversial ones, changes were made accordingly.

2.3.2 Validity

When using a cross-sectional design the matter of determining causality becomes an issue (Bryman & Bell, 2011, pp. 53-57). Since this paper is mainly theoretical in nature, the arguments for establishing the direction of a causal relationship will instead be grounded in the literature.

Also important for the validity of a study is that the theory used is relevant for the data collected (Bryman & Bell, 2011, pp. 393-399). Ensuring such internal validity was not the main imperative in the writing of this paper, since the aim and purpose is to explore as to whether or not there is any relevance in applying the selected theoretical perspectives to the problem at hand.

Paramount to the study was instead making sure that several different perspectives were employed when researching the problem. This external validity (Ibid.) is oftentimes more important in quantitative research. It was argued however that since the main contributions of this paper will be to provide suggestions for future research, it was deemed very important to ensure that at least some credibility as to the replicability of the results could be provided. In order to do this it was important to make certain that the ERP consultants that were interviewed had different backgrounds and experiences of working with different ERP systems. This would give a broader perspective, thus raising the external validity (Gibbert et.al, 2008).

Initially the goal was to interview both users and consultants. However, access proved to be a limiting factor and a judgement call was made that if a choice had to be made between users and consultants, then consultants would provide a richer and more complete material since their experience spanned many more ERP projects. It must of course be acknowledged that in
order to truly reach the core of the issues studied in this paper, an empirical study that involves interviewing several ERP users would have been preferable, since they are more likely to be open to discussing the post-implementation phase of the ERP project. Such research will be left for other scholars to pursue.

2.3.3 Ethics

Looking at ethics in the context of this paper, the main issues that were encountered were related to the interview subjects and the important aspect of ethical research that requires providing the interviewees with information regarding the research (Tracy, 2013, pp. 243-245). Here a few compromises had to be made. Initially the potential interview subjects were provided with plenty of information regarding theoretical background, research goals and research contributions and this led to difficulties in gaining access to the interviews. Many of the interview subjects did not feel as if they had the competence to answer the questions because of the technical and abstract nature of the theoretical areas involved. Once the information provided was scaled back, access was more easily gained. It was deemed that the most important information to provide the interview subjects with were the aim of the paper, the goals of the research and the contexts in which the data provided would be used since this would fulfill the information principle (Forskningsrådet, 2002) and still provide the answers needed.to balance the needs of treating them in an ethical manner with the need for gathering data.

In order to fulfill the remaining three research principles provided by Forskningsrådet (2002), information was also provided as to voluntarity, confidentiality and post research use of data.
Part II

In the previous part a background to the aim of this thesis was described. This was then elaborated on in the problem identification and finally a strategy for studying this problem was laid out in the methodology chapter. This part will be about presenting the toolbox needed for studying this problem. As such, part two will present the bulk of the paper in terms of data. First the data collected from the literature review will be presented in chapter three. Following this will be a presentation of literature on isomorphism and paradoxes necessary for studying and discussing the problem areas of the thesis. This part is concluded with a presentation of the data from the interviews and this serves as a leaping board into part three, where reality and theory meet.

Figure 5 – Content of Part II

- Literature review to motivate the research questions, and present previous research in the field
- Building the toolbox - Presentation and further development of existing theories

3. Literature review of the ERP field

In order to firmly establish the raison d’être of this paper a literature review was conducted. It was necessary to explore just how much of the ERP literature that has concerned itself with post-implementation issues of ERP systems. A secondary goal of the review was to get a grasp of the direction in which the field of ERP studies has been evolving over the past few years. Finally the articles found in the literature review that were deemed relevant for the aim of this paper would of course be used as data that could be analyzed and treated with a paradox perspective. The review was modeled after a study by Addo-Tenkorang & Helo (2011). In order to clarify the key concepts of the literature review conducted for this paper, a brief summary of what Helo and Addo-Tenkorang found will be given first.

3.1 The model study

In their review, Addo-Tenkorang & Helo (2011) reviewed 154 articles published in peer-reviewed journals and sorted them into one of six categories based on the aim and main focus of the article. The six categories were: ERP implementation, mainly concerned with different issues of implementing an ERP system, ERP exploration, treating the subject of ERP in use...
once implemented, *ERP extension* and *ERP future trends* investigated how to add new functionality to the systems and how the ERP market could or would evolve in terms of new products and services. *ERP Values* discussed the different values that could be added by an ERP system and *ERP education and training* treated the subject of getting employees and users to adopt the system and use it as intended. Furthermore, some of the categories had sub-categories which more specifically classified each article but this was not deemed necessary for the review in this paper.

Addo-Tenkorang & Helo (2011) found that over 50% of the ERP publications between 2005 and 2010 were centered on ERP implementation. They concluded that this was a natural consequence of ERP implementations being such massive undertakings whose success can decide the fate of an entire organization. Furthermore they found that 20.5% of the reviewed articles were concerned with ERP exploration, 18% with ERP extension and future trends, 3.33% with ERP Values and finally 2.4% with ERP education/training. The authors concluded that it was likely that as the field matured, more articles would focus on the less explored areas.

3.2 The updated study

Looking at literature published in peer-reviewed journals after Addo-Tenkorang & Helo's study in 2011, 225 articles have been published with the phrases *Enterprise Resource Planning* or *ERP* in the title. Five of these were either literature reviews themselves or in other ways found to be non-applicable to the sorting criteria, hence they were removed from the selection. Of the remaining 220 articles 42% were concerned with implementation, 38% with ERP exploration, 10% with ERP value, 9% with ERP Extension and future trends and 1% with ERP education and training. This is consistent with the conclusions of Addo-Tenkorang & Helo (2011), that the number of implementation articles would be reduced in favor of others categories. It would seem as if though researchers have shifted their focus somewhat from the implementation of the system to instead examining the most efficient use of the system once implemented. However, it can be seen that researchers are more interested in examining the system from a perspective of designing new processes, and end user acceptance and satisfaction rather than from a user training perspective.
The implementation articles where mainly concerned with how to select and review the available ERP systems and make an appropriate selection, suggesting different implementation frameworks, case studies of various implementation projects and critical success factors (CSFs) of ERP implementation projects. Much of the alignment and customization oriented articles were to be found in this category.

The ERP exploration articles had seen a dramatic increase compared to the review by Addo-Tenkorang & Helo (2011) and are, together with the ERP extension and trends and the ERP education/training articles those of most interest to this paper. Many of these articles concern themselves with the maintenance of the ERP once implemented. It is under this category (ERP exploration) which this paper falls. The articles in this category however where mainly concerned with investigating end-user acceptance and the post-implementation impact of ERP systems on isolated parts of the organization. Many of them also revolved around the topic of risk management and knowledge management in the context of ERP systems.

The articles concerned with ERP extension and trends primarily focused on ERP Software as a Service (SaaS) and cloud based solutions. Furthermore they also looked into how ERP systems functionality could be expanded.

The ERP value articles discussed the impact of using ERP systems on performance management and the value for small- and medium enterprises (SMEs) in general. This included discussions of the general benefits of ERP systems, attempts to quantify and measure their impact and exploring how well ERP systems were utilized.

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Table 3. Results from literature review of articles published 2011-2016.

<table>
<thead>
<tr>
<th>Category</th>
<th>No. Of articles</th>
<th>Key concepts</th>
<th>Percentage of total articles</th>
<th>Percentage in model study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Implementation</td>
<td>93</td>
<td>Frameworks, ERP selection, CSF, fit</td>
<td>42 %</td>
<td>54 %</td>
</tr>
<tr>
<td>ERP Extension/Trends</td>
<td>19</td>
<td>SaaS, Cloud, specific functionality</td>
<td>9 %</td>
<td>18 %</td>
</tr>
<tr>
<td>ERP Value</td>
<td>21</td>
<td>Benefits, quantification of value, SME</td>
<td>10 %</td>
<td>3.33 %</td>
</tr>
<tr>
<td>ERP Exploration</td>
<td>84</td>
<td>End user acceptance, impact of ERP, maintenance</td>
<td>38 %</td>
<td>20.5 %</td>
</tr>
<tr>
<td>ERP Education/Training</td>
<td>3</td>
<td>Training methods</td>
<td>1 %</td>
<td>2.4 %</td>
</tr>
</tbody>
</table>

The implementation articles where mainly concerned with how to select and review the available ERP systems and make an appropriate selection, suggesting different implementation frameworks, case studies of various implementation projects and critical success factors (CSFs) of ERP implementation projects. Much of the alignment and customization oriented articles were to be found in this category.
The ERP education/training articles were the hardest to classify as they generally could fit well within other categories, mainly within the implementation category. In the cases when the main theme of the article was training or education though, they ultimately fell into this category. Overall there were very few of these articles, and as such not much can be said of the main themes in this category. The articles did have in common that they suggested different training methods.

In conclusion it can be said that the field of ERP research seems to be moving in a direction where implementation gets a less central role and the role and impact of an ERP already existing within the organization seems to be an increasingly relevant subject. However, implementation is still the single largest category. Very few of the articles tackled the subject of ERP systems as an isomorphic force, constantly applying pressure. None of the articles attempted to adopt a paradox perspective.

