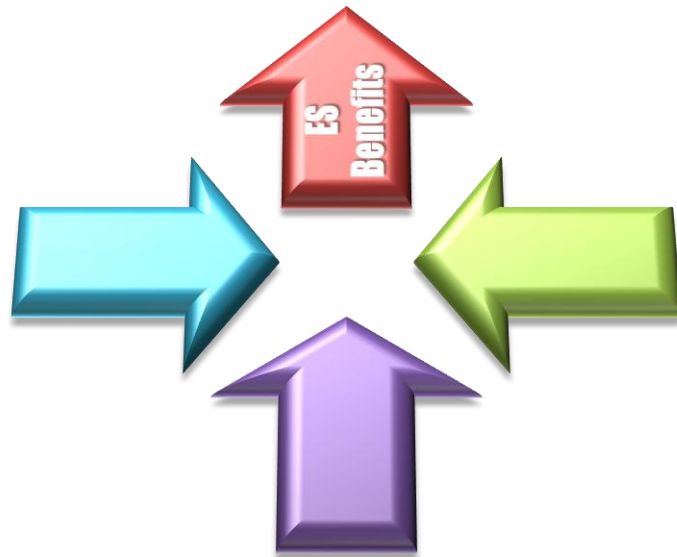KPMG and University of Twente

A roadmap to an ES benefits realization plan

Realizing benefits with an Enterprise System implementation

Amanda de Jong BSc.
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Management Summary

An enterprise system (ES) can provide many benefits for an organization, but because of the different issues during an ES implementation, the target is often changed to get the system operational instead of realizing the (initial determined) goals and benefits. Almost 70% of all ES implementations fail in delivering the desired benefits. Goal of this research is therefore to improve the benefits realization during and after ES implementations. Most (ES) implementation researches and methodologies are concentrated on realizing a working ES, but lack in focus on benefits realization. This research addresses this gap by presenting guidelines by means of a roadmap, for the development of an ES benefits realization plan.

Recommendations

This research presents a roadmap for developing an ES benefits realization plan (ES BRP). This plan can be used during and after an ES implementation by the line organization in order to realize benefits from their ES. The roadmap to an ES benefits realization plan exists of seven steps;

The first four steps serve as input for the ES BRP, which is brought together in step five. The last two steps ensure that the plan can be executed and take critical factors into account to increase the chances on ES implementation success so benefits can be obtained from the ES. This is not a linear process, because the information will become more detailed and clearer during the process. For example, during the gap analysis (step 4) it will become more clear which benefits can be realized or not, which is considered in the previous step. This means that (if necessary) a step back can be taken to improve the ES BRP.

An ES BRP should be developed in the initiating and planning phase of an ES implementation project. The ES BRP can then be used during the implementation to enable the realization of benefits after the go-live stage. Nevertheless, the ES BRP has to be monitored during the whole ES implementation and changed when necessary, e.g. when it becomes more obvious which benefits can and cannot be realized and in which way.

Besides, the ES BRP can be used after the implementation as an evaluation tool to reveal which of the desired benefits are, or still need to be realized.

Argumentation

The steps of the roadmap to an ES BRP are based on practices for the first two phases of the benefits management process, identify and structure benefits and benefits realization planning (Ward, Daniel & Peppard, 2006; Ashurst 2008). This is a process for general IT-projects, but made ES specific by applying ES specific models like ES implementation drivers, ES benefits classification framework and critical factors for ES implementations. Although it is assumed that more benefits can be realized when the complete benefits management process is executed during an ES lifecycle, the main focus of this roadmap is on planning the ES benefits.

From the case study and literature review is concluded that in order to realize benefits from an ES, benefits management and critical factors for ES implementation success have to be considered. When critical factors for an ES implementation are taken into account, this increases the chance on ES implementation success; a working ES. This is a pre-condition to realize benefits from an ES. When benefits management is applied during an ES implementation, there is more attention focused on benefits and improves the realization of benefits.

In this research is concluded that most critical factors are taken into account in the practices of benefits management, especially in the planning phase of the benefit management process. Thus by applying the roadmap for the ES BRP, most critical factors are considered and the benefits realization in ES implementations can be improved.

Limitations and further research

This research focuses only on the planning phase of the ES benefit management process. It is assumed that more benefits can be realized if the complete ES benefit management process is executed during the ES lifecycle, in example after an ES implementation and initial benefit realization, more benefits are exploited. Therefore, it is suggested that the ES benefit management process should be further developed.

This research also lists 21 critical factors for ES implementation success, and although this and other researches point out that these are of importance with benefits realization, it is still uncertain what their exact relationship is, and if all critical factors are evenly important for all benefits to be realized. For further research is suggested to give a critical review on the relationship between benefits and critical factors.

Preface

After more than five years it is now time to finish my student life. The last eight months I was allowed to spend this on my master thesis, which now lays here before me. These last months I spent at KPMG – IT advisory at the business unit ZOOM, where I got the opportunity, time, space and knowledge from the colleagues and interns to do this graduation research.

Since the first time I heard of enterprise (resource planning) systems in my first year my study Industrial Engineering and Management, it fascinated me. It was hard to imagine that such systems could integrate processes from complete organizations and the impact it has in an organization. But enterprise systems have to be implemented and managed, which are challenging but not impossible processes, which I experienced during my master and writing these thesis. Although writing this thesis gave me more insight in enterprise systems, there is still a lot to learn for me.

I am glad I can now finish my master thesis about enterprise systems. However, I couldn't have done this without support and confrontational feedback from different people.

First of all I would like to thank my supervisors at KPMG, Mark Scheurwater for introducing me at KPMG, ERP advisory and giving his feedback on my ideas. I thank Wido Dalhuisen, for all his motivational feedback and compliments that gave me the spirit to continue to improve my research. I would also like to thank the KPMG interns for sharing our research experiences and other colleagues that shared their knowledge, experiences, lunches and social time to listen to me. Special thanks to Jarno and Wilco that even in their free time and weekends kept in touch with me for support!

Secondly, I would like to thank my supervisors at the university. I thank Christiaan Katsma, for sharing his knowledge about enterprise systems throughout my time at the university and especially for his support and feedback during my master thesis. He pushed me to make the most of this thesis. Not to forget, I thank Silja Eckartz, for her feedback and support, even in the little details in this master thesis.

I must not forget to thank my social network friends on Hyves and Twitter that shared the joys and complaints in my graduation time and their grammar and spellings check of this thesis. I will keep on twittering, although the overall subject is going to change.

Last, but not least, I would like to thank my parents, sister Anika and Arno for their support and encouragement during my study and thesis time.

This leaves me with saying only that I hope you will enjoy reading this thesis. I also hope that the results of this thesis give inspiration to realize more benefits from enterprise systems. Do not hesitate to contact me if you have any questions or comments about this thesis.

Kind regards,

Amanda de Jong
December 2009

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1 Introduction

This chapter gives an introduction to this research by describing the background first and an analysis of the problems that this research considers. It continues by describing how this research is conducted in the research approach. This chapter is concluded by presenting the outline of this thesis.

1.1 Background

1.1.1 Motivation

Enterprise systems are packaged software applications that connect and manage information flows within and across complex organizations. Implementing an Enterprise System (ES) is a major project requiring a significant level of resources, commitment and changes throughout the organization. Often the ES implementation project is the single biggest project that an organization has ever launched. As a result, the issues surrounding the implementation process have been of major concerns in industry. And it further worsens because of numerous failed cases including a few fatal disasters which lead to the demise of some companies (Moon 2007). An ES can realize many benefits for an organization, but because of the many issues during an ES implementation, goals are often changed to getting the system operational instead of realizing the goals (Scheurwater & De Swaan Arons 2009).

Much research on ES implementations is aimed at finding the issues or factors that influence the chances on ES implementation success. Although these factors are of importance within an ES implementation project, it does not directly result in benefit realization. This research is aimed at addressing these issues by designing an ES benefits realization plan to improve benefit realization with ES implementations.

1.1.2 Relevance

Although this research clearly has practical impact, by trying to solve the benefit realization issues of ES implementations, it also has a firm theoretical impact.

This research addresses the theoretical gap of relating benefits with critical factors in ES implementations. There are some models available that link critical factors and benefits (or success) of an ES implementation, but these models have not been empirically researched, nor do they explain the causal relationship between these variables (Almashari 2002, King & Brugess 2006, Karimi 2007). Besides, these models lack of guidelines that can be used to realize and assess benefits from ES implementation (Eckartz et al. 2008). This research fills this theoretical gap on how to realize ES benefits through critical factors with the use of benefits management.

In practice this means that the IT advisors of KPMG do not have specific guidelines for their clients to help them realize benefits with their ES. Although the KPMG advisors do know how to assess the ES implementation on the system side, it is hard to tell the organization how to realize benefits from the ES. At this moment many organizations deem that their ES implementation does not deliver the promised benefits (Al-Mashari 2006). The goal of this research is to improve the benefit realization process within an ES implementation to obtain more benefits from the ES. This is done by first investigating how organizations are currently implementing an ES with regard to benefits management and considering critical factors for implementations. Based on the found results, a roadmap is created to plan benefits realization of an ES implementation.

1.1.3 KPMG IT Advisory

This research is performed at KPMG, an organization with 100,000 employees worldwide and over 3,600 in the Netherlands, who provide audit, tax and advisory services. IT advisory is part of the advisory service and helps their clients to realize the maximum value from their IT investments. They advise their clients on IT assurance, -projects, (enterprise) systems, -security and –governance.

Several IT advisors at KPMG deal with enterprise systems issues at their clients on a daily basis. They service their clients throughout the enterprise systems lifecycle, by giving advice during the project initiation, implementation but also when the system is operational.

Nevertheless many of their clients find it difficult to unleash the value of their ES implementations. The KPMG advisors know that although the project organization delivers a (technical) good system, the line organization that has to use the system does not seem fit to accept the system and deliver the benefits.

This research provides IT advisors a roadmap that can they can use to develop an enterprise system benefits realization plan. This plan can be used by the line (or demand) organization to improve the realization of the benefits from the enterprise system implementation.

1.2   Problem analysis

The IT advisors of KPMG sketched the problem that many organizations find it difficult to realize the benefits from their ES implementation. In previous research can be found that almost 70% of ES implementations fail to achieve their estimated benefits (Al-Mashari 2006). The reason is that the implementation of enterprise systems is complex, organizationally disruptive and resource intensive. Many organizations (with a technical mind-set) are not able to absorb such complexity which comes from the wide-scale organizational changes. The project associated with this change could therefore be lengthy, over budget, inconsistent, or result in incomplete installations of the system modules and lower benefits than hoped for (Al-Mashari 2003; Markus et al. 2000).

In addition, not focusing on the results in the business from the beginning of the project is a key factor in failure to achieve business results (Markus et al. 2000). Besides, major benefits do not emerge from the use of ES per se but rather from the organizational change induced by the ES and the extendibility of the software to support additional functionality (Stefanou 2001; Peppard 2007).

A business case is often used as an instrument to justify the investment in an ES only and is not used during the implementation process (Ward 2006; Eckartz et al. 2009). Organizations initiate an ES implementation process by creating a business case which mostly contains the costs of implementation, maintenance and some basic (financial) benefits that are expected to be achieved by implementing an ES. Yet, in more than 50% of ES implementation situations, there is no business case at all or the business case was never evaluated (Scheurwater & De Swaan Arons 2009).

Business cases are scarcely evaluated because the reasons for implementation, or desired benefits are not easily identified, quantified (Ward 2008; Stefanou 2001) nor defined in financial performance indicators (Scheurwater & De Swaan Arons 2009). When there are benefits defined, there are no guidelines on how to realize these benefits through an ES implementation (Eckartz et al. 2008). Once the system is implemented, the estimated benefits do not match the outcomes of the ES implementation, which leads to an unsuccessful project in terms of realized benefits.

Organizations that do not have a business case often view an ES implementation strictly as a technology replacement decision and cannot justify ES in terms of business benefits and therefore do not know if they realized benefits from the ES (Markus 2000; Peppard 2007).

Concluding, the main problem (hypothesis) of this thesis is:
Organizations do not achieve the estimated benefits from implementing an enterprise system, because organizations do not use guidelines to define and realize benefits, like benefits classification schemes, benefits management and / or critical factors.

Recent literature only seems to support the fact that ES benefits are not being realized (Al-Mashari 2006), and that critical factors are important for ES success and risk management (Muntslag 2001). The reason

that is given here, the lack of use of guidelines for benefit realization during the implementation phase, is not yet researched to the best of our knowledge. Therefore, the above statement is a hypothesis that will be examined with this research.

1.3 Research approach

The research approach will be described by the research goal, research model, questions and methodologies on how these questions are going to be answered. This is finished with giving the scope and reliability of this research.

1.3.1 Goal

The goal of this research is;

To improve benefits realization of enterprise system implementations by providing guidelines for developing a benefits realization plan. These guidelines can be used during the planning phase of an enterprise system implementation to identify desired benefits of the system by an organization and realize the benefits after implementation.

1.3.2 Questions and methodology

To reach the goal of this research, the following research question is defined;

What guidelines can be used to improve benefits realization from an enterprise system implementation?

To answer this question, several sub-questions have to be taken into account. Table 1 represents these questions and how these are answered.

Question	Methodology
1. What are the critical factors for an ES implementation with regard to benefits realization?	Literature research
2. Which benefits can be realized by implementing an ES?	Literature research
3. Which methods or best practices exist to realize benefits through ES?	Literature research
4. Are there benefits realization practices and critical factors used by organizations during ES implementations?	Case study
5. How can the proposed method(s) improve benefits realization in ES implementation projects?	Case study & expert interviews

Table 1 Research methodology

Literature research

To answer the first three questions, a literature research is conducted based on the structured approach by Webster and Watson (2002). In search for relevant research two databases, Web of Knowledge (Science) and Scopus are used, because these cover the top 25 IS journals (Schwartz & Russo 2004). The queries used in these databases are 'ERP / enterprise system* implementation*', 'benefit* management' and 'benefit* management ERP / enterprise systems'. The hits obtained are sorted by relevance and picked based on the title of the article and abstract. Besides this search, some articles are provided by the supervisors based on relevance with this research. To get more relevant literature, a forward and backward search is done also trough reference and citation search in Scopus.

The found relevant researches are divided in to three categories; (ES) benefit management, critical factors and general ES (implementations). The articles in the critical factor category contain many of the same concepts; this is plotted in a concept matrix that can be found in Table 3 on page 19. From the other categories the most relevant concepts from the literature are described, and when the same concept comes back in another source, another reference is made.

Based on the found literature, an in-depth analysis is made that forms the foundation of a theoretical model. This model is then validated through case studies.

Case studies

To answer the last two questions, two different kinds of case studies are conducted. The theoretical model is validated through four cases. Information of these cases our found in project documentation and interviews with KPMG advisors of that client for triangulation. Another case is used to assess the applicability of the theoretical solution in a practical situation.

Yin (2003) provides detailed case study design guidelines that are used to design this research in the form of a case study protocol. For the first case study such a protocol is desired because it makes it possible to compare the different cases. The case study protocol for the first case study can be found in Appendix 1.1.

The case study approach is the preferred research method for validating the theoretical model and ES benefits realization method. Case studies are the preferred strategies when "how" or "why" questions are being posed, when the researcher has little control over the events and when the focus is on a contemporary phenomenon within some real-life context (Yin 2003). This research complies with all these criteria. The research question is a "how" question (which guidelines on how to improve benefits realization), the researcher does not have control over the implementations and these implementations that are going to be studied are in real-life context, almost impossible to simulate in a laboratorial context.

Second case study is performed at an online retailer with an ES implementation to validate the applicability of the proposed guidelines. Since this is only one case and the guidelines prescriptive, there is no need for a case study protocol.

Expert interviews

To reflect on the applicability of the proposed method for improving benefits realization with ES implementations, interviews were held with experts on ES implementations and benefits management in IT-projects. This was done twice. During the first session, opinions are gathered and used to optimize the first ES benefit realization method, which resulted in the roadmap for developing an ES benefits realization plan. To validate this roadmap, experts' opinions were asked again as input for the discussion and further research with these results.

1.3.3   Research model

The methodologies as described above are structured executed according to the regulative cycle of Van Aken (1994) as presented in Figure 1. This cycle is especially useful for structuring design research. This research can be described as design research since the goal of this research is to design guidelines for planning ES benefits realization.
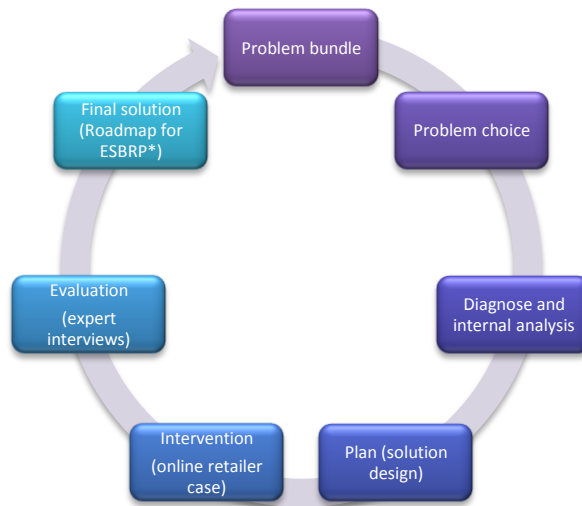
Figure 1 Reflective cycle (after Van Aken 1994) (*ESBRP = ES Benefits Realization Plan)

The cycle begins with an analysis of the problem in the form of a problem bundle, where several different problems and their causalities are analyzed. From that analysis, the main problem is determined. Then, a problem diagnosis or analysis is made in this problem domain, in example by doing a literature review as discussed above. Since that analysis is only based on theory, an internal analysis is added to validate the theoretical analysis in practice through a series of cases. From those case studies and literature analysis, a design or plan is developed to solve the main problem. This design is then tested at a specific case of an online retailer. Based on that experience an evaluation is executed to verify if the proposed design indeed solves the problem. That evaluation, together with the results of the test and design, is the foundation of the final solution in this research, the roadmap for developing an ES benefits realization plan.

1.3.4 Validity

Although the regulative cycle of Van Aken (1994) is an academic way of executing a design research, it does not ensure the validity of this research. In this section, this is discussed in terms of construct, internal, external validity and scope of this research.

Construct validity

An important issue with case studies is the validity of the research measurements. To ensure construct validity it is important to notice that multiple sources of evidence are used to establish a chain of evidence (triangulation) that should support the results of this study. The construct validity of the cases is ensured by the use of project documentation of ES implementations and interviews with ES implementation project managers and KPMG advisors who were involved in the project.

Internal validity

A threat to this research internal validity is the possibility that other factors, which are not included in the theoretical model, could lead to realization of benefits. To eliminate this threat it is important, while evaluating the cases that other factors that could be of influence on benefits realization are paid attention to as well. However, it is impossible to discover all factors of influence, thus it should be noted that this research could lack some factors and has more focus on the management of benefits together with the use of the identified critical factors.

External validity

External validity deals with the problem of knowing whether this study's findings are generalizable beyond the immediate case study. Case studies have to rely on analytical generalization (Yin 2003). In this research this is reached through matching the already existing theory with the cases and replicating the study and

logic in multiple cases. Besides, since the focus of this research relies in ES implementations, the applicability of the findings of this research on other cases than ES implementations is questionable.

Reliability

The goal of reliability is to minimize the errors and biases in a study. In this research this is achieved by providing a case study protocol that provides a guide on how the research is conducted. Besides a case study database will be provided with a small description of the cases that were used for this research that can give insight on the applicability of the cases.

Scope

Another way to ensure the validity of this research is by determining the scope. Because enterprise systems are such complex systems and can have an impact on every aspect in an organization, it is a very broad subject.

The scope of this research is given by focusing on the *realization of benefits* from an ES implementation instead of looking at the ES implementation process as a way to realize a working ES in the organization. Most researchers and practitioners think of success when an ES is implemented within time and budget. This thesis focuses more on the outcomes of the implementation process and tries to improve the benefit realization process during the implementation project. This is reached by looking at the (already identified) critical (success) factors and linking these to a benefits management approach.

1.4   Thesis outline

The outline of this thesis is structured according to the reflective cycle (Van Aken 1994) as presented in Figure 2.
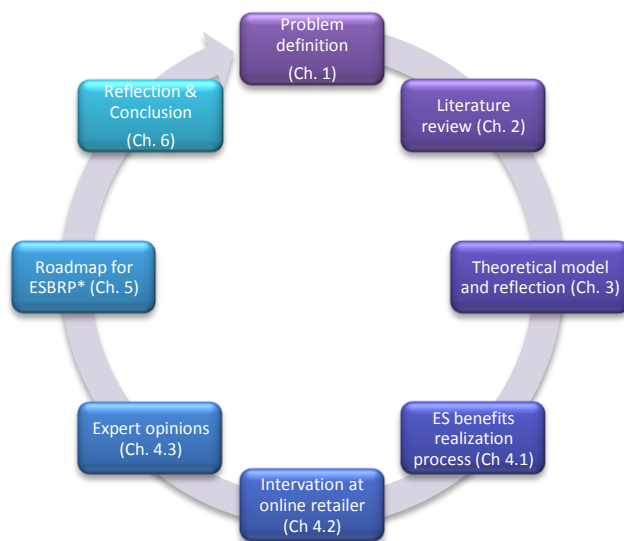
Figure 2 Thesis outline

Chapter 1 describes the background of this thesis based on the motivation and relevance (1.1), it also defines the problem that is being researched in this thesis (1.2) and how this research is conducted (1.3).

Chapter 2 analyses the problem domain with the concepts of ES implementations (2.1), their critical factors (2.2), ES benefits and benefits management (2.3).

Chapter 3 presents the theoretical model of the problem (3.1) and validates this with four different cases (3.2).

Chapter 4 illustrates the first version of an ES benefits realization method (4.1) for the problem as described in chapter 1, based on the theoretical models of chapter 2 and 3. Besides it assesses the applicability of this by testing it at an online retailer who is currently implementing an ES (4.2). This implementation is evaluated by experts in Section 4.3.

Chapter 5 presents the final design of the solution in the form of a roadmap to an ES benefits realization plan, by describing it design rationales (5.1) and each step in detail (5.2). The roadmap is discussed with experts in Section 5.3.

Chapter 6 concludes this thesis with answering the research question (6.1), recommendations (6.2), research limitations and suggestions for further research (6.3).

2   Literature review

This chapter describes the theoretical background of the research. It begins with the description of the unique characteristics of enterprise systems (ES). These define the scope of this research, since these make the implementation of such an information system and realizing benefits from that difficult.

Due to the complexity of enterprise systems, implementations can fail, which has an impact on the realization of benefits. For that reason are critical factors defined as well, as they should be taken in to account to realize benefits (2.3).

The goal of this research is to improve the realization of benefits from an ES implementation. In view of that, it is important to know the possible benefits from an ES, which is described in Section 2.4.1. Scholars have tried to link benefits of an ES (outcomes) with the critical factors of an implementation (2.4.5). However, the link between ES benefits and critical factors is a relative one rather than absolute in terms of what specifically can be expected (Al-Mashari 2003). Therefore benefits management is introduced at the end of this chapter (2.4.7) as a way to realize benefits from an ES implementation by use of critical factors.

2.1   Defining Enterprise Systems

Enterprise systems started from standard inventory control packages, to material requirement planning (MRP), manufacturing resource planning (MPR II) and further expand to include other enterprise processes such as sales and order management, marketing, purchasing, warehouse management, finance and human resource management and were called Enterprise Resource Planning (ERP) systems (Kumar & Hillegersberg 2000). But since these systems are used through the whole organization and are not only used for planning any more, the term Enterprise System (ES) is more appropriate.

Enterprise systems differ from 'traditional' software because of multiple special characteristics that can be summarized as follows:

- *Integration (end to end process logic)* – integration of business processes (Markus 2000; Davenport 1998; Katsma 2008; Shang & Sheddon 2002; Stefanou 2001)
- *Best practice-based* – 'best ways of doing business' as defined by the ES vendors (Katsma 2008; Markus 2000; Kumar & Hillegersberg 2000; Davenport 1998; Shang & Sheddon 2002)
- *Configurable commercial-of-the-shelf (COTS) packages* – standard packages developed by vendors, configuration can be set by the organization through modules and configuration tables (Katsma 2008; Markus 2000; Kumar & Hillegersberg 2000; Davenport 1998; Shang & Sheddon 2002).
- *Customization* – going beyond the setting of the systems specifications (alter the core code), but highly impractical (Katsma 2008; Davenport 1998; Stefanou 2001)
- *Real time availability of data* – integrated databases makes information retrieving easier (Davenport 1998; Katsma 2008)
- *One platform / upgradability* – standardization but also dependency on one platform (Katsma 2008; Markus 2000).
- *Some assembly required* – platform needs to support the ES (Markus 2000)

Although some of these characteristics can also be applied to 'traditional' software (e.g. Microsoft Office is also a COTS package), an ES contains all these characteristics. For example, the Microsoft Office package does not integrate different business processes. The more 'general' software packages are mostly implemented for only a small set of functions within an organization, like text processing in Office. Therefore an ES is seen as an exceptional type of information system, with unique aspects that impacts an organization that uses an ES. These unique ES aspects mark the boundaries of this research.

Summarizing Enterprise Systems (ES) can be defined as (Davenport 2004):
Enterprise Systems are packaged software applications (from vendors such as SAP, Oracle and Microsoft) that connect and manage information flows within and across complex organizations, allowing managers to make decisions based on information that truly reflects the current state of their business. These systems also automate complex transaction processes and thus have the potential to reduce costs.

This definition will be used for this research, because of its completeness. Besides the characteristics that are listed above, this definition also contains other important aspects of enterprise systems. In this definition Davenport (2004) points out that an ES is also a decision support system based on the (real-time) information in the system, automates processes and an ES changes the organization as a consequence in different ways, like ways of working in an organization.

Enterprise systems are rapidly evolving and facets of the system are changing. The ES technology changes on architecture, from client-server to web-based and functionality by including the supply chain, front and back office functions. Also service arrangements with an ES change, instead of buying the software only, organizations buy the application service that will maintain the package (Markus & Tanis 2000; Kumar & Hillegersberg 2000).

These changes can also be described by three generations of the ES technology. The first generation is the ES as defined above, which integrates the business processes within the organization and contain some standard functionality. The second generation (ERP II) is an ES that supports inter-enterprise co-operation, by collaborating along the supply chain and include functionalities like supply chain management (SCM) and customer relationship management (CRM). The third generation is an ES that supports e-community collaboration in a networked situation. This ES has functionalities like electronic marketplaces and works with open (internet) standards (Muntslag 2001). In this research the focus relies on the first generation enterprise systems, since most enterprise systems that are currently implemented can be classified under this generation. However it is important to take the second generation into account too, since this generation becomes more popular and more challenging to realize benefits with more stakeholders.

2.2   ES implementation

Because of the integrated and complex aspects of enterprise systems, much attention is given to how such a system should be implemented in an organization. Reflecting the importance, almost 40% of all articles about ES are about ES implementation (Moon 2007). Although a precise definition of ES implementations is hard to find in the literature that is used for this research.

One explicit definition of ES implementation is given by Katsma (2008):
"An ES implementation is a technologically driven organizational change process that requires paying deliberate, equal attention to the technological issues, the financial and project management affairs, but also to the personal development of the participants."

In this definition Katsma focuses on the organizational change as an impact of the ES implementation and taking the issues of an ES implementation into account. Although the organizational change is inevitable according to some researchers like Davenport (1998), Markus (2000) and Muntslag (2001), an ES implementation can have different approaches that could change this definition on an ES implementation because of different drivers and different impact of the ES on the organization.

2.2.1   Approaches

There are different strategies to implement an ES. The most known approach is the 'Big Bang' where the whole organization will switch to the new system at once. Another method is a more incremental, module per module or unit by unit to switch from the legacy systems to the new ES (Parr & Shanks 2000). However, ES implementation approaches can differ on more factors than the implementation strategy.

Parr and Shanks (2000) present a taxonomy of ES implementation approaches based on five different implementation characteristics (Table 2). The physical scope gives a representation of the size of the ES implementation. Business Process Reengineering (BPR) scope accounts the amount of adaptation of the organization to the ES, on the other hand the technical scope represents the amount of adaptation of the ES. The module implementation strategy account first how much of the ES modules will be implemented and secondly the way the ES is implemented (incremental or big bang). Finally ES implementations can be compared to the resource allocation of time (length of the project) and the budget.

Physical scope	Business Process Reengineering (BPR) scope	Technical scope	Module implementation strategy	Resource allocation
• Single site • Multiple sites, regional • Multiple sites, international Number of users • Small (<100) • Medium (<200) • Large (>200)	• Alignment to ERP • Local BPR • Global BPR	• No modification to ERP • Minor modification • Major modification	*Decision 1:* • Skeletal • Full functionality *Decision 2:* • ES module-by-module integration to legacy systems • All ES modules implemented then integrated to legacy systems	Time: 6 months – 12 months Over a year Over 4 years Budget: $1-2M Over $3M Over $10M

Table 2 ES implementation taxonomy characteristics and values (Parr & Shanks 2000)

It is theoretically possible to generate numerous combinations of the above characteristics. However, the evidence that Parr and Shanks used to develop this taxonomy indicated that there were three types of implementation categories (Parr & Shanks 2000):

- *Vanilla* - the 'smallest' least ambitious approach with implementing an ES at one site, small number of users, using only the 'core' of an ES, minimal business process reengineering (BPR), taking 6-12 months at the cost around 1 to 2 million dollars.
- *Middle-road* - the ES is implemented at multiple sites with a selection of core modules of the ES, significant level of BPR, taking 3-5 years at the cost about 3 million dollars.
- *Comprehensive* - the most ambitious ES implementation that typically involves multiple sites (international), where the full functionality of the ES is implemented, the level of BPR is high and takes multiple years (up to seven) and costs tens of millions of dollars.

It could be said that the more ambitious the implementation approach is, the more benefits can be realized. However, with an ambitious implementation, complexity rises and it becomes harder to make an implementation successful (Parr & Shanks 2000). This framework is especially useful for evaluating and comparing ES implementation projects on their ambition level.

Although this taxonomy was validated through interviews, it has a rather technical view on implementation approaches and doesn't take the impact of the ES on the people and culture into account like Katsma (2008) did in his definition of an ES implementation. Different ambition levels not only differ in their physical, technical, and business scope, but also in their organizational impact, especially on required structural changes and on development of the participant. The actual driver is thus of essential importance for the type or character of the change process that will take place (Katsma 2008).

