Planning and Managing Strategic Information Systems Project: A Case study on IS quality process in ABC.

Olayele Adelakun
Olayele.adelakun@tukkk.fi
Turku Centre for Computer Science TUCS, and
Turku School of Economics and Business Administration,
Institute of Information Systems Science, 20521, Turku, Finland.

Abstract

This paper presents a case study carried out in one organization called ABC (name disguised) on how ABC has understood the concept of IS quality and its implementation in practice. Information System (IS) quality is one of the critical success factors in any IS project. IS quality is a multiple dimensional construct and there is no single universally accepted definition for it yet. This research defines three dimensions of IS quality that are crucial for the successful implementation of an IS project, and they are business quality, technical quality and the use. Many organizations are realizing that these three dimensions of IS quality are needed in order to ensure the success of the IS project. The existing problem, which has not been fully explored in practice, is how to implement these three dimensions of IS quality in an IS project.

The applied research method in this study is an interpretive case study. An IS project was studied in one organization. Data materials were collected through personal interviews of 13 managers and a questionnaire survey from 45 end users of the information system project under study. The analysis of the survey responses led to another personal interview of ten end users. One of the major results of the data analysis was that for a successful implementation of an IS project it is important that the technical and user dimensions of quality are in line with the business dimension of the IS project. The organizational IS success is highly connected to the degree to which the business quality is satisfied, and the technical and user dimensions of quality will only contribute toward the organizational dimension of IS success if, and only if, they are in line with the business quality.

Keywords: IS project, IS quality, Case Study

BRT Keywords: UF, AI, AD

1 Introduction

The objective of this research is to find out how the IS quality is established in practice, and what are the key quality issues considered from the IS project planning to its use. IS quality is a multiple dimensional construct and there is no single universally accepted definition for it yet. Three dimensions of information systems (IS) quality were identified in this research as follows: the business quality, technical quality and the use quality (Erikkson and Törn, 1991; Braa, 1995).

Addressing how to implement IS quality in practice, several IS quality models or frameworks have been proposed (e.g. Eriksson and Törn, 1991; Kahn, Strong, and Wang,

1997; Braa, 1995). One of the main disadvantages of the frameworks is that they are sometimes too theoretical to be used in practice. Nevertheless, several reports have shown that they have contributed significantly towards a deeper understanding of IS quality (Rao et al., 1997). In order to assist in the practical implementation of IS quality, some standards have been developed.

The ISO 90003 series and the capability maturity model (CMM) are the two most popular standards. These standards are more detailed and more practically oriented than the earlier models. Many organizations use these standards to improve the quality of the IS they are developing. An organization that follows a standard is usually certified. Unfortunately, many researchers have observed that the unquestioning application of these standards (e.g. ISO 90003 series) can be a backward step in the practice and research of system development (Braa and Ogrim, 1994; Pilj et al., 1997). During the pilot case study, one manager stated that *we make sure we acquire the certificate because our clients want to see it, but we do not follow it strictly, we have our own standard which includes some of the issues in the ISO 9000 series*.

In this research a quality process model was developed and it had been pilot tested in one case company. Recently it had been applied to guide an interpretive case study in another organization (ABC). Interpretative case study was chosen as the research method, because information systems quality is an intersubjective social construct with multiple views (Reeves and Bednar, 1994) and it should to be studied as such. One of the main findings in this study is that both the technical and the user dimensions of quality are necessary but not enough to ensure the organizational success of an IS project. On the other hand, the business dimension of IS quality might be enough in establishing the organizational IS success. However, the business dimension of quality cannot be obtained if the users' and the technical views of quality are significantly missing.

The remaining part of this paper is organized as follows. Chapter 2 presents the theoretical background for IS quality. This is followed by a brief discussion on interpretive case study in chapter 3. A description of the case study and its analysis is presented in chapter 4. Chapter 5 presents some discussions and the conclusion to the paper.

2 IS Quality

Several of the attempts made to define quality have produced inconsistent results (Juran, 1988; Crosby, 1979, Grönroos, 1990). IS quality is a multiple dimensional construct and any definition of it must take this into account. Most of the early definitions of quality considered one aspect of quality only and have therefore been criticized. Reeves and Bednar (1994) noted that the fragmented nature of the literature suggests that multiple definitions and/or models of quality are required to capture the complexity and richness of the construct.