The final part of this literature review will present a synthesis of those articles that were selected for a more thorough review and subsequently included, and they will then be part of identifying ERP-related RoT’s which allows for evaluating the ERP from a paradox perspective.

3.3 Selected Articles

Of the reviewed articles there were 10 that were identified as relevant to the purpose of this paper in that they concerned themselves with post-implementation customization. However, three of them were centered on discussing methods for customizing, fit or use, rather than attempting to identify underlying reasons for the customization. Of the seven that remained, two articles had to be discarded due to a lack of access. That left five articles in which reasons for post-implementation customization could be found and as such, yield potential RoT’s.

When reviewing the selected articles, presented in table 4, a few key concepts emerge that seem to be a constant issue when the question of changing and customizing the ERP system arises. Tasks and needs related to users (Glowalla & Sunyaev, 2014), the cost of customization and increasing system complexity (Koch & Mitteregger, 2016) and user acceptance (Zach & Munkvold, 2016) are all recurring themes.

Identified in the literature gathered from the review in this study, the study of Addo-Tenkorang & Helo (2011) and other articles cited in the reviewed literature, are a few potential RoT’s between elements of the ERP system and the organization that can be
rendered salient when change occurs (Smith & Lewis, 2011). These relationships will be presented here and then examined with a paradox perspective in part 3.

**Customization versus systems quality**

Looking at ERP systems, they will give rise to tensions caused by misfits that arise over time (Glowalla & Sunyaev, 2014; Koch & Mitteregger, 2016). The reason these misfits arise are often that processes (Sales, SCM etc.) change within the organization, for example as an

<table>
<thead>
<tr>
<th>Author</th>
<th>Article</th>
<th>Year</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grant &amp; Hwang &amp; Qiang</td>
<td>An empirical investigation of six levels of enterprise resource planning integration</td>
<td>2013</td>
<td>Included</td>
</tr>
<tr>
<td>Parthasarathy &amp; Daneva</td>
<td>Customer requirements based ERP customization using AHP technique</td>
<td>2014</td>
<td>Discarded due to focus on methodology rather than underlying reasons</td>
</tr>
<tr>
<td>Zhou &amp; Chen</td>
<td>Information Systems of ERP Implementation and Adaptation in the Context of Organizational Fit</td>
<td>2012</td>
<td>Discarded due to lack of access</td>
</tr>
<tr>
<td>Zach &amp; Munkvold</td>
<td>Identifying reasons for ERP system customization in SMEs: a multiple case study</td>
<td>2012</td>
<td>Included</td>
</tr>
<tr>
<td>Glowalla &amp; Sunyaev</td>
<td>ERP system fit–an explorative task and data quality perspective</td>
<td>2014</td>
<td>Included</td>
</tr>
<tr>
<td>Koch &amp; Mitteregger</td>
<td>Linking customisation of ERP systems to support effort: an empirical study</td>
<td>2016</td>
<td>Included</td>
</tr>
<tr>
<td>Sternad, Gradisar &amp; Bobek</td>
<td>The influence of external factors on routine ERP usage</td>
<td>2011</td>
<td>Discarded due to focus on use rather than customization</td>
</tr>
<tr>
<td>Pishdad &amp; Haider</td>
<td>Responding to external and internal changes: Organizational responsiveness pressures in institutionalising ERP systems</td>
<td>2013</td>
<td>Discarded due to lack of access</td>
</tr>
<tr>
<td>Clegg &amp; Wan</td>
<td>Managing enterprises and ERP systems: a contingency model for the enterprization of operations</td>
<td>2013</td>
<td>Included</td>
</tr>
<tr>
<td>Gallagher &amp; Gallagher</td>
<td>Organizing for post-implementation ERP</td>
<td>2012</td>
<td>Discarded due to focus on fit rather than customization</td>
</tr>
</tbody>
</table>
As the organizational needs change, the ERP system will need to be adjusted in order to fit the organization or vice versa (Westelius, 2006b). In the case of the ERP system being customized, this entails costs related to the degree of customization already in place (Koch & Mitteregger, 2016). The higher the degree of customization, the more the system will deviate from the supplier’s standards and therefore incur higher costs for both parties when altered. The prevalent opinion in the ERP literature is that this is to be expected since customization of a standardized product might lead to several problems with lower quality in the product and lack of proper documentation (ibid). Furthermore, increasing the customization of the ERP system may adversely affect the potential for future upgrades, such as system updates reducing overall system integrity (Soffe et.al, 2005). In essence, the systems do need to change, but this comes at the cost of systems quality.

**ERP purpose versus required systems functionality**

Sometimes a misfit between the ERP and the organization can occur simply because the tasks the ERP system was designed to perform have changed (Glowalla & Sunyaev, 2014). For example, external regulations imposed on the organization may alter the information required from the system (Ibid.). In these cases altering the ERP system can be preferable (Sia & Soh, 2007). Depending on the original purpose and intended use of the ERP system, integration (Davenport, 1998), administrative tasks (Glowalla & Sunyaev, 2014) or achieving competitive advantages (Westelius, 2008b), this can lead to more customization than intended and consume more resources and time than originally planned (Soffer et.al, 2005). This all comes down to a series of trade-offs, between what the system was intended to do, what it is now required to do and what the users want it to do. For example if the users require a completely new functionality in the system, this may be better to implement with a *bolt-on* system rather than altering the ERP system (Glowalla & Sunyaev, 2014). However, if external pressure such as regulations has led to ERP systems customization this would be accompanied by costs that have not been planned for since further customization might be required to accommodate the bolt on program, which is undesirable. However, not providing users with a system they are comfortable with using is harmful to the system integration overall (Grant

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4 A *bolt-on* system is an alternative to customization, where a third party application is integrated with the ERP system in order to add required functionality.
et.al, 2013). Add to this that the entire reason for implementing the ERP simply might have been to realign the processes of the organization which is often a requirement for implementing an ERP (Soffer et.al, 2005), and an endless series of potential conflicts between purpose and requirements appear.

Organizational change versus user acceptance

In their study, Zach & Munkvold (2016) note that one reason for customizing an ERP system might be to increase end-user acceptance for the system. If the users and system are not fully integrated with each other cognitive dissonance occurs and overall integration suffers (Grant et.al, 2013). Once implemented however, there is always a risk in allowing stakeholders to be involved about deciding their own future as they might hold a limited perspective or be unwilling to adapt (Glowalla & Sunyaev, 2014). This will continue to be an issue throughout the life-span of the ERP system as it will itself, once implemented, become a source of institutionalization in the organization (Grant et.al, 2013). Thus it will shape the roles taken by the users as well as their way of working, should the ERP system need to be customized or altered again, it will likely lead to the same issue arising once more.

Summary

This literature review was done in order to investigate to what extent post-implementation customization, and reasons for it, has been researched in the ERP field. The assumption was that this was not a frequently recurring topic. This proved to be partly true. The amount of articles in the ERP exploration category was surprisingly high, showing a shift in focus amongst ERP researchers. However, not many of these articles exclusively focused on the matter of fit or tensions over time. Fit between system and organization is still primarily the domain of implementation oriented articles.

In conclusion it can be said that there are numerous reasons for misfits between the ERP system and the organization. This has been well covered in the literature, especially by Sia & Soh (2007) who examined over 400 misalignments in their study. The problem when looking at the relationships identified in this chapter is that they appear to be highly dynamic and constantly ongoing. The ERP system becomes a perpetually constraining factor on the organization, acting as an isomorphic force, playing into every decision. As such the ERP literature could benefit from a new perspective that takes these ongoing relationships into account. The concept of fit of course has its benefits, without it, the daunting task of implementing an ERP system would be nigh impossible. In a more long term perspective
there appears to be room for alternative discussions that allow for the inclusion of technical isomorphism without losing sight of the specific questions of how well the system aligns with the organization.

Vignette 3- ERP systems for dummies

Intelligence versus Logic, what’s the difference?

Previous vignettes have covered, and hopefully explained, what an ERP system does and why they are so important. They have also dealt with the complexity of the system, with effects both on the organization and technologically.

To really grasp this, another issue to address is the way in how we perceive the system conceptually. Our expectations! One common misperception is that many often overestimate IT systems ability to adapt. They fail to think of it as a system and expects the system to do everything it can. For example; if an invoice has been administrated by a certain employee, and some processes involved now are automatized in the system. Many expect the system to be just as flexible and creative as the employee used to be when dealing with anomalies. However, this is not the case.

An ERP system, code and technology aside, consists of a huge set of rules, logic. However competent and effective it might be, it is still nothing but a huge code. The train of thought in an IT system is binary; If 0 then “A”, If 1 then “B”. This way extensive logic can be built in, making the system able to perform rather complicated tasks.

The problem however, arises when we ignore (or fail to understand) the binary logic just explained. If something changes that is not programmed in the system, it will inevitably come to a halt. In the analogue world we can assume that if Anna, which usually takes care of the invoices is home sick, her colleague Benjamin will deal with it instead. This intelligent act of Benjamin is not to be expected by the system. If the potential absence of Anna is not programmed in the system with a rule that forwards her tasks to Benjamin, he might not even be able to do her tasks even if he wanted to. If he does not get her log in and can act like her (in other words, the system will not notice her absence at all), the process will not proceed until Anna is back at work.

