



OULUN YLIOPISTO
UNIVERSITY of OULU

Benefits Realisation in Post-Implementation Development of ERP Systems

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Heidi Hietala
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Abstract

Complex applications, like Enterprise Resource Planning (ERP) systems, that significantly influence organisational performance and business strategies, are the most challenging in terms of identifying and managing expected benefits. ERP systems can generate benefits from variety of underlying factors, but systems do not provide benefits on their own. In this, formal benefits realisation practices can be highly effective.

The existing ERP research has largely focused on ERP implementations leaving the post-implementation phase to lesser attention. Nevertheless, the work does not end there, but continues with post-implementation activities which aim to ensure also the future benefits from the ERP systems. Motivated by the insufficient research regarding benefits realisation in post-implementation development of ERP system, this study aimed to identify how organisations manage benefits realisation in post-implementation phase of ERP systems, what challenges they might face and how the benefits realisation is ensured. It was also the purpose to find out what tools or methods organisation use in this.

This study was a revelatory embedded single-case study with positivist approach. Qualitative data was collected from interviews and documents supported by data from the ERP system. This study is revelatory, because access was gained to the Case organisation's data to study phenomenon inaccessible previously. The data was analysed inductively allowing patterns and concepts to arise and the findings were evaluated through theoretical lenses. The aim of all the chosen methods was to get rich, in depth understanding of the phenomenon.

It is argued that this study has created in-depth understanding of circumstances and challenges of benefits realisation in post-implementation development of ERP system providing window to phenomenon largely unstudied before. It was identified that old and evolved business processes, which are further complicated by workarounds, can be unfamiliar to Information Technology (IT) and business managers responsible of ERP development making it largely difficult to identify all benefits. Moreover, when subsidiaries are unable to identify new benefits on their own and the benefits further vary from one subsidiary to another, the complexity increases further. These unique characteristics, that surround ERP post-implementation development, require modified approach to benefits realisation practices. This is the main contribution of this study.

Keywords

Benefits realisation, ERP, post-implementation development

Supervisor

PhD, Professor Tero Päivärinta

Foreword

I have been working with an ERP system over the past decade as a user, system specialist and system manager. It was this professional interest that directed my choice of the topic of my master's thesis. I feel that information systems should first and foremost provide high quality benefits for organisations, which inspired me to choose this particular topic.

I am very grateful for all, who have contributed to this study and enabled me to work on a topic I particularly value. I would like to thank the Case organisation for letting me access the data and to conduct this study. I would like to thank all participants who were willing to spare time for the interviews and share their knowledge and views on the topic. I would also like to thank my thesis supervisor Professor Tero Päivärinta, who provided me advice on how to conduct the study and helped me enormously in the writing process. The journey has been rewarding.

Finally, I would like to thank my husband and family, who have given me time and space to conduct this study. It has not been easy since the children are so small, and I have not taken it for granted. Thank you from the bottom of my heart!

Heidi Hietala

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Acronyms and Abbreviations

ASAP	Accelerated SAP
BRM	Benefit Realisation Management
CEO	Chief Executive Officer
CO	Controlling
ERP	Enterprise Resource Planning
FI	Financial accounting
FTE	Full Time Equivalent
HQ	Headquarters
IS	Information System
IT	Information Technology
KPI	Key Performance Indicator
MM	Material Management
PP	Production Planning
QM	Quality Management
ROI	Return on Investment
SAFe	Scaled Agile Framework
SAP	Systeme, Anwendungen und Produkte in der Datenverarbeitung
SD	Sales and Distribution

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1. Introduction

Organisations use Enterprise Resource Planning (ERP) systems to integrate processes from various business functions by utilising shared data and standardisations (Sumner, 2018). ERP systems are standard software packages using integrated database (Klaus, Rosemann & Gable, 2000). These systems are complex due their size and influence on business processes, but also due to their risk factors and benefit opportunities (Sumner, 2018; Ward & Daniel, 2012, p. 252). As a standard package, the ERP systems need to be customised on deployment to meet the requirements of the organisations (Klaus et al., 2000). Klaus et al. (2000) stress, it is the rich potential for customisation that separates ERP systems from other packages. Sumner (2018) states that ERP implementation projects can be the largest projects organisations carry out. Although ERP implementation projects require massive efforts from organisations, Oseni, Foster, Rahim and Smith (2017) emphasise that the work does not end there but continues with post-implementation activities which aim to ensure also the future benefits from the ERP systems.

As the role of ERP systems in organisation have become significant and organisations are investing great sums on them, also the question of ERP benefits becomes interesting (Johansson, Karlsson, Laine & Wiksell, 2016; Oseni et al., 2017). According to Ward, Taylor and Bond (1996), benefits evaluation focuses on identifying benefits that an investment might produce and the implemented Information System (IS) should improve organisational performance in order to realise those expected benefits. However, they emphasise that IS does not provide benefits on its own, but merely enables opportunities for them. Johansson et al. (2016) contribute to the subject by stating, it is a complex matter as various underlying factors can generate benefits, but no coherent ways to manage them exist. Perhaps due to the complexity, many organisations merely assume that the anticipated benefits will actualise without formal practices (Haddara & Päivärinta, 2011; Peppard, Ward & Daniel, 2007). Marnewick (2016) states that improvements in benefits realisation can lead to increase in return on investment (ROI), which can ensure successful and sustainable future. If benefits realisation has so significant importance and moreover, if organisations understand the importance, formal practices should be used widely. However, literature indicates otherwise (Hesselmann and Mohan, 2014). The purpose of this study is to examine and address this contradiction.

Many models have been developed on ERP lifecycle during the past decades (Huang & Yasuda, 2016). Esteves and Pastor (1999) defined already in the 90's the lifecycle phases as adoption decision, acquisition, implementation, use and maintenance, evolution and retirements. Shanks et al. (2000) call the lifecycle phases planning, implementation, stabilization and improvement. Law, Chen and Wu (2010) divide the phases a decade later as initiation, contagion, control and integration stages. Regardless the exact definition, they all are divided roughly to pre-implementation, implementation and post-implementation phases. Literature suggest that the emphasis of research regarding ERP systems is heavily focused on implementation, leaving the post-implementation phase only to little attention (Law et al., 2010; Oseni et al., 2017; Osnes, Olsen, Vassilakopoulou & Hustad, 2018). This is interesting since Esteves and Pastor (1999) pointed out already 20 years ago that in the later stage of ERP lifecycle,

new capabilities are introduced and as a result new benefits appear. While the ERP markets have matured along with the research conducted about ERP systems (Ali & Miller, 2017), one would expect more focus to be aimed on post-implementation. This insufficiency has also acted as motivation for this study.

Ali and Miller (2017) identified from the existing literature that ERP implementation projects do not end with go-live or that implementation project would even have an expiration date. Furthermore, they have identified that realising benefits from ERP implementation project can take up to three years. These findings indicate that it is far from easy to distinguish between different types of post-implementation activities. Many life-cycle models separate post-implementation into phases where corrective activities are done in order to stabilise the system for normal operations and into phases where new enhancements, improvements and development are conducted (Huang & Yasuda, 2016). In this study, the post-implementation term is used to refer to new opportunities concerning ERP enhancements, maintenance, development and capabilities that arise after ERP system implementation and stabilisation to normal use. Oseni et al. (2017) define these activities as “amendments” which include for example maintenance, enhancement and upgrade actions. Ng, Gable and Chan (2002) use term “maintenance” which they define as post-implementation activities related to the packaged application software undertaken by the client-organisation from the time the system goes live until it is retired from an organisation’s production system. In order to avoid inconsistent terminology, term development is used in this study to cover development, enhancement and amendments resulting from business requirements. Technical upgrades, in which the system version is replaced with newer one, and vendor-led maintenance are excluded from the scope of this study as these activities emerge from different needs and consequently have different benefits (Dempsey & Sheehan, 2011).

Literature recognises the critical importance of understanding how benefits from IS investments, including ERP systems, can be obtained, but organisations often fail to realise them (Coombs, 2015; Galy & Saucedo, 2014; Nwankpa, 2018). Although ERP systems play important role in organisations and are heavily invested on, formal benefits realisation management (BRM) is not necessarily done (Haddara & Päivärinta, 2011; Oseni et al., 2017). ERP systems are expected to generate vast financial and non-financial returns (Galy & Saucedo, 2014), but realising them is not a simple task. Ward and Daniel (2012, p. 61) write that benefit plans should be done among all departments affected by ERP implementation, but Haddara and Päivärinta (2011) noticed that expected benefits of ERP system are seldom compared against the realised benefits. Haddara and Päivärinta (2011) also noticed that since ERP benefits are often seen too obvious and benefit management difficult, the evaluation practices are considered in principal irrelevant.

While the benefit realisation practices are insufficient with ERP implementation, the question how these practices are handled after the deployment arises. Oseni et al. (2017) identified in their literature analysis that there is insufficient research conducted on this area. They suggest that first hand operational impact of amendments should be studied and the question how organisations manage benefit realisation with post-implementation amendments should be answered. Taken this research gap into consideration, this study was guided by the following main research question and its sub-questions.

- How do organisations manage benefits realisation practices in post-implementation phase of ERP systems?
 - What challenges organisations might have with benefits realisation practices and how the realisation of benefits can be guaranteed?
 - What tools or methods do organisations use with benefits realisation practices in post-implementation phase?

Zwikael, Chih, and Meredith (2018) emphasise that it is vital to understand the target benefits of a project, because it clarifies the project directions and ultimately enhances organisational performance. Moreover, Ward and Daniel (2012, p. 19) point out that since many IS projects fail, taking benefit realisation practices as part of project management practices, is imperative. Since realising benefits is the underlying reason why IS projects are initiated in the first place, the aim of this study was also to identify practical problems regarding benefits realisation in project management through a case study and finally to produce a framework that can help organisations to better embed benefits realisation into permanent project management practices. It was anticipated that this way organisations can make benefit realisation practices a part of their competitive advantage.

This study was a revelatory embedded single-case study with positivist paradigm. Yin's (2014) case study approach was used to provide rigor and reliability to this case study. Qualitative data was collected from interviews and documents supported by data from the ERP system of the Case organisation. This study was revelatory, because access was gained to the Case organisation's data to study phenomenon inaccessible previously. The data was analysed inductively allowing patterns and concepts to arise from the data and the findings were evaluated through theoretical lenses. The aim of all the chosen methods was to get rich, in-depth understanding of the phenomenon by conducting a reliable study.

As the main contribution of this study, it is argued that in-depth understanding of circumstances and challenges of benefits realisation in post-implementation development of ERP system was gained providing insight to phenomenon largely unstudied before. It was identified that old and evolved business processes, which are further complicated by workarounds, can be unfamiliar to Information Technology (IT) and business managers responsible of ERP development making it largely difficult to identify all benefits. Moreover, when subsidiaries are unable to identify new benefits on their own and the benefits further vary from one subsidiary to another, the complexity increases further. These aspects are unique characteristics highlighting post-implementation development of ERP systems and consequently require modified approach to benefits realisation practices.

The rest of this study is structured as follows. In the next chapter, benefits realisation and ERP related literature is reviewed and theoretical patterns are identified. Chapter 3 will outline the research methods, followed by the case study and results. In Chapter 5, the implications are discussed, and research questions answered and finally the study is concluded in Chapter 6.

2. Background

To understand the context of realising ERP system benefits in post-implementation development, the history and background theories are introduced in this chapter. The core literature regarding benefits realisation in general and ERP benefits in particular are introduced, followed by research conducted on post-implementation ERP development. The aim is to provide an overview of past studies and introduce the core concepts. In the last chapter the theoretical patterns identified from the existing literature are presented. Those patterns are used as theoretical lenses in this study.

2.1 Benefits realisation

Benefits management is defined by Ward, et al. (1996) as follows:

“The process of organising and managing such that potential benefits arising from the use of IS are actually realised.”

Over 15 years later Ward and Daniel (2012, p. 8) still use the same definition. Love, Matthews, Simpson, Hill and Olatunji (2014) summarise Benefits Realisation Management (BRM) as a process that is enacted to ensure that the expected benefits of capital investments are realised. However, according to Peppard et al. (2007) organisations often focus on technological implementation instead of actually realising expected benefits. They have noticed that IT project success is often measured if the IT was delivered on time and according to the budget, and if the agreed technical specifications are fulfilled. This process consequently fails to evaluate if the expected benefits were delivered and if the business can efficiently use the system (Peppard et al., 2007). However, IS does not provide benefits on its own, but only provides opportunities for them and due to this, formal realisation practices could improve the level of actualised benefits (Ward & Daniel, 2012, p. 61).

Cranfield benefits management process model was developed in the mid 90's to improve the ability of managing and realising benefits (Ward et al., 1996). Hesselmann and Mohan (2014) say that the research of benefits management has increased since the development of this model and consequently, the model has been the mostly used and cited one ever since. Ward et al. (1996) divide the process of benefit management into five phases. In the first phase, the benefits are identified, structured and proper measurement techniques developed. Second phase involves planning the benefits realisation, third phase executing the plan and fourth evaluating the results. The last phase focuses on identifying potential for new benefits that might be realisable. Hesselmann and Mohan (2014) write that the model emphasises continuous work of benefits management and many studies have demonstrated the high effectiveness of benefits management approach since 1996. Nevertheless, they say, the practices are still not widely implemented in organisations and they also feel there is a lack of studies how organisations use the practices and in which context. Figure 1 shows the process model and the embedded iterative cycles.

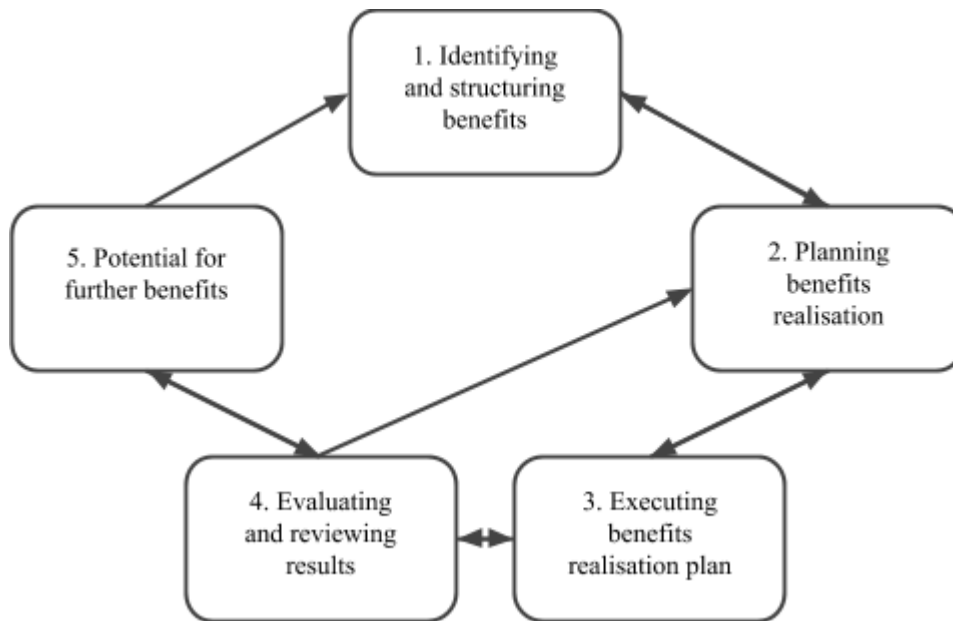


Figure 1. Cranfield benefit management process model (Ward et al., 1996).

Peppard et al. (2007) say that all efforts for realising benefits from IT investments must consider five principles of IT benefits realisation. According to the first principle, IT has no inherent value, but the value comes from efficient use of it. Secondly, benefits emerge when IT enables to do things differently. Third principle emphasises that since benefits come from work process innovations and changes, only business staff can release business benefits. Peppard et al. (2007) emphasise that the business staff needs to take responsibility in this. Fourth principle says that all IT projects have outcomes, but all outcomes are not benefits and finally Peppard et al. (2007) define that the benefits must be actively managed and the process does not stop at the technical implementation of the IT. They stress that the benefits management needs to continue until all intended benefits are achieved or it is established that all of them are not realisable.

Insufficient management practices explain to some extent the poor level of business benefits from IT implementation (Peppard et al., 2007). According to Peppard et al. (2007), often focus is on cost reduction rather than maximising the benefits. They also claim that lack of sufficient success criteria and overstated benefits on project proposal contribute to the situation where project can be technically completed, but business benefits are defective. Zwikael et al. (2018) write that it is critical to set effective target benefits. They have identified that target benefits are effective if they are comprehensive, specific and attainable. By comprehensive they mean how well the benefits reflect organisational strategies and objectives of stakeholders, specific means how clearly they are defined and measurable, and attainability means how realistic the benefits are. Zwikael et al. (2018) propose to measure the effective target benefits as it assists in benefits management process during projects and improves the likelihood of benefits realisation.

In addition to insufficient success criteria, overstating benefits in business case was another shortcoming identified by Peppard et al. (2007). According to Ward, Daniel and Peppard (2008), business cases are widely used to justify IT investments. However, they continue that most organisations are not satisfied with the outcome or the process even enables overstating the benefits. Ward and Daniel (2012, p.127) point out that often business cases are used only to gain funding for the project, but this stance overlooks

opportunities to enhance existing capabilities or even create totally new ones. Consequently, Ward et al. (2008) say that ideally business cases include wide range of benefits, not only financial, but non-financial too. In their view, this fulfils not only senior management expectation, but also other stakeholders' who might be interested in softer or more subjective benefits rather than only financial ones. However, Einhorn, Marnewick and Meredith (2019) state that although business cases are created, only half of organisations use them further. They continue that, although many studies have contributed on creating an effective business cases, no significant influence has been seen on the success ratio of IT projects. Einhorn et al. (2019) believe it indicates that there are insufficient guidelines how to use the business case to ensure the target benefits are realised.

The aim of the benefits management process is to improve the recognition of benefits that are achievable, but also to ensure that the investment actually leads to the targeted benefits throughout the lifecycle of the investment. Nevertheless, many organisations do not understand the nature of the benefits that IS is able to provide or what needs to be done in order to achieve the benefits. (Ward & Daniel, 2012, p. XII.) Doherty (2013) has noticed that only limited examples of tools used in benefit management can be found. Cranfield benefits management process model was created to fulfil dissatisfaction of tools in benefits management (Ward et al., 1996). Based on Cranfield model, Benefits Dependency Network (BDN) was developed, which is approach for identifying, planning, and managing of benefits (Peppard et al., 2007). Furthermore, Ashurst, Doherty and Peppard (2008) developed benefits realization capability model which is stakeholder-oriented model aiming to provide more common ways to evaluate system development projects. Regardless all possible tools, they also noted that organisations still have not endorsed the formal practices very widely. Moreover, Hesselmann and Mohan (2014) say that methodology on its own does not guarantee results if it is not aligned with the organisational environment and the requirements of employees. Merely implementing new techniques, processes or tools for managing benefits, only provide means to more efficient benefits management (Ward & Daniel, 2012, p. 199). Ward and Daniel (2012, p. 199) emphasise that only how they are used, can impact the ends, in other words how well benefits can be achieved from investments, and the commitment of individuals involved provides the ways for effective benefits management.

Even in cases where IT projects are completed successfully, it does not mean that notable benefits are delivered (Ashurst et al. 2008). Review procedures are included in all holistic project management and IS development methodologies, in benefits management too. Failure to realise some benefits, can be addressed in the following projects. Therefore, it is vital to identify that, because only then, the follow up projects can be used to do this. (Ward & Daniel, 2012, p. 80.) Also, benefits change over time (Love et al., 2014). Ongoing commitment is needed for effective benefits realisation (Ashurst et al. 2008). Badewi, Shehab, Zeng and Mohamad (2018) discloses that it might not be efficient strategy to aim to achieve all benefits at once, but rather focus on lower level benefits and only after organisational capabilities are developed, realise also the higher level benefits. Although the topic of realising benefits with IS has been identified important in academic scene, many organisations outline benefits only in the initial project proposal (Doherty, 2013). However, the goal of business is not to create accurate forecasts, but to make sure those forecasts actualise and that is also in the heart of benefits realisation (Ward et al., 1996).

In summary, the literature suggests that organisations generally do not follow formal practices for benefits realisation (Ashurst et al., 2008; Hesselmann & Mohan, 2014; Peppard et al., 2007). The benefits are often stated in the initial project proposal, but systematic approaches to follow the realisation are not in use (Ward & Daniel, 2012, p. 6). There are various challenges that organisation face in realising benefits such as insufficient management practices, the focus is on technological implementation rather than ensuring benefits, lack of sufficient evaluation criteria how to measure the success, unsatisfactory use of business cases or the benefits are overstated in the first place (Einhorn et al., 2019; Peppard et al., 2007; Ward et al., 2008; Ward & Daniel, 2012, p. 6). According to the literature, the benefits realisation could be guaranteed for example with implementation of formal benefits realisation practices, setting effective target benefits with clear measurement criteria and not aiming to realise all benefits at once (Badewi et al., 2018; Hesselmann & Mohan, 2014; Ward & Daniel, 2012, p. XIII; Zwikaël et al., 2018). In addition to methods developed for benefits realisation, such as Cranfield benefits management process model, BDN or benefits realization capability model, organisations could also utilise business cases or project management as tools to improve benefits realisation (Ashurst et al., 2008; Peppard et al., 2007; Ward et al., 1996; Ward et al., 2008; Ward & Daniel, 2012, p. 80). However, the methodology alone does not guarantee success, but how they are used, and ongoing commitment are required too (Ashurst et al., 2008; Hesselmann & Mohan, 2014; Ward & Daniel, 2012, p. 199).

