ES Implementations in Cross-Organizational Settings: How Should the Business Cases Look Like?

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Abstract. This paper describes my PhD research on the development of realistic and innovative business case guidelines that can be used for complex information system implementations, such as cross-organizational ES implementations. I identify problems and solutions related to the issue of assessing the benefits of such complex implementations. Based on a structured literature review, a multidimensional benefit framework was developed. This is used as input into the ES business case guideline development process.

1 Introduction

A Business Case (BC) is a structured proposal for business change that is justified in terms of costs and benefits [1]. The BC should ensure that, whenever resources are consumed, they are supporting the business. This applies in particular to business changes initiated during the implementation of large enterprise systems (ES). Thus, the BC should be reviewed at various stages during the ES lifecycle. Literature indicates that in most information system (IS) implementation, BC's are solely used to obtain funding approval for the huge financial investment and not to actively manage the project [1, 2]. Further, traditional BC's are often only based on financial benefits and costs, and thus, ignore non-financial benefits. Having this in mind, it is not surprising that many companies (65 % as per the survey by Ward et al. [3]) are not satisfied with the BC's they make and the ability of these cases to help to identify benefits during the implementation process. We argue that specifying benefits, related agreements (e.g. ownership) and actions (e.g. organizational change) in the BC is important for the success of every IS implementation. If an ES adopter could get clarity on the ES benefits and costs early in the project, then the adopter should be able to manage those benefits and costs by making informed decisions on how to steer the project to become a success. Thus, a more comprehensive BC is needed, one which (i) treats costs and benefits as equally important, (ii) is updated throughout the ES life cycle, and (iii) provides IT managers with robust guidelines. It is further

important to decide at each stage of the implementation whether or not to proceed with the ES solution. In this PhD research project, we use literature survey methods and explorative case study research methods to analyze the problems experienced in the current ES BC development practice. Based on this analysis, we aim at developing BC guidelines that consider the costs of realizing benefits and help to i) accurately determine the financial value of an ES implementation in terms of costs and benefits, and ii) actually achieve the desired benefits within time and budget. In the next sections, we first sketch the problem and present the research questions we plan to approach (Sect. 2.). We discuss the context (Sect. 3), our research methodology (Sect. 4) and our first solution proposal (Sect. 5).

2 The Problem

Business scholars [1, 4-6] have proposed a variety of approaches to analyze different types of ES benefits. However, relatively little research has been done on creating a complete benefit framework which could be used for the development of a successful ES BC. A BC, which includes such a benefit framework, would provide guidelines on how business change and ES implementations can be combined in such a way that each of the intended benefits is delivered. Developing guidelines for such a BC is crucial as more than 70% of ES implementations fail to achieve their estimated benefits [7, 8]. An accepted diagnosis is that many benefits stay unrealized as necessary organizational change and its management are often neglected in the ES implementation process [9]. Further, we indicate that ES adopters have an incomplete model of intended benefits [3]. Our findings from a first set of expert interviews show that whether or not a BC is perceived useful depends on the BC characteristics. In reality BC's are often only used for project approval and thus only the management summary of a BC is read. Further, the link between costs and benefits is often not discussed in the BC, so if e.g. the realization of some benefits results in an increase in costs is often not taken into account. Clearly determining all potential benefits to be derived from an ES implementation is a challenging task, as most benefits are not derived from the system itself but from the way an ES adopting organization implements and uses the system, which can vary broadly. While this is true for any type of IS implementation, it is a particularly burning issue for cross-organizational (X-organizational) ES implementations. Such systems deal not only with the processes within one company, but with the automation of process work flows and data control flows between multiple companies in a value web. Next to the problem of cost and benefit identification the issue of value distribution in X-organizational will be subject of my PhD research.

2.1. Research Questions

Following the findings we presented in the above discussion, our motivation is to develop complete, innovative and easy to use BC guidelines that help to successfully implement X-organizational ES, which are able to handle the complexity of such settings. Therefore, our research questions for this PhD project are presented below.

The nested structure of our top-level design question is analyzed using the research framework of Wieringa [17]. Several practical (P) and knowledge (K) questions, related to the different parts of a BC, are specified:

RQ1: P: Design business case guidelines that help to manage a successful X-organizational enterprise system implementation.
- RQ1.1: K: Design a comprehensive benefit model.
  - K: Which benefit models exist?
  - K: Integrate, improve and customize those models to ES.
  - K: How do companies ensure that their planned benefits get realized?
  - K: How early in the implementation process do they do this?
  - K: How and when in the implementation cycle do companies know that their benefits have been realized?
- RQ1.2: K: Design a cost model.
  - K: Which cost models exist and are relevant for our research?
  - K: Integrate, improve and customize those models to ES.
- RQ1.3: K: Find relationships between benefits and costs.
  - K: Which benefits, in the benefit model, are dependent on organizational change and therefore result in additional costs?
- RQ1.4: P: Design a way to allocate costs and benefits to partners in a network in an economically sustainable way.