So even if the process seems quite simple and straight forward, even dealing with rather uncomplicated tasks takes some reflection and analysis before the logic is put into code.

Point is, you can build immense amounts of logic into an ERP system. But never ever intelligence...

At least not without artificial intelligence.
4. Isomorphism

A brief introduction to isomorphism was given in the introduction of this paper. Here, the phenomena will be further explained, both in terms of its academic background and in the context of the technical isomorphism that concerns the issues pointed out in this paper. The theories will be applied on the ERP impact on organizations to make sense of the main arguments made in this paper, finally rendering in a wider discussion of the various ways an ERP system can put isomorphic pressures on organizations.

Regarding the methodological considerations about how to perceive the following, isomorphism does exist in an objective reality. Much like a three falling in the forest do make a sound, no matter if anyone is there to hear it or not.

4.1 Institutional isomorphism and definitions

The concept of isomorphism is not new, Max Weber wrote about bureaucratization in a relatable manner already back in 1952. One of the most influential works on the matter, and the base for this paper, emerged from *The Iron Cage Revisited: Institutional Isomorphism and Collective Rationality in Organizational Fields* by DiMaggio & Powell (1983).

The definition given in the introduction of that paper; “isomorphism is a constraining process that forces one unit in a population to resemble other units that face the same set of environmental conditions” is perhaps the most accessible one so far. Also stated in the introduction, DiMaggio & Powell defines isomorphism as both a state and a process (Ibid.). In this paper however, as stated in the introduction, it is defined as a process (Ibid.)

Traditionally there are two categories of isomorphism; competitive and institutional, whereof the latter is of most interest here. Focus from this point will be on the institutional one and further development of that.

The different mechanisms for institutional isomorphism that are accounted for by DiMaggio & Powell (1983) are divided in *coercive-, mimetic- and normative isomorphism*.

**Coercive isomorphism**

A company regulated by financial standards, pollution control regulations or otherwise enforcing government regulations is coercively forced to follow this, which also has an impact on the organization and its internal processes. Cultural expectations also can put pressure on organizations to behave in a certain way. Thus, the sources of coercive pressure
can be both formal and informal and is defined by the way it is put on the organization from an external force, defining the holding company of a subsidiary as an external force exerting isomorphic pressure. This causes companies with the same environmental preconditions to become more alike (DiMaggio & Powell, 1983).

As stated in the methodology chapter, the degree of tangibility is relevant for the ontological status. Coercive isomorphism here constitutes one of the two rather tangible phenomena, as it is clear that regulatory compliance have an impact on organizations processes.

Mimetic isomorphism

Another driver is uncertainty, this is a strong driver that encourages companies to imitate other more successful competitors. It occurs in times of uncertainty when there are ambiguous goals for example. It is not to be seen as a negative thing by default, but is yet another driver for organizations otherwise separated to become more homogeneous (DiMaggio & Powell, 1983).

The stance on tangibility for the mimetic isomorphism is categorized as one the two more abstract phenomena, since it is more difficult to derive the source of it compared to for example the coercive one.

Normative isomorphism

The third one defined concerns an even less tangible driver and primarily stems from professionalism. This is partly because of the fact that individuals are being formed through their formal educations, which often are much alike. In turn leading company management personnel to contain similar individuals, thoughts and ideas, regardless of what kind of company you look in to. Also, the behavior is affected by the industry and organization each individual actively take part in. Not only making them alike in terms of terminology, organizational vocabulary, dress codes and the way in which they make jokes. But also in how they view problems, that they see the same structures and procedures as normative and legitimate and so forth. Last, they also tend to be alike in how they make decisions. This is described as an *homosexualization* of management and is presented as the main reason for the effects of homogeneity accounted for (DiMaggio & Powell, 1983).

As stated above, this is the second one of the two more abstract types of isomorphism.
4.2 Technical isomorphism

That isomorphic homogenization also derives from the use of ERP systems in organizations is a more recent phenomena since the technology is rather new. Technical isomorphism was introduced by (Benders et.al, 2006) and aims to explain how organizations become more alike because the ERP systems they use forces them to adapt the best practice (Ibid. p.197) processes embedded in the systems by the developer/supplier. Even though it is technically possible to customize ERP systems so that they align extremely well with the wanted processes in an organization, the initial cost for deviating to much from the standards are simply too high for that to be a valid option in most cases. Also, the supplier becomes less willing to provide support for each alteration in the code made. Thus, making as few customizations as possible has many advantages, and is often the preferred choice even though some modules might have to be customized to make it fit the organizational needs (Ibid.). The source for isomorphism here is the standardization of the organization due to adopting the processes built into the limited number of ERP systems available on the market.

This may give the image of customizations as something that you would want to avoid like the plague. There are however arguments both for positive effects of isomorphism, and for taking the costs of customizing the system and therefor limit the isomorphic impact on the organization. Regarding the positive effects, Deephouse (1996) argues that isomorphic organizations (i.e. similarities between different organizations in society) gain legitimacy. Unlike this paper though, Deephouse defines isomorphism as a state (compared to DiMaggio & Powell (1983) that defined it as both a state and a process), meaning that he focuses on the similarities among organizations at each point in time. Decreasing isomorphic impact by putting more effort into alignment between the wanted organizational process and the ERP system by customizing it is also an option. The main arguments however is rather to make sure that the logic of the system are not counterproductive to the logic of the business, which can be the case if adopting an ERP system as is without reflecting over the possible consequences (Davenport, 1998).

The ontological stance on tangibility here constitutes the second more tangible one of the types, along with the coercive one. The technical pressure is in many ways similar to the regulatory in that it have a clear impact on the processes in the organizations.
4.3 A new perspective on technical isomorphism

The isomorphic forces introduced here, and briefly in the introductory chapter, represents two different methodological views on the phenomena. Not only do they stem from different sources, it can also be discussed how they exist. The mimetic and normative isomorphism are rather abstract, and regardless of whether they exist or not depending on our acknowledgement, it is definitely hard to measure them in any objective reality. The coercive and technological isomorphism on the other hand, are considerably more tangible, although not entirely objective. However, in the context of this paper it is fair to state that an ERP system has an impact on organizational processes and drives isomorphism, as do legal regulations, leaving aside the greatness of the impact.

With the previous sections in mind, what happens if the idea of normative pressure is applied on the far more tangible source ERP systems? Isomorphism is said to become evident because of the homogeneity among professionals. Add to this, the argument of homosexualization where behavior, the way of how to take on problems and seeing procedures became normatively legitimated which was also presented. If the ERP systems then set an objective restraint on what is possible and not to do, in a financially defendable manner anyway, it is likely that the homosexualized managers adapt to it and adopt this as a new, less spacious frame for creative thinking. This results in that ERP systems not only limit the objectively actual alternatives of processes and activities, it also limit the subjective, but still actual alternatives that the managers are even likely to consider.

Ontologically, and in terms of tangibility, this is to be seen as a normative source. Hence, it is sorted into the more abstract kinds of isomorphism.
5. Paradoxes

In their review of paradox literature Smith & Lewis (2011) divided the evolution of organizational theory into three distinct phases. The first phase begun in the early 20th century with scholars asking which alternative of A and B that gives the one best way of organizing. Following this was the emergence of contingency theory in the 1960s. From this perspective a choice between A and B is made one of which will likely lead to a more successful outcome. However the options themselves are no longer the only critical part of the equation but considering the circumstances in which the choice is made can be equally important in determining the outcome. Success now stems from how well the choice of A or B aligns with internal and external properties of the organization. In the late 1980s a new line of thinking emerged that offered an alternative to choosing. This paradox perspective argued that both options A and B will persist over time and cannot be chosen over each other. Success now comes instead from effectively engaging both A and B simultaneously.

This is a useful distinction for quickly breaking down and explaining the differences between contingency theory and a paradox perspective. The main differences between the three are perhaps their epistemological stance, from one where a best choice can be made to one where no best option exists at all, but rather requires balancing the different alternatives.

When reviewing the paradox field, Smith & Lewis (2011) asked why a unified theory of paradoxes has not emerged similar to a contingency theory. They identified several reasons where one of the most important ones was that the definition of what a paradox actually is seems to differ greatly amongst scholars and researchers. In order to remedy this the authors offer a conceptual classification of three frequently recurring sources of organizational tensions.

Paradoxes is the first category. What signifies paradoxes are that at their core are two contradictory yet interrelated elements, that is two elements that impact the same part of an organization but both put pressure on the organization to work in a way which hinders working in a way that is conducive to the other element. An example of this is ERP systems and how they are essential for operational efficiency, but can be a burden to organizational flexibility. While both operational efficiency and organizational flexibility are essential, the need for standardization in the former inherently hampers the other. Once again this is a result of technical isomorphism leading to processes being locked in the organization. This leads into the next part of the definition of an organizational paradox, that the elements when
examined individually are logical concepts but conflict with each other when bound together (Smith & Lewis, 2011).

