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# **IT investment decision making – the role of intangible benefits**

**Master thesis, 15 ECTS, Department of Informatics**

**Authors:** Erik Karlsson  
Maria Stypsanelli

**Supervisor:** Björn Johansson

**Examiners:** Agneta Olerup  
Markus Lahtinen



# Abstract

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**Authors:** Erik Karlsson  
Maria Stypsanelli

**Publisher:** Department of Informatics, Lund University

**Supervisor:** Björn Johansson

**Examiners:** Agneta Olerup  
Markus Lahtinen

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**Abstract:** Investments evaluation has been considerably studied by academics. Researchers argue that decisions are based on the least expensive investment because of the commoditization of Information Technology (IT) (Carr, 2003). Nevertheless, evaluating an investment strictly from a financial perspective may be problematic because it disregards other benefits that enhance organizational performance (Lin et al., 2005). For this reason, the research has focused on the analysis of the decision making process in order to trace the importance of the overall benefits of an IT investment.

In order to better analyze the decision making process, a theoretical framework was synthesized. This framework can be used to assess the organizational objectives which can be broken down to strategic, tactical, operational and financial considerations. Next, the actual benefits of the investment can be examined and categorized to strategic, informational and transactional dimensions. This assessment allows the effective evaluation of an IT investment in order to reach its justification. The theoretical framework was later evaluated by interviews which were conducted with senior managers.

Interestingly, the research has shown that several benefits are considered during the decision making process of the investment. These benefits are important to the final decision and overcome certain financial restrictions. Out of these benefits, customer relations and business efficiency are the ones that influence most the decision making process. However, the environmental dimension can also be added to the benefits assessment level in order to fully complement the research's framework.

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# 1. Introduction

In this thesis we explore the benefits that are considered during the decision making process of an IT investment. More specifically, we will want to explore which benefits are of particular importance to the people making the key investment decisions in organizations. Most will agree that familiar terms such as return on investment and total cost of ownership are part of the decision making process, not only because they are important, but also because they are very easy to measure. We take our exploration one step further and try to identify what intangible, elusive, benefits are also considered in an effort to find out which are just as important as the tangible benefits.

## 1.1 Background

Information technology (IT) investments have been extensively researched and organizational management has been subjected to a lot of criticism. Numerous organizations are increasingly spending more on IT investments and managers are seriously considering the payoff of these investments. Scholars have presented extensive literature focusing on the outcomes of investments and the value of IT, beginning with the productivity paradox which points out the lack of quantifying the actual contribution and outcomes of these investments (Brynjolfsson, 1993).

Later empirical studies of Brynjolfsson and Hitt (1996), however, have managed to validate IT investments and conclude that they enhance the organization's productivity. Thus, the productivity paradox is reconsidered and dismissed, since actual results are being revealed from IT investments (Kohli and Devaraj, 2003). Further research has also contributed to the field of IT evaluation but an interesting question then becomes what is actually done in practice in organizations?

Managers need more tangible and rigorous IT assessment methods before making any decision (Lee, 2004). Carr (2003) argues that the commoditization of IT could influence the decision of IT investments, thus managers select the lowest risk or cost solution for the desired IT capability. Moreover, previous literature has focused on financial aspects of an IT investment analyzing organizational success in terms of financial outcomes (Barua et al., 1995; Tam, 1998) and providing metrics such as return on investment, return on sales, and growth in revenue (Mahmood and Mann, 1993).

However, the traditional financial models may be problematic in the quantification of costs and it is even more difficult to evaluate intangible benefits and check possible financial outcomes out of these benefits (Lin et al., 2005). Thus, the evaluation of an IT investment often fails. On the other hand, an IT investment evaluation can be done by both considering implementation expenses and analyzing the overall benefits of the systems (Goodhue et al., 1992). Furthermore, the business value of IT has been shown as IT capability enhances market and financial performance and therefore the organization's overall competitiveness (Nakata, et al., 2008). Therefore, it is important to highlight that the assessment of IT investments is not only related to financial outcomes but also to a multidimensional aspect (Soh and Markus, 1996), enabling managers to regard multiple aspects when making decisions. Finally, and most importantly, a more complete picture of the business value of IT

can be provided if both the intangible (not directly measurable benefits) and tangible (directly measurable) benefits can be expressed in objective measures (Tallon, et al. 2000).

The main focus of this study is to identify how the decision process of evaluating an IT investment is done and what aspects influence the final decisions of managers in a company. For that reason, the study will not only focus on the financial measurements of an investment but also to the overall picture of expected benefits. Realizing the benefits of an IT investment is an essential part to account for an effective use of the company's expenses (Breese, 2012) and could also lead to wiser decisions.

Management tools and formal procedures are created in order to scrutinize the anticipated benefits of an investment and make it reach its final business goals (APM 2009). An earlier study of Changchit et al. (1998) has shown that organizations do not adopt a formal methodology of benefits realization which could be considered as responsible for poor performance of IT investments. Nevertheless, even if a more formal methodology of benefits is not adopted by organizations, research has to be made on the conceptions of decision makers and the benefits that are informally taken into consideration during the decision process of an investment. It can be suggested that the improvement of benefits evaluation can contribute to a better assessment of the value of an IT investment.

## **1.2 Research questions**

According to Lin et al. (2005), organizations fail to evaluate IT investments because the traditional financial models may be problematic in the evaluation of intangible benefits and in the determination of possible financial outcomes out of these benefits. Thus, the research will be based on the decision of an IT investment in relation to the intangible benefits that are anticipated. The basic research question which is raised is the following:

*Q1. How do organizations assess IT investments?*

In order for the research question to be answered, a framework that explores the investments justification will be used and an emphasis will be given to the benefits that managers may consider. Thus, the assessment of an IT investment will concern the benefits of this investment that are taken into consideration. Therefore, the initial research question is complemented by the next sub questions. These sub questions will identify the benefits that are included in the decision making process and investigate which of these benefits are of particular importance and thus, influence the decision the most.

*Q 1.1 What expected benefits are taken into consideration when assessing IT investments?*

*Q 1.2 How do the expected benefits influence the final decision?*

## **1.3 Purpose**

The purpose of the study is to present the decision making process of an IT investment in relation to the overall benefits that influence the final decision. Throughout this study financial and non-financial justifications will be involved, concerning the anticipated benefits of the investment. The anticipated benefits will be analyzed thoroughly and the ones that

influence the final decision will be stated. For this reason the study will include the prior assumptions and evaluations that companies are making before the implementation of an IT product. Remenyi and Sherwood-Smith (1999) also call it as predictive evaluation which allows the managers to make decisions of the efficiency and the effects of a project in a given future situation.

#### **1.4 Delimitations**

The research will include the pre-implementation evaluation of the IT investment since we are only interested in the benefits managers assume prior to the investment actually being made. Therefore, as the study is only focused on the decision making process of senior management, the assessment of the realized benefits after the investment was implemented and used will not be covered.

Moreover, no decision making or knowledge management tools will be considered as we are not interested to explore possible formal tools that are used by various organizations. Thus, the purpose of the research is not to present different decision making approaches but to demonstrate a more descriptive process of benefits assessment.

Furthermore, the research is aimed towards the senior management department of organizations and their input on benefits during the decision making process and not managers in other departments such as business managers. Finally, as the study only considered people who are active in the whole decision process, it does not regard practitioners who could have different perceptions of what a benefit is and other employees who do not have access to financial aspects of the company.

## **2. Literature Review**

In order to acquire a better understanding of the problem area we will discuss various frameworks and highlight their key points. Furthermore, we will also establish which framework we will use in our research and motivate the reasons why. To achieve this, a careful literature review needs to be done. When a specific framework has been established, we can then base the collected empirical data from our research on this framework.

### **2.1 Frameworks considering financial gain**

An earlier study which was done by Barua et al. (1995), resolved the common problem in IT in measuring the impact it has on an organization. The authors discuss how to measure the value of IT investments based on specific economic variables that contribute to an organization as a direct result of the IT investment. Thus, the main purpose of Barua et al. (1995) is to propose a process-oriented methodology which can be used to measure the financial impact of an IT investment for a strategic business unit or a profit center's performance. As part of their methodology, the authors have used intermediate variables of inventory turnover, relative price, relative product etc. in order to conclude to the final performance variables of market share and return on assets (ROA). It is evident that this approach measures only the economic impact of IT investments and is proposed as a tool that influences corporate strategy and future IT investments. Finally, Barua et al. (1995) argue that measuring the economic impact of IT investments is a very good indicator of what should be measured since it can result in reshaping the nature of how the organization conducts its business.

Tam (1998) aimed to evaluate the impact of computer based investments on a firm's business performance and market status. The study concerned newly developed economies across different countries. It classified and assessed IT value into different dimensions in order to evaluate its impact to the firm's performance. The measures used to depict business performance were return on equity, return on asset and return on sales. The measure accounting for the valuation of market was total shareholder return. The use of strictly financial measures nevertheless, did not depict a significant change on the firms' IT capital and did not manage to depict the contribution of an IT investment to the firm's performance (Tam, 1998).

Mahmood and Mann (1993) evaluate profitability and productivity measures of IT investments through financial and sales dimensions i.e. return on investment, return on sales, and growth in revenue. The authors provide a framework which demonstrates the relationship between IT investments and strategic economic performance. The purpose of the framework is to provide managers with a set of guidelines before making any decisions. Nevertheless, like in the previous mentioned models, they focus only on financial outcomes from the investment.

### **2.2 Investment justification**

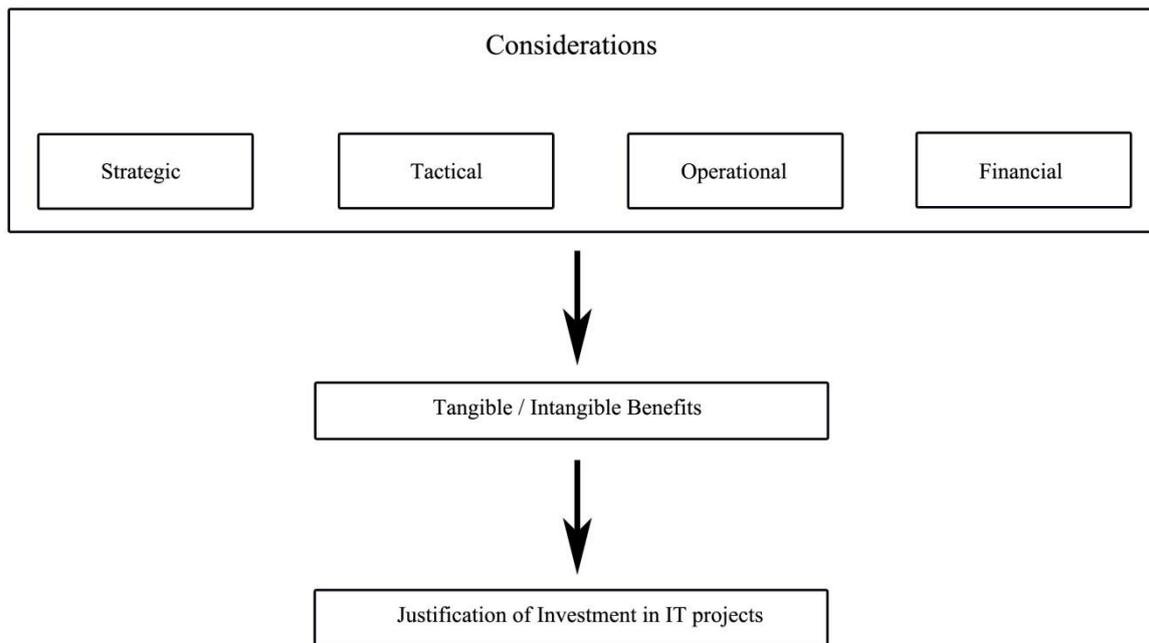
In fact, methods such as return on investment which were traditionally used to evaluate an investment fail to capture the whole contribution of the investment and cannot regard other

benefits (Lin et al., 2005). An organization depending only on financial performance measurements is minimizing the executives' ability to direct the company's strategy (Barker, 1995). Thus, contrasting financial measurements that were proposed by previous studies, it is realized that a more detailed framework is needed in order to better correspond to our research questions. That way, previously wrong investment evaluations caused by neglecting various intangible measures could be avoided (Gunasekaran et al., 2001).

Gunasekaran et al. (2001) have created a conceptual model for the evaluation of benefits and costs of an IT investment which also includes various decisions that may be made by managers. This model comes to fill the void of previously wrong investment evaluations caused by neglecting various intangible benefits and it regards strategic, tactical, operational, financial, tangible and intangible benefits appraisal techniques that managers should employ in order to justify an investment (Gunasekaran et al., 2001). Among these appraisal techniques, the strategic, tactical, operational and financial considerations regard organizational characteristics and are distinguished from the tangible, intangible benefits that concern the outcomes of a particular investment. Therefore, the Gunasekaran et al. (2001) model was altered in order to describe a two-step process that could dissociate organizational considerations from the benefits that arise from an investment.

An adapted figure from the Gunasekaran et al. (2001) model, which explains the process of an IT investment evaluation, is presented in Figure 2.1. This process aims to depict a logical flow for the introduction of an investment into the company. It begins with a series of business objectives that managers are considering, following by the extraction and evaluation of the total benefits of an investment and concluding to the overall justification of this investment. The main point of the document is to firstly perform an evaluation of the needs or considerations of the company according to several organizational areas, business objectives and later examine the benefits of an investment in order to reach its justification. This way a proper management framework will be produced in order to achieve the goal of realizing the actual benefits of IT (Ward et al. 2007).

The purpose of this model is to identify the organizational objectives and initial considerations that influence the need of an investment. These initial considerations are later followed by the actual benefits that are anticipated in order for the final decision to be justified. The anticipated benefits will concern both financial outcomes and non-monetary outcomes and contribute to the evaluation of an IT investment. The presented model of Gunasekaran et al. (2001) will be explained in the following section starting from the considerations and continuing to the anticipated benefits of the investment.



**Figure 2.1 Adapted Gunasekaran et al. (2001) model for the justification of an investment**

### **2.2.1 Strategic considerations**

Strategic analysis involves understanding an organization's business environment and internal processes while developing business strategies to counter competition (Lee, 2004). Elements of corporate strategy need to be linked to business objectives in order to establish a clear strategic direction and hence corporate success (Gunasekaran et al., 2001). It is important to note that each organization will have different objectives reflecting the economy, markets opportunities and preferences of those that are involved (Gunasekaran et al., 2001). Thus, it is the whole environment (market, employees) that affects the corporate strategy and decisions of the organization. Regardless of which objectives an organization is aiming for, the important issues need to be thoroughly examined and held together in order to provide the necessary direction for the business (Gunasekaran et al., 2001).

The strategic significance of IT plays a key role in organizational performance when determining whether a particular IT investment is needed and corporate strategy and goals can drive the need for that particular IT investment (Gunasekaran et al., 2006). From this we can deduce that there should be a link between corporate objectives and IT choices and activities (Gunasekaran et al., 2006). Thus, the type of an investment that will be chosen for a company along with its justifications will be strictly correlated with the strategic directions and the business characteristics of the company.

### **2.2.2 Tactical considerations**

It is important to note that it is not enough to only strategically plan for IT selection and implementation of IT in organizations but also to develop programs and actions for ensuring success (Gunasekaran et al., 2006). In this case, tactical considerations are used which aim towards objectives that could be achieved in the short term (Ward and Griffiths, 1996) and focus on specific organizational goals. Thus, tactical considerations regard the direct

outcomes that are expected after the implementation of the investment and might contain the strategic direction of the business or the initial deficiencies that triggered the need for the investment. Moreover, Ward and Peppard (2002) emphasize the need to accomplish tactical considerations in order to ensure that the strategic objectives are attainable.

Therefore, there is a need to establish critical success factors in order to identify suitable measures and metrics for the planning and implementation of an IT investment (Gunasekaran et al., 2001). These critical success factors are important because they “are the few key areas where things must go right for the business to flourish” (Ward and Peppard, 2002, p. 191). Moreover, these success factors should be project specific and serve as requirements which must be fulfilled by isolating detailed tasks, processes and resources to ensure medium and short-term success (Gunasekaran et al., 2001).

### **2.2.3 Operational considerations**

At the operational level, efficiency and productivity are the main goals that should be achieved (Singleton et al., 1988) after the implementation of the IT investment. It is feasible to measure, the performance of a system and performance measures could be considered from the IT perspective and from the enterprise perspective (Gunasekaran et al., 2006). Operational considerations may be triggered by efficiency or productivity problems which could cause a negative impact to the employees and the customers if not addressed properly. They could entail resolving integration problems through the existing IT infrastructure operation such as “data migration, upgrades, host servers, the need for a database, level of internal expertise, system administrator, need for training, department of users affected, type of license required are some of the issues in this branch of the model” (Gunasekaran et al., 2001, p.355).

