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Abstract

We find ourselves living in a time of rapid change, extensive innovation, and technological advancements, but also rising competition and uncertainty. All of this brings about the need for modification of daily operational practices. Research has been pointing to the potential laying in data exploitation, however, if not managed properly, data can end up being very costly without producing any actual benefit. ERP systems provide organizations with integrated and reliable data, intended to enhance management of day-to-day operations and increase overall performance. This study will address some of the central challenges associated with these complex implementation projects. Furthermore, findings of the empirical study analyzing the effectiveness of the commonly applied management tools from a user's perspective will be presented. The principal objective of this study is to verify whether there are differences in the way ERP implementation projects are managed in organizations of the public and the private sector.

Keywords: ERP Implementation; Public Sector; Private Sector; Change Management.

Deutsche Zusammenfassung

Wir leben in einer Zeit des ständigen Wandels, umgeben von umfangreicher Innovationen und technologischem Fortschritt. All dies führt dazu, dass eine Modifizierung der betrieblichen Abläufe notwendig ist. Anhand von Forschungsergebnissen wurde das Potenzial der Datennutzung dargestellt, wobei diese sehr kostspielig sein kann und keinen Mehrwert bringen kann, wenn die Daten nicht anständig verwendet werden. ERP Systeme versorgen unternehmen mit integrierten und zuverlässigen Daten, damit das Tägliche operative Geschäft verbessert werden kann und die Gesamtleistung gesteigert wird. Diese Studie handelt von einigen der zentralen Herausforderungen, die mit diesen komplexen Implementierungsprozessen in Verbindung stehen. Außerdem werden die Ergebnisse der empirischen Studie, die die Effizienz die gängigen Management-Tools aus Sicht der Anwender analysiert, präsentiert. Das wesentliche Ziel dieser Studie ist zu überprüfen, ob es Unterschiede in der Art und Weise gibt, wie ERP Implementierungsprojekte in Organisation des öffentlichen und des privaten Sektors behandelt werden.

Schlagwörter: ERP-Einführung; Öffentlicher Sektor; Privater Sektor; Change Management.

1. Introduction

In the recent years, global events have put continuous pressure on organizations to introduce cost cutting measures and to streamline operations. More than ever before, there is need for innovation and agility, enabling a more effective response to the rapidly changing environment and the new challenges it poses.

Enterprise Resource Planning (ERP) systems are one of the tools that have gained much attention, in this regard. They are an integrated software providing access to more reliable and up-to-date information. These systems were built to improve management of day-to-day operations and in doing so enable enhanced decision-making and overall performance.

Nevertheless, ERP implementation projects have been associated with a high degree of failure, manifested through extensive budget and schedule overruns. For this reason, there has been great interest in identifying ways to mitigate these risks, while enjoying the full intended benefits of the system. The academic research community provides general agreement on the critical success factors of ERP implementation, however, the matter of approaching these factors in different operational environments has insufficiently been addressed. This acknowledgement provided motivation for conducting this empirical study.

The question this master's thesis seeks to answer is: are there differences in the way public and private sector organizations approach ERP implementation projects?

The approach for addressing this question is initiated with a literature review on ERP implementation, and the specificities of managing such projects in the public and the private sector. The central part of this thesis is the empirical study seeking to verify the validity of insights provided throughout literature. The matters of interest will be viewed from a user's perspective, as such an approach provides insight into the effectiveness of management tools applied over the course of these projects.

ERP implementation projects can be viewed as a type of change initiative, which ultimately has the greatest impact on the individuals expected to operate the system. Considering that change is prone to resistance in any situation and environment, managing its effects represents a pivotal task. This is the reason that a user's perspective was chosen for this study. It is perceived as fundamental for the success of an ERP implementation project to collect

feedback from the user community and thereby gain insight into areas of management which could benefit from further improvement.

Section 2 of this thesis will address some of the key differences between the public and the private sector. Section 3 will introduce ERP systems in greater detail, presenting their central benefits and associated risks, with a particular focus on the aspect of implementation. Critical success factors of ERP implementation will be discussed within a general context throughout section 4, whereas references to their public and private sector specificities will be made in section 5. Section 6 will present the methodology applied in the empirical study, while section 7 is devoted to the sample, findings, and discussion of outcomes of the analysis. The thesis will be concluded with final insights presented in section 8.

2. Public vs. Private Sector

Most commonly, the first thought that comes to mind when comparing the public and the private sector, are their specific ownership structures. However, the differences go far beyond this prominent dimension. There are no clear-cut definitions of the two sectors, as it often depends on the way the author wishes to discuss them. As stated by Rainey, Backoff and Levine (1976), there are several approaches that can be applied in this regard: (1) *common sense approaches*, in which an author discusses the relationship of the sectors without explicit definitions; (2) *practical definitions*, in which unsubtle rules of thumb are applied; (3) *denotative approaches*, in which a sector is delineated by listing the activities or organizations which fall within its purview; and (4) *analytic approaches*, which attempt distinctions on the basis of defining factors or sets of factors (e.g. economists frequently base it on the nature of the goods produced i.e. social or collective goods). Even by applying one of these approaches, it may be difficult to draw the line between the two sectors.

In this chapter, certain fundamental characteristics of the public and the private sector will be presented. The purpose of this brief discussion is to set a foundation for the more focused and topic specific analysis coming up in the following chapters.

2.1 Key Differences Between the Public and the Private Sector

Table 1 presents some of the key differences between public and private sector organizations, as summarized by Sims (2010).

	Public Sector	Private Sector
Objective	Strengthen public good and demonstrate responsiveness to public wants and needs	Profitability and creation of competitive advantage
General strategic goal	Mission effectiveness	Competitiveness
Structure	Political-administrative	Flexible and adaptable
Operational autonomy	Under public scrutiny	Autonomous
Policy decisions	Managed under legal framework	Managed under rules of shareholders and corporate owners

Stakeholders	Taxpayers, inspectors, legislators	Stockholders, owners, market
Authority	Multiple lines of authority	Leadership is aligned or otherwise eventually replaced
Budget priorities defined by	Legislators, leadership, planners	Customer demand
Flexibility	Rules and policies	Flexible
Key success factors	Best management practices, uniformity, economies of scale, standardized technology	Earnings, market share, uniqueness, advanced technology

Table 1 – Differences between Public and Private Sector Organizations
Source: (Sims, 2010)

Public sector organizations focus on being responsive to societal needs and creating greater public good. However, there are numerous obstacles associated with the governance of these organizations. Political interests, bureaucratic systems and complex rules and regulations present a challenge to operations within the sector. In addition, being under constant public scrutiny, and even more importantly, having multiple lines of authority, considerably slows down decision-making and hence the delivery of results. The public sector tends to have internal incentive schemes distinct from those present in the private arena. For instance, in many cases, public organizations hold monopolies in their specific service area, which eliminates competition driven incentives. As presented by Sims (2010), their political-administrative structure implies that legislation on service of the public good are passed by elected representatives, who delegate the implementation of programs to the respective administrative agencies. The interests of the two parties may not always be in line. It is safe to say that political appointees wish to get re-elected and hence align their decisions and actions with that particular objective. This is likely the reason that radical changes are not a common occurrence across public sector organizations. Change attracts attention of the public and may provoke skepticism and critique, especially when involving a degree of risk. Risk aversion and preference for status quo are frequently associated with the public sector. While such an approach may have its benefits, it undoubtedly has disadvantages as well, particularly when operating in an era of rapid change and development. Change may not be a comfortable process, but if implemented adequately, it can bring countless long-term gains. The matter of activity funding is another important topic to mention in this regard. Public sector organizations tend to have a funding system significantly different from the revenue-

based system which prevails in the private sector. The public sector is largely financed through national budgets, although the proportion of such resources and other sources of funding may vary depending on the specific organization. For instance, the operations of a Ministry of Foreign Affairs are financed through the national budget, on the other hand, an international organization such as the World Health Organization to a large extent relies on private donor funding. While public sector budget proposals are reviewed and approved, generally, on an annual or biannual basis, it is almost never the case that an institution is left without funds or closed down for that matter. It can therefore be said that public sector funding is received irrespective of performance (Sims, 2010). Nevertheless, there may certainly be exceptions to this rule.

On the other hand, the focus of the private sector is set on selling of goods and services for the purpose of increasing shareholder wealth (Sims, 2010). These organizations tend to be characterized by flexibility, adaptability and competitiveness. Given that the ultimate objective is profit, decisions are made in a way that accelerates this measurement of success. The environment encourages entrepreneurship, innovation, and smooth decision-making processes, all for the purpose of increasing efficiency and growth. There is a continuous presence of competition, with all market participants reaching for the biggest piece of the pie. Unlike in the public sector, the survival of private sector organizations depends strictly on their performance. This differentiation comes with great importance, as it largely shapes the incentive schemes within the two arenas. Incentive schemes will be addressed in more detail in the following section.

Sector-wide generalization shall be applied with caution, taking into account that great differences exist, e.g. among private sector organizations. One of the more apparent examples are family businesses and startup companies. Family businesses tend to have characteristics of traditional firms, which oftentimes resemble public sector organizations, particularly when it comes to their hierarchical organizational structures and focus on nurturing established reputation and loyal customer base. Startups can more often than not be classified as modern firms, which tend to be more informal, opting for flat organizational structures and focusing on innovation as a tool for growth.

The bottom line is that in the private sector success is measured in terms of growth rate, earnings, market share, uniqueness and advanced technology (Sims, 2010). On the other

hand, performance assessments within the public sector are based on the degree of homogeneity, application of best practices, achievement of economies of scale and use of standardized technology (Sims, 2010).

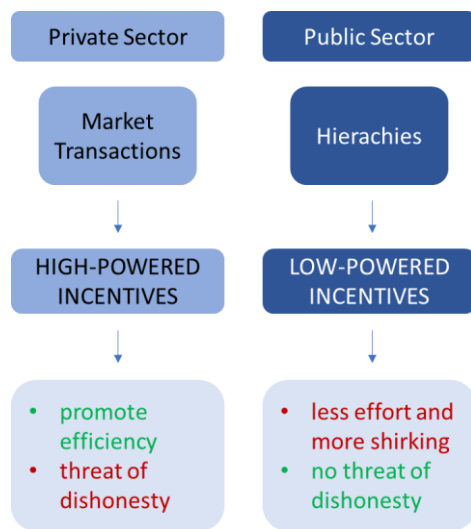
By considering some of the central characteristics of the two sectors, it becomes evident how wide their spectrum of differences is. The presence of distinct final objectives calls for an adaptation of their operational approach, dependent on the particular circumstances and environment they find themselves in. Moreover, this requires establishment of specific incentive schemes which are to serve as driving forces for achieving the set objectives. Incentive schemes are a highly important topic in this regard and will therefore be discussed in more detail in the following section.

2.2 Incentives: Public vs. Private Sector

This section will address one of the crucial discrepancies between the private and public sector, which are their incentive schemes. The concept is closely linked to the numerous differences between the two arenas, hence being of great importance for our further analysis.

We should start by mentioning the distinction made by Williamson (1985) between high-powered and low-powered incentives. The argument starts with Transaction Cost Economics. The underlying premise is that when in need of a good or service, a company can choose to participate in the market or to vertically integrate the service into its palette of operations. Outsourcing creates threats of opportunism coming from the other side, hence increasing the transaction costs, i.e. costs of monitoring, controlling and managing the transaction. Williamson brings this private sector concept to the public sector setting by saying that, when the service provider and recipient find themselves within the same organization, neither has a benefit from exploiting the other. He further associates the private sector with high-powered incentives and the public sector with low-powered incentives. In contrast to the low-powered incentives, high-powered incentives are related to tasks which provide direct gains for the agent as a result of increased performance. Frant (1996) points out that in part due to the tall hierarchical structures present in public sector organizations, it is more common to observe low-powered incentive schemes in such environments. The

Figure 1 - Illustration of Frant (1996) Arguments



idea is that tall authority structures impede agents from having direct gains as a result of increased performance, especially on the organization level. There are certainly possibilities for agents to get promoted, however when compared to private sector incentives, this continues to be categorized as low-powered. Private companies offer bonuses, stock and other monetary rewards to its agents. This is considered a high-powered incentive given that increased company performance translates into direct monetary benefits for the affected agents.

Frant (1996) further highlights that lower incentive structures tend to decrease effort and induce more shirking. The reason behind this is that if an agent doesn't see personal benefit from increasing effort, then she or he may lack stimuli to boost performance. Further assumptions state that in the case of insufficient incentives, agents are expected to shirk (Minkler, 2004). This brings us to an important question, i.e. why are low-powered incentive schemes prevailing in the public sector?

Burgess and Ratto (2003) mention several elements that support the theory against the creation of high-powered incentive schemes within the public sector. These elements are the presence of multiple principals, measurement problems, intrinsic motivation and the importance of teams in production.

Multiple Principals

The authors point out that having multiple principals creates a negative externality that decreases the aggregate marginal incentives. The multi-principle setting intensifies the principle-agent problem by introducing another dimension. Different principals are prone to have different personal interests. Therefore, in addition to asymmetric information and moral hazard resulting from the principal-agent problem, the new setting adds additional moral hazard on the level of the various principals. The issue of different principals having different interests, makes it even more challenging to align the agents' interests to their own. Burgess and Ratto state that the problem lies in agents assigning positive effort to the principals from whom they will receive the greatest return, and each principal advocating for their own

interests, which creates a negative externality for the other principals. Put into simple terms, the more principals an agent reports to, the less effort she/he can invest into meeting the demands of each superior, at least on a high level of quality. If each agent were to report to only one principal, this would mean that all the attention and effort would be directed to this source, hence increasing the aggregate performance of all agents and thereby also the aggregate marginal incentives.

Performance Measurement and Monitoring

Another prominent topic are performance measurement and monitoring challenges in the public sector. This doesn't go to say that such problems don't arise in the private sector, rather that they tend to be more frequent in the public sector due to the nature of the professions. Burgess and Ratto highlight the two key factors associated with this issue: (1) many professions in the public sector tend to have a decision-making role and (2) the organizations they work for are inclined to not have a single and clear objective. This makes it exceptionally difficult to measure output and hence to adequately incentivize agents. The inability to properly measure output would call for increased monitoring, however operations with unobservable effort are widely spread across the public sector. The division of labor tends to be done in such a way that makes it very difficult to measure and monitor performance on an individual level. This brings us to the next point of Burgess and Ratto, suggesting that there is high reliance on achieving results through teamwork.