2.2 ERP benefits

Complex systems, such as ERP systems, influence significantly the performance of organisations and their business strategies (Sumner, 2018). According to Haberli Jr., Oliveira and Yanaze (2019) ERP systems offer a holistic view of various business functions and enable automating information, material and financial resource flows. ERP systems provide business solutions to support all core processes and business functions, such as logistics, sales, distribution, material management and financial accounting. Moreover, these business processes are supported seamlessly across all functions. ERP systems therefore offer process-oriented view to the business functions. Since ERP systems are package software, in order to fit the specific requirements of an organisation, they require tailoring when being implemented. This customisation consequently makes the systems unique and therefore ERP systems can be defined merely generically. (Klaus et al., 2000.) ERP systems have come a long way and evolved into pervasive software able to handle complex tasks and organisational activities (Ali & Miller, 2017).

Ward and Daniel (2012, p. 252) write that complex applications, such as ERP systems, cause the most challenges for organisations in terms of identifying and managing the expected benefits. They stress the importance to understand the context dependency as achievable benefits can vary. They continue that organisations should be aware of this and not assume that benefits realised elsewhere will automatically be actualised in their organisation too. Even regarding to ERP systems, the benefits can vary very much from one organisation to another (Ali & Miller, 2017). Johansson et al. (2016) have, however, observed only little interest towards systematic follow-up of the benefits. They see this lack of interest very concerning as the decision-makers do not receive any verification if the investment was successful or not. They further suggest that future research should aim to find out what leads to the absence of follow-up activities.

Business environment is becoming increasingly volatile which lays an extra challenge on organisations (Niemi & Pekkola, 2019). Göhrig, Janiesch, Neuß, Kolb and Winkelmann (2017) have also identified this. They further reveal that expectations of end users and technical resources have changed radically. Therefore, attention should be paid to managing ERP system changes or otherwise it can lead to low quality or chaotic systems (Comuzzi & Parhizkar, 2017). Like Haddara and Päivärinta (2011) pointed out, often organisations see formal benefit realisation expensive and difficult, and expect ERP systems to provide assumed benefits without actual benefits management. The study of Johansson et al. (2016) contributes to this theme by revealing that although the case organisations were interested in identifying both, hard and soft, values of their ERP investments, there were no formal processes to seize soft values and consequently those were not obvious to all. Moreover, the study revealed that, although business cases with calculations of ROI were created, the realisations were not monitored.

Badewi et al. (2018) divide ERP benefits into automation, planning and innovation benefits. The automation benefits of ERP system, discussed by Badewi et al. (2018), are realised with new value-focused business processes and they require resources from technologies and system features as well as competence from IT department. Badewi et al. (2018) say that planning benefits are realised by using the system effectively to forecast the behaviour of internal and external environment, and innovation benefits are realised when the ERP system is used for process, service and product innovations. Sumner (2018) has identified that organisations seek ERP benefits in form of business benefits and system benefits. She lists integration of organisational system and data, improved information flow and customer satisfaction, incorporation of best practices, reduced inventory and improved planning as business benefits, and efficiency, standard processes, data integration and better access to it, improved system performance and scalability as system benefits. However, her study revealed that only some of the benefits were actually realised in organisations.

Due to the rapid changes in commercial context and constantly evolving use of technology, benefits management can help organisation to improve the value of IS investments. Benefits management can also help organisations to understand better the value that IS can produce to it. (Ward & Daniel, 2012, p. 2.) Galy and Saucedo (2014) point out the fact that ERP is a long-term investment and it is important to ensure that the costs do not surpass the benefits. Nevertheless, evaluation of ERP investment is complex and for example ROI calculations considers only financial value (Johansson et al., 2016). Haddara and Päivärinta (2012) have identified that while many ERP projects surpass their budgets, some even doubling it, formal practices to ensure benefits are not done. One explanation, that organisation give to this, is that they claim just to know if the implemented projects are successful or not (Johansson et al., 2016). In other cases the reasons can be that the ERP benefits are seen so obvious that they are taken for granted, the procedures regarding benefits realisation are seen expensive and complex, or there is general mistrust towards the formal practices (Haddara & Päivärinta, 2011).

Understanding the relatedness of benefits management and project management, can provide new insight to address the issues of failing IT investments (Badewi et al., 2018). Badewi and Shehab (2016) further say that more project and benefit management are used in organisation, the more they can improve ERP investment success. However, if the projects are considered as technical project rather than new business opportunities, the success might remain weak (Peppard et al., 2007). Johansson et al. (2016) envisage that in the future, ERP systems might not be possible to evaluate purely in monetary

terms. If that is the case, they say, more holistic approaches are needed with higher emphasis on soft values.

The ERP related literature confirm the overall comprehension how organisations manage benefits realisation practices, namely no formal practices are followed, although the number of studies is limited (Haddara & Päivärinta, 2011; Johansson et al., 2016). The missing practices of ERP system benefits realisation might be due to various challenges organisations face, like the practices are considered expensive and difficult, the formal practices are hindered by assumptions or the benefits are taken for granted, and processes to seize all benefits are insufficient (Ali & Miller, 2017; Haddara & Päivärinta, 2011; Johansson et al., 2016). Solutions to guarantee ERP benefits can be, for example, alignment of benefit management and project management and to better understand the complexity and context dependency (Badewi et al., 2018; Ward & Daniel, 2012, p. 235). Ward and Daniel (2012, p. 260) further emphasise that particularly ERP investments are often viewed as technical endeavours, failing to address the business aspects which is important to identify in order to guarantee benefits. In addition to the general benefits management methods covered in the previous chapter, some tools exist, that are developed particularly for ERP system context, for example two-stage model of ERP implementation (Ward & Daniel, 2012, p. 262). However, the research covering which of them might be in use with ERP benefits management is very limited.

2.3 Post-implementation ERP development

ERP systems started heavily to replace the legacy systems during the 90's (Osnes et al., 2018). Since then, the ERP markets have become saturated and organisations are widely using them. (Göhrig et al., 2017). Kallunki, Laitinen and Silvola (2011) stress that ERP systems are long-term strategic investments for organisations, which is why evaluation should be done over several year time period. The literature of ERP system lifecycle models also takes the stance of long-term life span (Esteves & Pastor, 1999; Huang & Yasuda, 2016; Shanks et al., 2000). Esteves and Pastor (1999) define ERP lifecycle model to include six phases, namely adoption decision, acquisition, implementation, use and maintenance, evolution and retirement, whereas Shanks et al. (2000) divide the phases to planning, implementation, stabilisation and improvement. Shanks et al. (2000) define that planning phase includes both, business and technical project focus, implementation phase covers configuring and implementing the system and in stabilisation phase problems of implementation are fixed and the business performance normalises. The last phase in Shanks' et al. (2000) model is improvement in which incremental and radical improvements are introduced. Since the ERP markets have matured, the focus should be turned on the opportunities that can be realised after the rollout, instead of focusing on the initial implementation projects (Ali & Miller, 2017; Göhrig et al., 2017). In particular, the evolution phase introduces new, emerging benefits for organisations (Esteves & Pastor, 1999).

Law et al. (2010) write that although successful ERP implementation can create competitive advantage, focusing only to the installation, cannot ensure long term success. Consequently, they emphasise the importance of post-implementation maintenance and support services which not only increase the quality of the system, but also extends the system life span. Oseni et al. (2017) contribute to this discussion by pointing out that maintenance, enhancement and upgrade projects inevitably follow the initial implementation. They continue to say that if ERP systems are used as strategic

tools for building competitive business, post-implementation activities, which they refer to as amendments, are essential.

After ERP implementation, organisations face pressure to align enterprise systems' capabilities with strategic objectives (Comuzzi & Parhizkar, 2017). Ng et al. (2002) argue that primary motivations for ERP maintenance, is to realise more business benefits. The needed development can vary from internal requests, such as adjustments to the logic how accounts payables are posted, or external requests, like development to vendor-managed inventory system. In addition, the development can be a result from new business needs or changing regulations. (Comuzzi & Parhizkar, 2017.) However, the post-implementation development can also have negative impact on the quality of ERP systems and consequently affect organisational performance, Parhizkar and Comuzzi (2017) stress. They provide an example of development on purchase requisitions which can consequently impact all open purchase orders with vendors. Moreover, Peng and Nunes (2010) have identified that misjudgements or mistakes made in the implementation, can impact the post-implementation phase. However, regardless the risks, many opportunities also lie in the post-implementation stage and therefore research in this field is critical (Göhrig et al., 2017).

In order to avoid failure with ERP exploitation, Peng and Nunes (2010) say it is important to understand that ERP systems are very different from other IS. They say that in fact they are most likely the most expensive and influential systems that organisations will ever implement. Osnes et al. (2018) have identified from existing literature that the most significant organisational challenges are revealed in the post-implementation phase. Since post-implementation development is budgeted in annual IT budgets in organisations, it is important to understand the nature of post-implementation development. Different types of development activities can be distinguished into upgrades, enhancement and maintenance, all of which have different impact on ERP systems and organisations. The post-implementation development can be further divided into pre-development, development and post-development phases that have different issues and themes. (Oseni et al., 2017.) Furthermore, Osnes et al. (2018) say when expanding the matter to multinational context, the situation becomes even more complex.

Law et al. (2010) emphasise that it is not possible to achieve sustainable competitive advantage, if ERP systems do not evolve to fulfil new business requirements. It is their believe that sound maintenance and support practices can extend the life span and create a stable system platform to support efficient and effective business operations. However, they also point out the issue of insufficient research in the area of strategies and methods to address post-implementation issues. Several years later Ali and Miller (2017) have also identified that existing research focuses mainly on implementation, consequently post-implementation research is lacking. Oseni et al. (2017) have discovered the same and so have Osnes et al. (2018). These recent studies are extensive literature reviews focused on ERP systems. The studies have established a clear need for further research on the topic. Many matters like managing various stakeholders' interests regarding ERP systems, new benefits and risks as well as development of ERP system after implementation still require answers and research (Law et al., 2010; Oseni et al., 2017; Osnes et al., 2018). Moreover, Ali and Miller (2017) have pointed out the need for empirical and case studies in the field of ERP post-implementation phase to better understand the actual problems.

In the light of current literature, organisation can have various challenges regarding benefits realisation in post-implementation development of ERP systems, like communication challenges, workarounds and the complexity of the system which increases even further when more people are involved (Osnes et al., 2018). However, the current literature does not clarify how organisations manage benefits realisation practices, how the benefits can be guaranteed or what tools or methods, do organisations use with benefits realisation practices in post implementation development of ERP systems.

2.4 Patterns of benefits realisation

The theoretical basis of this study lies on the conceptualisation of the theories presented in this chapter. The theories, identified from the existing literature, were transformed into the following theoretical patterns:

1. Systematic approach to benefits realisation improves benefits delivery of ERP development projects.
2. Planning the benefits realisation has more important role in project success than merely justifying the project, it can improve the relationship of IT and business and cooperation of stakeholders.
3. ERP development is considered as a technical project or benefits are considered so self-evident that no systematic approaches to follow the benefits realisation are in use.

These patterns are used as theoretical lenses to analyse the results of the study and to discuss the contributions of the study in context of existing literature.

3. Research Method

IS research domain is young discipline although it has grown significantly since its early days in the 60's. The early research focus was on technical matters, but it has broadened to studies covering communication and collaboration between people, organisations and IS. Due to the size of the domain, there is vast diversity within the approaches to study the field as well as with the research methods. (Myers & Avison, 2002.)

Borrego, Douglas and Amelink (2009) point out that no particular research method is better than other, but it is the research question that sets the goals and guides to choose particular method. In this chapter, the research methods used in this study are introduced with reasoning of the choices. First qualitative research is presented followed by case study and introduction to the case organisation. Chapter 3.4 introduces the case study plan and design, Chapter 3.5 preparations, Chapter 3.6 data collection and finally Chapter 3.7 presents the analysis. The choices of the research methods were guided by the main research question which aims to identify how organisations manage benefits realisation practices in post-implementation phase of ERP systems.

3.1 Qualitative research

Most information system related research focuses on collecting data with quantitative methods leaving qualitative research to lesser attention (Sarker, Xiao & Beaulieu, 2013). Avenier and Thomas (2015) confirm this view by revealing that for example in 2011 and 2012 only 10 % of articles published in MIS Quarterly were qualitative.

The origins of qualitative research are in social sciences with the aim of studying social and cultural phenomena. Qualitative methods aim to provide information and understanding of social and cultural contexts where people live and act in. Qualitative methods can be, for example, case study research, action research or ethnography. Furthermore, qualitative data can be collected in many ways for example by interviewing or observing. Data can also be collected with questionnaires or from texts and documents. It is important to understand that term qualitative is not equal to interpretive although it can be such. Hence, qualitative research can be positivist, critical or interpretive. (Myers & Avison, 2002.)

Sarker et al. (2013) studied how qualitative research is applied in information system studies with focus on identifying established practices in conducting and presenting qualitative research. They point out that details regarding research methodology are important, because the methodology define how the study should be conducted and presented, and how the quality of the study is evaluated by the readers. In their view many studies use too generic labels such as case study or even exploratory case study, or the labels can be unfamiliar like iterative qualitative data collection scheme. Sarker et al. (2013) emphasise the importance to use well established definitions as those provide consistent expectations among academics. They also identified that third of the studies they examined did not justify the methodological choices at all.

Baskerville and Myers (2015) say that in the field of information systems, the innovative improvements and the changing scene of information system technologies and practices are driving constant evolution of the field. In addition to that, Avenier and Thomas (2015) address the issue of various methodological approaches to qualitative research which is further complicated by diverse epistemological frameworks and need for rigor and high quality. Sarker, Xiao and Beaulieu (2018a) address the theme of diverse approaches in qualitative research and confusion regarding them by providing implications to make sense of the complexity. They say that research can be conducted, represented, and justified in various ways and this further impact how studies are designed, how the quality of the research is ensured and the basis according to which, the studies should be judged. Sarker et al. (2018a) also highlight the profound importance of theory in qualitative research, although the nature and purpose differ depending on the research approach. Further, they continue to say that analysis strategies such as interpretation, deduction or induction have important role providing practices to write, justify and evaluate the work. Goldkuhl (2019) contributes to this by pointing out that fundamental difference between qualitative and quantitative research is in the data analysis. Finally, Sarker et al. (2018a) remind that qualitative research can have various aims with claims of different contributions. Those aims might be to create new concepts, to influence on certain audience or to develop an understanding of phenomenon. It is the unique combination, rather than individual element, that leads to the selection of certain qualitative approach for a research, Sarker et al. (2018a) argue.

Sarker et al. (2013) emphasise that qualitative research is not one universal method, but rather consist of various forms of qualitative approaches. They have identified that there is some unclarity among researchers regarding which criteria to apply and in what kind of situation. Myers and Avison (2002) state that the theoretical view i.e. underlying epistemology of qualitative research can be positivist, interpretive or critical, and that the same views apply also for example with case study or action research. They further note that, according to positivist research, reality is objectively given, and it is possible to describe it with measurable attributes. Myers and Avison (2002) also describe that interpretive research assumes that only social constructions, like language and shared meaning, can offer access to reality whereas critical research sees social reality historically constituted. However, Borrego et al. (2009) emphasise that regardless the chosen theoretical view, it is essential that it is consistent with the research question.

3.2 Case study

Case study can be described as an investigation of one or more social settings by studying different dimensions and aspects of the case (Goldkuhl, 2019). Case study is not, however, appropriate method for all studies. The three following conditions determine if case study suits particular research. Firstly, the main research question seeks to answer how or why questions. Secondly, the researcher has no control over the phenomenon and thirdly, the study focuses on current phenomenon rather than historical events. It is important that all three conditions are fulfilled. If not, then other methods such as experiment, survey or history, might be more suitable. (Yin, 2014, p. 9-15.)

It is often assumed that case study is an easy method, however Yin (2014, p. 72) argues the opposite. He says that lack of well documented procedures makes it complex method in which the researcher needs to create high quality case study protocol and identify possible bias. In general, he says, researcher needs to be well prepared. Keutel, Michalik and Richter (2014) argue that additional confusion to cases studies pose by the

different epistemological approaches, namely, positivism, interpretivism and criticism. They say, if used without solid justification and proper understanding, it can lead to flawed results. Avenier and Thomas (2015) say that it is important to specify the epistemological view from early stage of a research project. It is their view that fundamental to any research, is the philosophy of knowledge. Yin (2014, p.17) address this matter by saying various epistemological views are compatible with case study method. Yin (2014, p. 19-22) demands also to evaluate and consider the known issues in case study research such as conducting the research with high rigor, pay attention to the generalisation and be aware of the possible expansion of scope. He also reminds about common misinterpretation people often have: anyone can conduct a good case study. He points out that conducting a case study is hard and requires to follow systematic procedures.

Ali and Miller (2017) emphasise, it is imperative to understand the actual problems organisations encounter in post-implementation phase of ERP systems and case studies are needed for that. Case study was therefore the chosen methodology in this study. To be more precise Yin's (2014) approach to case study was used. This approach provides rigor to case studies and it emphasises reliability. It is acknowledged that Yin's (2014) case study approach is embedded with positivism (Sarker, Xiao & Beaulieu, 2018b). This is seen for example in emphasis of objectivity, usage of multiple methods with data collection and analysis, emphasis of reliability and validity, and it typically seeks rival explanations (Yin, 2014, p. 45-47). Hence, this study was guided by positivist epistemology. The basic idea of positivism assumes that reality is independent from humans and its ontological stance is realism. Objectivism is also tightly connected with positivism, and therefore researchers need to strive for unbiased and neutral stance. However, when studying social phenomenon, it is difficult to be entirely objective and analyse the phenomenon as it was a natural world event. Therefore, with positivism, it is important to use language that describe the phenomenon as it is, with minimal interference. (Rehman & Alharthi, 2016.) In interview context, for example, this means that researcher should focus on what the participants say or do, rather than what they might mean.

Rehman and Alharthi (2016) highlight that elements of different paradigms can be mixed regardless of strict views of some communities. They emphasise that it is the studied phenomenon that should guide the usage of various philosophical assumptions and methods. Therefore, some elements from interpretivist paradigm were applied when discussing the findings. Moreover, although positivism is often connected with deductive data analysis method, with case studies, it is important to leave room for the possibility of emergence of new concepts. Therefore, inductive data analysis was considered the best approach. Yin (2014, p.17) himself points out that his all-encompassing method is possible to be used with different epistemological views, which is why broader view was taken in this study.

3.3 Case organisation

The Case organisation is a large Finnish company operating in consumer electronics. The headquarters (HQ) is in Finland, but the organisation has over 20 subsidiaries around the world. The Case organisation employees some 1300 people around the world, out of which 400 are in Finland. Although manufacturing consumer electronics has been the core business throughout the organisation's history, developing software and technological solutions has become increasingly important part of the business.

The Case organisation has used the current ERP system well over 15 years. Due to the maturity of the current ERP system at the Case organisation, this organisation was able to offer extremely valuable data regarding post-implementation development of ERP system as well as practices related to benefits realisation. The ERP system and development practices are introduced in more detail in Chapter 4.

3.4 Plan and design of the case study

The aim of the main research question was to identify how organisations manage benefits realisation practices in post-implementation phase of ERP system. Before designing the study, which aims to answer that question, some possible problems were analysed in order to avoid issues during the study. Concerns, listed by Yin (2014, p. 19-22), such as rigor of this study, generalisability of the results and importance of clear scope, were considered. In general, attention was paid on the fact, pointed out by Yin (2014, p. 23), that case study research can be remarkably hard.

A case study can be a single-case study, or it can have multiple-cases. Single-case design is justifiable for example if it is a critical test of theory, it studies unusual situation, it is a common case, revelatory or longitudinal case study. (Yin, 2014, p. 51-56.) In turn, Avenier and Thomas (2015) say that single case study can be developed for theory building. Single-case study design was chosen to this study, because the case was a revelatory. According to Yin (2014, p.52), a case is revelatory when researcher gets access to study phenomenon inaccessible previously. Although, post-implementation development with ERP systems is conducted in many organisations, this particular case provided an opportunity to access such data at Case organisation that has not been available before. Single-case design was chosen also to conduct an in-depth analysis. Due to the scope of this study, in-depth analysis would have not been possible with multiple cases. Moreover, the aim was to identify concepts from the collected data and to produce solution in form of a framework, which can be considered as theory building.