In this consideration project specific critical success factors can also be identified. One can think of these as requirements, which must be achieved on an operational day-to-day level to ensure the success of the project (Gunasekaran et al., 2001). One way of determining these measures and their effectiveness is by ensuring that the IT department is working closely with the business functions and that the organization puts an emphasis on the importance of balance between the departments that are involved in the project (Gunasekaran et al., 2001). Thus, since it entails technical details and specifications, the IT department of an organization becomes valuable in order to ensure that certain standards are met.

### **2.2.4 Financial considerations**

Another consideration in the model is financial evaluation. Gunasekaran et al. (2006) highlight the following important issues:

- Is the company in a position to make the required investment?
- What are the sources of finance for capital budgeting?
- Does the investment fit in the organization’s overall strategy?
- What is the overall outcome of the IT investment (Return on investment, profit increase etc.)?

Gunasekaran et al., (2001) continue by describing how the financial considerations are affecting the decision. They suggest that, when the costs have been established and the budget agreed, the objective is then to match the most appropriate financial appraisal technique to the project characteristics and identify which appraisal techniques will be the most suitable for a particular investment. When this has been established we gain an accurate financial performance indicator from the investment and we are able to see if the financial returns meet the specific requirements of the organization such as payback period, hurdle rates, etc. The importance of this process cannot be overstated as IT implementations can have high start-up costs and coupled with over optimistic forecasted savings and ambitious benefits, could lead to the project being considered a failure. Therefore, the traditional way of reasoning is that the financial evaluation must be included in the decision making process, as a successful investment decision must yield a return that outweighs the cost. (Gunasekaran et al., 2001)

All the above considerations precede the benefits evaluation. A benefits evaluation is required as it justifies what could actually be achieved by a specific investment in order to reach a final decision.

### **2.2.5 Tangible and intangible benefits**

Tangible benefits are the kind of benefits that can be “measured by an objective, quantitative and often financial measure” (Ward and Daniel 2006 p.20) and are opposed to the intangible benefits that can only be “judged subjectively and tend to employ qualitative measures” (Ward and Daniel 2006 p.21).

The four business considerations from Gunasekaran et al. (2001) (strategic, tactical, operational, financial), are followed by a benefits evaluation. This section will answer questions regarding the benefits that are anticipated during the decision of an investment and evaluate their importance. This is the largest part of this study as it is considered the missing link where managers fail to assess the appropriate value of an investment. Thus, the benefits evaluation becomes the second step of the investment justification and contains the outcomes that are expected from an investment.

Because of the dynamic factors that are inherent in IT investments, the decision making process should be based on current market characteristics and frequent re-evaluations should be performed. Without regular re-evaluation, additional benefits may be missed. Gunasekaran et al. (2001) argue that potential benefits may remain undiscovered for the following reasons:

- The technology itself may develop to a stage where cheaper technical solutions become viable
- Users may outgrow the current system
- The demands of the market environment in which a company operates may change so that older systems no longer address current needs

Since the evaluation of the investment benefits is such a complex issue, it is evident that a more detailed research should be performed in that field in order to capture the complexity of intangible benefits and create a model that presents this broad subject as extensively as

possible. To fill this gap, a more detailed research was done in academic articles in order to discover a tool that provides a more detailed and comprehensive assessment of the benefits of an IT investment. Several articles have argued that the decision making process should consider the benefits of the investment, and have presented a comprehensive classification of these benefits (Mirani and Lederer, 1998; Mooney et al., 1996; Shang and Seddon, 2002; Weill and Olson, 1989; Gregor et al., 2006); Saunders and Jones, 1992). Thus, the next section explores these articles and presents the reasons for the selected framework of benefits taxonomy that will replace the tangible and intangible benefits section of the Gunasekaran et al. (2001) model.

**2.3 Frameworks considering using IT benefits taxonomy**

Some researchers have shown that benefits realization of an IT investment allows organizations to accomplish all needed objectives. It leads to a more efficient administration of organizational decisions which indicates organizational maturity (Lin et al. 2005) and aims towards organizational success (Irani, 2002). Researchers have argued that modern economy leads organizations to be focused on benefits assessment, both financial and nonfinancial, in order to justify a decision on investments (APM, 2009). This assessment will be comprehensively presented by using a benefits taxonomy framework since it explores all the dimensions of expected benefits.

Several articles that have created benefit taxonomies can be used as a tool to assess the value of an IT investment. These articles along with the categorization of the benefits are presented in Table 2.1. In the following section a more detailed exploration of these articles will be presented. From table 2.1 we can see that more emphasis was given to strategic, informational and transactional benefits which are clearly stated in the Mirani and Lederer (1998) framework.

**Table 2.1 Categorization of investment benefits**

	<b>Authors</b>				
<b>Benefits Categories</b>	Mirani and Lederer (1998)	Mooney et al. (1996)	Shang and Seddon (2002)	Weill and Olson (1989)	Gregor et al. (2006)
Strategic	X		X	X	X
Informational	X	X		X	X
Transactional	X			X	X
Automational		X			
Transformational		X			X
Managerial			X		
Operational			X		

Starting from the three categories of Mirani and Lederer (1998) framework - strategic, informational, transactional, a clear classification of organizational benefits is presented, and a better understanding and assessment of IT investments benefits is achieved. Moreover, these three basic categories of benefits are further divided into subcategories which allow a comprehensive explanation of these notions. Thus, the Mirani and Lederer (1998) framework serves as a starting point of the analysis of benefits classification as it provides a clear classification of organizational benefits, and a better understanding and assessment of IT investments benefits. In the following sections, the multidimensional assessment of the model is described in detail along with converging articles that have assessed the benefits of an IT investment. More specifically, each basic category of the Mirani and Lederer (1998) model is presented and explained along with its assigned sub dimensions.

### **2.3.1 Strategic benefits**

The strategic benefits category makes up the first and more important category of the selected framework. Farbey et al. (1995) used an 8 rung ladder identifying points of decision variables of an investment. The higher the rung, it becomes more difficult to quantify estimations which results to bigger uncertainty and requires the participation of senior managers. Strategic systems are placed on the seventh rung of the ladder which holds one of the highest positions and signifies the importance of these decisions. According to Farbey et al. (1995), the strategic aspect in organizations is regarded as achieving competitive advantage, advancing productivity and performance, enabling new management ways, organizing and developing new types of business. Ives and Learmonth (1984) state that, a strategic application explores new opportunities for IT systems and it may alter the competitive aspects of a firm in its industry. Moreover, a strategic benefit involves both decisions relating to competitive product-market choices and implementation relating to the organization's ability to execute the product-market choices (Henderson and Venkatraman, 1993). Thus, strategic benefits concern the overall business models, the competitiveness of an organization and are considered of great importance (Ives and Learmonth, 1984).

Several other articles have handled strategic benefits, using the same characterization as 'strategic' or a different naming for this category. These articles share some common elements and the equivalent notions from other models are presented in the following paragraphs.

Shang and Seddon (2002 p. 278) state that strategic activities involve long-term planning in regard to high-level decisions, for example "business merging and acquisition, marketing competition, product planning, customer retention and capital sourcing". Weill and Olson (1989) argue that strategic benefits involve associating IT with long term considerations, including a long lead time between investment and return while the meaning of what is strategic could change over the years.

Mooney et al. (1996) use the notion of transformational benefits of IT concerning the value that can be derived from IT's ability to facilitate and support process innovation and transformation. In turn, the business value associated with these effects can be seen as "reduced cycle times, improved responsiveness, downsizing, and service and product

enhancement” (Mooney et al., 1996 p.74). Finally, Saunders and Jones (1992) discuss strategic direction and corporate planning as two means to allow organizations to distinguish their operations from those of their competitors, achieve organizational goals, and also state that it is important to tie IT planning with organizational planning.

All the previously mentioned articles are either a subset of the Mirani and Lederer (1998) framework or conclude the same principle. Thus, the Mirani and Lederer (1998) framework encapsulates all the previous aspects of strategic benefits. According to Mirani and Lederer (1998), the purpose of IT investments is therefore to create strategic benefits which could result in competitive advantages for the organization. Furthermore, the organization can then become more flexible, responsive and adaptive.

In addition, the Mirani and Lederer (1998) framework further divides strategic benefits into the following elements: competitive advantage, alignment and customer relations. Competitive advantage is important since it enables the organization to adapt to radical changes to the business processes which strengthens the organization’s value on the market. Alignment aims at achieving organizational goals, establishing links with other organizations and a faster response to environmental changes. Finally, customer relations can be improved by establishing a better perception of the organizational image from a customer perspective through providing improved products or better services. (Mirani and Lederer, 1998)

Thus, the dimension of strategic benefits, including its sub dimensions and characteristics, as it is described by Mirani and Lederer (1998), is presented in Table 2.2.

**Table 2.2 Strategic benefits**

<b>Strategic Benefits</b>	
<i>Competitive Advantage</i>	<ul style="list-style-type: none"> <li>- Enhance competitiveness or create strategic advantage.</li> <li>- Enable the organization to catch up with competitors.</li> </ul>
<i>Alignment</i>	<ul style="list-style-type: none"> <li>- Align well with stated organizational goals.</li> <li>- Help establish useful linkages with other organizations.</li> <li>- Enable the organization to respond more quickly to change.</li> </ul>
<i>Customer Relations</i>	<ul style="list-style-type: none"> <li>- Improve customer relations.</li> <li>- Provide new products or services to customers.</li> <li>- Provide better products or services to customers.</li> </ul>

**2.3.2 Informational benefits**

Gregor et al. (2006) suggest that the intent of investing in IT for informational purposes should provide information and communication for decision making in the organization. This should be achieved by making information faster and easier to access and improve the ways to manage data. Goodhue et al. (1992) also continue by stating that this approach improves the decision making and enables the user to capture information and take more informed actions.

Informational benefits may regard the information provided by the IT investment, and the support provided by the managers to the users of the system (Hamilton and Chervany, 1981). Also, informational benefits may concern the way information is disseminated between the management team. Mooney et al. (1996), argue that informational benefits are benefits that emerge mostly from IT’s capacity to collect, store, process and disseminate information. Because of these capacities the value is increased by “improved decision quality, employee empowerment, decreased use of resources, enhanced organizational effectiveness and better quality” (Mooney et al, 1996 p.74). Weill and Olson (1989) also argue the same point in terms of benefits by discussing the information and communication infrastructure in organizations. According to Weill and Olson (1989), the value of the infrastructure is information for the management of the organization. Moreover, Shang and Seddon (2002) refer to managerial benefits in order to represent business management activities which involve allocation and control of the organization’s resources, monitoring operations and supporting of business strategic decisions. Saunders and Jones (1992) state that the importance of the quality of information outputs should be judged on accuracy, usefulness and timelines of the information they produce.

Mirani and Lederer (1998) argue that informational IT supports the organization with an infrastructure for information and communication. Therefore, informational benefits are important since they can help decision makers in the decision making process by granting faster and easier access to information. Furthermore, the available information also becomes more accurate (Mirani and Lederer, 1998).

The selected definition of informational benefits, including its sub dimensions and characteristics, as it is described by Mirani and Lederer (1998), is presented in Table 2.3.

**Table 2.3 Informational benefits**

<b>Informational Benefits</b>	
<i>Information Access</i>	<ul style="list-style-type: none"> <li>- Enable faster retrieval or delivery of information or reports.</li> <li>- Enable easier access to information.</li> </ul>
<i>Information Quality</i>	<ul style="list-style-type: none"> <li>- Improve management information for strategic planning.</li> <li>- Improve the accuracy or reliability of information.</li> <li>- Improve information for operational control.</li> </ul>
<i>Information Flexibility</i>	<ul style="list-style-type: none"> <li>- Present information in a more concise manner or better format.</li> <li>- Increase the flexibility of information requests.</li> </ul>

**2.3.3 Transactional benefits**

Transactional IT benefits are found in both management processes of the organization and in financial aspects such as cost reductions. (Gregor et al. 2006). Weill and Olson (1989) also refer to transactional benefits in order to support operational management focused on short time spans and significant repetition with short-term return on investments. Therefore, transactional IT can be simply defined as an IT investment made with the objective of cutting costs.

Mooney et al. (1996) refers to the notion of automational benefits as an efficiency perspective where the value is derived from the role of IT as a capital asset substituting labor. For example, automational benefits would be productivity improvements, management control, efficiency and reliability. Shang and Seddon (2002 p.278) also, use the notion of operational benefits to refer to the automated business processes that “offer benefits in terms of cost reduction, cycle time reduction, productivity improvement, quality improvement and improved customer service”. Finally, Saunders and Jones (1992) regard the organization's financial performance and gather financial measures such as return on investment, return on assets, cost allocation, return on management, cost of maintaining systems and others.

Mirani and Lederer (1998) argue that transactional IT is supporting the operational management and functions as a tool to reduce costs. Therefore, it is a valuable benefit to the organization and it can be broken down into three types: communications efficiency, systems development efficiency and business efficiency. Communication efficiency can directly reduce costs such as costs of travel in an organization. Systems development can progress faster and maintenance costs can be reduced. Finally, business efficiency makes employees and business process more efficient. (Mirani and Lederer, 1998)

The selected definition of transactional benefits, including their sub dimensions and characteristics, as they are determined by Mirani and Lederer (1998), is presented in Table 2.4.

**Table 2.4 Transactional benefits**

<b>Transactional Benefits</b>	
<i>Communications Efficiency</i>	<ul style="list-style-type: none"> <li>- Save money by reducing travel costs.</li> <li>- Save money by reducing communication costs.</li> </ul>
<i>Systems Development Efficiency</i>	<ul style="list-style-type: none"> <li>- Save money by reducing system modification or enhancement costs.</li> <li>- Allow other applications to be developed faster.</li> <li>- Allow previously infeasible applications to be implemented.</li> <li>- Provide the ability to perform maintenance faster.</li> </ul>
<i>Business Efficiency</i>	<ul style="list-style-type: none"> <li>- Save money by avoiding the need to increase the work force.</li> <li>- Speed up transactions or shorten product cycles.</li> <li>- Increase return on financial assets.</li> <li>- Enhance employee productivity or business efficiency.</li> </ul>

**2.4 Framework selection**

Analyzing all the above benefits taxonomies, we conclude that the Mirani and Lederer (1998) framework contains all the previously mentioned categories and even if a category is presented using different definitions, the authors converge to the same notions of the Mirani and Lederer (1998) framework. Thus, this framework provides a comprehensive assessment of investment benefits and could be integrated to the adapted Gunasekaran et al. (2001) model.

Hence, the final framework that best corresponds to the aim of this study is in Figure 2.2 and results from the combination of two different theoretical frameworks. The final selected framework contains the basic organizational considerations that are depicted by Gunasekaran et al. (2001) model along with the benefits taxonomy of the Mirani and Lederer (1998) framework. More specifically, the tangible and intangible benefits of the Gunasekaran et al. (2001) model are replaced by the more comprehensive benefits classification of the Mirani and Lederer (1998) framework. The analysis of decision making process of an IT investment will be based on a framework that contains a logical flow of decisions starting from organizational considerations and continuing to the benefits evaluation that justify the investment.

The first level of the selected framework is taken from Gunasekaran et al. (2001) which explains in more detail the beginning of the decision making process. The initial considerations of this decision are categorized to strategic, tactical, operational and financial dimensions (Gunasekaran et al., 2001). These initial considerations are later expected to lead to the benefits justification of the investment.

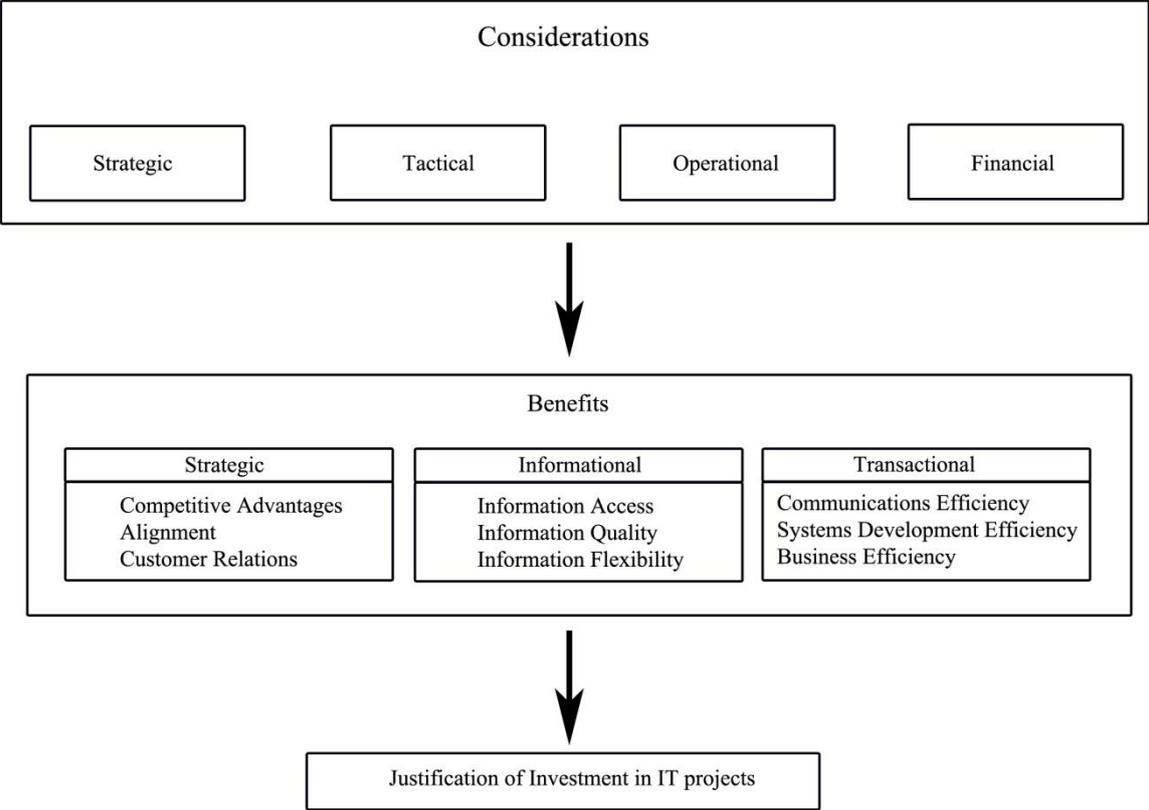
The second level of the framework and the more important side of the study regards the benefits evaluation to which the Mirani and Lederer (1998) framework corresponds as it provides an in depth multidimensional assessment of the organizations benefits of IS projects. Thus, three key areas need further investigation: strategic, informational and transactional benefits of an organization. The Mirani and Lederer (1998) framework accounts for all three categories and breaks them down into sub-categories which allows a better exploration of IT benefits. Moreover, since the research questions are focusing on finding the benefits that are taken into consideration and influence the decision making process of an IT investment, the study will be based on the three categories discussed above.