Teamwork

The authors begin by introducing the work of Holmström (1982) in which he detects the free-rider problem as being widespread within teams. As per Burgess and Ratto this occurrence is particularly prevalent in large teams and large organizations. Notwithstanding this issue, the introduction of team rewarding systems, which would be considered as low-powered incentive schemes, may create some positive externalities. These are peer monitoring and team cooperation. No one appreciates free riders in their team, which incentivizes peer monitoring to take place, in turn reducing the need for centralized monitoring. Furthermore, as the wellbeing of an individual agent in this system depends on the performance of the team as a whole, an automatic incentive for cooperation and knowledge-sharing is created. This evidently generates great benefits for the organization. The bottom line is that the incentivization which coexists with this feature of the public sector tends to be low-powered.

Intrinsic Motivation

Burgess and Rotto point out that when there is no residual claimant, which is the case in public sector organizations, agent's intrinsic motivation can serve as sufficient ground for the implementation of low-powered incentive schemes. Agents may actually care about the cause of the organization and hence choose not to shirk, with the awareness that their decreased effort will diminish the overall output and impact the society. The role of the residual claimant in this scenario is that she/he provides a sort of cushion, making it clear to the agents that in case of decreased effort from their side, the overall output need not decrease. This is due to the residual claimant (e.g. owner in the private sector) having personal interest in making up for any losses, to secure overall financial health of the business. Another interesting argument that was brought up is that financial rewards i.e. high-powered incentives schemes, may even have a negative effect on intrinsic motivation in that it sends a message of a strictly market relationship between the agent and the organization. This eliminates, for instance, the feeling of altruism in the agent, hence lowering a portion of their utility and therefore their motivation for high quality performance.

Dixit (2002) brings up another very important feature of the public sector, namely the lack of competition. Competition creates strong incentives in the case of for-profit firms, as it regularly raises the need for cost cutting and productivity increases. He suggests that the absence of competition and therefore a weakness of incentives is what sets the ground for high cost and poor quality associated with public sector products and services. Nevertheless, Dixit (2002) brings us back to one of the previously mentioned premises, noting that exposing a public agency to competition may not work as well as in the private sector. This can be due to features like unobservable effort. As a reminder, the widespread issue of unobservable, hence unmeasurable, effort in the public sector can trigger a shift of attention onto tasks with verifiable output when high-powered incentives (e.g. financial) are introduced. The academic findings appear to be mixed when it comes to the potential benefits of competition within the public sector. On the one hand, there is proof of competition increasing efficiency, output and quality in the medical field i.e. hospitals (Cooper et al, 2011, Cooper et al, 2010b). On the other hand, there has been extensive controversy around the matter of government contracted prisons, i.e. privatization of prisons. The main argument in favor of privatization is

cost containment, however according to Mason (2012) there is insufficient evidence supporting this. The lack of unanimous agreement on whether the economic benefits of privately run correctional facilities are high enough, shifts the attention onto the infamous violation of human rights. In summation, it remains somewhat unclear whether a lack of competition in the public sector comes to its overall disadvantage, nevertheless it is an important thought to keep in mind for the sections to come.

Incentives are one of the central driving forces of performance. Building an incentive scheme that is suitable for a particular operating environment has the power to accelerate and direct performance, as well as the overall outcomes. Given the vast differences between the public and the private sector settings, it can be expected that the incentives schemes need to be adjusted accordingly. Literature proposes high-powered incentives as the generally adequate choice for the private sector. On the other hand, there are various arguments in favor of maintaining low-powered incentives within the public sector. The idea is that managing incentives in a multi-principle setting requires an adjusted approach to the private sector monitoring and performance management techniques. This is due to public sector efforts oftentimes being unobservable and unmeasurable, at least in the standard and well-established ways. The public sector does however have mechanisms in place that address this obstacle. Teamwork is presented as one of the influential tools, creating a self-sustaining system of positive externalities, that establish cooperation and internal monitoring.

Chapter 2 has addressed some of the fundamental differences between public and private sector organizations. Special focus was put on their distinct incentive schemes, which will prove important for conducting a critical analysis of the remainder of this study's content. Public sector organizations tend not to have a single and clearly defined goal, rather aim to contribute to the general public good. Their operations are generally controlled by strict rules and regulations, as well as multiple lines of authority. Budget provisions are largely determined by political agendas and earmarking of national resources, thereby contributing to the low-powered incentives schemes within the sector. Application of best management practices, uniformity, economies of scale and standardized technology are some of the key determinants of success in this arena.

On the other hand, the private sector is characterized by flexibility, adaptability, aligned leadership and a firm focus on profitability and competition. The success of these companies is primarily measured in terms of growth rate, earnings, market share, uniqueness and advanced technology, paving the way for high-powered incentive structures.

Further differences between the two sectors, those more closely related to the central topic of this study, will be addressed throughout the upcoming chapters.

3. Enterprise Resource Planning (ERP) Systems

Information and communication technology play an increasingly prominent role in today's societies. Data, or rather its effective management and use, have become the major competitive advantage in modern-day markets. In order to preserve prosperity, it is necessary to keep up with the technological developments and innovation trends.

The late 1980s and early 1990s mark the arrival of Enterprise Resource Planning (ERP) systems to the marketplace. ERP systems are software designed for use by organizations, with the aim of enhancing management of business activities. For the purpose of simplification, the system can be visualized as a bucket filled with data from different operational units of an organization and in turn used for data-driven decision-making. The initial intention of the system was to facilitate and enhance day-to-day operations, whereas over the years its use has also expanded to managerial decision-making. Research suggests that data-driven decision making is associated with higher productivity, market value and profitability (Brynjolfsson, Hitt and Kim, 2011).

ERP systems were created to replace the traditional in-house-designed company-specific systems by integrated multi-module commercial packages (Rashid et al., 2012). It was built as an instrument that synchronizes, integrates, and streamlines data and processes of an organization into a single system (Madanhire and Mbohwa, 2016). One of the key benefits of the system is the provision of real time data and with its continuous development it enables more and more possibilities for customization and improvement of overall services. The

available modules have significantly increased over the years, allowing coverage for areas ranging from financial accounting, across human resources, to project management, etc.

Figure 2 presents the global ERP software market revenue. As it can be seen, forecasts suggest a continuing growth trend, expected to reach 43.35 billion U.S. dollars in 2021 (Statista, 2020).

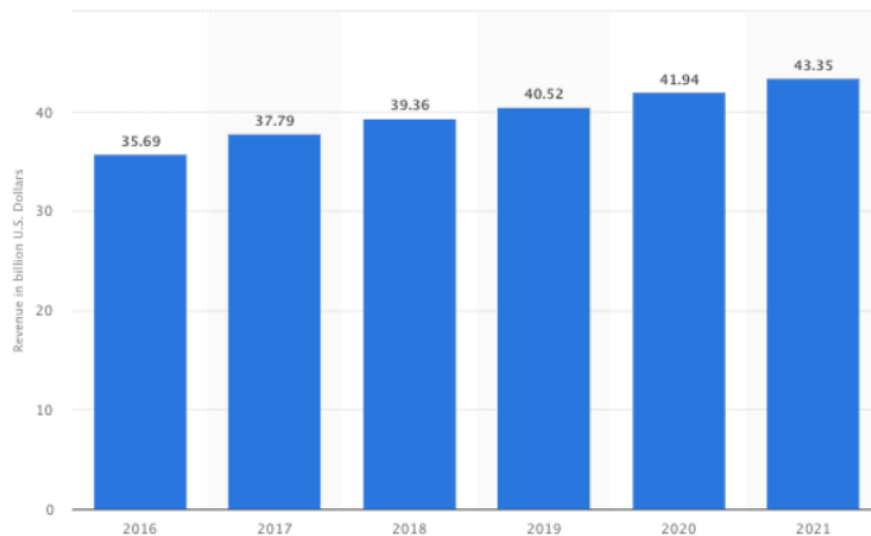


Figure 2 - Source: Statista (2020)

SAP and Oracle are the two largest ERP vendors, with Intuit Inc., FIS Global, Fiserv and Microsoft being some of the other leading competitors in the market. In 2018, the top 10 ERP software vendors accounted for nearly 31.9% of the global ERP applications market (Pang et al., 2019).

3.1 Implementation of ERP Systems

The edge of this multi-billion-dollar industry is that, ERP systems provide two major benefits that don't exist in non-integrated departmental systems (Umble et al., 2003):

- (1) A unified enterprise view of the business that encompasses all functions and departments, and
- (2) An enterprise database where all business transactions are entered, recorded, processed, monitored and reported.

Instead of each segment of a business or organization having insight only into their own financial and operational information, this system solution offers an integrated view. It

enables more effective decision-making based on comprehensive data with enhanced accuracy.

In addition to the principal features mentioned above, ERP has numerous other advantages. The integrated view creates transparency and improves communication and coordination across the organization. This further eliminates the burden of reconciling inconsistently defined information originating from different reporting units (Gattiker and Goodhue, 2000). The system features lead to decreased administrative costs, e.g. by enabling centralization and accelerating information sharing (Gattiker and Goodhue, 2000). Some of the other most commonly mentioned benefits of ERP include the application of best practices integrated into the system and timely access to reliable data.

Table 2 summarizes some of the most commonly discussed advantages and disadvantages of ERP systems. The benefits that can be derived from a successful implementation project are numerous, with their degree depending on the starting point and particular needs of the organization. There are however certain disadvantages that can arise from this process. Implementation tends to be time-consuming and expensive, particularly when organizational practices are not in line with the best practices built into the system. This may entail additional high costs arising from business process reengineering (BPR) or conversely system customization. Another frequently mentioned disadvantage is that organizations become dependent on vendors for any system maintenance, upgrades, adjustments etc. This is opposite to having a system that was built in-house. Lastly, users tend to point out the complexity of the system and that it may not be that straightforward to use.

Table 2 – Advantages and Disadvantages of ERP Systems
Sources: Gattiker and Goodhue (2000), Rashid et al. (2012)

Advantages	Disadvantages
Reliable information access	Time-consuming
Avoid data and operations redundancy	Expensive
Delivery and cycle time reduction	Vendor dependence
Cost reduction	Features and complexity
Easy adaptability	High costs of customization
Improved scalability	Costly BPR
Improved maintenance	
Improved communication and coordination	
Timeliness of information	
Centralization of admin activities	
Reduce maintenance costs	
Economies of scale	
Application of best practices	
Improved decision making and planning	

Examples such as the United Nations’ customized ERP system, Umoja, direct attention towards the potential implementation drawbacks and the associated risks. The SAP ERP implementation project represents a monumental modernization initiative within the UN system, intended to, among other things, upgrade its technology, tools and practices to those appropriate for the 21st century (Umoja.un.org, 2019). In a 2016 UN press release, the total project budget was estimated to have reached nearly \$544 million (Un.org, 2016). Umoja has become associated with extensive cost over-runs and persistent delays. The project, which was initiated in 2008 and scheduled for completion in 2011, is only now coming to an end. The United Nations are certainly not the only example of limited success when it comes to the implementation of ERP software.

The German grocery store chain Lidl is one of the prominent examples of failed ERP implementation projects from the private sector. In contrast to the decisions made for UN’s Umoja project, the executives of Lidl decided to scrap their SAP implementation project after investing 7 years and an estimated half a billion euros (Dolfing, 2020). The start of the downward spiral was when Lidl opted for introducing significant customization, thereby adapting the system to their existing practices. The more alterations need to be made to the

system, the more complex the implementation project becomes, bringing along high additional costs. As declared by Jesper Hoyer, the former CEO of Lidl, “The strategic goals as originally defined were not possible at an acceptable expense.” and this is what ultimately concluded the project (Consultacy.uk, 2018).

ERP implementation projects are frequently associated with budget and schedule overruns, which is why for years they have been evaluated as projects with low success rates. This statement is dependent of one’s understanding of success or failure, however, consultancies such as Garter, McKinsey and others have highlighted the costly challenges that tend to arise over the course of their implementation.

3.1.1 Why do ERP implementations fail?

Considering the complexity, high costs and resource requirements associated with ERP implementation, it is essential to understand the factors increasing the risk of failure and to properly mitigate them.

The following list presents some of the most frequently mentioned factors increasing the likelihood of ERP implementation failure (Umble et al., 2003, Momoh et al., 2010, Stanicu and Tinca, 2013, Ali and Miller, 2017):

1. Excessive ERP software customization
2. Inadequate change management strategy
3. Lack of top management support
4. Inadequate business process reengineering
5. Organizational resistance
6. Limited user involvement
7. Hidden costs
8. ERP vendor selection
9. Mismatch between organization requirements and system functionalities
10. Data migration problems.

ERP software customization is a matter that has come up in various implementation cases. The underlying reason for failure in this regard is that the scope of additional requirements on such projects are oftentimes not adequately considered and planned for. This brings the matter back to the common risk on any project, namely, inadequate project management and change management. The organization must prepare in advance, being aware of the system functionalities and understanding the ways in which they can be aligned to their operational requirements. In many cases, a tradeoff needs to be made between adapting the ERP to existing organizational practices and accepting high, additional costs of customization. ERP implementation projects are highly complex, costly, and hence bearing a degree of risk. The difficulty of successful implementation is often underestimated, as many elements tend to be disregarded or overlooked during the initiation stage. Hidden costs are a prominent subtopic that is closely linked to many of the factors presented above. These unanticipated costs can arise from a variety of areas, e.g. business process reengineering, system customization, overcoming technical obstacles, organizational resistance etc. We can take the Lidl case as an example. When the decision was made to hire SAP, not all implications of adapting the system to their established ways was considered. SAP's built-in best practice scheme was a purchase-price-based inventory system. On the other hand, Lidl bases their inventory on retail prices, something they refused to change. This meant that extensive system customization needed to be made. In addition to the base cost of customization, Lidl feared the hidden costs which could arise from this decision e.g. lack of data accuracy and system errors. After having evaluated the financial implications of the situation it was decided to go back to the old system, disregarding the 500 million euros of sunk costs. This example illustrates how important it is to prepare carefully and conduct detailed planning ahead of project initiation. The technical challenges are not the only kind of obstacle that is overlooked in the initial stages of these projects, the requirements associated with human capital are equally important. Resistance to change is nearly inevitable and it imposes significant resource requirements in order to be overcome. People of the organization must feel prepared for the transformation, both with respect to understanding the implication of the change initiative, as well as possessing the necessary skills to ensure effective continuation of operations.

While it may not be possible to foresee all that can occur, there are things that should be considered based on existing lessons learned. The matter of identified critical success factors of ERP implementation will be further addressed in section 4.

3.1.2 Implementation of ERP Systems: Public vs. Private Sector

Very few comparative studies focusing on ERP implementation within the public and the private sector have been done. One potential explanation may be that, public sector ERP implementation projects predominantly took place in the recent past, which may not have provided enough opportunities for large studies to be conducted. There is a base of studies focusing on the two sectors separately, which may shed light on the need to proceed to the next step, namely, to conduct an analytical comparison. This subsection presents two rare examples of comparative studies that were found.