Case study can be holistic, studying overall phenomenon, or it may contain embedded units of analysis. Holistic approach can be good, if no clear embedded units can be identified or the underlying theory is very general. (Yin, 2014, p. 53-56.) However, in this study, clear embedded units were possible to distinguish and those were also considered to provide deeper understanding on the case rather than just focusing on the ERP development in general. Therefore, it was decided that this case study is a revelatory embedded single-case study.

It is important to evaluate the quality of the research design in case study design phase. The validity can be tested with the following four aspects. Construct validity aims to recognise concrete measures for the studied concepts. Internal validity ensures causal relationship between conditions. External validity connects the study with theory. Reliability indicates that the study is conducted with repeatable methods. (Yin, 2014, p. 45-49.) Table 1 shows how each of these quality criteria were used and considered in this study.

Table 1. Case study rigor (Yin, 2014, p. 45).

Criterion	Guidelines	Applied in this study
Construct validity	Multiple sources of evidence Chain of evidence Review of key interview participants	Interviews, documents and ERP system Was considered throughout the study One key participant reviewed the study
Internal validity	Pattern matching	Theoretical patterns, identified in the prior literature, were matched against findings in this study
External validity	Theory usage in single-case studies	Theory was used in pattern matching
Reliability	Case study protocol Case study database	Designed in the preparation phase Designed in the preparation phase

These quality tests were considered important, as they provide rigor to this study. The quality of the research was considered throughout the planning, field study, analysis and reporting the findings.

3.5 Preparations

Preparation activities of the case study included acquiring the needed skills to conduct a high quality case study, getting approval from the Case organisation to access the needed data, considering possible bias, creating a consent for the interview participants and preparing a case study protocol. In Yin's (2014, p.72) opinion, too often researchers assume that mastering case study research does not require much effort. He argues the opposite by saying that only well-trained researcher can conduct a case study with high quality.

The case study protocol was created in order to improve the reliability of this study. The aim of the protocol is also to guide the researcher throughout the study. The protocol is used to identify and foresee data sources when conducting the field work. Consequently, these preparations ensure more efficient field work. If any changes or problems would occur during the study, the case study protocol helps to identify how the data collection activities need to be adjusted to address the changes or problems. (Yin, 2014, p. 84-94.) Table 2 highlights the most relevant case study protocol questions with the anticipated sources of evidence. The questions are divided by the unit of analysis as well as by organisational dimensions. Yin (2014, p. 89) stresses that these questions are posed only for the researcher, not for the interviewees.

Table 2. Highlights of the case study protocol questions.

Unit of analysis	From the organisation	From individuals	Purpose
ERP system development	<ul style="list-style-type: none"> • General procedures or guidelines how ERP related development is conducted • General guidelines how ERP related benefits are identified and documented • General guidelines how ERP related benefits are ensured • General guidelines how ERP related benefits are followed up after implementation • Different level of benefits (organisational level / business unit level / team level / individual level) • Different types of benefits (financial / non-financial) • How the benefits are measured? 	<ul style="list-style-type: none"> • Are general guidelines or procedures followed? • Are different levels of benefits identified? • Are there challenges in realising benefits? • How the benefits are measured before project and after project? • What kind of improvements are needed with ERP system in general to improve benefits realisation? 	Data to the unit of analysis: ERP system development
Individual development projects	<ul style="list-style-type: none"> • Tools or methods used to identify and document ERP related benefits • Tools or methods used to manage ERP related benefits throughout the project • Tools or methods used to follow up ERP related benefits after implementation • Different level of benefits (organisational level / business unit level / team level / individual level) • Different types of benefits (financial / non-financial) • How the benefits are measured? 	<ul style="list-style-type: none"> • Are tools or methods used? • Are benefits identified and documented? • Are benefits managed throughout projects? • Are there challenges in realising benefits? • How the benefits are measured before project and after project? • What kind of improvements are needed in development projects to improve benefits realisation? 	Data to the embedded unit of analysis: individual development projects
Possible sources of data	Organisational policies and guidelines, investment proposals, project documentation, interviews	Interviews, project documentation, development tickets, ERP system	

The case study protocol with full list of case study protocol questions can be found in the Appendix A. Case study protocol.

3.6 Data collection

Data can be collected in qualitative research many ways, such as by interviewing or observing people or collecting data from texts or documents (Myers & Avison, 2002). Yin (2014, p. 105) lists six sources of evidence relevant for case studies, those being

documentation, archival records, interviews, direct observations, participant observation and physical artefacts. Kautel et al. (2014) have discovered that most case studies use interviews as primary data sources followed by documents and observations. Their study also reveals that majority of case studies utilise multiple data sources. They point out that that this is necessary requirement for case study method. Yin (2014, p. 119) emphasises that case study inherently utilises wide variety of evidence which is also the major strength of case study method. The following chapters explain the data collection practices used in this study followed by the data collection methods, namely interviews, documents and ERP system.

3.6.1 Data collection practices

The three principles of data collection, listed by Yin (2014, p. 119-128), were followed to ensure construct validity and reliability of this study. Firstly, multiple sources of evidence was established by collecting data from interviews, documents and ERP system. Secondly, a case study database was established to cloud storage to ensure all data was accessible when needed, but also secured. The chain of evidence, which is the third principle, allows to trace the evidence from the research questions to conclusion and back. Yin (2014, p. 128) links research question, case study protocol, relevant citations in the case study database, the case study database and the case study report as the chain of evidence. This chain of evidence was established to ensure construct validity.

The interviews were the primary data collection method which was complemented by document and ERP system data. Data collection was aimed to address each research questions to ensure relevant and reliable data. Tables 3, 4 and 5 visualise how the research questions map with case study protocol questions and the interview questions. Documents were used to identify various details regarding research questions and as secondary data to confirm interview data.

Table 3. Mapping main research questions with case study protocol and interview questions.

Research questions	Case study protocol questions	Interview questions
<p>How do organisations manage benefits realisation practices in post-implementation phase of ERP systems?</p>	<ul style="list-style-type: none"> • General procedures or guidelines how ERP related development is conducted • General guidelines how ERP related benefits are identified and documented • General guidelines how ERP related benefits are followed up after implementation • Different level of benefits (organisational level / business unit level / team level / individual level) • Different types of benefits (financial / non-financial) • How the benefits are measured? • Are general guidelines or procedures followed? • Why or why not? • If so, how? • If so, by whom? • Are different levels of benefits identified? • Why or why not? • If so, how? • If so, by whom? • How the benefits are measured before project and after project? 	<ul style="list-style-type: none"> • Where did the development requirement come from? • How was the need for development identified? • What benefits were anticipated from the development? • What was the development process? • How the benefits are measured? • Different level of benefits (organisational level / business unit level / team level / individual level) • Different types of benefits (financial / non-financial) • Are general guidelines or procedures followed? • Why or why not? • If so, how? • If so, by whom? • <input type="checkbox"/> Are different levels of benefits identified? • Why or why not? • If so, how? • If so, by whom? • How the benefits are measured before project and after project?

Table 4. Mapping first sub-research question with case study protocol and interview questions.

Research questions	Case study protocol questions	Interview questions
What challenges organisations might have with benefits realisation practices and how the realisation of benefits can be guaranteed?	<ul style="list-style-type: none"> • General guidelines how ERP related benefits are ensured • Are there challenges in realising benefits? • Why or why not? • If so, what kind? • What kind of improvements are needed with ERP system in general to improve benefits realisation? • What kind of improvements are needed in development projects to improve benefits realisation? 	<ul style="list-style-type: none"> • Were the anticipated benefits received? • Were new benefits identified during the project? • Were there challenges during the project? • Are improvements needed with benefits management? • Are there challenges in realising benefits? • Why or why not? • If so, what kind? • What kind of improvements are needed with ERP system in general to improve benefits realisation? • What kind of improvements are needed in development projects to improve benefits realisation?

Table 5. Mapping second sub-research question with case study protocol and interview questions.

Research questions	Case study protocol questions	Interview questions
What tools or methods organisations use with benefits realisation practices in post-implementation phase?	<ul style="list-style-type: none"> • Tools or methods used to identify and document ERP related benefits • Tools or methods used to manage ERP related benefits throughout the project • Tools or methods used to follow up ERP related benefits after implementation • Are tools or methods used? • Why or why not? • Are benefits identified and documented? • Why or why not? • If so, how? • If so, by whom? • Are benefits managed throughout projects? • Why or why not? • If so, how? • If so, by whom? 	<ul style="list-style-type: none"> • How was the work documented? • What tools were used for documentation? • Who did the documentation? • How was the realisation of benefits monitored? • Are tools or methods used? • Why or why not? • Are benefits identified and documented? • Why or why not? • If so, how? • If so, by whom? • Are benefits managed throughout projects? • Why or why not? • If so, how? • If so, by whom?

In general, the data collection practices were designed in a manner that they produce relevant and reliable data which can be consequently used to answer the research questions.

3.6.2 Interviews

Conducting an interview, according to Yin (2014, p. 110), requires considering two aspects. Firstly, the interviews should follow the line of inquiry established in the case study protocol. Secondly, the questions need to be asked in unbiased and friendly manner to support the line of enquiry. Yin (2014, p. 110-111) writes that interviews can either be prolonged case study interviews, short case study interviews or survey interviews. Schultze and Avital (2011) list three interviewing methods in their study, those being appreciative interviews that focus on positive communication, laddering interviews that aim to identify multiple layers of meaning and photo-diary interviews where the aim is to make the interview concrete with help of visual aid. Regardless the actual interview method, Schultze and Avital (2011) emphasise that the aim is to generate rich data by connecting the interview with the experiences of the interviewee, valuing the experiences of the interviewee and helping the interviewee to articulate their experience as well as possible. However, Yin (2014, p. 113) points out that the researcher needs to be aware that the data received from the interviews can be bias or subject to poor recall or inaccurate articulation. Schultze and Avital (2011) further highlight that the interviewees might try to influence the study as a political tool to advance their own agenda. They continue that this situation can further cause issues, because interpreting the data from the interviews can be consequently very difficult.

Goldkuhl (2019) have identified some aspects regarding interviews that are noteworthy to mention. He points out that interview situations are arranged by the researcher and thus are separated from the everyday lives of the interviewee. With this observation, he emphasises that it is the situation and predefined themes and questions that help the interviewee to produce the data, which the researcher collects and consequently uses in data analysis. According to Goldkuhl (2019) the situation can contribute to the interviewee's reflections and consequently alter their future behaviour.

The candidates for the interviews were identified and selected from different business units and IT department of the Case organisation. Since it was considered important to form as full picture of the studied phenomenon as possible, it was critical to have data from different points of view. A request with general information about the study was sent to five persons in different business units and four persons in IT department. Two persons from business units and all four persons from IT department were willing to participate. In addition, one interview was arranged with a person from Case organisation's management team. In total, seven persons were interviewed in this study. Literature suggest that the sample size of the interviewees is not required to be large, since the goal of qualitative study is to describe a situation in sufficient depth with meaningful way rather than produce generalisation that apply in most similar situations (Borrego et al., 2009). Therefore, it was evaluated that seven interviewees produce sufficiently data to this study.

The interviews took place at the Case organisation's premises during two-week period. Each participant were given a consent form. The form included an option if the interview could be recorded or not. The participation was confidential. The interviews were organised so that it was possible to learn from previous interviews. First interview was arranged with the key participant from IT department to collect data about ERP

system background, history and protocols regarding ERP development and project management. During the first interview, different documents were also reviewed to acquire additional data. The interview was prolonged case study interview as the first interview followed by additional session. The first interview was followed by IT personnel interviews and last by business unit personnel interviews. The interview with the management team member was hoped to be last, as the idea was to get data first about the history and current practices of ERP development after which the findings could be discussed with the management team member. However, due to scheduling reasons, the management team member's interview needed to be before the business unit persons.

After the first interview, more attention was focused on the interview questions in the interview situation. Although the aim was to make the interviews conversational situations with relaxed atmosphere, it was very important to clearly articulate accurate questions. Firstly, as identified in Chapter 3.4, language has significance in positivist case study. Using clear and understandable language with minimal technical or theoretical terms, was considered important. For example, if unfamiliar terms would have been used, the answers might not provide relevant data. Secondly, leading questions were avoided as much as possible and only used to confirm whether an answer was understood correctly. Kvale and Brinkmann (2009, p. 172) argue that leading questions are useful in those situations.

Participants were provided themes and questions before the interviews (Appendix B. Interview themes) The aim of this was to help the participants to understand better the aim of the interview. The interviews mainly started from specific development case. The participants were asked to describe a recent ERP development project they have been involved with. The list of helping questions, provided prior the interview, were not necessarily asked in the interview, but they were rather aimed to inspire stories.

All interviews that were recorded were further transcribed into text format. Special attention was paid to the quality of the transcribing process. Kvale and Brinkmann (2009, p. 177) say the quality of interviews are usually considered, but often neglected with the transcriptions. Further, since the aim of this positivist research was to study what the participants say, not what they might mean, attention was paid to that in the transcribing process. Like Kvale and Brinkmann (2009, p. 178) point out, a transcript is ultimately a translation and the process produces an impoverished version of the interview.

3.6.3 Documents

Regarding data collection from documents, Goldkuhl (2019) describes that the process starts from the search after which initial screening, to determine whether the content is suitable or not, is most likely needed. Subsequently, content analysis usually requires some interpretation. The most important value documents can produce to case study research, is the ability to support the evidence collected from other sources. In case there is contradictory between the evidence from different sources, the researcher needs to take a further look into the topic. Documents are also useful for making inferences. However, those should be used more as indications for further investigation rather than definite evidence. Documents, which are useful in case studies, are, for example, administrative documents like proposals and reports, meeting minutes, e-mails and other written evidence of events. (Yin, 2014, p. 105-109.)

Documents were used as a second source of evidence. The aim was to find useful data for the main research question: How do organisations manage benefits realisation practices in post-implementation phase of ERP systems? The documents were investment proposal and final report of sales related project, introduction document of ERP implementation project, and process descriptions. The documents were used to corroborate and build on the data received from other sources, like Yin (2014, p. 107) suggests.

3.6.4 ERP system

ERP system proved to be good source of data regarding the extent of the development work conducted throughout the years. It has been noted in the literature that systems are often overlooked as source of evidence (Goldkuhl, 2019). In this case the ERP system was reviewed, and organisation specific customisations were searched. The review provided some quantitative figures to describe the level of custom development. Those are presented in detail in Chapter 4.

3.7 Analysis

Analysing the data is a challenge with case study research. This is partly due to inadequately defined techniques, but also because researchers might start a case study without clear idea how to analyse the evidence. (Yin, 2014, p. 133.) Sarker et al. (2018a) define data analysis as a process that is used to process the data in order to derive results. They point out that data analysis has important role in qualitative research since it defines the practices for writing, justifying, and evaluating the study.

Data analysis strategy can be for example deductive, inductive or interpretative. Deductive data analysis strategy uses theory as the starting point. The original proposition of the study, which led to the case in the first place, can be used as hypothetico-deductive starting point. Inductive strategy on the contrary proceeds the opposite way. Researcher can identify concepts from the data which can consequently be the starting point of the analysis. Interpretative approach may be either iterative or elaborative, but the typical reasoning is hermeneutic. (Avenier & Thomas, 2015; Sarker et al. 2018a; Yin, 2014, p. 135.) In addition to the general analytic strategies, Yin (2014, p. 142-163) further describes analytic techniques such as pattern matching, explanation building and logic models that can assist to achieve high quality analysis.

Inductive analysis strategy, which Yin (2014, p. 136) refers as working the data from the ground up, was used in the analysis. The analysis of the results started by searching for concepts and patterns by juxtaposing the collected data in matrix of themes suggested by Yin (2014, p.135). This approach helped to identify various patterns emerging from the data. Separate matrices were created for the main unit of analysis and the embedded units to distinguish variation between them and to ensure the data is analysed in correct context. The data in the matrices was coded with time stamps to ensure better chain of evidence and consequently better construct validity. Furthermore, Yin (2014, p. 55) reminds that in embedded single case study, the analysis often focuses mainly on the embedded units, failing to address the main unit of analysis. This possible pitfall was considered in the analysis and reporting.

In order to improve internal validity of this study, pattern matching as data analysis technique was used, which is also recommended by Yin (2014, p. 143). Internal

validity, according to Yin (2014, p. 47), is mostly relevant with explanatory research where the aim is to explain the causal relationship between events. In this study, internal validity was considered important as it is part of rigorous research and it also ensures the validity of inferences that were made based on the collected data. Yin (2014, p. 168) highlights that analytic strategy, such as pattern-matching, should be used to ensure high quality analysis. Pattern matching was conducted between the patterns identified from prior research, which were presented in Chapter 2.4, and with each embedded unit as well as the main unit of analysis. The results of pattern matching are reported in Chapter 4 and discussed in the context of prior literature in Chapter 5.

4. Results

The Case organisation has undergone large changes only a short while before this study. New Chief Executive Officer (CEO) was selected less than a year prior the study and organisational changes were implemented short while after that. Due to these reasons, many people and their responsibilities have changed. Moreover, new work processes have been implemented. Due to these reasons, all responsibilities were not clear to the employees and some uncertainty existed during the study.

In this chapter, the results of the key findings are presented, and the chapter is organised as follows. First, the ERP system, used at the Case organisation, is presented followed by ERP development practices and the data collected from the system. Then, the results regarding the embedded units of analysis, namely ERP development projects, are reported followed by results from the main unit of analysis, that is ERP system development in general. Further, Chapter 4.6 presents pattern matching analysis and in Chapter 4.7 the results are reflected from the research questions point of view. The last chapter covers the future aspirations of the Case organisation and Scaled Agile Framework (SAFe) which was under deployment during the study.

4.1 The ERP system in the Case organisation

The ERP system, used in the Case organisation, was Systeme, Anwendungen und Produkte in der Datenverarbeitung (SAP). To be more precise, it was SAP R/3 enterprise edition with client–server architecture. SAP has developed a new version of their ERP software called S/4HANA. This new ERP system utilise SAP HANA in-memory database solution and it can be used as on-premises or as cloud solution. SAP has ensured support to the old R/3 version till 2025, but they have extended this recently two year further. The Case organisation, as well as many other organisations around the world using SAP R/3, will eventually have to decide whether to migrate to S/4HANA or not.

Before SAP was implemented at the Case organisation, the HQ and subsidiaries had their own ERP systems in use. Due to upcoming business changes, it was decided to implement one ERP system throughout the organisation. The implementations started in 2002 and almost decade later, the HQ and all subsidiaries were using one ERP system. The implementation methodology was Accelerated SAP (ASAP) which at the time included 5 phases: project preparations, business blueprints, realisation, final preparations, and go-live and support. Although ASAP model seems to be a traditional waterfall model, the implementations were conducted in agile manner. The projects followed by enhanced support period of 3 months after which transition to continuous development phase occurred. All implementations were conducted with clear cut-off to the new system with no simultaneous use of the legacy systems. During this study, the Case organisation had some 350 SAP users around the world.

SAP R/3 is a modular ERP system. At the Case organisation, implemented modules are Sales and Distribution (SD), Financial Accounting (FI), Controlling (CO), Material Management (MM), Production Planning (PP), Quality Management (QM). Each of the modules have dedicated application specialist, at the IT department of the HQ,

responsible of the continuous development. The organisational changes had some impact on the responsibilities, but in practice, the changes have not yet impacted the everyday work at the time of this study.

The system landscape of SAP R/3 contains three clients: Development, Test and Production. ERP development, such as configurations and programming, is conducted in Development client from where the changes are transported to Test client and eventually are implemented to Production. The process at the Case organisation was distributed between different responsible persons on quality reasons. A person responsible of ERP development did not have access to transport changes to Production. Before Production implementation was done, the documentation of the development work was checked. Only if the documentation was sufficient, the implementation was done to Production client. In addition to the three-system landscape, the Case organisation had two Sandbox clients which were not connected to three-landscape system. The Sandbox clients were used to test, for example, very complex development or functionalities that might not be implemented at all. All ERP users, at the Case organisation, had access rights to Production and Test clients. Technical personnel only had access rights to Development client.

4.2 ERP development process in the Case organisation

The Case organisation has been in the continuous development phase well over 15 years, since the first SAP implementations were completed. The system development was centralised and conducted at the HQ in Finland. The development requirements can come from subsidiaries, centrally from the HQ or from the top management team. The ERP development can be anything from enabling a new freight forwarder or implementing new EU legislative requirements to integrating new sales applications. The development work can require only one person from the IT department or cooperation from several persons. Figure 2 shows the basic process regarding requirement management and ERP development.