Certainly, the selected framework will be used throughout the whole process of the study and will be evaluated according to the performed interviews. Alterations will be made in case it is needed or indicated by the next step of the research. The next chapter gives a more detailed explanation of the conducted research methodology of collecting empirical data that will validate the selected theoretical framework.

## **2.5 Conclusion**

The thorough literature review presented in the previous chapter serves as the foundation of the research. Several articles have dealt with the evaluation of an IT investment and it becomes evident that over time, the perceptions of managers are changing. Some researchers wanted to emphasize the importance of only pure financial measurements and some others denounce the importance of considering the benefits of an IT investment. The need for a more compact conceptual model that will provide a constructed justification of an IT investment is covered by the Gunasekaran et al. (2001) model. This model, which examines organizational areas that need to be considered, is complemented by the Mirani and Lederer (1998) framework that provided the actual benefits that justify the decisions. Thus, the in depth literature review enabled us to broaden our view of the different IT investment evaluation

techniques and allowed us to build a framework that combines the managerial considerations depending on organizational fields with a multidimensional assessment of IT benefits.



**Figure 2.2 Theoretical framework for the justification of an investment**

### **3. Research Methodology**

#### **3.1 Strategy and procedure**

Since the study relied heavily on the theory and models, empirical data are collected in order to better explain the assessed benefits on IT investments. The broad structure of the selected model will allow us to investigate which areas and benefits are the most important for an organization. Since, it can be considered rare to spot a formal tool for benefits realization (Changchit et al., 1998), our selected model will account to the overall benefits that are informally considered and lead to the approval of an IT investment. It is assumed that, the rapid speed of technological advancements, demands a precise evaluation of the appropriate IT investment and this research points to further investigate actual organizations. Thus, more empirical data is collected by analyzing the perceptions of senior managers and directors who are in charge of the final decisions.

#### **3.2 Data collection methods**

Given the research questions of the study, a qualitative research method is most appropriate in order to obtain an in depth analysis of the study. This research is used when it is required to understand complex social phenomena (Yin, 2003; Kvale and Brinkmann, 2009) which in our case concerns organizational processes. Interviewing will form the main method for data collection as we are seeking an in-depth analysis of the decision making domain which is not usually accessible through public sources as the internet. Moreover, even though there is a wide range of academic articles that contributed to the decision of an investment, there is an uncertainty of what procedures are actually followed by organizations. Therefore, the need of interviews is evident as the basic tool for the investigation.

The interview questions are purposely open in order to allow the interviewee to elaborate as much as possible on a given topic. The semi-structured interview with the open ended questions is imperative because diversity on the responses was expected. Thus, the main goal is to explore, in the best possible way, what decision criteria each company is considering and use a lot of follow-up questions depending on the previous answers of the interviewees.

Since interviews are used as the main method for data collection, careful consideration has been taken to ensure the validity and question design for this part. An interview guide based on Creswell (2007) guidelines is designed for that reason that contains a set of basic and broad questions, in order to allow the participants to speak freely about the subject. Nevertheless, as the questions design is open-ended, it was important to be able to assert some control of the interview without violating its semi-structured format. In other words, the participants needed to be allowed to speak freely, but some main topics needed to be controlled as checkpoints in our interview guide. As the study is influenced by the framework in Figure 2.2, the follow-up questions are designed to allow the interviewee to analyze the organization fields that affect the initial considerations of an investment and elicit the overall expected benefit based on the strategic, informational and transactional structure.

During the study, a set of extra additional documents was asked in order to supplement the interviews. These documents were related to the decision making process of organizations

which could better describe the IT investment appraisal techniques. Nevertheless, due to confidentiality issues, only one participant was able to provide us with an additional decision making document that describes the flow of an investment process. This document will be a part of our data collection method and will later be used in the description of interview findings.

To summarize, several reasons lead to the choice of interviews as the main source of data collection. Firstly, the problem area is complicated with plenty of perspectives and it was expected to receive a variety of answers to our interview questions. Secondly, the diversity of the chosen interviewed companies, allows us to identify similarities or differences in the evaluation of an IT investment which will later provide useful data for our analysis. Finally, and more importantly the uncertainty of the already used decision making processes demands an open interview that explores further dimensions and reexamines facts and models that were already stated in the literature.

### **3.3 Interview Procedure**

Kvale and Brinkmann (2009) argue that interview skill depends on the interaction with the subject, the posed questions. The first impression of the interviewer from an interviewee perspective is important if the subject is to open up. This is why using some sort of structure can be so effective (Kvale and Brinkmann, 2009). The importance of brief and simple questions which would most likely lead to short and direct answers from which a meaning can be easily interpretable, should also be followed. This leads to a good flow in the interview which results in useful data. This is called the art of second or follow-up questions which simply means the ability for the interviewer to listen (Kvale and Brinkmann, 2009).

One important aspect in interview technique is that the interviewer needs to have knowledge of the topics that are being covered (Kvale and Brinkmann, 2009). That is the reason for our extensive literature review covered in chapter two. With a strong knowledge of models, frameworks and theory we were efficiently prepared to ask suitable questions. Furthermore, with a strong theoretical background we were also better prepared to ask non-scripted supplementary questions based on the answers that were given.

The interviewees were given a small idea on the interview topic in advance so that they knew what to expect. However, not specific questions were sent to them in advance because this could lead to well-prepared answers with little interesting data (Kvale and Brinkmann, 2009). Instead, the aim was to trace spontaneous answers as the question was being asked. This spontaneity could also lead to much richer and interesting data.

During the interviews, we used an audio recorder, as suggested by Kvale and Brinkmann (2009). The audio recorder served two main functions. First of all it let us focus on the interview without having to focus on taking large notes which allowed us to come up with better follow-up questions. Second of all it made the transcribing process much easier since we were able to listen to the interview and make sure we did not miss anything of importance. Moreover, the designed interview guide allowed us to keep field notes of every answer and maintain a certain flow of the interview. This procedure helped firstly to mark important

issues that would later be explored by follow-up questions and secondly, contributed to the analysis of the interviews.

### **3.3.1 Interview guide**

The interview guide was based on the Creswell (2007) guidelines and contained a basic body of the interview questions (Appendix A). It was designed with the theoretical background and research questions in mind. Our study aims to find what benefits are considered for an IT investment and later assess them to strategic, informational and transactional structure. The need to explore this area and to allow the participants to speak open about this subject, made us choose wide, open-ended questions which may later be clarified by follow-up questions. Thus, there was a diversity of questions in the performed interviews but the main body of the interview remains the same.

The first part relates to making the interviewee feel comfortable by asking some general questions before covering the important topics. These questions also, will provide an overview of the participant, the company's details, and will be later considered in the interview analysis. For example it was important to establish the core business and activities of the company as the research framework contains information about the strategic and tactical considerations of the company. So, the general questions are the following:

- What is your current position at the company?
- What are your current areas of responsibilities?
- What is the core business of your company?

The second part contains questions which relate to IT investments and covers the basic topics of the research such as IT investments, decision making process and identifiable benefits from IT investments. The aim of these questions follows the logical model of Figure 2.2 and thus, the goal is to extract the needs of the company - depended on several organizational fields - that triggered the consideration of the investment. The initial needs are later supplemented by the consideration of the overall benefits that an investment will achieve. This part of questions consists of the following set of main questions:

1) How does the decision making process of IT investments work in your organization? Which people are involved?

*(This question offers an introduction to the decision making process. It aims to understand if there is a standardized procedure which later allows the consideration of investment benefits.)*

2) Could you briefly describe one of the larger IT investments where you were directly involved?

*(The second question is crucial for the interview as we need to understand the most important investment of every company. The following interview questions will be based on that investment and its characteristics.)*

3) How do you justify the cost expenses of an IT investment?

*(The purpose of this question is to start introducing the interviewee to the purpose of the research. We have to understand the justifications that interviewees are using in order for the investment to be approved. For example, are the justifications based on pure financial motives or do they also consider other means?)*

4) What kinds of benefits or criteria are identified when this investment is decided?

*(The fourth question is highly related to the literature framework as it specifically concerns the benefits that are expected from the investment. The aim of the interviews is not to ask specific questions about strategic, information or transactional benefits that belong to the framework, but to use a lot of follow-up questions that will be based on the answers. These follow-up questions will allow us to deeper explore the anticipated benefits of the investment and later categorize them into the research framework.)*

5) What difficulties are found when measuring these benefits?

*(The fifth question aims to identify the importance of these intangible benefits compared to the financial measures that are used. Moreover, it could demonstrate how easy it is for the managers to demonstrate the value of the intangible benefits in case it is difficult to measure.)*

6) What expectations do you have from the new system? What needs will it cover?

*(This question is also of a particular importance as it relates to business goals and considerations that are depicted in the research framework. This question is also expected to be followed by supplementary questions as it is closely related to the framework.)*

7) Are you satisfied with the IT investment decision process?

*(This question aims to evaluate the degree of acceptance of the decision making process and examine whether changes have to be made and if some specific areas need to be improved.)*

8) What would you think that was the most important factor that contributed to the decision for your investment?

*(The final question is related to the research question as we aim to identify which expected benefits influence the final decision of the investment.)*

The above questions are asked in all of our interviews and form the basic structure of the interview. Supplementary and different follow-up questions were used in every question, because they were dependent on the initial answers of the interviewees. Finally, some of the follow-up questions were clarifying the previous questions in order to facilitate the participant to reflect and thoroughly analyze the answers.

### **3.3.2 Interviewee Selection**

In order to ensure that we can fully explore our problem area we have performed three interviews with three different key people from different organizations (two IT managers and one Chief Information Officer). The three organizations are in different business areas but are all heavily invested in IT solutions. In order to find interviewees we contacted different organizations, which we thought would be of relevance to our study, by email and explained the purpose of our study. In order to find relevant and solid data for our study the interviewees

needed to be IT managers directly involved in the investment decision making process. Furthermore, the interviewed people do not come only from a single country but by multiple European countries which are England, Sweden and France. For the sake of ethics all our informants and their respective organizations will remain anonymous. However, each informant is described briefly in the next section.

Informant A (Gaming company): works for an organization which is a major player in the video gaming industry for more than twenty years. The company prides itself on delivering AAA titles and has enjoyed tremendous success with many of their released games. The company focuses on multiplayer games. Informant A has been with the company since 2006 as an IT manager and is directly responsible for any customer facing IT investments. Informant A was a great match for our study because of the knowledge of IT benefits in a complex IT environment and the direct involvement in the decision making process.

Informant B (Cargo company): is working in an organization which deals with cargo transportation. Just like the previous company this organization also has a large complicated IT environment and has recently done a major IT investment which will alter the business strategy in a major way. Informant B is the CIO of the company and is directly responsible for any IT investments. This person is well suited to be used as a source because of the direct involvement in the decision making process, business cases, best practices and knowledge of IT benefits.

Informant C (Retail company): is working in an organization which is in the wine industry. This organization focuses on online sales as well as allowing customers to visit physical locations. This company has a much smaller IT environment than the other two which makes it an interesting choice as well to see if the thinking of IT benefits differs. Informant C is the IT manager and is directly responsible for any IT investments and also directly involved in the decision making process. This person does also have a good understanding of IT benefits in a different setting from the other two informants which makes Informant C an interesting choice for our study.

### **3.3.3 Performing and transcribing interviews**

Since the interviewees were conducted in different countries both computer based calls and face-to-face interviews were used. In the case of computer based calls, Kvale and Brinkmann (2009) spot difficulties such as lack of gestures and facial expressions. In order to minimize that problem, the chosen computer program allowed us to have video calls and perfectly check the facial expressions of the participants. Certainly, we were missing the immediacy of being close to the participant but the use of video calls provided the ideal tool for long distance communication. Finally, one of the interviews was face-to-face which enhanced the reciprocity with the participant. In fact, it was the only one from which we managed to acquire an extra document about the IT investments decision process.

Kvale and Brinkmann (2009) note the importance of speaking the same language as the interviewees especially when it concerns technical language and the interviewees are well-established people in their fields. This case was applicable in our research since our main

subject on decision making concerned a lot of technical expressions and more specifically, managerial tools that are used to organizations. Moreover, since most of the participants were senior IT managers and directors, the need to understand their norms and communication tools, was evident. The fact that both of the researchers have working experience in IT companies enhanced the flow of the interview and resolved certain communication gaps.

After the interviews were conducted and recorded, a transcript was produced. The transcript included at the beginning the pauses of the participant’s interview which were later deleted from the final transcription. According to Myers and Newman (2007), every record or transcript should be confidential and secure. In our case the first transcription of the interview contained information about the participant’s company and products which made his or hers identity, obvious. Thus, all of this information was deleted by the second transcript and were replaced by more abstract words. The full transcriptions of the interviews, along with the comments for the analysis, are presented in Appendix B.

**3.4 Data analysis**

The interviewer should have a basic structure of the interview analysis before the actual analyzing begins (Kvale and Brinkmann, 2009). Yin (2003) suggests relying on the research questions that triggered the study and on a descriptive framework about the study. In that case both the research questions and the chosen main framework allowed us to have this basic structure. Thus, the first part of analysis aimed at the initial considerations of managers, according to organizational needs and fields. Thereon, the study persisted and focused on the benefits that are expected by the managers. Thus, a more detailed analysis was performed in that field, concerning the identified benefits and their importance in the decision making process.

**Table 3.1 Strategic benefits - coding**

<b>Strategic Benefits</b>		
<i>Competitive Advantage</i>	<b>STR-1</b>	- Enhance competitiveness or create strategic advantage.
	<b>STR-2</b>	- Enable the organization to catch up with competitors.
<i>Alignment</i>	<b>STR-3</b>	- Align well with stated organizational goals.
	<b>STR-4</b>	- Help establish useful linkages with other organizations.
	<b>STR-5</b>	- Enable the organization to respond more quickly to change.
<i>Customer Relations</i>	<b>STR-6</b>	- Improve customer relations.
	<b>STR-7</b>	- Provide new products or services to customers.
	<b>STR-8</b>	- Provide better products or services to customers.

Kvale and Brinkmann (2009) propose the coding of the basic concepts and meanings of the transcripts in order to proceed to a more efficient analysis. Thus, every answer of our transcript had a second column that indicated extra comments and codes especially on the

benefits that the participant states. In our case, since the main focus of the study is the identified benefits, the codes STR, INF and TRS were given to strategic, informational and transactional benefits respectively. The coding was of particular importance for the research as it allowed a more efficient interpretation of the interview findings and provided an efficient way to directly trace the requested benefits inside the long transcripts. The used codes along with the appropriate numbering are shown in Tables 3.1 to 3.3.

**Table 3.2 Informational benefits - coding**

<b>Informational Benefits</b>		
<i>Information Access</i>	<b>INF-1</b>	- Enable faster retrieval or delivery of information or reports.
	<b>INF-2</b>	- Enable easier access to information.
<i>Information Quality</i>	<b>INF-3</b>	- Improve management information for strategic planning.
	<b>INF-4</b>	- Improve the accuracy or reliability of information.
	<b>INF-5</b>	- Improve information for operational control.
<i>Information Flexibility</i>	<b>INF-6</b>	- Present information in a more concise manner or better format.
	<b>INF-7</b>	- Increase the flexibility of information requests.