3 Theoretical Context

Because this research is interdisciplinary in nature, it is closely related to a number of subject areas – strategic IS's, X-organizational IS's, IT benefits realization, business networks, gain and cost sharing models, each of which is potentially in understanding the concepts associated with our research questions. In particular, for the first stage of our research, we chose to review literature on X-organizational ES, on classifications of IT benefits and on value distribution in business networks. This section introduces these concepts and provides references for background information on them.

3.1. Cross-Organizational ES

ES are packaged computer applications that support most of a company's information needs within and across functional areas in an organization. ES provide the foundation for a wide range of e-commerce based business models [11]. Implementing an ES results in the following life cycle management challenges:
- The need for business process as well as people change;
- The length of the benefit payback period makes the management and assessment of the ES very challenging [4];
- Comprehensive functionality, makes the software very complex and complicated [12, 13] but also more rewarding [14].

Research by Gable et al. [15] showed that existing models of IS success may not be entirely appropriate measuring ES success. In our research we will adopt some IS models, such as the one by Ward et al. [16] to an ES setting. In our definition, ES include enterprise resource planning (ERP) software and such related packages as customer relationship management (CRM) [17, 18].

Going one step further in level of complexity, our research is focusing on X-organizational, also referred to as inter-organizational [19], ES implementations that deal with the automation of process work flows and data control flows between multiple companies in a value web. In this proposal we call a X-organizational ES to have the following contingent properties:

- Focus on linking the enterprise to their customers, e.g. CRM and vendors, e.g. supply chain management (SCM) [19, 20];
- Offers solutions to all sectors [19];
- Having a web-based open architecture [19];
- Evolves during multiple upgrades of existing ES;
- Being dominated by different priorities and interests of the stakeholders in the different companies, which make coordination very difficult;
- Do not have an identified owner at X-organizational system level, as the system is shared.

We will provide first steps and guidelines for successfully implementing such complicated system later in this paper.

3.2. IT Benefit Classifications

Davenport [14] and Gattiker et al. [21] were among the first who first initiated studies on the classification of ES implementation benefits. They grouped the benefits into four categories: (1) the improvement of information flow across sub-units, (2) administrative savings through centralization of activities, (3) reductions in IS maintenance costs and (4) an increase in the ability to deploy new IS functionality, such as the possibility to move away from inefficient business process towards accepted best practice business processes. Based on this ground work more detailed classifications schemes which also provide first guidelines for managers to achieve those benefits were developed. An example is given in [22] who propose an ES benefits framework based on five benefit dimensions: operational, managerial, strategic, IT-infrastructure and organizational. The first three categories can be traced back to the classic work of Antony [23].

Because some ES benefits are more likely to arise early in the life cycle and others later or even are completely absent initially [9], it is useful to include the benefit time frame in an ES benefit framework. Our observation from the reviewed literature is, however, that very few authors recognize this time-dependency of ES benefits. Shang et al. [22] are among those few who approached this explicitly, namely in their research on patterns of perceived net benefit development. They show how different benefits vary during the system stages. They do not directly link the benefits to their position in the overall ES implementation life cycle of the company, meaning when exactly they are perceived to happen. However, they describe the development of a benefit from the moment onwards that the company experiences it.

Investments into large-scale systems as ES are very expensive and require justification in terms of returns and benefits. However, many of the benefits are intangible which makes it difficult to quantify all benefits from an ES project in monetary terms. For the purpose of this research, we use the definition of 'intangible benefit' given by the International Accounting Standards (IAS): "an intangible asset is an identifiable non-monetary asset without physical substance" [24]. Determining the intangible benefits derived from IS implementation has been a goal for many scholars since more than twenty years [25].

As intangible benefits are very difficult to measure and manage in practice, several researchers focused on the development of classifications which translate intangible benefits into measurable concepts. For example, Ward et al. [3] propose a framework which uses the degree of explicitness of benefits to identify financial, quantifiable, measurable and observable benefits ranging from high to low degree of explicitness, respectively. Explicitness is defined as the degree of how much is already known or can be determined about the benefit prior to the investment.