The second category identified are dilemmas. Dilemmas differ from Paradoxes in that they present a choice between two options, one can be discarded in favor of the other. Important for distinguishing dilemmas from paradoxes are that there are clear advantages to one option over the other, as well as disadvantages to both. As mentioned in the introductory chapter, the difference can be summarized to that paradoxes should be engaged with an attitude of both/and whereas dilemmas need to be approached with an either/or mindset. This however does not tell the entire story since dilemmas can prove to be paradoxical in nature over time (Luscher and Lewis, 2008). That is the resolution of tensions by making a choice of one element over the other may only be temporary, and tensions can resurface.

Thirdly a category of dialectics is presented. In a dialectic the elements are treated as one being the thesis (A) and the other being its anti-thesis (not A). A dialectic differs from both paradoxes and dilemmas in that it advises integration of the two elements, whereas paradoxes and dilemmas require the elements to be treated individually. This new synthesis of the two conflicting elements A and B will however create its own opposite element C that over time will lead to new tensions. A summary of the three concepts can be seen below in table 5.

<table>
<thead>
<tr>
<th>Conceptual classification</th>
<th>Main features</th>
<th>Resolution strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paradoxes</td>
<td>Persistent over time, contradictory</td>
<td>Engage both elements over time, both/and</td>
</tr>
<tr>
<td>Dilemmas</td>
<td>Contradictory, singular in time</td>
<td>Choosing one element, either/or</td>
</tr>
<tr>
<td>Dialectics</td>
<td>Thesis, anti-thesis</td>
<td>Synthesis</td>
</tr>
</tbody>
</table>

*Table 5. Conceptually distinguished sources of tension*

In order to apply a paradox perspective to ERP systems an overview of the different types of paradoxes will be presented below as well as an overview of writings on how to effectively manage them.
5.1 Classification of paradoxes

One of the research questions of this paper is what different types of ERP system-related RoT’s there are. Classifying the RoT’s according to existing literature has two upsides. First it allows for a more thorough examination of the paradoxes identified in the literature review and the data collected through interviews. Examining the paradoxes with the aim of classifying them requires thinking about the place and role of the elements involved within an organization rather than just examining the elements in isolation. The second upside offered by a classification of paradoxes is that the frameworks used are built from a wide range of paradox research. The framework used for classifying paradoxes in this paper was developed by Smith and Lewis (2011) and in order to develop it, the researchers examined over 350 articles of paradox research. Simply put, if the RoT’s identified in this paper can be classified with reasonable precision into the categories of the framework used, then they have also undergone the scrutiny of much of the paradox field research, further strengthening the argument that there is much value in adopting a paradox perspective when working with ERP systems.

In essence, Model 5 presents four basic types of organizational paradoxes, belonging, learning, organizing and performing. Another six categories are made up from combining these basic categories, bringing the total to ten different categories. Different types of tension between elements can be identified within each category as well as in between the individual categories.

Belonging paradoxes are related to matters of individual and group identity and surface as they seek homogeneity and distinction. Possible sources in an organization include opposing...
roles, memberships and values of a group. Learning paradoxes often emerge as organizations change and renew themselves since change includes altering or destroying what once was to give way for something new, which leads to tensions and conflict. Paradoxes related to organizing come from the implementation of competing systems and processes in an organization. Performing paradoxes are rooted in the need to satisfy multiple goals and stakeholders within an organization and the impact this has on the strategies of the organization.

Looking in between these categories reveals paradoxes that stem from both learning and performing, that is, tensions that arise when trying to balance short term success while planning and building for the future. Tensions can also be found at the intersection of learning and belonging where the need for organizational change can often clash with the individuals desire to retain an ordered sense of self. The need for operational stability and efficiency, and the way this conflicts with a need for agility makes up the organizing and learning combination of paradoxes. Organizing and performing paradoxes come from juggling, for instance, employee and customer demands. Performing and belonging paradoxes are the result of individuals trying to maintain their identity whilst pursuing different goals, for instance trying to separate ones private and professional personality. The final category is belonging and organizing and relates to tensions that arise when trying to enforce collectivity whilst wanting to retain the best traits of each individual.

5.2 Managing paradoxes

The paradox literature offers several approaches for managing paradoxes. The two main categories are those that attempt to identify and then embrace and live with the paradoxes, accepting that they cannot be resolved (Lewis, 2000; Luscher & Lewis, 2008; Smith, 2015) and those that do seek to resolve the paradoxes (Smith, 2015). Acceptance strategies usually involves working pro-actively to prevent tensions from arising further on (Smith & Lewis, 2011). Resolving paradoxes usually involves either combining the two oppositional elements into something new (Smith, 2015) or seeking to separate them in an organizational context. The separation can be either spatial or temporal (Smith & Lewis, 2011).

In order to avoid any confusion at this point, it is necessary to point out that table 5 states that paradoxes are persistent over time, and thus unlike a dilemma should logically be impossible to resolve. This is true in the sense that a paradox cannot be resolved by engaging the problem and finding a permanent resolution, because the problem will resurface. This is the key to
understanding the difference between a paradox and a dilemma. Paradoxes, if treated as dilemmas, will only provide a temporary relief of tension, whereas a dilemma once resolved remains resolved. In fact, if what appears to be a dilemma is examined more carefully it can prove to be a paradox (Luscher & Lewis, 2008). The outcome of this is that paradoxes are not resolved by engaging them once, but continuously and iteratively over time (Smith & Lewis, 2011) regardless of how they are engaged. In fact, Smith & Lewis suggest a method for engaging paradoxes that includes iterating between different methods over time.

To illustrate this in an ERP context, several articles on ERP systems argue the importance of minimal customization in the implementation phase as a critical success factor for an ERP implementation project (Avital & Vandenbosch, 2000; Benders et.al, 2006; Davenport, 1998; Light, 2005). However in order to maintain a competitive advantage a certain extent of customization will likely be necessary at some point (Light, 2005; Benders et.al, 2006; Westelius, 2006b). Glowalla & Sunyaev (2014) argued that the critical role of managers in ERP projects is to determine the extent of customization in the ERP phase. With a paradox perspective the paradox of customization versus standardization can be separated, with minimal customization in the implementation phase and more customization in the post-implementation phase. As such both of the oppositional elements are satisfied at one point in time or another which is an integral criteria for managing paradoxes (Smith & Lewis, 2011). This example is somewhat over-simplified, but serves to illustrate how a paradox perspective and ERP systems literature can be combined.
6. Practical perspectives

Qualitative data has been collected through interviews with three experienced ERP (business) consultants (covered also in the methodology chapter). Even though this paper is primarily driven by theory, there is a gap in previous research which these empirics aim to supplement. Also, the data presented below is up to date as of this year (2016), contrary to the research that lays the foundation to the theoretical chapter where even the latest published articles used consist of data from at least 8 years back (disclaimer: assumption based on the nature of the academic process in research). Normally, this is a matter of less concern. But given the high pace of development in the IT industry, it seemed both fair and important to test the thesis and update the overall understanding of the problem by interviewing those most involved in the process. Even if both reliability and validity might be at stake due to the scarce number of interviewees and their rather one sided point of view on the matter. However, this will be discussed as it is presented in the following chapter.

In order to keep this chapter from becoming impossible to overview, the collected data is presented in a coherent manner and structured as it fits this papers logic. This means that the individual opinions of the interviewees are only specified when discrepancies occur. Otherwise, the content is to be read as their collective opinion on each matter that was discussed.

Three interviews were conducted. Two with consultants who have primarily worked with the German SAP system that more or less dominates the market for huge global companies and the third with experience from several different ERP systems.

Even though the non-disclosure agreement varies between the interviewees, neither names nor company names on examples given in the interviews will be presented here. Instead focus will be put on the outcome and results.

However, to be able to get this chapter in order and enable readers to connect the dots, a short (anonymous) introduction will follow:
• **(A)** Senior Business Consultant. Has worked with several ERP systems, both in implementation projects and in post implementation projects. Previous career in Supply Chain Management and Business Development.

• **(B)** SAP senior Manager. Experience from SAP since 1998, has been involved in numerous implementation projects in this current role. Previous career in Supply Chain Management, and also has experience from ERP projects building global templates and ERP implementations from scratch.

• **(C)** Consultant Manager (SAP partner). Previously Business Consultant with many years of experience from SAP projects.

6.1 Methodology recap – How the interviews were carried out

To recap a bit from the methodology chapter, the aim of the interviews was to collect the thoughts and points of view from the ones that actually met our presumed problem on a daily basis. Given the abstract nature of this paper problem identification, combined with the potentially different roles and experiences the interviewees contributed with. We did not aim to carry out structured interviews. Also, since the paper is derived from an understanding of both the technological and strategical challenges large organizations of today meet, we could not assume that the consultants would be up to date or even familiar with the theoretical side of the problem discussed. Therefore, the structure was disposed so that the beginning of the interview dealt with ERP systems in general, in order to establish a common ground between the interviewers and the interviewee. Throughout each interview the questions were narrowed down and the interviewees were asked to elaborate on the post implementation era of the ERP life cycle.

This structure allowed for responses that both implied what was the focus of the consultants, as well as discussions on the actual topics we were most interested in.

6.2 The findings – Comments on the overall impression

First, the overall impression that became evident was that all of the interviewees had a striking eagerness to talk about the implementation process. Even later on in the discussion when the interviewers actively tried to turn focus towards the post implementation
development of the organizations behavior regarding the ERP system, they tended to get back to the implementation.