**Table 3.3 Transactional benefits - coding**

<b>Transactional Benefits</b>		
<i>Communications Efficiency</i>	<b>TRS-1</b>	- Save money by reducing travel costs.
	<b>TRS-2</b>	- Save money by reducing communication costs.
<i>Systems Development Efficiency</i>	<b>TRS-3</b>	- Save money by reducing system modification or enhancement costs.
	<b>TRS-4</b>	- Allow other applications to be developed faster.
	<b>TRS-5</b>	- Allow previously infeasible applications to be implemented.
	<b>TRS-6</b>	- Provide the ability to perform maintenance faster.
<i>Business Efficiency</i>	<b>TRS-7</b>	- Save money by avoiding the need to increase the work force.
	<b>TRS-8</b>	- Speed up transactions or shorten product cycles.
	<b>TRS-9</b>	- Increase return on financial assets.
	<b>TRS-10</b>	- Enhance employee productivity or business efficiency.

### **3.5 Research quality criteria**

The purpose of this section is to discuss how we attempted to ensure that our research is of the highest quality. We will do this by discussing what steps we have taken to ensure the quality. This includes discussions about reliability, validity, bias and ethics. These definitions are well established in academic research and we will demonstrate how we have used them to achieve a high quality study.

#### **3.5.1 Reliability**

In order for a study to be considered of high quality, reliability is an important aspect. The whole process of the study aimed at reliability. All of the interviews were recorded and later transcribed and presented to the section 4. More specifically, since the transcription of the interviews is a difficult procedure, and errors are possible, we had to check again that the recorded audio matches the transcription. So, the interview findings are presented to the reader in an accurate way, and the same conclusions can be drawn if this procedure repeats again.

#### **3.5.2 Validity**

Just like reliability, validity is also an important factor to ensure a high quality study. Creswell (2007) argues that in order to strengthen the validity of our research, validation is an attempt to establish the accuracy of the findings and the final report is a representation of the researcher. The final report contains a linear analytic format which starts from the problem area, continues to research questions and literature review, researchers' findings and analysis (Yin, 2003). This way, a logical flow of events is presented to the readers in order to fully comprehend the sequence of events of the study.

Moreover, Seale (1999) suggests some steps to account for in regards to internal validity: the use of low interference, the use of participant researchers, peer examination and recording data mechanically. We have tried to achieve all these steps by recording field notes (low interference), by using peer examination during thesis supervision meetings and by recording data mechanically by using an audio recorder. We have also established how we should interpret the data collected. Moreover, Seale (1999) argues that replication is important in order to achieve external validity and by being as transparent as possible when describing our research findings. In this study, the references from the available literature combined with the presented interview findings, contributed to the transparency of the study.

#### **3.5.3 Bias**

Hammersley & Gomm (1997) argue that the main problem with bias is that it is an ambiguous definition. The authors also raise a caution flag by suggesting that that research today is increasingly susceptible to bias due to funders trying to establish goals of research in terms other than the pursuit of knowledge. Because of this risk we have made sure to be as transparent as possible and show that we are only concerned on the knowledge this research can provide. We are also working without any funding from other parties which implies that we have no bias in that context. We have given to Norris (1997) careful consideration as he suggests considering yourself as a researcher in relation to the topic of research in order to

cope with bias. Moreover, the fact, that we were two students conducting this study, enhanced diverging opinions and decreased preconceived personal bias.

#### **3.5.4 Ethics**

Ethical considerations have been made throughout the whole process of the research and especially when we contacted our interviewees. The suggested Kvale and Brinkmann (2009) ethical guidelines were used for the interview process. Firstly, informed consent was asked from the participants by the interviewees. Secondly, anonymity was kept in order to resolve confidentiality issues. Finally as Berente et al., (2011) state, it is important for researchers to estimate the expected benefits or consequences from the research. Thus, the participants were informed that the thesis will be published to Lund University's library. Nevertheless, since anonymity is kept in the thesis, we could not identify any benefits or consequences for the participant.

## 4. Empirical Findings

In this section we will discuss the findings from the interviews. The interview questions can be found in the interview guide (Appendix A). Each question is presented in Tables 4.1 to 4.5 and includes the corresponding answers taken from the transcripts. This whole process, also, contains quotes of the participants which contribute to an efficient and logical representation of the study (Creswell, 2007). The references of these quotes are drawn from the transcripts of Appendix B.

### 4.1 Decision making process

In order to establish a clearer picture of how IT managers reason in terms of benefits we will first need to comprehend the decision making process for IT investments. Through this decision process it would be plausible to identify possible IT benefits that are expected from an investment. Furthermore, we also try to establish the scope of an IT investment where the IT manager was directly involved to see how it related to the decision making process.

**Table 4.1 Decision making process for IT investments**

Decision making process for IT investments			
Question	Gaming company	Cargo company	Retail company
How does the decision making process of IT investments work in your organization?	“We have the regional team, other team globally and other teams such as the project managers, the engineering team, the admin team, the network team and so on”. [A:10]	“We have processes for everything. We are ISO certified so we should have processes for everything. The process depends on the investment. If it is driven by IT itself or by the business areas”. [B:14]	“...it is a basically simple procedure. I am responsible for making the best decisions about the software and hardware of the company”. [C:8]
Could you briefly describe one of the larger IT investments where you were directly involved?	“We are planning some upgrades for a future expansion in one of our games”. [A:18] “...big investments will be handled as a global purchase. We are involved in the review of the hardware like cost analysis”. [A:12]	“We are implementing a new terminal operating system (TOS). It is the system which handles all in an out goods and cargo. It is the system that keeps us in contact with our customers. So basically it is the core IT system”. [B:18]	“...we noticed that some of the machines were obsolete...We have an old accounting software that we use that needed certain specifications. So we had to change the machines all together”. [C:10]

It is interesting that all three organizations have an established process for IT investments, although it may vary. The Gaming company suggests that in their organization when a new solution is to be implemented the first interaction will come from the development team. They will proceed with the request to the engineering team to design a solution to the problem. The next step is then for the engineers to evaluate what hardware and software will be needed to

implement the new feature based on the specifications that come from the development team. When the evaluation has been made from the engineers' point of view the project managers take over the process. At this point in the process the project managers will engage in creating business case, start with the purchasing process by talking to multiple vendors and create multiple hardware and software options. Once the multiple options have been compiled, the engineers evaluate all the options and decide on which direction to take. Of course, this is done by collaborating with the developers.

When a solution has been decided on, the project escalates to the CIO who then makes the decision on whether this is the appropriate solution and begins negotiating with the vendors (Gaming company). Any final purchasing decision reaches all the way up to senior management. Furthermore, the Gaming company explains that the process is defined and not informal. In the Gaming company, the decision making process is quite complex as it involves a range of departments including developers, engineers, business people, project managers, the CFO and the CIO and finally senior management.

The participant of the Cargo company explains that their organization is ISO certified, so they do have well documented processes which include the decision making process for IT investments. However, in the organization the process depends on the investment whether it is initiated by IT or the business areas. If it is initiated by IT then the CIO needs to write a business case explaining why the investment is needed. This business case should detail all benefits and the pros and cons, the total cost of ownership (TCO) and return on investment (ROI). The business case is then sent on to the economics department to check if the case is correct and the reasoning is sound. If the economics department approves the business case it is escalated to the CIO for yet another approval. Finally, the CIO and the CFO make the final decision on the investment.

If the initiative of the Cargo company comes from the business area it is usually a request for a new IT system such as a tool or new software. The business people would then bring a compiled list of systems that they think would work and if they are solid and can fit into the IT strategy or if they will work in the long term. The IT department then advises them on which course of action is prudent and IT does all of the negotiating with suppliers. As with the previous case of the Gaming company, the project is again escalated to the CIO and CFO level for the final go ahead decision. An important issue that may arise is that the best solution cannot always be chosen. If that is the case, it may be that the second best option is given the go ahead because it is better for the company overall.

Regardless of where the investment initiative originates from, the Cargo company has a standardized procedure. The organization is using the ITIL framework for creating processes for every step in a project or investment which is shown in appendix C. Some of the information in the procedure could vary depending on the investment. For example, it could be an IT investment in terms of new hardware or a system or it could be an operations related investment such as a new crane or machine. The overall process, however, remains the same.

The Retail company is much smaller than either the Gaming or Cargo company and does not have a lot of different departments. However, there still exists a decision making process for

IT investments. The Retail company is directly responsible for identifying which IT investments, whether it is software or hardware, are needed. Again, the investment suggestion can be initiated from different departments, either from the IT manager or the IT users themselves. If the initiative comes from the IT manager then the Retail company is directly responsible for exploring different options from vendors and creating a business case. Once a vendor and solution has been chosen, the projected is escalated to the general manager for final approval. If the initiative for the investment comes from the users of the IT system it is first escalated to the participant of the Retail company who begins exploring options, creates a business case and it is then escalated to the general manager for the final approval.

It is important to note that even though all three informants work in very different industries and are involved in very different IT environments they all have a defined process for decision making in regard to IT investments. In all cases the process follows a logical flow where different departments interact with each other before any decision is made. Most of the responsibility, quite naturally, falls on the IT department and one would expect it is here most discussion around benefits from an investment is being done. It also follows that the larger the organization, the more complicated the process becomes and it can be iterated several times before it is sent for final approval. This may lead to communication issues within the organization which will be discussed later.

It is also worth pointing out that regardless of the size of the organization and the scope of the investment, all informants agree that a business case should be created and multiple vendor and solutions should be explored. During the business case creation and vendor exploration all informants start thinking about what benefits the investment may bring. This topic will be discussed in more detail later in this chapter.

As mentioned above the scope and complexity of an IT investment varies for the informants due to the nature of their organizations. This is important to note since we are interested in what benefits are anticipated from an IT investment, regardless of its scope. The Gaming company is directly involved in large IT investments that are done on the regional level. However, the largest investments are done globally.

The Gaming company explains that they are currently planning hardware upgrades for a future expansion for one of their games and important issues such as cost analysis when reviewing the hardware are done regionally. Interestingly, benefits of the investment are also thought of for the implementation of the hardware. The Gaming company explains that once the chosen IT solution has been made the IT team starts preparing the data centers for the implementation. If there is no physical space available in a designated datacenter, multiple data centers will be contacted. In essence, an additional business case is created where the data centers take the role of vendors and are compared for pricing options for cooling, power, space costs and energy requirements. The data centers considered are located in multiple countries and owned by various companies. The reason for this comparison is namely to compile multiple options and establish which option grants the most benefits.

Once a data center option has been established, the floor plans, i.e. the physical layout where the hardware is supposed to be placed are designed (Gaming company). This results in a

logical overview of how things will look after the implementation. The Gaming company is also responsible for reviewing the parts list and ensuring that it is valid. This is yet another process. Once the parts list has been reviewed and accepted the purchase is done and a purchase order is established. With the purchase order the actual carrier (data center host) can be contacted for shipping details and an implementation schedule can be created. This is yet another process which the IT department is responsible for and it involves creating the technical implementation plans including writing the manual, cabling options, location of hardware and power requirements. The Gaming company, also, points out that communication is paramount due to the very complicated processes that take place before and during an IT investment. For example, shipments may not be delivered on time or even to the wrong locations because of communication issues.

The participant from the Cargo company explains that one of the largest IT investments is currently being done in the organization. The investment is a completely new terminal operating system (TOS) which is basically the core IT system. It handles all in and out goods and cargo and keeps the company in contact with their customers. The main reason for the new investment was that the old TOS was getting outdated and many more benefits could be gained from a new model (the benefits will be discussed in detail further on in this chapter).

The TOS investment has been ongoing for more than a year and a half but now they are in the final testing phase. The Cargo company informs us that this is quite a long process but that such time frame is almost required for the scope of the investment. During the whole process, the IT department has been working closely with the largest business area (customers). The customer needs and processes were identified and the IT department then matched those needs and processes with current TOS systems available in the market. Due to the sensitivity of the system and the fact that it is a core service, the planning and decision period was quite long in order to ensure that the right system was chosen.

The Retail company recently exchanged all of the personal computers and the backend server in the office. The reason for this investment was that the previous hardware was getting obsolete and was causing issues for the users. Upgrading single computers were not a good option since it would cost more than just replacing them with newer models. During the decision making process benefits from new hardware were explored and they will be discussed in more detail below.

All three informants provided with examples of IT investments they have all been personally involved with. Naturally, the scope and complexity of the investment varies depending on the organizations, but there are common themes and issues in the investments. For example, all three informants had faced outdated hardware or software and were aiming to resolve problems that were decreasing the organization's productivity.

## **4.2 Justifying costs and identifying benefits of IT investments**

This section is of particular importance since it gives us valuable information regarding our problem area. Since our informants are working in different organizations involved in different industries and markets, important parallels can be drawn. The purpose here is to

identify which benefits IT managers think about during the decision making process of an IT investment.

**Table 4.2 Identifying Benefits and Justifying Costs**

<b>Identifying Benefits and Justifying Costs</b>			
<b>Question</b>	<b>Gaming company</b>	<b>Cargo company</b>	<b>Retail company</b>
How do you justify the cost expenses of an IT investment?	“You should at least see if you have some kind of return on investment (ROI).” [A:22]	“...you have to compare it with other systems and compare it with the costs you have today. But in the end of the day is how much you can save with your new system.” [B:24]	“We have to have competitive machines on the implementation. So basically I look on the RAM, the processors...” “Basically, allowing people to work faster and with fewer chances of blue screen and machines that work together.” [C:16]
What kinds of benefits or criteria are identified when this investment is decided?	“...lower costs of support, to improve stability”. “...you achieve fewer problems in your platform. So clients become happier, they will keep playing, they will tell their friends they’ve found no problems...” [A:26]	“One [reason] was to get more efficiency in the way you work... to lower costs.” “And [another] was to have a good relationship with our customers. The system has a huge amount of good interfaces in order to talk and exchange information with our customers.” [B:22]	“...to be more reliable. When you have to access the database that is based on the server, on a specific location, you have to be able to trust that what you’ve done have been translated and saved on quite fast timeframe. Because if you are too slow, it is not good. [C:20]
What difficulties are found when measuring these benefits?	“...in one of our games we had a big investment deploying all the hardware. In the beginning we couldn’t give estimations because we didn’t know how many customers we would have.” [A:24]	“...if you lose a customer, and he or she says it is because of the system, you can measure but otherwise it is not possible.” [B:26]	“Basically, the machines are much faster all together. So, there isn’t much to think about that. But the time doing certain reports or reconciliation at the end of the day, has decreased drastically.” [C:18]

During the decision making process, the Gaming company states that a basic justification comes from Return on Investment (ROI). One would think that it is something that seems to be quite easy to measure, however this is not necessarily the case. The Gaming company explains that for one of their projects they had to make a substantial hardware investment in order to get the product to the market. At this time, they were unable to make estimations of what the actual ROI would be because they did not know exactly how many customers they would have. However, after the launch and after the decision was made it is a rather easy calculation to make in order to see the ROI.

The Gaming company states that during the decision making process a business case is made for justifying the investment. Included in this business case is proof concepts and close collaboration with the marketing department in order to get an idea of what the ROI should be. Starting with the ROI seems like a logical first step in justifying costs since obviously an organization will try to avoid making bad investments. However, the Gaming company considers other benefits in the decision process which are not related to financial measures as ROI. One of these benefits is improved customer relations and improved customer experience. The Gaming company suggests one way of doing this is by making platform improvements such as investing in additional hardware. The result of this is increased platform stability and improved performance resulting in a more enjoyable experience for the customer. It is important to note that these types of benefits do not directly impact the ROI but are just as critical since the better customer experience you can offer, the higher your customer satisfaction rate is and the more customers the company will have.

Concerning the benefits of the investment, the Gaming company distinguishes customer relations through the provision of better services or products. The main point of having their customers happy, will come from stable, efficient infrastructure and an effective customer support system. One issue with benefits such as customer relationships is that it can be very difficult to measure. The Gaming company explains that direct feedback from other departments such as the customer support department is one way of measuring the impact of a benefit. The customer support department continuously monitors any complaints that can arise from customers and report the complaints to management. The Gaming company suggests that IT investments in the customer support department are common and in that case the most vital benefit is improved customer satisfaction. As an example, the Gaming company mentions deploying a customer support call center that operates 24 hours a day. In order to deliver such a project you have multiple departments involved, including developers that develop a new tool which allows the support people to directly interact with the customer. The customer agent can then perform an analysis of the issue and ideally resolve it as fast as possible. There will also be hardware investments required to establish such a call center. The Gaming company explains that in this case you are not directly interested in ROI but there is a focus on improved customer relations and customer satisfaction.

Some other important factors that the Gaming company includes during the decision making process are the support contracts that the vendors are offering and the stability of the machines. All these are accumulated to make the investment good and increase their competitiveness. The Gaming company also, refers to other investments that are not bought but built internally. The developers of the Gaming company build internal systems that are used to monitor their platform. Thus, this kind of investment is used to check online players, and monitor possible failures of their system.