The first matter to address is the rationale behind the public and private sector decision to implement an ERP system. Globalization brought along increased complexity with respect to organizational structures and geographical dispersion (Alves and Matos, 2013), which in turn gave rise to coordination and data integration challenges. This increased interest in enterprise-level, integrated information systems as a suitable solution to the problems. The world-wide economic situation has intensified pressures for streamlining and cost cutting in the public sector just as much as in the private sector. For instance, the concept of eGovernment technologies has become more and more appealing, giving the stage to new and more efficient ways of operating within the public arena. Alves and Matos (2013) conducted a comparative study on Portuguese organizations, examining the differences between the two sectors when it comes to motives for ERP implementation and some of the key decisions associated with these initiatives. Using the survey method, Alves and Matos (2013) found that the majority of respondents indicated the following as the main reasons for ERP system implementation: integration of applications (86%); increased demand for real-time information (82%); integration of information (80%); and information generation for decision making (77%). Their findings from Portugal were compared to those of studies conducted in Greece and in Brazil, and the results seem to largely coincide. Furthermore, the study does not find support for the top motives for implementation being significantly

different in the public and in the private sector. Nevertheless, there is reason to believe that although the similarities are apparent, the degree to which different factors drive the decision to implement an ERP system, may vary across public and private sector organizations (Alves and Matos, 2013). These findings seem rational, considering that the principle functionalities and benefits of an ERP system remain irrespective of the environment in which it is implemented. Similarly, the findings of Karaman Akgül and Gözlü (2014) demonstrate no significant difference between the two sectors, neither with respect to CSFs nor the reported benefits of ERP systems. The limitation of this study may be a small analysis sample (total of 73 responses), particularly from the public sector (only 4.5%). This may have prevented significant differences to be identified between responses from the two sectors. While there are studies presenting similarities with respect to underlying characteristics of ERP projects, depending on the challenges the organization aims to overcome, certain aspects may be assigned a slightly higher or lower level of importance. Alves and Matos (2013) further report that on average, more modules are implemented in the private compared to the public organizations. While the differences are found to be small, they appear to be statistically significant. The authors explain this through the nature of operations within the public sector. There are certain modules, for instance, sales and distribution, production planning, logistics and quality control, of which most public organizations couldn't make much use (Alves and Matos, 2013). The study further found that most private organizations implemented an ERP system before the public sector, which is to be expected considering that the system was initially designed with the private sector in mind and only later adapted and expanded to the public sector. Lastly, the differences in time requirements for ERP implementation in the two sectors were not found to be statistically significant. There is a positive correlation between the number of modules being implemented and the time required to complete the entire process (Alves and Matos, 2013). This premise was, however, found to be statistically significant only in the case of private organizations. In conclusion, Alves and Matos (2013) found some differences between public and private sector organizations with respect to their ERP system implementation decisions. Likewise, they presented that not only does the implementation of more modules increase the total implementation time, but different modules require more time to implement than others. These findings explain why implementation in the public sector tends to be shorter and highlight that given the type of work of public organizations, certain modules are simply not needed for their operations.

Considering the fundamental differences between the public and the private sector, there is reason to believe that those effects are reflected also in the context of organization-wide transformations in the area of IT. Findings of the briefly presented studies are being challenged with the assumption that samples, particularly ones limited in size, create biases which may distort the overall picture. The matter of critical success factors of ERP implementation will be addressed in greater detail in section 4, whereas section 5 will provide insight into the potential differences of their application within the public and the private sector.

4. Critical Success Factors (CSFs) of ERP Implementation

Given the high rate of failure when it comes to the implementation of ERP systems, critical success factors have been a matter of great interest within the research community. Extensive literature covering this topic exists (e.g. Dezdar and Ainin, 2011; Alves and Matos, 2013; Gard and Garg, 2014; Algashami and Mohammad, 2015; Ali and Miller, 2017; Menon et al., 2019; etc.) and there appears to be general agreement on the top critical success factors of ERP implementation.

Literature (e.g. Hasibuan and Dantes, 2012; Menon et al., 2019; etc.) differentiates between three categories of CSFs, namely: people, process & organization and technology. The first two categories are very closely linked, as people of the organization are the ones driving the process and organization. It is crucial to have, not only a competent project team, but also an organization consisting of people willing to cooperate and take on the change. Keeping this in mind, all stakeholders should be perceived as equally important in the process of successfully adopting change. On the other hand, if there is no adequate action plan in place, then it is very difficult to make full use of people's potential. Given that we are discussing a technological change process, it goes without saying that technology plays a central role. However, research (e.g. Umble et al., 2003; Ara and Al-Mudimigh, 2011; Tarhini et. al, 2015; Panorama Consulting Solutions, 2019; etc.) suggests that obstacles related to technology, unlike the other two, are rarely large enough to break the entire implementation project. Panorama Consulting Solutions found that a higher percentage of companies rated the

technical aspects of implementation as easy, compared to the process change & organizational change (16% and 5% respectively) (Panorama Consulting Solutions, 2019). The claim is not that factors relating to technological aspects are not important, on the contrary, however, the ample possibilities and skills in this area generally provide sufficient solutions for such obstacles.

Garg and Garg (2014) tested 21 CSFs, identified in literature, with respect to their validity in the retail industry in India, i.e. private sector. The CSFs were categorized into four groups, namely, strategic, technological, people and project management. The findings show that the strategic CSFs had the biggest impact on the success rates of the investigated companies. With respect to the significance, these factors are followed by the category of people, technological and then project management factors. The tested strategic variables were business process reengineering, top management support, business plan and vision, ERP product selection and selection of external consultant/vendor.

Dezdar and Ainin (2011) tested the impact of some of the most commonly identified CSFs on the success of ERP implementation across user-companies in Iran. The selected factors were top management support, enterprise-wide communication and user training for which user satisfaction was tested as a mediator. The findings demonstrate a positive and significant correlation between the three tested CSFs and successful implementation. Furthermore, the mediator, i.e. user satisfaction, was also found to have a positive impact on the success of implementation.

Ağaoğlu et al. (2015) conducted a study built on user's perception regarding the effect of CSFs on ERP implementation, where input was gathered from employees of a multinational consumer goods company. The model that was tested consists of three groups of variables, namely, CSFs, ERP project outcomes and business process outcomes. The hypotheses postulate that CSFs determine the project outcomes, while the project outcomes in turn form the business process outcomes. The users identified user involvement and user training as the most important CSFs. Nevertheless, the regression analysis contradicts this by not having found a significant correlation between these CSFs and project success. Ağaoğlu et al. (2015) concluded that the importance attached to CSFs may be independent of their actual effect on ERP implementation success. This study demonstrates the importance of differentiating between respondents, taking into account that not all stakeholders are impacted by the same

factors, and their role in the organization as well as type of connection to the ERP system may be relevant dimensions to consider.

As the objective of this study is not to identify CSFs, only a limited literature review was conducted. For the purpose of putting together a high-level summary of the top CSFs (*Table 3*) a set of 14 studies¹ was used. The authors investigated ERP implementation in diverse sectors, regions of the world, as well as from the perspective of different stakeholders.

CSF	Count
Communication	14
ERP Product	14
Project Management	14
Change Management	12
Top Management Support (TMS)	12
Clear plan and vision	10
Business Process Re-engineering (BPR)	9
Project team	9
Training	8
Monitoring and Evaluation (M&E)	8

Table 3 – Top 10 CSFs

As demonstrated in *Table 3*, communication, project management and ERP product have been identified by all analyzed studies as CSFs.

Effective communication is certainly one of the most frequently mentioned determinants of success in multi-agent environments, encompassing areas far beyond the implementation of ERP systems. Communication in our currently addressed context, refers to a variety of relevant levels, e.g. interdepartmental communication, communication between project members, between external consultants and organization staff, management and staff etc. ERP product refers to the quality of the product and choosing the right product for your organization and needs. Project management, being a central topic of any sort of project, will be addressed separately in the following subsection. The remainder of the top 10 CSFs list

¹ (Ara and Al-Mudimigh, 2011; BearingPoint, 2004; Hasibuan and Dantes, 2012; Bancroft et al., 1998; Al-Mashari et al., 2003; Nah and Delgado, 2006; Holland and Light, 1999; Jafari et al., 2006; Soja, 2006; Umble et al., 2003; Nah, Lau and Kuang, 2001; Alqashami and Mohammad, 2015; Tarhini et al., 2015; Saade and Nijher, 2015)

includes: change management, top management support, having a clear plan and vision, business process re-engineering, project team, training and monitoring & evaluation.

Table 4 presents the classification of these factors according to the previously mentioned three categories, i.e. the PPT framework. As the framework itself suggests, all three aspects need to be balanced in order to drive action. Panorama Consulting Solutions (2019) however makes a remark that before choosing the technology, organizations should have a clear vision and prepare their people and processes to enable successful implementation.

People	Process & Organization	Technology
Project team Top Management Support (TMS)	Clear plan and vision Project Management Change Management Communication Business Process Re-engineering (BPR) Monitoring and Evaluation (M&E) Training	ERP product

Table 4 – Top 10 CSFs in PPT Framework

It can be said that all of the presented CSFs are closely related. For instance, proper change management entails effective communication, providing adequate training to users, top management support and adjusting existing business processes i.e. applying BPR. On the other hand, having a clear plan and vision, M&E and having a qualified project team are elements of successful project management. After all, change management and project management should coexist to reach the organization's transformation objectives.

This study will not be addressing the technological aspects of ERP implementation projects. The remainder of the section will address the more general aspects of some of the main CSFs that have been identified in the area of people, and process and organization.

4.1 Project Management

Although a great idea and a competent workforce are fundamental components of a successful project, there is only so much they can achieve without effective project

management building a bridge between the two. Project management is a tool necessary for any sort of operational undertaking. Whether in the private or the public sector, projects are all around us, requiring well thought out approaches and strategies.

According to the definition of Wirick (2009), project management:

- Defines outcomes to be achieved.
- Identifies the minimal resources necessary to complete those objectives.
- Allows the organization to move quickly and to hit schedule targets.
- Manages the risks of failing to meet set objectives.
- Focuses the organization's attention on the goal and the required outcomes.

Chen et al. (2009) highlight that rigor project management is needed to overcome some of the common problems occurring in ERP implementations, e.g. scope creep, poor risk management, inadequate allocation of human resources over time, and vendor management. They further point to the fact that ERP projects need to be approached as ongoing initiatives, given that they comprise of more than just the implementation segment. It can be said that the pre- and post-implementation stages are equally as important as the implementation, if not more. Successful pre-implementation is highly reliant on, among other things, realistic planning and proper preparation for the change process. In course of post-implementation, there is need to monitor operations following the transition and to ensure that the change is built into the new organizational culture.

Chen et al. (2009) describe a project life cycle as consisting of five phases namely, initiation, planning, execution, controlling and closing. Initiation and planning can be grouped into the pre-implementation phase, primarily focusing on the definition of goals, building a project plan, as well as setting deadlines, budgets and expectations (Figure 3). The following two phases are again closely linked, with controlling taking place during and after the project execution. As demonstrated in Figure 3, the execution stage should be strengthened by maintaining communication, managing relations of the project team and other stakeholders, as well as addressing new requirements arising throughout the project. Controlling is marked by measurement of project performance and cross-functional coordination. During the closing phase of an ERP project, focus is set on the integration of the system into daily

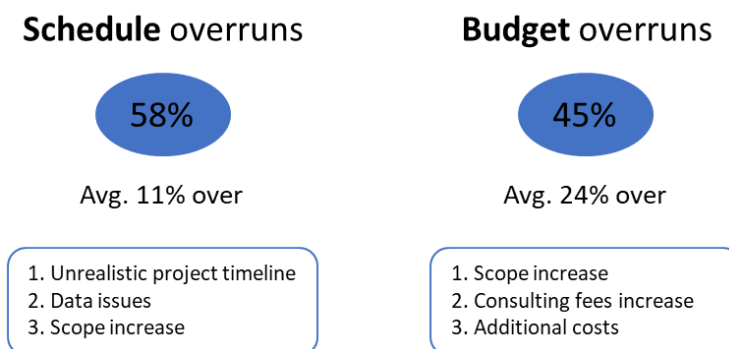
operations, transferring responsibility to users, releasing resources, rewarding efforts, and conducting final reviews.

Figure 3 – ERP Project Life Cycle
Source: Chen et al. (2009)



The most critical project management tasks, in any sphere of operation, are controlling the project schedule, quality and budget (Chen et al., 2009). It is two of these matters that are all too frequently mentioned as central problems of ERP implementation, namely running over time and budget.

Figure 4 - Most Common Overruns (Panorama Consulting Solutions, 2019)



The Panorama Consulting Solutions (2019) ERP report notes that 58% of examined implementation projects faced schedule overruns, while 45% were over budget. From the 58% of surpassed project timelines, the planned duration had to be extended by an average

of 11%. Unrealistic project timelines were reported as the most prominent reason for these overruns, while data issues and the expansion of the project scope followed in ranking. On the other hand, from the 45% of projects with budget overruns, the average project was 24% over the initially set budget. The most common explanation was the expansion of the project scope, followed by higher than anticipated consulting fees and additional costs arising from organizational issues.

Chen et al. (2009) conducted a case study on a large private sector company that gave ERP implementation two attempts. During the first attempt, various errors were committed in the area of project management, which was identified as the breaking point of the implementation initiative. The second time around, lessons learned were applied and several areas were approached with significantly more gravity than before. The central issues were project scope, HR, risk, communication, procurement, and integration management. With respect to managing the scope of a project, the company recognized the need for more comprehensive analysis, planning and evaluation prior to the initiation of the project. For instance, the project team needs to determine the level of customization early on, thereby building a strong foundation for a realistic budget, timeline and expectations. Relevant HR matters refer to (1) managing in-house employees throughout the project and (2) retaining skills and knowledge within the IT department. The solution applied by the company in the second ERP implementation attempt was to have internal employees shadow the vendor consultants, with the intention of securing knowledge transfers. Such interaction is expected to further engage the staff and make them more willing to accept the change initiative. In the area of risk, it is important to have knowledge on the threats posed by ERP implementation projects and to adopt control processes to mitigate the associated risks (Chen et al., 2009). Effective communication is a proven method for resolving conflict arising from different stakeholders having different interest within the organization, hence also with respect to the ERP project. This topic will be addressed in greater detail, in section 4.4. Procurement, as discussed by Chen et al. (2009), refers to the importance of monitoring and managing vendor relations and operations. This entails close performance monitoring and evaluation, as well as leveraging vendor knowledge. Lastly, the company's lesson learned with respect to integration management was that prioritization committees are a useful tool for successfully implementing the system, while acknowledging and considering the requirements of internal

stakeholders, i.e. the users. All stakeholders must be on the same page and working towards the same goal, while exhibiting willingness to compromise and make concessions. Additionally, integration management links the organization's business strategy with the ERP strategy, thereby optimizing the degree of customization and application of best practices. The Chen et al. (2009) study provides proof for how imperative the application of project management skills is, something that is oftentimes underestimated.