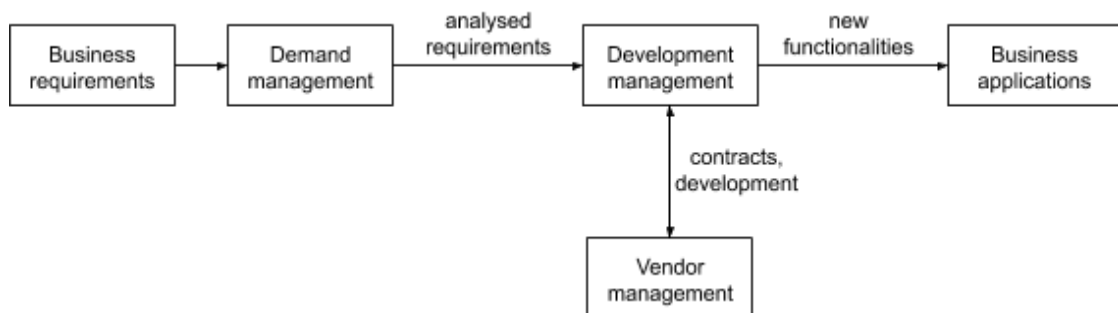


Figure 2. Diagram of the development process.

The development projects can be roughly divided into small-scale and large-scale projects. Large-scale projects require more discussion and investment proposals to be approved by the management team. However, the definition for large-scale development projects in Case organisation has varied throughout the years. Currently the rule of thumb states that if the costs are over 10 000 Euros over three-year period, the project is considered large-scale and it requires investment proposal. The business cases of the large-scale projects follow the same pattern where the background investigation is conducted including analysis of alternative solutions and justifications to demonstrate the reasons of the proposal. Usually the investment proposals are composed by IT and

business together although there has been variance in this too. The costs of these large-scale projects are followed systematically.

Most ERP system development work is conducted as small-scale development projects and is conducted whenever requested. There are no formal guidelines how benefits are managed in the small-scale projects. Small-scale development projects or development work does not require approval from management team. No costs are calculated with internal development work and therefore no cost follow up is done either. Small-scale development projects can include also external resources. In these cases, the development can be commissioned without further approvals to the level the person can approve invoices.

4.3 Data from the ERP system

ERP system was used as source of data to understand the extent the development is conducted. The system revealed that there were 1206 organisation specific programs created in the ERP system. These programs include enhancements of standard system, such as include programs of function module, and development of custom programs. There were also 157 organisation specific tables and 203 transactions developed throughout the years. It was also discovered from the ERP system that during the year 2019, 748 transport requests were created and released from Development client. The transport requests are used to transport changes from a client to another. Depending on the change, the transport request can be either automatically created or created manually by calling transport function.

4.4 ERP development projects

Altogether five embedded units of analysis were selected to this study. The projects were selected base on three main reasons, namely they needed to be recent, clearly describable and the data needed to be available. The collected data regarding the embedded units was characterised by a few underlying themes, namely business case, project management, documentation, scope creep and benefits. In the following chapters, the analysis of the key results of each five projects are reported together with pattern matching. In order to protect the anonymity of the participants, details of the projects as well as the participants who reported the details were excluded.

4.4.1 Project 1

Project 1 was a small-scale project although the costs were over the defined small project limit. Hence, the development project did not require investment approval from the management team. However, it required major changes to highly regulated business processes and due to these regulations and legal requirements, it was difficult to get approval for the project. Therefore, extensive business case was conducted by responsible people in business units. The business case revealed various new benefits that were not identified originally. All benefits were transferred to cost reduction calculations which made the arguments more solid. The well justified business case also improved the user acceptance on some parts of the changes and consequently there was less resistance towards change when the new processes were implemented. Regardless the business case, the development project encountered resistance from the IT department due to different opinions how the development should be conducted. Once

the development started, the project was managed as joint effort between IT and business, and it was considered that both contributed very well to the project.

Documentation of the system development was done at IT department. IT also documented the benefits after the development project. No unexpected benefits were identified during the project as the business case was comprehensive.

There was no systematic comparison of anticipated benefit and realised benefits, but reviews were done after the project. Since the new process with system development was initially implemented only to some functions, it was possible to compare the old and new practices. For example, reduction in work time was significant. Furthermore, figures retrieved from the ERP system, showed clear reductions. Although, it was challenging to attribute the changes to this particular project, reductions were systematically occurring after the implementation. The solution has proved to be very beneficial and further implementations have been done after the initial project. The project did not encounter expansion of scope and it was evaluated to be very successful based on the interviews.

The first theoretical pattern defined in Chapter 2.4 state systematic approach to benefits realisation improve benefits delivery of ERP development projects. Benefits anticipated form Project 1 were defined in the original project justification, namely business case. Although systematic approaches to follow the realisation were not in use in the strictest form, several elements can be identified, specifically all benefits were identified in the business case, benefits were reviewed and documented after the project and comparison between old and new processes were done. Further, ERP system was used to review various reductions of various figures which in highest probability were due to the project. In general, the project was considered to have realised variety of benefits due to which further implementation were done later. Consequently, it can be inferred that patterns identified from the empirical data match with the first theoretical pattern outlined in Chapter 2.4.

The second theoretical pattern states planning the benefits realisation has more important role in project success than merely justifying the project, it can improve the relationship of IT and business, and cooperation of stakeholders. Initially the project encountered resistance from different stakeholders and also IT department. However, once the extensive business case was created, including identified and structured benefits, and the nature of the development was agreed on, many stakeholders as well as IT were committed. Furthermore, the project was led as a joint effort between business and IT and the cooperation was considered to have worked very well. Regardless the initial resistance, the evidence indicates that the relationship between IT and business improved significantly and many stakeholders were cooperating. This can be inferred to have resulted from high level of planning due to which the goals of the project were clear for the project group and stakeholders and the they were committed to achieving them. Therefore, the second pattern can be confirmed.

Project 1 was managed as a joint effort of IT and business, due to which optimal expertise was possible to combine from both departments. The cooperation and involvement level of IT and business stakeholders, in addition to the above mentioned follow up activities, infer that the project was considered to be technical but at the same time offering significant business opportunities to realise benefits. Moreover, although no systematic follow up was done in the strictest form yet follow up was done to some extent. Therefore the activities undertaken in this project, do not support the technical emphasis nor the self-evident perspective of benefits, hence, it can be concluded that the

evidence does not support the third theoretical pattern according to which ERP development is considered as a technical project or benefits are considered so self-evident that no systematic approaches to follow the benefits realisation are in use.

In summary, no formal benefits realisation practices were used in the project. However, elements of the practices, such as identifying and structuring all benefits and examining the realised benefits to some extent after the project, can be identified from the project practices. Furthermore, after the project, benefits were documented by IT. Although no systematic comparison between anticipated and realised benefits were done, processes were compared and consequently time saving was possible to calculate. The first challenge of this project was to get approval. Due to difficulties and misunderstandings prior the project, the extensive business case was conducted. Challenges during the project were, for example, language barriers and resistance towards the development project. The extensive business case helped to guarantee benefits to some extent, for example, the stakeholders understood the justification for the project better and consequently decreased resistance and since the project management was joint effort of IT and business, optimal expertise was possible to combine from both departments. Regarding the tools and methods, the business case was documented with normal office software, technical documentation and post-project benefits documentation were done at IT department. Other than that, no particular tools or methods were used regarding benefits realisation.

4.4.2 Project 2

Project 2 was a small-scale project where the development requirement emerged from complex work process where constant problems were encountered at the HQ. Similar processes existed between the HQ and other subsidiaries, but the one, changed during Project 2, was different. In order to harmonise the processes as well as avoid the constant issues, the development project was initiated by one of the HQ business unit. No business case was formulated as the change seemed simple. However, more and more information was received along the way and the scope expanded. Consequently, the project was prolonged. The evidence suggests that commitment of various stakeholders was low and there were difficulties to get resources when needed. From project management point of view, a business case should have been composed. No formal project management practices were used during the project including meetings, where all relevant people would have been together. Proper documentation started a few months after the first discussions. The technical development work was documented by IT.

New benefits were identified during the project when the unknown business processes of the subsidiary were recognised. The emerging benefits were possible to address within the project timeframe. There was no systematic follow up of the realised benefits, but the ERP development enabled to execute business process changes. The changes were done and consequently the reasons why the development project was started in the first place, were solved. Hence, benefits were assumed to have realised. However, it was not verified if the subsidiary had changed their processes and consequently it was not known if the new benefits, identified during the project, were realised.

The first theoretical pattern describes that systematic approach to benefits realisation improve benefits delivery of ERP development projects. Project 2 was originally initiated to mitigate disbenefits, but also new benefits were identified when the local

business processes became familiar. Formal benefits realisation practices cannot really be identified from Project 2. For instance, no business case was created, only some benefits were identified initially, and no follow up activities were undertaken. Although, the business process at the HQ was changed, assuming the benefits were realised, it remained unknown if the subsidiary changed their business processes and was able to realise benefits. Hence, due to lack of systematic benefits realisation approach, the benefits of the Project 2 were difficult to identify and also, whether the benefits were realised or not, remained unknown. The empirical evidence suggests that lack of systematic approach to benefits realisation leaves the outcome uncertain suggesting further that systematic approach would improve the situation. Hence, the first pattern is confirmed.

The second theoretical pattern was defined as planning the benefits realisation has more important role in project success than merely justifying the project, it can improve the relationship of IT and business and cooperation of stakeholders. When Project 2 was initiated, the extent of development was considered small which was the reason no planning was done. However, when more information was received the scope expanded. It was reflected in the interviews that the project should have been planned better with proper pre-study. The evidence suggests that the different stakeholders were not specifically committed to the project due to which the project prolonged. Moreover, resources were not available when needed which could be attributed to low level commitment, although high workload can also explain it. Nevertheless, although no evidence revealed any particular issues in the relationships between IT and business, the evidence suggests cooperation issues were present with stakeholders. It is derived that better planning could have prevented it and therefore it is concluded that the second pattern is confirmed.

The ERP development conducted in Project 2 enabled to change business processes which was assumed to generate benefits. The business process changes were done at the HQ. Hence, benefits were assumed to have realised. Furthermore, no business case was generated nor follow up was done to see if all identified benefits were actually realised. However, no evidence in particular suggest that the project was considered particularly technical, although technical development was needed for the business process changes, but rather the benefits were considered so self-evident that no systematic approaches to benefits realisation were in needed. Based on the evidence collected during the study it is derived that the third theoretical pattern, defined as ERP development is considered as a technical project or benefits are considered so self-evident that no systematic approaches to follow the benefits realisation are in use, is confirmed on the self-evident part, but not on the technical part.

It can be concluded that no formal project management or benefits realisation practices were used during this project. The major challenges were the unknown business processes and inability to identify the level of development that was needed. Moreover, due to lack of project management practices, the project was uncontrolled. As a result of these challenges, the project scope expanded, and new benefits were identified along the way. The conducted development enabled to change the business processes, which was done at the HQ after the ERP development implementation. This was evaluated to have guaranteed the anticipated benefits were realised. However, it was not known if the process was changed at the subsidiary and thus if benefits were realised there. No tools or methods were used in benefits realisation, apart from technical documentation done at IT department.

4.4.3 Project 3

Project 3 was a small-scale project. Although this development project did not require investment approval from the management team, it required approval to initiate the development and to get allocated resources for it. The project faced difficulties to get approval from the HQ. The development proposal had been under investigation before, but no resources were granted for it. Therefore, a business case with ROI calculations was conducted by responsible subsidiary.

Although business case was conducted at the subsidiary, further studies were required as the local business processes were not documented and largely unfamiliar to the HQ personnel, both IT and business. The project was managed at IT department where the business process study was also conducted. The existing processes were documented, after which process changes were possible to suggest. As a result, the created documentation included old and new processes and the tools that were used in each stage of the process. Ultimately, the final business case included the business case conducted at the subsidiary and the study conducted by the HQ IT department. Once the process changes and the development plan were approved, it was possible to start the system development.

Unexpected benefits were identified during the project. For example, some work phases were not needed anymore. These were not anticipated, because the focus was directed so heavily on other parts of the process. No active follow up of benefits realisation was conducted, but it is known that the processes and work is smoother due process changes enabled by technical development.

The first theoretical pattern defines that systematic approach to benefits realisation improve benefits delivery of ERP development projects. In Project 3, original business case was complemented by business process reengineering and development plan conducted by the project manager from IT department. Although no actual reviews of benefits realisation were conducted, it is known that the business processes have improved. No systematic approach to benefits realisation was undertaken, but extensive planning was carried out which included elements of formal benefits realisation such as identification of benefits, structuring them and calculating return. It is derived from the evidence that systematic approach to benefits realisation improved the delivery, although no formal measuring was conducted in this project.

The second theoretical pattern state planning the benefits realisation has more important role in project success than merely justifying the project, it can improve the relationship of IT and business and cooperation of stakeholders. Originally the subsidiary, requesting the ERP development, created a business case to justify the project. However, since the project lead was assigned to IT rather than responsible business unit at the HQ, it indicates that the commitment from the HQ was not particularly high. On the other hand, the HQ business units contributed to the business process reengineering so in that sense cooperation existed. Furthermore, stakeholders at the subsidiaries were cooperative and committed. Nevertheless, no particular evidence indicate that the extensive planning conducted in the project, improved relationships or cooperation. Hence, the empirical evidence does not confirm the pattern.

According to the third pattern, ERP development is considered as a technical project or benefits are considered so self-evident that no systematic approaches to follow the benefits realisation are in use. Project 3 was managed by IT although it was mainly business process reengineering endeavour. Furthermore, the business process

reengineering itself was also managed by the IT department. Therefore, strong inference can be made that the project was considered as technical project. Although benefits realisation reviewing was not done, the efforts invested in the business case and business process reengineering suggest that benefits were not considered as self-evident. Like described above, no particular approaches were used in Project 3 to follow the benefits realisation. It was rather assumed that benefits are realised along the technical implementation and business process changes. It can be concluded that empirical evidence supports the third pattern on the technical aspect, but not on the self-evident nature.

No formal benefits realisation practices were used in the project. However, some elements of the practices, such as identifying and structuring benefits, can be identified from the project practices. The major challenges of this project were to get approval for the project and once the project was approved, to familiarise the local business practices as those were mostly unknown. The project was IT led although it was largely a business process reengineering project. The benefits were guaranteed with solid business case and development plan, although unexpected benefits were identified during the project and no actual follow up was done. Regarding the tools and methods, the business case was documented with normal office software and technical documentation IT department tools. Other than that, no particular tools and methods were used regarding benefits realisation.

4.4.4 Project 4

Project 4 was small-scale project initiated by a HQ business unit, but it involved operations of five subsidiaries. The project was started with very light requirements and no business case was established. The ERP development requirement seemed simple and quick to implement. After the project was started, more requirements were initiated by the involved subsidiaries expanding the project scope. Project manager was chosen from a HQ business unit, but no project management practices, regular meetings or project coordination were done.

Due to the expansion of the scope, the development work amount was doubled or tripled. Moreover, resources were not available when needed. Technical documentation was done by IT where the requirements were also documented when available.

New benefits were identified along the way and those were addressed during the project. Anticipated benefits were not known, but some benefits were assumed as the development enables business process changes which were conducted after the project. Some implementation remained on hold as business related obstacles were faced during the project.

The first theoretical pattern stipulates that systematic approach to benefits realisation improve benefits delivery of ERP development projects. Since no business case was created, initial benefits were not articulated to the project group and moreover benefits were merely identified along the way rather than in the original project justification, it can be derived that no systematic approaches to benefits realisation were used in this project. The benefits identified along the way were realised, although it was done with the expense of project scope. The evidence suggests that due to lack of systematic approach, the benefits delivery was largely inefficient suggesting further that systematic approach would improve the situation. Hence, the first pattern is confirmed.

According to the second theoretical pattern, planning the benefits realisation has more important role in project success than merely justifying the project, it can improve the relationship of IT and business and cooperation of stakeholders. The collected evidence indicated existing frustration towards the project due to insufficient pre-study and requirements as well as lack of project management practices. Furthermore, no anticipated benefits were articulated prior the project, but those were merely assumed based on the business process changes that were possible to conduct as a result of the ERP development. The evidence indicates general frustration in this project. Since the benefits planning would clarify, for example project goals, responsibilities and deliverables, it is derived that it would have improved the relationships and cooperation in the project. Therefore, it is concluded that the second pattern is confirmed.

Project 4 was managed by responsible business manager, but no business case was established, or benefits documented. The ERP development conducted in Project 4 enabled to change business processes. Those business process changes were executed after the implementation. Thus, benefits were assumed to have realised although no formal review was done. Nonetheless, the evidence does not particularly indicate that the project was considered specifically technical, but it rather signals that the benefits were considered so self-evident that no follow up was needed. It is therefore concluded that the third theoretical pattern, stipulating ERP development is considered as a technical project or benefits are considered so self-evident that no systematic approaches to follow the benefits realisation are in use, is confirmed concerning the self-evident nature, but not by the technical aspect.

Although project manager was chosen, no project management or benefits realisation practices were used during the project. The major challenge in this project was lack of business case, due to which requirements were unclear or unknown. Furthermore, unknown business processes at the subsidiaries caused further challenges. New benefits were therefore identified throughout the project, most of which were also addressed during the project. Benefits realisation was largely guaranteed by including new benefits into the project and addressing them simultaneously. However, this approach led to severe scope expansion. No tools or methods were used in benefits realisation, apart from technical documentation conducted by IT department.

4.4.5 Project 5

Project 5 was a large-scale project where a formal investment approval was needed. The project preceded by a business case and for example different alternative solutions were evaluated. Benefits, such as significant cost and work time reductions, improved processes with less possibilities for errors as well as ramp down of some alternative applications, were identified. The investment proposal was created in cooperation between business and IT. The investment proposal included calculations of the benefits.

Project was led by IT although there were discussions during the project whether the lead should be transferred to business. The steering group had one member from IT department and two from business units. Regular meetings were held among the project group as well as the steering group with agendas and task lists. In addition, the business units nominated dedicated resources to the project.

Extensive documentation was done for this project. In addition to the business case and investment proposal, technical documentation and project progress such as meeting memos and open issues, were documented too. However, final report of the project

stated there were some issues with the documentation. Firstly, consultants had their own documentation in their system which led to double work. Secondly, subsidiaries of the Case organisation did not use the collaboration tool where internal project progress was documented and consequently there was no visibility to the project progress.

Although the project was planned, unexpected requirements emerged during the project. These requirements were not considered in the planning phase. The final report states that the actual workload was much higher than what was the management's view. Consultants reported the changed specifications caused extra workload. On the other hand, the report also notes that the number of bugs was higher than expected. Consequently, the project costs were 20% over the estimation and go-live date was three months later than the original aim.

The project was considered successful in the final report regardless the surpassing of costs, schedule and scope. Nine months after the first implementations, the anticipated benefits have not yet been realised, but one of the project's steering group member was confident that eventually the benefits are realised. However, it was also acknowledged that it is extremely difficult to determine if the benefits are resulting from the solution or due to some other factors. Further, there was no schedule for the benefits realisation found in the documents. One of the project targets was to have usage rate of 90% in the solution, but during the interviews, the rate was significantly lower. The anticipated benefits were substantial financial savings generated, for example, from reduced work time and ramp down of alternative applications. The final report states that no user analysis was done to identify how to get them to use the solution. The anticipated benefits listed in the investment proposal were not informed to the project group. Nevertheless, information, how the new solution leads to improved business processes and reduced error rates, was shared.

There were different views whether the benefits realisation was followed after the project. One participant believed that no follow up was done, but it was confirmed in two other interviews that the usage rate, which enables some of the benefits, was followed. The low usage rate was considered problematic in the responsible business unit and efforts were made to increase it. The responsible manager reported the progress to the management team of the Case organisation.

Benefits of the investment were defined in the business case, investment proposal and final report of the project. Although, the anticipated benefits were not yet realised during this study, efforts were made to achieve the targets, which consequently can lead to realising some of the expected benefits. Moreover, one of the steering group members was confident that the benefits will be actualised eventually. Elements of more systematic approach to benefits realisation can be identified from the project, which indicates that the realisation is more likely to occur. However, since the benefits were not yet realised during this study, it is difficult to confirm the first theoretical pattern, stating systematic approach to benefits realisation improve benefits delivery of ERP development projects. Nevertheless, the evidence, such as active work to increase the usage rate, follow up of the benefits realisation and confidence of a steering group member suggest that the benefits will be achieved. Hence, the first pattern can be confirmed.

Second pattern was defined as planning the benefits realisation has more important role in project success than merely justifying the project, it can improve the relationship of IT and business and cooperation of stakeholders. Although the benefits were identified and structured at the beginning of the project, the documents revealed that the means

how to achieve the benefits were insufficient. This indicates the planning was not comprehensive. Another issue, identified from the evidence, was that the benefits were not articulated to the project group nor the stakeholders, namely users, were taken into consideration in the project. These findings support further insufficient planning. Since the benefits planning would provide the means to realise benefits and to consider stakeholders, it is derived that it would have improved the cooperation in the project. Therefore, it is concluded that the second pattern is confirmed. However, in order it to influence the relationship between IT and business, it would also be important to communicate the plan with responsible people.

Although the project lead was at IT department suggesting the project was considered as technical project, the investment proposal and original project justification was done as joint operation between business and IT. Furthermore, the reporting progression of project targets to the management team with active monitoring of the targets suggests that the project was considered to have business significance. Furthermore, the benefits realisation was not considered self-evident as some level of reviewing was conducted. Therefore, pattern stating ERP development is considered as a technical project or benefits are considered so self-evident that no systematic approaches to follow the benefits realisation are in use, is not confirmed.