2.2.2 Drivers

There are different reasons (or drivers) for implementing an ES. A simple distinction is technical or business reasons to implement an ES (Markus & Tanis 2000). Examples of IT-reasons are integration of IT-applications or the need to replace hard to maintain legacy systems. Business reasons can be to accommodate business growth or to standardize procedures on different locations (Markus & Tanis 2000).

Another distinction in drivers can be made on the process level when implementing an ES. As KPMG IT advisors define *'the main objective of ES implementations is to optimize the IT environment supporting the business processes in such a way that the strategic objectives can be achieved in the most optimum way* (Scheurwater & De Swaan Arons 2009).' They introduce a model that looks at an ES implementation from a business, process and application (IT) perspective (Figure 3). In their opinion, if the implementation is driven from an application model, the process model is to be adapted, and when the process model is adapted, the business model should be adapted as well. The other way around is when the business model is going to be improved, it demands that processes should be improved and therefore it demands an alignment in the application model. Thus the change from an ES is a process with impact on business, process and application level.
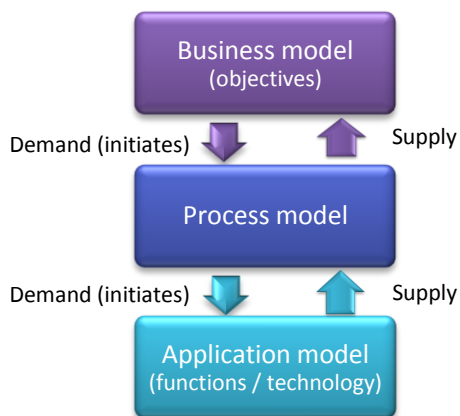
An almost similar viewpoint on ES implementation drivers is described by Muntslag (2001), with more focus on the organizational change. The types of organizational change with an ES are explained by drivers, enablers and impact of the ES implementation in the organization;

- *Structural reconfiguration implementation (SRI)* –driver of this implementation lies within the organizational structure and employees are capable to realize change (enabler). This top-down process affects the ES that already exist or is going to be implemented as a result of the change process (impact).
- *Package Enabled Reengineering (PER)* – driver of this implementation is to facilitate a business process reengineering effort by implementing a new ES (enabler) with its 'best practices'. The change process tends to navigate through technology and structure resulting in a significant cultural change that affects the individuals (more than with IDR). This can be compared to the *concerted change process* that intends to change the business processes at the same time the ES is implemented (Robey et al. 2002). Markus (2004) calls this approach a technochange (technology-driven organizational change) for the situation that IT is used to trigger major organizational changes.
- *IT-driven replacement (IDR)* – driver of this implementation is to adopt a new ES as replacement of the legacy systems, enabled most times by the IT-department. Business process and structure changes because of the ES, has an impact on individuals and their roles within the organization.

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This approach can also be linked with the *piecemeal change process* (Robey et al. 2002), where first the ES is implemented and then processes are adapted to the ES.

- *Human Driven Renewal (HDR)* – this implementation is driven by learning and developing individuals within an organization that initiates changes in business structure and processes through e.g. adopting an ES.

These types of organizational change with an ES, is based on a general typology of IT-enabled strategic change of Hsiao and Ormerod (1998). They propose these four different change paths, based on different case studies. However other paths are theoretically possible as well. E.g. a change is driven by individuals, and enabled by process improvements and technology that impacts the organizational structure. This model is based on the MIT model of Scott-Morton (1991), Henderson and Venkatraman (1993) to explain how IT enables a strategic change.

In the model of Hsiao and Ormerod (1998), the PER and SRI approach the strategy pushes the change thus is a planned change. On the other hand, IDR and HDR are examples of emergent changes that influence the strategy of an organization. Although on a high level this can be true in general IT cases, it does not have to be the same for ES implementations. E.g. IT-driven changes in ES are mostly planned changes since it is often to replace legacy systems and as a result driven by strategy instead changing the strategy. The typology of Muntslag (2001) does not take this strategy component into account and specifies the changes for ES specific situations, thus is most preferable to use as ES driver typology.

According to Muntslag (2001) the SRI approach is not relevant in the specific perspective of ES implementations because the implementation of an ES is not central in SRI. Example of such an implementation is when a new ES is forced by the holding organization that acquired a new company. However for achieving benefits, this type of ES implementations could still be interesting, since the driver for the change (e.g. standardization of processes in the acquired businesses) could be a major benefit that has to be achieved. The same accounts for the other implementation approaches and their drivers. Drivers of an ES implementation can have an impact especially on which kind of benefits an organization wants to achieve with their implementation (Markus & Tanis 2000; Schubert & Williams 2009). E.g. the PER approach focuses more on process benefits and the IDR approach focuses on IT-infrastructure benefits.

Currently in practice, IDR and PER are the types of implementation that most exist (Muntslag 2001; Katsma 2008). HDR is only seen as a theoretical option because the ES technology today is not mature yet to be used for HDR (Muntslag 2001; Katsma 2008), but can become more interesting since ESs are evolving towards 'agile' packages that support HDR, like the Oracle SOA suite.

Although the approaches used by organizations are different, Robey et al. (2002) discovered that both the piecemeal (IDR) as the concerted change process (PER) approach experienced the requirement to implement new systems and processes simultaneously. Important lesson from this is that implementation approaches can differ on driver and focus (BPR or IT replacement) or other factors described by Muntslag (2001), Parr and Shanks (2000), but executing the ES implementation can have much similarity like overcoming knowledge barriers and thus are not mutually exclusive.

2.2.3 Process

Most research on ERP implementation is process research. The process is typically conceived as a sequence of stages, from a company's decision to go for it to the final 'go live and use' stage (Robey 2002; Moon 2007; Katsma 2008). Researchers have described ES transition with models having three (Parr & Shanks 2000), four (Markus & Tanis 2000), six (Cooper & Zmud 1990) or even eleven steps (Umble 2003). Each of these models recognizes that firms have a planning stage, an implementation stage, a stabilization stage and a stage in which new systems are maintained and improved (Robey 2002). Therefore most implementation processes can be compared to the staged process of Markus and Tanis (2000) (Figure 4).

Figure 4 Enterprise systems experience life-cycle (Markus & Tanis 2000)

The staged approach of the ES implementation process is based on the traditional 'waterfall' methods of designing information systems. Although information systems design methodologies are changing to a more 'agile' approach, with flexible, more adaptable systems, ES implementations are not because of the current ES technology is not that adaptable (Katsma 2008).

Since the focus of this research is on benefits management, the process of benefits management is important to take into account with the definition of the ES implementation process. For that the definition ES implementation process of Robey (2002), Markus and Tanis (2000) is a basis for defining the process of realizing benefits in ES implementations.

2.3   Critical factors for ES implementation

Because of the unique aspects of ES implementations, identifying and developing critical factors (CFs) is one of the popular topics in the ES implementation research (Moon 2007). Critical factors are defined as 'the limited number of areas in which results, if they are satisfactory, will ensure successful competitive performance for the organization' (Ward & Peppard 2006). The idea is that some important factors determining the success or failure of an ES implementation can be learned from prior implementation experiences (Moon 2007).

When too little attention is spent on critical factors during ES implementation, this could lead to risks like user resistance, bad decision making, project delay etc. (Muntslag 2001). Besides, it is even suggested that critical factors bridge the link between ES implementation and business performance through realizing the benefits of the ES (Al-Mashari 2003).

From the literature review, a long list of factors[1] with regard to benefits realization can be subtracted and are summarized in a concept matrix in Table 3.

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[1] Some authors use different names for slightly the same factor, like 'training' and 'user education', and sometimes one author details factors more then the other. But in the end, most authors do agree on which factors are most critical for ES implementations.

Literature	Hong 2001	Karimi 2007	Bueno 2008	Wognum 2004	Somers 2004	Wang 2006	King 2006	Somers 2001	Al-Mashari 2003	Gattiker & Goodhue 2005	Chou & Chang 2008
1. Business process reengineering				✔	✔						
2. Training		✔	✔	✔	✔				✔		
3. Dedicating resources					✔						
4. User support						✔		✔			
5. Top management support		✔	✔	✔	✔	✔	✔	✔	✔		
6. Project management		✔		✔	✔		✔	✔	✔		
7. Communication			✔		✔		✔	✔	✔		
8. Consultant resources		✔			✔	✔					
9. Performance & Evaluation management									✔		
10. Business plan & vision				✔	✔		✔	✔	✔		
11. Fit with current business	✔		✔	✔	✔	✔	✔	✔	✔	✔	
12. ES scope		✔		✔	✔			✔			
13. ES radicalness		✔	✔						✔		
14. Organizational adaptation	✔				✔				✔		✔
15. Resistance to change	✔		✔		✔			✔	✔		
16. Management of expectations					✔						
17. Cooperation			✔		✔		✔	✔			
18. Data analysis					✔				✔	✔	
19. Defining the architecture					✔				✔		
20. Vendor support					✔		✔				
21. Package adaptation	✔			✔	✔			✔	✔	✔	✔

Table 3 Critical factors concept matrix

2.3.1 Importance of critical factors throughout the ES lifecycle

Sommers (2004) researched which factors are most important, spread over six implementation stages defined by Zmud (1990). Result of this study is that especially in the beginning stages critical factors are more important than in later stages. Besides multiple factors are important through multiple stages, like top management support is deemed important in the first stages but not to be forgotten in the rest of the stages.

Since Sommers' research is based on opinions of senior IT executives, the numbers are not representative enough or hard enough to say which factors are important in which stage exactly. However, it does give an overview of the most important factors in an implementation phase. Based on this research most critical factors are deemed important during the beginning and implementation phases. After go live a focus is on communication with the users, their cooperation and consultant / vendor resources.

By defining critical factors that have to be taken into account during an ES implementation, the changes of realizing benefits from an ES rises. Nevertheless, it is still ambiguous which benefits can be realized from an ES and the method to realize these benefits.

2.4 Benefits

A business benefit can be defined as "*an advantage on behalf of a particular stakeholder or group of stakeholders*" (Ward 2006). Although this definition is clear and simple, it lacks an important characteristic that has to be taken into account with this research. A benefit implicitly describes the gap between the current and desired state, because a benefit implies an improvement from current state. Thus benefits can be many things, as long there is an advantage or improvement for a stakeholder.

2.4.1 ES benefits classification

Determining potential benefits from an ES implementation is a challenging task, since most benefits are not derived from the ES itself but from way it is implemented, used and its impact in the organization (Eckartz et al 2009). Therefore, different scholars have developed frameworks for defining and evaluating ES benefits. Shang and Sheddon (2002) first defined an ES benefits framework based on 223 ES reported stories and 34 interviews. A list of their defined benefits can be found in appendix 8.1.1.

Although this framework is especially useful for evaluating the benefits of an ES, it does not link these back to the drivers of an ES implementation project or the timeframe for benefits realization. For those reasons, Chand et al (2005) developed an ES benefits framework based on the balanced scorecard (BSC) of Kaplan and Norton (1996) and added a dimension with Zuboff's levels of automate, informate and transformate.

While the BSC approach is valuable as well, Chand's framework is not as comprehensive as Shang and Sheddons framework with five classes instead of three that Chand uses. Therefore, Eckartz et al (2009) combined the BSC and Shang and Sheddons framework into a three dimensional framework. Besides they added the impact of human resource as well to the BSC since this impacts the ES project success as well (Eckartz et al 2009; Umble 2003).

Recently, Schubert and Williams (2009) presented a new three dimensional taxonomy for classifying realized ES benefits, solely based on case studies. They suggest that a complete ES benefits classification should incorporate motivations of organizations for implementing an ES, modality and change over time of benefits and the reach and scope of an ES project, that currently existing frameworks lack.

In the following matrix (Table 4) the frameworks are compared on their different classes, purpose and foundations.

	Shang and Sheddon (2002)	*Chand et al (2005)*	*Eckartz et al (2008)*	*Schubert and Williams (2009)*
Dimensions?	1	2	3	3
Classes (dim)	Operational (1)	Automate (2)	Operational (1)	Business design (1)
	Managerial (1)	Informate (2)	Managerial (1)	Company management (1)
	Strategic (1)	Transformate (2)	Strategic (1)	
	IT-infrastructure (1)		IT-infrastructure (3)	Information technology (1)
	Organizational (1)		Organizational (3)	Business functions (1)
BSC		Process (1)	Process (2)	
		Customer (1)	Customer (2)	Supply Chain (1)
		Finance (1)	Finance (2)	Company management (2)
		Learning and innovation (1)	Innovation (2)	
			HR (2)	
Other dimension		Goal & Outcomes		Aspects (2), Criteria (3)
Purpose	Evaluation	Identify ES success	Identify, realize and evaluation of benefits	Compare & evaluation
Based on	223 cases	Literature	Literature	60 Cases
Validated?	34 interviews	1 case	Not	Not

Table 4 ES benefits framework matrix

Most frameworks are designed to evaluate the benefits of an ES implementation (Shang and Sheddon 2002; Chand et al 2005; Schubert and Williams 2009). The framework of Eckartz et al (2009) however is especially designed to represent the impact of the ES on different dimensions in the organization. Although the frameworks of Schubert and Williams (2009) and Eckartz et al (2009) are very comprehensive, the amount of dimensions and classes make the framework (unnecessary) difficult. Especially when these three dimensional frameworks are compared to the framework of Shang and Sheddon (2002) that is validated and widely used by other researchers.

2.4.2   ES benefits characteristics

Besides the identification of ES benefits through dimensional classification, issues with ES benefits mostly come from their special characteristics. IT managers often use only easily estimable factors to evaluate IT projects, because they are unable to capture many of the qualitative and intangible benefits that are expected. However many ES benefits are indirect and not tangible or (easily) quantifiable, but still important to consider with an IT-project assessment (Murphy 2002).

Murphy (2002) distinguishes ES benefits based on tangible and quantifiable benefits. How tangible a benefit is depends on how it affects the firm's profitability. If it affects the profitability direct, the benefit is tangible. How quantifiable a benefit is depends on how easily it is measured, but it may or may not directly influence a firm's profitability.

Murphy characterized the benefits according to the framework of Shang and Sheddon (2002) (Appendix 8.1.1). Generally speaking, strategic benefits are more intangible and not quantitative in nature compared to operational benefits that are more tangible and quantitative in nature. As a consequence is assumed that in our framework too, operational benefits are easier identified then more strategic benefits, although strategic benefits could have more (indirect) influence on an organization its profitability.

2.4.3   Benefit dependencies

One important characteristic of ES benefits that Murphy (2002) describes is that many ES benefits are indirect benefits that come from other benefits. Eckartz et al. (2009) underlines this principle by the propositions that organizational and IT-infrastructural benefits enhance operational, managerial and strategic benefits. E.g. IT-infrastructural benefits influences the processes of an organization and thus has an influence on the strategy of the organization. Although these dimensions have been outlined separately, they nevertheless interact (Karimi 2007; Chand 2005). Operational benefits may come with increased managerial effectiveness; strategic benefits rely on process efficiency; etc. (Karimi 2007).

In their research, Gattiker and Goodhue (2005) found through surveys that data quality benefits improve coordination and task efficiency and that those benefits contribute to overall benefits in local firms (plants), and the longer the ES is implemented, the more benefits are realized. If data quality is in this case seen as an operational benefit, this improves a managerial benefit by coordination improvements. Thus it is important to take into account that benefits influence each other on different levels and time.

Another way to describe the dependencies of the benefits is by defining how the benefits are realized. '*Benefits emerge only when individuals or groups within an organization, or its customers or suppliers, perform their roles in more efficient or effective ways* (Peppard & Daniel 2007).' Consequently changes have to be made in order to realize benefits.

To deliver benefits in IT-projects, two types of changes are identified, business and enabling changes. Business changes are permanent changes to working practices, processes or relationships. For example, instead of sending an invoice per mail, this is done in e-mail, which results in an improvement in time and costs. However, these changes cannot be made until the new IT-system is available for use and other enabling changes have been made. Enabling changes are typically 'one-off' changes that are pre-requisites for making the business changes or bringing the new system into effective operation. An example of such a

change is the configuration of the ES (Peppard & Daniel 2007). Business and enabling changes have to be inline with the benefits objectives in order to actually realize these benefits.

2.4.4   Stakeholder viewpoint

Since benefits are an advantage on behalf of a particular stakeholder or group of stakeholders (Ward 2006), each stakeholder can have a different view on ES benefits. In example, a benefit for an IT-manager is that the IT-infrastructure maintenance is improved while a benefit for another employee is an improvement in support of their tasks. Each stakeholder has its own stake in the ES implementation, but can also be of help to identify the changes and resources needed for realizing the benefits.

There are different methods for stakeholder analysis, which can be used for identifying the stakeholders of an ES implementation and their benefits and requirements. The purpose of a stakeholder analysis is to understand those organizational factors that will affect the organization's ability to achieve the required improvements (Ward & Peppard 2006).

To perform a benefit driven stakeholder analysis, the (adapted) method of Benjamin and Levinson (1993) can be used (Ward and Daniel 2006). In this technique stakeholders are first identified based on the benefits that are expected for these stakeholders and the changes that are needed. Four kinds of stakeholders can be identified (Figure 5).
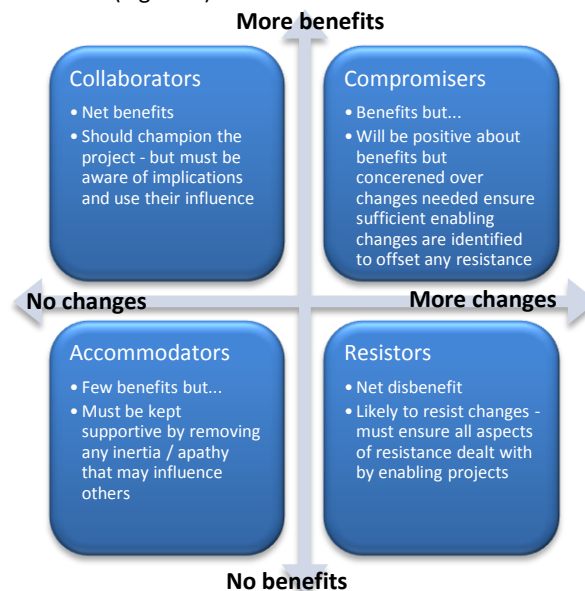
Figure 5 Stakeholder analysis (Benjamin & Levinson 1993)

The deeper stakeholder analysis of Benjamin and Levinson (Ward & Daniel 2006) can be used to identify for each stakeholder the benefits they are affected by and which changes they need to make to realize this benefit. However, some benefits for one stakeholder can be disbenefits for another and could lead to resistance to change and a risk for the project. Therefore this stakeholder analysis takes the actions required to make the changes into account as well based on the commitment of the stakeholders.

A way to link each stakeholder with their benefits, needed changes, perceived resistance and action required to make the change is presented in Table 5.

Stakeholder group	Benefits perceived *(disbenefits)*	Changes needed	Perceived resistance	Commitment (Current & Required)				
				Anti	**None**	**Allow it to happen**	**Help it happen**	**Make it happen**
List of stakeholders and stakeholder groups	Individual and organizational benefits for each stakeholder and group	Changes to be made by which affect each stakeholder or group	Resistance of each stakeholder or group and reason for this	Are against the project and will attempt to stop it or hinder progress	Are either unaware the project is going on or do not think it affects them	Will comply, when requested to do tasks required by the project, e.g. attend training	Will provide know ledge, time and resource to ensure the project meets objectives and time scales	Will instigate, oversee or carry out changes and ensure that all relevant changes are completed success fully

Table 5 Stakeholder analysis (2) (based on Benjamin and Levinson) (Ward & Daniel 2006)

2.4.5 Relationship between ES benefits and critical factors

It seems quite logical that to reach benefits, critical factors have to be taken into account. But not much research has been done to link benefits to critical factors. This can have many reasons like that the benefits differ per project and are hard to define and evaluate. The link between ES benefits and critical factors is a relative one rather than absolute in terms of what specifically can be expected (Al-Mashari 2003).

There are four models that intend to represent the relationship between critical factors and benefits from an ES implementation. These are compared in Table 6.

	Al-Mashari (2003)	*King & Burgess (2006)*	*Karimi (2007)*	*Gattiker & Goodhue (2005); Chou & Chang (2008)*
Model	Taxonomy of ES critical factors	Dynamic model of ES success	Factor based study of ES implementation outcomes	Implementation factors that influence ES benefits
Critical factor clusters	Setting –up Implementation Evaluation	Organizational context Supporters Project organization (Based on Sauer's construct of IS innovation)	ES scope ES delivery system ES radicalness	Interdependence and differentiation between plants Customization of ES and organization
Outcomes	ES Success ES Benefits (Shang & Sheddon 2002)	Development stage (success) Operational stage (Shang & Sheddon 2002)	Business process outcomes (Process benefits)	Improvement in coordination and efficiency
Relationship	All factors lead to outcomes	Project organization delivers benefits, other factors influence project	Scope & Radicalness lead to outcomes, delivery system & radicalness influence	All factors influence improvements
Validation	-	(intended for simulation)	148 interviews	111 + 70 interviews

Table 6 ES critical factors in relationship to benefits

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All models show influence of critical factors on ES outcomes, but this relationship does not directly explains on which factors have what influence on ES outcomes. Still, the results of Karimi (2007), Gattiker and Goodhue (2005), Chou and Chang (2008) validate a positive relationship between critical factors and ES benefits. Thus for benefits realization with ES systems, critical factors should be taken into account.

Recently, while finalizing this report, a new paper about the relationship between ES critical factors and benefits was published. In this paper Liu and Seddon (2009) researched 18 critical factors their influence on organizational benefits from ES use, but through the factors of delivering a working system, functional fit and overcoming organizational inertia. From prior research (working paper of Seddon), these factors explain a significant difference in variance in organizational benefits. The results from this new research explain that the 18 critical factors influence functional fit, overcoming organizational inertia and delivering a working system. The critical factors of consultant resources and IT-infrastructure influence organizational benefits direct.

Although Liu and Seddon (2009) only researched the influence of critical factors on organizational benefits, all critical factors had a (indirect) influence. Therefore it could be assumed that in order to realize benefits from ES, in all levels, all critical factors should be taken into account.

2.4.6   Benefits realization

In the research model in the first chapter benefits realization is used to describe the relationship between critical factors and benefits with an ES implementations. With most implementations, the main objective is to replace the legacy systems or renew the business processes (Muntslag 2001). From this the organization hopes to achieve business benefits. If an implementation process is driven by benefit realization, the benefit management process should be the driving mechanisms of these change activities (Ward 2006). Substantial benefits are realized only when an organization creatively takes the raw components of an ES, claims them as its own and directs them to meet its unique business vision (Davenport 2004).

Peppard (2007) describes five principles for realizing benefits through IT:
1. IT has no inherent value, benefits results from effective use of IT assets.
2. Benefits arise when IT enables people to do things differently.
3. Only business managers and users can release business benefits.
4. All IT projects have outcomes, but not all outcomes are benefits.
5. Benefits must be actively managed to be obtained.

These principles underline the importance of benefit management with an IT-investment, in this research the ES, and its implementation.

Active benefits realization

There are different methods or processes described to actively manage benefits. One such method is the Active Benefits Realization (ABR) approach of Remenyi and Sherwood-Smith (1998). This method is developed to improve the performance of information systems project through a continuous evaluation approach. ABR focuses on project management as a means of identifying, defining, monitoring and delivering business benefits as a result of an information system development opportunity. Although ES implementation processes can often be compared with general information system development (Section 2.2.3), drivers of ES implementations are hard to compare with development opportunities. ES implementations are often driven by the need for structural reconfiguration, improving business processes or replacement of legacy systems (Section 2.2.1), thus more 'problem solving' then a 'development opportunity'. Therefore the applicability of ABR for ES implementations is not preferred.

ES benefits realization

For explicit benefits realization with an ES, Davenport (2004) proposes a model, based on a survey and interviews, which predicts that organizations can achieve more perceived value when they focus on three value drivers:

1. *Integrate* – unify and harmonize the ES, data and processes with an organization's unique environment, and use the systems to better connect organizational units and processes, as well as customers and suppliers
2. *Optimize* – standardize most processes using best practices embodied in the ES software, mold and shape processes to fit the unique or strategic needs of the business, and ensure that processes flow and fit with the systems themselves.
3. *Informate* – organizations informate by transforming the ES data into context-rich information and knowledge that supports the unique business analysis and decision-making needs of multiple work forces.

While these drivers can enhance the value of the ES, they are not explicitly linked to the benefits organizations can achieve with the implementation of ES. While this model focuses more on 'how' to realize value, this research turns this around by first looking which benefits organizations want to achieve and then on how to do this. These value drivers can be of help with 'how', although it will be ambiguous which benefits can be realized through these drivers.

To accelerate the business value organizations can get from their ES, organizations should (Davenport 2004):

- **Invest the effort** required to get a **critical mass** of implementation, set **resources** on the ES.
- **Manage the ES as an ongoing program**; dedicate ongoing management resources to the ES.
- **Prioritize benefits** and **create an action plan** to achieve them.
- **Manage** and **measure benefits**, **holding someone accountable** for realization of targeted benefits to shorten time to realize value.

With these activities Davenport points out the importance of benefit management in ES implementations. Thus this can be a first step towards a combination between ES implementations and benefits management.

2.4.7   Benefits management

Another more general IT-system benefits management approach is that from Ward and Peppard (2006), who define benefits management as:

'Benefits management: the process of organizing and managing such that potential benefits arising from the use of IT are actually realized.'

It should be noted that this definition focuses on the use of IT rather than implementation of a system. An ES is a more complex system than general IT-systems, so have a more complex implementation, as is concluded in Section 2.2. An important aspect with ES implementations is that these systems already enable changes in the business during the implementation of the system (Deloitte 1998), hence some benefits can already be realized during the implementation and not only by use of the ES. This comes back in the second principle of realizing benefits from IT: *'Benefits arise when IT enables people to do things differently'* (Peppard 2007). Therefore benefits should already be managed from the beginning of an ES implementation project, even if the ES is not used yet, by aligning benefits to the implementation drivers and changes enabled by the ES. Thus ES benefits management can be defined as:

'ES benefits management: the process of organizing and managing such that potential benefits arising from the implementation and use of an ES are actually realized.'

The benefits management process activities are described by Ward and Peppard (2006) as follows (Figure 6):
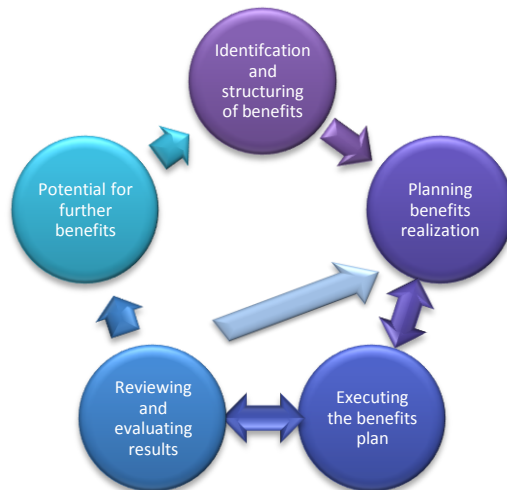
Figure 6 Benefits Management Process (Ward & Peppard 2006)

The main difference between this benefits management model and that from ABR is that this model does not focus on the opportunity development of an information system, but rather an already existing information system that has to be used to realize benefits. Accordingly this benefit management process is more suitable for benefits realization of an already developed ES.

A key characteristic of this process is that it is iterative; benefits continuously have to be managed in order to realize them, even after the system is implemented. Even though most ES implementations processes are viewed linear, the phases of both the processes can be compared together. Below each benefits management process phase will be discussed in detail and compared to the ES implementation phases of Markus and Tanis (2000).

Identify & structure benefits
The first stage in the benefits management process is to identify and structure the benefits from the ES project, based on the drivers for an ES implementation.

Main activities in this stage are (Ward & Daniel 2006):
- Analyze the drivers to determine the investment objectives
- Identify the benefits that will result by achieving the objectives and how they will be measured
- Establish ownership of the benefits
- Identify the changes required and stakeholder implications
- Produce first-cut business case

Compared to the traditional ES implementation process as described in Section 2.2.3, some activities can be compared to the first phase, the project chartering phase described by Markus and Tanis (2000). The other activities are more benefit oriented then the traditional implementation process, only the production of a business case is also mentioned as a product of the first stage by Markus and Tanis (2000).

Planning benefits realization
The purpose of this stage is to develop a plan that describes how to realize the identified benefits. An action plan helps to realize value from an ES (Davenport 2004). One of the activities as part of this phase described by Markus and Tanis (2000) is 'approving a schedule'.

Main activities in this stage are (Ward & Daniel 2006):
- Finalize measurements of benefits and changes.
- Obtain agreement of all stakeholders to responsibilities and accountabilities.
- Produce benefits plan and investment (business) case.

This stage could be compared with the project chartering phase of an ES implementation. The explicit activities regarding benefits, obtaining agreement and finalizing the business case are also described as activities by Markus and Tanis (2000) in the project chartering phase.

The steps involved in the first two stages of the process can be summarized as a set of questions that have to be answered to produce a benefits plan. These are shown in Figure 7 (Ward & Daniel 2006).
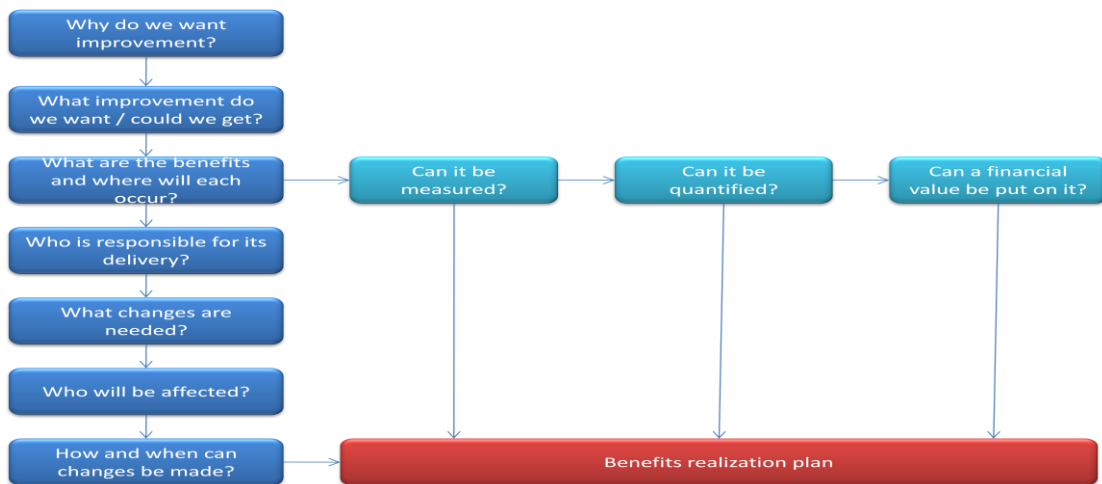
Figure 7 Key questions in developing a benefits plan (Ward & Daniel 2006)

The first three questions are answered in the first phase of the benefits management process. For the questions regarding to the changes, it can be useful to describe these with business and enabling changes as described in Section 0, especially for appointing the responsibility for the delivery of the benefit. Besides the responsibility, it is also important to define who is affected by the changes. This can be done through a stakeholder analysis. The combination of these answers lead to a benefits realization plan for achieving all the benefits (Peppard & Daniel 2007).