4.2 Change Management

Agility, or the ability to quickly respond to change, has become a key requirement for success in the rapidly changing global environment we find ourselves in. Despite people having a general preference for status quo, Touhill and Touhill (2014) remind that change creates possibility for acquiring new capabilities, better efficiencies, and creative new approaches to operations. Change however comes with a great amount of risk, especially with respect to its management. This is the reason that many individuals and organizations prefer avoiding change and carry on with existing practices despite the benefits that a change could bring. Unfortunately, this approach is no longer sustainable as the market imposes the need to keep up with current developments, e.g. in the IT sphere.

Despite change impacting every element of an organization, the way it impacts its most indispensable component, the people, shall not be underestimated nor neglected. Individuals tend to fear change and oftentimes feel threatened by it, thereby responding to it with resistance. Not only for the purpose of successfully implementing the desired transformation, but also to keep the organization running, challenges associated with people must be addressed with utmost attention. These potential obstacles can be mitigated or even eliminated with action taken from the side of management.

Touhill and Touhill (2014) advise to comply with the following points, during and outside of periods of change:

- Transparent, honest, and two-way communication, i.e. making sure that both staff and management get a chance to express their thoughts and concerns.
- Involvement of agents in the change process.

- Clear definition of roles and responsibilities.
- Accountability from the side of all stakeholders, this applies to management just as much as to anyone else.

Proper leadership is found to be the key to building and securing loyalty from the side of employees, which in turn drives their willingness to invest additional efforts for the wellbeing of the organization (Touhill and Touhill, 2014). One of the principal reasons that people dislike change is that it requires extra effort, frequently reflected through the need to adapt to the new ways, develop additional skills and obtain new knowledge. One needs to understand and believe in the benefits the change is expected to produce, in order to feel motivation to devote additional efforts and time into the realization of this transformation.

Management holds the power to determine the path of change, which is why effective leadership in times of change plays a central role.

„Executives need to be both effective managers and great leaders, guiding and controlling the process that leads to change.“

(Touhill and Touhill, 2014)

Kotter (1996) detected some common mistakes organizations make with respect to how they approach implementation of change.

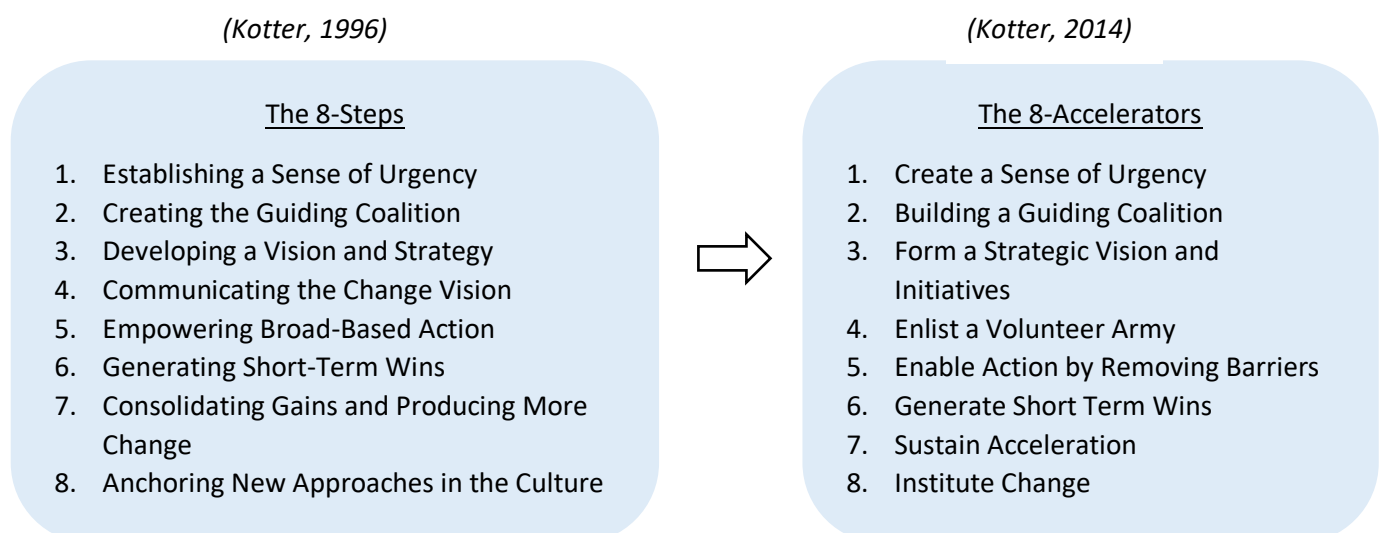
1. **Allowing too much complacency.** This results from underestimating the level of difficulty when it comes to imposing change on an organization and getting individuals to leave their comfort zone.
2. **Failing to create a sufficiently powerful guiding coalition.** The organization needs to not only be told, but also to see through actions, that the highest decision-making bodies are standing behind the initiative and expecting appropriate results.
3. **Underestimating the power of vision.** Presenting the initiative in the form of a vision illustrates to the people what exactly is being done, and why and how it expected to increase overall wellbeing of the organization and its members.
4. **Under-communicating the vision.** There is need for credible communication, where both the quality of the information, as well as the frequency of its sharing are considered fundamental.

5. **Permitting obstacles to block the new vision.** Governance and internal practices must be adapted to permit for the realization of the vision. For instance, if the organization is switching to a new ERP system, management must ensure that what they ask of their staff can effectively be executed using the new platform. They need to adjust their way of operating to stimulate and facilitate the process of migration to the new system.
6. **Failing to create short-term wins.** The identifying and celebrating individual milestones throughout the project can boost morale and maintain the desired level of motivation for the execution of the long-term initiative.
7. **Declaring victory too soon.** Unrealistic time frames, set with a desire to discontinue extra outflows of resources as early as possible, can end up being much more costly than extending the duration of the project.
8. **Neglecting to anchor changes firmly into the corporate culture.** The change initiative can be considered successful and complete only once it becomes rooted into the organizational culture. Prior to this moment, there is great risk of reversal of efforts.

As demonstrated through these frequently committed errors, success of a change initiative is dependent on more than a solid plan that is set into motion. There are numerous factors that can make or break the entire process of change.

Kotter adapted his 1996 “8-Step Process for Leading Change” to the modern-day environment, while preserving the underlying premises of the framework.

Figure 5



Kotter (2012) explains that accelerators are concurrent, always at work, they require flexibility and agility of a network and aim to pull in as many people as possible to form a “volunteer army”. On the other hand, he makes a remark that his 1996 steps are rigid, finite, intended to be done sequentially, primarily used to address episodic change, are driven by a small and powerful core group and most importantly were designed for traditional hierarchies.

Hierarchies have for a long time been the preferred organizational structure and continue to be widespread, especially in the public sector. They have certain benefits, such as allowing work to be clearly organized and divided, but they also come with limitations, particularly when it comes to operating in a rapidly changing environment. Hierarchies are inherently risk-averse and resistant to change, with part of the issue laying in their political and cultural characteristics and pursuit for stability (Kotter, 2012). Kotter argues that the change management approach of hierarchies can work well up to a certain point but faces great challenges when more change needs to be quickly absorbed. With this in mind, it may be advisable for hierarchical organizations of the public sector to shift their change leadership approach from the “8-Steps” model to the “8-Accelerators”. This would be done with the intention of building an organizational structure that promotes agile operations, which has become a necessity nowadays.

Although Kotter’s underlying premises remain, his change management framework has switched focus from pure, hierarchical management to leadership, which is expected to bring prosperity in the modern-day operational context. Based on the distinct characteristics of the private and public sector, it can be said that Kotter’s new 8-Accelerators model may be more suitable for the private sector environment, while his 8-Steps may still hold for many public sector organizations. This idea should, as everything, be applied with caution given that certain public sector organizations may resemble the private sector more than others. In this regard, the following subsection takes a closer look at the differences between the public and private sector in the context of change management.

4.3 Top Management Support

Throughout literature, top management support (TMS) has been one of the most frequently identified critical success factors of ERP implementation. TMS refers to the extent to which top managers provide direction, authority, and resources during and after the change initiative (Ifinedo, 2008). Ifinedo (2008) points out that when top managers publicly express their support for an IT project, staff tend to react positively and to adjust their behavior accordingly. Dong et al. (2009) presented the following as some of the key benefits of TMS associated with IT projects:

- Increased system usage
- Positive user perceptions
- Improved IT adoption and diffusion
- Better performance.

Ahmed et al. (2014) tested top management support as a multidimensional measure promoting project success. The authors used the dimensions identified by Boonstra (2013), namely provision of resources, structural arrangements, communication, expertise of top management team, and power. This approach is innovative in that it recognizes that TMS is not a single construct, rather consists of a variety of dimensions (Boonstra, 2013). While some of the dimensions are self-explanatory, some may require additional information. Structural arrangements refer to strategic planning and management of the project, as well as preparation of the organization for the expected changes. Power entails to which extend top management exercises its authority to manage the project. The Ahmed et al. (2014) study found a positive correlation between all 5 identified dimensions of TMS and the likelihood of IT project success.

Despite resources being a key necessity for project implementation, Dong et al. (2009) found no statistical support for their provision promoting learning, overcoming knowledge barriers, increasing user satisfaction, skillfulness or having any other positive organizational impact for that matter. In line with these findings, it can be said that while the provision of sufficient resources sends a message of commitment to the project, it doesn't resolve some of the

central obstacles falling under the category of resistance from the side of users. The Dong et al. (2009) study shows that users are primarily concerned with the changes to their daily tasks, and their potential challenges with operating the new system. Top management is advised to clearly communicate the degree of change that is expected to result from the new system implementation (Dong et al., 2009). Furthermore, small tokens of appreciation and recognition of efforts of the future system users is a powerful tool for motivating staff and taking down the walls of resistance. Top management support in this process can be further exhibited through the redesigning of trainings based on user needs, effectively removing barriers as they appear, engaging with users at a social level and regularly seeking feedback from the user community (Dong et al., 2009). The bottom line can be seen as recognizing the need to effectively listen to users, showing flexibility and addressing their concerns with care and determination to have a satisfied and well-prepared user community operating the new system.

Vision sharing appears to be another important area for expressing top management support. Top management needs to shape their vision in a way that speaks to the audience, allowing them to relate to it and hence begin to pursue the same objective (Dong et al., 2009). The vision loses its intended power if the receiving end of the message cannot relate to it or understand it for that matter.

Boonstra (2013) specifies the following as important dimensions of communication originating from top management:

- Frequently communicating with the project team and promoting the project to the rest of the organization.
- Explaining the organizational implications and organizational changes expected to result from the implementation project.
- Discussing possible system changes with those involved.
- Discussing the project's implications with various stakeholder groups.

However, Dong et al. (2009) point out that it may be insufficient for top management to rely solely on formal communication, this needs to be reinforced by proactively clarifying confusion, engaging key stakeholders in early stages of system development and inspiring a strong sense of ownership and commitment.

The study provides practical advice for top management, highlighting that formal communication from a distance tends to be insufficient for these types of organization-wide change initiatives. Support is not to be kept only on the level of words, it should instead be brought to life through clear actions which demonstrate and strengthen them. Furthermore, Dong et al. (2009) advise not to rely solely on standardized training and technical assistance programs but to rather remain flexible and adapt the approach based on collected feedback and the needs expressed by the user community. Dong et al. (2009) suggest that top management shall tailor their approach, not only based on the specific circumstances and the environment, but also towards different groups of stakeholders. Users who are already acceptant of the change, may simply require support in the form of resources, i.e. trainings and other forms of technical support (Dong et al., 2009). On the other hand, it has been demonstrated that this approach is insufficient in the case of users exhibiting resistance towards the implementation of the new system. This group may require a more diverse set of ways through which top management will express their support throughout the process.

4.4 Communication

Communication is one of the most frequently discussed CSFs of ERP implementation. It has proven to be a powerful tool for motivating members of an organization to embrace change. The essence of this factor is exchange of information between different project stakeholders. Aubert et al. (2013) recognize the multidimensionality of communication, specifically through the following nine dimensions: completeness, credibility, accuracy, purpose adequacy, timeliness, openness, audience adequacy, bidirectionality, and balance of formality vs. informality. Depending on the sector and specific environment, the communication lines may differ, nevertheless the most essential and powerful one is probably the one connecting the vendor, top management, the project team, and staff. Different stakeholders tend to have different interests and are hence interested in different types of information. They will likely want to know how the project and the associated changes will impact them and their workload, whether the initiative may put in jeopardy their job security, and many other elements depending on the individual stakeholder.

Boonstra (2013) presents the following as some of the effective communication methods: weekly team meetings chaired by a top manager, frequent emails, phone calls, and face-to-face meetings addressing the needs of members of the organization. It shall be noted that a balance should be found in these activities, ensuring that the audience does not become overwhelmed with the amount of engagement and information shared. The internal stakeholders in particular, have their everyday tasks to complete and may hence not appreciate an excessive amount of communication about the ERP project, as it will likely distract them from their other responsibilities.

As mention in section 4.1, management of vendor relations is a very important part of proper ERP project management. This entails ensuring effective communication between members of the organization and the vendors. The lack of mutual understanding with respect to what the organization needs and what the vendor can provide destines the project for failure.

Aubert et al. (2013) studied the role of communication quality between the organization and the IT project team with regard to ERP implementation success. The motivation arose from the fact that authors like Sarker and Lee (2003) or Maditinos et al. (2011) (as cited in Aubert et al., 2013) began to question the widely accepted claim that communication is a CSF of ERP implementation. The findings suggest an impactful role of communication when it comes to ERP implementation projects, however, the degree of impact varies depending on the parameter of success that is being considered. The strongest relationship was found when considering elements related to users. One of the interesting insights provided by Aubert et al. (2013) is that user satisfaction with the development process and the system itself are not necessarily related. Furthermore, the results demonstrate that communication quality facilitates the process of change management and coordination, while its concrete dimensions, openness and timeliness increase the overall project efficiency (Aubert et al., 2013). Confirmation is presented for effective communication enabling better coordination of project activities taking place in different teams or areas of the organization. Likewise, sharing relevant information in a timely and transparent manner, allows the actors to properly process the information, respond and take action. This seems rational as incomplete information whose sharing is overdue, does not serve any specific purpose and can hence be perceived as purely ticking of a box on management's to-do list and even a waste of valuable resources. An important message from the Aubert et al. (2013) study is that both direct and

indirect effects should be considered, with user satisfaction being a concrete example from the study. There are, the so called, spill-over effects, with the long-term impact of user satisfaction being reflected on various areas of operations, channeled through, for instance, motivation and commitment. At the end of the day, users are the ones who will be operating the system and their satisfaction, attitude, and perception of the entire ERP project are unquestionably significant. This matter will be further addressed through the discussion of empirical findings of this thesis.