Formal project management practices were used in the Project 5, but no formal benefits realisation practices. However, some elements of the benefits practices, such as identifying and structuring benefits, creating a business case, evaluating benefits at the end of the project and following the realisation, can be identified from the project practices. The challenges faced during the project were, for example, new requirements, insufficient understanding of all stakeholders which led to low usage rates, insufficient measures of the anticipated benefits which made it difficult to attribute the benefits directly to the investment, insufficient identification how to achieve the benefits and lack of schedule for the benefits realisation. On the other hand, benefits were guaranteed by various formal project management practices like creating a business case, identifying and structuring the benefits, following the project progress and the targets after the project which can help to realise some of the anticipated benefits. Regarding the tools and methods, formal project management methods were used during the project with collaboration and project management tools. Project documentation was also done with normal office software.

4.5 ERP system development

Multitude of themes were identified in connection to the main unit of analysis, ERP system development in general. These themes were further classified under overall categories to organise them in a logical way. Four main categories were generated, those being business case and analysis, project management, follow up and challenges.

The chain of evidence, which aims to improve the construct validity of the study, was considered when reporting the results. Therefore, participants were coded as follows. Participants from business units are referred as Business Participant 1 (BP1) and Business Participant (PB2), participants from IT department are IT Key participant 1 (ITK1), IT Participant 2 (ITP2), IT Participant 3 (ITP3) and IT Participant 4 (ITP4) and the management team member is referred as Management Team Member (MTM). This chapter is organised as follows. First the results of the business case and analysis category are presented followed by, project management, follow up and challenges.

4.5.1 Business case and analysis of development projects

The interviews revealed various perspectives regarding business cases and analysis of project requirements. Business cases, in which the business requirements of the needed development are analysed, were considered in many occasions to be insufficient or totally absent. Two participants, ITP2 and BP2, considered the business cases to bring more clear view to the project requirements and to improve the development process. They both agreed that business cases helped to identify the project scope and how much work and time the projects require. They have noted that due to lack of the business case, either the project scope or schedule expands beyond control. However, the question how and who should be responsible of the business case divided opinions. ITP3 stated that analysis and benefits evaluation should come from business before a project starts and IT can contribute to it by estimating workload. Yet, BP1 emphasised cooperation and reduction of unnecessary bureaucracy when initiating system development and ITK1 stretched the notion by saying that business should be able to come with very informal requirements and IT personnel should make sense of them by asking relevant questions. MTM pointed out that there will be improvements to the process. Some checkpoints, for example, will be implemented before the work is taken into development, which consequently helps the requestor to consider the request more as well as commit to it.

The documents revealed that pre-studies were conducted with large-scale projects. As a result, business cases and investment proposals, including for example analysis of alternative solutions, costs, risks and benefits, were created. However, ITK1 revealed that there was no systematic follow up of the benefits nor comparison between the intended and realised benefits. MTM responded to this by saying that the management team trusts that the proposed benefits are achieved, although the lack of monitoring is identified as a problem. BP2 said that the anticipated benefits in the investment proposal can often be optimistic so therefore follow up would be good in order to see what actually has been achieved. The final report of one project also identifies this issue. The report states that the initial planning focused mostly on the end results leaving the overall picture and details how to get there insufficient. Furthermore, documents have no planned schedule when the benefits are aimed to be realised.

Language barrier was reported by PB1 to cause substantial obstacles in some development projects. For example, if the benefits are not understood in distant subsidiaries, there can be resistance towards the intended development. BP1 continued that articulating complicated matters clearly in foreign language is also challenging and gaining the trust of the people in distant subsidiaries was also reported to be difficult, but once the trust is gained, it is easy to keep it.

Identifying different levels of benefits depend, according to the interviews, on the project. BP1 said, in some projects, benefits are identified on many levels, such as individual, team or organisational levels. ITK1 confirms this view. However, ITP4 has not seen distinguished benefits anywhere in writing. MTM contributed to this matter by pointing out that instead of measuring benefits on every development project, the measuring could be done on organisational level by using Key Performance Indicator (KPI). MTM continued that if measuring is done on several levels, there will be overlapping in measuring and reporting.

Based on the interviews, the identified benefits can be financial or non-financial. The overall perception in the interviews were that both are identified, but ITP3 pointed out

that in the end everything ends up with money. ITK1 confirmed this by saying that all benefits in investment proposals should be converted into financial terms, even the ones that first seem non-financial. MTM acknowledged that both are suitable, but they need to be numeric in order to be measurable:

“Somehow it [benefit] needs to be measurable. If it cannot be converted into numbers or measured, is it a benefit or opinion?”

ITP4 and BP2 agreed that both are probably considered, however, they have not seen any calculations or analysis regarding justification of ERP development projects.

It became apparent from the interviews that the intended benefits are not always clear to the people involved in the projects. ITP2 assumed what benefits a development project might seek to establish. However, ITP2 also pointed out that in order to do their job better, it would be good to know the background and why the development is needed. ITP4 confirmed that it often remains unclear what benefits the development actually provides. On the other hand, ITP3 acknowledged to have received feedback every now and then regarding the realised benefits, although those are not measured. Further, BP1 aimed to provide feedback of the realised benefits when possible. The reason for that was to improve the visibility and to demonstrate that the solutions were used and those were beneficial. BP2 has identified that it is an issue if people involved do not know the whole picture of the development project. Consequently, for example, the importance of schedule can remain unclear. BP2 further said that if the aim is to reduce costs, the calculations should be available to the people involved. ITK1 provided different viewpoint to the matter by saying that IT personnel should consider on their own if they are happy with the developed solution and also request feedback from the users to evaluate the work. ITK1 also highlighted that in international context benefits may vary very much from one subsidiary to another. Consequently, according to ITK1, this poses a conflict to the benefits evaluation. In general, knowing the intended benefits, would make own work seem more valuable was confirmed in several interviews (ITP2, ITP3 and ITP4). MTM acknowledged that it is a problem as everybody should be able to do work that feels valuable. Furthermore, documents show that large-scale projects in particular have clear intended benefits listed. Hence, the information is available.

4.5.2 Project management

Project management practices during the development projects vary quite much based on the collected evidence. Documents show that large-scale projects have dedicated project managers, steering groups and business might also have dedicated resources. Furthermore, meetings are organised regularly. However, according to ITK1 there is a general management issue due to which many solutions do not have owners. According to ITK1, development projects might be initiated, but those are not necessarily followed through. Consequently, matters get scattered and forgotten. ITK1 identified this as a problem, but also acknowledged that it was not considered as a big problem in the Case organisation as efforts were not made to solve it. Based on the interviews, this issue is visible to both, IT and business, as ITP3 and BP2 also reported the unclarity regarding solution owners. BP2 pointed out that more organised project management could improve this as well as benefits management as the big picture would be clearer from the start of the projects. ITP2 added to this subject by saying that even though project manager would be assigned in small-scale development projects, it does not guarantee that the projects are actually managed. According to MTM, efforts will be made to improve the situation by enhancing reproducibility of project management. The goal is,

according to MTM, that project methods do not depend on the people involved and consequently there should be very little variance between the projects. BP1 raised also different view to the issues in development projects, namely cooperation. It was BP1's view that often IT personnel considered ERP system as separate from the business. Further, BP1 pointed out that in addition to the more systematic approach to the development projects, cooperation between IT and business also needs to improve.

ITP2 reported that scope creeps, meaning more requirements are introduced during projects and consequently the scope expands, often occur with all size of ERP development projects. As a result, ITP2 stated, the work amount can double or triple during the projects. According to PB2 this situation occurs, for example, when the work amount is originally estimated low and information about the big picture is received a bit by a bit. The phenomenon is also visible in the documents of large-scale projects as the costs and schedule are followed. ITK1 anticipated, that ongoing improvements in IT department will bring solution to this. New framework, which was under deployment during the interviews, helps to split the work into smaller pieces and only known matters are agreed on, ITK1 specified. Consequently, ITK1 continued, if new requirements are introduced during the project, those are handled as new matters and scheduled as such.

4.3.3 Follow up

Benefits follow up was discussed in all interviews. BP2 confirmed that the benefits are often visible in the normal work and BP1 made efforts to show every now and then how beneficial a development was. However, all IT participants reported that only low level of active follow up on benefits realisation existed. ITP3 and ITP4 informed that the work hours of development projects are followed on IT side, but those are not compared against the benefits nor it is evaluated if the work was even useful. ITP2 acknowledged that it is possible to see from the system that for example automations are running. ITK1 reported, although benefits realisation is not actively followed, in projects, where proper final meetings are held, the solution is reviewed to see if the outcome enables the benefits, in other words, if the solution work as needed or if some parts were left out. Large-scale projects have final reports, where the benefits are listed. However, the benefits might not be realised at that point. MTM contributed to the matter by saying that new investment proposal process, which was not yet in use during the interviews, has compulsory follow up practices for investments over a certain limit. Nevertheless, MTM continued, there are other more acute issues to solve, like resource interdependence in investment projects.

In general, the difficulties in benefits follow up, according to ITK1, was that when they are tightly converted to Euros, it can be difficult to measure them afterwards. For example, if a benefit is defined as certain amount of more sales per customer visit, it is difficult to determine if the increase in sales was due to the developed solution and not, for example, marketing campaign. Hence, ITK1 continued, it is difficult to attribute the realised benefits to a specific reason. According to ITP3 the issue is that benefits are not measured. Consequently, ITK1 suggested that it would be good to agree right in the beginning of a project what should be followed. BP2 stated that project management in the Case organisation should be improved a lot. However, when there is no sufficient follow up, according to ITP2, it enables not to take the developed solutions into use at all. In that case, ITP2 continued, the benefits are zero.

The collected evidence revealed there are unused solutions. ITP2 and ITP3 confirmed, there are solutions that have not taken into use or the usage rate is very minimal. In addition, the ERP system revealed that there are several years old transport requests regarding a certain solution, but the solution is not released to ERP Production. ITK1 agreed that from organisational point of view this is a problem. However, ITK1 also acknowledged that if the situation has changed so much that the solution does not serve its purpose, there is no point to take it into use. However, ITK1 continued, if it would be useful and still not taken into use for some reason, it should be pushed. MTM addressed this matter from different point of view by saying:

“I do not see this as a big problem, because some development projects fail. Development specifications should state the measures of success. In case those are not achieved, even with boost attempts, the solution should be ramped down. It is ok to fail, but that needs to be recognised.”

The follow up and pushing the solutions into use should be done by all people involved in the projects, in ITK1 and ITP4’s opinion. ITK1 continued that even IT could push the solutions, but there needs to be pull from business side.

4.5.4 Challenges

The interview with ITK1 revealed that ERP development in the Case organisation is done typically only if someone requests for it. No active work is done to see if subsidiaries need help with identifying benefits. ITK1 acknowledged that it is quite possible that old practices, introduced in system implementation phase, are still in use. This assumption was confirmed in several interviews where participants reported to have encountered these old practices in recent development projects. ITP2 reported that a distant subsidiary had very manual processes in use. ITP3 had encountered similar situation, but the practices were patched further with Excels. Furthermore, BP2 reported to have encountered additional manual Excel process outside ERP system. The participants reported that these processes were improved, or at least possibilities to improve the processes were implemented to the system, during the projects. However, BP2 pointed out that they cannot know if the excess process outside the ERP system is still used or if the improved process in ERP system is followed.

Since the organisation wide ERP system has been in use for so many years, according to ITP3, the local processes in subsidiaries can be unknown, especially if not documented anywhere. The interviews with ITP2, ITP3 and PB2 revealed that when developing ERP solutions in these circumstances, new benefits are likely to occur during the project. All three confirmed that in recent projects new benefits were identified. These were not possible to anticipate before, as the local work processes were unknown.

It was discovered in the interviews that the ERP development and consequently benefits realisation faces also another type of challenge, namely personification. The existence of this phenomenon at Case organisation was reported by participants on IT as well as business side. BP1 discussed the issue of insufficient processes which enables personal aspects to influence the development work. More precisely, job descriptions on business side do not state what is required from businesspeople regarding system development and lack of mutual standards on IT side impacts how development projects are accepted. On the other hand, MTM is aware of an issue that personal interests of business stakeholders direct the development projects which is not necessarily beneficial on organisational level. Further, ITK1 reported that since the work is very personified,

when people leave the organisation, some solutions are forgotten, or they just slowly dry out. In ITK1's opinion, this is because people have different interests.

4.6 Pattern matching

The theoretical basis of this study was built on conceptualisation of the prior research presented in the Chapter 2. The aim of pattern matching was to compare empirical evidence with the theoretical patterns and consequently improve the internal validity of this study. The theories were transformed into following three patterns:

1. Systematic approach to benefits realisation improves benefits delivery of ERP development projects.
2. Planning the benefits realisation has more important role in project success than merely justifying the project, it can improve the relationship of IT and business and cooperation of stakeholders.
3. ERP development is considered as a technical project or benefits are considered so self-evident that no systematic approaches to follow the benefits realisation are in use.

The evidence collected in this study has revealed various aspects regarding the theoretical patterns. Many of them were analysed in Chapter 4.4 where data regarding embedded units of analysis were covered. However, some overall themes were also identified from the data. The data revealed that the members of project groups wish more focus on conduction of robust business cases and analyse the business requirements before development projects. This was considered to clarify the big picture and providing clear goals. In general, the lack of formal approaches to project management was considered defective by both, IT and business, which was further complicated by unclear roles. Furthermore, in some cases solutions did not have owners due to which projects were initiated but not necessarily followed through. It was also reported that sometimes developed solutions were not taken into use at all. The evidence therefore seems to support the first theoretical pattern. However, it was also seen important that unnecessary bureaucracy should be reduced, and it was even suggested that business should be able to provide only limited requirements and IT personnel should make sense of them by asking relevant questions. Moreover, the lack of coherent project management practices and insufficient benefits follow up were acknowledged or even identified as problematic by the management, but since no corrective measures have been taken, it can be inferred that largely the issues are not considered as significant. Although, it can be derived from the evidence that no systematic approaches are used to ensure benefits realisation, there seem to be differing views if it is a problem or not, and to what extent. The current practices are seen largely unsatisfactory, but at the same time no systematic efforts have been made to change the practices.

The study also revealed that the identified benefits are either not measured or even when measured, it is very difficult to attribute the realised benefits to a specific development projects suggesting the measurement techniques are not suitable. It was further pointed out that perhaps the measuring should be done on organisational level rather than on each project to avoid overlapping in measuring and reporting. Nevertheless, it was considered widely that in order to have sense of valuable work that has meaning, it is important to know if the ERP system development was beneficial. This in turn can increase overall job satisfaction. Furthermore, the evidence suggested that transparency was valued. This extended from the project justification and anticipated benefits to

project progress and the actual outcome. Although it was also acknowledged that benefits vary, meaning one subsidiary might consider a system development beneficial whereas other one not, regardless of that, understanding the reasoning behind development requirements and also understanding the big picture was valued high. It is drawn from this that the transparency was considered to improve this. Although there is evidence suggesting that in many respect, the current practices for realising benefits from ERP development in the Case organisation are sufficient, there are significantly more evidence to support the first theoretical pattern stating systematic approach to benefits realisation improve benefits delivery of ERP development projects. Therefore, it is concluded that the first theoretical pattern is confirmed.

Regarding the second theoretical pattern, much of the same arguments as presented above, can be used to justify the significance of benefits planning. For example, a robust business case and analysis of the business requirements, conducted before development projects, clarify the big picture and provide clear goals. Further, transparency of the benefits and the project goals were valued high. Also, unclear roles were considered to produce unclear projects. The evidence further suggested that measuring the benefits in general was considered important, because then the benefits are more than just matter of opinions. Overall, the project planning and management was considered beneficial to project success. Since both, IT and business, shared these views, it can be derived that planning benefits realisation to ensure better project success, would improve the relationship of IT and business, as largely, it would eliminate general unclarity, make the goals and roles more clear, and improve the job satisfaction. Also, since the Case organisation have many overseas subsidiaries using the same ERP system, often ERP development projects concern multiple sites involving stakeholders with various interests. The evidence suggests that due to insufficient planning, often the stakeholders might not be interested in the developed solutions, consequently leaving the usage rates low or their requirements can even put the project on hold. Based on the evidence, it is inferred that planning the benefit realisation would improve the cooperation of the stakeholders. Consequently, the variety of evidence suggest that the second theoretical pattern can be confirmed.

The collected evidence suggests that in addition to large-scale projects, also projects that encounter initial resistance and consequently need to be justify better, have more systematically defined benefits. Furthermore, the evidence indicates that in these cases, also the benefits realisation is followed in more organised manner. However, most of the ERP development projects are small-scale projects requiring very little, or not at all, justification, business cases, requirements analysis, formal project management or follow up. The collected data suggests that these projects are considered so small-scale that no formal or systematic practices are needed. However, it was also identified that due to this approach, the scope or schedule of the projects often expand due to increasing requirements and emerging benefits. Since these insufficient practices are, based on collected evidence, so common, it indicates that the development is largely considered as a technical project, in which the responsibility of asking relevant questions is handed over to IT department, or the benefits are considered so self-evident, that those are assumed to be realised once the system development is implemented without particular follow up actions. It is concluded that the third theoretical pattern is confirmed on both grounds.

In summary, the results of the pattern matching revealed that there was dispersion between different projects and in ERP development in general. The summary of the pattern matching can be found in Table 6. The first pattern was confirmed in all projects

and also in the context of main unit of analysis. Although evidence existed to both, refute and corroborate, the first theoretical pattern, it can be concluded that significantly more evidence verifies that systematic approach to benefits realisation improve benefits delivery of ERP development projects.

The second pattern, stating planning the benefits realisation has more important role in project success than merely justifying the project, it can improve the relationship of IT and business and cooperation of stakeholders, was refuted only in one project. In that project, extensive planning was conducted, but no particular evidence indicated, it would have improved relationships between IT and business or stakeholder cooperation. However, evidence regarding the rest of embedded units as well as the main unit of analysis suggested, the planning has significant role in relationships and cooperation. Therefore, the second pattern can be confirmed.

The third pattern inflicted the most dispersion. The data suggested that in well planned projects, the benefits realisation was not considered self-evident nor the projects were considered purely technical endeavours as active approach from business was evident. Consequently, it can be seen that more systematic approaches to follow the benefits realisation were used. The rest of the embedded units were evidently considered either as technical or the benefits were perceived so self-evident that no particular actions were needed to follow the benefits realisation. In the context of main unit of analysis, there were substantial evidence, that in most projects the responsibility is readily handed over to IT, suggesting the projects are considered merely technical, or the benefits were considered to be so self-evident that no particular actions were needed to realise the benefits. Based on the evidence, in most cases the third pattern applied, which is why it is also confirmed.

Table 6. Summary of pattern matching of embedded units of analysis.

	Project 1	Project 2	Project 3	Project 4	Project 5	ERP development
Pattern 1	Confirmed	Confirmed	Confirmed	Confirmed	Confirmed	Confirmed
Pattern 2	Confirmed	Confirmed	Not confirmed	Confirmed	Confirmed	Confirmed
Pattern 3 Technical	Not confirmed	Not confirmed	Confirmed	Not confirmed	Not confirmed	Confirmed
Pattern 3 Self-evident	Not confirmed	Confirmed	No confirmed	Confirmed	Not Confirmed	Confirmed

The pattern matching between the empirical evidence and the theoretical patterns increased the internal validity of this study. The implications of the pattern matching are further presented in Chapter 5 where the contributions of this study are discussed in context of existing literature.

4.7 Reflecting results in the light of research questions

In general, there were no systematic approaches to manage benefits realisation in post-implementation development of the ERP system in the Case organisation. At least not in the strictest form. In some projects, like described in the previous chapters, more formal

project management practices were used and consequently more elements from benefits realisation practices were possible to identified. In general, business cases, with identified benefits or ROI calculations, were created if the project encountered resistance and justifications were needed (Project 1 & Project 3) or if investment approval from the management team was required (Project 5). However, mainly projects were initiated without business cases, justification or defined benefits. The general view of both, IT and business, was that the current practices were not sufficient, but it can be derived that it is not considered as a big problem, because no notable actions have been implemented to change the situation. As a result of the current practices regarding insufficient or completely absent business cases and benefits planning, the intended benefits and the aim of the development projects remained largely unclear. Furthermore, new benefits were identified along the way and realised ad hoc, which resulted project scope, schedule or costs to expand (Project 2, Project 4 & Project 5). When benefits were identified, both financial and non-financial benefits as well as different levels of benefits were captured where applicable. In large-scale projects, the benefits were converted into financial form. However, systematic follow up was largely missing, although in some projects, follow up to some extent was done (Project 1 & Project 5). The evidence suggested that often the benefits were seen self-evident making the follow up actions unnecessary. For example, if a development project enabled to change business process, it was merely assumed the benefits will be realised after the business process was changed. On the other hand, projects were readily handed over to the IT suggesting the development projects were considered as technical projects.