ES balanced scorecard

A way to represent the ES benefits plan is by plotting the answers into a balanced scorecard (Kaplan & Norton 1996). Originally, the balanced scorecard was to supplement traditional financial measures with criteria that measured performance from three additional perspectives of customers, internal business processes and learning and growth. With some alterations, these perspectives are also used to describe the impact of ES benefits by Eckartz et al (2009) and Chand et al (2006).

Besides this resemblance, the balanced scorecard can also be used for (Kaplan & Norton 1996):
- Translating the business vision to short term objectives.
- Communicating and linking goals to performance of groups within the organization.
- Business planning that links the objectives with actions.
- Feedback and learning by supplying a mechanism for review.

Accordingly the balanced scorecard can be especially useful as a foundation for an ES benefits realization plan.

For each perspective, objectives can be established and relevant measures can be assigned against each objective, leading to the information needed to measure performance. Ward and Peppard (2006) add to

the objective and measure, action and information systems need in order to achieve the objectives. This combines some of the answers from the questions presented in Figure 7 for developing the benefits plan. However, the answers to the questions dealing with the responsibility fro realization of the benefit and 'when to change' have to be in the plan as well. For that the following scorecard is proposed (Table 7).

Supply Chain Perspective

Benefit objectives	Measure(s)	Requirements ES / Organization	Action (Change)	Responsibility for realization	Change date
Operational	For each objective, measures are given	How to reach the benefit		Stakeholders accountable per benefit	
Managerial					
Strategic					
Organizational					
IT-infrastructure					

Table 7 ES BSC for benefit realization: Supply Chain perspective (after Ward & Peppard 2006)

For each column of the ES benefits framework, such a scorecard can be filled in with each benefit of that column. The answers to the questions of Figure 7 provide the information to fill out the scorecard. The cards for every business perspective can be found in Appendix 8.1.4.

Executing the benefits plan

As with any plan, the next stage is to carry it out and adjust it as necessary, as issues and events affecting its viability occur. Monitoring progress against the activities and deliverables of the benefits plan is just as important as for the ES implementation plan and the two plans are components of the overall project plan. It may be necessary to establish interim targets and measures to evaluate progress towards key milestones or the final implementation.

Main activities in this stage are (Ward & Daniel 2006):
- Manage the change programs.
- Review progress against the benefits plan.

As the project evolves, inevitably the plans will have to change, due to changes in resources and personnel plus unexpected events or problems that have to be assessed and dealt with. Besides during implementation, further benefits may also be identified, or it becomes apparent that intended benefits are no longer feasible or relevant (Ward & Daniel 2006). Therefore during the execution of the realization plan, sometimes the decision has to be made to go back to the previous stage and revise the benefits realization plan, implementation plan or even the business case where necessary.

This stage can be compared to the implementation or 'the project' (configure & rollout) stage defined by Markus and Tanis (2000). Activities in this phase of the ES lifecycle can be associated with the activities defined by Ward and Daniel (2006). Typical activities in this stage are ongoing project management, software configuration and customization, system integration and executive and end-user training as change programs. But realization of benefits also continues in the following phases during the shakedown or routinization phase when the ES is actually in use.

Reviewing and evaluating results

To assess whether the project is a success or not, this should be evaluated after completion. Once the ES and business changes have been implemented, there should be a formal review of what has and has not been achieved. This is a business review aimed at maximizing the benefits gained from the particular investment and increasing benefits from future investments. The results of such assessment may provide explanations for the non-delivery of intended benefits, as well as knowledge to improve the management of future projects or IT-implementations. It is worth stating that any post-implementation review should

not become a 'witch-hunt'; it must be an objective process with future improvements in mind, not a way of allocating blame for past failures (Ward & Daniel 2006).

The following main activities are involved in this stage (Ward & Daniel 2006):
- Formally assess the benefits achieved or otherwise.
- Initiate action to gain outstanding benefits where feasible.
- Identify lessons for other projects.

These activities can be associated with the activities in the shakedown stage (Markus and Tanis 2000). Activities in the shakedown stage are focused at solving problems with the ES and fine-tuning, like system performance tuning, problem resolution, process and procedure changes etc., thus can be directly associated with 'initiate action to gain outstanding benefits where feasible'. Only to know which changes are still needed, a formal review is necessary. This activity is postponed by Markus and Tanis (2000) to the next ES lifecycle phase, 'onwards and upwards', since they claim that only in that phase 'the organization is able to ascertain the benefits (if any)'. However, when benefits are actively managed, they can be realized earlier, thus be earlier reviewed. When reviewed too late, it has become harder to implement the changes needed to realize benefits. Accordingly a review of the (estimated) benefits should be done as soon as benefits are realized.

Potential for further benefits
It is almost impossible to identify all the benefits of an ES in advance. Further benefits often become apparent only when the system has been running for some time and the associated business changes have been made. If more benefits are actually identifiable after the event than before it, where there is no review process these will probably never be identified. Therefore, having reviewed what has happened, it is equally important to consider what further improvement could now be possible as a result of implementing the ES and associated changes (Ward & Peppard 2006). This then will feed the first stage of the benefits management process again; hence benefits management is an ongoing process, even after implementation that will release more value from ES (Davenport 2004).

Activities during this stage are (Ward & Daniel 2006):
- Identify additional improvements through business changes and initiate action
- Identify additional benefits from further IT investment

This stage can be compared to last phase of the ES implementation process what Markus and Tanis (2000) call the 'onward and upward' phase of the ES. Characteristic activities in this phase are continuous business improvement, additional end-user skill building or technology upgrading, which are almost the same as described by Ward & Daniel (2006). By exploring potential new benefits, the use of the ES can be improved and more benefits can be realized in a next cycle of the benefits management process.

2.4.8 Benefit realization competences
Ashurt et al. (2008) continues on the general benefits management process of Ward and Daniel (2006) with a benefits realization capability model. This model is based on the process described by Ward, Peppard and Daniel (2006) and contains four competences for benefits realization:
- Benefit planning (page 77)
- Benefits delivery (page 78)
- Benefits review (page 79)
- Benefits exploitation (page 79)

For each of these competences practices are defined (Appendix 8.1.2), based on information system literature and severe review, which organizations could carry out during IT-development projects. Although Ashurst did not define the benefit identification and structuring competence (like in the benefits management process), the practices for the benefits planning competence does contain practices for

identification of benefits. In example the practice to identify strategic drivers or identify and define benefits what leads to an analysis of benefits. A complete overview of the benefit identification and structuring practices can be found in Appendix 8.1.2 on page 76.

The benefit realization practices are compared to 25 cases of IT-development projects. The findings of this research is that benefits are planned for getting the project authorized and funding approved (through defining benefits in a business case), but not as starting point to get benefits realized through the project. Business benefits tend to disappear from the project teams' agenda until the system was implemented, at which point the benefits might possibly be evaluated, but rarely in a comprehensive way. Only after implementation, when benefits are exploited, teams make clear recommendations that more specific benefits-related practices should be adopted in future projects (Ashurst 2008).

In total Ashurst defined 26 practices, but some practices were not or hardly used by organizations. Although all practices can be found in literature, the question remains if they are all necessary for benefits realization, especially with ES projects. Perhaps Ashurst even lacked to include some practices that have to be in place for successful ES benefits realization.

In Section 2.3 is a list of critical factors that are assumed to be necessary for benefits realization in ES implementations. These factors should come back in the practices defined by Ashurst for realizing benefits with an ES. To ensure this is the case, the practices are compared with the factors based on the description and output of the practices (Appendix 8.1.2).

From this comparison it seems that most factors do come back in the practices defined by Ashurst. For example, all strategic factors are already dealt with in the first phase of the benefits management process. Only the factors top management support, consultant resources and vendor support are not found in the benefit realization practices. Thus, for realizing benefits with ES implementations, these should be added somehow to the practices.

Another noticeable aspect in the comparison is that the practices of review and evaluation are only supported by the critical factors of performance and evaluation management (Al-Mashari 2003) and dedicating resources, while other competences have more critical factors. This is almost inline with the results of Sommers (2004), which does link critical factors with the 'routinization' phase of an ES implementation, but these are not as important as in other phases. This could be explained by the fact that critical factors are defined for use during the implementation and influence the results of the implementation. Nevertheless, one cannot say a project is successful when it is not reviewed, hence practices for review and evaluating benefits stays important in the benefits management process for ES implementations.

2.4.9 Benefits management in project management practices

There are several IT project management best practices which are often used by organizations for managing IT implementations. Project Management Body of Knowledge, or PMBOK is an example of guidelines often used for (IT) projects in the US. This is a process based standard to project management which describes five project processes (initiating, planning, executing, controlling and monitoring and closing) over nine different project knowledge area's (integration, scope, time, cost, quality, human resources, communications, risk and procurement). PMBOK is a typical project management practice that is used for controlling the project and quality of its products. However, it does not take benefits realization into account (Project Management Institute 2000).

PRINCE2, or Projects In Controlled Enviroments, is another example of a project management standard that is often used in Europe for IT projects. The PRINCE2 approach aims to deliver end products at a specified quality within budget and on time. The emphasis is placed on the delivery of these products, not the activities to achieve their production. Although the project is driven by the business case, which is often

reviewed, the approach is not benefit driven but product driven. It covers the same processes as PMBOK, but like PMBOK, there is only attention for the product and not benefits realization (Avinson & Fitzgerald 2002; OCG 2009a).

The question is if an ES implementation can be viewed as a single project, since it is such an immense, complex project. If such implementation is split up in multiple projects, it can be said that it is better managed as a program of multiple projects. An example of a program management standard is MSP, or Managing Successful Programmes.

MSP defines program management as 'the action of carrying out the coordinated organization, direction and implementation of a dossier of projects and transformational activities to achieve outcomes and realize **benefits** of strategic importance to the businesses.' In other words, MSP can exist of different projects which are managed by PRINCE2, but MSP manages these on a higher level. According to MSP, benefits realization management is the core difference between program and project management. MSP treats benefits on high level as an outcome of different projects together (Sowden 2007, OCG 2009b). Some comparisons could be made between an ES implementation approach and MSP. This goes beyond the scope of this (academic) research, but should be further researched.

2.5 Analysis

In this chapter different theoretical concepts are described, which fit together as follows (Figure 8).
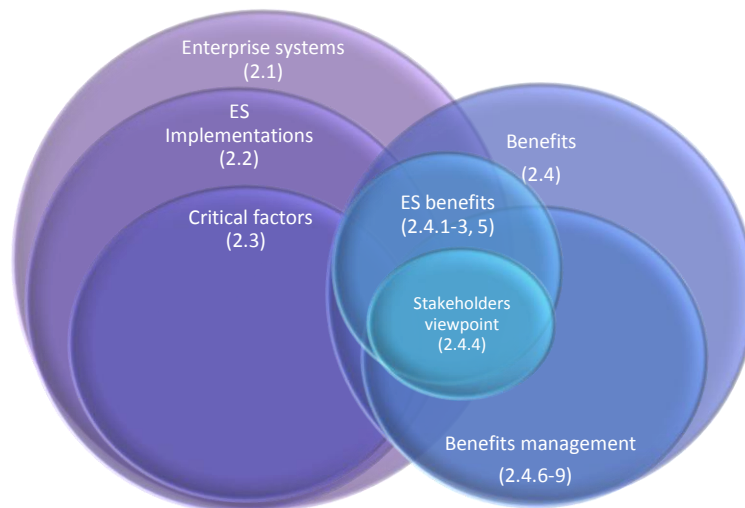
Figure 8 Theoretical concepts

This chapter began with the definition of Davenport (2004) as definition of enterprise systems (Section 2.1): *'Packaged software applications that connect and manage information flows within and across complex organizations, allowing managers to make decisions based on information that truly reflects the current state of their business.'*

To get an ES up and running, this has to be implemented, which is described in Section 2.2. Parr and Shanks (2000) present a taxonomy to classify and describe ES implementations, which will be used in the case studies (Section 3.5). Another way to describe ES implementations, is based on the drivers behind these implementations, which are identified and described by Muntslag (2001). This is used in this research to indicate which benefits are desired when driven by a specific driver (Section 3.2), but also for describing the case studies (Section 3.5). Finally, the ES lifecycle as described by Markus and Tanis (2000) to define the process of an ES implementation, is used to structure the ES benefits realization method that is presented in Chapter 4.

To make an ES implementation successful, critical factors have to be taken into account (Section 2.3). These factors are identified by various authors, as summarized in Table 3 on page 19. In the case studies (Section 3.5) is checked if these critical factors are currently taken into consideration by organizations. The critical factors should also come back in the ES benefits realization method (Chapter 4). This is done through a comparison of the benefits management practices with the critical factors (Appendix 8.1.2). Besides, the critical factors are used for risk assessment in the roadmap to an ES benefits realization plan to assess the chances on ES benefits realization.

In this research benefits are considered as the desired result from an ES implementation. In Section 2.4 benefits are defined as *'an advantage on behalf of a particular stakeholder or group of stakeholders'* (Ward 2006). Determining benefits from an ES is a challenging task because of its size and impact in an organization. Therefore, different authors have made classifications to identify and structure benefits from an ES. These classifications are compared in Table 4 (Section 2.4.1), which are used as foundation for a new ES benefits framework as presented in Section 3.2. This framework is used to identify and structure (desired) benefits in the theoretical model (Section 3.1) and in the ES benefits realization method (Section 4.1.1).

The definition of benefits states that stakeholders are needed to define the benefits, in this research of the ES. In Section 2.4.4 a stakeholder analysis of Benjamin & Levinson (1993) is described that can be used to identify the stakeholders of the ES implementation and their benefits.

But how to realize benefits from ES implementations? Some authors have tried to explain the relationship between critical factors and benefits realization, as summarized in Table 6 in Section 2.4.5. Although these researches prove that critical factors need to be taken into account to realize benefits from ES implementations, there are no guidelines given on how to realize these ES benefits. Davenport (2004) does describe some activities to accelerate benefits realization from an ES implementation that supports the use of benefits management (Section 2.4.6).

Section 2.4.7 describes the benefits management method of Ward, Daniel and Peppard (2006), which is used as foundation for the ES benefits realization method (Chapter 4). The benefits management process exists of five phases, which can be linked to the ES implementation process. In the first two phases, key questions are presented to develop a benefits realization plan. These questions are used in Chapter 4 to develop an ES benefits realization plan. The structure of this plan is based on the balanced scorecard (Kaplan & Norton 1994).

Based on the benefits management method, Ashurst (2008) defined practices on how to execute this method (Section 2.4.8 and appendix 8.1.2). These practices, together with the critical factors for ES implementations, form the guidelines to realize ES benefits, which is discussed in Chapter 4 and 5.

2.6 Conclusion

The analysis forms the summary of this chapter and presents the relation between the concepts and frameworks that are going to be used as design specifications for the ES benefits realization method. From this literature review can be concluded that much literature that describes ES implementations is process based, or factor based with explaining why certain implementations fail or succeed. Since the scope of this research is on the outcomes of the implementation, not all found literature on ES implementations and critical factors is used. This because most papers in this context described similar concepts.

However, the question remains with the critical factor researches if all factors are equally important and how exactly they influence each other and the realization of benefits (Al-Mashari 2003, Karimi 2007). The relationship between critical factors and benefits realization is rather complex to describe, but does exist. That is why critical factors for ES implementations have to be taken into account for ES benefits realization.

It is also noticeable that different authors structure and classify ES benefits based on the framework of Shang and Sheddon (2002). Nevertheless, none of the presented frameworks is suitable for identifying possible benefits from an ES implementation, based on the drivers behind the implementation and impact in the organization. In the following chapter a new framework that does include ES implementation drivers is presented, based on the comparisons of the existing frameworks in Table 6 in Section 2.4.5.

In literature no exact guidelines for realizing benefits from ES could be found, except from Davenport (2004) who suggests to actively managing the benefits from an ES. To do this, the benefit management method of Ward, Daniel and Peppard (2006) is presented. Although this benefits management method is intended for general IT-projects, it is the most comprehensive method for use in ES implementations. Therefore, the application of this method could, in combination with critical factors, lead to benefits realization in ES implementation. In the following chapter, these variables are further discussed and presented in a theoretical model.

3 ES benefit realization theoretical model

This research began with the problem that most organizations are not realizing the expected benefits from their ES implementations. The goal of the literature review in the previous chapter was to find the reasons why organizations have this problem and provide direction on how to solve this. This chapter further defines the theoretical model of this problem and validates it through four case studies.

3.1 Problem domain

In the first chapter of this research, the problem domain was described as:

Organizations do not achieve the estimated benefits from implementing an enterprise system, because organizations do not use guidelines to define and realize benefits, like benefits classification schemes, benefits management and / or critical factors.

In this description, the ES benefits are the dependent variable, since organizations do not realize them as well as desired. The ES benefits are dependent on the use of guidelines to realize benefits, like benefits management, which is defined as independent variable. However, critical factors play an important role as moderating variable in realizing ES benefits, since these are of importance for ES implementation success. In the literature review these variables are further defined with indicators and the relationship between these variables is described. This leads to the following theoretical model (Figure 9 and Appendix 8.2) which explains the relationship between critical factors, benefits management and benefits realization.
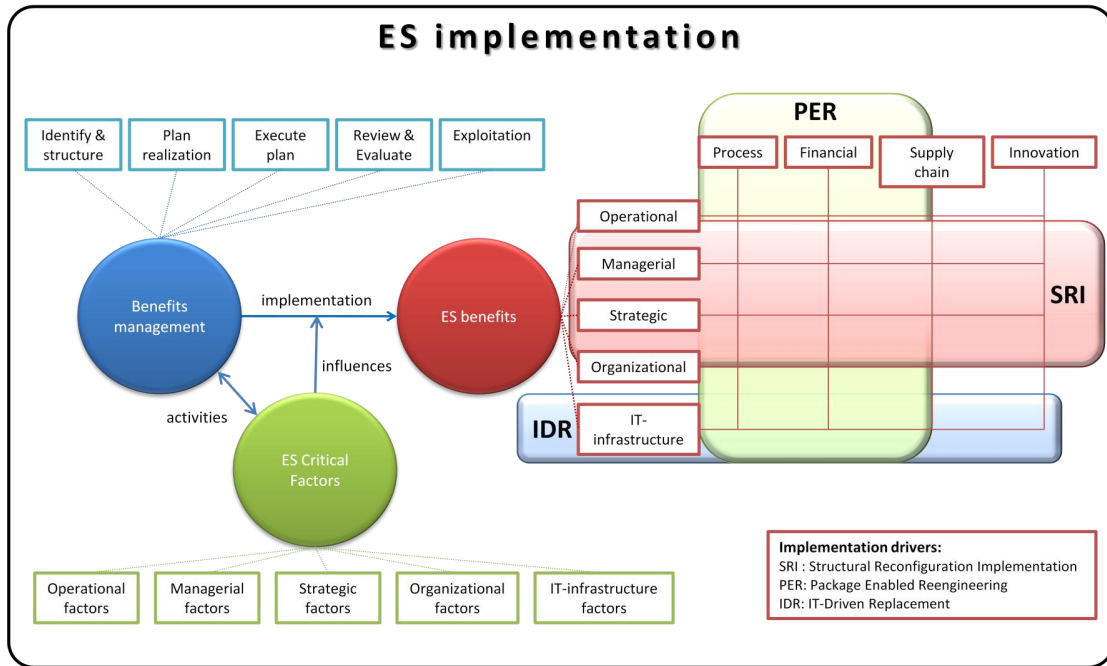
Figure 9 Theoretical model for ES benefits realization

This theoretical model represents the relationships between the variables as found in literature. These relationships can be explained as follows. In literature it is found that ES benefits can be realized through the use of benefits management in the implementation. However, an ES implementation is heavily influenced by ES critical factors, since these are responsible for ES implementation success. Nevertheless, ES critical factors can be combined with benefits management through the activities defined for benefits management. In each benefit management activity, critical factors can be found. This comparison is made in Appendix 8.1.2. As a result this model assumes that for realizing benefits from an ES implementation, benefits management practices can be used that also encompass the critical factors which relevant with ES implementations.

Each variable in this theoretical model will be discussed as foundation for the ES benefits realization method, which will be presented in Chapter 4.

3.2   ES benefits - dependent variable

This research views benefits as desired outcome of an ES implementation. An ES can have many different benefits. To structure these benefits different classification frameworks have been presented in the literature review (Section 2.4.1) and were compared in Table 4. Although all these frameworks have desired characteristics, like having different levels on which an ES can benefit in an organization (Shang & Sheddon 2002) and represent the impact on the organization (Chand 2005; Eckartz et al 2009), none of the frameworks explicitly takes the drivers of an ES implementation into account.

Drivers give direction to the benefits an organization wants to realize with an ES implementation and could strongly help organizations to define and structure their desired benefits. Therefore, this research suggests the following framework (Figure 10) for identifying ES benefits. This framework is adapted from the framework of Eckartz et al. (2009). This framework put the levels of Shang and Sheddon (2002) on two dimensions. The third dimension in that framework is the balanced scorecard concepts, added with human research. In this framework (Figure 10), the levels of Shang and Sheddon are again in one dimension, and the second dimension is an adapted version of the balanced scorecard. The last dimension in this framework is for the drivers for ES implementations (Muntslag 2001), to assess and explain the impact of the drivers on the outcomes (benefits) of an ES implementation (Markus & Tanis 2000; Schubert & Williams 2009).
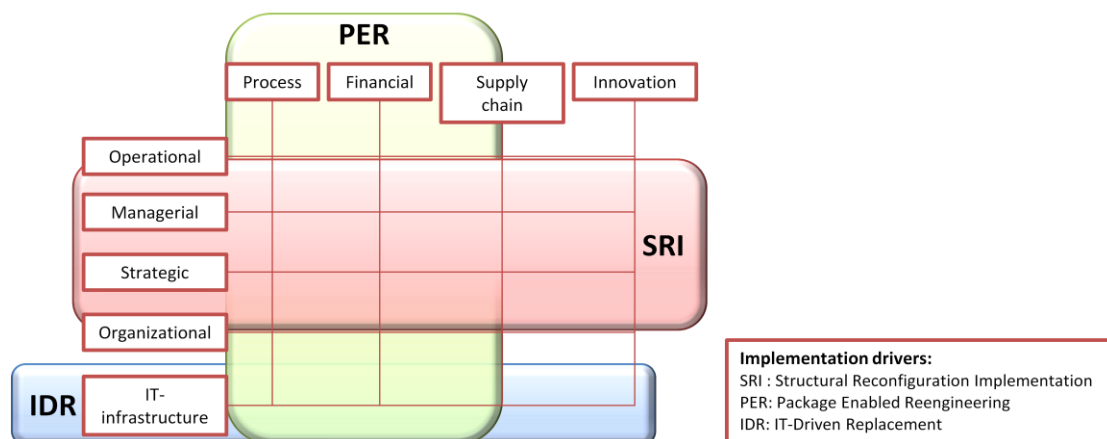
Figure 10 ES benefits framework

On the horizontal axis the benefit classes defined by Shang and Sheddon (2002) can be found:
- **Operational benefits** - improvement from automating and optimizing operational business activities.
- **Managerial benefits** – improvement in control by support of the ES in planning and decision making.
- **Strategic benefits** – improvement in achieving and attaining a competitive advantage.
- **Organizational benefits** – improvement in focus, cohesion, learning and execution of the strategies chosen by the organization.
- **IT-infrastructure benefits** – improvement in sharable and reusable IT-resources that form a backbone for other business applications.

These benefits can have a different impact on the organization, which is represented on the vertical axis:
- **Process** – when the benefit improves the business processes.
- **Financial** – when the benefit increases profits by lowering costs or increasing revenues.

- **Supply chain** – when the benefit gives advantages to customer or supplier relationships.
- **Innovation (learning and growth)** – when the benefit enables the possibility to innovate the organization.

These impact classes are based on the balanced scorecard (BSC) (Kaplan and Norton 1996; Chand et al 2005). Although in this framework the original BSC customer perspective (the external perspective) is replaced by the supply chain perspective that Schubert and Williams (2009) use in their ES benefits framework. The reason for this is that (second generation) enterprise systems especially provide support for supply chain management, and not only for customers.

On each intersection of the framework benefits can be plotted, for example, an improvement in customer services is an operational benefit that impacts the supply chain. Examples of such benefits can be found in Appendix 8.1.3. Some benefits are easier to identify than others, thus an organization implementing an ES should not expect to have the same amount of benefits in each section.

The third dimension in this framework gives an indication of the scope of a project, by linking the drivers to desired benefits. These drivers (Muntslag 2002) can be plotted on the framework as follows;
- IDR (IT-Driven Replacement) implementation focuses on replacing legacy systems, this mostly deliver benefits in the IT-infrastructure (and its maintenance) classes.
- PER (Package Enabled Reengineering) implementation focuses on the improvement of processes, what gives benefits in all classes. The impact is mostly on processes, financials and partly the supply chain if processes in the supply chain are affected by the implementation too.
- SRI (Structural Reconfiguration Implementation) focuses on unifying and improving processes throughout their subsidiaries, thus realizing benefits especially on the organizational, strategic and managerial levels. But it can also achieve benefits on operational and IT-infrastructure levels since these are automatically affected by the implementation. SRI has the biggest impact on all levels of process, financial, customers and innovation within the organization.

From this framework can be concluded that an IDR approach has a smaller ambition focus on benefits than PER or SRI. Therefore, it should be noted that when an organization chooses for the IDR approach only, the full potential and value from an ES will not be realized. Thus when an organization desires more value from their ES, a bigger focus should be applied. This can be done in example by taking the three value drivers of integrating, optimizing and information (Davenport 2004) into account, that mostly delivers process and customer benefits. Nevertheless, having an exact driver for the implementation does not mean that benefits can only be realized in these boundaries. On the contrary, it is likely for example that with an IDR implementation besides IT-infrastructure benefits, an organization could also gain strategic benefits.

With this framework it is possible to identify and structure ES benefits and link this to drivers of the ES project. It also gives an insight in the ambition of the project by looking at the amount and place of the benefits (e.g. are all classes covered). Appendix 8.1.3 shows examples of benefits found in literature placed in the framework.

3.3 Benefits management - independent variable

To realize the benefits from an ES implementation, benefits management is introduced here. Most ES implementations are currently managed as a combination of a system development and project management (e.g. PRINCE2). Although these methodologies make sure a system is delivered within time and budget and with the (right) functionalities, they lack the focus on delivering benefits from the system. That is why a traditional ES lifecycle process should be combined with a benefits management process. A traditional ES lifecycle process can be described as follows (Markus and Tanis 2000):

1. Planning – making decisions to implement an ES and plan this implementation.
2. Implementing – execute the plans and delivering an ES.

3. Shakedown – when the organization is coming to grips with the ES.
4. Onwards and upwards – when the organization is improving their performance with an ES.

Benefits management for ES implementations is the process of organizing and managing in a way that allows potential benefits arising from the implementation and use of an ES to be realized. This process can be described in five stages.

1. Identification and structuring of benefits – based on the drivers for the project, benefits can be defined.
2. Planning benefits realization – to determine the changes required for delivery of each benefit and how the ES implementation will enable the changes and benefits to occur.
3. Executing the benefits plan – and monitoring progress against the activities and deliverables of the benefits plan.
4. Reviewing and evaluating results – a formal review of what was and was not achieved to maximize the realized benefits and learn to improve the delivery of benefits for future projects.
5. Potential for further benefits –after the implementation of a system it is more apparent which benefits can be realized as well.

These stages are not linear, but iterative and incremental since it is sometimes necessary to adapt the benefits plan during the implementation and evaluation stage.

When the activities of each stage in the ES lifecycle process and the benefits management process are analyzed, some similarities found. For example in the planning phase of the ES lifecycle it is necessary to identify drivers for the project and delivering a business case, just like in the first two phases of benefits management. Nevertheless, like said before, the ES lifecycle does not focus on benefits realization but on delivering an ES. Benefits management does give general guidelines in how to realize benefits from an IT-project. Thus when the benefits management process and the ES lifecycle are merged, this leads to Figure 11 ES benefits lifecycle process:
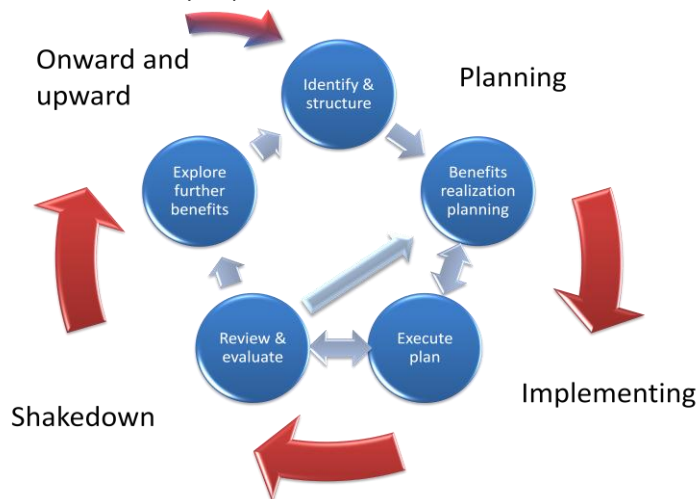
Figure 11 ES benefits lifecycle process

This figure suggests that during the planning phase of the ES lifecycle benefits should be identified and planned. During and at the end of the implementation of the ES the benefits realization plan should be executed. This benefits realization plan does not describe how an ES should be implemented, but it is an addition to the implementation plan. The plans together form a project plan that can ensure benefits realization from the ES implementation.

During the shakedown phase, the benefits should be reviewed and evaluated on their realization. Then, in the onward and upward phase, further benefits can be exploited and a new benefits management cycle can begin.