Second, they all came back to the importance of top management’s involvement throughout the implementation project. Not only to make sure that the budget and time plans where kept, but also to maintain the eye on the goal and reinforce the overall strategic goal with the project itself.

What is worth mentioning is that all three of the interviewees are working with leading systems that services the very largest companies on the market. Also, they all have experience from working with SAP. In fact, only (A) has input from other systems than SAP. Moreover, they all state that SAP indeed is the system of today that represents rigidity in many regards, where the projects are often even more complex and time demanding than for other systems. Also, when it is in place, it allows for fewer exceptions than many other competing systems on the market.

6.3 The interviews
The outcome of the interviews are presented by topic.

Standardized vs customized - Implementation projects
As mentioned above SAP is the system of today with least acceptance for deviating processes, or exceptions if you prefer. Whether this is positive or not depends on the view upon standardization. Interviewee (A) (who is not exclusively an SAP consultant) had a dissenting opinion on this matter and was less optimistic than the two SAP consultants. Even so, all three agreed on that an implementation project, without doubt, was considerably smoother performed with as few changes from the standard system as possible. Thus, regarding the technical aspect of the matter they all agreed. Whether the extra headache of customizations is worth it though, they all parted in their opinion. However, even the most customization friendly interviewee A made several points for the benefits of standardization. The difference was that the willingness to compromise appeared as bigger.

There were several reasons given for why customization could have negative effects on both the project itself and the system afterwards. One being that the projects are so exhaustive that the effort simply does not reach all the way to the goal. Leaving some parts insufficiently thought through, thus leading top management to give orders such as “just make it happen”,

6
which in turn ends with middle management taking in IT-consultants (programmers) to make the quick fix and *make it happen*.

(C) instead chose to tell a success story. A client of (C) went through the ERP system procurement process in an exemplary manner by engaging three competing suppliers and making a thorough pre-study. Once the internal processes were mapped out and set they gave the suppliers the opportunity to create a demo environment so that they could test it properly and get a really good idea of what they were paying for. After this unusually extensive pre-study and tests, which took about two years, the implementation project was described as really successful.

Also, the discussion of standardization seems fairly one sided if the project managers were to be asked, according to the interviewed consultants these would categorically be pro standardization without doubt!

And finally, both of the SAP consultants talked about their product as an *enabler* for standardization. Which sets the tone for the perspective on the matter.

**Managements involvement**

Another recurring topic is the matter of managements involvement and role both in the implementation process and the post Go-Live era.

Even though the importance was consistently emphasized, the arguments for it varied between the interviewees. There were however no implications that they did not agree with one another, but merely had different focuses on the matter. Thus, these differences will not be elaborated here. Instead the results will be presented in full.

An ERP project serves several purposes and sets up numerous challenges. Many times, if not always, the ERP implementation also comes with vast organizational changes. These strategies should be decided on by top management already in the early stages of the pre-study. Since the project often stretches over such a long time and sets up exhaustive challenges it is sometimes hard for the super users and project managers to maintain focus on the strategic goals of the project. Leading them to make decisions to solve technical issues, but in turn lose sight of the strategy. Here, upper management plays an important role to make sure that the projects overall objectives are maintained. This sometimes constitutes a problem, when there is a lack in clarity of what *the wanted position* is.
Also, the importance of top managements involvement is crucial for the project for several other reasons. First off, it is not solely an IT project, but a strategic and operational one as well. Second, the middle management in the project is extremely important since they are the ones that many times hold the up to date factual knowledge about the project. To appoint the right people in projects like this is utterly important, especially from the business side of it.

User acceptance

On top of the strategical dilemmas that have to be solved (choosing how to set up processes) and the mere technical difficulties that come with an ERP project and use of the same, the human factor is of great importance for a successful project and use of ERP systems. This is a recurring issue from all three consultants when discussing all kinds of problems and tasks, and can be divided into two categories; lack of training and unwanted creative minds.

That lack of training can lead to inferior use of the system is not hard to understand. Pushing new routines into an operation requires a lot of changes, and emphasized through the interviews is the resistance to change in most organizations. To overcome this hindrance on-site support and training is utterly important, but the availability to these resources might not be enough. (C) expressed the problem as “...to embrace the change”, which quite well captures the others statements also. The elaborated meaning of this is that the system users have to want the system to work the way it is supposed to, otherwise it most likely will not. Not only do they have to adapt to it and really follow the new routines fully, post Go-Live they also affect the ability of the project team to fix what is not properly done from the beginning. So their commitment to the new way to work is of great importance since they basically are the only ones in direct contact with the operational process on-site on a daily basis. In other words, when user do not take the time and/or effort to learn the new routines, the system (in an organizational meaning, not technically) does not work the way it is supposed to, and data later in the process is likely to be false.

The problem described with creative minds is similar, but in a way because of the opposite reason. Some users are really keen on learning, and grasp the system in depth rather fast. Here another risk occurs, namely that some of these (and local managers for that matter) tend to find loop holes in the processes. Allowing them new ways to work that are faster and less demanding for them, probably without making any difference in their own function or even business unit. Later on however, these alterations in the process also sometimes change what is captured as master data, leaving the central controllers and top management looking at KPI:s and similar
data that does not mean what they think. The master data becomes polluted by false numbers and therefore useless to analyze. Locally this might be of little concern, but this is often what is used to decide on both investments and cut downs.

Both the pre-study phase with demo versions of the system and the support post Go-Live should include user acceptance tests according to (A). An estimate from (A):s experience is that about 50 % of the problems in an implementation is related to user process failure rather than technical issues. Pure user errors occur due to lack of training and that they do not fully understand the new process routines. (A) also expresses, which is brought up by the others as well, the importance of a release board and a rather high degree of transparency to it. This is not only a tool to manage the priorities for the project management, but also a way to signal that the complains and suggestions from the users are being heard and perceived, and that it is on the agenda even if it might have to wait before being dealt with. This way the consultants all mean that user acceptance can be increased, with positive effects on both the willingness to learn the new processes and to tame the creative minds a bit.

In summary, the user acceptance is of great importance both to make the system work the way it could and should, but also so that they understand and accept the importance of following the processes. Transparency and the users ability to affect the system is considered key here.

Post Go-Live customizations

The interviews also dealt with the matter of post Go-Live customizations, you have already in the introduction read this papers stand on static IT systems vs dynamically changing organizations, this of course had to be addressed. The formal way for this appears to be to send a change request to the central IT function that administrates it accordingly. The latter will instead be presented under “Customizations effect on quality” below. As stated previously when presenting the findings on “standardized vs customized” in the context of implementation projects, the interviewees were consistently pro standardization. However, that alterations in the organizations need were inevitable never got questioned, thus the interesting findings are divided into why to make changes, where to make changes and how to make changes.

Regarding the why, a recurring reason was that the organization started doing new business of some kind, or at least increased in volume significantly. For example, if a (new) customer or
supplier demands that invoices are to be sent and managed electronically, or else they will execute some kind of penalty fees of some sort, this is a decision to be made. If the volumes are great enough for the investment to be worth it or not almost always is the determining factor here.

The next common reason is simply to take care of the remains of the wish list from that never got taken care of before the point of Go-Live. These requests are to be prioritized and dealt with in order, unless they get denied of course.

Also, operations might find or think about a different way to do work. Altogether changed processes or just slight changes to reach the same result with less effort.

Finally, most organizations have to comply to a number of regulations. If the SOX\textsuperscript{5} regulation changes, the company concerned by it probably have to as well for example.

The matter of where to make changes the questions were presented in a way to try attempt to identify if this occurred more commonly in certain functions or processes than others. The results were rather inconclusive, but implied that Supply Chain and sales were more eager to change. This was also explained with the fact that all investments follow some kind of cost/benefit analysis, and the two cases are especially important for costs and revenues respectively.

On how to make these changes the answers also was somewhat inconclusive. The sum of them however implied that they were treated as new, individual projects and were dealt with differently depending on the nature of the problem. (B) emphasized that the system did not have to be changed at all in many cases, but you could change the way the standard system was used with some “creative thinking”.

\textsuperscript{5} The Sarbanes-Oxley Act. A financial accounting regulation emerged after the accounting scandals with following bankruptcies in USA around the turn of the millennium. One of the most famous for this is Enron.
According to SearchDataManagement.com the definition of master data is: “Master data is the core data that is essential to operations in a specific business or business unit. The kinds of information treated as master data varies from one industry to another and even from one company to another within the same industry.” The Swedish media IDG discusses how to become the master of master data in an article and mentions a number of problems derived from the difficulty to manage master data.

To further develop and help the understanding for the definition given above, master data also can be defined as; data and information that are common for, used by, and affected by, all or several parts of the organization. Thus, the integrity of the master data is utterly important. The IDG article above lists a number of potential problems derived from faulty master data in a few examples.

- A new CEO for a big company wanted a list of the ten largest customers for the corporation. This proved impossible due to flaws in the information management.
- Two sales companies in the same corporation might compete for the same accounts without even being aware of it.
- A customer can be identified by its company registration number at the financial department, by its client account ID at the marketing department and by its company name at the customer service department, where the customer can be registered with or with suffixes as ltd, AB etc.
- The managements decision basis can become faulty, sometimes without their awareness. This leads to analyses being made on false data, which of course leads to bad decisions.