4.5 User Participation

User participation is another CSF of ERP implementation that has been identified as a particularly powerful tool for, among other things, overcoming resistance to change. Throughout literature, different understandings of employee, or in this case user involvement / participation / engagement can be found. This thesis focuses on the management side of this concept rather than the psychological. In other words, the aim is to examine the extent to which top management gives employees opportunities to participate in the decision-making process, instead of how willing or interested the employee is in doing so. Nevertheless, Msweli-Mbanga and Potwana (2006) (as cited in Erwin and Garman, 2010) found a positive relationship between the possibility to participate and one's willingness to do so. Additionally, their findings suggest that there is a negative relationship between one's willingness to participate and resistance to change, which supports the assumption made throughout this thesis. Put into simple terms, if an employee is given the possibility to take part in decision making, he or she will be more likely to do so, which in turn will reduce their overall resistance to change.

Dong et al. (2009) found that strong leadership and involving users throughout the implementation process have a notably positive effect on the over success of an ERP project. Aubert et al. (2013) bring to light one of the central challenges associated with user participation, namely, due to the size of these projects it may be particularly difficult to involve a large portion of users. More often than not, ERP systems are implemented in large organizations, intended for use by a large user base, which makes it hardly realistic to include everyone in the process and to address the concerns and needs of each individual. However,

there are different methods for overcoming these obstacles. For instance, user representative teams can be deployed, or it can be carried out through two-way communication channels. The essence is to find a way of acknowledging and reflecting user interests over the course of the implementation project. Success in this area will not only reduce user resistance but it is also believed to increase quality of the final product (Abelein and Paech, 2013). Ultimately, the group of stakeholders that is affected by these change initiatives in the most direct way are the system users. They can provide meaningful insight for effective alignment of old and new ways of working. However, it shall be noted that there are different types of users, ranging from higher level management to the more operational roles which find themselves lower on the chain of command. The frequency and kind of work undertaken in the system by these different users also differs. This matter will be mentioned again in the findings segment of this thesis.

Matende and Ogao (2013) point out that user participation can take place during two different stages of an ERP implementation project: 1. the planning stage when the company's ERP system needs are being defined, and 2. the implementation stage. It may be insufficient for project teams to include users only in the final stages, i.e. implementation, as at that point there isn't much that can be fundamentally changed based on their expressed concerns. For this reason, feedback shall be collected throughout the project, providing sufficient time for consideration and alignment of user needs with the possible functionalities of the system. When users are given an opportunity to shape the system based on their priorities and business requirements, hence having a degree of control over the final outcome, they are bound to have a positive reaction to the whole project and the system itself (Matende and Ogao, 2013).

The following chapter will address the specific type of organizational change that this thesis focuses on, i.e. implementation of ERP systems, with special attention being devoted to the potential differences in approach applied by the public and the private sector.

5. Critical Success Factors (CSFs) of ERP Implementation: Public vs. Private sector

Despite the limited availability of studies comparing the management aspects of ERP implementation in the public and the private sector, this section will readdress the CSFs discussed in section 4, with an objective of comparing the different contexts and formulating the hypotheses of this thesis.

5.1 Project Management: Public vs. Private Sector

Wirick (2009) studied in great detail the differences between private and public sector project management, with a particular focus on the challenges faced by public sector organizations. The two important public sector characteristics to keep in mind are the difficulty of measuring results and the multiple principals or diverse stakeholders. This significantly contributes to the complexity of public projects. Time and budget overruns mentioned in the preceding subsection, are said to be particularly common in the public sector (Wirick, 2009). Wirick (2009) highlights that not only are there numerous examples of overruns, but also of projects that have been cancelled and abandoned after much investment. Furthermore, it is not seldom the case, that the delivered final product is significantly below expectation. At times, the final product can even end up creating more issues than benefits. Information system projects appear to be on the radar in this regard, which includes our topic of interest, i.e. ERP systems. Wirick (2009) states that the vast majority of failed IT projects are caused by disagreements between users and developers.

The following list comprises of some of the interesting points brought up by Wirick (2009) with respect to challenges faced during public sector projects, which are also their common drivers of failure.

1. Loss of support for the initiative, resulting from change of administration induced by electoral cycles.
2. Overwhelming number of administrative rules and required processes for purchasing and hiring.

3. Adoption of overly conservative approaches due to the contentious nature of the project environment.
4. Bias of public sector managers and staff toward compliance over performance.
5. Failure to identify project goals given the numerous stakeholders and the challenges of identifying metrics for success.

Changing administration and high turnover within teams are common occurrences in the public sector. This may significantly impact the level of devotion to a certain project, and even more so to the willingness to take on big change initiatives. Due to the common practices and employee incentive schemes within the public sector, oftentimes, the risks associated with proposing and taking on change outweigh the potential benefits. Even if someone was to decide to take such a bold path, there is possibility that their successor will not continue in their footsteps, rather redirect the organization towards implementation of their own agenda. Public sector operations are governed by ample administrative rules and regulations, and clearly defined processes. Largely due to the preference for conservative management and decision-making, compliance tends to be prioritized over other significant parameters. Lastly, the challenges of operating in an environment with multiple principals remain and continue to be recognized by different authors.

Wirick (2009) has further identified five critical success factors for managing public sector projects.

1. Project management methodology customized for the specific needs of the project and shaped based on its identified risks.
2. Continuous and interactive dialogue between stakeholders.
3. Detailed process for identifying user and supplementary requirements.
4. Management support of the project management process.
5. Capable project management with both hard and soft skills.

These factors certainly hold in the private sector as well, however, they have been identified as critical starting points for overcoming some of the central challenges faced on public sector projects.

Project management represents an imperative aspect of ERP implementation, encompassing multiple of its identified critical success factors. Every stage of a project life

cycle carries a significant weight and is hence pivotal for its successful completion. Schedule and budget overruns are some of the frequently reported challenges encountered during ERP implementation and given their large monetary impact, there is clear need for planning and monitoring activities to be approached with thoroughness and rigor. Furthermore, best practices tend to be based on private sector experiences and should hence be applied with caution in the public sector environment. It is crucial to consider the specific characteristics and additional challenges posed by the public sector setting and to adjust these practices accordingly.

In addition to proper project management, the success of transformation projects, such as implementation of an ERP system, is highly dependent on change management. Such organization-wide initiatives trigger the need for adjustment of existing practices and similarly the internal culture.

5.2 Change Management: Public vs. Private Sector

Extensive research has been done in the area of private sector change management, something that cannot be said for the public sector. For this reason, best practices from the private sector tend to be transferred onto the public arena, which as pointed out by van der Voet (2014) may be problematic. The author further highlights findings suggesting that the public sector context plays an important role in its organizational change (Isett et al., 2012; Klarner et al., 2008, cited in van der Voet, 2014). This means that when managing change, the specific characteristics of the public sector shall be considered, and the approach adjusted accordingly.

Fernandez and Rainey (2006) identified the following as the CSFs of change management in the public sector, which is perceived as a public sector adaptation of Kotter's 8-Steps framework:

1. **Ensure the need** – refers to effective communication with a wide variety of stakeholders regarding the need for change and creating a sense of urgency for its implementation.

2. **Provide a plan** – transform the points of communication into a concrete action plan. The authors highlight the importance of clarity of the strategy and that it rests on sound causal theory. This is said to be particularly important in the public sector, to avoid confusion and free interpretation of policies, while ensuring consistency of its implementation across the organization.

3. **Build internal support for change and overcome resistance** – there are many strategies that can be applied in this regard, with one of the mentioned being the “dual approach”. This approach seems very relevant for the public sector due to the long history of its institutions. The idea is to create pride in the organization’s history and past success while promoting new ways of doing things. Another important point that was brought up in this regard is wide-spread participation in the change process. Fernandez and Rainey point out that the limited duration of public sector mandates (referring to top of the chain of authority) creates an opportunity for staff to avoid or resist the change initiatives until the next administration comes to power. Promoting participation in the change process mitigates this problem by establishing a more widespread sense of ownership of the initiative.

4. **Ensure top-management support and commitment** – irrespective of whether it comes in the form of a single change agent or a guiding coalition, this factor has numerous times been confirmed as a critical success factor for change. This, as previously mentioned, may be challenging in the public sector setting due to the high turnover of executives.

5. **Build external support** – specific to the public sector, this factor sets weight on the need to gain support from political overseers and influential external stakeholders. The public sector’s multi-principal character returns to the forefront, creating potential imbalance as a result of different stakeholders having different interests.

6. **Provide resources** – refers to overcoming the frequent challenge of scarcity of resources in the public sector.

7. **Institutionalize change** – in other words, embedding change into the organization by permanently replacing old ways with new ones. This requires evaluation and monitoring of the implementation process, with the post-implementation activities being particularly significant. In this context, Fernandez and Rainey bring up the matter of choosing the right speed of change. Although empirical findings are mixed with regard to the best approach, an

interesting point was brought up, specifically that, faster transformations may create additional benefits with respect to overcoming the obstacle of changing political leadership. Nevertheless, it shall not be overlooked that declaring victory prematurely may come with great costs in the long run.

8. Pursue comprehensive change – refers to ensuring that change takes place in all parts of the organization, as this is the only way to truly implement organization-wide transformation.

The model of Fernandez and Rainey greatly resembles the messages sent by Kotter, however certain public sector specificities are brought up which help adjust our mind to this context. The importance of tradition, changing administration and external support should particularly be kept in mind when managing change in the public sector. Employees in this sector tend to have the majority of their career based in the same environment and after many years of work it may be hard to see the results of past efforts being replaced. Therefore, acknowledgement and respect for tradition are crucial. It shall be pointed out that past efforts are what helped the organization prosper for many years, and more specifically what brought it to the modern-day, in which the environment imposes new requirements and ways forward. Furthermore, considering the changing administration, in order for transformation to fully be seen through, most drive should originate from the staff who remain throughout the rotations. This assigns particularly high importance to involvement of staff and making sure that resistance is permanently overcome. Lastly, public sector organizations strongly depend on external support and considering the size of this group, and therefore the amount of potentially opposing interests, much attention should be directed toward its coordination. Discussions with representatives of different stakeholder groups are to be conducted ahead of implementation. This should be done to mitigate the risk of resistance and conflict arising at a later stage, when such an obstacle could create great monetary challenges. The key is to consider the specificities of the operational environment and not to rush into change with a one-size-fits-all mindset.

Kickert (2013) combined and tested Kotter's criteria for successful change, discussed in the previous subsection, with those of Fernandez and Rainey. This empirical study was conducted on Dutch ministerial departments, and it found support for some of the tested success conditions, while suggesting that others may require a certain degree of modification.

The study validates the importance of ensuring the need for change, building internal support, communication, commitment, top management support, and anchoring change into the new culture (Kickert, 2013). On the other hand, less support was found for the, as stated by Kickert (2013), more private-sector conditions, specifically the sense of urgency, guiding coalition, vision and strategy, and empowerment of employees. The finding related to the establishment of a sense of urgency is explained through the bureaucratic and hierarchical characteristics of ministries, i.e. if at the top of the chain it is decided to introduce change, then this decision tends to be sufficient to trigger action. The study assigns high importance to building internal support, as it is said to be the key to avoiding organization-wide resistance to change. Despite the truly wide-spread belief that developing a vision, strategy and plan is pivotal to the successful execution of change, this study did not find support for it, at least not in the Dutch ministerial organizations. There are many factors which may distort empirical findings and create bias, particularly when data is based on people's perceptions. Effective communication of change is perceived as a crucial way to compensate for the absence of a sense of urgency, while empowerment of employees isn't considered a common occurrence in hierarchical bureaucracies (Kickert, 2013). The structure of these organizations works well for the top-management support factor, as nearly every decision that takes place goes through a long line of approval and must be authorized by the top. The creation of guiding coalitions is not perceived by Kickert (2013) as a viable condition for the ministries' environment. The most prominent support was found for the condition requiring change to become anchored into the organizational culture. This is due to a large portion of the examined samples having change initiatives which were considered only momentary successes. Their omission to take necessary action following the closure of the formal parts of the change implementation were perceived as the breaking point of the entire project.

Jurisch et al. (2014) empirical findings suggest that when it come to change management and learning capacity, the private sector entities outperformed the public sector in four out of five categories. The only area in which the public sector was found to invest more is training in support of the organization-wide transformation.

Any type of change or transformation requires a suitable management approach, preferably one that is adapted to the particularities of the operational environment. Literature demonstrates that there is general agreement on some of the best practices that

have been identified in both the public and the private sector. Some of the focal points are on transmitting the message of a need for change, having a vision and a solid plan, evident top-management support, effective communication, both internal and external support for the initiative, and anchoring the change into the organizational culture. Change management to a large extent addresses the matter of people management in times of change. Although, the more technical components, such as business process reengineering, are not to be neglected, most mistakes appear to be centered on the people aspects. For this reason, authors like John Kotter, accentuate the power that lies within leadership. While some organizations and sectors modernize at higher speed, some may be lagging. Therefore, these potential differences shall be recognized and taken into account when initiating change. Private sector entities are transforming into network structures while the public sector to a great extent still resembles the old hierarchies. John Kotter highlights that both ways have certain benefits and it may hence be beneficial to create a balanced combination of both within a single organization, in other words run a dual operating system. The bottom line is that best practices need to be handled with care and adapted to the specifics being faced in the particular organization. Identified critical success factors and shared lessons learned are great starting points for in depth planning of transformation initiatives and were hence shared in the preceding sections.

The first hypothesis of this master's thesis concerns resistance management or overcoming resistance to change, a concept that falls under the umbrella of change management. Studies show that resistance to change is one of the central problems encountered by management over the course of change implementation projects (Bovey and Hede, 2001 as cited in Boohene and Williams, 2012). The challenges associated with this occurrence can be addressed in a variety of different ways. Some of the more prominent and widely recognized methods are employee involvement, communication, knowledge exchange, and building trust which can be perceived as an added benefit of effective application of the other methods (Boohene and Williams, 2012). Erwin and Garman (2010) add to the list, providing support and training, addressing individuals' concerns, encouraging feedback, ensuring employees understand the reasons for and implications of change, and aligning management actions with the objectives of the change initiative.

Considering the lack of comparative studies analyzing resistance management in the public and private sector, the hypothesis will be formulated based on the findings focusing on the broader category of change management.