Although the ES lifecycle is a 'cycle', ES implementations are mostly seen as an ending process. The duration of each phase is different, e.g. planning and implementing can take up to a year or more depending on the size of the project, thus it is hard to say when an ES implementation is ended. During the onward and upward phase, more benefits of the ES can be discovered. A new lifecycle for the ES begins only after years when a 'new' ES is introduced. Therefore, it is proposed that a new benefits management cycle can begin during the onward and upward phase until a new ES is introduced.

3.4 Critical factors - moderating variable

Multiple studies about ES implementations are factor based, where the goal is to identify factors that influence the chances of ES implementation success. However, in this research the ultimate goal is not ES implementation success, but rather ES benefits as outcome of a (successful) ES implementation. Critical factors are conditions to realize ES benefits with an ES implementation, since these are critical for implementation success. Therefore, in this research the ES critical factors variable is introduced as a moderating variable in the relationship between ES benefits and benefits management.

Based on the concept matrix (Table 3 page 19) derived from the literature review on critical factors, the critical factors are classified based on operational, managerial, strategic, organizational and IT-infrastructure levels. But why are the factors divided in these levels? Al-Mashari (2003) points out that a balanced implementation strategy will have critical factors of a strategic, organizational and operational nature, like this classification. Furthermore, the level of a critical factor gives an indication of the influence of the critical factor. For example the business plan and vision of an ES implementation should be influenced by the business strategy, while training is most important with the users of the system on operational level. Thus when issues arrive in a certain level of the organization, this classification could give an indication which factors have to be paid more attention too.

An overview of these factors can be found in Figure 12:

Operational factors	Managerial factors	Strategic factors	Organizational factors	IT-infrastructure factors
• Business process reengineering* • Training* • Dedicating resources • User support	• Top management support* • Project management • Communication* • Consultant resources • Performance and evaluation management	• Business plan and vision • Fit with current business • ES scope • ES radicalness	• Organizational adaptation • Resistance to change • Management of expectations • Cooperation	• Data analysis • Defining the architecture • Vendor support * • Package adaptation

 * Factors with * could be in different places

Figure 12 ES critical factors

Operational critical factors

The critical factors on operational level deal with running the (new) business processes and using the ES. These factors include business process reengineering, training, dedicating resources and user support.

Managerial (informational) critical factors

Managerial critical factors are factors that influence the amount and way information about the ES implementation is shared within the company and how the implementation process is managed. These are

factors including communication within the organization, cooperation with stakeholders, project management, consultant resources, top management support and performance management and evaluation.

Strategic critical factors

Strategic critical factors are factors such as having a business plan and vision for the ES, importance of fit between the ES and the current business, scope of the ES project, the radicalness. These are factors that have to be aligned with the organizational strategy and vision for making an ES implementation a success.

Organizational critical factors

Organizational critical factors deal with the human aspects of an implementation. ES implementations often require adaptation of the organization. Thus people in the organization have to change (e.g. their tasks), only most people tend to be resistant to change. Other factors that also deal with this organizational change are management of expectations and cooperation of employees with the implementation of the ES.

IT-infrastructural critical factors

IT-infrastructural critical factors have a direct impact on the technology and configuration of the ES. These are factors like data analysis, defining the architecture, vendor support and package adaptation.

Although these factors are divided among different categories, these still can have a direct or indirect impact on each other. For example, when users get to know the system through training (operational) could lower their resistance to change (organizational).

The critical factors that are marked with an asterisk (*) can be divided among different levels, depending on how the critical factor is described. E.g. top management support is here grouped under managerial factors since support from top management is sometimes given by being member of the steer group of the project. Nevertheless, top management support has a big influence on the organizational context as well since it can steer the organization in the new situation with the ES, thus it an be an organizational factor as well.

Critical factors and ES benefit realization

In this research it is assumed that all critical factors that are identified from the literature have to be taken into account when realizing benefits from an ES implementation. Some scholars empirically validate a positive relationship between the use of critical factors and realization of ES benefits, but also an influence of critical factors on each other (Karimi 2007; Gattiker & Goodhue 2005; Chou & Chang 2008; Liu and Seddon 2009).

Almost all critical factors from Figure 12 can be found in the activities for benefits management (Appendix 8.1.2). For example, in the identification and structure of the benefits phase in benefits management it is necessary to review the strategic drivers and the stakeholder requirements, to identify and agree on target benefits. Hence this activity considers the factors of a business plan and vision, ES scope and management of expectations. Thus when executing the practices, the critical factors are implicitly taken into account.

3.5   Validation of the theoretical model

The theoretical model presented in the first Section in Figure 9 depicts the relationships between the variables based on the literature review. This does not necessarily mean in practice as well. To illustrate the use of this model in practice, the case study method as proposed by Yin (2003) is used. First a summarized case study protocol is defined on how and what to research in the cases. The complete protocol can be found in appendix 8.3.

The goal of the case study is to validate the theoretical model by the following proposition;

Organizations can realize benefits from their ES, by using benefits management practices and managing critical factors during an ES implementation.

This is researched by answering the following questions:
- *Which critical factors are taken into account by organizations during the implementation of an ES?*
- *Which benefits management practices are used by organizations during an ES implementation?*
- *Which benefits have been realized with the ES implementation?*

Besides the main proposition, the cases are also used to validate the propositions of how the implementation drivers focus on desired benefits. Therefore, the following proposition is defined:

The driver of the implementation focuses which benefits are desired;
- *An IDR approach focuses on IT-infrastructure benefits.*
- *A PER approach focuses on benefits on all levels in process, financial and sometimes supply chain areas.*
- *A SRI approach focuses on benefits in all areas on the operational, managerial, strategic and partly organizational level.*

Although a driver focuses on a specific set of benefits, this does not necessarily exclude the appearance of desired benefits outside the focus area. From literature can be concluded that especially with ES implementations, a combination of benefits in different areas (thus drivers) is possible as well. However, this proposition predicts a relation between a certain driver and the desire for certain benefits.

Cases to validate the theoretical model are gathered by asking KPMG IT-advisors if they had any clients in the past three years that involved an ES implementation. Four cases were selected based on the relevant documents available through the IT-advisors and internal server. Relevant documents are reports from KPMG about the ES (implementation) and other project documentation from the client like project presentations, project initial documents, business cases, project plans etc.[2] Unfortunately, no other cases could be found within KPMG that dealt (recently) with ES implementation (issues) and had enough valuable information for this case study.

The case study research questions were further divided through sub-questions based on the theoretical framework (Appendix 8.2). Most questions are answered through analysis of the documentation, but sometimes some information was lacking or unclear. To get the missing information and check whether the analyses of the cases were correct, KPMG advisors that worked with the cases were interviewed.

In total, four cases were suitable for validating the theoretical framework, which will be briefly discussed below.[3]

3.5.1 Case 1

The first case is about a pharmacy department in a university hospital that is responsible for the pharmaceutical care (like medication) in the hospital. Besides the internal care, the pharmacy gives out (urgent) medication to other care facilities outside the hospital like other pharmacies. In the whole hospital (except the pharmacy) the internal, administrative processes like purchasing are supported by (a version of) Oracle eBS. With this implementation the pharmacy was left out because this is a critical department

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[2] The exactly used documentation per case can be found in the 'Theoretical framework case studies' addition of this thesis (confidential).

[3] The detailed analysis of the cases can be found in the 'Theoretical framework case studies' addition of this thesis (confidential).

for the hospital and the risk was too high to do the implementation at once. However, the legacy system of the pharmacy wasn't going to be supported anymore, so there was an urge to implement the new Oracle ES.

Approach and critical factors

This 'vanilla' like implementation had an IDR approach, a budget of half a million euro and was implemented at once (big bang) in six months. Except for the strategic vision or plan factors, almost all critical factors were taken into account.

Benefit management practices

Since this implementation was merely seen as necessary (e.g. management of the pharmacy did not really support the implementation) and perhaps because a hospital is a non-profit organization, there were neither benefits defined nor a business case for this implementation. Thus they did not use any of the benefits management practices to realize benefits.

However, according to the project manager from KPMG, more benefits could have been realized if the implementation in the pharmacy was benefits driven. In example, some employees became unnecessary in the warehouse since the new system automatically counts the stock, but they are still working in the warehouse because the pharmacy does not consider this benefit as necessary.

Realized benefits

In the end, the pharmacy and especially the hospital did benefit from the new ES. For example, processes are more efficient and a big part of the legacy system is replaced, but what benefits are exactly realized is unknown. KPMG did exploit some benefit opportunities if the pharmacy decides to improve the use of the new ES, in example, for making reports, but the pharmacy has not continued yet to benefit more from the new ES.

3.5.2   Case 2

The second case is a foundation that supplies innovative ICT-resources to national and international higher education and research facilities. One task of the foundation is to organize meetings for these schools and research facilities. Some administrative processes like financial accounting is supported by Exact Globe, but the foundation had difficulties in maintaining the legacy systems that supported the difficult primary processes like the organization of meetings. To solve these problems, the foundation initially chose to implement eSynergy of Exact, with some modifications in order to support the unique processes. The implementation went somewhat incremental, but there were a lot of bugs. Additionally users had difficulty with working with the new system.

Approach and critical factors

The implementation was PER driven. This organization wanted to improve their processes by implementing a new ES, which also solved several issues with their legacy systems. The implementation had a vanilla approach and was implemented module-by-module in 1.5 years before the project was set on-hold during the design and configuration phase. During that implementation, almost none of the critical factors were taken into account; the implementation was only supported by top management and the implementation partner.

Benefit management practices

In addition, none of the benefit management practices were used. The business case, which was written by the implementation partner, only described the organization and their processes and did not contain any estimated benefits that could be realized from the implementation. After analysis of the available documentation, operational and IT-infrastructural benefits with an impact on the business processes could be identified.

Realized benefits

From this implementation no benefits are identified or known. A reason for this could be that the organization saw the implementation more as a 'must have' than as an opportunity realize business benefits from a new ES. As a result, the foundation decided to put the implementation on-hold and compared eSynergy to other enterprise systems like Microsoft Dynamics NAV, in order to find out which ES would be the best fit for the foundation, based on the requirements of the users.

3.5.3   Case 3

This organization collects information about registered properties in the Netherlands, records them in public registers and cadastral maps and makes this information available for interested parties in society. It is a self-administering state body, thus an independent organization with information intensive processes.

Within this organization there was a demand for a structural improvement of the management information resources. The supply of information in the former situation was time consuming, took a lot of effort and gave different reliability risks. Therefore the organization decided to implement a SAP Business Warehouse (BW) that integrated different information systems.

Approach and critical factors

This 'middle-road' like implementation approach was driven from a PER perspective, since the main driver was to improve the business processes. It took about two years to fully implement and a budget around 2.2 million euro was available.

During the implementation the strategic vision and scope and operational IT critical factors were taken into account. Managerial and user operational critical factors were poorly taken into account (e.g. named but not well executed). Human strategic factors (in example, taking resistance to change into account) were not explicitly found in the case.

Benefits management practices

In the business case financial and non-financial benefits were identified based on the current and desired situation. KPMG performed a post-implementation audit to asses whether the non-financial benefits that were estimated in the business case were realized.

Realized benefits

The benefits identified from the business case are mostly managerial with a process impact, and on other levels with a financial impact. Conclusion from the post-implementation audit was that most (non-financial, managerial) estimated benefits were realized in 2006, but more could be realized. In 2004 was an audit as well, but the ES was not fully operational yet and no benefits were realized at that time. Although some (managerial) benefits were realized in 2006, this was not directly linked with steps in the implementation. It is also unknown if the financial benefits were not realized, nor was there a benefits realization plan available.

3.5.4   Case 4

The last case is about an energy company that produces and sells electricity, gas and services to corporate customers and consumers. In 2006 this company acquired two energy suppliers for retail customers to introduce a new national label. These companies used different versions of SAP and an own developed ES and had to transfer to one version of SAP and one version of the other ES.

Approach and critical factors

This middle-road, SRI driven implementation took one year and about 4 million euro of budget, before the acquiring organization decided to put the implementation on-hold during the configuration phase.

Most critical factors were taken into account minimally, for example, top management was that it made decisions only regarding the project. Human strategic and user operational critical factors were not

considered at all, like management of expectations or training. A part of this can be explained by the fact that this organization stopped the project during configuration and did not get to the phase to let users cooperate, but this should be planned from the beginning of the project.

Benefits management practices

The project did start with a business case that contained financial data, but only intangible benefits were defined without an explanation how these could be realized. No other benefit management practices are found in the project documentation.

Realized benefits

From the business case, benefits were identified on process / operational, process / managerial, process / strategic, process / organizational, financial / IT-infrastructure, supply chain / managerial, supply chain / organizational and innovation / strategic area's. Besides the lessons that the energy company learned from this project, no benefits were realized. The project was put on-hold to discover the issues why the project was failing, after it went out of budget and time.

3.6   Case study results

From these case studies can be concluded that the cases at KPMG about ES implementation are often not provided with a business case that should steer the project. There can be many reasons for that, for example, KPMG is often requested after the investment decision is made or the business case does not exist. Secondly, none of the implementations studied here are benefit driven. From the project documentation the implementation is often seen as a way to get a new system working instead of improving the business.

Other results regarding the questions to be answered with these case studies are summarized in Table 8 and discussed below.

	Case	1	2	3	4
General	ES	Oracle eBS	Exact eSynergy	SAP BW	SAP / IBIS
	When?	2008	2008/2009	2003/2004	2007/2008
	Driver	IDR	IDR/PER	PER	SRI
	Success?	Yes (system in use)	No / continues	Yes (system in use)	No
Critical factors	Operational[4]	+	~	~	~
	Managerial[4]	~	~	~	~
	Strategic[4]	~	-	+	~
	Organizational[4]	+	-	-	-
	IT-infrastructure[4]	~	-	~	~
Benefits management	Identification / structure[4]	NA	NA	Difference between current / wanted	No structure in identification
	Benefits realization plan	NA	NA	NA	NA
	Realization benefits	NA	NA	Implementation not directly linked with benefits	NA
	Evaluation	NA	NA	By KPMG	Process, not benefits
	Benefits exploitation	KPMG, no explicit benefits	NA	Implicit in advice	NA
ES benefits	Business case benefits	No BC	BC in project initial document was more of a blueprint	Financial & non-financial	Named, not tangible
	Benefit focus	P&IT,P&Or	P&IT, P&Op	P&M(3), F&Op, F&m, F&Or, F&IT	P&Or&S&O, F&IT, SC&M&Or, In&S
	Realized benefits	Process efficiency / NA	NA	Non-financial	None

Table 8 Case study results

Organizations do take some critical factors into account but not in the right ration to make the implementation successful. It can be said that an implementation needs to be successful in order to realize benefits. For example, the first case did take the critical factors into account, had a successful implementation and realized some benefits. However, it is not know which benefits exactly are realized, but there is a notion that more benefits could be realized.

Benefits realization practices are rarely found in these cases; only the third case identified benefits in the business case, realized benefits and evaluated this through a post-implementation audit. Therefore it is clear in this case that some (non-financial) benefits that were realized, but it is unknown if there are more benefits realized or if the financial benefits have been realized.

With these results, the proposition can be discussed;

Organizations can realize benefits from their ES, by using benefits management practices and managing critical factors during an ES implementation.

The third case proves that when some benefit management practices are executed, benefits realized from the ES implementation can be identified. Perhaps when the more structured benefits management method was applied, more benefits could have been realized. The cases also show that in order to realize benefits,

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[4]
- None of the critical factors in this level are found in the project documents or interview
~ Some of the critical factors in this level are found in the project documents or interview
+ Most of the critical factors in this level are found in the project documents or interview
NA Not available in documentation or interview

an implementation must be successful and to do that, critical factors have to be taken into account sufficiently.

Thus critical factors do have an influence on the realization of benefits as a kind of precondition to realize benefits. By using benefits management practices, more benefits can be realized. This leads to an adapted model of the variables (Figure 13). In this model, the ES critical factors variable has become an independent variable that leads to an intermediate variable of a working ES. This variable as a precondition, together with benefits management lead to ES benefits realization.
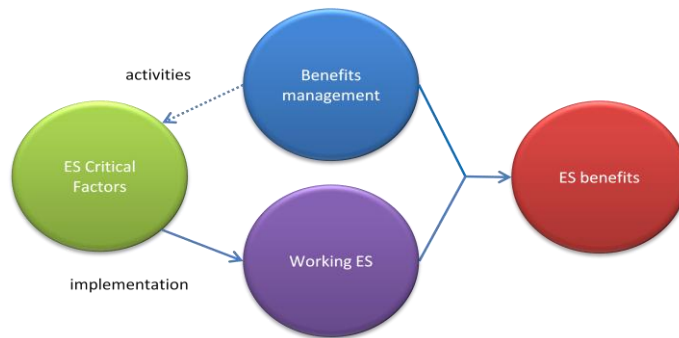
Figure 13 Adapted model of ES benefits realization variables

Besides the main proposition, there is a proposition for the relationship between implementation drivers and estimated benefits;

The driver of the implementation focuses which benefits are desired;
- *An IDR approach focuses on IT-infrastructure benefits.*
- *A PER approach focuses on benefits on all levels in process, financial and sometimes supply chain areas.*
- *A SRI approach focuses on benefits in all areas on the operational, managerial, strategic and partly organizational level.*

The following model (Figure 14) represents the case study results for this proposition;
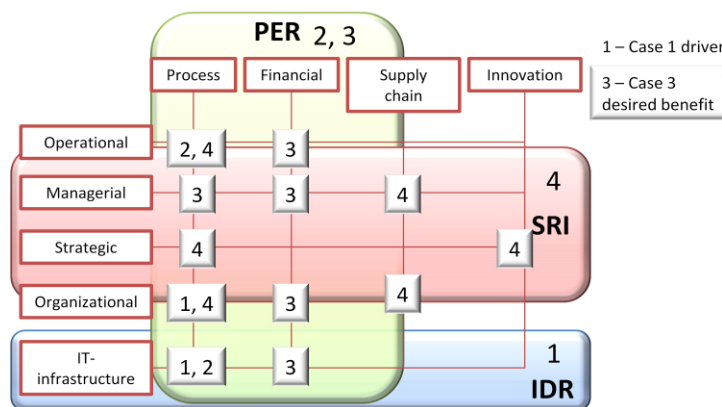
Figure 14 Case study results plotted in ES benefits framework

The digits besides PER, SRI and IDR, represent the driver of the cases. For example, the fourth case is a SRI driven implementation and it is expected that the desired benefits are in the red area. Except for one (desired) benefit from the first case, all desired benefits that are identified from the cases fall within the expected areas.

Based on this result it can be said that the implementation driver gives an indication of the desired benefits and that there can be multiple drivers. Nevertheless, there can also be benefits identified outside the focus area of the driver. This proves that this ES benefits framework can be used to identify and structure (desired) benefits during an ES implementation.

3.7   Conclusion

From the theoretical model and the case study results can be concluded that in order to realize benefits from an ES, benefits management practices can be used. However, critical factors in order to make an ES implementation successful are a precondition to realize benefits from an ES. Besides, the case study also proves that the ES benefit framework fits to identify and structure benefits (desired) from an ES implementation.

Thus, the frameworks behind the theoretical model can serve as ingredients for an ES implementation method:

- Benefits management practices can be used as guidelines for realizing benefits from an ES implementation.
- Critical factors have to be managed as well to realize a working ES as a precondition to realize benefits from an ES.
- The ES benefits framework can be used to identify and structure ES benefits based on the drivers of the implementation.

These elements come back in the ES benefits realization method, which will be presented in the next chapter.

4   ES benefits realization method

In this chapter the ES benefits realization method is presented, based on the theoretical models of chapter 2 and conclusions of chapter 3. The first phase of this method, Planning ES benefits realization, has been exercised at a case of an online retailer that is implementing an ES (Section 4.2). The ES benefits realization method and the results of the exercise have been discussed with experts from KPMG and at the case site (Section 4.3). This chapter concludes with lessons learned from the exercise and expert opinions that will be used to improve this method for ES benefits realization.

4.1   ES benefits realization process

Based on the results of the theoretical model, the following process is proposed to improve benefits realization in the ES lifecycle (Figure 15).
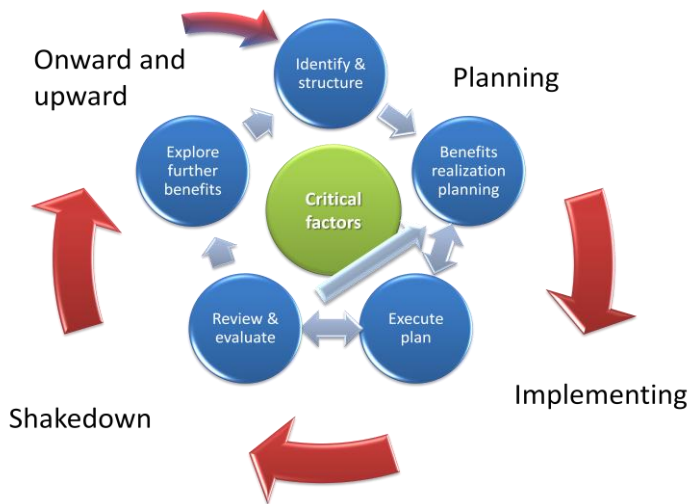
Figure 15 ES benefits management process

The outer circle is the 'regular' ES lifecycle, the blue circle is the benefits management process and in the heart of the model are the critical factors as precondition for a successful ES implementation. These critical factors are mostly considered through the application of the benefit management practices that therefore increase the chances on ES benefits realization (Section 2.4.8 and Appendix 8.1.2).

In this method the most attention is given on the first phase of the ES lifecycle, the planning. Not only because it covers two stages of benefits management, but also because it is the foundation of the rest of the method. Besides, most critical factors for ES implementations are covered in this stage that gives a foundation for a successful implementation.

This method for realizing benefits in ES implementations fills the gap of existing guidelines for realizing benefits with critical factors in ES implementation. Important to note is that this method does not replace existing ES implementation methods, but is more of an add-on to improve benefits realization during ES implementations. The method is described by the phases of the ES lifecycle.

4.1.1   Planning

In the first phase of the ES lifecycle decisions are made on why to implement an ES and how this project should be done. Benefits management adds some benefits specific activities to this phase. An overview of these activities and the critical factors that are related to these can be found in Appendix 8.1.2. Examples of a specific benefit management activity is planning benefits realization, that shows what the expected benefits are from the ES and how they are going to be realized. With this activity the business plan and

vision is considered for this project, since the benefits from the ES should contribute by executing this plan and vision.

A way to perform these activities is by answering the following questions (Figure 16):
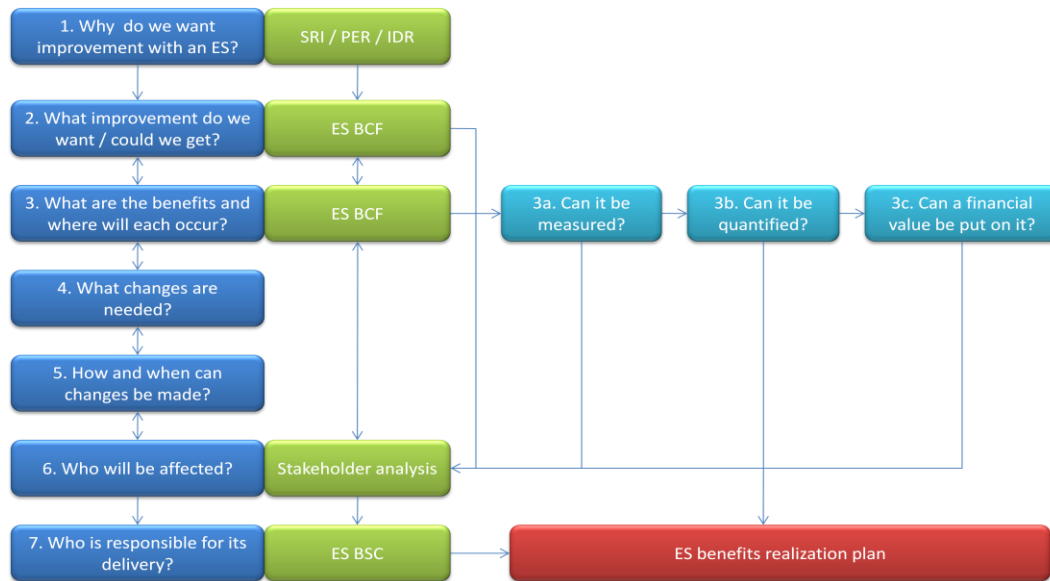
Figure 16 Questions for developing an ES benefits realization plan

Answering these questions lead to a benefits realization plan, that besides a business case and an ES implementation plan, gives a direction on how to deliver benefits from an ES. However, an ES is such a complex system that it is difficult to give a precise answer to these questions. Therefore several (specific ES) frameworks are introduced as a tool for answering these questions.

ES benefits
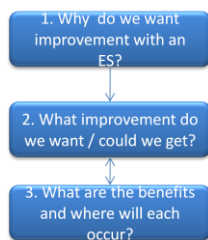
For answering the first three questions the ES benefits classification framework (ES BCF) can be used, as introduced in Section 3.2. Nonetheless, to make certain benefits quantifiable is a very complex task, since ES benefits often rely on each other and demands to make a prediction for future values. Thus for defining benefits and their measures, it is necessary to have in-depth knowledge about the organization, the ES and its business processes.

Required changes and resources
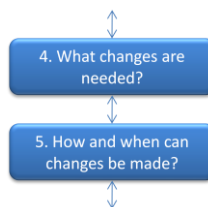
In question four and five is answered which changes and resources are necessary in the ES or in the organization to realize benefits. Once the desired benefits are defined, it is necessary to discover where these benefits should come from. The level of the benefit gives an indication of where in the organization the benefit is expected to be realized. However, an exhaustive analysis of the organization and their processes and characteristics should be made to discover which changes are needed to realize the most important benefits.

Two kinds of changes can be identified; enabling and business changes. Business changes are permanent changes to working practices, processes or relationships, like a new procurement process. Enabling changes are 'one-off' changes that are pre-requisites for making the business changes or bringing the new ES into effective operation. These enabling changes could be some kind of resources as well, like new IT-hardware.

Stakeholder analysis
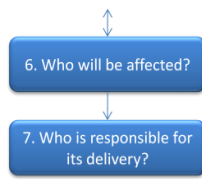
For the last two questions it is important to know who the stakeholders of the ES are, especially because benefits are advantages on behalf of a stakeholder (Ward 2006). A stakeholder analysis should be executed to find out who are affected by the system, in what way and what their benefits from the ES can be. Based on that analysis, benefit owners should be appointed. This should be one person who has enough power in the organization to make the changes that are necessary to realize the benefits he owns.

ES benefits realization plan

The answers of the questions above lead to a benefits plan. This benefits plan can be represented in balanced scorecards for ES benefits (ES BSC). Since the columns (impacts) of the benefits framework are based on the balanced scorecard categories, a scorecard can be defined for each impact on process, financial, supply chain and innovation of the organization. An example of such a balanced scorecard can be found in Table 9 ES SC for benefits realization: Supply Chain perspective and Appendix 8.1.4.

Supply Chain Perspective

Benefit objectives	Measure(s)	Requirements ES / Organization	Action (Change)	Responsibility for realization	Change date
Operational	For each objective, measures are given	How to reach the benefit		Stakeholders accountable per benefit	
Managerial					
Strategic					
Organizational					
IT-infrastructure					

Table 9 ES SC for benefits realization: Supply Chain perspective

4.1.2 Implementing
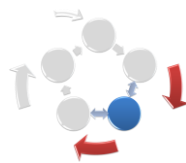
The ES benefits realization plan is executed during the implementation stage while the ES is set up to run in the organization. Some of the activities defined for benefits realization as described in Appendix 8.1.2 on page 78, are also 'normal' activities during an implementation, but more focused on realizing benefits. E.g. the activity to specify changes to work and organizational design are similar activities in benefit management as in the ES implementation.

Although it is not possible yet to realize the benefits in this phase, it is important that the needs and changes in the ES benefits realization plan are managed, monitored and executed. Only after the needed changes have been made, it is possible to realize the benefits from the ES.

4.1.3 Shakedown
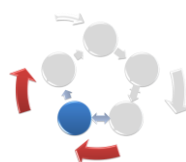
During the shakedown phase the organization is coming to grips with the ES. Since the ES is up and running in this phase, this is the ultimate moment to do an evaluation and review of the benefits realization process. This could be done by answering the following questions per benefit based on the information on the (altered) benefits plan:

1. Have the needed changes for realization of the benefit taken place?
2. Are the necessary resources available to realize the benefit?
3. Is the objective of the benefit reached?
4. What could have been done better or should be done to realize the benefit objective?

With these questions criteria should be defined to undertake a systematic assessment of the benefits, together with criteria for the evaluation of the ES implementation project. Based on the assessment

lessons can be learned and a new benefits plan could be made to realize the benefits that remain unrealized. More activities in this phase can be found in Appendix 8.1.2 on page 79.

4.1.4   Onwards and upwards
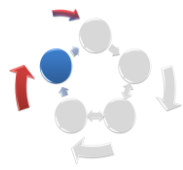
In the onwards and upwards phase can become clear which other benefits could be realized. Once the organization is used to the new ES, there could still be some improvements made by e.g. discovering new functionalities or (minor) changes in the processes. Hence another benefits realization process can be started when (big) improvements can still be made (and changes needed), although it is not needed to implement a new ES. Example of an activity in this stage is evolving working practices, thus continue to reengineer business processes to realize further benefits. More activities for this stage of the benefits management can be found in appendix 8.1.2 on page 79.

4.2   Test at online retailer
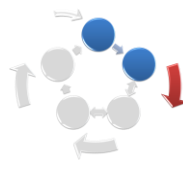
The above described ES benefits realization method is tested at an online retailer who is implementing Microsoft Dynamics AX 2009. Since ES implementations often take at least a year, the whole method cannot be tested while writing this thesis, which takes about half a year. However, the emphasis of the method is on the planning stage with the deliverable of an ES benefits realization plan (ES BRP), which can be developed in a short time and validated in this research.

4.2.1   Short case description

An ES BRP is developed for a large mail order / online retailer that exist in the Netherlands since 1952. Because their business model and profit relies on high volume orders and transactions, there was an early need for automation of processes. Based on these 1960's systems, the organization grew. Some of these systems are still in use in 2009 and make the organization rely on old and currently scarce IT-knowledge. The current architecture of these systems makes it very hard for the organization to continue to grow. For that reason there was a need for replacing these legacy systems with a new ES, making this an IDR implementation.