Recall what was said in the introductory chapter about the purpose of ERP systems, one main point also was to enable centralized functions such as purchasing, and keeping control over all processes throughout the organization. To do so, the master data is key, and the local benefits for the business units is mere a part of the whole. The latter sometimes becomes difficult to sell to the management and users of the individual business units part of the ERP system.

Summed up this means that master data is one of the major issues when dealing with ERP systems. It is a core in the list of benefits, but also constitute an antagonism in that it forces operations into processes they do not always benefit from. If they, which they sometimes do, ignores this and make their own local solutions in process or code, the price is paid further up the hierarchy. Thus the system integrity is sacrificed.

1 May 17 2016: http://searchdatamanagement.techtarget.com/definition/master-data
2 May 23 2016: http://cio.idg.se/2.1782/1.466236/sa-blir-du-mastare-pa-masterdata
Customization effects on quality

The consultants view on the value of standardization has been declared in the beginning of this chapter. One of the reasons for their eagerness to stay with the standardized system is to protect the quality of the system. This can be discussed in two perspectives, general customizations and local customizations. General customizations is defined as alterations in the ERP system to better make it fit with the organizations business processes, opposite from altering the business processes to the ones suggested and available in the ERP system as is. Local customizations is defined as changed made, and decided on, locally. Locally in this case means a business unit or division. It also implies that they use a local IT consultant with knowledge in the ERP system instead of the official project team or ERP consultant agency.

Note that these two are nothing but classifications used in this paper to separate two phenomena described in the interviews.

General customizations are almost always made to make the ERP system fit the business processes. This is by no means unexpected since the implementation projects often are used as a driver for change. Instead, the question is how many and how comprehensive the changes are. The argument against customization in this regard concerns the regular updates that is provided from the ERP supplier. Even though a buyer may consider the extra investment worth it for the advantages it provides, there is always a risk that the updates messes with the flow in the system in some way since the customizations are not part of the update provided. These updates occur about once every third month, and the scope varies largely.

Organizations with a great numbers of changes from the standard code therefor takes on a lot of extra costs to maintain these customizations. This leads some organizations to skip the updates, which sometimes leads to a situation where the gap between their ERP system and the current (including all updates) standard system is so big that it becomes a costly and extensive project just to catch up with it. “In cases like this it can be questioned if it is a standard system at all, at least it is some sort of hybrid” says (A).

Local customizations is another issue, and often derives from local needs that are not included on top of the overall prioritization list. This sometimes leads local managers to take in local consultants to make the changes necessary (in their opinion) to please customers and/or employees. The problem described with this is that these alterations can make the master data false once it is gathered and presented to the central functions. The data becomes dirty so to speak. Either because the work process has been altered so that all necessary data does not get
put in the system in a correct way, or that the code is changed (actual customization). The problem in this case might not be the extra cost itself. But that the system functionality becomes dependent on this local consultant, there is a lack in control over the documentation that risks the future stability of the (local) ERP system. And again, the master data becomes dirty.

(B) Described the reasons for failed projects as follows:

“There are five main reasons for an ERP implementation project to fail.

- Master data
- Master data
- Master data
- Master data
- Master data

It has to be part of the project from day 1 in the preparing stages already. It is a mini project itself, and often that starts way too late in the project cycle.”

(B) emphasizes the importance for centralized master data of some kind, and pushes for clarified routines and strategies of how to deal with the master data.

In conclusion, according to the interviewees ERP customization has negative effects on quality for two main reasons. First, it creates a gap between the actual system and the standard configuration, sometimes to a point where it can be questioned if it is a standard system at all. To put it like (A) did, when the customizations become too many it is rather a hybrid between a standard system and some kind of in house development. In turn, this makes software updates problematic and sometimes makes the company vulnerable if third party consultants have been involved, since the ERP supplier for obvious reasons cannot take responsibility for actions taken without their knowledge or acceptance. Secondly, local customizations can risk the integrity of the master data, and make the local installation hard or impossible to develop or update further on. This is because of third party consultants that sometimes write the code in an untidy way with lacking documentation etc. Which in turn makes it hard for the original ERP supplier to get a grip of what is done or not.

Summary

The most prominent finding is that all three interviewees without doubt have the experience based opinion that customization of the ERP system is unwanted. This is mainly because of the difficulties customization brings to the project and the negative effect on its success rate.
Management’s involvement was deemed utterly important for several reasons. Among them being to make sure the overall strategic goals were kept in mind and that the wanted position was not forgotten, but also to make sure the right people are appointed in the project. User acceptance appeared as important throughout the whole project, from the planning phase to post Go-Live when the last tweaking of the system was about to be dealt with. This was described as derived from two main causes, lack of training and (too) creative minds. Post Go-Live customizations were also discussed and it got stated that these were inevitable, however resistant the consultants seemed in the previous statements. New business require support for new processes. It is also worth working through the wish list of functionality that were never dealt with before Go-Live, partly to avoid lacking user acceptance. These were most common in the Supply Chain and Sales parts of the system and were often treated like a new development project. Finally, the customizations discussed also had impact on the quality of the system according to the consultants. General customizations by sometimes making the system too different from the standard configuration, making it some kind of hybrid between an in house developed system and a standard system. This led to problems later on when updates was not easily done or the documentation of the changes made had flaws. Local customization had more internal effects that often made dealing with master data difficult.
Part III

This part is about combining what has so far been collected in part two, where the necessary building blocks were presented. Here in part three they will be woven together. Chapter seven, which is the penultimate chapter of the thesis, will pursue an in depth discussion as to how well the collected data in chapter three (data from the literature review) fits together with the empirical data from chapter six. Chapter seven also discusses how well the data from chapter three and six appear to fit with paradox literature from different criterion which are also presented in the beginning of the chapter. The eight, and final chapter of the thesis provides an in depth discussion as to the implications of the findings, suggests further research and provides answers to the research questions asked in part one.

Figure 7 – Content of Part III

7. Evaluating the merits of paradoxes

The analysis will not aspire to prove the existence or non-existence of any ERP-related paradoxes in an organization. Instead this chapter will be about combining what the literature says about ERP systems customization in a post go-live phase and the data gathered through the interviews, which was presented in chapter five. This combination will serve to synthesize a new set of potential paradoxes from the three purely theoretically founded relationships that were identified in the literature review and presented at the end of chapter three. These relationships were: Organizational change versus user acceptance which stemmed from the fact that since the ERP system is embedded into the organization it will also shape how users want the organization to change, ERP purpose versus required systems functionality which is a discussion about how the role of the ERP might not always match what the users want from it and what problems this causes, and finally Customization versus systems quality were the ongoing problem of maintaining the system integrity and quality clashes with the need for matching its characteristics to the organizational needs and goals. This combination will also serve to render both empirical and theoretical support for the relationships. Each relationship will then be discussed from a paradox perspective as to whether or not they qualify as
paradoxes given the paradox literature presented in the second part of the paper. This qualification is divided into two parts. The first part includes discussing if and how the elements are contradictory, and whether they are persistent over time. The second part assesses management strategies suggested by literature and the interviews, and if and how they bear characteristics of paradoxes, dilemmas or dialectics. The above criterion are summarized in table 6.

<table>
<thead>
<tr>
<th>Step</th>
<th>Criterion</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>Elements are contradictory</td>
</tr>
<tr>
<td>2</td>
<td>Elements are individually logical</td>
</tr>
<tr>
<td>3</td>
<td>Management strategy is iterative over time</td>
</tr>
<tr>
<td>4</td>
<td>Management strategy seeks resolution or acceptance</td>
</tr>
</tbody>
</table>

*Table 6. Criterion against which RoT’s are evaluated.*

The second half of this chapter is then spent discussing these new paradoxes with the aim of classifying them in accordance with the framework provided by Smith & Lewis (2011).

7.1 Paradoxes in the ERP-Organization relationship

The demand for local customization vs maintaining overall systems integrity

When looking at the literature it seems as if though the more the system is customized, the more it will cost to change the system. Looking at the data gathered from the interviews, ERP customization is something which has the potential to seriously harm the system integrity. Two of the three interview subjects prompted the importance of avoiding customizing the system to the greatest extent possible. They also agreed that the quality of a customized system would inadvertently be lower than that of an unmodified one. There was also support in the empirical data for customization leading to higher costs. One of the interviewees stressed that customization would over time lead to the system being incompatible with future upgrades. Overall though, it appears as if the major issues related to customization are not companywide customization caused from a misfit between the organization and the system. These misfits are usually found and dealt with in the implementation of the system. Instead tensions arise from the difficulty in maintaining the integrity of the system when geographically or organizationally separated units start changing, customizing and altering the system to local demands.
From a paradox perspective, the two opposite elements that make up the paradox would be local customization on the one hand, and the need to maintain the system integrity on the other. Examined individually they are both perfectly logical. Local customization makes sense if it helps increase local efficiency. The importance of maintaining overall system integrity is stressed in both the literature and by all the interview subjects. Also, these two competing elements are not something that will change as time passes. They will remain in the organization as long as the use of the system is spread across it, which is the fundamental purpose of the ERP system to begin with. The relationship of customization vs systems quality that was identified in the literature appears, in light of this, to be a present RoT in organizations. However, the nature of the relationship seems to be more of a coordination problem. That is, as the system is altered locally the quality of the changes is not the most important issue, it is rather how these changes relate to the overall system integrity in terms of code, purpose and functionality.