There were various challenges regarding benefits realisation in post-implementation ERP system development at the Case organisation, namely resistance and insufficient understanding of stakeholders, varying interest of the subsidiaries, language barriers, unknown business processes, insufficient or absent business cases, new emerging requirements, uncontrolled identification and realisation of emerging benefits, insufficient measures of the anticipated benefits, insufficient identification how to achieve the benefits, and lack of schedule for the realisation, hence, some solutions were not used. Furthermore, it was identified that often the projects were directed by personal interests and the anticipated benefits were not articulated to the project group, resulting the projects were unclear, project group was not able to contribute to the benefits realisation efficiently and it was not clear if the development was even beneficial. Furthermore, to some extent the projects were managed by IT although the main focus of the project was on reengineering business processes (Project 3) or technology was otherwise only a partial element of the project (Project 5). One major challenge emerged from the management of ERP development. The ERP development was conducted at the HQ largely on request of business units. The evidence revealed, no systematic benefits identification was done at the subsidiaries and therefore old, often manual processes, were in use. Due to lack of centralised evaluation to identify potential for further benefits, the process overlooks the inabilities of the subsidiaries to identify new benefits on their own. Consequently, the ERP system might not be in its full potential.

On the other hand, there were many practices that helped to guarantee the benefits realisation. For example, formal project management practices were used in some projects and business cases were created even more often. Consequently, these practices improved stakeholders' understanding of the justification and intended benefits, and thus improved the cooperation. In some cases, the benefits were followed or identified after the projects (Project 1, Project 3 & Project 5). Further, when new, emerging benefits were identified those were addressed and often included to the project which on the

other hand enabled the realisation, but consequently the scope, schedule and even budget expanded. There was also evidence that if the development project was managed as joint effort between business and IT, the optimal outcome was received (Project 1).

Regarding the tools and methods, formal project management methods, at least to some extent, were used in some project with regular meeting practices, project progress monitoring assisted by collaboration and project management tools. Project documentation was done with normal office software and the technical documentation was done by IT with specific tools. No formal benefits realisation practices were used at the Case organisation.

4.8 Improvements and SAFe

The interviews in general revealed that the benefits realisation regarding ERP development in post-implementation phase should be improved in the Case organisation. Comments from business participants emphasised cooperation and better project management:

“Forget bureaucracy and work together towards mutual goals. Perhaps the mutual goals are often missing. It would make the work more efficient.”

“More organised approach towards project management. I think more consideration right from the beginning and commitment from the management team. They after all need to consider and prioritise big things. Perhaps the benefits would emerge when the big picture would be more clear right in the beginning, what is wanted and why. The why is consequently linked with the benefits.”

Views of IT participants focused more on follow up and measuring:

“There is lots to improve. Those [benefits] are not systematically followed to see if the intended benefit points are realised.”

“It [lack of follow up] is acknowledged, at least I have acknowledged it as a shortcoming. Not necessarily as a problem, but in my view, something definitely should be done.”

“From the measured results of project work, efficiency and benefits, in my view, should be possible to drill down to the reasons why benefits were not received. Or why something was not finished. Concrete reasons are needed in order to improve operations or to see what kind of development is not worth to do, where not to invest time.”

The IT department of the Case organisation was in process to take SAFe into use at the time of the interviews. MTM discussed that only some parts of the framework, namely Develop on Cadence, which is paced development scheduling, has been taken into use and the maturity of SAFe was still low in the IT department. All IT participants perceived the framework as positive development of IT processes although it was considered to measure mainly IT performance rather than the actual benefits of the development work. MTM continued to explain that the entire framework is based on value creation and once the capabilities and experience of the framework increases at the Case organisation, the work processes will become value directed.

In the opinion of ITK1, the previous project management practices regarding small-scale development projects have not been sufficient and SAFe could bring clarity to that by splitting the work into smaller pieces and promising only the known requirements. Consequently, additional requirements would be handled as new requirements and scheduled accordingly. ITP2 and ITP4 hoped that the framework would improve the development processes, follow up and benefits realisation. ITP3 anticipated that more analysis will be done regarding the development requirements, although at the time of the interview, the analysis was not yet done by business. In general, the IT participants were hopeful towards the framework and the benefits it would bring to the system development.

Business participants reported to know very little about SAFe. BP1 stated that terms, such as increments and sprints, are used by the IT personnel, but the meaning has not been explained. The unknown framework was considered to add complexity:

“Development should be for us, for the process, the increments and such.”

BP2 has requested and received training on the framework to better understand where the Case organisation is heading. BP2 anticipated that the framework might improve development projects and speed them up as often those prolong. On the other hand, the strict planning of 10-week increments was seen complex as all development work is not possible to plan.

MTM explained, the intended aim of SAFe in the Case organisation. The intention was to review, based on some priorities, all development requests. The review aims to establish if the intended benefits are reasonable. After consensus about the benefits is established, analysis is conducted to evaluate what is required to realise those benefits. Consequently, technical solution is formed after which it is either discarded or approved to the actual backlog. MTM explained that typically there is a lean business case behind the development requirements where business benefits are defined. MTM concludes:

“I dare to claim that this [SAFe] is truly value directed, but we do not exploit it like that yet. We are not quite there yet.”

In an ideal situation, according to MTM, the entire Case organisation would be in the same cycle and function under the same principles. It would improve the cooperation:

“After all, the fact is that for example testing and spec phases require input from business and IT. If resources are not available on both sides at the same time, either party needs to wait and that is waste.”

SAFe was also hoped to bring transparency to the development projects in general. ITK1 pointed out that the use of this framework brings wider audience to the development projects and MTM specified that when the planning sessions, where requirements are reviewed, would be open for all, it would improve internal communication which was challenging in the Case organisation. MTM concluded that majority of challenges in the Case organisation would be possible to fix, if not entirely, at least partly by better internal communication.

In summary, SAFe seems to address many of the issues identified in the interviews regarding the current practices, such as insufficient requirements, business cases and project justification. Further, it can provide coherence and transparency to development projects. However, some issues should be considered regardless the new framework.

Firstly, the business participants had some concerns regarding the new framework, which should be addressed in order to ensure good relationships and cooperation between IT and business. Furthermore, the usage of the SAFe alone does not address the complexity of the ERP development projects. For example, the local business processes and workarounds can remain still largely unknown before a project start although business requirements would be better planned at the HQ. Also, the varying benefits of different subsidiaries and requirements of variety stakeholders still exists and affect the development projects. Consequently, the emerging requirements and issues can cause project scope, schedule or budget to expand, if not considered properly.

5. Discussion and Implications

This study has addressed the topic of benefits realisation in post-implementation development of ERP system. The data collected during the case study has revealed various aspects relevant to this topic. It was confirmed that systematic approach to benefits realisation with solid business case and benefits plan, not only improve benefits delivery from ERP development projects, but also improve the relationships of IT and business, and cooperation of stakeholders. This study has further revealed that systematic approach and solid planning of benefits realisation improves project success by preventing expansion of scope, schedule and budget, increasing transparency and ultimately improving job satisfaction whereas poor practices result that projects are confusing and IT does not know to what extent the solutions they have developed, are beneficial. It was also confirmed that often ERP development was considered either as a technical project or the benefits were seen so self-evident that systematic approaches to follow the benefits realisation were not used. Although variance existed depending on the project size, the insufficient follow up practices ultimately enabled to develop solutions, which would be beneficial, but for one reason or another, are not taken into use. In those cases, the benefits are zero.

In addition to the above findings, this study revealed some noteworthy implications relevant in context of post-implementation development of ERP systems. It was identified that due to the long lifecycle of the ERP system in multinational context, new types of challenges emerge. Old or evolved business processes might be in use which are unfamiliar to the IT and HQ business units responsible for ERP development projects. This is complicated further by workarounds that might occur outside ERP system making them invisible. Also, the subsidiaries might not be able to identify new benefits on their own and furthermore, the benefits vary between subsidiaries.

These themes, identified in this study, are discussed further in this chapter. In Chapter 5.1 the findings are discussed in the context of prior literature. It is argued that this study has revealed some causal relations which provide insight to the research in the area of post-implementation development of ERP systems. In Chapter 5.2 the research questions are answered, in Chapter 5.3 the theoretical implications are made to explained how this research contribute to the existing knowledge of the subject providing some suggestions for further research, in Chapter 5.4 practical implications of this study are presented, Chapter 5.5 summarises the key findings of this study and finally Chapter 5.6 covers the limitations.

5.1 Discussion

In order to ensure internal validity of this study, pattern matching, which is the most advisable analytical technique recommended by Yin (2014, p. 143), was used. The collected data revealed evidence on both accounts, to refute and confirm the theoretical patterns defined in Chapter 2.4, but after thorough analysis in Chapter 5, it was concluded that considerably more evidence supported the patterns rather than refuted them. In this chapter, the findings are discussed through the lenses of the theoretical patterns defined in Chapter 2.4.

The data collected from the Case organisation revealed that often business cases or analysis regarding ERP development as well as identification and communication of the anticipated benefits were considered to be insufficient or those were not done at all. Business cases and project justifications were conducted more regularly with large-scale projects where project success, namely costs, scope and schedule, were followed. However, systematic follow up of the benefits was mostly not done, although some review practices were identified. These findings are largely in line with the literature. According to Hesselmann and Mohan (2014) organisations often lack methodological standards for benefits realisation and Ashurst et al. (2008) believe benefits realisation practices are often ignored in organisations. Peppard et al. (2007) further point out that the lack of benefits reviews enables to overstate the benefits which was also recognised by the participants of the Case organisation. The lack of business case was also considered in the Case organisation to cause either the project scope or schedule to expand beyond control. Furthermore, the lack of proper project management practices was seen to cause further issues in the ERP development projects. Badewi and Shehab (2016) argue that the role of project management in realising ERP benefits is critical although that alone does not guarantee benefits realisation. Zwikael et al. (2018) suggest that clear target benefits can help to clarify the project management targets and consequently improve project performance.

The evidence collected from the Case organisation also revealed that business cases were regarded important as those were considered to clarify the big picture, provide clear goals and generally concretise the requirements. However, often business cases, referred at the Case organisation also as pre-studies, were not created at all, leaving the goals and reasoning unclear. In addition to the confusion in the projects, the lack of business cases led further to other issues. For example, at the time of the interviews, one project was on hold due to unidentified business requirements which consequently blocked the remaining implementations. Regardless all identified issues at the Case organisation concerning insufficient business cases or project planning, the evidence revealed that the management team of the Case organisation trusts that the anticipated benefits are realised. Johansson et al. (2016) identified the same pattern by discovering that often organisations do not follow the exact return on the investments, but rather rely that the anticipated benefits are received without follow up.

It was discovered from the evidence that when benefits are identified and measured, it is very difficult to attribute the realised benefits to a specific development project. This in turn suggests the measurement techniques are not optimal. Ward and Daniel (2012, p. 135) advice that measures should be relevant to the benefits themselves and also to the changes required to achieve them. They continue, this way it is possible to attribute the improvements to the conducted development. It was further pointed out in the interviews that perhaps the measuring should be done on organisational level rather than evaluate each project. This would avoid overlapping in measuring and reporting. However, the interviews revealed that it is important to know if the development project was beneficial. That in turn provides sense of meaning in the work and it further can increase overall job satisfaction. This aspect is largely overlooked in the literature. Ward and Daniel (2012, p. 6) identified that organisations, succeeding in IS investments, have more benefits related to themes, such as collaboration, knowledge sharing and individual job satisfaction, defined in the investment proposal. Nevertheless, based on the findings of this study, the systematic approach to benefits realisation would impact on the job satisfaction of the project group and stakeholders.

Although evidence, collected in this study, suggested that to some extent, the current practices for realising benefits from ERP development in the Case organisation were considered sufficient. There was considerably more evidence supporting the first theoretical pattern stating systematic approach to benefits realisation improve benefits delivery of ERP development projects. This was evident in the projects where more systematic approaches were used, but also in the dissatisfaction of the participants towards the current practices.

Careful planning has significant role in successful outcome of projects. This has been confirmed by many successful and failed projects. Furthermore, the larger the change is, the more prominent role the planning has. (Ward & Daniel, 2012, p. 234.) Based on the evidence collected in this study, planning was often neglected at the Case organisation and projects were started with very minimal requirements, although also exceptions were identified. Regardless the actual practices, the empirical data confirmed that benefits planning was evaluated important by the participants. For instance, a solid business case and analysis of the business requirements, were considered to clarify the big picture and provide clear goals. Moreover, transparency of the anticipated benefits and the project goals were valued high. The evidence further verified that planning benefits realisation, improved relationships between IT and business and also cooperation of stakeholders. This is also largely in line with the prior literature (Peppard et al., 2007; Ward & Daniel, 2012, p. 234).

Good relationships between IT and business leads to clearer understanding how mutual knowledge of the entire project group can cause the development projects to either succeed or fail (Ward & Daniel, 2012, pp. 83-84). This in turn suggests that the anticipated benefits should be shared among the people involved in the projects. However, the evidence collected in this study revealed that this was often neglected resulting confusion in the projects. The collected evidence in general indicated that both, business and IT, hoped for good relationships and cooperation in the projects. It is therefore inferred that improved relationships and cooperation could be achieved with better planning, transparency and articulating the anticipated benefits to the project group better. Precisely as it was verified in this study, planning the benefits realisation has more important role in project success than merely justifying the project, it can improve the relationships of IT and business and cooperation of stakeholders. The evidence in general suggested that more formal benefits realisation practices, do not only by improve the level of achieved benefits, but also improves employees' satisfaction in the projects. Osnes et al. (2018) identified from the literature that in order to succeed in post-implementation ERP development project, the project team should be able to communicate the main targets. Therefore, it is argued, knowing the targets and the benefits is critical for project success.

Regarding the benefits realisation plan, Ward and Daniel (2012, p. 71) emphasise the importance of ownership of each benefit, which needs to be established with measuring criteria. The collected data in this case study revealed that this is evaluated important also at the Case organisation. The participants pointed out that when benefits are measurable, it would be possible to identify why some benefits are not achievable and thus learn from them. It was also pointed out that immeasurable benefits are merely opinions. Nevertheless, the Case organisation did not have formal tools or practices to define owners or set measuring criteria which can be the reason why the IT department participants did not generally know to what extent the solutions they have developed, were beneficial.

This study revealed various challenges at the Case organisation regarding the benefits follow up. Johansson et al. (2016) identified that one common explanation of absent follow up practices is that organisations claim just to know if the implemented projects are successful. This was also seen in the evidence collected during the study. The benefits were considered to be evident in the ERP system and in adjusted business processes after ERP development was implemented. It was also identified in this study that projects can be sold to the management with end results leaving the means how to get there insufficient. These types of practices were also identified by prior literature. Ashurst et al. (2008) observed that although project aims were articulated, explicit discussion of how strategic aims would be realised was lacking and Johansson et al. (2016) discovered that business cases are used to sell the investment to the management after which organisations do not follow if returns are received. Ward and Daniel (2012, p. 204) highlight that the benefits realisation plan, provides those means to realise the anticipated benefits. Therefore, this study implicates that advantages are received if more practical approaches including benefits plan is implemented.

The empirical evidence confirmed two major reasons for the insufficient follow up practices. The projects were either considered merely technical endeavours or the benefits were considered so self-evident that no formal follow up was required. Ashurst et al. (2008) point out that typically the focus of IS projects is on the delivery of the technical solutions, rather than ensuring benefits from the investment where as Haddara and Päiväranta (2011) have identified that the explanation for insufficient follow up procedures is the self-evident nature of ERP system benefits. However, this matter inflicted variance in the evidence. In some projects more follow up was done, suggesting the matter is more multifaceted than first appeared. One explanation of the varying follow up practices is the magnitude of the projects. Based on the evidence, larger projects had more systematic project management practices including monitoring the benefits realisation more systematically. Other reason explaining variance between projects was personification. This phenomenon was evident to both, IT and business, and it was identified in many contexts. For example, personal interests influenced which projects were carried out, how development projects were accepted at IT department and how the benefits realisation was ensured. Influence of personality of managers along with management style, have been identified by Osnes et al. (2018) to influence the approach and duration on ERP implementation. Similarly Ward and Daniel (2012, p. 177) reveal that stakeholders' perception of personal benefits or disbenefits can influence the project scope. Hence, literature acknowledge the issue of personification to some extent. However, in this study, it was revealed that personification can have significant influence on various aspects of ERP development projects.

The insufficient follow up practices at the Case organisation have also led to the situation that all developed solutions are not necessarily taken into use. The participants pointed out that in those cases the benefits are zero. It was acknowledged, that some development projects fail or due to changed circumstances the developed solution might not serve its purposes anymore. Nevertheless, this was still mostly considered as a problem. The prior literature has not really addressed this issue in full. Ward and Daniel (2012, p. 1) recognise the failing IS projects and Ashurst et al. (2008) explain that successful IT solutions do not alone guarantee meaningful business benefits. However, the literature has not identified the issue, resulting from insufficient benefits realisation practices, which in turn enables to develop solutions that would be beneficial, but for one reason or another, are not taken into use.

The Case organisation had several subsidiaries using the same ERP system. The ERP development projects often extends to multiple sites involving stakeholders with various interests. The evidence revealed, that due to insufficient planning, the stakeholders can have low interest towards the developed solution. According to Ward and Daniel (2012, p. 4), the stakeholders might even pursue conflicting goals, which in turn can waste time and resources, if they do not understand why a development project is needed. Ward and Daniel (2012, p. 4) continue that consequently it can lead to unsuccessful benefits realisation. The varying benefits of different subsidiaries were acknowledged at the Case organisation. The study further revealed that this has caused issues at the Case organisation which further highlights the importance of planning. Like the literature suggests, planning the benefits realisation and creating robust business case increases stakeholders' commitment and cooperation (Ward & Daniel, 2012, p. 234).

The evidence revealed that the international aspect poses further challenges in the Case organisation. It was identified that language barriers can cause issues with the development projects, which is further complicated by the fact that benefits can vary from one subsidiary to another. According to the collected evidence in this study, language barrier can cause substantial obstacles in some development projects. If the benefits are not understood, there can be resistance towards the intended development. This was also identified by Osnes et al. (2018), who further point out that when overseas subsidiaries, are not willing to adopt the standard processes developed by the HQ or employees of subsidiaries are not aware of the system functionalities, workarounds can be developed. Participants in this study reported to have encountered workarounds, such as additional processes outside the ERP system. Hence, the evidence of this study is in line with the findings of prior literature.

The first ERP system implementations at the Case organisation were conducted well over 15 years before this study meaning the post-implementation phase has lasted long time. It was anticipated at the Case organisation that old business processes, introduced during the implementation projects, might to some extent still be in use. This perception was confirmed during this study. Furthermore, due to the development projects conducted over the years, many business processes have evolved and there was variance in the processes between different subsidiaries. These local business processes can be largely unknown at the HQ, which complicate the ERP development projects and benefits identification. It was further anticipated that the subsidiaries might not be able to identify realisable benefits on their own, but due to the unknown processes it is very challenging to identify the benefits from the HQ either. The literature has not identified these issues very well. Osnes et al. (2018) have discovered from the literature that good implementation strategy helps in post-implementation and that early focus should be directed on the post-phase, especially regarding the requirements for maintenance. However, the findings do not contribute much to the issues experienced at the Case organisation which suggests that further research is needed on this area.

Regardless the challenges the Case organisation has encountered, vast amount of ERP development projects throughout the years have provided opportunities for extensive amount of benefits. The benefits applied from the ERP system development at the Case organisation were largely automation and planning benefits defined by Badewi et al. (2018). However, the evidence indicate that ERP innovation benefits had only minimal role. The data collected from the interviews suggested that the Case organisation lacks experts who would be responsible of business development which consequently could lead to realising also innovation benefits. However, Badewi et al. (2018) also highlight that traditional ERP systems can be too strict to be used for innovation benefits as the

system needs to be scalable to deploy new technologies. Nevertheless, Badewi et al. (2018) continue, it is also required that the IT department has the ability to customise the current system reliably and validly. This consequently suggests that in order to realise innovation benefits, organisation needs to have well cooperating business and IT staff.

5.2 Answering the research questions

This study set out to address a research gap, namely how organisations handle benefits realisation in the post-implementation phase of ERP system lifecycle. According to Oseni et al. (2017), insufficient research conducted on this area. Consequently, they suggest studying primary operational impact of development and to answer how do organisations manage benefit realisation with post-implementation development. At the start of this research, the following research question and its sub-questions were set to direct this study.

- How do organisations manage benefits realisation practices in post-implementation phase of ERP systems?
 - What challenges organisations might have with benefits realisation practices and how the realisation of benefits can be guaranteed?
 - What tools or methods do organisations use with benefits realisation practices in post-implementation phase?