3.3. Value Distribution in Business Networks

We define a business network as a value web of profit-and loss responsible units which cooperate for some purpose. Businesses in the network typically cooperate to satisfy a consumer need, and they cooperate by means of commercial value exchanges, in which goods, services or money are exchanged. These exchanges should take place according to a revenue sharing model, which the partners in a value web usually negotiate and agree upon prior to designing their coordination processes and building their coordination support systems. Such a revenue sharing model can be specified by means of the e3value method. Existing VITAL research and literature on e3value emphasize the importance of revenue sharing models (as this is the very reason that sticks the cooperating partners together). However, it gives very little indication on how partners select, negotiate, and ultimately agree on the design elements of their revenue-sharing models.

4 Research Plan and Methods

The present PhD research forms the COSMOS project [26] and a part of the VITAL project [27], currently running at the University of Twente in the Netherlands. It is supervised Roel Wieringa and Jos van Hillegersberg. Figure 1 provides an overall framework for the four- year PhD work. The research effort is divided into three main topics that all provide an input for the final deliverable, BC guidelines. The first research topic – benefit estimation and benefits management (BM) – was the main focus of my first PhD year and therefore will also be discussed later on in the preliminary results part of this paper. Our premise is that having a useable benefit framework will be a valuable input:
-   into any ES cost estimation process, which is the topic of the COSMOS project;
-   into a value distribution model, which will explicate the way partner companies share benefits and costs. (Leveraging existing results from the VITAL project).
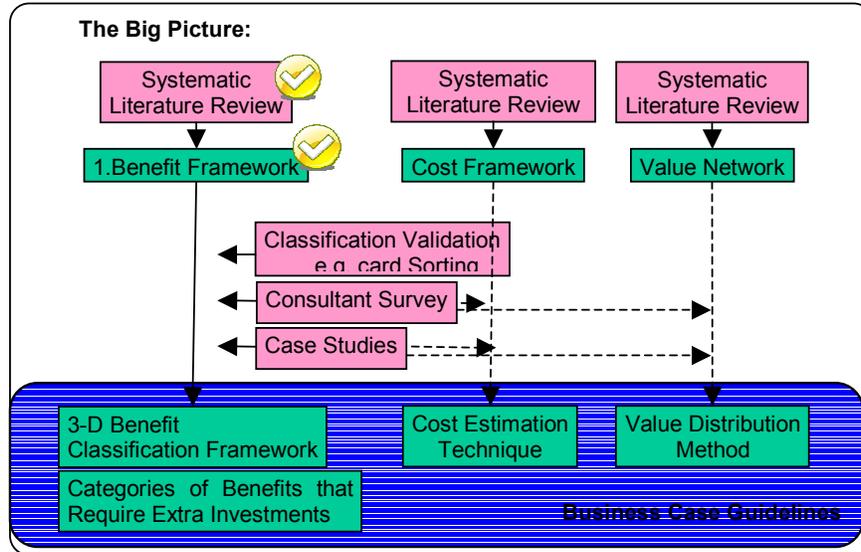
Figure 1: PhD Overview

In what follows, we narrow down the discussion to the area of BM, shown left in Figure 1, because that is what the author completed in her first year of her PhD research. Our research approach included the following: We begun with a structured literature review of sources on X-organizational ES and ES benefits [28]. In order to develop a benefit framework, literature in the following four areas was analyzed: (i) ES implementation, (ii) analysis of ES benefits, (iii) general IT investment valuation, and (iv) the BSC approach in IS. Besides the systematic analysis of these sources, we extended our review with new relevant articles and original sources which we found in the reference lists of our reviewed articles. Based on this literature we developed a first benefit classification framework, which will be described later in this paper. Ensuring validity, card sorting will be used to check if our division of benefits in the different framework categories is concurred with the one of consultants. In order to test whether our benefit framework and BC guidelines can actually be used in practice we are currently conducting a survey amongst consultants in the Netherlands and Germany. An online questionnaire is being used to collect data and information about how consultants are currently using BC's during ES implementations. Besides information about the timing, goals and actors involved in the BC, we collect data about which parts are included in real-life BC's and how consultants currently identify, describe, quantify and measure financial as well as non-financial benefits. Further, case studies will be conducted to analyze whether BM can improve the BC guidelines and following ES implementations. Based on our findings we will adopt our benefit framework and BC guidelines.

5   Preliminary Results

In this section we will introduce our preliminary benefit framework and further show how it can be used as input for a first set of BC guidelines.