Since the investment of the Cargo company is part of their core IT system, several benefits are considered during the decision making process. The first one is to bring more efficiency into the workplace since at the end of the day it is about the bottom line for the company. With the new TOS system they will be able to reduce costs by eliminating some redundant processes in the way they work and thus lower costs. The other main benefit was improving

the customer relationship. The new system provides a vast amount of new interfaces which greatly improves communication and information exchange with the customers. Another benefit was competitiveness since the TOS system had to be different from the one that their competitors were using.

Moreover, the Cargo company mentions that in order to justify the investment they consider some criteria. During the decision making process they look at three key aspects: the environmental aspect, the technical side of the system, and the soft side of the system. Finally and perhaps most importantly, they are aiming at how the investment can make the company better. The Cargo company suggests that if two possible investment solutions are preselected for the available solutions, then they consider and grade each investment according to these three key aspects in order to reach a decision.

The Cargo company, like the Gaming company, suggests that it can be difficult to measure benefits like customer satisfaction but one way of looking at it is by customer feedback. Positive or negative feedback can be acquired by communicating with the customers through a customer support service or by simply talking to the customers and let them share their experiences. It is not, however, always an easy task to evaluate the performance of an investment. For example, the Cargo company explains that it is hard to know how a new system or hardware implementation will work in the company. It is important to trust your previous experiences when making a decision. Experience was a very important factor for doing proper evaluations and you always learn something new from every investment. The Cargo company argues that you cannot measure the hard facts in some systems and at times it is speculation when analyzing how many resources you will save.

The Retail company states that in their organization the focus during the decision making process is on making the workplace more efficient and reliable. They value these particular benefits because the organization had faced a lot of problems in the past and they want to enable the staff to perform tasks much faster. Reliability is also an important benefit that is being considered during the decision making process. Some common issues during the daily work are slow network connections and malfunctioning servers. This results in the workforce not being able to be as efficient as they would like. Efficiency and reliability then are the two main benefits that the Retail company suggests when IT investments are being compared. The system that brings more efficiency and reliability to the workplace, it will usually be approved, even if it is more expensive.

The Retail company also notes that customer relations are critical to the organization. The Retail company argues that if the workplace is efficient it results in better customer service and a better image of the business from a customer perspective. Finally, in relation to the price of their purchased machines they also regard support features that their vendor might supply (Retail company). That was an important feature as well, because with their previous investment, they had to regularly contact their support providers which cost them time and money.

### 4.3 Expectations of IT investments

In order to obtain a better understanding of what benefits would be discussed we also need to know the expectations the interviewees had on the IT investments and the reasons for deciding on making the investment. These expectations is an implemented part of the decision making process and relates to the business objectives of each company and to the nature of the investment. Thus, the expectations depend on the needs of the company and to the problems that they face.

**Table 4.3 Expectations of the IT investment**

<b>Expectations of the IT investment</b>			
<b>Question</b>	<b>Gaming company</b>	<b>Cargo company</b>	<b>Retail company</b>
What expectations do you have from the investment?	“Whatever we do has to fulfill a need. So depending on what it is, we are aiming to improve an already existing product - provide stability or a new feature. If it is a completely new product we are aiming to make the customers satisfied and happy.” [A:34]	“Well it is fulfilling a lot of needs. We have the customer side of it, we have a good booking interface where customers can book, release their trailers etc.” “And the organization of course. With the old systems a lot of procedures had to be manually performed... Now, we hope to decrease the turn time by 48%.” [B:36]	“...you need to have really reliable machines to work on it. You understand that if you have to re-upload everything, it is time consuming which also lowers our image with our customers. All the background services are also quite important for the customers. So my responsibility is to assure that everyone will be done on time and these work 100%.” [C:22]

The Gaming company distinguishes the investment between the ones that are implementing a new product or service and the ones that add new features to existing systems. In the event that an investment is needed for creating a new product, the highest priority is given to customer satisfaction. It will have to be a new product for the market which has to be centered to the customers’ needs in order for it to succeed. In case enhancements are added to existing products, stability is the main concern. In that case, the market acceptance was already tested, thus the company wants to make sure that their product will remain stable and reliable for its customers.

The Cargo company, specifically, addresses customer relations expectations as the most important outcome of the investment. The new investment is expected to facilitate customers in the way they interact with the company. Moreover, their older system had been time consuming since all of the procedures had to be executed manually. Problems identified from the previous system, are expected to be dismissed with the new one which will automate procedures. Therefore, on one hand customers will be faster and more efficient in their transactions. On the other hand, the efficiency and automation of the new system could provide a faster way for the employees to do business which will increase their productivity. Finally, on the bottom line, the company will avoid costs for extra work force.

The Retail company also focuses on reliability and efficiency needs. Their business, as they own a web shop, does not allow them to be slow and unreliable. Their previous software packages on the other hand were inefficient and too difficult to operate. That resulted to a decrease of employees’ productivity and consequently to a bad image to the customers. Thus, the expectations of the Retail company were predefined and centered to efficiency related demands.

**4.4 Satisfaction with the decision making process**

The next question aims to clarify the degree of acceptance of the decision making process. In this question, conclusion can be drawn regarding the effectiveness of their decision procedures.

**Table 4.4 Satisfaction with the decision making process**

Satisfaction with the decision making process			
Question	Gaming company	Cargo company	Retail company
Are you satisfied with the IT investment decision process?	“I would say yes. We invest in a lot of things. We do it the correct way. But no company or person is perfect and a lot of times the investment is not enough so we have to go back to the joint board for an additional purchase and investment. A lot of times we invest too much, and transfer what we bought to different projects.” “Generally, it could be improved in the communication part.” [A:36]	“Well you can always improve the decision making process. You learn by every investment you make. There always the need to have an extra document for your investment. So for the next investment we learn from our mistakes. In a large company, IT can learn from other departments and I think we already have too much work in our department. We don’t exchange experiences as much as we could or should.” [B:38]	“... I am satisfied with that. It is a really nice environment. Nobody bothers me. If I decide something, I am able to buy it. When there is a need I go and buy what is needed and everyone is happy. But, I am also sensible on what products I am going to buy. I don’t go with the first solution. I look around to find what is available, what are the current prices etc. and I make my decisions from there.” [C:26]

The Gaming and Cargo companies agree that there could be improvements in the decision making process. Nothing is perfect so mistakes can also be made. Nevertheless, as the Gaming company states that, alternative solutions can be found in the event that problems come up. Both the Gaming and Cargo companies also perform a testing and analysis on big investments in order to specify more clearly the expectations. Also, both of them denoted communication problems with the other departments of the company. The communication part is the one that can accept improvements and facilitate the decision making process. Nevertheless, it could be noted that each investment provides valuable experience to the employees and previously neglected actions contribute to the acquired experience for the next investments (Cargo company).

The Retail company belongs to smaller company with fewer participants on the decision making process. In this case, the participant of the Retail company is perfectly satisfied with the decision procedure of every investment. Of course the rest of the employees recognize the participant’s ability of making the best decisions towards the company’s best interest. Thus, the whole communication flows normally, as the few people who are involved in the decision, trust participant’s evaluations.

**4.5 Weighing the importance of benefits**

This question aims to identify the factors that contributed the most to the selection of a particular investment. Since, the participants have to evaluate all the available products from the market, certain factors or benefits are the ones that enact the participants to prioritize a specific solution. So, the next question evaluates which benefits weight most towards the final decision of the investment.

**Table 4.5 Benefits importance**

<b>Benefits importance</b>			
<b>Question</b>	<b>Gaming company</b>	<b>Cargo company</b>	<b>Retail company</b>
What was the most important factor that contributed to the decision for your investment?	“It has to do with 2 or 3 important things. So final user experience, support contracts on the purchased hardware, previous stability of hardware from a vendor.” [A:44]	“...there were new features and the benefits of those features were better relations with the customers, better infrastructure, better way of running the business and better support for the company.” [B:46]	“We consider the support issues we can get from the vendor. And of course specifications in relation to the price. For example what the price is when the specifications are the same.” [C:24]

The Gaming and Retail companies are mostly considering support issues from the vendors. This is an important factor for them and regards both financial and productivity related benefits. The Gaming company has also commented on a badly structured support dimension where the company loses a lot of time and resources in order to handle this problem. The Gaming company also considers final user experience and stability features that are equally important in the decision. So, once again stability and user experience become an essential feature for the strategy of the business as they focus on efficiency and customer relations respectively. The Cargo company accounts for a wide range of benefits that could result from an investment. Firstly, the mentioned benefits include efficiency and a better way of running the business which has an immediate effect on the productivity of the employees. Secondly, customer relationship is also denoted which result from a better customer support applications from the newly added features.

## **5. Discussion**

In this section, the chosen framework will be discussed and analyzed along with the interview findings. The section will start by analyzing the decision making process as it is depicted in the research framework. More detail will be given to specific parts of the framework such as the initial organizational considerations and the benefits that are expected by each available investment. The coding of the transcribed interviews will be used in the benefits section – more specifically for the strategic, informational, transactional benefits the coding (STR-1 to STR-8), (INF-1 to INF-7) and (TRS-1 to TRS-10) will respectively be used. This way it will be easy to track and connect with the selected framework every benefit that was identified from the transcribed interviews.

### **5.1 Decision making process**

It was important for the research to comprehend the decision making process and what people in the organization are involved in order to get an overall picture of this process. In our research findings, the decision making process shares some common elements in all organizations. An IT investment initiative may come from various departments but the IT department, quite naturally, is always involved (Gaming, Cargo company). The decision making process for IT investments involves a multitude of considerations. For example, IT managers consider costs, benefits, service and support as the research findings suggest, while the IT department considers more technical and operational aspects. Several departments may be involved regarding of the scope of the company but the final request is escalated to senior management who makes the final approval.

It has become evident from the interviews that the decision making process for IT investments is a complex and a time consuming procedure which involves a lot of people for its justification. Making the proper decision of an investment is an important factor as it affects the whole organization, thus a strong need is created for an established method. This is the reason why the chosen framework helps in analyzing the complicated process of decision making. The framework firstly presents considerations related to the organizational objectives, goals and problems that the organization might face from previous objectives and secondly it relates all these considerations to the range of benefits acquired from the investment. All these different assessments provide a formal way of categorizing the thoughts and needs of the decision makers and analyze the outcomes of the intangible benefits.

According to Gunasekaran et al. (2006) the decision making process and the criteria that are examined are mainly based on the organization's strategies, goals and objectives. Thus, the decision of an IT investment can be analyzed by a logical flow which begins from strategic, tactical, operational and financial considerations based on organizational objectives. All of these dimensions provide considerations that decision makers need to apply in order to reveal the benefits that the investment will bring. For these reasons, it is required that different departments cooperate in the process. For example, if the business department is looking to invest in a new IT system to enhance business processes it needs to ensure that the system fits with the organization's IT strategy and the financial department investigates if the costs are acceptable (Cargo company). On the other hand, the IT department of the Cargo company contributes to more technical based objectives. The final decision is made by senior

management which could reach as far up as the CEO and CIO level (Gaming, Cargo company).

The first and most important finding from all of the interviews is that justifications of an IT investment are not solely based on cost reduction criteria but to the overall benefits. This way the whole contribution of the investment is evaluated to the overall organizational performance (Lin et al. 2005). Thus, several anticipated benefits are considered and influence the decision of an IT investment. It is important to note that some benefits are more important than others depending on the organization but the key point, that cost benefits may not be as important as it may seem, is the same. Our research has revealed other benefits that are at least as important as financial benefits. For example, improved customer relations and business efficiency were regarded as very important benefits.

All of the interviews have shown that measuring the intangible benefits is not a procedure that can be easily defined and quantified. Nevertheless, experience is an important factor that allows the decision makers to proceed to the more beneficial solution (Cargo company). The interviewee from the Cargo company also suggested grading the benefits in order to provide their quantification. Certainly, this grading is strongly dependent on the experience of the participants and more importantly on the objectives of the company that are analyzed on the first level of the framework. Therefore, if a company wants to enhance its competitive advantage, the investment that is graded higher on the view of strategic benefits, will be prioritized.

Since, the main characteristics of the decision making process have been established, the following sections will describe in more detail every part on the theoretical framework along with the findings from the interviews. It will begin from the first level considerations that every department performs, followed by the anticipated benefits of the investment.

## **5.2 Strategic considerations**

Strategic considerations focus on the strategic dimensions of the organization and may vary depending on the organization as each company may have different objectives regarding economical, market and competitive goals (Gunasekaran et al., 2001). First and foremost, an IT investment is correlated to the company's strategies, thus it is important to firstly identify the strategies and business objectives of the company. For example, for a Gaming company it is crucial to have high performance machines and a sophisticated data center in order to support its demanding services. Moreover, the Cargo company has to provide efficient solutions that would facilitate the frequent interactions with its customers. Finally the Retail company wants to efficiently provide and advertise its new products. Thus, the business and strategies of the company become standardized things when considering the requirements of every investment.

All these objectives may belong to the strategic planning of the organization as "a series of discussions and decisions among key decision makers and managers about what is truly important for the organization" (Bryson, 1988, p.74). Therefore, all of the interviews have

shown that senior management is responsible in considering the strategic dimensions of an investment and it is that department which approves the final investment.

Gunasekaran et al. (2006) also, argue that the significance of IT plays a crucial role in the overall organizational performance and therefore the strategic considerations are linked with IT investments. The response of the Cargo company was indicative in that case since it was admitted that an investment decision is based on criteria that improve the overall company and not in choosing the first best solution.

Moreover an IT investment is related to the company's ability of being competitive (Ives and Learmonth, 1984; Henderson and Venkatraman, 1993). All of the interviewed companies, regardless of their sector and administrative structure, had to deal with different kinds of competition. The interviewees were well aware of the market demands and their competitors. Thus, every consideration of an investment was made regarding the existing competition and was aiming to improve customer relations. For example, before the decision of the investment, the Cargo company was well aware of the services that their competitors were providing.

Interestingly, our findings indicate that most strategic considerations are done with the customers in mind and all of them deliver some service to customers. Some of the investments were directly addressed to customers (Gaming, Cargo company) and some other indirectly – they were addressed to the employees that could allow the improvement of offered services (Retail company). The customer relation benefit will be discussed in a later chapter, but it is still worth noting that our research indicates that all organizations have a strong need to establish good customer relations and this is clearly shown in the strategic considerations.

Furthermore, competitive business leads to an added need for good customer relations since it is seen as a clear competitive advantage. We argue that a core long-term business strategy is dependent on a strong customer relationship. For example, the participant of the Retail company argues that the business is unable to sustain frequent outages in IT since they would lose customers and they cannot afford to have their system down at any time. Therefore, improvements on customer relation are always part of the strategic considerations.

It is important to note that strategic considerations focus on long term objectives and plans (Weill and Olson, 1989). The research indicated that long term strategic considerations are very important as it is a tool to think about where the company will be several years from now. More specifically the Cargo company has spent more than a year before the implementation of the investment which indicates that this system is intended to be used in the long-term. Because strategic considerations are being looked into during the IT investment process, it naturally follows that organizations are not only looking at financial benefits but also other benefits that can be extremely valuable in the long term.

### **5.3 Tactical considerations**

While strategic considerations focus on long term goals and objectives, tactical considerations focus on short or medium term goals. Tactical considerations of an IT investment are usually addressed to an immediate goal (Ward and Griffiths, 1996). According to Gunasekaran et al. (2006), it is important to consider how IT may directly or indirectly affect organizational performance in order to identify the suitable measures and metrics for planning and implementation of IT.

All of the interviewed companies have indicated tactical considerations in their decisions which were close to operational problems that were faced. For example, the participant of the Retail company recognized that simple tasks, such as uploading products to their website, are being done much slower than they should due to network latency. Database stability problems were concerning the Gaming company as it results to a less than optimal customer experience. All of these issues were of high priority since they were affecting the organizational goals and hampering customer relations. Therefore, the immediate outcomes of an investment were needed.

Moreover, tactical considerations have to ensure the success of the investment (Gunasekaran et al., 2006) and the use of critical success factors could allow the evaluation of the investment (Gunasekaran et al., 2001). A critical success factor could for example be the response time of a service (Cargo company) or the number of customers that will start using the service (Gaming company). The Cargo company stressed the importance for a fast turnaround time for their customers. The tactical consideration in this case used a critical success factor that was proposed to reduce the turnaround time by 48%. Also, the Gaming company mentioned that they were making estimations about the expected clients that will be registered to their game and success is related to the number of customers and the positive feedback that they will receive.

### **5.4 Operational considerations**

Operational considerations focus on short term goals. They are similar to the tactical considerations but concern more technical aspects that affect organizational performance, efficiency and productivity (Singleton et al. 1998). Moreover, operational considerations are usually determined with data migration, operational upgrades and anything relating to the existing IT infrastructure, in mind (Gunasekaran et al., 2001).