To answer the main research question, the findings of this study are largely in line with the past literature. No formal benefits realisation practices were used at the Case organisation and there is general trust among the management team and project steering groups that the anticipated benefits are realised although not measured or followed formally. These kinds of assumptions have also been acknowledged by the past literature (Haddara & Päivärinta, 2011; Peppar et al., 2007; Ward et al., 2008). Haddara and Päivärinta (2012) identified also that even though many ERP projects overrun their budgets, formal practices to ensure benefits, are not used. This phenomenon was also identified from the evidence collected in this study. Ashurst et al. (2008) have further identified that often organisations do not understand the disadvantage of insufficient benefits review practices and that something should be done differently in future projects, but as was discovered also in this study, the disadvantages are not considered so major that immediate actions need to be taken.

Although formal benefits realisation practices were not used at the Case organisation, due to project management practices used in some projects, elements of formal benefits realisation were identifiable. For example, business cases with anticipated benefits were created in some projects, new benefits were identified during the projects and some level of follow up was conducted in some projects. However, like Badewi et al. (2018) have identified, the project management practices alone do not ensure benefits realisation and thus alignment of benefit management and project management is needed.

The evidence further suggested that regardless the lack of formal benefits realisation practices, largely benefits were considered to have realised at the Case organisation. This can be, for example, because the ERP development enabled business process changes and when those changes were done, it was assumed that the benefits were also realised. Hence, it can be derived that benefits were considered self-evident.

Consequently, Haddara and Päivärinta (2012) state that the self-evident nature of benefits, often leads to absent of formal realisation practices. This study supports that view. Another identified reason for missing practises was the technical nature of the projects which support the view of Ashurst et al. (2008), who argue that the aim of IS projects is often the delivery of technical solution, not benefits realisation. Nevertheless, the evidence of this study also indicated that, among IT participants, it was unknown to what extent the benefits were realised and uncertainty existed whether substantial benefits were received at all. Furthermore, it was discovered that often new benefits were identified and also realised during the projects, although these practices frequently resulted expansion of scope and schedule, and sometimes even the costs. These practices were largely considered insufficient and improvements were desired by the participants from IT as well as business units. Although all participants considered the current practices of benefits realisation insufficient, inference can be made that this was not considered a major problem in the Case organisation as immediate actions have not been taken to improve the situation.

The first sub-question aimed to examine what challenges organisations might have with benefits realisation practices and how the realisation of benefits can be guaranteed. This study has identified large set of challenges that organisations can face with post-implementation development of ERP system. Many of the challenges faced at the Case organisation were also identified in the past literature. For example, insufficient management practices, focusing on technological implementation rather than ensuring benefits, insufficient use of business cases or the benefits can be overstated in the first place and lack of sufficient evaluation criteria how to measure the success, (Einhorn et al., 2019; Peppard et al., 2007; Ward et al., 2008; Ward & Daniel, 2012, p. 6). However, some distinctive challenges were identified in this study. Firstly, the projects at the Case organisation were directed and prioritised largely by personal interests rather than organisational targets. Thus, personal attributes affected what development projects were undertaken and how, personal interests permitted not to follow the realisation or even not to use the solutions. Although these aspects can be considered as part of insufficient management practices leading to failed delivery of business benefits, highlighted by Peppard et al. (2007), some implications resulting from the personification, like not deploying the solutions at all, have not been identified by the literature. In these cases, the benefits are zero. Furthermore, challenges were faced already with identifying the benefits. Since the current ERP system has been in use for so long at the Case organisation, the local business processes were largely unknown, and workarounds existed. In addition, the subsidiaries were not able to identify new benefit opportunities on their own. Due to the limited studies on post-implementation ERP development, these issues faced by the Case organisation, have not been identified by the past literature.

The challenges at the Case organisation culminate in many terms to the general confusion. In many cases the anticipated benefits were not articulated to the project group resulting that the projects were unclear, project group was not able to contribute to the benefits management efficiently and it was not clear if the development even was beneficial or the work had much value. In addition, it was evident that when the development enabled business process changes, it was assumed that benefits are realised once the business processes changes were done. These challenges are in the heart of benefits realisation. Ward and Daniel (2012, p. 13) emphasise that formal benefits realisation practices offer tools and frameworks which can be used to ensure that both, business and IT, are able to contribute their knowledge to produce something neither group could have developed alone.

The question of how the realisation of benefits can be guaranteed is largely possible to be addressed by overcoming the identified challenges. In general, proper project management practices along coherent ways to accept the development projects were considered at the Case organisation to improve the situation. However, Badewi and Shehab (2016) argue that project management alone does not guarantee benefits realisation. They claim that in addition to coherent project management practices, benefits management practices are needed and further, organisations mastering the both outperform others that do not have this capability. At the Case organisation, the project management practices were considered to improve stakeholders' understanding of the justification and intended benefits, and thus improved the cooperation. Moreover, if the development project was managed as joint effort between business and IT, the optimal outcome was considered to have received.

The second sub-question addressed the question of what tools and methods organisations use with benefits realisation in post-implementation phase. The case study revealed that in large-scale projects, traditional project management practices were used more systematically. The practices included analysis of the business case and alternative solutions, drafting investment proposal, selecting project manager and steering group, organising regular meetings, documenting the process and conducting a project review at the end. However, the process did not include benefits management directly and, like the literature suggests, this kind of process enables to overstate the anticipated benefits (Peppard et al., 2007). The large-scale projects in general utilised more collaboration and project management tools. In small-scale projects, less coherent practices were used at the Case organisation. The study revealed that that often small-scale projects are started with very light business case and while the project progress more information is collected, more requirements are expressed and more benefits are identified. Ward and Daniel (2012, p. 234) emphasise that planning at the beginning of the project has significant impact on the project success. Mostly, the small-scale projects at the Case organisation were documented only by IT personnel with their tools. According to the participants, besides the collaboration and project management tools and the application for technical documentation at IT department, no specific tools or methods were used in the small-scale projects.

5.3 Theoretical implications

The prior literature identified that existing research focuses mainly on ERP implementation, leaving post-implementation phase to less attention. These studies established a clear need for further research on this topic pointing out that many matters, like managing various stakeholders' interests regarding ERP systems, new benefits and risks as well as development of ERP system after implementation, need more research. (Law et al., 2010; Oseni et al., 2017; Osnes et al., 2018.) Consequently, this study has focused on ERP system development in post-implementation phase which, according to literature, was under studied (Göhrig et al., 2017; Osnes et al., 2018). This study has identified a large set of attributes in the context of benefits realisation in post-implementation phase of ERP system lifecycle. It was discovered that while many of these findings are in line with the prior literature some issues were identified which the past literature has not addressed in depth. Those matters in particular are covered in this chapter. It is argued that this study has contributed to research area where very limited prior research exists. Furthermore, this study has provided in-depth description of contemporary phenomenon by undertaking revelatory case study. This study therefore

contributes to largely uncovered research field of post-implementation development of ERP systems by providing insight to phenomenon previously understudied.

Post-implementation phase of ERP system can be further divided into phases where corrective activities are done in order to stabilise the system for normal use and phase where new enhancements, improvements and development is conducted (Huang & Yasuda, 2016). The two phases, stabilisation and improvement, are highlighted by different activities and concerns (Shanks et al., 2000). The stance of this study was to address the later where, according to Esteves and Pastor (1999), new benefits emerge. However, the current literature covering post-implementation research of ERP systems, such as Osnes et al. (2018), do not necessarily distinguish the different post-implementation phases, but rather address it in general. This study has contributed to the improvement phase of post-implementation ERP study by addressing it from benefits realisation perspective. It is the implication of this study that more attention is needed to the definition in future studies focusing on post-implementation. The separation is needed between different post-implementation phases as ultimately, they have vastly different challenges and issues.

The prior literature has acknowledged that benefits realisation practices, can improved relationships between IT and business and also cooperation of stakeholders (Peppard et al., 2007; Ward & Daniel, 2012, p. 234). The evidence of this study revealed further that the practices has also significance in individuals' job satisfaction. It was established in this study that it is important to know if the development project was beneficial. That in turn makes the work seem more valuable and in addition makes the work more meaningful. This further leads to increased job satisfaction. This implication is largely overlooked in the literature. Ward and Daniel (2012, p. 6) identified that well performing organisations define also softer benefits, such as collaboration and individual job satisfaction, in their IS investments. Nevertheless, based on the findings of this study, the use of systematic approach to benefits realisation can impact also on the individuals' job satisfaction. Although Ward and Daniel (2012, p. 201) suggest that introducing benefits realisation approach, also improves the cooperation between project groups and managers, benefits realisation practices are mostly studied from organisational perspective. Hesselmann and Mohan (2014) considered more humanistic perspectives in context of benefits management, but they focused on overcoming resistance of individuals towards the new IS, rather than implementing systematic benefits realisation approach due to the requirements or dissatisfaction of IT and business. This study therefore contributes to area of benefits realisation, namely individual's job satisfaction, that is largely ignored in prior research. It is suggested that future studies should focus also on employee satisfaction in context of benefits realisation.

Insufficient follow up of benefits realisation has further causes, which are not particularly addressed in the prior literature. Although Ward and Daniel (2012, p. 1) recognise the failing IS projects and Ashurst et al. (2008) explain that successful IT solutions do not alone guarantee meaningful business benefits, the studies do not cover unused solutions as consequence of insufficient benefits realisation follow up. It was discovered in this study that resulting from insufficient benefits realisation practices, namely lack of follow up, the developed solutions that would be beneficial for business, are not taken into use for one reason or another. It was indicated in this study that if solutions are not used in the first place, the realised benefits are zero.

One explanation to the above mentioned issue was personification. It was identified that personal interests often directed and prioritised development projects. Consequently, personal attributes, rather than organisational targets, influenced what development projects were undertaken and how. Personal interests further enabled not to follow the benefits realisation. Although these aspects can be considered as part of insufficient management practices leading to failed delivery of business benefits, also acknowledged by Peppard et al. (2007), some implications resulting from the personification, like not deploying the developed solutions at all, have not been identified by the literature. Osnes et al. (2018) have identified that personality of managers along with management style influence the approach and duration on ERP implementation. Furthermore, Ward and Daniel (2012, p. 177) state that stakeholders' perception of personal benefits or disbenefits can influence the project scope. Hence, literature acknowledge the issue of personification to some extent. However, in this study, it was revealed that personification can have significant influence on various aspects of ERP development projects and one consequence is unused solutions.

Ward et al. (2008) argue that in less successful organisations, business cases are often used only to justify projects, resulting that all benefits are not identified. However, based on the evidence regarding post-implementation development of ERP systems, the benefits identification is particularly challenging due to three main reasons, namely unknown business processes which can be either implemented long time ago or alternatively evolved throughout the years, workarounds and subsidiaries' inability to identify new benefits. These findings indicate that some unique characteristics exist in context of post-implementation phase of ERP lifecycle which in turn require more attention.

It was discovered in this study that old business processes, introduced during the implementation projects, were to some extent still in use. Due to various development projects over the years, business processes had also evolved, and variance existed in the processes between different subsidiaries. These local business processes were largely unknown at HQ, which complicated the ERP development projects and benefits identification. It was also identified that the subsidiaries were not be able to identify realisable benefits on their own, but due to the unknown processes it was very challenging to identify the benefits from the HQ either. Prior literature has not identified these issues very well. Although Osnes et al. (2018) discovered some solutions, such as good implementation strategy helping also in post-implementation phase, the findings do not contribute much to the issues identified in this study suggesting more research is needed on this area.

Although workarounds have been identified in the literature, some noteworthy aspects were identified in this study. According to Osnes et al. (2018), workarounds occur when users are not aware of all system functionalities or subsidiaries are not willing to adopt standard processes. However, in this study workarounds were identified as part of business process evolution resulting either from subsidiaries' inability to utilise the ERP system or workarounds were used to solve process issues without system development. Nevertheless, the workarounds, outside ERP system in particular, are not visible nor can be identified from overseas, which in turn can complicate development projects significantly and further, it complicates the identification of new benefits.

While ERP literature identifies above discussed challenges to some extent, limited research has been conducted to identify how to overcome these issues in order to be better equipped to realise benefits from post-implementation ERP development projects.

Ward and Daniel (2012, pp.69, 273) emphasise that all the potential benefits should be identified in the first step of the benefits realisation procedure. They acknowledge the difficulty in identifying all benefits only on programme level, not particularly on project level. It is the theoretical implication of this study that formal benefits realisation procedures do not address these issues, which based on this study, characterise complex system like ERP in the post-implementation phase after it has reached maturity. The long lifecycle complicates benefits identification and realisation in the later stage of the post-implementation phase exposing new kind of challenges, like revealed in this study. The prior literature has largely not recognised these challenges as the focus has been on implementation phase. The future research on ERP systems development in post-implementation phase in context of benefits realisation should focus more on this aspect occurring during long lifecycle.

In general, this study has identified several matters the prior literature has not covered much. For instance, the issues resulting from insufficient benefits realisation practices, like lower job satisfaction and not knowing if the work in general holds value or unused solutions and impact of personal interests. On the other hand, this study has confirmed empirically several previously considered aspects of benefits realisation, such as challenges in identification and evaluation of ERP system benefits in multinational context where the benefits vary a great deal and workarounds exists. Due to these reasons this study can make prominent contribution and theoretical implications to the body of research regarding benefits realisation regarding ERP system development.

5.4 Practical implications

This study has collected vast amount of evidence on various aspects regarding benefits realisation practices of ERP development projects in post-implementation phase of ERP system. Due to the rich, in-depth evaluation of those practices together with prior literature, also several practical implications can be derived from this study. Those practical implications are evaluated through formal benefits realisation practices, namely Cranfield benefits management process model (Ward et al., 1996). This model is the mostly used and cited one since it was developed in 1996, with emphasis on continuous work of benefits management. Many studies have demonstrated the high effectiveness of this approach. (Hesselmann & Mohan, 2014.) It was however, revealed in this study that some unique characteristics emerge in the post-implementation phase of ERP lifecycle. Therefore, some adjustments of the model are introduced. This chapter introduces the modified benefits realisation model, namely Benefits Realisation Framework in Post-Implementation Development, with each step covering the unique characteristics of ERP development in post-implementation phase. The introduction of the model is followed by summary of practical implications made from this study.

5.4.1 Benefits Realisation Framework in Post-Implementation Development

There are many challenges regarding the benefits resulting from IS development projects. When systems are organisation wide, they impact large amount of people internally, but also external partners, such as customers, are affected and consequently realising benefits depend on active cooperation also with the external partners. Furthermore, the benefits that IS can deliver have become more difficult to identify, describe, measure and quantify. This is further affected by the interdependence of

development projects and business changes resulting the benefits being combination of many changes. (Ward & Daniel, 2012, p. 2.) Like Peng and Nunes (2010) stated, ERP systems are very different from other IS and it is important to understand that. Furthermore, the data collected in this study suggests that there are some unique characteristics, such as unknown old or evolved business processes or lack of capabilities to identify new benefits opportunities, that highlight ERP system exploitation in post-implementation phase. The data collected in this study suggests that the existing benefits management processes, which originate more from IS implementation requirements rather than from continuous development viewpoint, require some specific alterations to ensure that the benefits are identified, managed and realised efficiently throughout the development projects and beyond.

Benefit management process model in post-implementation phase of ERP system (see Figure 3) moves the potential for further benefits into the centre of the model. It was identified from the collected data that new, unexpected benefits are typically identified in many stages of the development processes. Therefore, the potential for further benefits need to be embedded to every phase of the process.

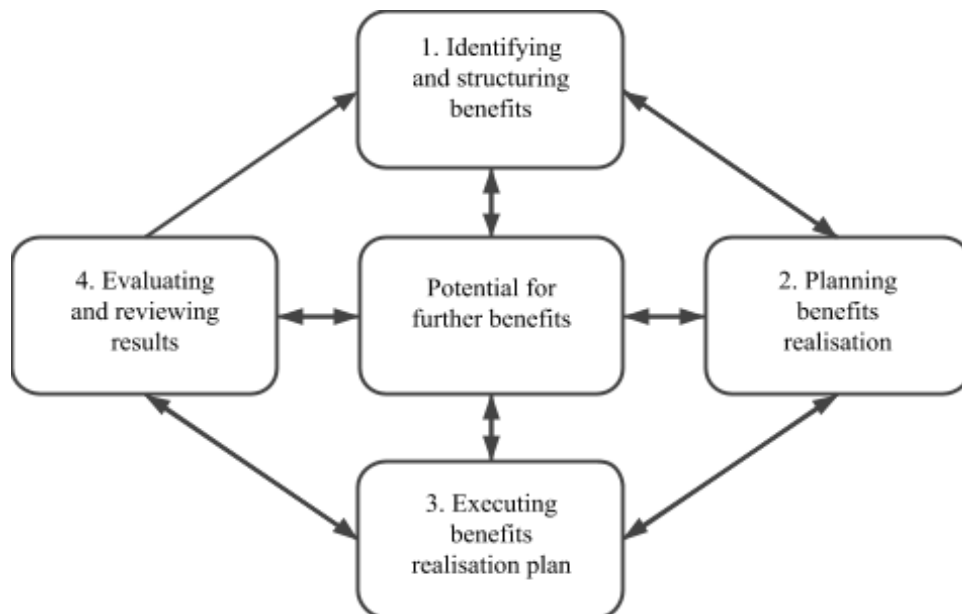


Figure 3. Benefit management process model for post-implementation phase of ERP system.

The following chapters explain how the benefit management process model can be utilised in ERP system post-implementation development to ensure efficient benefit realisation.

Identifying and structuring benefits

In the first step of benefits management process, all potential benefits are identified, and understanding is formed regarding how the system development together with business changes can enable the benefits realisation (Ward & Daniel, 2012, p. 69). As it was identified in this study, cooperation between business and IT is regarded important as both have specific and relevant expertise. Therefore, benefits identification should be a joint effort between business and IT. The starting point for this comprehensive benefit identification phase can be the initial benefits identified by business.

Identifying and structuring benefits at the project start as well as creating benefits realisation plan, which will be discussed in detail in the next chapter, are the first steps of the Cranfield benefits management process model (Ward et al., 1996). However, this study has revealed that in post-implementation phase of ERP system, identifying all benefits can be challenging if not impossible. It was identified that old business processes, introduced in the implementation phase, are to some extent still in use or those have evolved due to various development projects throughout the years. As a result, the business processes can be largely unknown. The matter was further complicated by workarounds and subsidiaries' inability to identify new benefits. Consequently, much uncertainty is associated in the ERP development projects regarding benefits identification. Largely due to these reasons, the cooperation between IT and business in this first step of benefits realisation practices can be immensely valuable.

In this first step of the benefits management process, also the ownership of each benefit must be established with measuring criteria. It is important to identify that all benefits realised from IS can be measured, some directly and some indirectly, and whenever the benefits can be converted to financial terms, it should be done. (Ward and Daniel, 2012, p. 71.) It was identified in this study that mostly benefits were not measured, but when done, there were difficulties to attribute the realised benefits to a specific development project. This in turn suggests the measurement techniques were not optimal. Ward and Daniel (2012, p. 135) advice that measures should be relevant to the benefits themselves and also to the changes required to achieve them. They continue, only this way it is possible to attribute the improvements to the conducted development. They further argue that if a benefit does not have an owner, a responsible person who ensures it is realised, or it cannot be measured, it does not really exist. This study revealed that no benefits owners were defined in the Case organisation, which should be taken part of formal practices.

Once the potential and achievable benefits are identified and structured in cooperation between IT and business, the overall view of the entire project will be clearer to the project group. This was considered important in order to understand the reasons why a development project is conducted. It is argued that sound benefits evaluation can improve that. Moreover, when setting effective target benefits, it enhances the probability of benefit realisation (Zwikael, 2018).

Planning benefits realisation

Benefits realisation plan includes the needed responsibilities, activities, schedules, resources and clearly identified relationships and dependencies, which are crucial in realising the anticipated benefits (Ward and Daniel, 2012, p.74). The ERP system post-implementation development projects were mainly small-scale development projects in the Case organisation. Although unnecessary bureaucracy was considered inconvenient based on this study, creating a realisation plan, however, needs not to be a complex endeavour. The lack of formal processes in development projects and unclear responsibilities were considered problematic. Hence, benefits realisation plan with agreed responsibilities and clear objectives, would improve development projects (Peppard et al., 2007).

This study revealed that new requirements and benefits can be identified during the projects resulting scope, schedule or costs to expand. This was often due to insufficient planning, but also due to unknown business processes. Since, according to Ward and

Daniel (2012, p. 59) benefits plan ensures the ability to explicitly identify and plan benefits realisation of development project, the plan can be used to address these issues. It was also discovered in this study that lack of means how to establish the anticipated benefits was considered as defective. The purpose of benefit realisation plan is to provide those means as well as support the business case (Ward & Daniel, 2012, p. 204).

Another practical implication of this study is the importance of defining schedule in benefits realisation process. Zwikael et al. (2018) suggest that setting effective target benefits will support the benefits management process and improve the probability of benefits realisation. It is implied in this study, that it is not enough. In addition to set clear target benefits, it is equally important to define when those are to be achieved. The literature in general does not address this issue very specifically. The evidence collected in this study showed that a project might have clearly defined benefits such as fixed costs savings on Full Time Equivalent (FTE) and ramp down of alternative applications. However, clear schedule ensures explicit actions towards benefits realisation and consequently, the likelihood of achieving benefits promptly after ERP system development projects, can be ensured.