In the beginning of 2009, the retailer decided to replace a big part of their systems with MS Dynamics AX 2009, and in the summer of 2009, when this test was executed, the organization was busy with configuring and implementing the system. In the summer of 2010 the organization should be switched to the new ES.

4.2.2   Information gathering

To make the ES benefits plan, information was gathered in different ways. First some project documentation was analyzed to get familiar with the case, like the reports of the KPMG IT-advisors and the system integration action plan. Unfortunately, the business case of the project could not be found anymore, which could give a lot of information about the estimated benefits.

To get some more information, an interview was conducted with the (IT) project and program manager of the retailer. In this project his main responsibility is the quality assurance of the project, however, because of his in depth knowledge of and experience in the organization he is also on other levels committed to the implementation project.

In the interview, more in-depth knowledge of the organization and the project was gathered. Important themes were the primary process of the retailer, the goal of the project and which benefits he thought the organization wants to realize with the project. The goal of the interview was to answer the seven questions for realizing an ES benefits plan as described in Section 4.1.1, yet one hour interview with one person was to short to get all the details on the implementation and change process.

4.2.3 Developing an ES benefits realization plan (ES BRP)

Based on the information from the project documentation and the interview an attempted is made to answer the seven questions. The answers to these questions are summarized here, but the complete outcomes of these questions can be found in Appendix 8.4.
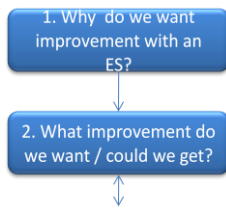
First the driver of the project is determined, in this case the main driver is to replace the IT-systems, and so this implementation can be qualified as an IDR. This should mean that the desired benefits are likely on IT-infrastructural level.

After that, the second question is 'what improvement do we want / could we get'. This is answered by plotting the benefits identified during the interview on to the ES benefits management framework. During the interview this framework was already introduced. Especially besides the IT-infrastructure benefits, benefits that impact the innovation are identified with the ES benefits framework Table 10. Analysis from this framework concludes that more benefits can be realized, if the retailer would want this.

	Process	Financial	Supply chain	Innovation
Operational benefits	Improved processes			
Managerial benefits				
Strategic benefits			Support business alliances	Support business concept (innovations)
Organizational benefits		(IT) FTE reduction Less (IT) trainings for up-to-date knowledge (costs)		Less dependency on knowledge of older employees
IT-infrastructure (IDR)	Central assortment administration	Less maintenance (costs)	Connection with WMS / TRC	Build business flexibility for current and future changes Standard IT architecture

Table 10 ES benefit framework online retailer
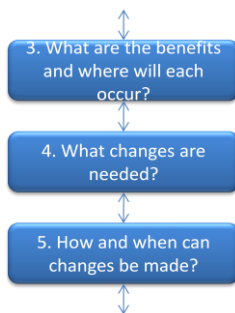
Based on the identified benefits, an attempt is made to specify the benefits with the current knowledge from the interview with measures. This worked, however, the benefits are too abstract and the measures can be more specific and absolute when there is more knowledge of the organization and their processes. So to make benefits better achievable, these should be specific and based on the organizations standard measures.
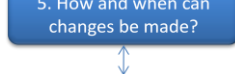
A lot harder to identify are the changes needed to realize the benefits, because this requires an in-depth knowledge of the organization. The changes that are specified are high level, e.g. some benefits can be realized by 'implementing AX', but such a change comes with a lot more changes, like configuration of the system, user training, etc.

From the action plan of the system integrator it can be defined how and when changes are made. Even precise dates can be abstracted from this plan.
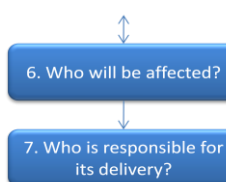
The changes are divided between enabling and business changes. This gives a better insight in which changes are actions that need to be taken to enable the business change, accordingly to the column the change belongs in the benefits plan. Enabling changes are specified as actions and business changes are specified as needs in the ES benefits realization plan. For example, user training as enabling change and

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introducing new business concepts as a business change.

Also an effort was made to identify who is affected by the implementation. This is solely done based on the interview and not with a stakeholder analysis. With the information from the interview a good indication of the stakeholders is possible.

With this information, and the information from the action plan, is identified who should be responsible for the change leading to the benefit. This can be a group of persons, or one person that suited the role that is designated to the change. For example, to deliver the benefits of more efficient processes in the procurement department of the retailer, the team leader of that department should be the benefit owner and responsible for delivering the benefit.

4.2.4   ES benefits realization plan

ES benefits realization plan

Based on the answers to the seven questions above, an ES benefits realization plan has been developed for the retailer. This can be found in Appendix 8.4.2. Per business impact a balanced scorecard is made with the benefits of that impact, its measures, actions, requirements, responsible and change date. In other words, per column of the benefits framework, a table to realize these benefits is made.

The information in the ES benefits realization plan often comes from the action plan and has therefore many similarities. The value of the ES benefits realization plan is that the actions from the action plan are linked with the desired benefits from the ES. Besides, the information in the ES benefits realization plan is very high level, which makes it difficult to execute the plan.

As an outsider with not as much experience as a practitioner or knowledge about the organization, it is hard to develop an ES benefits realization plan. Lessons learned from this development is that to make the benefits realization plan better executable, more knowledge is needed of the organization, its processes and the changes the new ES brings along. This knowledge and information can be gathered in different persons and on different ways. But with this knowledge a more specific ES benefits realization plan can be developed for the organization.

With the first interview a new appointment was made to come back and present the ES benefits plan as result and for feedback from the organization. This feedback is combined with the feedback of other experts on the method. Lessons learned from this case and expert interviews will be used to improve the development method for the ES benefits realization plan.

4.3   Expert opinions

Besides the cases and the test, experts[5] were asked about their opinions on the model and method that is presented based on theory. This was done through interviews and short discussions. The opinions are summarized per model.

4.3.1   Theoretical model

First glance at the complete theoretical model (Figure 9 on page 34) is that it is rather complicated. Especially the relationship between the critical factors and benefits realization is hard to make clear. This model uses benefits management as a 'bridge' to link the use of critical factors with benefits realization, even though some experts question this virtual bridge. It still does not make clear how and which benefits are realized through which critical factors.

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[5] Associate partner, senior managers and managers within KPMG with experience in ES implementation projects and a project manager from the retail case

Besides, some experts question the use of benefits management to realize benefits. The first case is an example of a successful ES implementation, where there are no benefits identified while these do exist. By applying benefits management in this case, the implementation would not have to change to deliver the ES and the same benefits are realized as without benefits management. However, by applying benefits management it is now clear which benefits are realized by the ES implementation. Thus applying benefits management could be a self-fulfilling prophecy. Nevertheless, by giving more focus on benefits, the realization of benefits is still improved since organizations are now aware which benefits an ES delivers.

4.3.2 ES benefits framework

The ES benefits framework (Figure 10 on page 35) as a tool to identify and structure the possible ES benefits is also seen as complicated at first glance, mostly because of the third dimension of drivers. However, after explaining the levels and impact categories and giving examples of benefits, the framework seems to make more sense for the experts.

Experts even see the value of this framework because it gives a very different view on benefits than the traditional view of financial benefits in business cases. It gives more ideas of the impact. In example, in the online retailer case the expert finally could position the innovation (future) benefits of the ES where to realize the benefits. This framework could be very useful in business cases for not to name only the financial benefits, but also on (how to deliver) other benefits of the ES. Perhaps it could also be used in other IT implementation projects, but with not as many different benefits.

The downside of this framework however is the lack of representation of the dependencies between benefits. Especially with financial benefits that are realized through the realization of other benefits. Thus double benefits can exist in the framework and it is hard to see exactly how the benefits are realized. This can be solved by giving a detailed description of the benefit and where it comes from, although it is hard to structure that in the framework.

4.3.3 ES benefits realization plan

The ES benefits realization plan is developed by answering the seven questions as presented in section 4.1.1 Criticism on these questions and on the development of the plan is that it is too high level. The questions can perhaps be used as a framework, but do not give the needed information when exactly asked at the client. To develop the plan, detailed information of the processes and the ES is needed. The experts think that the client does not know how to answer these questions.

This issue was also experienced with the application of the seven questions at the online retailer. The benefits as defined in the online retailer case were too high level, because of the answers. A way to make this more specific is by applying the SMART principles for objectives, thus to make the benefit objectives specific, measurable, achievable, relevant and time bounded. This is also proposed in the improved roadmap for developing an ES benefits realization plan in 5.2.3.

Another comment on this version of the plan is that it is an extra plan during the ES project. Each project has already some kind of planning, e.g. an action plan of the system integrator and a project plan of the organization, and sometimes more. If another plan exists that has some of the same information as the other plans, the planning is hard to maintain and the questions arise e.g. which planning to follow. In the online retailers case the actions as defined in the benefits plan were the same as in the action plan. Thus it is advised to separate these plans. This means that changes needed in the organization to realize the benefit should be in the ES benefits realization plan and actions to set a working ES should be in the action plan. However, the action and benefits realization plan should be aligned, since the ES is the enabler for realization of many benefits. When the ES does not support certain changes, the benefits cannot be realized.

Nevertheless, experts did see value in the ES benefits realization plan. The action plan during the project is focused on the project organization; however the ES benefits realization plan is a plan especially for the (line-) organization that can use this plan especially after the project to realize the benefits from the project.

An additional advantage of the ES benefits realization plan is that a person is responsible for realizing the benefit. In other words that someone can be appointed to take action and changes to realize the responsibility. Advice from the experts is that this person should be someone from the line-organization and not the project since most benefits will be delivered after the project. Besides, the 'measure(s)' column in the plan makes the benefit more manageable since this gives a direction on where and how to observe the realization of the benefit.

4.3.4   ES benefits realization method

To finish, some opinions were gathered about the ES benefits realization method (Figure 15 ES benefits management process on page 47). First reactions to this model were that the experts recognized it from the 'plan-do-check-act' cycle. It is also clear how the benefits management process can be combined with the ES lifecycle. Although an ES implementation is not as much a cycle thus that should linear to make the model more realistic.

One major critique is that, according to the experts, it is not possible to realize benefits from the beginning of an ES implementation. Their opinion is that benefits only can be realized when the ES is implemented and ready for use. Only with different 'plateaus' or phased implementations it is possible to realize benefits after such a phase. This lead to a difficult discussion, since some research results (e.g. Deloitte 1998) say that benefits are realized from the beginning of an ES implementation. For example, when organizations reengineer their processes according to the ES processes, even before the ES is completely implemented (Deloitte 1998).

Although most benefits can only be realized after implementation, some changes can be made during or right after implementation that help to realize the benefits. Executing the ES BRP is not directly realizing benefits and can be done during, but also after the implementation of the ES. Therefore, it is important that during the shakedown phase it has to be reviewed if benefits are realized after the implementation of the ES. Based on that review, the plan should be changed and or further executed until the organization is satisfied with the realized benefits from the ES.

Another comment is that in this model it is unclear what the relation is with the critical factors. By explaining that critical factors are a precondition for a successful ES implementation and thus benefits realization, the experts knew their importance. However, this does not explain the relation with benefits management. This is clearer when they see that benefit management practices incorporates the critical factors, as can bee seen in Appendix 8.1.2.

Overall comment is that, because of the complexity and size of an ES implementation, the model is too high level. Although the practices make this a bit more specific, it is too vague to exactly apply it with ES implementations. For that reason, it was advised that the research should have more specific focus on one phase of the ES lifecycle and to make that more concrete and applicable in practice than a vague theoretical overview. This focus is given in chapter 5, by developing a roadmap for an ES benefits realization plan.

4.4   Conclusions

This chapter presented an ES benefits realization method that covers the whole ES lifecycle (Figure 15). To validate the applicability of this cycle, this research should take at least a complete ES implementation (over a year), therefore it is decided that a focus is developing an ES benefits realization plan that can be used in the complete ES benefits realization method.

To assess the applicability of the ES benefits realization method, an ES benefits realization plan was developed for an online retailer. The results were unfortunately disappointing due to a lack of experience and information, but several valuable lessons can be learned from that experience. Besides these results, experts were asked for opinions on the methods, and together with the exercise at the online retailer, the following lessons are learned and used to improve the development method for an ES benefits realization plan. This improved method is presented in chapter 0 as a roadmap with substantial steps towards an ES benefits realization plan.

4.4.1 Lessons learned

Issue	Solution
1. Not enough detailed information from the organization is gathered through the ES benefits realization method.	More specific questions to ask to get the information needed for development of the ES benefits realization plan, identify players in the organization who do have the specific needed knowledge
2. Not enough detailed information of the ES is gathered through the ES benefits realization method for a complete realization plan.	Make the ES benefits realization plan specific for the line organization to deliver benefits, not the project organization which delivers the product. Involve consultants with specific knowledge of ES.
3. Relationship between critical factors and benefits realization not clear in the ES benefits realization method.	Define with each action for the development of the ES benefits realization plan which critical factors are taken into account and how this is done.
4. Lack of representation of dependencies between benefits in the ES benefits framework.	Analyze benefits / organization / ES interactions to find out how the benefits will be realized, thus where they come from and find similarities.
5. The seven questions as presented in Section 4.1.1 are too high level to use at clients.	Make questions more specific to get the needed information from the client.
6. Benefits described are too high level in the ES BRP to execute.	Applying the SMART principle will make the benefit Specific, Measurable, Achievable, Relevant and Time bounded.
7. An extra plan with actions during an ES implementation gives confusion.	Divide plans between project and line organization, with the ES BRP especially for the line organization that also can be used after the implementation. Make line organization (benefit owners) responsible for maintenance of the plan.
8. Too much focus on the complete ES benefits realization method, which is too high level.	Build a roadmap for the development of an ES BRP and describe each step to an ES BRP more substantial.
9. Not possible to realize benefits when an ES is not implemented yet.	The ES BRP is also for use after the implementation, when benefits can be realized.
10. Plans and visions change during the implementation of an ES	The ES BRP continuously needs to be monitored and reviewed, especially after implementation to see whether some benefits are or still can be achieved or other benefits are realized.

Table 11 Lessons learned

5 Roadmap to an ES benefits realization plan

As a result from the online retailer case and expert opinions, from the previous chapter, a roadmap to an ES benefits realization plan (ES BRP) will be introduced in this chapter. This roadmap is based on the general ES benefits realization method as presented in Section 3.5, but only specifying the planning phase in substantial steps. The other design rationales behind the roadmap will be discussed in Section 5.1. Figure 17 Roadmap to an ES benefits realization plan represents the summary of the steps in this roadmap (also found in Appendix 8.5). Each step will be further described in Section 5.2. The roadmap is also discussed with experts. Their opinions on the roadmap can be found in section 5.3.
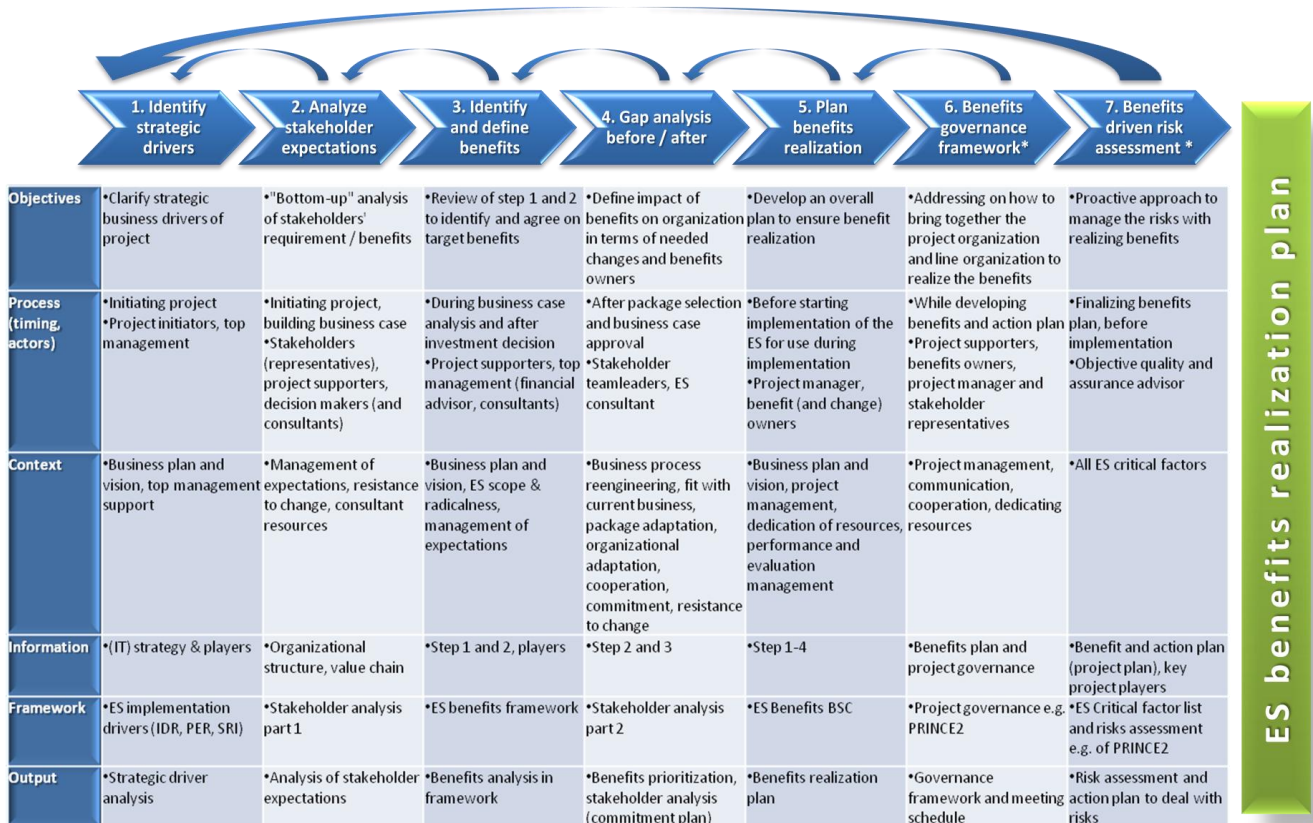
	1. Identify strategic drivers	2. Analyze stakeholder expectations	3. Identify and define benefits	4. Gap analysis before / after	5. Plan benefits realization	6. Benefits governance framework*	7. Benefits driven risk assessment *
Objectives	•Clarify strategic business drivers of project	•"Bottom-up" analysis of stakeholders' requirement / benefits	•Review of step 1 and 2 to identify and agree on target benefits	•Define impact of benefits on organization in terms of needed changes and benefits owners	•Develop an overall plan to ensure benefit realization	•Addressing on how to bring together the project organization and line organization to realize the benefits	•Proactive approach to manage the risks with realizing benefits
Process (timing, actors)	•Initiating project •Project initiators, top management	•Initiating project, building business case •Stakeholders (representatives), project supporters, decision makers (and consultants)	•During business case analysis and after investment decision •Project supporters, top management (financial advisor, consultants)	•After package selection and business case approval •Stakeholder teamleaders, ES consultant	•Before starting implementation of the ES for use during implementation •Project manager, benefit (and change) owners	•While developing benefits and action plan •Project supporters, benefits owners, project manager and stakeholder representatives	•Finalizing benefits plan, before implementation •Objective quality and assurance advisor
Context	•Business plan and vision, top management support	•Management of expectations, resistance to change, consultant resources	•Business plan and vision, ES scope & radicalness, management of expectations	•Business process reengineering, fit with current business, package adaptation, organizational adaptation, cooperation, commitment, resistance to change	•Business plan and vision, project management, dedication of resources, performance and evaluation management	•Project management, communication, cooperation, dedicating resources	•All ES critical factors
Information	•(IT) strategy & players	•Organizational structure, value chain	•Step 1 and 2, players	•Step 2 and 3	•Step 1-4	•Benefits plan and project governance	•Benefit and action plan (project plan), key project players
Framework	•ES implementation drivers (IDR, PER, SRI)	•Stakeholder analysis part 1	•ES benefits framework	•Stakeholder analysis part 2	•ES Benefits BSC	•Project governance e.g. PRINCE2	•ES Critical factor list and risks assessment e.g. of PRINCE2
Output	•Strategic driver analysis	•Analysis of stakeholder expectations	•Benefits analysis in framework	•Benefits prioritization, stakeholder analysis (commitment plan)	•Benefits realization plan	•Governance framework and meeting schedule	•Risk assessment and action plan to deal with risks

ES benefits realization plan

Figure 17 Roadmap to an ES benefits realization plan (ES BRP)

5.1 Design rationales behind the roadmap

The focus of the roadmap is on the first phase, the planning phase of the ES benefits management method (Section 4.1). The roadmap begins with finding the reasons behind the ES implementation from top down (step 1) and bottom up (step 2). These reasons and stakeholder expectations form the groundwork with which the desired benefits can be identified and defined (step 3). The fourth step is to analyze how these benefits can be realized, and the needed organizational changes. With the output of the first four steps of the roadmap, an ES BRP can be developed (step 5). To ensure that the ES BRP can be executed, a benefit governance framework is developed to make clear who is responsible for realization of the benefits (step 6). Besides the framework, a benefit driven risk assessment has to take place to identify the risks that influence the realization of the benefits (step 7).

Although these seven development steps seem linear, the process of developing an ES benefits plan is iterative; the further you go in the process, the more you get to know about previous steps. For example, in step 2 the expectations of the stakeholders are analyzed, which become more distinct after step 4. If these changes are significant, it is necessary to go back to step 2 and add the newly acquired knowledge. Steps 6

and 7 are not explicitly necessary for the ES benefits realization plan, yet these steps should be taken before implementation starts as they positively influence the chances of realizing more ES benefits.

This roadmap to an ES BRP, solves the issues that resulted from the case experience and expert opinions. These are summarized in Section 4.4.1 in the previous section. Issues 2 and 7 are solved by emphasizing that the ES BRP is meant for the line organization and not as much for the project organization, although these organizations and their plans should be aligned with each other. Issue 4 is solved with step 4 by defining the interactions between the benefits and the organization or ES. Issue 6 is solved in step 3 by defining the benefits according to the SMART principle.

When an ES is not implemented yet, some benefits cannot be realized (issue 9). The ES BRP is developed before the implementation begins to steer the project toward benefits realization. During the implementation, plans and visions can change (issue 10). Therefore, the ES BRP continuously needs to be managed and even changed when necessary when the plans and visions are altered. After implementation, the ES BRP can be used to realize the benefits from the ES.

The remaining issues are solved with the characteristics that further describe the steps of the roadmap. These are discussed in the following section.

5.1.1   Characteristics

In the next sections the seven steps of the roadmap are further described with respect to the following characteristics, together with an indication of the issues that it solves from lessons learned of the first ES BRP exercise, Section 4.4.1:

- *Objectives* – a description defining the purpose of the step (Ashurst 2008) (issue 8).
- *Process* –an indication of when and how the step is taken and who should be involved executing the step (issue 1 and 8).
- *Context* – a description defining how and which critical factors are being managed in the step (issue 3).
- *Information* – an indication of where the needed information for the step can be gathered, since this can be an issue during the development of the plan (issue 1 and 2).
- *Framework* – a theoretical model to analyze the information of the step.
- *Output* – gives an example of the deliverable that is expected from this step to make clear how the information for this step is used (issue 1 and 8) (Ashurst 2008).
- *Instruments (Question list)* – a list containing examples of questions that can be asked during this step, in order to make the step better applicable in practice (issue 5). These lists can be found in appendix 8.1.2, and will not be discussed in the next sections.

5.1.2   Benefit management practices

The steps are based on the first 10 benefit management practices for benefits planning by Ashurst (2008) (appendix 8.1.2 pages 76-79). Most of these practices are used as foundation for the steps in the roadmap, except for step 4. Ashurst originally described step 4 as four different benefit interaction practices with stakeholders, organization, technology and processes. While these interactions are used to define gaps or changes needed in order to realize the benefits, they did not fit with the structure of the ES benefit framework. Step 4 therefore is a gap analysis that implicitly makes the interactions Ashurst defined, but then according to the benefit level (operational, managerial, strategic, organizational and IT-infrastructural level). The changes identified with this gap analysis are analyzed through a stakeholder analysis. Thus by replacing 4 steps of Ashurst by 1 gap analysis step (step 4), the roadmap exists of 7 steps instead of 10 as defined by Ashurst.

Not only step 4 but also the other steps are made more ES specific by using ES specific frameworks from Chapters 2 and 3. These frameworks can be used to analyze the information in the step, which can be used

to form the ES BRP. By defining the relationship between the steps and the ES critical factors (Section 2.3) that have to be managed in that step, the steps are made even more ES specific.

5.1.3   Applied example

An applied example of the outcomes of the steps of this roadmap can be found in Appendix 8.5.1. This example is based on the online retailer's case, with assumptions and changes made where information was lacking for the ES BRP development.

5.2   Roadmap steps

In this section the seven steps in the roadmap are described in more detail according to the characteristics described in Section 5.1.1.

5.2.1   Identify strategic drivers

Objectives

The first step in the roadmap to an ES BRP is a top down activity to clarify the strategic business drivers for the project, together with its contribution to the achievement of business strategy. These drivers can then define objectives and benefits of the project in the upcoming steps, which are in line with the business strategy.

Process

This step should be taken while initiating the project, since an ES implementation should have explicit drivers to commence such a project. People that should be involved are the project initiators like an IT-department, program managers and top management who decide on the organization's strategy. Together with these people the drivers behind the ES implementation should be made explicit, using the questions 'why is there a new ES needed' and 'how does an ES implementation contributes to the organizations strategy'.

Context

The critical factor of business plan and vision is taken into account with this step, by defining a driver that contributes to the organization's strategy. For example, the vision of the organization is to grow and a new ES can support this. Top management support is another factor that is taken into account in this step, while top management gives their vision on the organization and how a new ES can support this.

Information

Information to decide on the drivers for the implementation can come from the organization's (IT) strategy, which ought to steer the project. Deciding on the drivers should be done by the players in this step.

Framework

In literature different kinds of drivers for implementation of an ES can be found, which can be used to identify the reason for the project existence. The drivers of Muntslag (2001) are preferred, since these drivers can be easily linked with the desired objectives in the ES benefits framework that will be used in step 3. The following drivers can be identified for an ES implementation:

- When the ES is implemented to replace legacy systems because they are either hard in maintenance, costly, do not support growth, are not stable or not reliable, the implementation is an *IT-driven replacement (IDR).*
- When the ES is implemented to improve current business processes e.g. cycle time reduction with certain activities, more efficient or effective processes, less errors in processes etc, the implementation driver is a *Package Enabled Reengineering (PER)*.

- When the ES is implemented to be more in control or to standardize processes of the business units, easier consolidations of financial data, it is driven by a *Structural Reconfiguration Implementation (SRI).*
- A combination of the above drivers mentioned above is also possible.

Output

The output of this step is a strategic driver analysis that describes the organization's reason to implement an ES, which can be used for step 3, defining the desired benefits. An example of such a driver is that a new ES can support the organizations strategy to grow, since the legacy systems cannot support this. This is a typical example of an IT-driven replacement (IDR) ES implementation.

5.2.2 Analyze stakeholder expectations

Objectives

The second step in the roadmap is to conduct a structured, 'bottom-up' analysis of the stakeholders' requirements, in terms of delivered benefits. Although strategic drivers (step 1) give a direction towards desired benefits from the top-down or strategy view on the project, benefits ultimately are 'an advantage on behalf of a particular stakeholder or group of stakeholders' (Ward & Peppard 2006). Thus analyzing stakeholders' expectations of the ES implementations helps identifying desired benefits, which can be guided by the strategic drivers from step 1.

Process

A stakeholder analysis should be executed when initiating the project and while building the business case, since the benefits identified here ought to be used in the business case. Nevertheless, only after the approval of the business case and choosing an ES to implement and its scope, a better and thorough stakeholder analysis can be made. Only then it is more certain what stakeholders can expect from the ES.

Although stakeholders have to be considered here, not all stakeholders have to participate in this step. This could lead to great chaos, especially with an ES, as there could be a lot of stakeholders. The supporters or decision makers of the implementation are of great use for identifying the stakeholders since they know the organizational structure. Though for knowledge of the impact of the ES on stakeholders, (external) consultants can be used.

This step begins with first identifying the stakeholders who are affected by the system. Then for each stakeholder an analysis is made on how the new ES will impact them by investigating what possible (dis)benefits can be.

Context

In this step the factor of management of expectations is taken into account by analyzing the expectations of the stakeholders. The resistance of the stakeholders to change is also considered when possible disbenefits of the stakeholders are identified that could increase the resistance. Finally, consultant resources as a critical factor can be considered in this step as well, as a consultant can be used for his knowledge of the impact of an ES in an organization.

Information

In addition to the information from the people who are involved in this step, the organizational structure and the value chain of the organization can give an indication of the stakeholders. These 'models' give structured overviews on the connections of the stakeholders with the organization that is implementing the ES.

Framework

To identify the stakeholders and their benefits from the ES, the first step of the stakeholder analysis of Benjamin and Levinson (1993) can be used, like discussed in section 2.4.4. This step divides the stakeholders in four different groups; collaborators, compromisers, accommodators and resistors. This gives a first indication on which expectations of the ES implementation can be used as input of stakeholders for the following step, where the benefits will be identified. Based on the analysis of this step, a deeper stakeholder analysis can be made, with precise (dis)benefits for each stakeholder. This is done in the fourth step.

Output

The output of this step is a first stakeholder analysis that defines the players in this implementation and gives an indication of which benefits they expect from the ES implementation. An example of such a stakeholder analysis can be found in Appendix 8.5.2 on page 97.

5.2.3 Identify and define benefits

Objectives

The third step is a review of strategic drivers (step 1) and the stakeholder expectations (step 2), to identify and agree on target benefits that the organization wants to realize with its ES implementation.

Process

This step is taken while building the business case, since benefits (and costs) should be the decisive reason to invest in an ES. Still, the benefits have to be reviewed again after the investment decision and during the implementation. When more knowledge about the ES becomes available, both its functionalities and its impact on the organization and the benefits are more apparent.

The people that decide on the target benefits should be supporters of the project, like top management and the IT-department. A financial advisor could be useful for defining financial benefits.

The ES benefits framework, discussed later on, can be very useful for identifying possible benefits from the ES with the output of step 1: the drivers and step 2: stakeholder expectations. Together with the people who are involved in this step, each class of the framework can be discussed with respect to the possible benefits. If desired, the focus can be changed to the preferred benefits based on strategic drivers (step 1).

Identified benefits should be described according to the SMART-principle. A benefit must be that specific that each stakeholder understands it. The benefit should also be measureable, achievable, relevant, and time bounded.