5.1. Conceptual Benefit Framework

So far, one can see that many researchers define benefits, however, they do it mostly one-sided, and do not position them in a larger conceptual model, so that it's possible to understand how the benefits investigated by different authors relate to each other. We also noticed that there are no papers – to the best of our knowledge, which relate the concept of benefits to X-organizational ES. Only few authors [29, 30] have used approaches such as the balanced scorecard (BSC) to classify IT benefits and even fewer [12, 31] focused on the application to ES implementations. Based on our structured literature review [28] we developed a proposal for a benefit framework which, we believe, helps to identify, realize and assess benefits. The key idea of this framework is to help business and IT managers analyze ES benefits as related to ES project cost. We will first explain how the framework evolved and afterwards, we will show how the framework is different to previously developed ones and how it can be used for ES BC's. While most research looks on benefit evaluation and measurement after the ES implementation to determine the success our benefit framework includes the estimation of benefits before the system implementation. Thus, one is able to plan and budget necessary benefit realization mechanisms in beforehand.

When constructing our benefit framework we decided to base it on the BSC [32], as the encouraging experiences by several researchers [12, 31] motivated us to use it as an underlying theoretical framework for our ES benefit classification model. Adopting the BSC framework to the ES context, one can add another dimension, namely the nature of the goal of the ES. According to Chand et al. [31], benefits can be either of operational, tactical or strategic nature. Thus, one can use the ES BSC as a tool to provide support for the identification and selection of operational, tactical and strategic benefits in each of the four BSC categories. Comparing these categories with other literature [31], we concluded that tactical benefits mentioned in [31] can be considered similar to managerial benefits described by Shang et al. [22], as both focus on improved decision making and planning. Combining the first three benefits categories – operational, managerial and strategic – into one main dimension, and the last two – IT-infrastructure and organizational factors – into a second main dimension, gives us the possibility to link this model [22] with the one by Chand et al., as both have one dimension in common. The third dimension is represented by the four BSC categories which are extended with a fifth one focusing on the human resource (HR) side of the company [5, 14, 33]. We use this classification combination to build our multidimensional benefit framework (Figure 2). The framework allows for continuous ES benefit monitoring, as the business situation can be compared with the benefit framework at each moment in time.
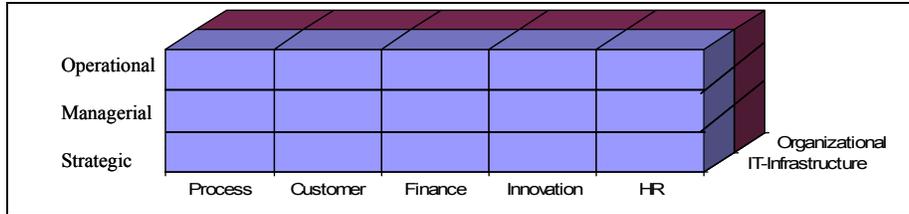
Figure 2: Basic three-dimensional ES benefit framework

5.2. Business Case Guidelines

Clearly, defining guidelines for a complete BC is a very complex and time consuming task. Therefore, we decided to start with guidelines for BM, as this is the part of the BC which is not much researched yet. Based on the work by Ward et al. [3] on BM for general IT investments, we developed a benefit dependency network [34] specific for X-organizational ES implementations, shown in Figure 3.
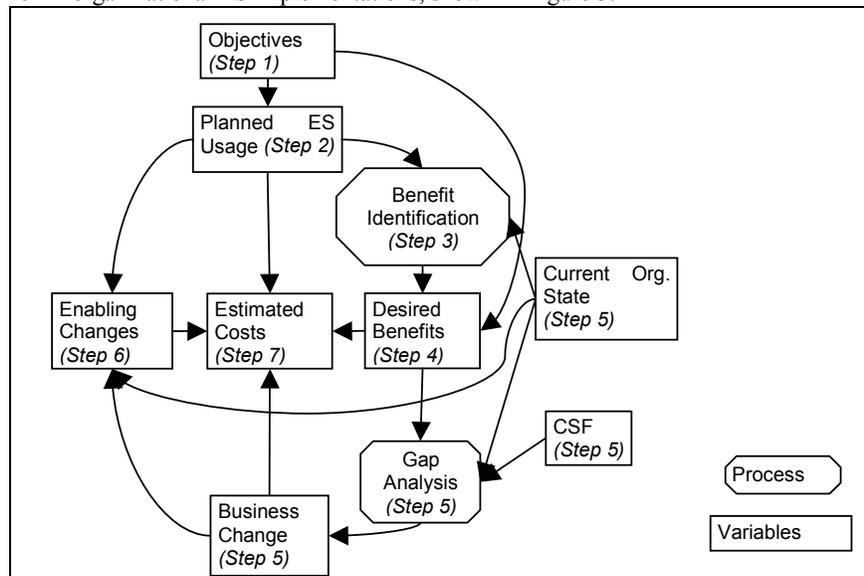
Figure 3: Benefit dependency network