All investigated organizations recognized what the target is for the operational matters such as efficiency, stability and time reduction. These issues are also related to deficiencies that organizations face from their previous systems. For example the Retail company faced several system breakdowns and network latency. So, operational considerations are directly linked to these problems and aim to an investment that could provide a solution to the issues. For example, all our interviewees emphasized efficiency when accounting for operational considerations. In some cases also there were several stability problems (Gaming, Retail company) and time consuming issues (Cargo company) which negatively affected the organizational performance.

The main point here is that all departments work in unison with the IT department (Gunasekaran et al., 2006). For example, the IT environment, whether it is hardware or software, in an organization should be spearheaded by the IT department in collaboration with other business functions. The research agreed with that point and indicated the collaboration among different departments with the IT people (Gaming, Cargo company). More specifically, it was recognized by the Cargo company that the business department was consulting the IT department whenever an IT investment was needed. In this case, the business department would know precisely what goals the solution should meet and the IT department would be in charge of the technical aspects and propose solutions that would fit with the IT strategy (Cargo company). Moreover, the IT manager from the Gaming company argued that most IT investment requests will be initiated from the development department. The IT department would take lead on the investment but the opinion of the developers was dominant in order to ensure that operational goals are met (Gaming company).

For these considerations also, critical success factors can be established in order to validate the success of the investment. The participant from the Gaming company claimed that the estimations of the expected customers allowed calculating the needed database usage. Finally, the participant from the Retail company was expecting to dismiss network failures and machine crashes.

## **5.5 Financial considerations**

Financial considerations are always an important part of every investment. Therefore, a basic budget is always regarded in order to estimate if the company is in a position to make the required investment (Gunasekaran et al., 2006). If the initial budget is not approved by senior management or directors, it becomes impossible to consider extra intangible benefits that might increase the cost (Gaming, Cargo, Retail company).

Furthermore, financial estimations do not only regard the initial budget of an investment but also the long term costs. Thus, the decisions of the organization are not focused on the initially less expensive investments but also on long term financial considerations. Thus, systems which are expected to cause unjustifiable costs in the long run are rejected from the decision. As an example, a system that does not provide the desirable support could not be regarded advantageous for the company as it will cause extra financial expenses in the long run (Gaming, Retail company). Finally, as Gunasekaran et al., (2006) suggest, financial evaluation regards the overall outcome of an IT investment in terms of metrics. The research indicated that the managers from the Gaming and Cargo company were performing certain financial measurements such as Total Cost of Ownership (TCO) and Return on Investment (ROI).

The financial considerations complete the first level of organizational considerations of the decision making process. The following level examines the tangible and intangible benefits that are expected from the investment. These benefits complete the justification of an investment and allow a better evaluation of the available investment options.

## **5.6 Benefits**

Following the above mentioned considerations, the anticipated benefits will approve a specific investment and will position it towards the success and progress of the organization (Irani 2002). Strategic considerations which are related with the core business of every industry and concern long term goals (Weill and Olson, 1989) are related to strategic benefits. On the other hand, tactical and operational considerations, which regard medium or short term goals (Weill and Olson, 1989), are related to informational and transactional benefits.

This part of the anticipated benefits was coded in the interview transcripts (section 3.4). Since the interview contained several follow-up questions, several benefits were identified among the answers. For this reason the coding was used to easily trace and place in every category (strategic, informational, transactional) of the research framework, the according expected benefit from the investment.

### **5.6.1 Strategic benefits**

The strategic anticipated benefits of an investment were widely examined and used from the research. These strategic benefits are correlated with the strategic considerations that an organization is making in order to achieve long-term goals (Shang and Seddon, 2002) and enhance its competitiveness. Thus, it was found that all of the companies were examining the strategic benefits that the investment could yield and their decision was highly depended on these benefits.

All the sub dimensions, i.e. competitive advantage, alignment, and customer relations of the Mirani and Lederer (1998) framework were included in the anticipated benefits of the investment. Firstly, most of the companies in the today's market face competition, thus their investment aims to enhance their competitiveness. Even though none of the investment was identified as something that would create a strategic advantage (maybe it is difficult to presume that an investment could bring a strategic positioning), the market competition was expected and more importantly the investments were regarded as the means to catch up with competitors (Mirani and Lederer, 1998). Most of the interviewed companies are well aware of their competitors' best practices, services and tools they use. This case is mostly indicative in the Cargo company which had considered implementing the same terminal application as with its competitor. Therefore the organizational decisions on investments are influenced by their immediate competitors.

Secondly, benefits belonging to the alignment category are correlated with organizational goals (Mirani and Lederer, 1998). The approved investments of an organization form a part of their core business and are always aligned with predefined organizational objectives. For example the Gaming company has a primary goal to provide highly efficient services to its customers. Therefore, its investments are aiming to be aligned with these demands by buying highly competitive machines. Mirani and Lederer, (1998) also refer to linkages that could be achieved with other organization. Nevertheless, this kind of benefit was not revealed to be a part of the anticipated strategic benefits.

Finally, the most important factor of the expected strategic benefits refers to customer relationships. Decisions on an investment are centered on the customers either by providing a new product or service or improving previous ones. The investment could directly or indirectly affect the customers. For example, it could be either used indirectly within the company in order to facilitate internal processes or directly as a tool that is addressed to customers. The Retail company has mentioned their previous inefficient system which decreased the employees' productivity and caused a bad relationship with the customers. On the other hand, their new investment will eliminate previous malfunctions and thus improve their image towards their customers. The Cargo company was also implementing a new service which is directly addressed to customers as it is expected to lower customer transaction times. Finally, the Gaming company was counting a lot on customer's feedback and mentioned that a pleased customer brings publicity and more customers. In all of the cases, the strategic dimensions of a company are towards the customer, thus an investment is anticipated to provide better services or products to the customers and improve the organizational image (Mirani and Lederer, 1998).

Even if strategic benefits are so important for the organizations, they are difficult to quantify and measure. For the most important strategic benefit from the research – customer relations – managers could make some estimations but it is difficult to measure even after the implementation of the investment. One way to address this issue is through direct feedback from the customers (Gaming, Retail company) and through predicting the response time on customer support issues (Cargo company).

### **5.6.2 Informational benefits**

Informational benefits regard a better and qualitative diffusion of the information within an organization that could facilitate the communication and the internal processes (Mirani and Lederer, 1998). Possible informational benefits of the investment were not directly affirmed by the interviewees and these types of benefits were not influencing considerably the decisions of the managers. In most of the cases, focus was given only to accurate, reliable information for produced reports on the customer support aspect (Retail company).

The omission of informational benefits could prove as a paradox since the research has identified communication problems among the company departments (Gaming, Cargo companies). Nevertheless, even though decision had not been centered to the informational benefits of an investment, it was stated that every investment is expected to contribute to the overall experience of the departments (Cargo company). Also, the decision making process in big companies, such as the Gaming and the Cargo companies, is well-documented which is something that provides useful insights for future investments.

Moreover, it was found that investments that run as internal tools of monitoring or reporting, contribute to the overall Mirani and Lederer (1998) benefits of informational accessibility, quality and flexibility. It could be noted that informational benefits depend on the nature of the specific investment which means that investments directly addressed to decision making services, are expected to deliver informational benefits. For example, the Gaming company was using a tool that was implemented internally in order to produce an overview of their

platform performance. This tool was indeed very helpful for the accessibility and presentation of useful information but it was not one of the top priorities investment. In fact, it was mentioned that the initial purpose of the investment was different from the one it serves now.

### **5.6.3 Transactional benefits**

Transactional benefits are primarily focused on systems development efficiency and business efficiency as a means of decreasing costs and saving money (Mirani and Lederer, 1998). Transactional benefits are equally important as the strategic ones. These benefits are related to tactical, operational and financial considerations. For example, tactical and operational problems that are faced by a company are expected to be solved by the new investment. It is evident that all of the interviewed companies were aiming towards reducing financial expenses. Thus, the anticipated transactional benefits of an investment hold a primal role for every company.

The first sub dimension of transactional benefits is communication efficiency which reduces expenses such as travelling and communication costs (Mirani and Lederer, 1998). The Retail company, of the research, had faced issues such as frequent communication with their support center. This kind of problem is expected to be resolved by the new investment and to reduce the constant interactions with the support center. Also, the Cargo company explained that the newly implemented investment is expecting to reduce the constant interactions between the customers and the personnel and thus gain more financial resources and time. These kinds of benefits, which are anticipated in the short-term, are related to previous inefficiencies and are considered as prerequisites for the investment to be approved.

The second sub dimension of transactional benefits is to save money by advancing systems development and maintenance activities (Mirani and Lederer, 1998). This benefit is focused on efficiently developed applications and it was more evident in the Gaming company. This company was aiming to achieve fewer problems in their platform and reduce costs of support. Thus, the only important factor from the Mirani and Lederer (1998) sub dimension, was the decrease of maintenance, system enhancement and modification costs.

For the third sub dimension, the bottom line of the company is to automate procedures that could increase employee productivity and avoid the need for extra work force (Mirani and Lederer, 1998). The Cargo company was firstly anticipating these benefits. It was clearly mentioned by the Cargo company that it is aiming to avoid increasing the work force and to shorten the transaction cycle of a previous procedure. Moreover, the automation of procedures is an important factor because it enhances the employees' productivity and shortens transactions (Mirani and Lederer, 1998). This is a highly considerable attribute from the investment since both of the Cargo and Retail company admitted that they were facing several operational problems with their previous systems. The Cargo company aims to automate a procedure which will eliminate earlier manual operations and the Retail company was concentrated on the new investment which will manage to upload data without any errors and thus increase efficiency and productivity. Finally, the decision of the Gaming company was depending on the technical department which knew exactly what was needed in computer specifications in order to enhance efficiency.

Finally, an important benefit that it is also feasible to measure is the increase of return on financial assets (Mirani and Lederer, 1998). Most of the interviewed companies were leaning towards the financial outcomes of the investment. More specifically, both the Gaming and Cargo company were estimating measures of ROI in order to justify financial measures.

#### **5.6.4 Environmental benefits**

The research has revealed an extra benefit that is considered during the justification of an investment. It concerns the environmental dimensions of a company. This category was missing from previous literature but was implemented in the decision making process of one of the Cargo company.

Environmental benefits positively affect both sides of organization and community. It is highly depended on organizational social conscience aspects but it yields to multiple advantages. On one side, the public is benefited by implementing green solutions for the environment. On the other hand it is linked with both the strategic and transactional benefits of the selected framework. According to the interviewee from the Cargo company, the contribution to the strategic dimensions of the company is publicity and having a better image which enhances customer relations. Other benefits identified which are towards the transactional dimensions of the framework have to do with saving money by using more energy efficient devices.

Nevertheless, it could be assumed that organizations need to have the financial assets to invest on a more environmental friendly and possibly expensive solution (Cargo company). Thus, organizations whose strategic objectives focus on environmental decisions, will have environmental benefits implemented in their decision making process. For example, it was mentioned by the interviewee of the Cargo company that their strategy is directed towards the environment because they are operating in a less environmental business. Moreover, their company has the financial ability to select an environmental system and thus, the environmental decisions hold an important role for the investment justification.

## 6. Conclusion

The research presents the decision making process of an IT investment through the investigation of the overall benefits that contribute to that decision. The extensive literature review allowed us to create a generalized model that could be applied to the decision making process. This model is a combination of two different theoretical frameworks and has two levels. It begins by investigating and assessing the organizational considerations that could trigger and enhance the process of decision making. The second integrated level to our model categorizes the benefits that are expected from an investment. The benefits categorization permits the better exploration of the benefits that are anticipated and provides a better analysis of the interview findings. Thus, it was easier to identify the intangible benefits that justify a specific investment over the other.

### 6.1 Research questions

In the following section we will the initial research question will be answered and the final conclusions will be presented.

*Q1. How do organizations assess IT investments?*

Regardless of the internal tools that are used during the decision making process of an investment, the whole process could be generalized and described by the proposed theoretical framework. The framework explores the initial strategic, tactical, operational and financial considerations that are based on the objectives and characteristics of each company. The next step is to identify the overall tangible and intangible benefits that are anticipated by the investment and finally lead to its justification. The generalized procedure of the framework allows breaking down the objectives, goals of an organization and later assessing the benefits that each investment could bring. All the initial objectives are correlated with the anticipated benefits and this case presents a general way to justify the decision of an investment.

It can be concluded that even if organizations do not have a formal benefits management tool implemented in their decision making process, benefits are always considered informally and affect the final selection of an investment. Thus, it is important to observe that the consideration of intangible benefits becomes an inseparable part of the investment decision process. Therefore, the commoditization of computers as mentioned by Carr (2003) does not result to the least expensive and low risk solution, but to the investment that is thoroughly examined and which could bring various benefits in the long term. Finally, “many managers are now appreciating the wider strategic implications of an IT infrastructure” (Gunasekaran et al., 2001 p. 351), and their final decision is based on objectives that could yield long-term benefits.

In general, organizations do not focus solely on a single factor when evaluating an investment but on a range of factors that contribute to the overall goals of their business. The basic aim of an organization is to increase its competitiveness and thus, enhance the strategic direction of its business. Since the overall benefits account for the decision of the investment, it is concluded that a decision targets the long term prosperity of the business of the company.

Finally, the synthesis of the proposed theoretical framework allows the analysis of the basic organizational goals and benefits that could enhance the overall company.

*Q 1.1 What expected benefits are taken into consideration when assessing IT investments?*

The research has shown that several other benefits are influencing the decision making process and are expected to be achieved by the investment. A list of these benefits is presented according to the (Mirani and Lederer, 1998) categorization:

Strategic Benefits

- Enhance competitiveness or create strategic advantage.
- Enable the organization to catch up with competitors.
- Align well with stated organizational goals.
- Improve customer relations.
- Provide new products or services to customers.
- Provide better products or services to customers.

Informational Benefits

- Enable faster retrieval or delivery of information or reports.
- Enable easier access to information.
- Improve the accuracy or reliability of information.
- Improve information for operational control.

Transactional Benefits

- Save money by reducing communication costs.
- Save money by reducing system modification or enhancement costs.
- Allow other applications to be developed faster.
- Allow previously infeasible applications to be implemented.
- Provide the ability to perform maintenance faster.
- Save money by avoiding the need to increase the work force.
- Speed up transactions or shorten product cycles.
- Increase return on financial assets.
- Enhance employee productivity or business efficiency.

In addition to the mentioned benefits an extra benefit was revealed by the research which is related to environmental dimensions. This benefit is of particular importance since it was not mentioned in the previous literature as a benefit that could influence the justification of an investment. Therefore, companies can implement the environmental benefits in the decision making process of an investment. Moreover, this extra benefit has a dual role. First, it yields a positive impact to the whole community and second it improves the organization's image and customer relations. So, it is correlated to the strategic considerations and objectives of the organization and affects the final decision of the investment. Certainly, it is highly dependent on the strategic directions of the organization, its social conscience and moreover on financial aspects.

### *Q 1.2 How do the expected benefits influence the final decision?*

Customer relations and business efficiency were the benefits that were influencing the most the decision making process. Firstly, for the customer relations, it becomes evident that every company counts on a specific customer which is essential for its existence. Thus, an investment that could become more appeal to the customers, becomes a priority. Secondly, efficiency is also an important factor for the companies. The research has shown that efficiency related problems are commonly faced by organizations. Therefore, a top priority for the investment, is to eliminate these issues and increase the overall operational efficiency – both for the employees and the customers.

The final decision is highly dependent on the cost of the investment as it has to be approved by the senior managers or the directors of the company. Nevertheless, customer relations and business efficiency are two benefits that are considered essential for the evaluation of the investment. Thus, the final decision is considerably influenced by these two benefits that enable managers not to regard solely cost reduction aspects.

## **6.2 Final discussion**

The research has analyzed the anticipated benefits of an IT investment which supplement and sometimes overcome traditional financial evaluation models. A generalized framework was composed which enables managers to assess attributes, considerations and organizational objectives that could lead to an effective justification of an IT investment. All these appraisal techniques provide a means of assessing the benefits of an investment and yield to an effective decision that contributes to the overall organizational performance.

The final presented framework could allow senior management to categorize business objectives, and finally grade each benefit according to its importance for the company. Each investment may target different objectives, thus benefits weigh differently in the decision process. All these different assessments provide a formal way of categorizing the thoughts and needs of the decision makers and analyze the outcomes of the intangible benefits. It is concluded that the measurement of intangible benefits is a procedure that could not be easily achieved. Nevertheless, an informal grading of the benefits of each investment based on the experience of the decision makers could demonstrate a way of measuring an intangible benefit.

## APPENDIX A - Interview guide

Interview Guide Project: Assessment of the justification criteria of an IT investment.

Date and time of interview:

Place:

Interviewer:

Interviewee:

Position of the interviewee:

*(Description of the project)*

### Questions

- What is your current position at the company?
- What are your current areas of responsibilities?
- What is the core business of your company?
  1. How does the decision making process of IT investments work in your organization? Which people are involved?
  