Many frameworks have been developed to address this problem (Erikkson and Törn, 1991; Kahn et al., 1997; Salmela, 1997; Braa, 1995). The problem with most of these frameworks is that they are often too theoretical to be used in practice. Recently, many organizations have turned towards IS quality standards for support. These standards include the ISO 9000 series and the Capability Maturity Model (CMM). Unfortunately, these standards are too technically oriented, and they hardly consider other aspects of IS quality besides the technical quality (Braa et al., 1994; Rao et al., 1992).

This situation has made several researchers call for a more empirically in-depth

study of what is really happening in organizations. An IS quality model was developed to guide the case study process. To construct the model the literature on IS planning, IS development and IS user evaluation was reviewed. The objective of this literature review is to investigate how these three phases address the issue of IS quality.

The notion of quality as seen from our point of view is that it is a multidimensional concept, which is context-dependent. First of all, the quality of any information system can be said to be a function of three dependent variables. They are the type of IS, the Stakeholder group, and Time. The quality of any information system can be determined from this concept. Figure 1 below shows the quality model and how the three variables are related to the information systems quality.

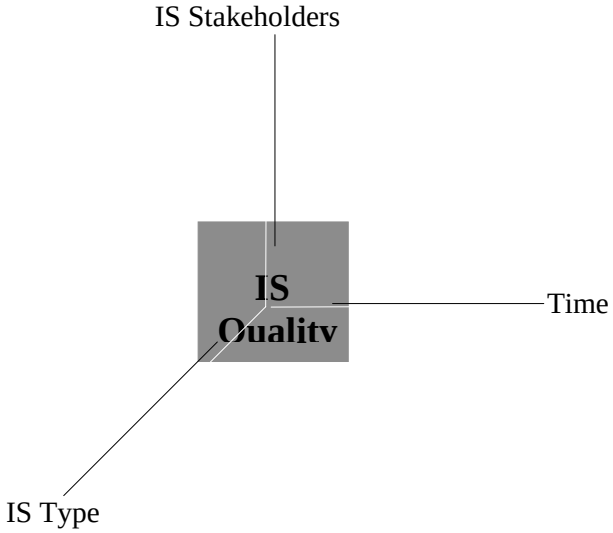

Figure 1. The Quality Model

We define the quality of information systems as a phenomenon which depends on (1) the type of information system under planning, (2), the IS stakeholder group whose perspective is being considered, and (3) the time frame when the system will be evaluated. Mathematically this can be expressed as Q = F(I,S,T) (i.e. Q: quality = is a F: function of I: type of information, S: stakeholder group, and T: Time)

2.1 The IS Quality Process View

The IS quality process model, figure 2, was developed to operationalize the above framework, (i.e. figure 1). The three categories in figure 2 (IS planning, developers and users) cover the stakeholders' views in figure 1. IS planning is a process of identifying IS that could be used to support a business strategy (Lederer et. al, 1996; Reponen, 1994). This body of literature gives us insight into the business dimension of quality. The business dimension of quality is defined as meeting or exceeding the stakeholders' expectations of the business benefits from the IS project. Examples of this business dimension of IS quality include: increasing productivity, improving customer services, reducing cost, compressing cycle time, and improving the accuracy of the delivery process. Most of these objectives are close to the objectives in many business processes reengineering (BPR) projects (Grover et al., 1995; Bahn et al. 1998).

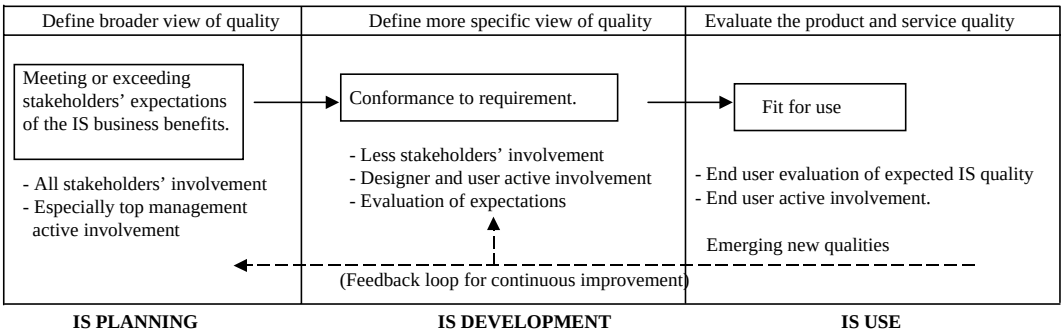

Figure 2. IS quality process model.