Our BC guidelines follow the structure shown in Figure 3. Therein, we mirror the iterative process of ES implementations in our BC, by allowing for changes in the guidelines at each stage of the ES life cycle [14]. We now describe each step.

Step 1: The BC starts with the assessment of the current business situation, resulting in an overview of internal and external issues that need to be dealt with in the ES project and BC. By addressing these business drivers, clear objectives/ goals,

which have a desired value, are formulated for the BC. These objectives are the start point of building up our benefit dependency network.

Step 2: As shown in Figure 2, the objectives predefine the (planned) ES usage, i.e. our IT enabler in the case of ES projects. This is the IS required to support the project, as it allows the benefits to be realized and provides the basis for change to be undertaken. This will impact the enabling changes and the benefits. Depending on the required ES characteristic (functionality, performance, scalability), the costs of the whole program will change as well.

Step 3: Assuming a relation between ES usage and desired benefits, one should be able to connect them in a coherent process that optimizes both. The benefit identification process, which is based on our benefit framework shown in Figure 3, is our original contribution to providing a clear structure on how desired benefits can be identified [35]. So far, previous research [16] did not link the benefits directly to the objectives. By using the framework, stakeholders are asked to sort the goals, identified in step 1, according to their nature [23]. Given the goals, management can identify the benefits that are expected to arise in each benefit category when the goals are achieved. Structuring the benefits around a framework is very useful, as it allows for comparisons among projects. Further, it can stimulate, at pre-implementation time, detailed discussions among stakeholders about the expected benefits [3].

Step 4: Once the desired benefits are identified, several attributes related to the benefits need to be identified as well: these are owners, measurements and quantifications. For each benefit, an owner needs to be identified who will gain from the successful ES project and therefore will take responsibility for those changes that might be needed during the ES implementation. Next, it is vital at this stage to determine how the benefit will be measured and quantified. This might be a difficult task for some benefits, primarily for those which are intangible; however, it is necessary to ensure that all achieved benefits are also recognized when the project is over. It is also essential at this point to investigate the interdependencies between the benefits which might reinforce each other.

Step 5: Because business change is unavoidable when major IT systems are implemented [16], the next step is to take the need for change management into account. Business change can be defined as various new ways of working. A typical approach being used to determine the business change needed is gap analysis. A number of gap analysis techniques have been described in the ES literature [6, 8]. The expected outcome would be a list of required business changes that are needed to achieve the desired benefits and organizational situation. Special attention should be drawn to those benefits which are only realized when additional investments, such as change and knowledge management are made [36, 37]. These are most often intangible or subjective benefits. While their realization is often overlooked, they are critical for an organization's successful ES implementation [25, 38].

Step 6: The next step is to identify the enabling changes needed for the achievement of all business changes. Enabling changes are e.g. training and education in new system usage or how to deal with business changes. Such change-enabling activities are further dependent on the ES usage, as e.g. the type of the system implemented will influence the decision on which training is needed.

Step 7: For a BC to be complete, the costs associated with the ES project need to be assessed.

6 Conclusion

The problem of understanding and assessing the benefits of X-organizational ES is under-researched and few benefit measurement tools have so far been proposed. Our study provides a multidimensional framework that can be used to classify benefits according to their position along the following three dimensions: (i) operational/managerial/strategic; (ii) five BSC categories and (iii) as being either IT-infrastructure-oriented or organization-oriented. Based on this framework we propose steps for BM in the form of BC guidelines, where the benefits a company wants to realize are mapped against the three dimensions. We further show that the realization of some benefits which are e.g. intangible is dependent on business and enabling changes. We are currently conducting a survey among Dutch and German consultants where we collect data on how consultants are using BC's during ES implementations. We also work on the identification of the distinctive characteristics of BC's referring to intra-organizational implementations and those referring to X-organizational ES initiatives. Our expected outcome is a set of BC guidelines which help consultants and client companies to successfully implement ES also in complex settings, such as X-organizational implementations.

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