H1: Resistance management on ERP implementation projects is conducted more effectively in the private compared to the public sector.

5.3 Top Management Support: Public vs. Private Sector

Jurisch et al. (2013) suggest that the private sector can learn from public sector experiences when it comes to managing the interests of a large stakeholder base, and more importantly gaining their support and commitment to the change initiative. Jurisch et al. (2013) argue that given the operational setting of the public sector, these organizations are required to devote more efforts to establishing commitment to change, which is directly linked to higher senior management and employee support. MacIntosh (2003), as cited in Jurisch et al. (2013), notes that public sector change initiatives tend to be more inclusive and participative, with higher emphasis being set on consultations and consensus. The empirical findings of Jurisch et al. (2013) show that senior management support and commitment to BPC projects is higher in public (72%) than in private (58%) organizations. Furthermore, they found that 56% of public, compared to 47% of private, senior management had a clear vision and understanding of the change initiative. These findings can for instance be explained through the multi-stakeholder characteristic. Prior to the launch of an initiative in the public sector, thorough planning needs to take place. It must receive approval and support from the key decision-makers as this is the main criteria for securing resources, without which no project can take place. The long timeframe devoted to developing understanding behind the initiative increases support, as it is much more likely to receive support for something the people clearly understand.

ERP implementation projects are a type of change initiative and it is hence safe to assume that what holds for the large group, should also hold for one of its subsets. This brings us to the second hypothesis of this study.

H2: Top management support on ERP implementation projects is higher in the public compared to the private sector.

5.4 Communication: Public vs. Private Sector

Effective communication on public sector projects can be seen as even more complex than in the private sector, considering the particularly large group of stakeholders.

Van der Voet (2016) confirmed that the quality of change communication in the public sector is positively related to both change leadership and change recipients' commitment to change, which gives communication a meaningful mediator role between leadership and employees' commitment to change. Furthermore, the study demonstrates that red tape, i.e. bureaucracy, complicates the process of communication in public organizations. Nevertheless, no support was found for red tape having a negative moderating effect on the positive relationship between direct supervisors' change leadership and the quality of change communication. In other words, bureaucratic characteristics of public organizations don't appear to impact communication between staff and their direct supervisors. The effects may become more apparent as the communication line expands across the hierarchy. The implication of these findings suggests that direct supervisors are an important source of communication, even more so in large, bureaucratic organizations (van der Voet, 2016).

The Jurisch et al. (2013) study found that, compared to the public sector, private organizations (55%) appear to invest more into communicating the need for and desirability of change, with the aim of convincing staff of the urgency and necessity of the initiative. This insight could potentially be explained through a cost benefit analysis. There is a large set of factors that impact the success of ERP implementation projects, it would therefore be rational for an organization to assign more resources to a factor resulting in higher return on investment. In other words, communication has been identified as a CSF but if there is another factor e.g. user training, that costs the organization less but provides the same or higher benefit, then

the second option may be the clear choice. If effective communication with a wide group of stakeholders is challenging and has a lower success rate for public organizations, then they may opt for a different option, which will decrease their input-output ratio.

Although the positive impact of communication on public sector ERP implementation projects is not being denied, the third hypothesis to be tested postulates that:

H3: The overall quality of communication on ERP implementation projects is higher in the private compared to the public sector.

5.5 User Participation: Public vs. Private Sector

Van der Voet (2016) confirmed that the degree of employee participation in the public sector projects has a positive correlation with change recipients' commitment to change. Furthermore, the findings suggest that bureaucratic characteristics of public organizations have a negative effect on user participation. Another interesting thought presented in this study is that there are situations in which employee involvement on public sector change initiatives may be counter beneficial. Organizational change in this sector is often a result of sector-wide reforms or policy changes on which individual organizations, together with their members, have hardly any say (van der Voet, 2016). In this regard, van der Voet (2016) points out that promotion of user participation may result in the feeling of "window-dressing" given that all important decision had already been made at that point. The bottom-line is that any method shall be applied with caution, taking specificities of the operational environment and situational circumstances into account.

Despite the period in which the study was conducted, Kingsley (1997) provides some interesting insight which further contributes to the formulation of the third hypothesis of this study. Red tape was used also in this study as, especially in the past, it has been closely linked to public sector organizations. Interestingly, red tape is found to increase employee participation in specific strategic decision processes (Kingsley, 1997). This suggests the presence of positive correlation between the level of bureaucracy and the degree of employee participation in decision-making. The explanation is said to be high formalization of processes which stand behind red tape (Kingsley, 1997). On the other hand, Kingsley (1997)

doesn't find any significant difference is the way public and private organizations facing the same type of decision and exposed to a similar environment make decisions. Taking these findings and putting them into the context of modern-day organizations, it is questionable how valid a presumption is that the two sectors are exposed to similar environments. This thesis focuses on one type of decision, namely, those associated with the implementation of an ERP system. On the other hand, the private sector has changed considerably since the late 90s, while the public sector has done so at a slower pace. Nevertheless, more recent work such as Jurisch et al. (2013) appear to largely agree with these findings. MacIntosh (2003), as cited in Jurisch et al. (2013), highlights that public sector change initiatives tend to be more participative, putting greater emphasis on consultations and consensus.

While a wide array of literature recognizes the importance of user participation on ERP projects, and in general employee participation in decision-making, there appears to be limited scientific work capturing potential differences when it comes to the application of this concept within the public and the private sector. For this reason, the available information will be used to formulate the fourth and final hypothesis of this thesis:

H4: User participation in ERP implementation projects is higher in the public compared to the private sector.

The following section will discuss the methodology applied for the empirical segment of this master's thesis.

6. Methodology

The survey method was chosen as the principal approach for testing the hypotheses presented in the previous section.

Tarhini et al. (2015) categorized different stakeholders of ERP implementation projects into nine groups: end users, top management, IT department, project team, organization, vendor, ERP consultant, employees from different departments and business processes experts. The focus of this study is on the end user community and the CSFs in which they are directly involved. Thereby, the target demographic for the questionnaire were end users of public and private sector organizations that have recently implemented an ERP system.

The survey method was chosen with the intention of reaching a broad range of end-users and ensuring their anonymity throughout the data collection process. The aim was to avoid scenarios which may trigger biased responses. Complete absence of bias is nearly unattainable when collecting data directly from the respondents, particularly when working with a subjective unit of measurement such as satisfaction. Nevertheless, the reason this particular unit of measurement was chosen is that when attempting to evaluate the effectiveness of management tools, the most appropriate is to focus on the evaluation of those affected by them. As mentioned in the previous sections, user satisfaction has a large impact on the overall success of an IT project, and it should therefore be accounted for from the management side.

The questionnaire consisted of 24 questions: 2 about the respondent's use of the ERP system, 19 about the ERP implementation project in their organization and 3 about basic demographic characteristics. There were different types of questions, namely: multiple choice (5), Likert scale (18) and open-ended (1).

The 19 questions seeking user perception on certain elements that may have affected them during the ERP implementation project in their organization can be sorted into the following 4 groups: 1. Communication, 2. Top management support, 3. User participation, and 4. Other, which intends to briefly capture some of the other prominent CSFs from the literature.

Identification and getting ahold of the target group of respondents came with certain challenges. First of all, given the high costs associated with these complex organization-wide

projects, large multi-national organizations are generally the ones that implement and use ERP systems. Such organizations, particularly from the private sector, were part of the early wave of implementation, in most cases the early 2000s. With the aim of obtaining the most accurate data, and avoiding response biases, implementation projects from far in the past were not considered. It was particularly challenging to get cooperation from the private sector, with little to no success resulting from direct contacting of private companies that have reported ERP implementation in the recent years. For this reason, it was necessary to resort to other mediums such as professional groups for ERP user support on social media channels e.g. LinkedIn. Distribution of the questionnaire through personal contacts was applied for both the private and the public sector. In case of the public sector, this method has proven very successful. The public sector sample consists primarily of a variety of large international organizations. No geographical targeting or restrictions were introduced for either of the sectors considering the previously mentioned awareness that a large portion of organizations using ERP systems are international. Likewise, geographical characteristics and culture are not dimensions considered in this study.

Data was analyzed using the Microsoft Excel application. Pivot tables were the tool applied for summarizing the questionnaire responses in a reliable and structured manner. The more scientific work, namely the regression analysis, was conducted using the data analysis ToolPak of the application. Analysis was not taken to a more advanced level given the purpose of this empirical study. From the regression output, focus was primarily set on: regression statistics (R Square and Adjusted R Square) and ANOVA (Significance F and P-value of the independent variable). First step was to, based on the R^2 and/or adjusted R^2 , identify how much of the variance in the dependent variable (e.g. communication quality and content, top management support, etc.) can be explained through the sector that the ERP implementation took place in. Secondly, the F value in the ANOVA table was consulted to determine whether the overall regression serves as a good prediction model for the dataset. When this was the case, and the null hypothesis could be rejected, the coefficients and P-values were observed, to determine how the dependent variable is expected to change with increase in the independent variable (sector). For the purpose of this part of the analysis, the sector variable was transformed into a binary variable where the public sector was 0, or the base, and the private sector was 1. The following section will discuss the findings of sample analysis.

7. Findings and Discussion

This section is dedicated to the empirical segment of this study and it will present the sample, the findings addressing matters including but not limited to the hypotheses and finally a brief discussion linking the findings to the literature review.

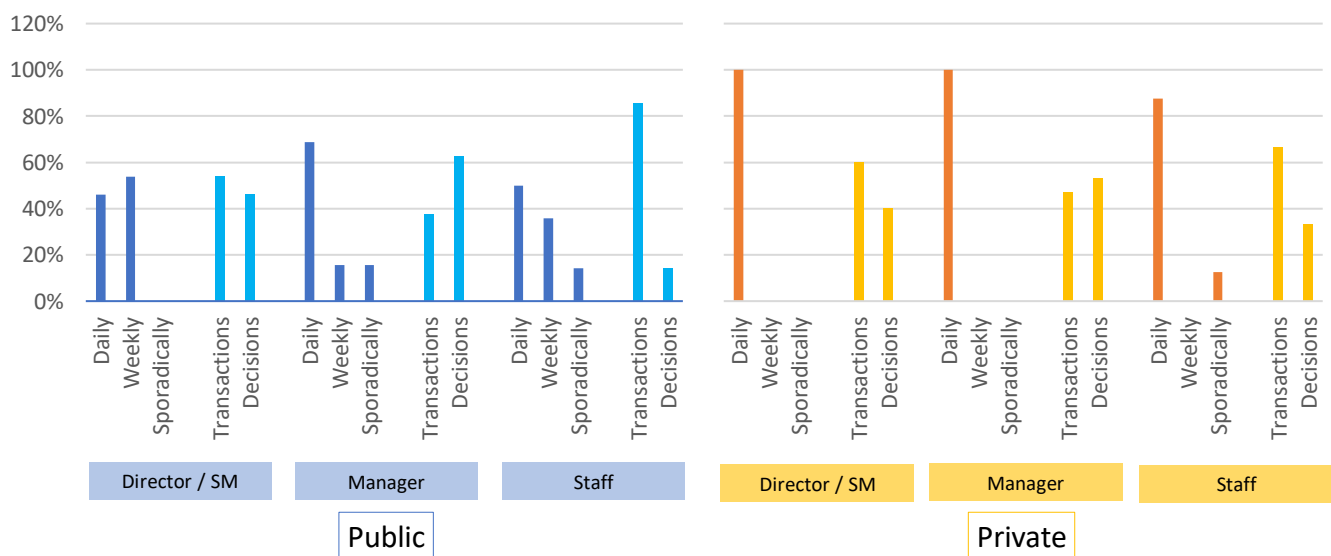
7.1 Sample

The analysis was conducted on a sample consisting of 106 responses: 59 (55.7%) from the public sector and 47 (44.3%) from the private sector. The majority of responses (73.6%) are based on ERP implementation projects from large organizations. 74.5% of respondents reported using the system on a daily basis, whereas the purpose of ERP system use was closely split between recording transactions (55.7%) and decision-making (44.3%). *Table 5* below summarizes the identified characteristics of the sample.

	Variable	Level	Frequency	Rate (%)
Organization	Sector	Public	59	55.7%
		Private	47	44.3%
	Organization size <i>(number of employees)</i>	1-49	9	8.5%
		50-249	19	17.9%
		250 or more	78	73.6%
Respondent	Role in organization	Director / Senior Manager	18	17.0%
		Manager	49	46.2%
		Staff	39	36.8%
	Frequency of ERP system use	At least once a day	79	74.5%
		About once a week	17	16.0%
		Sporadically, or less than once a week	10	9.4%
	Purpose of ERP system use	Decision-making	47	44.3%
		Recording transactions	59	55.7%

Table 5 - Summary of sample characteristics

Based on the reported purpose and frequency of ERP system use, some assumptions can be made for the data analysis portion of this study. Operational staff predominantly use the system for recording transactions, whereas middle management use it more for decision-making. The data demonstrates that directors and senior managers use the system more for recording transactions than decision-making, which considering the sample size of this group of respondents and the underlying implication may suggest the presence of an error. This doesn't seem to be explained through the organization size nor any other observation from the sample, therefore no assumption will be made with respect to the purpose of ERP system use by directors or senior managers. Furthermore, the responses concerning the frequency of use appear to be mixed and not necessarily dependent on the role in the organization, hence no assumptions will be made in this regard. The frequency of use may likely be more dependent on the nature of work or the department, for instance. The graph below presents the frequency and purpose of use of the ERP system, organized by sector and the respondent's role within the organization.



7.2 Findings

This subsection presents the findings of the sample analysis. The structure is aligned with the topics of the four hypotheses of this study; however, the content is not restricted purely to those matters. However, the hypothesis concerning resistance management will be presented last due to the way the variable was constructed, namely that it is a sum of the other variables. Additional observations were made during the analysis, which may provide interesting insight and questions for future research.

Top Management Support (TMS)

In the context of this study, top management support is manifested through: 1. Openness to feedback and suggestion, 2. Addressing staff concerns, incl. by adopting measures to mitigate adverse impact on staff, 3. Boosting morale and 4. Direct involvement in the project. To increasing the validity of conclusions being made based on the present data, responses from directors and senior managers have been excluded for the TMS variable. Respondents from the private sector on average rated top management support higher than their public sector counterparts. This holds also for the specific elements, with the exception of openness to feedback, for which on average both respondent groups expressed equal satisfaction. *Table 6* below shows that compared to staff, middle management was on average less satisfied with TMS. This is true for both sectors and all elements making up the TMS variable. The regression analysis provides support for statistically significant correlation between one's role in an organization and the level of satisfaction with TMS. However, no such support was found for the relationship between sector and TMS.