  2. Could you briefly describe one of the larger IT investments where you were directly involved?
  
  3. How do you justify the cost expenses of an IT investment? *What kinds of benefits or criteria are identified when this investment is decided? What difficulties are found when measuring these benefits?*
  
  4. What expectations do you have from the new system? *What needs will it cover?*
  
  5. Are you satisfied with the IT investment decision process?
  
  6. What would you think that was the most important factor that contributes to the decision of an investment? *What other factors were of less importance?*

*Thanking the participant and asking for additional documents.*

## APPENDIX B - Interviews

Q. = Question, A. = Answer

### Informant A – Gaming company

1.	Q.	What is your current position with the company?	Comments
2.	A.	I am the company's online network systems supervisor for Europe. I am the manager of the European team and then we have several teams like the admin team, sys admins, the technicians, networks admins who all report to me. Finally, I report to the senior IT manager of my company.	
3.	Q.	What are your current areas of responsibilities?	
4.	A.	Our team is responsible in Europe, for all its external systems which includes game rounds, websites, authentication, payment. Everything that is involved with the customer directly- where they play, what they interact with. It's our responsibility to maintain and to implement. If there is new hardware, new solutions to be developed, it is responsibility of our team to fix and develop.	Customer focused processes
5.	Q.	What is the core business of your company?	
6.	A.	The core business is gaming, entertainment for everyone, for kids up to grownups. I know a lot of people who play some of our games which is very successful. The company does not focus so much on the quantity but on the quality of its products.	
7.	Q.	How many titles you've released?	
8.	A.	[big pause] Basically 15 games in 20 year lifespan.	
9.	Q.	How does the decision making process of IT investments work in your organization? What people are involved?	
10.	A.	<p>Within our department we have several teams. We have the regional team, other teams globally and other teams such as the project managers, the engineering team, the admin team, the network team and so on. So whenever there is a new solution to be developed, the first interaction will come from the development team. They will ask the engineers to design of a solution for their game. On that case, the engineers will start evaluating what will be needed for the system. All the specifications come from the development side. They are the ones who are developing. They know which kind of services is needed to run in our sides. With all that information, we will be able to estimate the amount of hardware that will be needed. Once that is done, the engineers will request to the project managers to prepare a project with 'x' amount of hardware. They provide all the specifications and the project managers will start running all of the process. The process will include purchasing, engaging with multiple vendors and different types of hardware. Afterward, the vendors will provide that, the engineers will test and evaluate this, collaborating with the developers. The developers need to be happy about the solutions we are proposing.</p> <p>I would say that our decision making process is partially formally defined. So we provide some different kinds of solutions for the developers and then the developers together with us will reach the final decision of what solution will be better. In total, we have a lot of people and business "views" involved – business man, technical guys, operations, management. The decision may reach close to the CIO level depending on the negotiation that will be done with the partners. It is the senior management that gives the ok for the purchasing part. But the decision on what to buy comes from the operational part.</p>	
11.	Q.	Could you briefly describe one of the larger IT investments where you were directly involved?	
12.	A.	Now in this position that I have, the decision making is on a regional level. On the other hand, big investments will be handled as a global purchase. We are involved in the review of the hardware like cost analysis.	
13.	Q.	Besides the investment decision, how is the implementation of the investments handled?	

14.	A.	On the implementation process, once we know the selected hardware, we start preparing for the data centers for it. If we have no space for it, we have to contact multiple data center providers who will provide cooling, energy etc. All of that will be done in multiple countries and companies, in order to achieve the best price. Once we have the datacenter, we start designing the floor plans and after that we have an idea of how everything will be designed and look like logically. For example, we use visio to check the designs, possible free space. All these should be evaluated before signing the contract. Once we have all these done, everything will be purchased in USA which will send us the parts list to review it and everything is purchased in USA.	
15.	Q.	<b>Is there an internal procedure for checking the parts?</b>	
16.	A.	After USA send as the part list, all regional teams have to review it and we check what is correct or not. Once it is accepted the purchase is done. Once we have the purchase order, we will contact the carrier that will do the actual shipping and start having the implementation dates. We always have timelines for the different projects and we want to have everything ready some months before. During this procedure, the technical teams are creating the technical implementation such as the manual, cabling option, where servers are placed, extra memory requirements etc. We work globally now and it is complex, mostly because it hard to work with different time zones. For example, some problems that we face happen at 3.00 AM in USA.	Complex IT department. Different regions, global scale. Different time zones
17.	Q.	<b>Could you briefly describe a recent implementation or a software that needed to be designed and what issues were faced?</b>	
18.	A.	We are planning some upgrades for a future expansion in one of our games. We receive a shipment from USA where and no one communicated with us, so the hardware that was supposed to go to Germany, stayed in France. So sometimes, this kind of communication is not very fluid but we are working on this and it gets better.	
19.	Q.	<b>So is communication one important problem that you can run into during the implementation of a new investment?</b>	
20.	A.	It is difficult to assume some situations, if you have bad communication, or if people don't tell you what to expect. And if don't tell you exactly what they want, a lot of time you have a perception that is different from what they want and expect. And that may create a bit of confusion. In my opinion, communication is a very important thing.	
21.	Q.	<b>How do you justify the cost expenses of an IT investment?</b>	
22.	A.	You should at least see if you have some kind of return on investment (ROI). Let's say you invest have a million and you know that you will get a really small ROI, it is a bad investment.	
23.	Q.	<b>How hard is it to measure this ROI?</b>	
24.	A.	Sometimes it is hard and sometimes not. For example in one of our games we had a big investment deploying all the hardware. In the beginning we couldn't give estimations because we didn't know how many customers we would have. But now we know about the customer and we know what to expect every month. Of course we have to calculate the amount of accounts that are closed or new subscriptions but you will always have a margin of the return. In other games, it is like a black hole. You do proof of concepts, you collaborate with marketing to get number for you. So in that sense, I think that operations are not directly related to that part, mostly because even if IT believes that something is too expensive to implement and developers really want it, they will prevail. They are the ones that are making money to that company so their opinion matters.	Proof of concepts
25.	Q.	<b>So, before the IT investment was done, you immediately think on ROI? What other kinds of benefits or criteria are identified when this investment is decided?</b>	
26.	A.	We primarily think about the ROI, and also if it is not directly related, one thing very important is related to reasons you are buying something. For example, you	TRS-3, TRS-9,

		might change a server for a different one to lower costs of support, to improve stability and so on. All these things don't give you a direct ROI but you achieve fewer problems in your platform. So clients become happier, they will keep playing, they will tell their friends they've found no problems etc.	<b>TRS-10, STR-6</b>
27.	<b>Q.</b>	<b>How would you to measure customer acceptance?</b>	
28.	<b>A.</b>	I think it is harder compared to ROI. Sometimes it comes from direct feedback from other teams. We also deploy a customer support call center which is open 24/7. There is also a lot of reporting on the customers support case. The developers develop a new solution that allows them to interact directly with the player and allows the agent to perform some kind of building analysis. Everything will be integrated in one system. This will require a new hardware which we design, deploy and implement.  So how do we measure all that. In first case it is response time in customer support. This could be a result from faster servers, having more agents. So it is tricky to evaluate up until where we are responsible for ROI that we have there because it involves so many teams and different departments.	<b>INF-1, INF-5</b>
29.	<b>Q.</b>	<b>What other indirect benefits could you identify?</b>	
30.	<b>A.</b>	The only problem here is gamers. If they are not happy, you need to check why they are not. Is it because they cannot play (server instability)? Is it because of customer support or because they don't have any perks for what they are doing? But indirectly we can support some services that have impact on our customer support and the players' experience. So there are some things that are directly related to us and some others that are indirectly relates to us. If it is not directly related to us, it is not sure if we will have an impact on this. So, this is a tricky matter.  We also have internal teams that are our customers as well. So, in that perspective a customer is in my team and we have to provide service to them to work that will impact the players indirectly. In that case we can measure because the software only had 90% of uptime instead of 99.9% uptime. (This results to angry players and colleagues and managers)	<b>STR-8</b>
31.	<b>Q.</b>	<b>What expectations do you have from the new system?</b>	
32.	<b>A.</b>	Professionally, if it doesn't impact us in any way, I wouldn't even think about it. Depending on what it is it can cause a lot of headache. We can have a lot of expectations but usually having the lowest expectations is a better practice.	
33.	<b>Q.</b>	<b>What needs do you think it would fulfill?</b>	
34.	<b>A.</b>	Usually, whatever we do has to fulfill a need. So depending on what it is, we are aiming to improve an already existing product - provide stability or a new feature. If it is a completely new product we are aiming to make the customers satisfied and happy. If they are happy the can suggest it to their friends and revenues will increase.	<b>TRS-10</b>
35.	<b>Q.</b>	<b>Are you satisfied with the IT investment decision process?</b>	
36.	<b>A.</b>	I would say yes. We invest in a lot of things. We do it the correct way. But no company or person is perfect and a lot of times the investment is not enough so we have to go back to the joint board for an additional purchase and investment. A lot of times we invest too much, and transfer what we bought to different projects. A lot of times before the big investment we conduct a proof of concept where we create a baby project that will fulfill the same goal, in a lot lower scale and then we test it. We do an analysis and predetermine what are the expectations. Generally, it could be improved in the communication part.	
37.	<b>Q.</b>	<b>What criteria or requirements is your IT team using when they need a new investment?</b>	
38.	<b>A.</b>	Ok let's say that we will have a new game when we estimate 10 million new subscribers. We know that for every one of them, a new account will be created. A new account is predetermined to use 'x' amount of space in the database. So just by measuring marketing numbers, and cross-referencing with existing numbers	<b>TRS-10</b>

		that we have of how much space the subscriber needs. So, we create a projection of what to expect in hardware for example increment the existing storage by ‘x’ and maybe change the existing servers to support more people. All of these created expectations will be used to look for the right investment (how many servers we need and how powerful they will be).	
39.	<b>Q.</b>	<b>What needs do you have for software tools that will be used internally?</b>	
40.	<b>A.</b>	We have needs such as usability, user experience, and applicability to whatever we want to do with it. If it is things that we will work directly with them it will be our team that we will decide for that.	
41.	<b>Q.</b>	<b>What criteria are considered in that case?</b>	
42.	<b>A.</b>	It depends. If the solution is applicable in what we want to do. If we can expand on it. If we can develop on it. If it is stable. If It is preferable If it has a lot of developers wanted to develop on that (open source community).	<b>TRS-4</b>
43.	<b>Q.</b>	<b>What would you think that was the most important factor that contributed to the decision of an investment?</b>	
44.	<b>A.</b>	<p>It has to do with 2 or 3 important things. So final user experience, support contracts on the purchased hardware, previous stability of hardware from a vendor. All of these things are very important for us because you might choose a solution that cost half a million but if you spent another half a million to support the hardware, it’s a bad investment. And of course it is code quality that has a direct impact on the server performance.</p> <p>If the investment is good we become competitive not only on the hardware but also on the developed features that our games will have. So, we strengthen our competitiveness by having good and strong games.</p> <p>The final decision on the investment has to do with what is better for the user and not so much on how expensive it will be.</p>	<b>STR-1, STR-2, STR-6, STR-8, TRS-3, TRS-6</b>
45.	<b>Q.</b>	<b>What internal tools can be used for your team in order to be more efficient?</b>	
46.	<b>A.</b>	<p>We actually have a group of guys that also develop internal tools for us. For example we created a software tool like a monitor page that creates a quick overview of how the platform is running. How many players we have, if everything is ok with the network, if we have a lot of crashes or not etc. Mostly it started as a downtime project and it evolved to that which very useful to everyone – even to the president of the company.</p> <p>For that product we need to maintain the code, create a change management control, create peer review, management approval for new deployments and document everything. We hire the technical writer and a lot of workhours are invested to this.</p>	<b>INF-1, INF-2, INF-4, INF-5</b>
47.	<b>Q.</b>	<b>What benefits are expected from documenting things?</b>	
48.	<b>A.</b>	For us, operations people, the documentation is only useful to us because it is more technical. The technical writer will make the documentation accessible to a bigger audience because he will use proven, standardized ways to document things. Afterward, we have our own wiki where we dump information which translates into a lot of things.	

## Informant B – Cargo company

			Comments
1.	<b>Q.</b>	<b>What is your current position at the company?</b>	
2.	<b>A.</b>	I am the CIO.	
3.	<b>Q.</b>	<b>What are your current areas of responsibilities?</b>	
4.	<b>A.</b>	I do everything from being part of the management team. Together with the general CIO and the vice president of the company. My responsibility is purchasing IT related things like IT systems, telephone related things, infrastructural things and so on. So, I do a lot of strategic work as well, helping our business areas to fulfill their commitments to their customers.	
5.	<b>Q.</b>	<b>So do you have an internal IT department that you are in charge for, like laptops, printers, etc. and an external environment as well like a datacenter?</b>	
6.	<b>A.</b>	Yes, we host everything on our own. We have an IT department with different responsibilities. We have the system engineer people, the services people and the infrastructural people.	
7.	<b>Q.</b>	<b>How large is your company?</b>	
8.	<b>A.</b>	It is quite large, approximately 500 employees.	
9.	<b>Q.</b>	<b>What is the core business of your company?</b>	
10.	<b>A.</b>	It is delivering port and terminal services to customers in order to have goods and other stuff in and out of the Oresund region.	
11.	<b>Q.</b>	<b>How does this work? Could you describe us this a little bit more?</b>	
12.	<b>A.</b>	Well if you are a big company in Sweden and Denmark or if you are a car company like Toyota. If you buy a Toyota car around the northern part of the world, this car is handled by our personnel. And if you buy TVs and radios, here in Lund and Malmo, all of these are discharged by us.	
13.	<b>Q.</b>	<b>How does the decision making process of IT investments work in your organization?</b>	
14.	<b>A.</b>	<p>We have processes for everything. We are ISO certified so we should have processes for everything. The process depends on the investment. If it is driven by IT itself or by the business areas. If it is driver by IT, I have to write a business case, explaining why I want to make the investment, the benefits, the pros and cons, the TCO the ROI. All of these things. And then I have to get an approval from the economics department to see if my cases are correct and then it goes up to the CIO of the company who gives me an ok. The CIO and CFO take the final decision of the investment.</p> <p>In the case of a driven investment by the business area, they (the business people) would either come to us with pre-systems and ask if any of the chosen systems are good and can fit into their IT strategy or are they good for the company in the long run. Then we have to advise them and then we do the negotiation with the suppliers of the systems and do what the technical resources do.</p>	
15.	<b>Q.</b>	<b>What problems can be identified in the case of investments driven by business people?</b>	
16.	<b>A.</b>	Well, there are several speed bumps but we are working with these processes for several years in order to resolve problems. And the company understands the importance of having a close dialogue with IT before the actual decision in order to avoid problems. We take the discussion before we reach a decision. So, in that perspective, there always difficulties. Sometimes you cannot choose the first best system but the second one because it is better for the overall company.	
17.	<b>Q.</b>	<b>What was one of the larger IT investments where you were directly involved?</b>	
18.	<b>A.</b>	One of the largest is the one we are doing now. We right in the middle actually. We are implementing a new terminal operating system (TOS). It is the system which handles all in and out goods and cargo. It is the system that keeps us in contact with our customers. So, basically it is the core IT system. The previous one was pretty old so started last January looking for a new one and it's been more than one and a half year since this process started and now we are at the end and testing phase of the system.	<b>STR-2</b>