When looking at the strategies recommended by the interview subjects for managing these opposites, arguments against a paradox view can be found. All of the interviewees were opposed to altering the system unless absolutely necessary, which would mean ignoring the demand for local customization. This is not typical of how a paradox is managed as it requires both elements to be addressed over time. However, when suggesting methods for addressing local demands, they did stress the need for acknowledging these demands. One suggestion was to continuously make sure that the users found ways of working around the system without altering it. This would be an acceptance strategy, simply acknowledging that the system is not perfect and working proactively to prevent any major tensions from arising further on. Another suggestion was to allow the changes, but have safeguards providing bureaucratic inertia in the form of requiring formal change requests. This resembles more of a resolution strategy, trying to find a way of separating the two elements in an organizational context. The separation in this case becomes temporal, separating demand of change from customizing the system. This is done by making sure that the change request can be processed methodically and in a way that allows the system to remain coherent over time. A final suggestion was to, if absolutely necessary, simply allow changes. This would again be more of an acceptance strategy. In summary, two of these methods included making a choice between changes or not whilst one would mean no changes would be made. They all have in common though that they were iterative, implying that the underlying tensions they were
meant to manage were constantly resurfacing, which is indicative for an organizational paradox.

**Master data vs required systems functionality**

This relationship is similar to the previous one in many ways. The common denominator is the difficulty in controlling what individual users want from the system and how they manipulate it. The difference between them is that the above tackles the subject of customizing the system itself, whereas this relationship is about what information goes into the system.

This relationship was not one of the issues mentioned by any of the articles found in the literature review. Instead master data emerged in the interviews as something that was constantly subject to user manipulation, causing tensions as a result. A certain similarity can however be discerned between the perceived dilution of the master data, and the relationship of ERP purpose vs required systems functionality that was identified in the literature. Even though the latter was more concerned with the system itself, it addresses the same discrepancy between intended use and actual use. In the literature there was support for customizing the ERP system when the required change was brought on by external factors. If the change is caused from internal factors, making changes to the organization might be preferable. It turns out in the interviews however, that when users felt that they were missing functionality they would instead get creative in how they used the ERP system. For instance, feeding information into the wrong place of the system would help the users generate reports that were previously unavailable. This is a problem because the master data becomes corrupted and diluted with unnecessary information.

Applying the writings on paradox literature from chapter four, the two opposing elements in this instance then are the need for intact master data and the needs of the ERP systems users. Looking at them separately, intact master data that is easy to analyze and understand is a logical and essential part of any ERP system-using organization. On the other hand though, users manipulating the system for their own good requires some discussion as to whether it is a logical and necessary element in the organization. One way of looking at it is that it is wrong, and that users have no right to behave in a manner which is harmful to the system. In the interviews there is support for this and the problem was attributed to lackluster training and a lack of competence amongst the super users. With this line of reasoning, the paradoxical nature of the relationship between the elements becomes questionable. There is one other
aspect to consider though. In the interviews, one of the consultants emphasized the need for creativity over altering the system. The argument was made for the importance of users continually evaluating other options for working around the system instead of customizing it. This reveals a true paradox, not just in the definition of organizational literature but in the classic Greek paradox sense. The need for being creative in getting what is needed from the system without altering or manipulating the system in any manner. There are of course numerous other options available such as changing the routines in such a way that the need for the report is eliminated in the first place. Although it does seem a bit far-fetched that a user would demand that everyone around him or her to change their way of working when it actually is possible to generate the report. This would require a great deal of respect for the ERP system and its data, which according to the interviewees usually isn’t the case. Either way, whether or not this element appears to be logical or not, it cannot be easily discarded as not potentially being so.

The strategies and methods for managing these problems, suggested by the interview subjects, included training, compliance and architectural congruency. Whereas the first two relate to the users, the third one was more about making sure local customization of the system didn’t change the meaning of certain data. Thus, it relates more to the local customization vs systems integrity paradox and will not be elaborated on here. The training and compliance methods are both iterative approaches that address the element of user need over time. They are also indirectly related to the master data since, if done properly, they will ensure that the master data is not meddled with. They are both acceptance seeking strategies and involve working proactively in order to prevent tensions from arising. One of the interviewees suggested a centralized function whose sole purpose would be managing the master data. On its own, this strategy does not take into account the needs of the users and as such does not qualify as a strategy for managing paradoxes. Combined with compliance and training however, it becomes a resolution strategy that separates the two elements spatially.

User acceptance vs organizational change

The two previous RoT’s that have been identified in this chapter have both emerged as a result of asking the interviewees to elaborate on the theoretical findings of chapter three. As was to be expected, they took on a different shape when theory and empirics were combined. They did however remain rather closely related to the original RoT’s identified in the literature. The RoT of user acceptance vs organizational proved to be different. In all of the interviews the topic was subject to much debate centered on increasing user acceptance and
the consequences of low user acceptance. There was not much support however for the theoretical findings that indicated that organizational change and user acceptance were related. When asked, the interviewees tended to answer the question with a discussion on super users and how their role was impacted. The role of the super user though was not prevalent in the selected articles. The way it was discussed in the interviewees did not offer a connection to the literature in the same way as the master data either.

In summary, the relationships identified in the literature, and elaborated on in the interviews, seem to have their merits when examined with a paradox perspective. The elements of the different relationships can with somewhat credibility fulfill the individual criterion of a paradox, and the management strategies suggested in the interviews for the most part involve paying attention to both elements over time. The second part of this chapter will continue testing the merits of these relationships by discussing how they fit into the paradox classification-framework presented by Smith & Lewis (2011).

7.2 Classification of the paradoxes

When classifying these relationships of tension, that are now a combination of literature and interview data, it is important to note that an ERP system is integrated into every part of the organization. This means that the perspective on the role of an individual in the organization will have more impact on the final outcome than the relationships themselves. For example, tensions between user and system can be a learning/belonging paradox if the intention is to evaluate how the routines, habits and roles of the users change over time. On the other hand it can be an organizational paradox if the intention is to evaluate how the users handle conflicting instances between what the system can do and what they need from it. As was discussed in the methodology chapter, this paper is concerned with examining an objective reality where system and organization are intertwined. This will as such drive the classification, and if a RoT appears to be logically suited for more than one category, this criteria will guide the final decision. In order to keep the discussion centered on the RoT’s which had empirical support, only they will be classified.

Local customization vs Systems integrity: Organizing/learning

Looking at this relationship, what was most frequently emphasized by the interviewees was the lack of a big picture-view when local customization was done. The reasons for the customization was noted by the interviewees as being either to satisfy customer demands or increase local efficiency. This would point to a RoT that belongs in the performing category,
since it means balancing the goals of several stakeholders. The stakeholders in this case are
the organization, which in this instance has a goal of remaining architecturally congruent with
regards to the ERP system, customers that have several needs and the employees that have a
goal of increasing their efficiency. There are also indicators that this is a learning/performing
paradox since it involves trying to keep up with customer demand in the present whilst
ensuring the longevity of the system. Looking at paradox categories that relate to user
identity, this does not appear to be as much of an issue with this particular relationship and as
such, the belonging category is not applicable here. Finally, the organizing/learning category
appears to be valid, since it relates to matters of balancing stability and efficiency versus
agility in an organization. Both of the learning/performing- and organizing/learning
categories seem like perfectly good matches in this case. Ultimately, the RoT does relate to
the organization and the ERP system changing, and as such the organizing/learning category
is chosen as the best match.

Master data vs Systems functionality: Organizing

The categorization of this particular relationship is rather straightforward since there is little
indication that it relates to external actors such as customers or the role of the users. The
belonging category is therefore discarded. Instead the conflict here is between user and
system, or rather what the user needs in order to fulfill her or his duties, and what the system
can provide them with. Looking at the paradox categories there are two that explicitly address
the need to balance competing demands, the performing and organizing categories. An
argument can be made that this RoT is the result of having to satisfy multiple stakeholders
since it requires the user to balance what is required of them at a local level and what is
required on a higher level in the organization. This appears to be a logical line of reasoning,
but rather treats the symptoms of the RoT than the cause. That is, the need to satisfy multiple
stakeholders in this manner stems from having implemented the ERP system in the first place.
This fits better into the organizing category since what the ERP system effectively does in this
instance is force the user to balance two systems simultaneously, the local routines and need
for information on one side and the ERP systems logic on the other. As such this RoT ends up
in the organizing category.
Summary

As noted in the beginning of this subchapter, the perspective from which the conflict between user and system is viewed has more impact than the nature of the conflict itself. The RoT’s that have been examined could be classified as belonging paradoxes since it effectively forces the user to relate to more stakeholders than previously. The aim of this paper however is to examine how the organization and system relate to each other, and this resulted in the organizing category being highly applicable to the examined relationships. Overall the notion of competing systems being implemented into an organization is very valid for ERP systems and its validity as a source of organizational paradoxes is credible. The identified RoT’s and their corresponding category are presented in table 7.