Sector	TMS	Openness to feedback	Addressing staff concerns	Boosting moral	Direct involvement
Private	3.2	3.1	3.2	3.1	3.3
Manager	3.0	2.9	2.9	2.9	3.1
Staff	3.3	3.3	3.4	3.2	3.4
Public	2.9	3.1	2.8	2.7	2.8
Manager	2.8	3.1	2.8	2.6	2.7
Staff	3.1	3.2	2.9	2.9	3.3
Grand Total	3.0	3.1	3.0	2.9	3.0

Table 6 - Summary of responses on TMS (staff and middle management responses)

The regression output suggests that top management support will be evaluated with 0.4 points less when asking a middle manager compared to a staff member. While one's role in an organization is found to be statistically significant when it comes to satisfaction with TMS, the findings suggest that only 4% of variance in the TMS score can be explained through the role. Nevertheless, this may be an interesting area for further investigation. The findings may suggest that middle management felt less support from top management over the course of the ERP implementation project. Middle managers should feel empowered and prepared to lead their team through the change initiative, ensuring business continuity and the maintenance, or preferably increase, of performance while keeping the team members satisfied. However, the findings may also suggest that the rigor of evaluation and the expectations increase with the line of authority. These are ideas that could potentially serve as questions for future research.

Based on the presented findings, hypothesis 2 of this study cannot be confirmed. While the summary of survey responses demonstrates a trend of higher satisfaction with TMS across private sector ERP implementation projects, the regression analysis suggests these findings being random, i.e. that there is no statistical significance. Nevertheless, the recommendation of this thesis is to use future research to verify the validity of these findings on a different sample. One of the particularly prominent challenges of applying the survey method for empirical research are the biases that may arise throughout the process. The effects of these biases may be mitigated with the use of larger samples, however, due to the limited resources available for this study, the sample size may be the cause of potential misrepresentations.

Communication

Communication was tested as a multidimensional concept. The two main dimensions are quality and content, while each of them is further described through several smaller elements.

Quality of communication is based on clarity, timeliness, frequency, and transparency. Respondents were asked to, on a scale from 1 (not satisfied at all) to 5 (very satisfied), express their overall satisfaction with the different elements of communication. Respondents from the private sector on average rated communication quality higher than their public sector

counterparts. This holds also for two of the specific elements, namely clarity and transparency. The findings for timeliness and frequency of communication suggest that both respondent groups were equally satisfied with their respective levels.

Sector	Communication: Quality	Clarity	Timeliness	Frequency	Transparency
Private	3.4	3.4	3.2	3.3	3.5
Public	3.2	3.1	3.2	3.3	3.2
Grand Total	3.3	3.2	3.2	3.3	3.3

Table 7 - Summary of responses on communication quality

The content dimension covers the following topics, which have been identified as valuable information for end-users: 1. Advantages of the ERP system, 2. Plan and implementation timelines, 3. Expected operational changes and impact on staff, 4. Expectations of staff during the implementation project, and 5. Impact on job security. Respondents from the private sector reported being on average more satisfied with the content that was communicated to them. This holds also for the specific elements, except in the case of advantages of the ERP system, which suggests that both respondent groups were equally satisfied with its level. The biggest difference lies in the category of communicating the impact on job security. This matter may pose bigger risk in the private sector, where job security is associated with greater uncertainty than in the public sector. For the purpose of avoiding fear and unnecessary worry, there is considerable need to discuss this topic with private sector employees. On the other hand, public organizations may fail to consider this matter given that greater job security is one of the more prominent characteristics of public sector employment.

Sector	Communication: Content	Advantages of ERP	Plan and implementation timelines	Changes and impact on staff	Expectations of staff	Job security
Private	3.4	3.7	3.5	3.2	3.2	3.2
Public	3.2	3.7	3.4	3.1	3.0	2.8
Grand Total	3.3	3.7	3.4	3.1	3.1	3.0

Table 8 - Summary of responses on communication content

Despite the questionnaire responses demonstrating a trend of higher satisfaction of private sector end-users when it comes to communication on ERP implementation projects, there is no statistical support for these findings. The regression analysis suggests that neither the sector, the size, nor the role of an employee in the organization explain enough of the variance in end user satisfaction with communication. The sample analysis findings fail to confirm hypothesis 3 and suggest there being no statistically significant relationship between the sector of ERP system implementation and end-user satisfaction with communication throughout the project.

Despite the absence of statistical significance, it may be interesting to take a closer look at the relationship between one's role in the organization and their evaluation of communication throughout a change initiative. The responses demonstrate that management on average rated both dimensions of communication with a lower score than staff did. This is even more so the case for the top management level (Director / Senior Manager) than middle management. This finding may potentially be exposing a bias of samples grouping together different levels of an organization. One of the questions that could be addressed through future research is, does the rigidity of evaluation increase with the sense of responsibility for an occurrence? In other words, does being closer to a position with decision-making power increase one's expectations for the outcome and consequently the level of self-critique? The response to this question may provide useful insight for constructing future research models.

User Participation

As mentioned in one of the previous sections, user participation, in the context of this study, is not regarded as the willingness of a user to take part in the ERP implementation project, rather the possibilities the individual was given to do so.

According to the summary of findings, the private sector respondents expressed on average higher satisfaction with the degree of user involvement on ERP implementation projects than their public sector counterparts. Nevertheless, this relationship is not found to be statistically significant. On the other hand, a relationship was observed between satisfaction with the degree of user involvement and one's role in the organization. The responses from directors and senior managers were again excluded from this regression analysis, as in certain cases

they appear to create distortions in the overall observations. There is a statistically significant correlation between the two variables, indicating that middle management rates user involvement 0.5 points lower than staff. Nevertheless, one's role explains only around 5% of the variance in satisfaction with their degree of involvement in the ERP project.

Tables 9 and 10 – Summary of responses on user involvement

Role	Degree of user involvement	Sector / Role	Degree of user involvement
Manager	3.0	Private	3.5
Staff	3.5	<i>Manager</i>	3.3
Grand Total	3.2	<i>Staff</i>	3.6
		Public	3.0
		<i>Manager</i>	2.9
		<i>Staff</i>	3.4
		Grand Total	3.2

Contrary to the indications made throughout literature, the responses do not demonstrate user involvement decreasing with the size of the organization. The responses appear to be rather mixed. This finding may be the result of a relatively small sample size and an uneven distribution across the different organization size categories (small, medium, large). Another potentially contributing factor may be the way user involvement was measured, namely, that it is based on user satisfaction, rather than an objective measure of its extent. It shall be noted that constructing such a measure for a cross-sectoral study comes with certain challenges and if successfully constructed, it can be debated whether the respective level of involvement had a positive effect on users, i.e. whether they were satisfied with it.

Ultimately, due to the absence of statistical significance hypothesis 4 cannot be confirmed.

Resistance Management

Finally, the resistance management variable covers the three previously mentioned dimensions and user training. They have been combined as each of them represents a method for overcoming resistance to change, or at the very least, mitigating the effects.

In one of the previous sections it was mentioned that resistance management can be taken as a subset of change management. With this in mind, it was tested how well communication, top management support, user involvement and user training explain one's overall satisfaction with the change management process. The change management process in this case is based on a single dimension, for which the respondents were asked to express their level of satisfaction. As demonstrated by the regression output below, the four variables appear to be good indicators for one's overall satisfaction with change management. The R^2 values suggest that about 66% percent of variance in satisfaction with the overall change management process can be explained through the four variables. The TMS p-value appears to show the least indications of statistical significance, however considering the extensive support found throughout literature, there is reason to assume its significance.

Table 11 - Change Management regression output

Regression Statistics						
Multiple R	0.82					
R Square	0.67					
Adjusted R Square	0.66					
Standard Error	0.70					
Observations	106.00					
ANOVA						
	df	SS	MS	F	Significance F	
Regression	4.00	100.88	25.22	51.89	0.00	
Residual	101.00	49.08	0.49			
Total	105.00	149.96				
	Standard					
	Coefficients	Error	t Stat	P-value	Lower 95%	Upper 95%
Intercept	- 0.46	0.26	- 1.78	0.08	- 0.98	0.05
Communication	0.64	0.12	5.24	0.00	0.40	0.89
TMS	0.12	0.12	1.04	0.30	- 0.11	0.35
User involvement	0.19	0.11	1.75	0.08	- 0.02	0.40
User training	0.13	0.09	1.39	0.17	- 0.05	0.31

Resistance management, as a subset of change management was analyzed as a sum of communication, top management support, user involvement and use training. The summary of questionnaire responses, reflected in *Table 12*, suggests that overall resistance management on ERP projects is conducted more effectively in the private compared to the public sector. As previously presented, the same holds for each of its components.

Sector	Resistance management	Communication	TMS	User involvement	User training
Private	3.3	3.4	3.2	3.4	3.3
Public	3.1	3.2	2.9	3.2	3.0
Grand Total	3.2	3.3	3.0	3.3	3.1

Table 12 - Summary of responses on resistance management

The level of statistical significance is 0.17 and there is strong reason to believe that with the elimination of potential biases within the sample, the value would be below the academically set ceiling of 5%. There is strong encouragement to re-test this correlation on a different, and preferably larger sample. Nevertheless, the strong indication of resistance management effectiveness being higher in the private sector is insufficient to confirm hypothesis 1 of this empirical study.

Other

In search of other potentially meaningful correlations within the collected sample, various other combinations were analyzed. The remaining variables include end-user satisfaction with post-implementation support and the overall improvements introduced through the ERP system. Statistical significance with a 0.06 p-value was found in the relationship between the sector of operation and the post-implementation user support. The correlation suggests 0.44 points higher satisfaction with post-implementation user support in the private sector. However, the calculations indicated that the sector explains around 3% of the variance in the variable. The relationship between the sector and satisfaction with the improvements made by the ERP system is not found to be statistically significant.

According to the regression output, aside from the sector, none of the other sample characteristic variables appear to explain variances observed in satisfaction with post-implementation support and the improvements introduced through the ERP system.

Table 13 presents a summary of responses of the other variables, namely post-implementation support and improvements made by the ERP system.

Variable	Level	Post-implementation support	Improvements by the ERP system
Sector	Public	2.97	3.12
	Private	3.40	3.47
Organization size <i>(number of employees)</i>	1-49	2.67	2.56
	50-249	3.53	3.53
	250 or more	3.13	3.29
Role in organization	Director / Senior Manager	3.00	3.11
	Manager	3.02	3.22
	Staff	3.41	3.41
Frequency of ERP system use	At least once a day	3.18	3.34
	About once a week	3.00	2.94
	Sporadically, or less than once a week	3.30	3.30
Purpose of ERP system use	Decision-making	3.13	3.36
	Recording transactions	3.19	3.20

Table 13 - Summary of responses on post-implementation support and improvements by the ERP system

The questionnaire was concluded with an open-ended question providing the respondents with an opportunity share any additional thoughts they considered relevant for this study. 22 respondents, 15 from the public and 7 from the private sector, provided additional comments with some very interesting insight.

The public sector users provided primarily (67%) negative comments. The recurring matters of concern were insufficient training and the rushed implementation timeline. Respondents stated that the project wasn't seen as a continuing effort which poses challenges for many users, primarily due to an absence of refresher trainings which several respondents highlighted as necessary. On the other hand, much attention was devoted to the consequences of the rushed implementation, which was perceived as a way to satisfy the political agenda, instead of ensuring the alignment of the vision and the final product. There was agreement on the system being a result of extensive compromise, which creates issues for the users due to the low speed and available functionalities. In the initial post-implementation stages, several users shared that they faced or continue to face challenges. Lastly, several comments mentioned that the use of the system is seen by many as a requirement and an additional burden, rather than a benefit.

While there were fewer comments from the private sector, and only one expressed dissatisfaction, it again brought up the matter of insufficient trainings.

The following section will discuss the findings of this empirical study in the context of the literature review presented throughout the preceding sections.

7.3 Discussion

Table 14 provides an overview of the hypotheses of this study, as well as an indication whether they have been confirmed or rejected through the empirical findings. Moreover, the table includes the additional, statistically significant findings which were found as a result of the sample analysis.

Table 14 - Summary of hypotheses and empirical findings

Hypothesis	Survey	Regression
H1: Resistance management on ERP implementation projects is conducted <u>more effectively in the private</u> compared to the public sector.	✓	X
H2: Top management support on ERP implementation projects is <u>higher in the public</u> compared to the private sector.	X	X
H3: The overall quality of communication on ERP implementation projects is <u>higher in the private</u> compared to the public sector.	✓	X
H4: User participation in ERP implementation projects is <u>higher in the public</u> compared to the private sector.	X	X
<i>Other statistically significant findings</i>		
1. Compared to middle management, staff are more satisfied with the level of top management support. 2. Compared to middle management, staff are more satisfied with the level of user-involvement. 3. Post-implementation user support is higher in the private compared to the public sector.		

Contrary to what was expected based on the reviewed literature, the collected responses show that private sector users are more satisfied with each of the observed aspects of ERP implementation projects, which in turn suggests that those organizations perform better in the respective areas. Nevertheless, regression analysis did not find statistical significance for any of the four correlations.

These findings can be interpreted in the following two ways:

1. There is no significant difference between resistance management on public and private sector ERP implementation projects. This assumption would similarly be made for each of the CSFs that were captured under the concept of resistance management, namely, top management support, communication, and user involvement.
2. Biases and other potential issues within the collected sample have led to distorted conclusions.

Literature presented in sections 2 to 6, provided reason to believe in the presence of statistically significant differences when it comes to public and the private sector ERP implementation projects. Nevertheless, the scarcity of literature covering the topic of this study may be further reason to reconsider the initially made assumptions.

ERP systems are based on best practices and they tend to be implemented with the assistance of consultants and experts specialized in this particular area. With this in mind, it can be assumed that the majority of organizations, irrespective of the sector, tend to follow a similar framework and set of guidelines. The literature addressing critical success factors of ERP implementation is extensive and it provides overall agreement on the key messages. It can be argued that while the input may be the same, the output will not, considering the vast differences in the operational environment of the two sectors. If we refer to some of the central characteristics of each of the sectors, presented in section 2, their potential influence on an IT project, such as the implementation of an ERP system, may be brought into question. While ERP projects are perceived as a complex and costly investment, there is firm belief in the long-term benefits it is expected to generate. Therefore, one of the central challenges in the public sector may not be of relevance in this context, namely the multiple principal and stakeholder argument. If there is general agreement on the benefits of an investment, that is also not politically sensitive, there is low likelihood that strong opposition will be made for its realization. The argument can further be made that the two sectors continue to converge towards similar management practices. Moreover, the people within the organizations of the two sectors are not fundamentally different, the assertion has been that their environment stimulates them to behave in distinct ways. If in conclusion we postulate that the public sector environment has truly been modernized then the first interpretation of empirical findings,

presented above, should not be dismissed. The general beliefs about ERP implementations in the two sectors may purely be the result of an anchoring bias based on several special cases.