There are some other business benefits of IS projects not included in many BPR projects, but they are mostly intangible. Based on the literature review on IS planning the following was concluded. It is very important for the senior managers to identify this business dimension of quality and to properly document it before starting the IS project. It is even more important to communicate this business quality to the developer (the arrow from IS planning to IS development in figure 2. The present study proves this activity to be one of the most important activities in an IS project. It is not only necessary to communicate this business benefit, it is also critical to follow it up. The follow-up turns out to be of higher importance, because the lack of it may result in serious problems later on.

The IS development phase in figure 1 traditionally focuses on the development of the software artifact. In this phase of the IS project the quality focus is primarily technical. IS developers use methods such as prototyping or a modified version of the life cycle approach to develop the software. Many software companies apply the software section in the ISO 9001 quality standard or capability maturity model in the development of the software product. These standards often view the IS development process as a linear one, starting with the functional requirements, programming, inspection and testing, delivery, and installation. Several researchers note that an unquestionable application of these standards in software development can lead to serious development drawbacks. (Braa et al., 1995) Many software companies are realizing the limitation of these standards and are gradually moving away from them. For example, the two software companies visited during this study have stopped using the ISO standards.

The last part of the IS quality process as we define it concentrates on the use quality. The use quality is primarily the user's view of quality. Concepts such as usability, quality-in-use etc. are applied here. One of the main points is that during the use of the IS, new use quality will be identified that perhaps could not have been identified before the system is taken into use. One argument in favor of the use quality is that the actual quality of the system can only be determined during its use.

The three phases discussed above are not totally sequential. It is important to note that the process should be iterative. Three important elements of these models in figure 1 are (1) the various stakeholders involved at each phase, (2) the content of the expected document to be communicated to the next phase, and (3) a need for a deep understanding of the quality focus at each phase. The process model however, is influenced by the type of system (i.e. strategic, operational, administrative etc.) and the time when the system is being evaluated (i.e. the time lapse between quality evaluations).

3 Research Approach: Interpretive Case Study

Interpretive studies generally attempt to understand phenomena through the meaning that people assigned to them. The proponents of the interpretive persuasions share the goal of understanding the complex world of lived experience from the point of view of those who live it (Schwandt, 1994).

The interpretive epistemology takes the position that the social world is essentially relativistic and can only be understood from the point of view of individuals who are directly involved in the activities which are to be studied. The interpretive ontology would be either of the following two positions: internal realism or subjective idealism. Internal realism views reality as an intersubjective construction of shared human cognitive apparatus. In subjective idealism reality is a construction of an individual's reality.

Interpretive methods of research in information systems are "aimed at producing an understanding of the context of the information system, and the process whereby the information system influences and is influenced by the context" (Walsham, 1993, p.45). Therefore, for us to obtain a deeper understanding of IS quality approaches (e.g. the interpretive approach) that allow the researcher to grasp the whole context is required.

This research study has followed the interpretive paradigm because information systems quality is an intersubjective social construct with multiple views (Reeves and Bednar, 1994; Erikkson and Törn, 1991) and it should to be studied as such. Information system quality is essentially a relative term that can only be understood from the point of view of the IS stakeholders. It does not exist independently of the IS stakeholders. In this research we hold that information systems quality can only be understood by occupying the frame of reference of the stakeholders. Three categories of the stakeholders were identified in this research, as discussed earlier on. The worldview of these three categories of stakeholders needs to be be entered in order to get a deeper understanding of IS quality.

In this research, the definition of a case study was drawn from those presented by Newman (1996), Yin (1989), Stake (1994), Benbasat et al. (1987), and Eisenhardt (1989). A case study examines a phenomenon in its natural setting, employing multiple methods of data collection to gather information from one or a few entities (people, groups, or organizations). Interpretive case study is well-suited to capture the knowledge of practitioners and develop theories from it.

Case study is used in this research for three reasons. Firstly, it is important to have a face to face discussion with those involved in the quality process personally. Therefore, 40 hours of personal interview discussions were carried out with thirteen managers. Four of them are in the vice-president and director positions, another two of the thirteen are operational managers, and the rest are middle managers. All the interviews were taped.