		So, that took a pretty close run with the largest business company that used the system. We looked through the processes they had today, their needs and they matched them against the TOS system on the market. And we had a really long planning and decide period because we want to choose the right system.	
19.	<b>Q.</b>	<b>How would you estimate the period for the implementation of this investment?</b>	
20.	<b>A.</b>	It is a rather long period. I think every big investment takes time. Also because the personnel in the company changes. So if a key person of that investment leaves, we have to slow down and find another key person who would grow more into that role, learn about this investment rather than pushing for timings. After all, The TOS system is part of our core business.	Part of their core business.
21.	<b>Q.</b>	<b>What kinds of benefits or criteria are identified when this investment is decided?</b>	
22.	<b>A.</b>	There were two main reasons (non-IT reasons) for buying the system. One was to get more efficiency in the way you work. In the end of day it is about the bottom line for the company. So, with this system we could reduce stuff, because there were a good way to supporting and ultimate some processes on how we work. So that was one thing – to lower costs.  And the other thing was to have a good relationship with our customers. The system has a huge amount of good interfaces in order to talk and exchange information with our customers.	<b>TRS-7, TRS-8, TRS-10, STR-6, STR-8</b>
23.	<b>Q.</b>	<b>How do you justify the cost expenses of an IT investment?</b>	
24.	<b>A.</b>	Of course you have to compare it with other systems and compare it with the costs you have today. But in the end of the day is how much you can save with your new system. One interesting thing is that I received an article from Gartner the other day, and it says for the first time in history, CIO's are admitting that they are buying systems not to reduce costs but rather to enhance business – which is kind of something. That means, you'd rather see what my business can do better rather than reduce cost.	<b>TRS-9</b>
25.	<b>Q.</b>	<b>How would you measure these kinds of benefits like customer relationship?</b>	
26.	<b>A.</b>	Well if you lose a customer, and he or she says it is because of the system, you can measure but otherwise it is not possible. I mean you get direct knowledge by talking to the customers and receiving their experience. If they say it is easy for us to exchange information with you, and give you good feedback, that's the kind of measure you can do.	<b>STR-8</b>
27.	<b>Q.</b>	<b>What competitive advantages could be identified? Are you a monopoly?</b>	
28.	<b>A.</b>	There is a competition. Our biggest competitors are in Trelleborg and Helsingborg. One interesting thing here. We had ended up with two final TOS systems which both fulfill our demands. One of the two was used by Helsingborg which would have been a disadvantage to choose the same system.	<b>STR-1, STR-2</b>
29.	<b>Q.</b>	<b>What measures do you use in order to justify the investment?</b>	
30.	<b>A.</b>	Well we have a list in our process that we should look. This is environmental facts, the technical side of the system and we should look at the soft side of the system – how can we be better as a company by choosing the system. So we have three key areas to look for when we choose the system. Let's assume we have two systems, pretty equal. Then we have to look at those three things. Of course it is rather unusual to two systems that are pretty equal. Almost always one system is better than another. But it is always hard to measure. When we choose we don't know how the system will work in the company. So, you have to trust your experience when you choose the system. You can measure the hard facts. We can do that in one system but not in another. And when it comes to saving resources, it also a guess. Because you do not know how many resources you will actually save. You calculate it but when it comes to live date you are not really sure. It's more on an experience thing.	<b>Environmental, (technical side/ efficiency)  STR-3</b>
31.	<b>Q.</b>	<b>What financial measures can be identified?</b>	
32.	<b>A.</b>	If you take a less complicated investment like a storage system. We have the	<b>TRS-3</b>

		demands, how we want to work, and it should be able to do certain things and then it very easy to find a supplier that can deliver that. So it breaks down to costs and service and support and it is an easy investment for us.	
33.	<b>Q.</b>	<b>How do you justify the service and support aspect for the smaller investment?</b>	
34.	<b>A.</b>	That's when the TCO comes in. If you should calculate costs, you should take the total cost of ownership. If we should have that for a 5 year period, what will it cost us during these 5 years?  It is also a backend system so it is what the company internally expects. An IT driven internal investment that does not focus on customer relationship.	TCO
35.	<b>Q.</b>	<b>What expectations do you have from this new TOS system?</b>	
36.	<b>A.</b>	Well it is fulfilling a lot of needs. We have the customer side of it, we have a good booking interface where customers can book, release their trailers etc. So, that's something we expect to increase – the customers are doing more of our job and it easier for us. That is a huge expectation. And the organization of course. With the old systems a lot of procedures had to be manually performed when a truck was entering the port but with the new one, everything is fully automated. The turn time is one thing we measure. It is how long it takes the operator to get into the terminal, get the cargo and return from the terminal. So we hope to decrease the turn time by 48%.	<b>STR-6, STR-7, STR-8, TRS-2 TRS-8</b>
37.	<b>Q.</b>	<b>Are you satisfied with the IT investment decision process?</b>	
38.	<b>A.</b>	Well you can always improve the decision making process. You learn by every investment you make. There always the need to have an extra document for your investment. So for the next investment we learn from our mistakes. In a large company, IT can learn from other departments and I think we already have too much work in our department. We don't exchange experiences as much as we could or should.	
39.	<b>Q.</b>	<b>How would documentation help the exchange of experiences?</b>	
40.	<b>A.</b>	I think it more of is simple case. For example is the building department is building a bridge, our processes never touch each other. So, then you have to talk on what we have learnt from the previous investment. Communication is really important on an organization but you should have time which is hard to find.	
41.	<b>Q.</b>	<b>What immediate benefits could you identify from the documentation?</b>	
42.	<b>A.</b>	We have documentation on every project that is closed and everyone can go and look at that. You could document a lot of things but is no one reads it, it doesn't matter.	
43.	<b>Q.</b>	<b>What does the investment document include?</b>	
44.	<b>A.</b>	It is all from the beginning, the different kind of systems we choose from, the decisions, the reasoning behind our decisions. We have a lot of presentations and we have the lessons learnt and the implementation process. These kinds of things.	
45.	<b>Q.</b>	<b>What would you think that was the most important factor that contributed to the decision of this TOS investment?</b>	
46.	<b>A.</b>	All of the mentioned factors were really important, because the old system didn't have those things. So there were new features and the benefits of those features were better relations with the customers, better infrastructure, better way of running the business and better support for the company.	Equally important benefits
47.	<b>Q.</b>	<b>How comfortable would you feel that the system will match your expectations?</b>	
48.	<b>A.</b>	I think that everything will go very well and at the end it will worth the money. I think we played it safe. We did a lot of field trips and field studies. We went to other companies, we communicated with the supplier, we talked and looked.	
49.	<b>Q.</b>	<b>How much time did you need to do the initial planning and talks with vendors.</b>	
50.	<b>A.</b>	We spend around 8 months before the decision. So we had a lot of planning and decision making. And my experience says that the longer the planning takes, the shorter the implementation period is. If you do everything right, you draw on the processes you need, you know how to implement it. You have a plan for how to	The right planning is very important

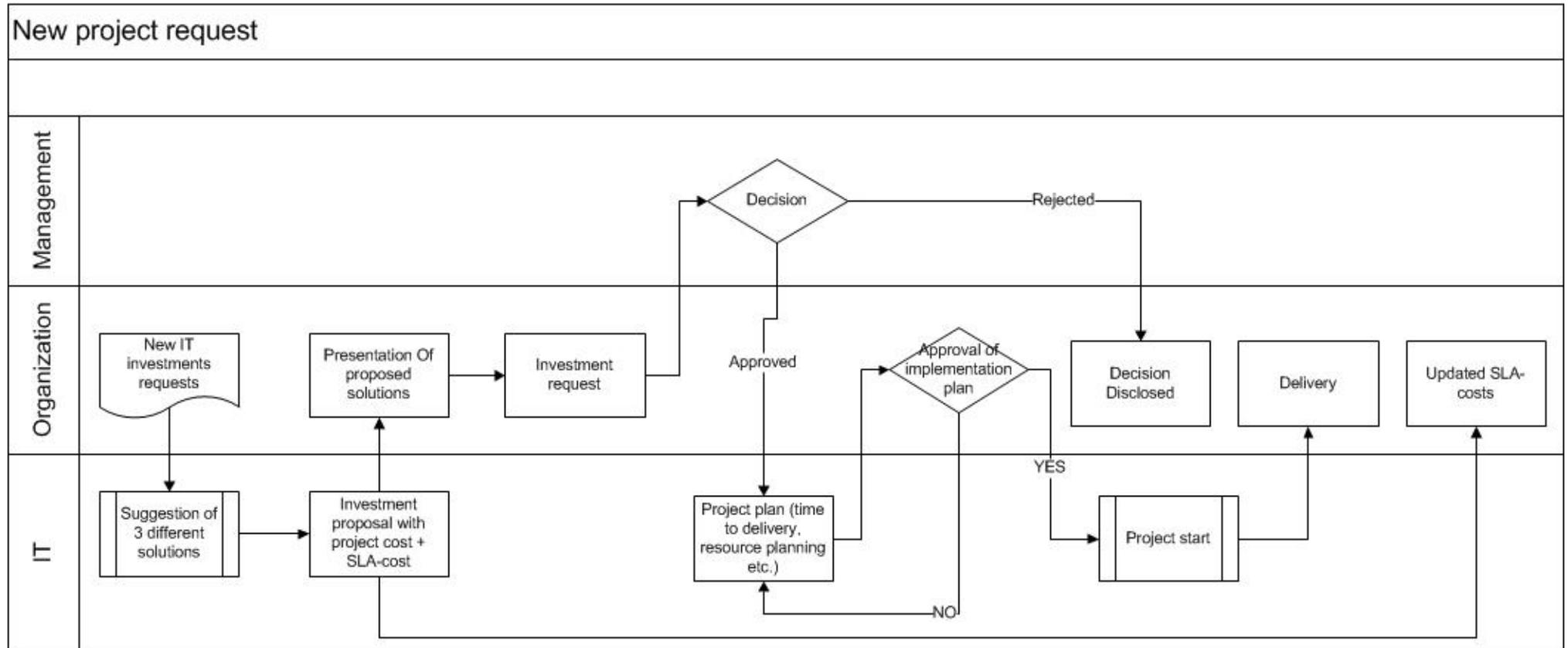
		inform the users that will be affected by the new system. If you plan all these things in advance, you have a lot shorter implementation period.	
51.	<b>Q.</b>	<b>What procedure does the planning take?</b>	
52.	<b>A.</b>	Every supplier has his own way of implementing and educating people. Someone educates all people, some others educate super users. And of course we have our own processes of how we want to have it done. So, it has to do with every different investment you want to do. You have to adjust to the supplier but you should have your own demands and fittings to your own organization – what your own users are used to. I mean the users are working in the company and we are doing things in a certain way and we are trying to squeeze the suppliers’ process into ours. That’s the best thing because they used to working in a certain way.	
53.	<b>Q.</b>	<b>What procedure do you follow during the decision of an investment?</b>	
54.	<b>A.</b>	We follow a standardized procedure. The questions in the procedure could vary depending on the investment (a crane investment, the TOS system, a storage system) but the process is the same. We create the business case and then it goes to the business people and then to the CIO. It is a standard flow every time. Currently we are using the framework of ITIL (a framework based on best practices) and we create processes for every step we want to do. For example if we have a new project we have a standard process at our company. We are trying to keep the processes very simple because there is no need to get it complex. We have a lot of documents and checklists tied up to this, but you can see this (Appendix C) that shows the main processes of my company. It starts by filling a paper with requests and then we get it and have a process that says that we should provide with different kinds of suggestions or solutions. So that is our job and afterward we contact the suppliers to check if their product fulfills the demands of our company. And after that we check the total cost, including license etc.	
55.	<b>Q.</b>	<b>And then how do you decide on the different suppliers?</b>	
56.	<b>A.</b>	Then we have our checklist of environmental stuff etc. and estimate the value on these three criteria.	
57.	<b>Q.</b>	<b>How important is the value of the environment from you?</b>	
58.	<b>A.</b>	It is important. We have how much we should pay attention to the environment, let’s say 40%, attention to technical advantages should be 20%. So we know what is considered more important to us. And that is a decision we have to make, because environment is important to us, even when have to choose on what kind of investment we want to do.	Environmental value
59.	<b>Q.</b>	<b>So, if you have an option between two systems and one is environmentally friendly but cost 3 times as much and the other one is more technically advanced but not so environmentally friendly and cost less, how would you choose?</b>	
60.	<b>A.</b>	We have the benefit of working in a company that goes well. So far we had the luxury to choose the environmental system. Because we are operating in a non-environmental friendly business. So, it gives us a really good advantage to consider environmental things. And that gives us a benefit compares to others. I mean in our case, we have this oil harbor to take oil from tankers and this is not sound to the environment. So together with the science team, we have planted a tree which actually reduces the oil in the ground. That’s a cost for us. We didn’t have to do it. But we did it and of course we announce which also helps the public image of the company. And then those kind of things who got to our CSR commitment. And we also choose systems that reduce power usage.	Financial ability to choose the environmental system

## Informant C – Retail company

1.	Q.	What is your current position with the company?	Comments
2.	A.	Office and IT manager	
3.	Q.	What are your current areas of responsibilities?	
4.	A.	Well basically I am responsible to keep the computers up and running to the maximum capability. I am also responsible to any repairs on hardware and software. It is not a very large IT environment. At the moment we have three laptops, twelve stations plus the server.	
5.	Q.	What is the core business of your company?	
6.	A.	Wine merchants.	
7.	Q.	How does the decision making process of IT investments work in your organization?	
8.	A.	I am the only one making the decisions. So basically if I see that a machine is having problems or changing all together, I look around, see what the best option is. I have the company's credit card in my possession and I make the purchases. So, it is a basically simple procedure. I am responsible for making the best decisions about the software and hardware of the company.	
9.	Q.	What large IT investments have you made?	
10.	A.	Well, we noticed that some of the machines were obsolete. We needed to upgrade Windows 7 professional. We have an old accounting software that we use that needed certain specifications. So we had to change the machines all together. It had been more expensive to upgrade them. We asked big suppliers as HP, Dell and ended up with some Dell machines.	
11.	Q.	What kind of procedure did you use for this investment?	
12.	A.	We created some business plans and we compared costs from different vendors. We have to do all that. Especially in small companies you can't just really go and buy. You have to shop around and see what the best option at the best price is. At the time Dell proposed a pretty good deal and we bought the new machines from them. The server though was from HP.	
13.	Q.	How many people are involved in that process?	
14.	A.	It was mainly me in the root and when I've made my decision, I talked to the general manager in order to approve the cost. I explained to him the benefits of this option and at the end of the day he told me to go for the one I think it was the best. So he approves the cost and at the end he wants to know what the total cost and the benefits for the company are. And as long as there is a benefit for the company, there is a need for it, so the investment is approved.	Total cost, other benefits
15.	Q.	How do you justify the cost expenses of an IT investment?	
16.	A.	Well basically we ended up with machines that were much quicker, more reliable. You can't have low RAM, low network cards. All of that make your machines crushing, slowing down everything and that's why we are working on the server. We have to have competitive machines on the implementation. So basically I look on the RAM, the processors and once all of that are put together, I could prove that I would be beneficial for the company. Basically, allowing people to work faster and with fewer chances of blue screen and machines that work together.	TRS-8, TRS-10  Efficiency, reliability
17.	Q.	What difficulties are found when measuring these aspects?	
18.	A.	Basically, the machines are much faster all together. So, there isn't much to think about that. But the time doing certain reports or reconciliation at the end of the day, has decreased drastically. So that was something to be shown.	TRS-10
19.	Q.	What benefits were expected by the new machines?	
20.	A.	The new machines will allow us to be more reliable. When you have to access the database that is based on the server, on a specific location, you have to be able to trust that what you've done have been translated and saved on quite fast timeframe. Because if you are too slow, it is not good.	STR-3
21.	Q.	What kind of issues did you face before this investment?	
22.	A.	We had some. When we tried to upload something to the web server and nothing uploads and get stuck so that you are not sure if it is done or not. So the employee	TRS-10, TRS-8,

		<p>has to upload it again, and do the same thing. That's really a nightmare. And our program is very hard to use. So you need to have really reliable machines to work on it. You understand that if you have to re-upload everything, it is time consuming which also lowers our image with our customers. All the background services are also quite important for the customers. So my responsibility is to assure that everyone will be done on time and these work 100%.</p> <p>And in that trade like that customers is the most important thing. Because if you don't have customers, you go down. In today's days, computers are so important. Everything is on that computer. The most striking thing is that if you have a power cut, you see how useless you are without the computer. And that's why I purchased UPS that manages to keep the computers running for four hours. We can't afford to be down at any time of the day.</p> <p>Machines need continues upgrades. It is a never ending process. There are always new solutions and new programs that if you want to keep them up-to-date you have to always be on them.</p>	<b>STR-6, STR-8</b>
23.	<b>Q.</b>	<b>What other issues are you considering when choosing a vendor?</b>	
24.	<b>A.</b>	We consider the support issues we can get from the vendor. And of course specifications in relation to the price. For example what the price is when the specifications are the same.	<b>TRS-3, TRS-6</b> Financial considerations and features of the machines
25.	<b>Q.</b>	<b>Are you satisfied with the IT investment decision process?</b>	
26.	<b>A.</b>	<p>Yes, it works very well because the communication with the director works. He asks me if I made my market research, if this is the best solution and at the end he will just sign the purchase order and that's it. He is not someone who will ask a thousand questions because he knows that it is worth for the business to be competitive and computer organized.</p> <p>And I am satisfied with that. It is a really nice environment. Nobody bothers me. If I decide something, I am able to buy it.</p> <p>When there is a need I go and buy what is needed and everyone is happy. But, I am also sensible on what products I am going to buy. I don't go with the first solution. I look around to find what is available, what are the current prices etc. and I make my decisions from there.</p>	<b>STR-1</b>
27.	<b>Q.</b>	<b>What other factors of less importance do you consider?</b>	
28.	<b>A.</b>	One thing that would have made me make a decision was the programs installed in the computers. Basically, the packages that come with the machines – like what kind of office or windows. For example, at Dell we had to buy the machines with the home edition of Windows and upgrade them with our own Windows 7 professional. In the meantime, HP proposed the same but at a cost, and I found that it was cheaper to do it ourselves than to ask the computer provider to do it.	<b>TRS-3</b>
29.	<b>Q.</b>	<b>What other financial benefits could you spot?</b>	
30.	<b>A.</b>	<p>Well, there is cost reduction in terms of the support package. For example we have a support package that allows us for a certain amount of time to resolve problems. Before the investment we were calling them every week but now it is every month.</p> <p>Also in term of the web shop, we no longer have uploading problems, and the work is done properly.</p>	<b>TRS-2, TRS-3</b> Cost reduction benefit

## APPENDIX C - Investment process of Cargo company



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