Context

With this step the critical factors of scope and radicalness of the ES is taken into account by deciding what the impact of the ES is going to be. By expecting benefits on all levels and impacts of the framework, there is a large scope and radicalness of the ES, since this inclines a lot of changes. By deciding only to focus on a specific part of the benefits framework, for example, only IT-infrastructure benefits with an IDR implementation, the scope of the ES is smaller. The business plan and vision has to be considered as well with defining the preferred benefits. Priority should be given to the benefits that support this plan and vision. The factor of management of expectations is also considered in this step, since the benefits should be aligned with the stakeholders' expectations.

Information

The information needed for defining the target benefits comes is the output of step 1, the strategic driver behind the implementation, since this provides a direction of the most desired benefits. Furthermore, the people involved and the benefits of the stakeholders (step 2) are useful for defining benefits.

Measures and targets can be based on (existing or new) key performance indicators (KPI), to be in line with the strategy and goals of the organization. Financial benefits have to be based on current costs and expected costs (or revenues) in the new situation.

Framework

To identify and structure benefits from an ES, the ES benefits framework as presented in section 3.2 can be used. This framework is especially useful for this step since it gives an indication of which benefits to expect, based on the strategic drivers resulting from step 1. Examples of benefits and questions to identify the desired benefits can be found in Table 14 in Appendix 8.5.1.

Output

The output of this step is a benefits analysis including: agreed measures and targets in a benefits framework that the ES BRP requires. An example of an ES benefits framework that is filled-in can be found in Appendix 8.5.2 on page 98.

5.2.4   Gap analysis before / desired after ES implementation

Objectives

This fourth step of the roadmap will relate the impact of the benefits to the organizational perspectives (balanced scorecard), prioritize the benefits and identify relevant measures. In this step the needed changes are identified on each benefit level (operational, managerial, strategic, organizational and IT-infrastructure) with the stakeholders affected by the change. It also defines who is responsible for realization of the benefit and when the benefit is to be expected. In it additions need to be defined how the stakeholders can commit to the realization of the benefits and who is responsible for this realization.

This is one of the most important steps in the roadmap for the realization of ES benefits, since of Davenports points (2004) come back in this step:

- Set resources on the ES, by deciding how the benefits from the ES are realized,
- Prioritize benefits,
- Manage and measure benefits,
- Holding someone accountable for realization of targeted benefits by defining responsibility.

All these decisions will come back in the final benefits realization plan. However, during and after the project the actions and changes should be monitored and adjusted based on newly gained insights on the ES benefits realization process.

Process

This step is taken after the ES is selected and the business case is approved, since this gives a precise idea of what is expected from the ES and what impact it has in the organization.

Representatives of the stakeholder groups or their direct management should be incorporated in this step, since they know what the current situation is in the organization and how this can be changed into the new situation with the ES. But for the needed changes it is also useful to have an advisor with knowledge of the processes the ES requires, so that a comparison can be made to the current situation and new situation with the ES.

In this step needs to be identified which changes have to be made and where this has to be done to realize a certain benefit, for example, changes in business processes in the procurement department in order to speed up the buying process. This should be done for every benefit level.

Then these changes per benefit are compared to each benefit to find similarities and dependencies to align changes and not to double these. After the comparison, the impact of these changes has to be related to the stakeholders; which stakeholder has to make the change in order to realize the benefit(s)? This is the second part of the stakeholder analysis, and also indicates certain actions to take to let the stakeholders commit to the change and thus to the benefit.

Important to notice with this step is that it is a very labor intensive step to identify all changes and needs to deliver the desired benefits. This could be simplified with fewer benefits, for example, only benefits with the highest priority. Otherwise, this step is a step to change management with identifying all needed (organizational) changes. This could result in the decision to take a step back in the roadmap and review which benefits are more desired or have a higher priority.

Context
Since this is a big and important step, several critical factors have to be taken into account:

- *Fit with current business* – when the ES package has a good fit with the current business, fewer changes have to be made in order to realize certain benefits.
- *Package (ES) adaptation* - where the ES does not fit with the current business and the processes of the current business are more efficient / effective than the ES, some adaptations to the ES have to be made, although this is often not desired since it also has an impact on the usability of the ES.
- *Organizational adaptation* - where the ES does not fit the current organization and proposes an improvement, the organization should adapt to the ES to realize the benefits.
- *Business process engineering* - when certain benefits come from improving business processes, these should be reengineered to the most efficient and / or effective way according to the new ES.
- *Cooperation and commitment* - to realize certain benefits, stakeholders have to cooperate and commit to the changes they need to make. The stakeholder analysis clarifies where the stakeholders have to cooperate and where there is a lack of commitment.
- *Resistance to change* – the stakeholder analysis also identifies disbenefits for stakeholders and the reasons to resist to the change. With this analysis, actions can be taken to let the stakeholders commit and cooperate to the change.

Information
The most important stakeholders can be identified through the stakeholder analysis of step 2. In the ES benefit framework of the previous step the desired benefits and their impact on the organization can be found. Information about the needed changes can come from the implementation partner (external consultant or vendor) and project manager.

Framework
For the deeper stakeholder analysis, the second part of the stakeholder analysis of Benjamin and Levinson (1993) can be used, like presented in Section 2.4.4 in Table 5. Next to the benefits, disbenefits and needed changes to realize the benefits can be defined per stakeholder. Besides, possible issues like perceived resistance and commitment of the stakeholder are identified as well. The latter should influence the actions to be taken to ensure realization of the benefits.

This is a general stakeholder analysis, but when there are many benefits identified in the ES benefits framework, it is hard to keep a good overview in one stakeholder scheme. Therefore a personal scheme for each stakeholder with many benefits and changes is proposed.

Output

This step results in a prioritization of benefits, a deeper stakeholder analysis with identification of the needed changes and an action plan to let the stakeholders commit to the realization of the benefits. The defined changes and highest prioritized benefits will be of use in the ES BRP, but to ensure the benefit realization the other deliverables are important as well. In Appendix 8.5.2 an example of a list of identified benefits and required changes can be found on page 100. On the next page a stakeholder analysis can be found.

5.2.5   Plan benefits realization

Objectives

The purpose of this fifth step is to develop the ES BRP to show what the benefits are and how they are going to be realized. The ES BRP ensures the delivery of benefits is faced as relevant and that there is appropriate consideration of stakeholders and their opinions.

In this step the focus is on the ES BRP, which is an addition in the implementation to the action plan (issue 7 from the lessons learned in Section 4.4.1). The difference between these plans is that an action plan in an ES implementation is to deliver the ES, other than the benefits plan is intended to help to realize benefits from the ES implementation. An action plan is used by the project organization, while the benefits plan should be used by the line-organization that after the project is ultimately responsible for delivering the benefits.

Process

The ES BRP should be realized before starting the implementation of the ES, to set out which changes are needed in the ES as well as in the organization. The ES BRP can then be used to assess the action plan for implementing the ES whether that plan indeed contributes to the realization of the benefits.

The benefits plan probably needs to be updated during and after the implementation when there are new insights in the exact delivery of the benefits. These insights can contain for example the fact that other changes are needed for the realization of the benefit. Furthermore, the plan can also be used after implementation during project review, namely for the assessment of the benefit realization.

All the previous steps give input for the ES BRP. The ES balanced scorecard gives the framework of how this input must be structured. The project manager should be responsible for the development of the benefits plan since this person has the most knowledge about the implementation plan. Agreement on responsibilities and when the benefits are expected are made with the benefit (and change) owners.

Context

Ensuring the delivery of benefits should include all critical factors, which should be made explicit in a benefits plan, which is a hard thing to do. Most critical factors are already taken into account in this roadmap. Nevertheless, the critical factors still need to be taken into account during the implementation. Step 7 is used to assess if all factors are taken into account by the organization for ensuring benefits realization with the ES implementation.

Project management is partly considered as a critical factor here, since the ES BRP should be aligned with the overall project plans and organizations. Nevertheless, ES BRP gives project management another tool to monitor and manage the project to the desired outcomes in terms of business benefit. This also means that the critical factor of performance and evaluation management is also considered with the ES BRP, since the plan can also be used for reviewing after implementation. By appointing benefit owners, who are responsible for the realization of the benefits, the critical factor of dedicating (human) resources is taken into account as well.

Information

The information needed for the benefit plan is gathered through the previous steps, like in the thorough stakeholder analysis (step 4) and the ES benefit framework (step 3). Nevertheless, the ES BRP needs to be aligned with the (implementation) project plan to ensure that benefits can be delivered.

Framework

The ES BRP is represented through the ES balanced scorecard. These cards have been changed based on the experts' opinion (issue 2 and 7, lessons learned in Section 4.4.1). Table 12 ES BSC for benefit realization: Supply Chain perspective is an example of such a card.

Benefit level	Benefit objectives	Measure(s)	Requirements ES / Organization	Responsibility for realization	Expected moment of realization
Operational	Investment objectives step 2	For each objective, measures are given	How to reach the benefit	Benefit and change owner	e.g. XX months after 'Go-Live'
Managerial					
Strategic					
Organizational					
IT-infrastructure					

Table 12 ES BSC for benefit realization: Supply Chain perspective

For each column of the ES benefits framework, such a scorecard can be filled in with all benefits for that column. A filled in scorecard provides a structured overview of all benefits, measures, changes needed (requirements ES / organization), responsibility and expected moment of realization.

Output

The output of this step is an ES BRP that defines the benefits and the actions required to realize them. An example of an ES BRP can be found in Appendix 8.5.2 on page 102. This output can be used to monitor the progress of the benefit realization and afterwards review, and for evaluating the benefits realization process.

5.2.6 Design a framework for benefit governance

Objectives

This step is to design a governance framework addressing the business change project, including the enabling ES implementation activities (from the action plan). There has to be agreed on how to bring together the sponsor, benefits owners, project manager and other stakeholders through appropriate meetings, workshops and other forms of communication.

Although this step is not completely necessary for *developing* a benefits plan, a benefit governance framework is needed to *execute* the benefits plan. This step is to align the line-organization with the project organization. The line-organization should be responsible for delivering the benefits; yet the project organization is responsible to make the benefit realization possible. Without a (working) ES, it is hard to realize certain benefits. Nevertheless, an ES does not deliver benefits, only users and managers can realize benefits (Peppard 2007). Therefore an alignment should exist between these organizations (and the benefit and action plan).

Process

This step is executed while developing the ES BRP and action plan, since this plan should also reflect the benefit owners and responsibilities that are decided with this activity. The governance framework is based on the tasks and responsibilities of the people who are involved in the project and with the realization of

the benefits. During this step it is also decided how the different actors in this project (and benefit owners) communicate with each other, for example by meetings or mailings.

From the description one can find that 'sponsor, benefits owners, project manager and other stakeholders' are the people that should be involved in this step. The sponsor is the supporter of the project, e.g. top management. Perhaps not all stakeholders are equally important, but the benefit owners are important, together with other members of the project organization to agree on the responsibilities for the project, changes and benefits to realize.

Context

By defining the governance framework, the critical factors of project management, dedicating resources and cooperation have to be taken into account. This is done by defining what the responsibilities and tasks are of each actor in the project, based on the project management and the ES BRP. Besides, by developing a communication plan the critical factor of communication is considered as well.

Information

Information about the benefit owners and stakeholders can be found in the ES BRP (step 5), stakeholder analysis (step 2 and 4) and from the overall project plan (as far as available).
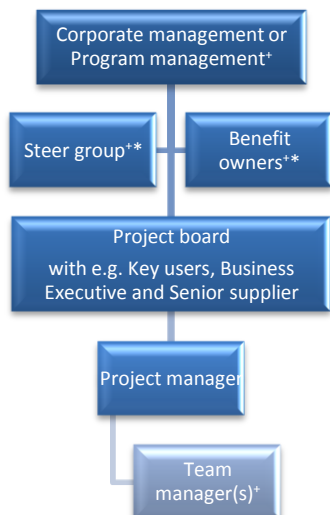

Figure 18 Example of project governance (based on PRINCE2)

Framework

The kind of model or framework that can be used to determine the governance of the project depends on the project management method used by the organization. Figure 18 is an example of a project governance structure, based on PRINCE2. However, in the original PRINCE2 governance there is no steer group (*) or benefit owners (*) defined. Nonetheless, in many ES projects, steer groups are present. And since for benefits management benefit owners are defined, these have to be represented in the governance structure as well. Although these groups of stakeholders do not have to be a direct part of the project team, these do represent the line organization (+) and their stakes in realizing the benefits.

Another noticeable aspect is that the roles in this structure do not have to be separated. Members of corporate management can be part of the steer group as well as being benefit owner and team managers could also be benefit owners. Often after a project the project governance does not exist anymore, but the responsibilities remain to realize the benefits with the benefit owners in the line organization. That is why project team members with benefit owner responsibilities keep these until the benefit is realized (and not only during the project).

Output

This step provides a governance framework and meeting schedule to bring together the benefit owners and project organization to ensure that the benefits planned can be realized. A governance framework example can be found in Appendix 8.5.2 on page 104.

5.2.7   Benefits driven risk assessment

Objectives

In this step a proactive approach is taken with respect to risks that focuses on business change and benefits realization by assessing the fact that all critical factors should be taken into account. This is not necessary for developing a benefits plan, but does lower the risks and thus ensures benefits realization.

Process

The risk assessment about benefits realization and business change can be done when the ES BRP (and action plan) is nearly ready for use, right before the actual implementation begins. By assessing the risks before the actual implementation begins, it can lower the chances on issues with benefits realization during and after implementation.

The benefit driven risk assessment should be done by someone with an objective view on the project, like a (external) quality and assurance advisor. Some information that resides with the project manager or benefit owners with regards to the benefits that are assessed, can be needed by the advisor.

A list of all critical factors and other possible risks has to be checked on whether or not these risks are taken into account somehow. This can be done through interviews with the project manager and benefits owners. However, by investigating project documentation a more objective view can be formed on the risks for benefits realization.

Context

The benefit driven risk assessment is based on all critical factors for ES implementations, since these factors influence the realization of the benefits. All critical factors have to be taken into account in someway to ensure benefit delivery. Most critical factors are already taken into account in this roadmap, but many critical factors stay important throughout the ES benefit realization process. So in the overall project, critical factors should be taken into account to ensure ES implementation success, which is a precondition to realize benefits from the ES (Section 3.6).

Information

Information for the risk assessment can be provided from the benefit and action plan. In these plans the critical factors should be present (explicitly or implicitly). Other information can be gathered from key players in the project like the project manager, since most information regarding an ES implementation resides within the people who are involved with the project.

Framework

The project management method of PRINCE2 gives an example on how to execute a risk assessment and action plan. However, this is a general (IT) project management method and especially with an ES implementation there are critical factors that need to be taken into account as well during such an assessment. Table 15 in Appendix 8.5.1 lists all these critical factors that should be present in the plans and where and how these critical factors can be taken into account.

Output

The deliverable of this step is a benefit driven risk list, as defined in Table 15 in appendix 8.5.1. From this table an action plan can be made on which critical factors should be taken into account as well, which can lead to a revision of previous steps in this roadmap (iteration).

5.3   Expert opinions of roadmap

KPMG experts on ES implementations and benefits management think that developing an ES benefits realization plan through the roadmap will improve benefits realization with ES implementations.

Organizations can commit to the plan and realize the benefits from the implementation. This can be done especially when different players within the organization can provide their insight in which benefits should be realized in which way.

At first the benefits can be a bit vague, like proposed in step 2 (page 59). But in step 3 the benefits have to be more specific. The SMART principle is indeed a good method to realize this. It is also suggested by the experts to let the benefits relate to the organization's (already existing) key performance indicators.

Step 4 (page 61) can be very comprehensive, thus an organization can loose its grip on the overview on the benefits. Therefore, suggested is that only the most important (10 to 15 benefits) should be taken into the ES benefits realization plan. The ES benefits framework gives a good overview on which benefits can be realized. However, the dependencies between the benefits are not explicitly represented in the framework, or in any other step in the roadmap.

A benefits dependencies network (Ward & Daniel 2006) can be of use with this problem, and can also help with discovering possible overlap between benefits. Such a network can also give an overview for the organization on where the benefits come from. And if it is limited to fit on one page, it naturally prioritizes benefits.

The roadmap and the ES benefits realization plan consist of all the important parts to realize benefits. Although it can be important for the plan to be not too high level, it is also important to keep overview and to stay comprehensible for the stakeholders. This can be realized by defining a proper amount of benefits and not too many, and provide representations on how to deliver these benefits.

5.4   Conclusion

In this chapter the roadmap to an ES benefits realization plan is presented as a method for improving benefits realization with ES implementations. This roadmap exists of seven steps towards an ES benefits realization plan and ensures it can be executed. These steps are taken before the actual ES implementation begins, since it includes defining drivers for the ES implementation and it should 'steer' the implementation towards the realization of ES benefits. Thus after implementation the desired benefits can be realized. Besides, an ES implementation often requires a business case analysis, which uses the benefits defined in this roadmap. Figure 19 represents this roadmap.

Figure 19 Steps of ES BRP roadmap

Each step is in this chapter is described according to their purpose, critical factors, when the step is taken, people involved, the source of information, framework and output. Questions for an organization implementing an ES, for every step in the roadmap, can be found in Appendix 8.5.1.

With the steps of the roadmap and the ES BRP, more benefits can be realized with the ES implementation. The roadmap and ES BRP give concrete actions to take for realizing benefits in ES, which the line organization can use to manage and realize the benefits, even after an ES implementation.

6 Conclusion and recommendation

In the previous chapters the research process was described, with as final result a roadmap to an ES benefits realization plan in Chapter 5. This chapter concludes this thesis by answering the research question first in Section 6.1. This is followed by a discussion on the limitations of this research (Section 6.3.1) and topics for further research (Section 6.3.2). Finally a recommendation is given on how to use the results in this research in Section 6.2.

6.1 Conclusion

The goal of this research is to improve the benefits realization with ES implementations. To reach this goal, the following question is answered:

What guidelines can be used to improve benefits realization from an enterprise system implementation?

A roadmap to an ES benefits realization plan (ES BRP) is introduced in Chapter 5 as guidelines to improve benefits realization with ES implementations. This roadmap exists of seven steps that eventually lead to a specific ES benefits realization plan and a risk assessment based on ES critical factors. Figure 20 represents this roadmap, and Appendix 8.5 gives a more detailed overview.

Figure 20 Steps of ES BRP roadmap

This roadmap is based on the first two phases of the benefits management process, identify and structure benefits and benefits realization planning (Ward, Daniel & Peppard 2006). These phases are comparable to the first phase of the ES lifecycle, planning. Thus during the planning phase of an ES implementation, this roadmap should be followed to deliver an ES benefits realization plan, which helps to improve ES benefits realization.

The complete benefits management process of Ward, Daniel and Peppard (2006) consists of five steps, that all can be generally compared to the ES lifecycle. This implies that the ES lifecycle can be enriched with the benefit management process for realizing benefits with ES. Figure 21 represents this complete process.
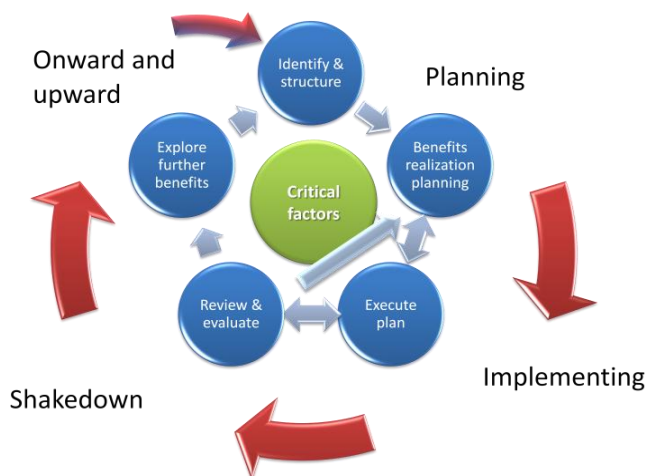

Figure 21 ES benefits management process

Although it is assumed that more benefits can be realized when the complete cycle is executed, the main focus is on the planning of the ES benefits. Planning is not only the most comprehensive phase in the process, but also the most important. The ES benefits realization plan forms the foundation for the other phases in the process is used to execute the benefit management process, but also to monitor and review benefits realization.

Based on a case study where the planning phase was executed at an online retailer, it is concluded that the steps for planning ES benefits realization need to be as specific as possible. In order to realize this, the research had to be more concentrated on the planning phase.

The steps of the roadmap to an ES benefits realization plan are based on the practices for the benefits management process (Ashurst 2008). These practices are defined for general IT projects, but an ES implementation has such complex characteristics that these had to be adapted to fit an ES implementation. This is done by adding the ES specific models from chapter 2 and 3 to apply in the steps and linking ES critical factors to the practices. These changes bring along that the ten practices as defined by Ashurst, are changed in to seven specific steps for developing an ES benefits realization plan.

Although the chances on ES implementation success are increased by actively managing ES critical factors, it does not directly lead to the realization of ES benefits. A successful ES implementation is a pre-condition for benefits realization. However, only with organizational change and effective use of the ES an organization can obtain benefits.

The benefit management practices include most of the critical factors, as depicted in Section 3.4. When these practices are used during the implementation to realize benefits, it implicitly means that ES critical factors are considered which increases the chances on an operational ES. To ensure that all critical factors are taken into account during the implementation, a risk assessment, based on these factors, is a part of the roadmap to an ES BRP.

In the case studies is experienced that taking the critical factors into account increases the chances on ES implementation success. However, the benefits management practices were scarcely applied in the cases to realize ES benefits. Some of the organizations in the study did define benefits in their business case, but only one organization reviewed the non-financial benefits a year after the implementation. This particular organization was the only example which obtained some benefits they expected from their ES implementation. This case shows that guidelines for benefits realizations indeed can improve realization of benefits with ES implementations.

Based on these results can be concluded that when the roadmap to an ES benefits realization plan is applied, more benefits can be realized with an ES implementation. This because by applying the roadmap, critical factors for an ES implementation are taken into account, together with benefits management which leads to an improvement of ES benefits realization.

6.2 Recommendation

To improve benefit realization with ES implementations, an ES benefits realization plan (ES BRP) should be developed. The roadmap for developing such a plan as presented in this research is an explicit tool that can be used to do this. This can be used by the organization itself, in example, a (steering) group of the ES project, or an external party that supports the organization with the ES implementation.

The sooner the drivers and desired benefits behind the implementation are identified, the better benefits realization can be managed during the implementation. The first three steps of the roadmap can also be used as an aid with defining the benefits for the business case. When this business case is accepted, the remaining steps of the ES BRP can be followed.

There must be an ES BRP before the implementation begins. However, it is important to notice that the ES BRP is a dynamic plan that can change during and after the implementation when it becomes more apparent which benefits can or cannot be realized and how this should be done. First, the plan provides a direction. In a later stadium the plan can be used to evaluate the value of the ES in the organization based on the benefits that are realized.

Most organizations begin implementing an ES without an ES BRP and find out after implementation the outcomes are not as expected. Although it is recommended to have a benefits plan in advance, it can also be made during the implementation to direct the project into realizing benefits for the organization. Even after implementation an ES BRP can be developed to realize more benefits from the existing ES. While these are not the most optimal ways to realize benefits, it can still improve the benefit realization of the ES in an organization.

Whereas the focus in this research was on the planning of benefits realization in ES implementations, the complete benefit management cycle in the ES lifecycle should not be forgotten. The plan, together with the practices defined by Ashurst (2008) and the suggestions of Davenport (2004) can be a foundation for completing the benefit management cycle as defined in the theoretical solution (Section 3.5). A complete ES benefits realization method will realize the most benefits from an ES implementation.

6.3   Discussion

The roadmap to an ES benefits realization plan is based on theoretical constructs and lessons learned from practice. Nevertheless, this result has some limitations, but also interesting suggestions for further research, which are discussed in this section.

6.3.1   Limitations

There are different limitations to this research. Although the benefits dependencies are discussed in the literature, they are not represented enough in the roadmap to an ES BRP. This is also supported by the opinions of the experts. The ES benefits framework does not support the representation of the dependencies. This can be done e.g. through a benefits dependencies network (Ward & Daniel 2006). Developing such a network can be very difficult and comprehensive for an ES (Peppard & Daniel 2007). Nevertheless, it is possible to develop an ES benefits dependencies network when priority is given on a set of benefits and needed changes.

The validation of the research models also has limitations. The propositions, as foundation of the ES benefit realization method, were validated using a rather small collection of four cases. Other cases could have lead to different results. The ES benefit method with a focus on planning, was tested at one organization, which was already in the implementing stage of the ES project. This is not a perfect setting, since it is assumed that the ideal moment to develop an ES benefits realization plan is before implementation. Nonetheless, this, and the other case studies gave valuable insights on how to develop and realize benefits from ES implementations.

6.3.2   Further research

The first suggestion for further research is to research the complete ES benefit realization method. The scope of this research is narrowed to the planning phase of this method. Although the planning forms the foundation of the complete ES benefit realization method, the remaining phases have not been fully researched yet.

Even though the roadmap is applied to an adapted setting of the online retailer case, it is not applied in an existing ES implementation case from the beginning of the project. Hence, for better validation of the given solution, additional research should be performed in with more cases.

Another interesting aspect for further research is the influence of drivers of an ES implementation and the relationship with the desired and realized benefits. With the four case studies an example is set on how to research this relationship. However, this relationship can be further validated with more cases.

An important variable in this research is the influence of critical factors on ES benefits realization. This research lists 21 factors that are important for ES implementation success and how these can be managed with the benefit management practices for realizing ES benefits. In this research a direct and clear relationship between certain benefits and use of critical factors. The critical factors are used here in a process to deliver benefits, but at this moment it is uncertain if all critical factors are needed to realize specific benefits. The levels of critical factors and the benefit levels, which in this research are the same, could propose a relationship between both. In example; to realize IT-infrastructural benefits, the IT-infrastructural critical factors are most important. Further research could explain this relationship.

Last suggestion for further research is a comparison of the roadmap to an ES benefits realization plan to other ES implementation methods like Accelerated SAP or general project and program management methods that deal with benefits management, like Managing Successful Programs (MSP) or PRINCE II. This research assumes that most project methodologies lack a benefit realization focus, especially ES specific implementation methods. Some of these methodologies can have some benefit management practices in it. The roadmap to an ES BRP could even be a valuable addition to these implementation methods and improve benefits realization with implementations.