<table>
<thead>
<tr>
<th>Name</th>
<th>Category</th>
<th>Empirical/Theoretical support</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local customization vs Systems integrity</td>
<td>Organizing/Learning</td>
<td>Both</td>
</tr>
<tr>
<td>Master data vs Systems functionality</td>
<td>Organizing</td>
<td>Both</td>
</tr>
<tr>
<td>User acceptance vs Organizational change</td>
<td>-</td>
<td>Theoretical</td>
</tr>
</tbody>
</table>

*Table 7. Summary of the RoT’s.*
8. Discussion

This paper began with an introduction of three different research fields. In this chapter a discussion on the central phenomenon presented throughout this paper will be made in order to summarize the findings, discuss their implications and make suggestions as to how practitioners and researcher can leverage them. Furthermore the key contributions of the paper will be presented as well as suggestions for future research.

8.1 The implications for technical isomorphism

The problem identification of this paper dealt with the idea that ERP systems exerts isomorphic pressure on the adopting organizations, not only in the implementation phase, but continuously over time. This idea was rendered from Benders et.al and their work on technical isomorphism described previously, which also was elaborated on to some extent in the chapter four on previous research.

Ontologically, one can surely argue for and against the institutional isomorphism as presented by DiMaggio & Powell. The abstract nature of the concept allows for nothing less. However, the institutional isomorphism has become a rather accepted theory in the research society, and it is difficult to find solid arguments as to why it should be discarded. Thus leading us to the conclusion that isomorphic pressures of various kinds at least explains parts of the similarities amongst organizations that are evident in society. Although this perspective neither deals with ERP systems, nor relates to the core problem of this paper, it has been important to introduce the concept in order to be able to discuss the impact of ERP systems to the extent that it is done in this chapter and still remain comprehensible.

Technical isomorphism on the other hand offers a tangible and objective idea of the ERP system as a valid force that influences the organization and the processes within it. Benders et.al take a stand for inter-organizational isomorphism in that competing companies become similar, thus limiting themselves regarding their ability to create competitive advantage. However interesting this might be, it is not the core of this paper. Instead both the institutional- and technical isomorphism can be used to explain the inertia of organizations due to the use of ERP systems.

Benders et.al primarily argues for the impact due to the implementation project and the alignment of process – system that occurs in that phase. DiMaggio & Powell provides us with the various sources for institutional isomorphism, amongst them professionalism as the driver
for normative isomorphism. Combining the theories presented by Benders et.al and DiMaggio & Powell, and acknowledging the long term isomorphic pressure on the organization from the ERP system, reveals the fact that the viable options at hand become rather limited when managers have to consider the ERP system. This makes it likely that isomorphism in this context is rather underestimated.

This is also supported both by the interviews conducted, and the literature review that implied that very little effort has been made from researchers in the ERP field to take a more holistic view on the use of ERP systems. Hence, there is a discrepancy between the interrelated fields of ERP systems and organizational/strategical research. This also implies that the same phenomenon exists amongst practitioners.

Note that this is not a criticism against neither researchers nor practitioners, but a reflection on the fact that the preconditions on the market have changed and that the interrelatedness has increased during the last decades. This thesis argues that communication between both researchers and practitioners is of great importance, to at least increase a sense of cross-sectional thinking, thus allowing the path forward to take into consideration how this affects, and gets affected by interrelated fields.

Therefore, taking a new stance on the fields of both the ERP systems and managing of organizations might be necessary to be able to adapt to the reality of today and the future, where almost all organizations are extremely likely to use ERP systems in one way or another. One way to do so might be to turn to a paradox perspective.

8.2 The implications of the Relationships of Tension

The problem identified in this thesis stems from technical isomorphism. This yielded the aim of this paper, which has been to identify and classify relationships of tension between elements in ERP systems and organizations. Three relationships were identified and two of these were supported but altered by the data gathered through interviews. The third RoT was not discussed to any great extent in the interviews simply because the interview subjects did not recognize the problem as it was presented. Since there was support for the third RoT in the literature however, a reasonable assumption is that this problem is not faced by ERP consultants on a regular basis, and might be more prevalent on the user side. The two RoT´s that had support from both literature and empirical data were then classified and both ended up being organizing-related.
Even though no claim is made that the RoT´s identified in this paper are actual paradoxes as described in the literature, there is no denying that there seems to be some logic to them, when using a paradox perspective. The value of this is that it opens up for new discussions on how ERP systems impact an organization. What has previously been regarded as a problem of fit that needs solving can with a paradox perspective now be seen as a relationship that needs attention over time. What it does not do, is to offer insight into ERP implementation projects. Since the ERP projects are so extraordinarily complex, trying to foresee all possible RoT´s that could follow from them would be nearly impossible. Here, contingency theory offers a way forward since the focus on fit allows the mapping and adjusting required to get the system functional in the first place. There could be some value however in attempting to develop frameworks for mapping RoT´s, and a reasonable starting point would be in the classification framework for paradoxes used in this paper. Such a framework, if applied after the ERP system has been implemented, would help to make organizations aware as to what efforts will have to be made further on to avoid that unnecessary tensions arise. Considering that the paradox literature distinguishes latent paradoxes from salient ones, this usually means that some paradoxes are not discovered until they surface, which is usually brought on by change in the organization. A framework for mapping out these RoT´s then, would help understand where danger may lurk and help prevent the fact that many organizations do paint themselves into a corner with their ERP system.

A final note on what was revealed in the interviews was that the RoT´s in many ways were related to the difficulty of central control of the ERP system. This is interesting, because in the ERP literature, the ERP system itself has often been mentioned as a useful tool for control. The choice of ERP system and its role within the organization though, has been seen mainly as a strategical decision. What the RoT´s imply is that there need to be control mechanisms in place for making sure that the ERP system is used and customized correctly. Such control systems exist, but could benefit from having two properties, the ability to evaluate fit and the ability to consider latent paradoxes. The former would be in place mainly to ensure that any changes made are not harmful to the overall system or the integrity of master data. The role of the latter would be to help consider what the impact of the customizations will be in the long run, and what latent paradoxes might be rendered salient. In essence, a system that is a hybrid between contingency theory and a paradox perspective.
8.3 Contributions

This paper mainly makes contributions to the field of ERP research. The contributions towards literature on isomorphism does also have value outside of this field, but is still aimed mainly towards ERP researchers and practitioners. Overall, the contributions of this paper are of the most value to researchers since a paradox perspective point to the value of exploring a new path in ERP research. Practitioners could however benefit from the knowledge that the relationship of an ERP system and the organization into which it is implemented needs to be nurtured over time, and consider this already in selecting and implementing an ERP system.

The contributions to the ERP field are: Two RoT´s have been identified and both have support from literature and empirical data. A third RoT has been identified with support from literature but not empirical data. These RoT´s point to the value of using a paradox perspective when studying ERP systems. This discussion has served to examine if there is a problem when combining isomorphism with a paradox perspective. This is an important contribution since ERP systems and technical isomorphism come hand in hand, and only discussing the merits of one of them without considering the other, from a paradox perspective would render the contribution somewhat short-handed.

Contributions have also been made to the ERP field through a discussion of isomorphism and how these pressures relate to ERP systems. By combining the static pressure from ERP systems with the normative isomorphism of institutional theory, this paper suggests that ERP systems have an impact on the adopting organizations, even in ways not directly and objectively affected by the technical impact on processes.

8.4 Future research

The contributions of this paper have been to point towards the value of discussing ERP system-related tensions with a paradox perspective. A first step has also been taken in attempting to identify and categorize RoT´s. In order to expand on this, future researchers have three main paths which they can follow. The first one is to further examine the relationships presented in this paper and explain them with greater precision and detail as well as formulate management strategies for them grounded in paradox literature. Smith & Lewis (2011) presents a framework for managing paradoxes and applying this to one or more of the identified RoT´s could yield interesting results. An empirical study centered on the third RoT that was identified, *user acceptance versus organizational change*, would of course also be a valuable contribution. Furthermore, there could be much value in conducting empirical
studies on the RoT´s with a different ontological and epistemological view and such studies would surely lead to discussions that have most likely been omitted from this paper.

The second way in which researchers can add to the contributions of this paper is larger empirical studies, with the aim of finding new RoT´s and management strategies based on a paradox perspective. This was initially the aim of this paper but access to interview subjects with proper experience proved difficult to obtain. An empirical study would serve to expand the number of RoT´s as well as strengthen the credibility of already identified ones. A longitudinal study with the aim of exploring one RoT, how it manifests itself over time and how it is managed, would be an excellent contribution as well.

The third path that has much to offer, is expanding upon the theoretical foundation of this paper. Here contributions could be made both to the ERP systems-field as well as to management literature. The ERP systems-field would benefit from a more exhaustive literature review regarding post-implementation customization. The review of this paper covered writings of the last five years and combined these with earlier writings identified by others, mainly Addo-Tenkorang & Helo (2011). A larger scale review in this area would help ERP scholars in many areas of research, even the more implementation oriented. Another theoretical contribution would be further elaborating on the combination of isomorphism and paradoxes in general and would be of use to scholars and practitioners interested in both institutional theory as well as management research.
References