The second interpretation of findings, which challenges to integrity of the analyzed sample, may also be based on viable reasons.

The findings presented in the previous subsection may be a result of unjustified generalization of the public sector. In this regard, there is need to highlight that the majority of public sector responses originated from international organizations. It can be questioned how representative these organizations are of the public sectors world-wide. While affiliated with the public arena, it can be argued that international organizations have various characteristics which distinguish them from other public institutions. The central distinction lies on their international environment of operation, which may not be the case for many other public organizations. There can be significant difference between private companies operating on a local and on an international level. This realization may be another argument against the broad generalization of the two sectors.

As mentioned in previous sections, a certain degree of bias is to be expected in samples, with the survey method further increasing this likelihood of such occurrences in particular dimensions. The two key challenges are sample biases and those resulting from the way respondents interpret and respond to the questions. The data collection process of this study aimed to obtain a nearly equal distribution of responses from the two sectors. On the other hand, no such efforts were made with regard to the other key characteristics of the sample, i.e. one's role in the organization, size of the organization, purpose and frequency of use of the ERP system. Therefore, the summary of responses may have provided different insight, had it been based on a larger and more representative sample.

This study encourages future research to reexamine the model on a different sample. There is additional encouragement to distinguish between the specific types of organizations within the two sectors, thereby accounting for their potentially influential differences. Furthermore, the supplementary observations made through the sample analysis may present valuable starting points further research. The following questions could be addressed:

1. Do the people oriented critical success factors of ERP implementation focus primarily of staff and if this is the case, how does that affect middle management?
2. Does ERP implementation success increase with additional support and involvement of middle management?
3. How impactful is post-implementation user support and to what extent do implementing organizations devote resources to it?

8. Conclusion

While the overall success rate of ERP implementation projects has increased over the years, significant room for improvement remains. Considering the level of complexity and high costs associated with these organization-wide change initiatives, there is strong incentive to devote further efforts into enhancing the utilized management tools.

This thesis has presented insights from academically recognized literature, based on which certain assumptions were made, empirically tested, and discussed.

Literature addressing the matter of ERP implementation, as well as broader topics, acknowledge the differences between organizations of the public and the private sector. Furthermore, these distinct characteristics are assumed to impact operations taking place within the two arenas. Nevertheless, certain studies, including this master's thesis, bring into question the extent to which the sector specific characteristics influence IT, modernization initiatives. The collected insights bring attention to the possible misconceptions resulting in flawed generalizations on a sectoral level. The findings further suggest that there may be need to distinguish between different types of organizations within the two sectors, for instance, differentiating between international organizations and local government institutions of the public sector.

Lastly, additional observations made throughout this study are encouraged to be addressed through future research, precisely with respect to the role of middle management on ERP implementation projects and the importance of post-implementation activities of these change initiatives.

References

2020. Eight-Step Process for Leading Change. [image] Available at: <<https://www.kotterinc.com/wp-content/uploads/2016/12/8-steps-2-e1508515045824.png>> [Accessed 12 September 2020].

Abelein, U. and Paech, B., 2013. Understanding the Influence of User Participation and Involvement on System Success – a Systematic Mapping Study. *Empirical Software Engineering*, 20(1), pp.28-81.

Ağaoğlu, M., Yurtkoru, E. and Ekmekçi, A., 2015. The Effect of ERP Implementation CSFs on Business Performance: An Empirical Study on Users' Perception. *Procedia - Social and Behavioral Sciences*, 210, pp.35-42.

Ahmed, R., Mohamad, N. and Ahmad, M., 2014. Effect of multidimensional top management support on project success: an empirical investigation. *Quality & Quantity*, 50(1), pp.151-176.

Al-Mashari, M. and Al-Mudimigh, A., 2003. ERP implementation: lessons from a case study. *Information Technology & People*, 16(1), pp.21-33.

Ali, M. and Miller, L., 2017. ERP system implementation in large enterprises – a systematic literature review. *Journal of Enterprise Information Management*, 30(4), pp.666-692.

Alqashami, A. and Mohammad, H., 2015. Critical Success Factors for Implementing an ERP System within University Context: Concepts and Literature Review. *International Journal of Managing Information Technology*, 7(4), pp.01-19.

Alves, M. C. and Matos, S. I. A., 2013. ERP adoption by public and private organizations--A comparative analysis of successful implementations, *Journal of Business Economics and Management* 14(3): 500-519.

Ara, A. and Al-Mudimigh, A., 2011. The Role and Impact of Project Management in ERP project implementation life cycle. *Global Journal of Computer Science & Technology*, 11(5), pp.1-5.

Aubert, B., Hooper, V. and Schnepel, A., 2013. Revisiting the role of communication quality in ERP project success. *American Journal of Business*, 28(1), pp.64-85.

Bancroft, N.; Seip, H. and Sprengel, A., 1998. Implementing SAP R/3: How to introduce a large system into a large organization. Manning Publication Co., USA.

BearingPoint, 2004. Implementing ERP Systems in the Public Sector: Nine Sure Ways to Fail – or Succeed. Whitepaper BearingPoint Inc. McLean, VA.

Boohene, R. and Williams, A., 2012. Resistance to Organisational Change: A Case Study of Oti Yeboah Complex Limited. *International Business and Management*, 4(1), pp.135-145.

Boonstra, A., 2013. How do top managers support strategic information system projects and why do they sometimes withhold this support?. *International Journal of Project Management*, 31(4), pp.498-512.

Brynjolfsson, E., Hitt, L. and Kim, H., 2011. Strength in Numbers: How Does Data-Driven Decision-making Affect Firm Performance?. *SSRN Electronic Journal*.

Burgess, S. and Ratto, M., 2003. The Role of Incentives in the Public Sector: Issues and Evidence. *Oxford Review of Economic Policy*, 19(2), pp.285-300.

Chen, C., Law, C. and Yang, S., 2009. Managing ERP Implementation Failure: A Project Management Perspective. *IEEE Transactions on Engineering Management*, 56(1), pp.157-170.

Consultancy.uk. 2018. *Lidl Cancels SAP Introduction Having Sunk €500 Million Into It*. [online] Available at: <<https://www.consultancy.uk/news/18243/lidl-cancels-sap-introduction-having-sunk-500-million-into-it>> [Accessed 20 October 2020].

Cooper, Z., Gibbons, S., Jones, S. and McGuire, A., 2010. Does hospital competition improve efficiency? An analysis of the recent market-based reforms to the English NHS. Centre for Economic Performance, London School of Economics and Political Science, London, UK.

Cooper, Z., Gibbons, S., Jones, S. and McGuire, A., 2011. Does Hospital Competition Save Lives? Evidence from the English NHS Patient Choice Reforms. *The Economic Journal*, 121(554), pp.F228-F260.

Dezdar, S. and Ainin, S., 2011. The influence of organizational factors on successful ERP implementation. *Management Decision*, 49(6), pp.911-926.

Dixit, A., 2002. Incentives and Organizations in the Public Sector: An Interpretative Review. *The Journal of Human Resources*, 37(4), p.696.

Dolfing, H., 2020. *Case Study 12: Lidl's €500 Million SAP Debacle*. [online] Henricodolfing.com. Available at: <<https://www.henricodolfing.com/2020/05/case-study-lidl-sap-debacle.html>> [Accessed 20 October 2020].

Dong, L., Neufeld, D. and Higgins, C., 2009. Top Management Support of Enterprise Systems Implementations. *Journal of Information Technology*, 24(1), pp.55-80.

Erwin, D. and Garman, A., 2010. Resistance to organizational change: linking research and practice. *Leadership & Organization Development Journal*, 31(1), pp.39-56.

Fernandez, S. and Rainey, H., 2006. Managing Successful Organizational Change in the Public Sector. *Public Administration Review*, 66(2), pp.168-176.

Frant, H., 1996. High-Powered and Low-Powered Incentives in the Public Sector. *Journal of Public Administration Research and Theory*, 6(3), pp.365-381.

Garg, P. and Garg, A., 2014. Factors influencing ERP implementation in retail sector: an empirical study from India. *Journal of Enterprise Information Management*, 27(4), pp.424-448.

Gattiker, T. and Goodhue, D., 2000. Understanding the Plant Level Costs and Benefits of ERP: Will the Ugly Duckling Always Turn Into a Swan?. *IEEE*, pp.1-10.

Hasibuan, Z. and Dantes, G., 2012. Priority of Key Success Factors (KSFS) on Enterprise Resource Planning (ERP) System Implementation Life Cycle. *Journal of Enterprise Resource Planning Studies*, pp.1-15.

Holland, C. and Light, B., 1999. A critical success factors model for ERP implementation. *IEEE Software*, 16(3), pp.30-36.

Ifinedo, P., 2008. Impacts of business vision, top management support, and external expertise on ERP success. *Business Process Management Journal*, 14(4), pp.551-568.

Jafari, S. M., Osman, M. R., Yusuf, R. M., & Tang, S. H., 2006. ERP systems implementation in Malaysia: The importance of critical success factors. *Engineering and Technology*, 3, 125-131

- Jurisch, M., Ikas, C., Wolf, P. and Krcmar, H., 2013. Key Differences of Private and Public Sector Business Process Change. *e-Service Journal*, 9(1), p.3.
- Karaman Akgül, A. And Gözlü, S., 2014. Enterprise Resource Planning Implementation: A Survey Of Turkish Manufacturing Organizations *Öneri Dergisi*, 11(41), P.41.
- Kickert, W., 2013. Specificity of Change Management in Public Organizations. *The American Review of Public Administration*, 44(6), pp.693-717.
- Kingsley, G., 1997. Decision participation in public and private organizations. *Knowledge and Policy*, 10(3), pp.56-70.
- Kotter, J., 1996. *Leading Change*. Boston: Harvard Business School Press, pp.3-56.
- Kotter, J., 2012. Accelerate!. *Harvard Business Review*, [online] Available at: <<https://hbr.org/2012/11/accelerate#>>
- Kotter, J., 2014. *Accelerate: Building Strategic Agility for A Faster-Moving World*. Harvard Business Review Press.
- Madanhire, I. and Mbohwa, C., 2016. Enterprise Resource Planning (ERP) in Improving Operational Efficiency: Case Study. *Procedia CIRP*, 40, pp.225-229.
- Mason, C., 2012. Too Good to be True: Private Prisons in America. *Sentencing Project*, pp.1-25.
- Matende, S. and Ogao, P., 2013. Enterprise Resource Planning (ERP) System Implementation: A Case for User Participation. *Procedia Technology*, 9, pp.518-526.
- Menon, S., Muchnick, M., Butler, C. and Pizur, T., 2019. Critical Challenges in Enterprise Resource Planning (ERP) Implementation. *International Journal of Business and Management*, 14(7), pp.54-69.
- Minkler, L., 2004. Shirking and motivations in firms: survey evidence on worker attitudes. *International Journal of Industrial Organization*, 22(6), pp.863-884.
- Momoh, A., Roy, R. and Shehab, E., 2010. Challenges in enterprise resource planning implementation: state-of-the-art. *Business Process Management Journal*, 16(4), pp.537-565.
- Nah, F. and Delgado, S., 2006. Critical Success Factors for Enterprise Resource Planning Implementation and Upgrade. *Journal of Computer Information Systems*, 46(5), pp.99-113.
- Nah, F., Lau, J. and Kuang, J., 2001. Critical factors for successful implementation of enterprise systems. *Business Process Management Journal*, 7(3), pp.285-296.
- Pang, A., Markovski, M. and Micik, A., 2019. *Top 10 ERP Software Vendors, Market Size and Market Forecast 2018-2023*. [online] Apps Run the World. Available at: <<https://www.appsruntheworld.com/top-10-erp-software-vendors-and-market-forecast/>> [Accessed 20 October 2020].
- Panorama Consulting Solutions, 2019. *2019 ERP Report: People, Process, Technology*. [online] Available at: <<https://www.panorama-consulting.com/resource-center/erp-software-research-and-reports/panorama-consulting-solutions-2019-erp-report/>> [Accessed 10 September 2020].
- Rabaai, A., 2009. The Impact of Organizational Culture on ERP Systems Implementation: Lessons from Jordan. *PACIS*, pp.1-14.

- Rainey, H., Backoff, R. and Levine, C., 1976. Comparing Public and Private Organizations. *Public Administration Review*, 36(2), p.233.
- Rashid, M., Hossain, L. and Patrick, J., 2012. *The Evolution of ERP Systems: A Historical Perspective*. Idea Group Publishing.
- Saade, R. and Nijher, H., 2016. Critical success factors in enterprise resource planning implementation. *Journal of Enterprise Information Management*, 29(1), pp.72-96.
- Sims, R., 2010. *Change (Transformation) In Government Organizations*. Charlotte, NC: Information Age Pub.
- Soja, P., 2006. Success factors in ERP systems implementations. *Journal of Enterprise Information Management*, 19(4), pp.418-433.
- Stanciu, V., and Tinca, A., 2013. ERP solutions between success and failure. *Accounting & Management Information Systems*, 12(4), pp.626-649.
- Statista. 2020. *ERP Software Market Revenue in The World 2016-2021 | Statista*. [online] Available at: <<https://www.statista.com/forecasts/966876/erp-software-market-revenue-in-the-world>> [Accessed 23 October 2020].
- Tarhini, A., Ammar, H., Tarhini, T. and Masa'deh, R., 2015. Analysis of the Critical Success Factors for Enterprise Resource Planning Implementation from Stakeholders' Perspective: A Systematic Review. *International Business Research*, 8(4), pp. 25-40.
- Touhill, G. and Touhill, C., 2014. *Cybersecurity for Executives: A Practical Guide*. 1st ed. John Wiley & Sons, Inc., pp.199-226.
- Umble, E., Haft, R. and Umble, M., 2003. Enterprise resource planning: Implementation procedures and critical success factors. *European Journal of Operational Research*, 146(2), pp.241-257.
- van der Voet, J., 2014. The effectiveness and specificity of change management in a public organization: Transformational leadership and a bureaucratic organizational structure. *European Management Journal*, 32(3), pp.373-382.
- van der Voet, J., 2016. Change Leadership and Public Sector Organizational Change: Examining the Interaction of Transformational Leadership Style and Red Tape. *The American Review of Public Administration*, 46(6), pp.660-682.
- Williamson, O., 1985. *The Economic Institutions of Capitalism: Firms, Markets and Relational Contracting*. New York: Free Press.
- Wirick, D., 2009. *Public-Sector Project Management: Meeting the Challenges and Achieving Results*. Hoboken, N.J.: John Wiley & Sons, Inc.