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8   Appendix

8.1   Theoretical models

8.1.1   ES benefits framework

Dimensions	Sub-dimensions	Tangible?	Quantifiable?
1. Operational	1.1 Cost reduction	Full	Full
	1.2 Cycle time reduction	Most	Full
	1.3 Productivity improvement	Most	Full
	1.4 Quality improvement	Some	Most
	1.5 Customer services improvement	Some	Most
2. Managerial	2.1 Better resource management	Some	Most
	2.2 Improved decision-making and planning	Some	Some
	2.3 Performance improvement	Most	Most
3. Strategic	3.1 Support business growth	Some	Full
	3.2 Support business alliance	Low	Most
	3.3 Build business innovations	Some	Some
	3.4 Build cost leadership	Some	Some
	3.5 Generate product differentiation	Some	Low
	3.6 Build external linkages	Low	Some
4. IT infrastructure	4.1 Build business flexibility for current and future changes	Low	Low
	4.2 IT costs reduction	Full	Full
	4.3 Increased IT infrastructure capability	Some	Some
5. Organizational	5.1 Support organizational changes	Low	Low
	5.2 Facilitate business learning	Low	Low
	5.3 Empowerment	Low	Low
	5.4 Build common visions	Low	Low

Table 13 ES benefits framework of Shang and Sheddon (2002) and extent of tangibility and quantifiability (Murphy 2002)

8.1.2   Benefits realization practices[6]
Benefits identification and structuring

Practice	Description	Output	Critical factor(s)
1.1 Identify strategic drivers	'Top down' activity to clarify the strategic / business drivers for the project and its contribution to the achievement of business strategy.	Strategic drivers analysis	Business plan & vision
1.2 Analyze stakeholder expectations	Conduct a structured, 'bottom-up' analysis of the stakeholders' requirements, in terms of delivered benefits.	Analysis of expectations by stakeholder	Management of expectations, resistance to change
1.3 Identify and define benefits	Review of strategic drivers and the stakeholder requirements, to identify / agree the target benefits.	Benefits analysis including: agreed measures targets and benefit owners	Business plan & vision, ES scope, radicalness, management of expectations
1.4 Establish benefit / process interactions	Relate the benefits to business processes to identify where changes will take place and help identify relevant measures. Assess the variability and uncertainty in the process and consider the implications for benefits realization.	Process / benefit map	Business process reengineering, fit with current business
1.5 Establish benefit / stakeholder interactions	Identify stakeholder groups affected by the technology, and changes required to realize the benefits. Identify business change issues and actions required including communication and engagement with the stakeholders, and the re-design of job specifications.	Stakeholder impact assessment	Organizational adaptation, resistance to change, communication, cooperation
1.6 Establish organization / benefits interactions	Explore the interaction between the benefits and a full range of perspectives on the organization	Organizational impact assessment	Organizational adaptation
1.7 Establish technology / benefits interactions	Establish a design for ES solution that takes account of the capabilities of the technology.	Conceptual architecture overview	Package adaptation, data analysis, defining the architecture

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[6] Adapted from Ashurst et al. (2008), added with critical factors

Benefits planning

Practice	Description	Output	Critical factor(s)
2.1 Plan benefits realization	Develop an overall plan to show the business case (what the benefits are) and how they are going to be realized. The plan relates to the type of project and ensures the delivery of benefits is phased as relevant and that there is appropriate consideration of organizational factors.	Benefits realization plan: defines the benefits and the actions required to realize them	Business plan & vision, project management (ensuring should include all CFs)
2.2 Design a framework for business change governance	Design a governance framework addressing the business change project, including the enabling ES implementation activities. Agree how to bring together the sponsor, benefits owners, project manager and other stakeholders through appropriate meetings, workshops and other forms of communication.	Governance framework	Project management, cooperation, communication, dedicating resources
2.3 Benefits driven risk assessment	Take a proactive approach to risk that focuses on business change and benefits realization.	Risk assessment and action plan	Organizational adaptation (and all other CFs)

Benefits realization

Practice	Description	Output	Critical factor(s)
3.1 Establish an adaptive project life-cycle	Establish a project life-cycle enabling change during the project in response to learning / uncertainty – based on iterative, incremental delivery and a small number of major phases controlled by phase end milestone reviews. The adaptive life-cycle continues into benefits ramp up and evolution deployment.	Project approach – including definition of phases, deliverables and milestones	Project management, dedicating resources
3.2 Actively lead the business change	Design, build and lead the project team and governance framework with a focus on realizing benefits. In particular address responsibility for benefits for the organization / sponsor, benefits for the end user and the effectiveness of the team.	Role description	Project management, organizational adaptation
3.3 Ensure continuing active involvement of stakeholders	Ensure there is communication and involvement with all stakeholders (based on the stakeholder analysis)	Participation and communication plan	Cooperation, communication
3.4 Specify changes to work and organizational design	The project focuses on the design and delivery of a business solution. This will typically require consideration of: business processes, working practices, structures, roles, management framework, performance measures and culture.	Business solution design	Organizational adaptation, business process redesign, package adaptation, resistance to change, fit with current business
3.5 make benefits-driven trade-offs	Trade-off decisions (features, cost and schedule) are driven from a benefits perspective.	Change log / decision log	Package adaptation, project management
3.6 Implement organizational changes	Implement new and revised business process, working practices, structures, roles, management framework and performance measures. Take action as required to encourage cultural changes.	Changed organization – this activity needs to be monitored to ensure that planned changes are actioned	Organizational adaptation, business process reengineering, resistance to change
3.7 Benefits-driven training and education	Ensure education and training is focused on the realization of benefits.		Training, user support

Benefits evaluation

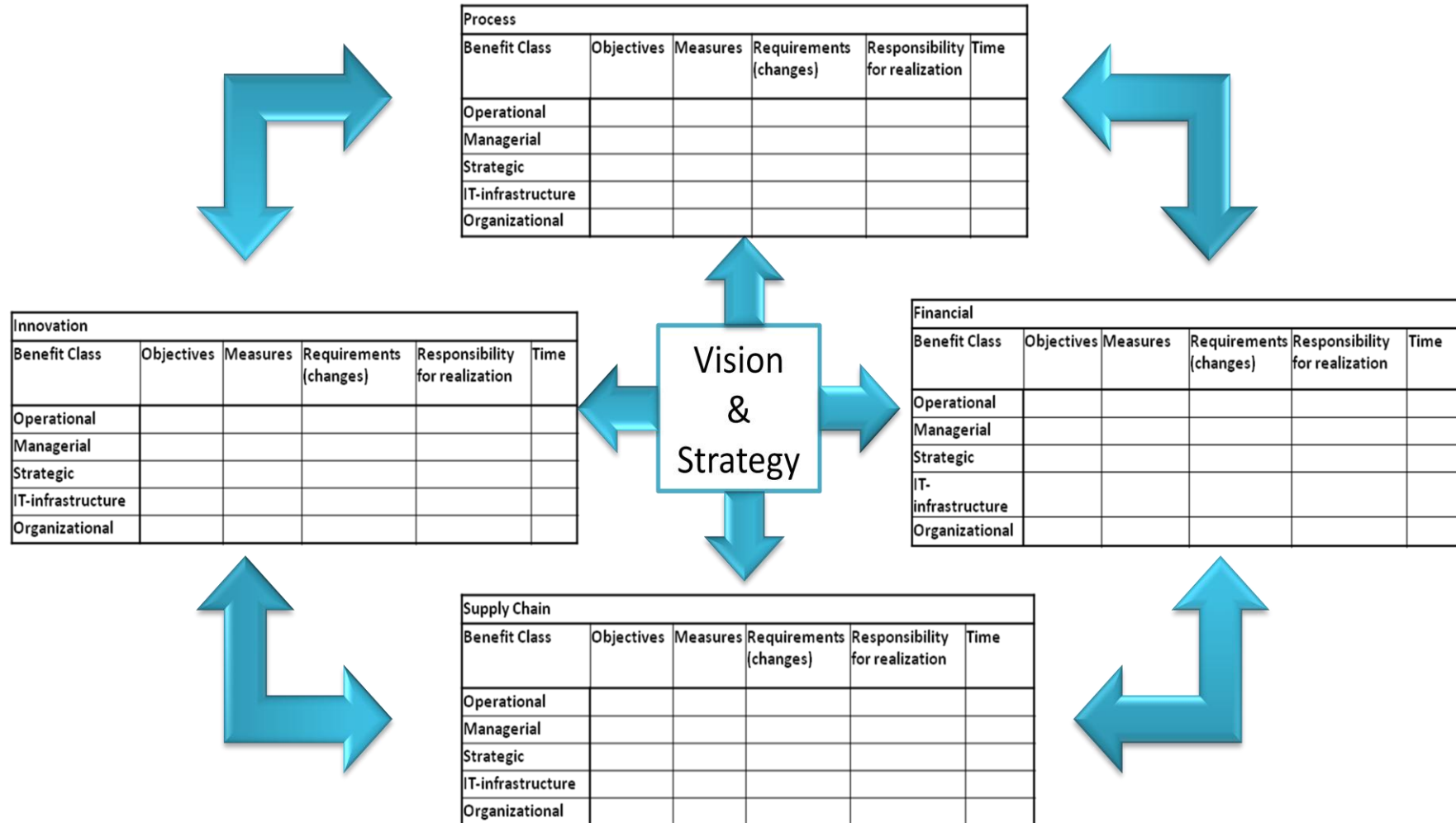| Practice	Description	Output	Critical factor(s)
4.1 Establish ES based evaluation criteria	Establish project evaluation criteria related to the ES	Evaluation framework and criteria	Performance & Evaluation management
4.2 Benefits-driven project appraisal	Use agreed evaluation criteria to undertake a systematic assessment of benefits.	Benefits assessment report	Performance & Evaluation management
4.3 Identify actions to realize further benefits	Where planned benefits have not been achieved, or opportunities for new benefits have been identified, a benefits' action plan needs to be established	Benefits action plan	Performance & Evaluation management
4.4 Facilitate lessons learned reviews	Carry out lessons learned reviews at key stages in the project on project completions	Lessons learned report and action plan	Performance & Evaluation management
4.5 Complete architectural roadmap review	Carry out a review on completion of a project to consider the contribution to the overall IT architecture. Also consider the strategic alignment of a program and implications for future projects / releases.	Updated architecture roadmap	Defining the architecture

Benefits exploitation

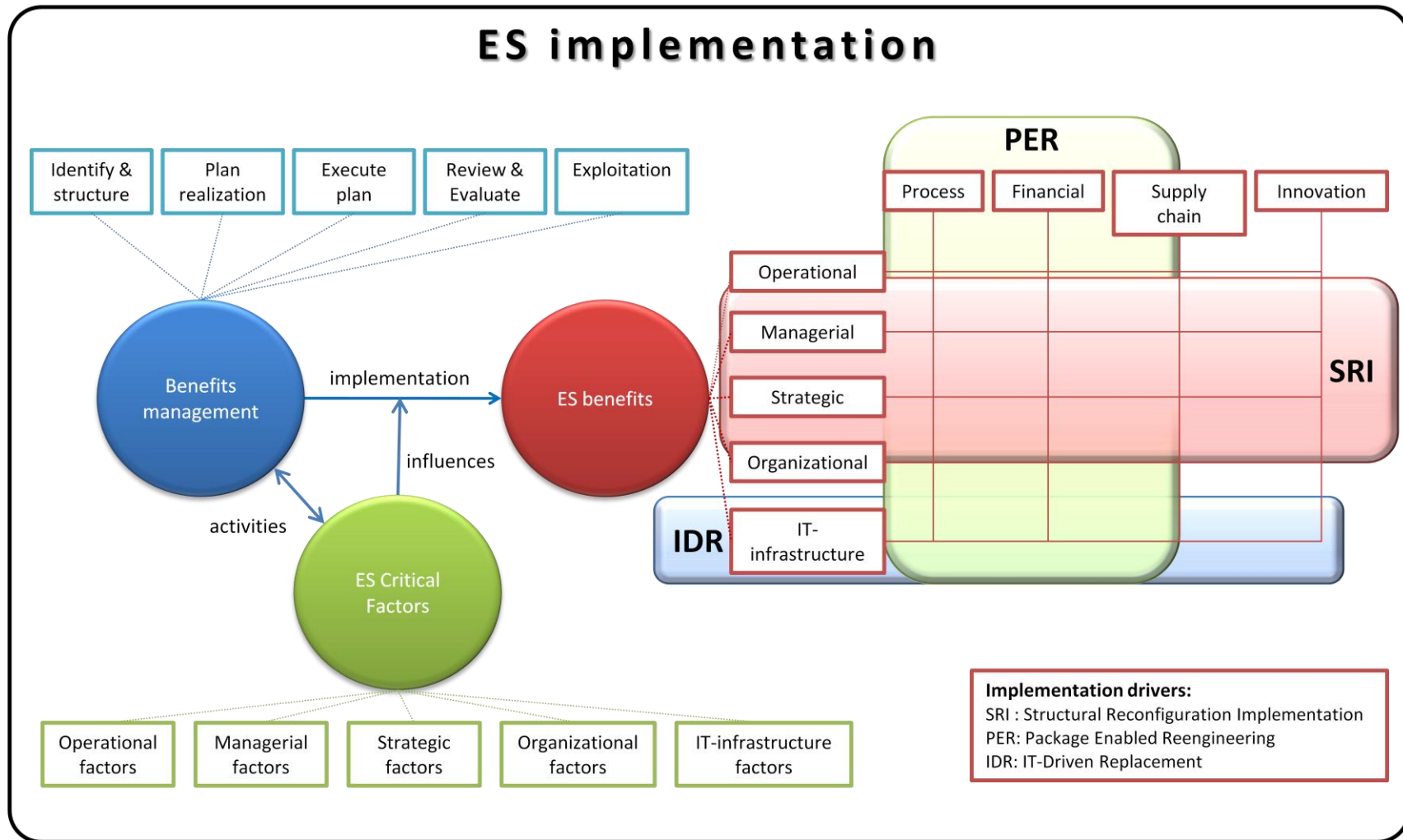| Practice	Description	Output	Critical factor
5.1 Ensure ownership of continued benefits exploitation	Establish a clear business role for ongoing ownership of realizing benefits.	Agreed / active benefits owner	Dedicating resources
5.2 Maintain benefits-driven training	Training is focused around benefits realization and establishing new ways of working.	Up to date training / education resources. Ongoing training plan and provision	Training, User support
5.3 Evolve working practices	Continue to evolve working practices post deployment to realize further benefits.	Revised working practices	Business process reenginering

8.1.3 ES benefits classification framework example

	Process	Financial	Supply chain	Innovation
Operational	• Cycle time reduction [a] • Productivity improvement [a] • New / improved processes [b, c, d]	• Cost reduction [a, c] • Revenue / profit increases [b]	• Customer services improvement [a, c, e] • Adding functionality in online channel for end B2C customers [e] • Increased product availability [e] • Improved traceability of products [e]	• Quality improvement [a]
Managerial	• Improved decision-making and planning [a, c] • coordination improvements [d]	• Better resource management [a, c] • Streamline financial consolidations [c] • Decrease cost pressure • Integration of suppliers for benefiting from the economies of scale [e]	• Better information [d] • Availability of detailed customer information [e] • Analysis of customer behavior for managing the sales promotion [e]	• Performance improvement [a, e]
Strategic	• Build external linkages [a]	• Support business growth [a, c] • Build cost leadership [a] • Generate / sustain competitiveness [b]	• Support business alliance [a] • Enables worldwide expansion [b] • New sales channels [b, e] • Open up synergies via the bundling of procurement across the organization [e]	• Build business innovations [a] • Generate product differentiation [a, e]
Organizational	• Facilitate business learning [a] • Shift work focus to core work [b] • Improved internal communication [b] • User accountability [b]	• Standardization [b, c]	• Empowerment [a] • Build common visions [a] • Increase employee morale and satisfaction [b]	• Support organizational changes [a]
IT-infrastructure	• Increased IT infrastructure capability [a] • Increased ES availability [e] • Eliminate redundant data entry and concomitant errors an difficulty analyzing data [c, e] • Reduce software maintenance burden through outsourcing [c] • Functionalities for manufacturing [e]	• IT costs reduction [a, c]	• Increased user-friendliness [b]	• Build business flexibility for current and future changes [a, c] • Improve IT architecture [c] • Application integration [b, c]

a) Shang & Sheddon 2002
b) Eckarts et al. 2008 (excl. Shang & Sheddon)
c) Markus & Tanis 2000 (reasons / drivers)
d) Gattiker & Goodhue 2005
e) Schubert & Williams 2009

8.1.4   Balanced scorecard for benefits management in ES

Process

Benefit Class	Objectives	Measures	Requirements (changes)	Responsibility for realization	Time
Operational					
Managerial					
Strategic					
IT-infrastructure					
Organizational					

Innovation

Benefit Class	Objectives	Measures	Requirements (changes)	Responsibility for realization	Time
Operational					
Managerial					
Strategic					
IT-infrastructure					
Organizational					

Vision & Strategy

Financial

Benefit Class	Objectives	Measures	Requirements (changes)	Responsibility for realization	Time
Operational					
Managerial					
Strategic					
IT-infrastructure					
Organizational					

Supply Chain

Benefit Class	Objectives	Measures	Requirements (changes)	Responsibility for realization	Time
Operational					
Managerial					
Strategic					
IT-infrastructure					
Organizational					

8.2   Theoretical framework

8.3 Case study protocol

This case study protocol is based on the method described by Yin in 'Case study research: design and methods' (2003).

Overview

The purpose of this case study is to validate the theoretical constructs of benefits realization in ES implementations. In the problem definition of the research is assumed that organizations are not achieving enough benefits from their ES and the reason for this is that there are no guidelines for using benefits management and critical factors (CFs). With this case study the following proposition is validated:

Organizations can realize benefits from their ES, by using benefits management practices and managing critical factors during an ES implementation.

This is researched by answering the following questions:
- *Which critical factors are taken into account by organizations during the implementation of an ES?*
- *Which benefits management practices are used by organizations during an ES implementation?*
- *Which benefits have been realized with the ES implementation?*

Besides the main proposition, the cases are also used to validate the propositions of how the implementation drivers focus on desired benefits. Therefore, the following proposition is defined:

The driver of the implementation focuses which benefits are desired;
- *An IDR approach focuses on IT-infrastructure benefits.*
- *A PER approach focuses on benefits on all levels in process, financial and sometimes supply chain areas.*
- *A SRI approach focuses on benefits in all areas on the operational, managerial, strategic and partly organizational level.*

Although a driver focuses on a specific set of benefits, this does not necessarily exclude the appearance of desired benefits outside the focus area. From literature can be concluded that especially with ES implementations, a combination of benefits in different areas (thus drivers) is possible as well. However, this proposition predicts a relation between a certain driver and the desire for certain benefits.

This is represented by the research model in appendix 8.2.

This theoretical model represents the relationships between the variables as found in literature. These relationships can be explained as follows. In literature it is found that ES benefits can be realized through the use of benefits management in the implementation. However, an ES implementation is heavily influenced by ES critical factors, since these are responsible for ES implementation success. Nevertheless, ES critical factors can be combined with benefits management through the activities defined for benefits management. In each benefit management activity, critical factors can be found. This comparison is made in appendix 8.1.2. As a result this model assumes that for realizing benefits from an ES implementation, benefits management practices can be used that also encompass the critical factors which relevant with ES implementations.

Based on this research model, a benefit management in ES method is designed. This model will also be validated on applicability through another case study.

How the case studies exactly will be executed is discussed in the following sections.

Field procedure

This section will discuss how the data for the case studies are collected.

Access to key organizations

First an inventory of possible interesting cases is made by e-mailing KPMG advisors with the question if they had cases that deal with implementation of ES. As respond we collected seven possible interesting cases that are selected based on their ES and their implementation that is currently busy or recently implemented.

An overview of these cases can be found in Table 8 Case study results.

Procedure for assistance / guidance

From the colleagues that respond, project documentation like business cases, blue prints and other interesting documentation is collected. If the collected documents are not sufficient enough, KPMG advisors with experience in ES implementation are asked to validate the assumptions made in the thesis and the benefits management model for ES.

Schedule

June
- Collection of cases

July
- Documentation of cases is collected and reviewed
- Interviews with KPMG IT managers about the cases

August
- Final interviews with KPMG ES experts
- Review of cases and models

Unanticipated events

Because the case study is planned during the summer, a lot of possible interviewees can be on vacation. Therefore the main data for the case studies are the project documentation that is available within KPMG and interviews are spread across the summer.

Case study questions

The following questions are to be answered through the case study. Important to notice that these are not interview questions! The questions for the interviews are based on these questions to validate the correctness of the documentation or to suffice that data.

Questions	Source of evidence
1. What are the drivers for the ES implementation?	Initial project documentation (business case)
a. What kind of implementation is it according to Muntslag? (IDR / PER / SRI)	Initial project documentation (business case)
b. What kind of implementation is it according to Parr & Shank? (Physical, BPR, Technical scope, implementation strategy & resource allocation)	Project documentation (business case)
2. Which stages of the implementation is executed?	Project documentation (blue print)
3. Which CFs were there used? (implicit / explicit)	Project documentation (blue print)
4. What were the estimated benefits that validated the initial investment?	Business case (initial project documentation if there are more benefits identified)
a. How can these be structured in the ES benefits framework?	Business case (initial project documentation if there are more benefits identified)

5.	**How where these benefits** (according to Ashurst):	
	a. Identified	Business case (initial project documentation if there are more benefits identified)
	b. Planned	Project documentation (blue print)
	c. Realized	Project documentation
	d. Evaluated	Final project documents
	e. Exploited	Final project documents
6.	**Which (kinds of) benefits are realized?**	Final project documents / other

Besides these questions, a small introduction is given of the case. This includes a short description of the organization, situation, the ES and if the implementation was a success.

Interviews
Based on the data collected from the documentation, interviews will be held with KPMG project managers of the cases. Like said, the questions will be based on the results of the study of documentations and dependent on the person that is interviewed.

8.4 Online retailer case

8.4.1 Retailer ES benefits plan (questions)

Augustus, 2009

1. *Why do we want improvement with an ES?*

Meest belangrijke reden is het vervangen van de oude legacy systemen. Maar daarbij wil Wehkamp ook hun processen verbeteren. Daardoor is de focus op een IT driven replacement (IDR), maar ook deels PER.

2. *What improvement do we want / could we get?*

1. Minder afhankelijkheid kennis 55+ medewerkers met kennis
2. Reductie in FTE's (op IT gebied)
3. Ingewikkeld oude platform minder (waardoor ook minder onderhoudskosten)
4. Efficiëntie door betere inrichting van bedrijfsprocessen
5. Minder trainingskosten IT medewerkers door standaardisatie van pakket
6. Meer flexibiliteit in IT
7. Betere ondersteuning voor nieuwe business concepten
8. Mogelijk maken andere retailers te ondersteunen met een eigen webshop en logistieke dienstverlening
9. Centraal administratiepunt voor assortiment
10. Betere koppeling WMS / TRC (?)
11. Standaardisatie van IT infrastructuur

(See also Table 10 ES benefit framework online retailer on page 51)

3. *What are the benefits and where will each occur?*

Zie BCF. Opvallend is dat meeste tot nu toe geïdentificeerde baten op IT-infrastructure level zijn. Daarnaast geen managerial benefits en weinig op operationeel niveau. Dit kan komen omdat er vooral een 'high-level' gesprek was, en wel veel toekomst gerichte baten (innovatie) zijn genoemd.

Voor de baten die hierboven genoemd zijn, wordt er per benefit gekeken of deze (A) observeerbaar is, (B) meetbaar en of hier (C) een financiële waarde aangehangen kan worden.

1. A. ja, B. in aantal FTE's, C. Als bekend is hoeveel deze FTE's kosten, kan er een besparing per jaar worden berekend (let hier ook op evt. sociale kosten)
2. Zie hierboven
3. A. ja, B. ja, in kosten, C. kosten huidig onderhoud – kosten toekomstig onderhoud
4. A. ja, B. doorloop tijd / stappen van oud proces vergelijken met nieuw proces, C. kan, maar wordt erg lastig (bijv. Minder tijd, minder FTE's, maar FTE kan niet ontslagen worden)
5. A. ja, B. in aantal trainingen / kosten per training, C. kosten huidige training – kosten up-to-date training nieuw pakket
6. A. ja, B. lastig, gezien dit meer toekomst gericht is en niet bekend is hoeveel / welke aanpassingen en flexibiliteit pakket nodig heeft / bied, maar er kan wel gezegd worden dat huidig pakket makkelijker kan aansluiten
7. A. ja, B. alleen op basis van oude concepten die nu ingevoerd kunnen worden en voorheen niet, C. lastig gezien dit in de toekomst ligt
8. A. ja, B. lastig, mogelijkheid bestaat wel of niet, C. alleen als er een business case ligt voor webshop voor die tijd en eventueel nu, maar nu niet noodzakelijk / wenselijk (business case kost nu meer moeite dan wat het oplevert)
9. A. ja, B. 1 punt t.o.v. verschillende punten in legacy systemen, C. lastig, kan vergeleken worden met FTE's

10. A. ja, B. eventueel minder foutmeldingen (lastig voorheen te bepalen en afhankelijk niet alleen van ERP system) / 'betere' of snellere (up-to-date) informatie vanuit kern naar WMS / TRC
11. A. ja, B. obv aantal standaarden oud / nieuw, C. niet noodzakelijk (wordt al berekend in 3 en 5)

4. *What changes are needed?*

1. Nieuw platform (enabling), training (enabling) van IT medewerkers, kennis up-to-date houden van nieuw platform bij overige IT medewerkers (business)
2. Nieuw platform (enabling), migratie legacy systeem (enabling), herplaatsen van overbodige IT medewerkers (enabling), kennis van nieuw platform bij overige IT medewerkers (business)
3. Nieuw platform (enabling) die oude vervangt (enabling)
4. Nieuw business process (business) die oude vervangt (enabling), training medewerkers in nieuwe processen (enabling)
5. Nieuw platform (enabling), training nieuw platform IT medewerkers (enabling)
6. Nieuw platform (enabling) die flexibiliteit ondersteund
7. Standaard platform (enabling), nieuwe business concepten (business) (niet nu nodig)
8. Nieuw platform wat verschillende webshops ondersteunt (enabling), koppeling tussen webshop en platform (enabling)
9. Functionaliteit in Ax voor assortiment beheer (enabling), assortiment beheer in Ax invullen door desbetreffende personen (bij F&L en Hardware)(business)
10. Afstellen van platform met WMS / TRC bijv. door technologie daarvoor (enabling)
11. Nieuw platform (enabling) met een goede standaard, migratie legacy systemen (enabling)

Als men op deze manier naar changes kijkt, lijken de enabling changes / ES enablers voornamelijk op requirements voor het platform. Dit kan komen door de highlevel view en omdat de baten gebaseerd zijn op het feit dat er een nieuw platform komt door Ax.

5. *How and when can changes be made?*

Gezien dat de implementatie al even bezig is, is er al een bestaande planning voor de implementatie. Er schijnen verschillende planningen te bestaan, maar de data voor het plan zijn nu gebaseerd op het PID van Centric. Waarschijnlijk is deze al een keer geüpdate, dus zal deze nog worden aangepast.

Uit de vorige vraag kunnen we de volgende benodigde (enabling) veranderingen opmaken.

a. Nieuw platform (met bepaalde requirements), dmv implementatie Ax*
b. Training van IT medewerkers
c. Herorganisatie van 'overbodige' medewerkers
d. Training overige gebruikers nieuwe processen, dmv key-users en testen (o.a. assortimentsbeheer)
e. Koppeling tussen webshop / CRM (TRC) en Ax
f. Functionaliteit assortiment beheer, dmv inrichten Ax
g. Koppeling (afstelling / 'integratie') met WMS en Ax
h. Verwijderen overbodige legacy systemen

* De implementatie van Ax brengt een heleboel benodigdheden in de organisatie mee, zoals hardware ondersteuning, ondersteuning voor gebruikers en dergelijke (kritische factoren) Maar gezien de 'high level' view in deze baten realisatie plan wordt hier niet dieper op ingegaan.

Ook zijn de volgende business changes gedefinieerd die pas kunnen worden doorgevoerd (blijvend) na bepaalde enabling changes.

1. Kennis up-to-date houden IT-medewerkers (na a en b)
2. Kennis up-to-date houden van processen overige medwerkers (waaronder assortiments beheer) (na a en c)
3. Nieuwe business concepten introduceren (na a,b en c)

Precieze data kunnen worden gevonden in de balanced scorecard.

De meeste baten zullen ontstaan in volgende fases, wanneer het ERP systeem in gebruik is genomen en men aan de nieuwe situatie gewend raakt. Sommige baten kunnen eerder ontstaan, zoals de lagere gebruiks- en onderhoudskosten van de systemen wanneer de systemen zijn gemigreerd tov efficiëntere processen. Een precieze datum aan de baten kunnen gegeven worden wanneer deze worden geëvalueerd in de gewenningsperiode.

6. *Who will be affected?*

Direct getroffen door de implementatie van Ax zijn de volgende afdelingen:

- Winkel fashion & living
- Winkel hardware & operations (excl. DC's met eigen WMS en aansturing call center)
- Finance & ICT

Indirect getroffen door de implementatie van Ax door koppelingen met het systeem zijn:

- DC's met hun eigen WMS
- Web-ontwikkeling en onderhoud TRC op de afdeling Marketing
- Wehkamp Finance (Lacent)

7. *Who is responsible for the benefit its delivery?*

Op basis van hier bovenstaande was er al een project governance / besturing die in verband staan met de benodigde veranderingen en dus het realiseren van baten. Per bate wordt er in de balanced scorecard weer gegeven wat de rol van de persoon moet zijn die verantwoordelijk is voor het realiseren van verandering en dus de baten.

8. *Baten realisatie plan*

Zie appendix 8.4.2

Meeste veranderingen in dit plan staan al uitgebreid omschreven in het 'Plan van aanpak', beschreven door Centric. Dit kan verklaard worden omdat Wehkamp al uitgebreid bezig is met de implementatie.

Het grote verschil tussen de baten realisatie plan en het algemene plan van aanpak is dat in het plan van aanpak een koppeling mist met de baten, of de 'waarom' van de benodigde stappen. Het baten realisatie plan geeft hier inzicht in. Daarnaast geeft de baten realisatie plan een manier om bij te houden of een implementatie daadwerkelijk de voordelen geeft als beloofd en eventuele andere voordelen kunnen ook met dit plan worden bijgehouden. Dit is een kenmerk van de balanced scorecard dat een methode geeft om doelen te managen en in controle te houden.

Een baten realisatie plan moet dus goed afgestemd zijn op dergelijke 'plannen van aanpak' en ondersteunt het plan met de doelen van het implementatie project.

8.4.2   AX benefits realization plan

September 2009

Process

Benefit Class	Objectives	Measures	Action (critical factor)	Needs in ES / Organization	Responsibility for realization	Change date
Operational	Improved process	Cycle time reduction	Define new process (Ax)	Business blueprints (current / Ax)	team leaders / q-rol	8-14-2009
			Training employees	Training resources (working demo)	key-users / team leaders / Ax consultants	9-25-2009
Managerial						
Strategic						
Organizational						
IT-infrastructure	Central administration assortment	1 administration point (unlike 4 current)	Configuring assortment management functionality	Assortment management functionality	system integrator	8-28-2009
			Training users in functionality	Training resources (working demo)	key-users / team leaders Hardware, Fashion & Living / Ax consultants	9-25-2009

Financial

Benefit Class	Objectives	Measures	Action (critical factor)	Needs in ES / Organization	Responsibility for realization	Change date
Operational						
Managerial						
Strategic						
Organizational	FTE reduction	Less FTE	Implementation Ax[7]	Ax	System integrator / conversion team / migration and interfacing team / design team (IT department)	11-6-2009
			Migration legacy system	-		11-6-2009
			Ax Training IT-employees	Training		9-25-2009
	Less training IT-knowledge	Less training (costs)	same	same	same	same
IT-infrastructure	Less maintenance	Reduced maintenance (costs)	Implementation Ax[8]	Ax	System integrator / conversion team / migration and interfacing team / design team (IT department)	11-6-2009
			Migration legacy system	-		11-6-2009
			Ax training IT-employees	Training		9-25-2009

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[7] With this implementation other actions are involved. A deeper analysis is needed which actions are needed for benefits realization.

[8] Idem

Supply Chain

Benefit Class	Objectives	Measures	Action (critical factor)	Needs in ES / Organization	Responsibility for realization	Change date
Operational						
Managerial						
Strategic	Better support business alliances	Less 'effort' for supply chain integration with partners	Implementation Ax[9]	support interface with system (CRM / web shop) partner	system integrator	9-25-2009
			Business alliance opportunities	CRM / Web shop of alliance	Marketing' web design / Strategic alliances (F&L)	when needed (future)
Organizational						
IT-infrastructure	Better integration WMS / TRC	"Real time" available information about assortment	Implementation Ax[10]	support interface with system (WMS / TRC)	System integrator	9-25-2009

Innovation

Benefit Class	Objectives	Measures	Action (critical factor)	Needs in ES / Organization	Responsibility for realization	Change date
Operational						
Managerial						
Strategic	Better support new business concept	"Effort" of implementing concepts (before and after implementation)	Implementation Ax[11]	New business concept opportunities	MT / IT-department	11-6-2009
Organizational	Less dependency on knowledge employees	Amount of persons (internal / external) with knowledge about Ax (compared to legacy system)	Implementation Ax[12]	(Microsoft standard)	System integrator / IT director or manager (IT department)	11-6-2009
			Training IT-employees	Training resources	System integrator / IT director or manager (IT department)	25-9-2009
IT-infrastructure	More flexibility in IT-infrastructure	"Effort" to implement changes in IT-infrastructure	Implementation Ax[13]	(need for change in IT-infrastructure)	System integrator / IT director or manager (IT department)	11-6-2009
	Standardization of IT-infrastructure	Less different systems	Implementation Ax[14]	Ax	System integrator / IT director or manager (IT department)	11-6-2009
			Migration legacy systems	-		

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[9] With this implementation other actions are involved. A deeper analysis is needed which actions are needed for benefits realization.

[10] Idem

[11] With this implementation other actions are involved. A deeper analysis is needed which actions are needed for benefits realization.