The benefits realisation plan is used during and after the development project to guide the progress and achievements. Important element of this approach is to get key stakeholders involved. (Peppeard et al, 2007.) The evidence in this study indicated that stakeholders might not be considered thoroughly resulting issues, such as low usage rates or obstacles causing hold ups in projects. For these reasons stakeholders should be identified and their viewpoints and abilities to influence the project and its success to be considered in the benefits plan.

Potential for further benefits should be also addressed at this stage of the process, because when anticipating new requirements and consequently new benefits, the project group can be prepared for the volatility during the project. It was observed in this study the constant unclarity and confusion that characterised the development projects were largely due to emerging requirements and benefits. When the potential for further benefits is anticipated and included to the benefits plan, consequently the project management can be conducted more organised manner. The benefits plan should be attached to the overall project plan and it needs to be evaluated throughout the project and adjusted when needed (Ward & Daniel, 2012, p. 75).

Executing benefits realisation plan

Executing the benefits realisation plan follows the plan creation. It needs to be noted that if any issues or obstacles arise or circumstances change, the plan needs to be adjusted accordingly. Often, the project manager governs the execution of the plan on behalf of the stakeholders owning the benefits. When changes emerge, the project manager needs to decide, in cooperation of other responsible people, how to handle them. If new requirements and benefits emerge, decisions need to be made if those are included to the current project or handled in the future projects. The decisions need to be aligned with the overall project objectives. (Ward & Daniel, 2012, pp. 75-76.)

It was identified in this study that often changes emerge during development projects. The changes frequently emerge when details of the development project start to unfold. The evidence uncovered that the varying benefits, workarounds and unfamiliar business processes are getting clarified at this stage. Although the systematic benefits

identification and planning, discussed above, have already addressed these issues, it is not possible to identify them all. The data indicated that it is practically impossible to identify all requirements and benefits up front due to the complexity and unknown aspects of the details, which is why changes must be accepted. However, when the entire process takes into consideration those most likely changes, it is possible to address them systematically and efficiently.

During the execution of benefits realisation plan, potential for further benefits should be considered iteratively throughout the execution. This way new benefits are actively identified, the changes are addressed in organised manner and expansion of scope, schedule or costs, can be managed or even avoided. It is argued that this systematic approach improves the process. Furthermore, establishing the potential for further benefits will be more efficient and above all, can be done by all project group members, because the process is transparent as the original anticipated benefits are clearly known to all relevant people.

Evaluating and reviewing results

Evaluation and reviewing of benefits is an essential part of the benefits realisation process. The benefits review is done after the implementation of the developed solution. Also, the project review should be conducted before. The aim of the benefits evaluation and review is not to point out failures, but rather evaluate which anticipated benefits were realised, which are not yet realised and if unexpected benefits were realised. It is important to understand why some benefits were realised and some not, and what needs to be done to improve the further projects. (Ward & Daniel, 2012, pp. 78-79.)

This study revealed that benefits realisation is often not followed in the Case organisation on a level the participants hoped for. Furthermore, there were unclear views if and how the benefits realisation is followed after the development projects and whether the development was beneficial. Evaluating and reviewing benefits would also improve the understanding of what kind of development is not worth of doing, which was, according to evidence, considered important. Based on the collected data, assumptions were made of anticipated benefits and which benefits were realised. Consequently, the review brings transparency to the accomplished achievements and it also enables people to identify potential for further benefits more efficiently. It is argued that ultimately the process improves relationships between IT and business, cooperation of stakeholders and overall job satisfaction.

Potential for further benefits

Ward et al. (1996) defined potential for further benefits as fifth step of the Cranfield benefits management process model. They specified that at this stage, after the post-project review, it can become evident that new benefits are achievable. This case study has, however, identified that the potential for further benefits is present in every step of the ERP system development projects, mainly because of three main reasons. Firstly, the various work processes can be unknown, because the ERP system was implemented so long ago and subsidiaries might have developed own processes, which might have been patched further with workaround or even external applications. Secondly, the employees or managers of different subsidiaries might not be able to identify potential benefits on their own. Thirdly, all benefits realisable from development project cannot be identified prior to the projects but are rather emerging along the way. Due to these

reasons, the step of establishing potential for further benefits was moved to the centre of the process model where it is embedded to all other steps. This modification enables to embed the potential for further benefits to the entire benefits realisation process where potential for new benefits can be established iteratively throughout the projects. This adjustment also improves flexibility, because the new benefits, at least partly, can be realised during the project.

5.4.2 Summary of practical implications

The findings of this study indicated some unique characteristics that emerge after ERP implementation, namely how to identify the benefit opportunities and manage emerging benefits during the projects when the local work processes can be unknown, workarounds exist and subsidiaries can have varying interests. In this kind of environment, establishing potential for further benefits become core part of entire project lifecycle. It was established in this study that these unexpected benefits can cause project scope, schedule or even costs to expand. In order to take that into consideration in all phases of benefits management process, potential for further benefits, which is the last step in the original model by Ward et al. (1996), needs to be elevated into the core of the process. It is the practical implication of this study that identifying potential for further benefits needs to be embedded to the entire benefits management process in post-implementation phase of ERP system development.

It is a practical implication of this study, that the Benefits Realisation Framework in Post-Implementation Development, introduced above, can contribute to the success of ERP development projects and this success can increase even more if also formal project management practices are used with it. Badewi and Shehab (2016) state that the role of project management in realising ERP benefits is critical although that alone does not guarantee benefits realisation. It became apparent in this study that proper project management practices are considered important by both, IT and business, in ERP development projects. The collected evidence suggested that SAFe, which under deployment during this study at the Case organisation, was considered to improve the practices how development projects are initiated and managed. It is acknowledged in this study that SAFe can most likely improve many issues like insufficient project planning and business cases, personal interest driving development projects and coherent way of managing projects. However, it is also argued that the Benefits Realisation Framework in Post-Implementation Development is able to provide further improvements especially in areas that are particularly problematic with ERP development. Hence, the practical implication is that the Benefits Realisation Framework in Post-Implementation Development can be integrated to project or software development frameworks and consequently improve benefits realisation in ERP system development projects in post-implementation phase of the lifecycle.

5.5 Summary of the key findings

This study has covered a vast amount of aspects regarding benefits realisation in post-implementation development of ERP systems. The data collected during the case study has revealed various aspects relevant to this topic. The in-depth evaluation of those aspects together with prior literature have revealed that this study was able to confirm many patterns identified by the prior literature. Nevertheless, also several important findings can be derived from this study which have not been covered in detail by prior study. Those core findings are summarised below.

Key findings regarding benefits realisation practices in general:

- Systematic approach to benefits realisation can increase job satisfaction.
- Systematic approach to benefits realisation can prevent expansion of scope, schedule and budget of projects.
- Scheduling the benefits realisation has significant role in the delivery of the benefits.
- Insufficient follow up practices can result unused solutions.
- Insufficient benefits realisation practices allow personal interests rather than organisational targets, to direct development projects.

Key findings regarding ERP development in post-implementation phase:

- Old or evolved business processes can be unfamiliar to the IT and business managers responsible of ERP development projects, which is complicated furtherer by unknown workarounds.
- Various development projects throughout the years might have created variance to the business processes between subsidiaries.
- Subsidiaries might not be able to identify new ERP benefits on their own.
- Benefits vary between subsidiaries which complicates the ERP development projects.
- Due to the complexity of the ERP development in post-implementation phase, benefits realisation practices need to be modified so the unique characteristics are addressed.
- Benefits Realisation Framework in Post-Implementation Development, introduced in previous chapter, can support benefits realisation better in post-implementation ERP system development.

Identification of new benefits in post-implementation ERP development projects is challenging due to above reasons. It is therefore imperative to take the challenges into consideration when planning new ERP development in the post-implementation phase.

5.6 Limitations

Although this case study was conducted rigorously using guidance of Yin's (2014) case study procedure, some limitations exist. Generalisation from single-case study can be limited. Yin (2014, p. 64) points out that analytic conclusions from single-case study can be weaker compared to multiple-case study. However, to increase the validity of this case study, for example embedded units of analysis, case study protocol and quality tests, recommended by Yin (2014), were used. Nevertheless, it is acknowledged that the results of this study cannot be generalised to cover all kinds of organisation, but rather organisations where similar circumstances exist.

Limited number of participants from business units is another limitation of this study. Equal amount of IT and business participants would have been preferable. Moreover, personal bias of the researcher can influence the outcome and due to the qualitative nature of this study, interpretations might be limited. However, these limitations were considered throughout the study focusing on mitigating the consequences. For example, the interviews were conducted with neutral stance with focus on what the participants said, rather than what they might have meant.

6. Conclusion

Organisations use ERP systems to integrate processes from various business functions. These systems are complex due to their size and influence on business processes, but also due to their risk factors and benefit opportunities (Sumner, 2018; Ward & Daniel, 2012, p. 252). Consequently, ERP implementation projects can be the largest projects organisations carry out (Sumner, 2018). Although ERP implementation projects alone are massive efforts requiring vast amount of resources from organisations, the work does not end there, but continues with post-implementation development which aims to ensure also the future benefits from the ERP systems (Oseni et al., 2017). Law et al. (2010) emphasise that it is not possible to achieve sustainable competitive advantage, if ERP systems do not evolve to fulfil new business requirements. The prior literature identified that the existing research on ERP systems focuses mainly on ERP implementation, leaving the post-implementation phase largely understudied. It was established that a clear need existed for further research on the topic of post-implementation development of ERP systems. This indicated that areas, such as new benefits and risks as well as development of ERP system after implementation, needed more research. (Law et al., 2010; Oseni et al., 2017; Osnes et al., 2018.)

This study has focused on benefits realisation in post-implementation development of ERP systems. A large set of attributes were observed in this study in the context of benefits realisation in post-implementation development of ERP system. It was discovered that while many of these findings are in line with the prior literature some emerging issues were identified, which the prior literature has not addressed in-depth.

This study confirmed that systematic approaches to benefits realisation with solid business case and benefits plan, not only improve benefits realisation from ERP development projects, but also improve the relationships of IT and business, and the cooperation of stakeholders. It was further revealed that systematic approach and solid planning improves project success by preventing expansion of scope, schedule and costs, increasing transparency and ultimately improving job satisfaction whereas poor practices result that projects are confusing and IT does not know to what extent the solutions they have developed, are beneficial. It was also confirmed that often ERP development was considered either as a technical project or the benefits were seen so self-evident that systematic approaches to follow the benefits realisation were not used. Moreover, lack of clear schedule for benefits realisation prolongs that delivery of the benefits. Although variance existed in the follow up practices depending on the project size, the insufficient follow up ultimately enabled to develop solutions, which would be beneficial, but for one reason or another, are not taken into use. In those cases, the benefits are zero. One explanation to these issues, discovered in this study, was personification. It was identified that personal interests often directed and prioritised development projects. Consequently, personal interests, rather than organisational targets, influenced what development projects were undertaken and how. Personal interests further enabled not to follow the benefits realisation.

In addition to the above findings, this study revealed some noteworthy implications relevant specifically in context of post-implementation development of ERP systems. It was identified that due to the long lifecycle of ERP systems in multinational context, new types of challenges emerge, which the prior literature has not addressed in-depth.

This study revealed that often old business processes were used or the development projects, conducted throughout the years, have evolved the business processes which consequently made them incoherent. As a result, these business processes were largely unfamiliar to IT and business managers responsible for the development projects. This matter was further complicated by workarounds occurring even outside the ERP system making them hard to identify. It was also identified that the subsidiaries might not be able to identify new benefits on their own and furthermore, the benefits vary between subsidiaries. These unique characteristics complicate benefits realisation in post-implementation development of ERP system and consequently the benefits realisation practices need some adjustments.

It is argued that this study has contributed to research area where very limited prior research existed. Furthermore, this study has provided in-depth description of contemporary phenomenon by undertaking revelatory case study. This study therefore contributes to largely uncovered research field by providing insight to phenomenon previously understudied, namely benefits realisation in post-implementation development of ERP systems.

It is argued that this study has created in-depth understanding of circumstances and challenges of benefits realisation in post-implementation development of ERP system providing window to phenomenon largely unstudied before. It was identified that due to old and evolved business processes, which are further complicated by workarounds, can be unfamiliar to IT and business managers responsible of ERP development making it largely difficult to identify all benefits. Moreover, when subsidiaries are unable to identify new benefits on their own and the benefits further vary from one subsidiary to another, the complexity increases further. Consequently, it is suggested that future research should continue to study these findings and identify to what extent these research results are generalisable. Furthermore, it is suggested that future research should investigate more how formal benefits realisation practices can influence individual job satisfaction.

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Appendix A. Case study protocol

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1. Overview of the Case Study

Mission and goals

The aim of the study is to find out how benefits realisation can be ensured in organisations regarding ERP systems post-implementation development. The study seeks to answer the below research questions and also to see how the practices could be improved, in case there are challenges.

Case study research questions

- How do organisations manage benefits realisation practices in post-implementation phase of ERP systems?
 - What challenges organisations might have with benefits realisation practices and how the realisation of benefits can be guaranteed?
 - What tools or methods do organisations use with benefits realisation practices in post-implementation phase?

Theoretical framework

Cranfield benefits management process model was developed in the mid 90's to improve the ability of managing and realising benefits [1]. The research of benefits management started with this model and consequently, the model has been the mostly used and cited model ever since [2]. Many studies have recognised the critical importance of understanding how benefits from information system investments, including ERP systems, can be obtained, but organisations often have challenges in realising them [3,4,5]. Although ERP systems play important role in organisations and are heavily invested on, formal benefits realisation management (BRM) is not necessarily done [6,7]. ERP systems are expected to generate vast financial and non-financial benefits, but often organisations merely assume those are also received [4,6]. Often business cases or project proposals are used only to gain funding for the project, but this stance overlooks opportunities to enhance existing capabilities or even create totally new ones [8]. Furthermore, overstating benefits in business case is done quite often [10]. Due to the shifts in current business environment, BRM can help organisation to improve the value of IS investments. It can help organisations to understand better the value information systems can produce to it [8].

It is not possible to achieve sustainable competitive advantage, if ERP systems do not evolve to fulfil new business requirements. Sound maintenance and support practices can extend the life span and create a stable system platform to support efficient and effective business operations. [9.] ERP is a long-term investment and it is important to ensure that the costs do not surpass the benefits [4]. Existing research of ERP systems mainly focus on implementation, consequently post-implementation research is lacking. Many studies have established a clear need for further research on the topic. [11,7,12.] Matters like managing various stakeholders' interests regarding ERP systems, new benefits and risks as well as development of ERP system after implementation still require answers and research [9,7,12]. Moreover, there is a need for case studies in the field of ERP post-implementation phase to better understand the actual challenges [11].

The aim of the benefit management process is to improve the recognition of benefits that are achievable, but also to ensure that the investment actually leads to the targeted benefits throughout the lifecycle of the investment. Nevertheless, many organisations do not understand the nature of the benefits that IS is able to provide or what needs to be done in order to achieve the benefits. [8] The goal of business is not to create accurate forecasts, but to make sure those forecasts actualise and that is also in the heart of benefits realisation [1].

Role of Protocol

The purpose of the case study protocol is to increase the reliability of the research. This case study protocol aims to provide guidance for the data collection conducted during the case study. The protocol is used to identify and foresee data sources when conducting the field work. Consequently, these preparations ensure more efficient field work. In case any changes or problems would occur, this case study protocol helps to identify how the data collection activities need to be adjusted.

2. Data Collection Procedures

Field work i.e. data collected in interviews and from documents and ERP system is conducted by Heidi Hietala.

Data collection plan

Data is collected by interviews, documents and ERP system. Data collection will start with prolonged case study interview with the key participant. During the interview also documents are searched and studied. Documents are expected to provide data regarding general guidelines and procedures of the case organisation. The aim is to identify general guidelines regarding ERP system development procedures. Data collection from documents will continue to inspect ERP development project specific documentation to find out what kind of data is documented regarding individual development projects. The aim of the prolonged case study interview with the key participant, is to generate overall understanding regarding ERP benefits realisation practices and also to have general idea how benefits are ensured on project level.

Based on the prolonged case study interview, more detailed interview questions are defined for further interviews. The further interviews are conducted with IT personnel responsible of ERP development and operational managers from different business units who are responsible of providing requirements and participate in the development project as business representatives. The aim of the interviews is to identify how the general guidelines or practices are followed in practice on general level as well as in individual ERP development projects. The aim is also to identify challenges and improvement possibilities. If needed, multiple interviews are arranged.

An interview will be conducted with one management team member to gain understanding of future aspirations regarding benefits realisation and to see if any improvement needs have already been identified in the case organisation. The aim of the interview is to generate overall understanding regarding benefits realisation practices at the case organisation and also to have general idea how benefits are ensured on general level.

The collected data from ERP system, documents and interviews, are used to gain understanding of both, the main unit of analysis, which is ERP post-implementation development in general, and embedded units of analysis, which are individual ERP projects.

Expected preparations before the field work

- Getting permission to conduct the interviews and access the documents in the Case organisation.
- Contacting potential interviewees and agreeing suitable times for the interviews well in advance.
- Case study protocol is prepared.
- Designing the interviews and defining the interview questions.
- Designing a consent form.
- Ensuring data collection equipment, such as laptop and audio recorders, are sufficient.

3. Data Collection Questions

Data collection questions are listed in the below table. The purpose and sources of evidence are defined in the table. It further demonstrates the different scope of questions depending the unit of analysis and organisational dimensions.

Unit of analysis	From the organisation	From individuals	Purpose
ERP system general	<ul style="list-style-type: none"> • General procedures or guidelines how ERP related development should be conducted • General guidelines how ERP related benefits are identified and documented • General guidelines how ERP related benefits are ensured • General guidelines how ERP related benefits are followed up after implementation • Different level of benefits (organisational level / business unit level / team level / individual level) • Different types of benefits (financial / non-financial) • How are the benefits measured? 	<ul style="list-style-type: none"> • Are general guidelines or procedures followed? • Why or why not? • If so, how? • If so, by whom? • Are different levels of benefits identified? • Why or why not? • If so, how? • If so, by whom? • Are there challenges in realising benefits? • Why or why not? • If so, what kind? • How are the benefits measured before project and after project? • What kind of improvements are needed with ERP system in general to improve benefits realisation? 	Data to the unit of analysis: ERP system general
Individual development project	<ul style="list-style-type: none"> • Tools or methods used to identify and document ERP related benefits • Tools or methods used to manage ERP related benefits throughout the project • Tools or methods used to follow up ERP related benefits after implementation • Different level of benefits (organisational level / business unit level / team level / individual level) • Different types of benefits (financial / non-financial) • How are the benefits measured? 	<ul style="list-style-type: none"> • Are tools or methods used? • Why or why not? • Are benefits identified and documented? • Why or why not? • If so, how? • If so, by whom? • Are benefits managed throughout projects? • Why or why not? • If so, how? • If so, by whom? • Are there challenges in realising benefits? • Why or why not? • If so, what kind? • How are the benefits measured before project and after project? • What kind of improvements are needed in development projects to improve benefits realisation? 	Data to the embedded unit of analysis: individual development project
Possible sources of data	Organisational policies and guidelines, investment proposals, project documentation, interviews	Interviews, project documentation, development tickets	

4. Guide for the Case Study Report

This case study will be reported in master's thesis which will follow formal instructions of Faculty of Information Technology and Electrical Engineering, Oulu University. The audience will be the master's thesis supervisor and other Oulu University personnel, the personnel of the case organisation, and also other students of Oulu University.

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Appendix B. Interview themes

ERP development project

Please describe a recent ERP development work that you have been involved with. The following questions can help to describe it.

- Where did the development requirement come from?
- How was the need for the development identified?
- What benefits were anticipated from the development?
- What was the development process?
- How was the work documented?
- What tools were used for documentation?
- Who did the documentation?
- Were the anticipated benefits received?
- Were new benefits identified during the project?
- How was the realisation of benefits monitored?
- Were there challenges during the project?
- Are improvements needed with benefits management?

ERP Project 5 (project name anonymised)

If you were involved in any way with this project, please describe the process from your point of view. The following questions can help to describe it.

- Where did the requirement come from?
- How was the need for development identified?
- What benefits were anticipated from the development?
- What was the development process?
- How was the work documented?
- What tools were used for documentation?
- Who did the documentation?
- Were the anticipated benefits received?
- Were new benefits identified during the project?
- How was the realisation of benefits monitored?
- Were there challenges during the project?
- Are improvements needed with benefits management?

ERP development in general

- Tools or methods used to manage ERP related benefits throughout projects
- Different level of benefits (organisational level / business unit level / team level / individual level)
- Different types of benefits (financial / non-financial)
- How the benefits are measured?
- What kind of improvements are needed in development projects to improve benefits realisation?
- Are there challenges in realising benefits?