[12] Idem

[13] Idem

[14] Idem

8.5 ES benefits realization plan – roadmap

ES benefits realization plan

	1. Identify strategic drivers	2. Analyze stakeholder expectations	3. Identify and define benefits	4. Gap analysis before / after	5. Plan benefits realization	6. Benefits governance framework*	7. Benefits driven risk assessment *
Objectives	•Clarify strategic business drivers of project	•"Bottom-up" analysis of stakeholders' requirement / benefits	•Review of step 1 and 2 to identify and agree on target benefits	•Define impact of benefits on organization in terms of needed changes and benefits owners	•Develop an overall plan to ensure benefit realization	•Addressing on how to bring together the project organization and line organization to realize the benefits	•Proactive approach to manage the risks with realizing benefits
Process (timing, actors)	•Initiating project •Project initiators, top management	•Initiating project, building business case •Stakeholders (representatives), project supporters, decision makers (and consultants)	•During business case analysis and after investment decision •Project supporters, top management (financial advisor, consultants)	•After package selection and business case approval •Stakeholder teamleaders, ES consultant	•Before starting implementation of the ES for use during implementation •Project manager, benefit (and change) owners	•While developing benefits and action plan •Project supporters, benefits owners, project manager and stakeholder representatives	•Finalizing benefits plan, before implementation •Objective quality and assurance advisor
Context	•Business plan and vision, top management support	•Management of expectations, resistance to change, consultant resources	•Business plan and vision, ES scope & radicalness, management of expectations	•Business process reengineering, fit with current business, package adaptation, organizational adaptation, cooperation, commitment, resistance to change	•Business plan and vision, project management, dedication of resources, performance and evaluation management	•Project management, communication, cooperation, dedicating resources	•All ES critical factors
Information	•(IT) strategy & players	•Organizational structure, value chain	•Step 1 and 2, players	•Step 2 and 3	•Step 1-4	•Benefits plan and project governance	•Benefit and action plan (project plan), key project players
Framework	•ES implementation drivers (IDR, PER, SRI)	•Stakeholder analysis part 1	•ES benefits framework	•Stakeholder analysis part 2	•ES Benefits BSC	•Project governance e.g. PRINCE2	•ES Critical factor list and risks assessment e.g. of PRINCE2
Output	•Strategic driver analysis	•Analysis of stakeholder expectations	•Benefits analysis in framework	•Benefits prioritization, stakeholder analysis (commitment plan)	•Benefits realization plan	•Governance framework and meeting schedule	•Risk assessment and action plan to deal with risks

8.5.1 Roadmap to ES benefits realization plan – questions

1. Identify strategic drivers

1. Why does the organization want to implement an ES?
2. What goal does the organization want to achieve by implementing the ES?
3. How can the implementation and use of the ES contribute to the strategy of the organization?

The answers to these questions can give an indication of the drivers and which benefits an organization wants to achieve with the implementation.

2. Analyze stakeholder expectations

1. Who is affected by the new ES?
2. How is this stakeholder affected by the ES?
   a. Directly since it is a user
   b. Indirect through benefits
   c. Indirect through….
3. What are the benefits for this stakeholder? E.g.
   a. Improved processes
   b. Improved usability
   c. Decreased costs
   d. …
4. What are the disbenefits for this stakeholder? E.g.
   a. Less dependencies (FTE reduction)
   b. More accountability
   c. Etc.
5. How much change is expected from the stakeholder to work with the new ES and realize benefits?

3. Identify and define benefits

To identify the desired benefits, the questions in Table 14 can be used. However, it is important that these benefits (objectives) are well defined, e.g. by the SMART-principle (after Doran, 1981; Ward & Daniel 2006). SMART objectives are mostly better to manage. To make sure the benefit is SMART defined, the following questions should be answered with each defined benefit:

1. (S – specific) Is the benefit defined specific in such a way that each stakeholder understands what is meant by the benefit?
2. (M - measurable) Can the benefit be measured? How?
   a. If so; can the benefit be quantified? How?
   b. If so; can a financial value be put on the benefit? How?
   c. If not; is it necessary that the benefit is realized?
3. (A - achievable) Is it realistic that the benefit can be achieved with the implementation of the ES?
4. (R - relevant) Does the benefit solve issues in the organization? Is the benefit therefore relevant or important?
5. (T – time bounded) When can be expected that the benefit is realized?

In regards to the benefits of the ES:

	Process	*Financial*	*Supply chain*	*Innovation*
Operational	**What operational processes can be improved?** E.g. • Cycle time reduction • Productivity improvement • New / improved processes • Fewer errors	**What financial improvements on operational level can be made?** E.g. • More sales • Less cost due to…. (fewer errors)	**What can be improved in the supply chain on operational level?** E.g. • Customer services improvement • Better (online) sales channel • Increased product availability • Improved traceability of products	**What operational innovations can be improved?** E.g. • Product quality improvement • Service quality improvement
Managerial	**What managerial processes can be improved?** E.g. • Improved decision-making • Improved planning • Coordination improvements	**What financial improvements can be made on managerial level?** E.g. • Better resource management • Streamline financial consolidations • Decrease cost pressure • Integration of suppliers for benefiting from the economies of scale	**What can be improved in the supply chain on managerial level?** E.g. • Better information of customers / suppliers • Availability of detailed customer / supplier information • Analysis of customer behavior for managing the sales promotion	**What managerial innovations can be improved?** E.g. • Performance improvement • Customer satisfaction
Strategic	**What strategic processes can be improved?** E.g. • Better support in building external linkages	**What financial improvements can be made on strategic level?** E.g. • Support business growth • Build cost leadership • Generate / sustain competitiveness	**What can be improved in the supply chain on strategic level?** E.g. • Support business alliance • Enabling worldwide expansion • Support sales channels • Open up synergies via the bundling of procurement	**What strategic innovations can be improved?** E.g. • Build business innovations • Generate product differentiation • Support in new business concepts and models
Organizational	**What organizational processes can be improved?** E.g. • Facilitating business learning • More focus on core work • Improving internal communication • Increased user accountability • More flexibility in HR processes	**What financial improvements can be made on organizational level?** E.g. • Transparency in (human resources) costs • FTE reduction • Less training costs	**What can be improved in the supply chain on organizational level?** E.g. • Empowerment of customers / suppliers • Build common visions • Increasing morale and satisfaction	**What organizational innovations can be improved?** E.g. • Supporting organizational changes • Less dependency on employee knowledge
IT-infrastructure	**What operational processes can be improved?** E.g. • Increased IT infrastructure capability • Increased ES availability • Eliminate redundant data entry, difficulty analyzing data • Reduce software maintenance burden through outsourcing • Functionalities for manufacturing	**What financial improvements can be made on IT level?** E.g. • IT costs reduction (less maintenance costs)	**What can be improved in the supply chain on IT level?** E.g. • Increased user-friendliness • Better integration with other packages	**What IT innovations can be improved?** E.g. • Build business flexibility for current and future changes • Improve IT architecture • Application integration

Table 14 ES benefits framework with questions and examples

Suggestion: for easier use in the following steps, give the benefits codes, like the first **or**ganizational **p**rocess benefit OrP1.

4. *Gap analysis before / desired after ES implementation*

For each benefit identified on each level:

1. How important is it to reach the benefit? (Prioritization of benefits) (E.g. scale 1-5 of importance)
2. Where is the benefit realized in the organization? (department / unit)[15]
3. Who (stakeholder) will be affected by the benefit?
   - Is it a benefit or disbenefit for that stakeholder?
4. How can the benefit be realized? / Which changes (enabling / business) are needed for realization? E.g.
   - What resources (functionalities) are needed in the system?
   - What job description goes with the improvement?
   - What skills are needed for working in the new situation?
   - What should change to transform the 'old' process to the new situation?

For each stakeholder for the stakeholder analysis:

5. How is the stakeholder affected by the changes?
   - Could the stakeholder have resistance to the change? Why?
   - What is current commitment of the stakeholder towards the benefit and needed changes? (Anti, None, they allow it to happen, help it happen or make it happen).
   - What should be the commitment of the stakeholder to realize the benefit? (Anti, None, they allow it to happen, help it happen or make it happen).
   - If the current commitment is not the same as the required commitment, how can the stakeholder be motivated to the required commitment?
6. Who is responsible for each change?
7. Who is responsible for the delivery of the benefit? (Who is the benefit owner?)
8. When can the benefit be expected?

Suggestion 1: As overview of the answers on the first four questions is advised to put this in a comparison table with codes that are easily found in the benefits framework and later on the stakeholder analysis and benefits plan.

Suggestion 2: Give changes a code for change management and when desired also analyze the stakeholders of the changes and their roles.

5. *Plan benefits realization*

Answers from the previous steps can be used to fill in the ES benefits realization plan. For agreement and validation, the following questions can be asked:

1. Is the benefit owner aware of its responsibility to realize the benefit?
2. Are there changes missing for realizing benefits?
3. Is the right person responsible for the realization and change?
4. Is the expected time for realization of the benefit correct?

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[15] The impact on the organization can partly be found in the ES benefit framework. However, this gives an indication and a precise location (e.g. department or unit) makes the realization of the benefit more specific.

6. Design a framework for

1. Which form of communication is most preferred and feasible to bring together the project manager, benefit and change owners to discuss the progress of realizing the needed changes and benefits?
     a. E.g. meetings, mailings, presentations, flyers, etc.
2. When should there be meetings or communication moments?

7. Benefits driven risk assessment

The risks for benefits realization in an ES implementation are listed below;

Level	Is this critical factor taken into account?	How? (Examples!)[16]	Where to find? (Examples!)[17]
1. Operational	1.1 Business process reengineering	Defined current and new processes	Action or benefits plan
	1.2 Training	Training dates set, resources set	Action plan, business case
	1.3 Dedicating resources	Resources set (human / financial)	Governance, action and benefits plan, business case
	1.4 User support	Resources set, 'super-users'	Action plan / benefits plan, other support documentation, business case
2. Managerial	2.1 Top management support	Part of project governance, decision structure	Governance, benefits plan
	2.2 Project management	Project governance	Governance, organization, action plan
	2.3 Communication	Meetings, mailings	Action plan, schedules, benefits plan
	2.4 Consultant resources	Support in planning and implementation steps	Action plan, business case
	2.5 Performance & Evaluation management	Reviewing action and benefits plan	Scheduled, action and benefits plan
3. Strategic	3.1 Business plan & vision	(IT) strategy reflected in the business case (/ benefits plan)	Business case, benefits plan
	3.2 Fit with current business	Assessment of different ES compared to the current business, amount of needed changes	Business case, action and benefits plan
	3.3 ES scope	Which part of the organizations are affected by the ES	Business case, governance, benefits and action plan
	3.4 ES radicalness	Assessment of different ES compared to the current business, amount of needed changes	Business case, action and benefits plan
4. Organizational	4.1 Organizational adaptation	Identified changes and ways to implement these changes	Benefits and action plan
	4.2 Resistance to change	Stakeholder analysis and the (current) resistance and commitment of the stakeholders	Stakeholder analysis (part of benefits and action plan)
	4.3 Management of expectations	Log of stakeholder requirements (desires) / management desires and regular meetings on benefit	Benefits plan, project schedule

[16] Based on case experiences, could be different depending on organization and project
[17] Idem

		realization	
	4.4 Cooperation	Governance, responsibilities, meetings, training with stakeholders	Project plan
5. IT-infrastructure	5.1 Data analysis	Comparing current data and how to transform this to new ES	Project plan (implementation / action)
	5.2 Defining the architecture	A (detailed) description / model of the new architecture	Business case, IT-architecture
	5.3 Vendor support	Support of ES vendor during and after the implementation	Agreement between vendor and organization
	5.4 Package adaptation	List of changes / configuration needed in the ES	Change log, action plan (benefits plan)

Table 15 ES Critical factor risk assessment

Besides assessing Table 15 ES Critical factor risk assessment, for each benefit in the benefit plan:

1. How realistic is it that this benefit will be realized?
   a. Is it necessary that the benefit is realized?
2. Is each change critical for realization of the benefit?
3. Are the changes defined in the benefit plan enough to realize the benefit?
   a. If not, which changes are missing? Do these come back in the action plan?
   b. Are these changes critical?
4. Does the action plan suffice the requirements to enable realization of the benefits?
   a. What does the action plan lack in changes needed for benefit realization?
   b. Is this change in the action plan critical for realization of the benefit?

8.5.2   Online retailer roadmap example

These steps for developing an ES benefits are explained by an example based on the case study of the online retailer.[18] Although the information in that case was originally not gathered through these steps, this case is still a good example on how to ideally develop an ES benefits realization plan.

1.   *Identify strategic drivers*

In the case of the online retailer, the driver of the implementation is to replace the legacy systems since these will not be supported anymore soon. This implementation is initiated by the IT-department, however, these systems also affect the business model and strategy. The online retailer strategy is to be Holland's biggest online retailer, with a modular organization setup, thus had different systems. However, to grow with new business models and strategies the old IT architecture could not support this. Thus top management supported the implementation of an ES as well.

2.   *Analyze stakeholder expectations*

Table 16 represents the stakeholders of the online retailer, how they are affected by the ES, examples of benefits they see in the ES, some disbenefits and some needed changes to be expected. However, since this is only a quick review of the stakeholders, the (dis)benefits and changes are not complete yet.

Stakeholders	Relation with ES	Benefits	Disbenefits	Changes
Management	(in)direct	Transparency in systems, better support business concepts, decrease in costs	investment in ES	
ICT (department)	direct	Less effort in maintenance, better IT architecture	ICT FTE reduction	new skills needed
Website management	indirect	Up-to-date assortment information		
Finance	direct	Transparency in costs		new skills needed
Fashion and living store	direct	Less effort in maintenance assortment	Loosing specific systems	new skills needed
Hardware and operations store	direct	Less effort in maintenance assortment	Loosing specific systems	new skills needed
Distribution centers (DC's)	indirect	Better connection with shop		
Customers	indirect	Up-to-date assortment information		
Human Resource Management (HRM)	indirect	Less dependency on ICT knowledge of some employees		
Strategic alliances	Indirect	Partner in delivering a webshop		

Table 16

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[18] The online retailer is an example; some information used here is fiction since the information gather through the online retailer case study is not sufficient enough to apply for this roadmap.

Based on this information, the stakeholders and their role can be represented as follows:

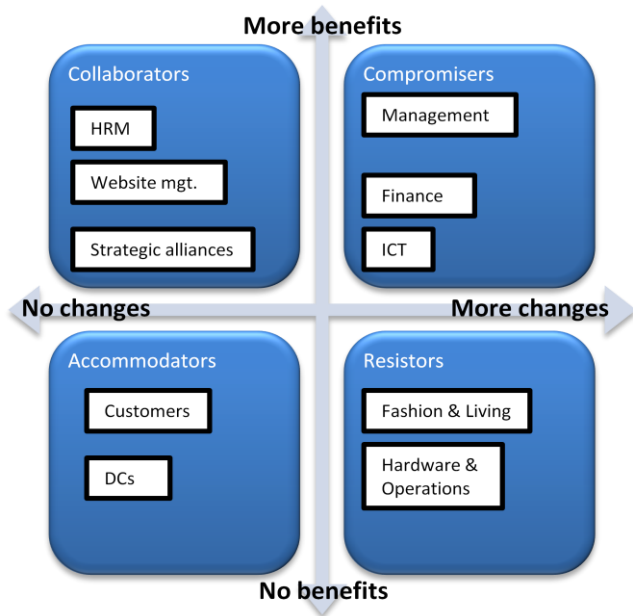

Figure 22 Stakeholder analysis 1 online retailer

3. Identify and define benefits

For the online retailer some following benefits were identified, depending on the vision and plan for the project more or less benefits can be identified:

	Process	Financial	Supply chain	Innovation
Operational benefits	▪ Cycle time to add and update product information in needed systems reduced to one hour a month after implementation ES (OpP1)		▪ Stock information from DC available in ES, thus for webshop a month after implementation ES (OpSC1)	
Managerial benefits	▪ Product information responsibility relies only with the shops a month after implementation ES (MP1)		▪ 80% less errors in product information two months after implementation ES (MSC1)	
Strategic benefits		▪ 30% less costs implementing new alliances when there is an opportunity (SF1) ▪ 20% less costs implementing new business concept when there is an opportunity (SF2)	▪ (New) Business alliances can use our ES and distribution with own webshop when they demand this (SSC1)	▪ When opportunity arises, new business concepts are easier to implement, reduced effort e.g. to six months (SI1)
Organizational benefits	▪ Knowledge of legacy systems not needed anymore an half year after migration of the systems (OrP1)	▪ 30% IT FTE reductions one year after implementation (OrF1) ▪ 15% less (IT) training costs one year after implementation (OrF2) ▪ 10% FTE reduction in shops one year after implementation (OrF3)	▪ Increased user-friendliness 6 months after implementation ES (OrSC1)	
IT-infrastructure	▪ One central assortment administration after migration of legacy systems (ITP1) ▪ 15 less legacy systems to maintain after migration (ITP2)	▪ 25% less maintenance costs after migration of legacy systems (ITF1)	▪ 99% uptime connection with WMS and TRC systems three months after implementation ES (ITSC1)	▪ When opportunity arises, less effort to implement new technologies (ITI1) ▪ Less need for coming 10 years to renew the system (ITI2)

Table 17

4. *Establish benefits / organization interactions*

The first four questions, the benefit / organization interactions, can be summarized in the following table:

Ben. Code	Priority (1-4)	Benefit Stakeholder(s)	Needed changes	Change code	Change stakeholders
OpP1	2	Stores, website, customer	Define new processes, train employees in new process	C1,C2	Store leaders
OpSC1	3	Stores, website, customer, DCs	(Real-time) integration with WMS / TRC, up-to-date info of WMS	C3, C4	Sys int. / ICT, DC
MP1	3	Stores, website, management, HRM	Define responsibility and tasks for product information management, train employee in task	C5, C6	Store leaders, HRM
MSC1	3	Stores, website, customer	Define responsibility and tasks for product information management, train employee in task	C5, C6	Store leaders, HRM
SF1	2	Management, ICT, stategic alliance	(New) strategic alliance, skills to integrate needs of alliance	C7, C8	Management, strategic alliance, ICT
SF2	2	Management, ICT	Opportunity for new business concept, skills to implement business concept	C9, C10	Management, ICT
SSC1	2	Management, ICT, stategic alliance	Opportunity for (new) alliance, integration (when needed) between system alliance and ES	C7, C8	Management, strategic alliance, ICT
SI1	2	Management, ICT, customer	Opportunity for new business concept, skills to implement business concept	C9, C10	Management, ICT
OrP1	1	HRM, ICT	Migration of systems (SysInt), dismiss legacy systems, define new needed knowledge and skills ICT, train or recruit employees with new needed knowledge	C11, C12, C13	Sys int. / ICT, management, HRM
OrF1	2	Management, ICT, finance	Dismiss IT employees	C14	HRM, management, ICT
OrF2	1	HRM, management, ICT, finance	Define new needed trainings and dismiss old trainings, recruit employees with required knowledge	C15, C13	HRM, management, ICT
OrF3	2	Management, shops	Define new job descriptions, tasks and processes for shops, dismiss store employees	C16, C17	HRM, ICT
OrSC1	4	Stores, ICT, finance	Implementation of ES, gather user opinions on ES	C18, C19	Sys int. (action plan), HRM, ICT
ITP1	2	Stores, ICT, website	Migrate and dismiss legacy systems, data analysis to copy data from one to another system (Sys Int)	C11, C20	Sys int. (action plan), ICT
ITP2	1	ICT	Migrate and dismiss legacy systems	C11	Sys int. (action plan), ICT
ITF1	1	Finance, ICT	Maintain new system more efficient, new maintenance skills	C22, C23	ICT
ITSC1	3	DC's, shops, website	"Integrate" WMS and TRC with ES	C3	Sys int. / ICT
ITI1	2	Management, ICT	Standard system / architecture, new (interesting) technologies, skills to implement technologies	C26, C24, C25	ICT, management
ITI2	2	Management, ICT	Standard system with up-to-date and standard technology	C26	Sys int. / ICT

Sys int. stands for System integrator. Although this player is not part of the stakeholder analysis, it has its responsibilities for changes in the ES and therefore named in this table. In step 5 this player has a role in the benefit governance, although it is not a benefit stakeholder of the project.

Table 18 represents the second part of the stakeholder analysis and their interactions with the benefits, needed changes, and perceived resistance. In this table not all benefits for the stakeholders are represented, to make this example not to large. It is an advice that with important stakeholders with many different benefits and changes, make their own stakeholder scheme.

Stakeholder group	Benefits perceived (disbenefits)	Changes needed	Perceived resistance	Commitment (Current & Required)*				
				Anti	None	Allow it to happen	Help it happen	Make it happen
Management	SI1, implementing business concepts	C9 a new business concept	*none*		C		R	
	OrF1, IT FTE reduction	C14 dismiss IT employees	*none*					CR
ICT (dept)	ITP2, less legacy systems maintenance	C21 migrate and dismiss legacy systems	*none*			C		R
	(OrF1) IT FTE reduction	C14 dismiss IT employees	Dismissal resistance	C		R		
Website management	ITP1, central product information	C27 dismiss product information responsibility from webmanagement	doubts about quality of product information from stores	C		R		
Finance	OrF2, training cost reduction	C15 define new trainings, dismiss old	*none*		CR			
Fashion and living store Hardware and operations store	OrSC1, user-friendliness	C19 gather user opinions on ES	*none*			C	R	
	MP1, product information relies only in stores	C5 define responsibility and tasks for product information	resistance to change tasks and responsibility		C			R
	(OrF3) FTE reduction in stores	C17 dismiss employees in stores	resistance against dismissal	C		R		
Distribution centers	ITSC1, reliable connection with WMS	*None*	*none*			CR		
Customers	MSC1, less errors product information	*None*	*none*		CR			
Human Resource Management	OrP1, employee flexibility IT	C13 train or recruit employees with new knowledge	*none*			C		R
Strategic alliances	SSC1, own webshop support	*(C7 new strategic alliance)*	*none*		C		R	

Table 18

5. *Benefits realization plan*

The results of the previous steps can be combined to the following benefits realization plan per organizational perspective like the balanced scorecard.

Process benefit perspective

Process Benefit Level	Benefit objectives	Measure(s)	Changes ES / Organization	Responsibility for realization (benefit owner)	Expected moment of realization
Operational	OpP1 Improved product information process	Cycle time reduced to one hour	C1 Define new process, C2 Train employees in new process	Managers from the stores	1 month after implementation
Managerial	MP1 Responsibility product information only in stores	No other units can update product information	C5 Define new responsibilities, C6 Train employees in new task	Managers from the stores	1 month after implementation
Strategic					
Organizational	OrP1 No knowledge legacy systems needed	List of skills and knowledge needed for maintenance systems	C11 Migration of systems, C12 Define new ICT skills, C13 Train ICT employees new skills	ICT department leader	6 months after implementation
IT-infrastructure	ITP1 1 Administration point assortment information	1 Administration point unlike 4 current	C11 Migration of systems, C20 Data analysis and transport	ICT department leader	Direct after migration and dismissal legacy systems and implementation ES
	ITP2 Less maintenance legacy systems	15 Less legacy systems	C11 Migration of systems	ICT department leader	After migration and dismissal legacy systems

Financial perspective

Financial Benefit Level	Benefit objectives	Measure(s)	Changes ES / Organization	Responsibility for realization (benefit owner)	Expected moment of realization
Operational					
Managerial					
Strategic	SF1 Cost reduction implementing new alliance	30% less costs	C7 (new) alliances, C8 skills to integrate with alliance	Top management	*When opportunity arises*
	SF2 Cost reduction implementing new business concept	20% less costs	C9 New business concept, C10 skills to implement concept	Top management	*When opportunity arises*
Organizational	OrF1 IT FTE reduction	30% less costs	C14 Dismiss IT employees	Top management	1 year after implementation
	OrF2 Cost reduction (IT) training	15% less costs	C15 Define new needed trainings, dismiss old, C13 train employees with new knowledge	HRM	1 year after implementation
	OrF3 Stores FTE reduction	10% less costs	C16 define new job description stores, C17 dismiss store employees	Top management	1 year after implementation
IT-infrastructure	ITF1 Maintenance costs reduction	25% less costs	C22 Maintain new systems more efficient, C23 new maintenance skills	ICT	1 year after migration

Supply Chain benefits perspective

Supply Chain Benefit Level	Benefit objectives	Measure(s)	Changes ES / Organization	Responsibility for realization (benefit owner)	Expected moment of realization
Operational	OpSC1 Stock information from DC available	Availability information in ES	C3 Integration with WMS, C4 up-to-date info from WMS	Managers from the stores	1 month after implementation
Managerial	MSC1 Correct product information	80% less errors than current (first / updated) information	C5 Define new responsibilities, C6 Train employees in new task	Managers from the stores	1 month after implementation
Strategic	SSC1 Alliances webshop integration	Option to (easily) integrate webshop alliance with ES	C7 (new) alliance, C8 skills to implement integration	Top management	*When opportunity for alliances rises*
Organizational	OrSC1 User friendliness	Increased positive opinion of users from ES	C18 ES implementation*, C19 Measuring user opinions	HRM	6 months after implementation
IT-infrastructure	ITSC1 Reliable connection with WMS	99% uptime of connection	C3 Integration with WMS	ICT / Managers from the stores	3 months after implementation

Innovation benefits perspective

Innovation Benefit Level	Benefit objectives	Measure(s)	Changes ES / Organization	Responsibility for realization (benefit owner)	Expected moment of realization
Operational					
Managerial					
Strategic	SI1 Easier to implement business concepts	15% less effort (resources like time, money and labour)	C9 New business concept, C10 skills to implement business concept	Top management	*When opportunity arises*
Organizational					
IT-infrastructure	ITI1 Easier to implement new technologies	25% less effort (resources like time, money and labour)	C26 Standard system, C25 skills to implement technologies, C24 new technologies	ICT leader	*When opportunity arises*
	ITI2 Less need for new ES	10 years without need new ES	C26 Standard system	ICT leader	10 years after implementation

6. *Design a framework for benefit governance*

Based on the original project governance, the benefit owners are added to the structure (Figure 23). In this structure the groups on the left is the project organization and to the right are from the line organization. However, the steer group only exists of members from the line-organization.
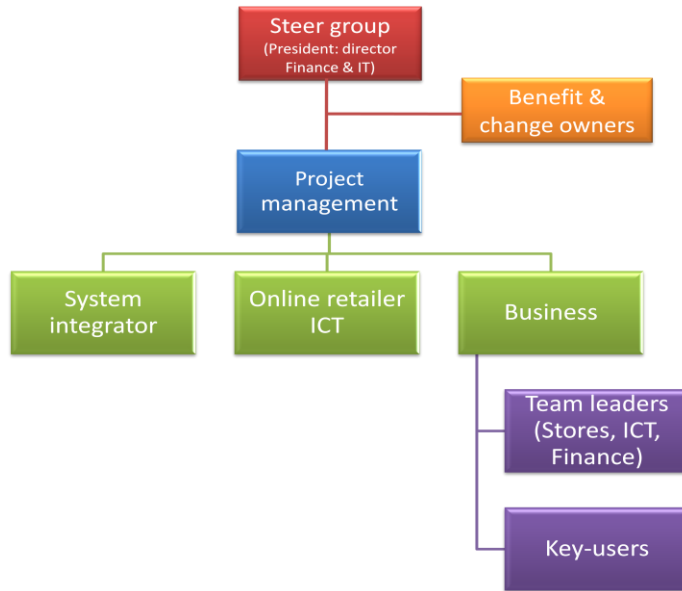

Figure 23 Benefit governance structure

Each green group has their own operational regular meetings. Meetings to align agree or solve problems of the project are every three weeks between team leaders as business representatives and benefit owners, ICT department as benefit owners too and the system integrator, who together form the project management. However, with big issues or decisions and go/no-go meetings, the steer group is present as well to secure their benefits. The steer group is updated every three weeks with the project progress. A month, three months, six months and a year after the implementation the benefits owners and steer group meet for updates on the benefits realization.

7. *Benefits driven risk assessment*

In this example is assumed that the benefits which are identified are realistic and necessary and that the changes and action plan are good enough to realize the estimated benefits. The assessment of the critical factors is as follows:

Level	Is this critical factor taken into account?		How?	Where found?
1. Operational	1.1 Business process reengineering	~	Not yet clear process descriptions, key-users are asked to help define	Benefits plan, action plan
	1.2 Training	+	Training dates set, resources set	Action plan
	1.3 Dedicating resources	+	Resources set (human / financial)	Governance, action plan
	1.4 User support	?	User support after implementation not known yet	
2. Managerial	2.1 Top management support	+	Top management is benefit owner and part of steering group.	Benefits plan
	2.2 Project management	+	Project governance, tight planning, use of PRINCE2	Governance, organization, action plan
	2.3 Communication	+	Communication plan available	Communication plan
	2.4 Consultant resources	+	Consultants used for implementation and independent for quality and assurance	Business case
	2.5 Performance & Evaluation management	+ / ?	Reviewing action and benefits plan planned	Project plan
3. Strategic	3.1 Business plan & vision	+	(IT) strategy reflected in the implementation driver and benefits plan	Benefits plan
	3.2 Fit with current business	+	Assessment of different ES compared to the current business, amount of needed changes in step 4	Business case, action and benefits plan
	3.3 ES scope	+	Defined by the changes that mostly affects central processes, not marketing or distribution	Governance, benefits and action plan
	3.4 ES radicalness	+	Assessment of different ES compared to the current business, amount of needed changes	Business case, action and benefits plan
4. Organizational	4.1 Organizational adaptation	+	Identified changes and ways to implement these changes	Benefits and action plan
	4.2 Resistance to change	+	Stakeholder analysis and the (current) resistance and commitment of the stakeholders	Stakeholder analysis (part of benefits and action plan)
	4.3 Management of expectations	+	Log of stakeholder requirements (desires) / management desires and regular meetings on benefit realization	Benefits plan, project schedule
	4.4 Cooperation	+	Governance, responsibilities, meetings, training with stakeholders and their commitment is taken into consideration	Project plan, stakeholder analysis
5. IT-infrastructure	5.1 Data analysis	+	During tests current data is analyzed on how to convert this to the new ES	Project plan
	5.2 Defining the architecture	~	Only a description of the current architecture, new architecture with remaining systems unknown	IT-architecture
	5.3 Vendor support	+	Support of ES vendor during and after the implementation	Agreement between vendor and organization
	5.4 Package adaptation	+	As less as possible adaptation of the package, although due to the specific needs of the webshop some adaptation needed	Action plan

Due to the use of this roadmap, most critical factors for implementation and realization of benefits are considered, but still need to be taken into account during the implementation. The factors of business process engineering and defining the architecture need to be considered before implementation. User support and review and evaluation can also be taken into account during the implementation, but should not be forgotten!