Secondly, case studies give the opportunity for multiple methods of data collection. Apart from data collected from other sources like project report documents, company internal reports, etc., 64 survey questions were sent out to the end user of the system to support the interview materials. 45 of these survey questions were returned, a response rate of 68%. The applied survey questions were taken from the end user computer satisfaction instrument (EUCS) developed by Doll and Torkzadeh (1988). This instrument has been applied in many researches (Seddon and Yip, 1992; Doll and Torkzadeh, 1989). Based on the analysis of the survey answers another 18 hours of

informal interviews were carried out among 10 end users in order to obtain some interpretation of our survey result. This research approach has allowed the researcher to learn more about IS quality than some other suitable methods.

Thirdly, there has recently been a call for more qualitative research addressing the quality issues in information systems. Such qualitative works should focus on the neglected dimensions of IS quality, for example business and organizational dimensions of information systems quality (Salmela, 1997; DeLone and McLean, 1992). One of the main focuses of IS quality as we define it is the business view of it.

4 The Case

ABC company (name disguised to protect identity as agreed) is a manufacturing company headquartered in Finland, with a strong market position in Finland and the Baltic Sea region. The company net sale is about 130 million US dollars per annum and the personnel about 800. The company operates three plant locations and several sales offices in about 12 countries in Europe. The company has three major lines of product and several ranges of products along each product line.

The company is rather stable, with long historical traditions. Until now it has been a functional organization. From the beginning of this year a new organizational structure was developed, which is more process-oriented. The company's success has been driven by a focus on high quality products. For example, the company has got the ISO 9001 and 9002 quality certificates to illustrate that it is the company's philosophy to produce high quality products. The other key to success is locating plants close to customers since they sell most of their products locally. Export sales are only about 46 millions US dollars compared to 130 millions US dollar net sales.

In late 1990/1991 the IT department made a proposal to the executive board for the replacement of the then order processing IS. The reasons mentioned in the proposal were that the system was too old (more than 10 years old in 1990), and it was written in the Cobol programming language. Therefore, it was difficult to find people capable of maintaining these codes. Moreover, the cost of maintenance and the complexity of adding new functionality to the system increase exponentially every time. Despite this, the proposal was rejected.

In 1994 there were some kind of changes in the organizational structure, so the IT department made another proposal for a replacement of the old system. The argument for the replacement was the complexity in maintaining the old system. This time the proposal was approved and four project groups were developed, plus a central group that was supposed to work with each of the four groups, a steering group, and the executive committee. Project groups one and two work on product identifications and definitions in all the plants so that a product will have the same ID in every plant. Project group three defines new business processes that the new system will support. Project group four works with the central group to select a vendor with the right application to support the new business processes. See figure 3.

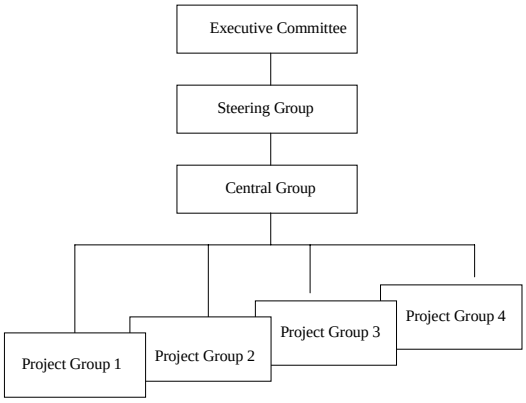

Figure 3. Project group from 1994 to 1996

After an extensive evaluation of about eight vendors the group selected the GJT system (name disguised also here), after initially selecting the SAP/R3 system and test-using it for three months among other systems which were also tested. The selection process took about 1½ years altogether. The final selection was based on three factors: the cost, the closeness of the vendor's application to the newly defined business processes, and the amount of modification required before the system could be taken into use. In January 1997 the GJT presented a compromised solution to ABC, because the GJT was not capable of delivering a system that could support the newly defined business processes. The compromised solution was reviewed, modified and finally accepted. An agreement was made that the compromised system should be delivered by January 1998. The new system contains the following modules: invoicing, sales statistics, inventory, EDI connection, order/delivery system, main planning (i.e. product planning on a weekly basis, capacity planning), and production planning (manufactory program on a daily basis).

At this point the previous projects groups were dismantled and a new implementation team was elected. The implementation group consists of one project group, which reports to a steering group, and the steering group reports to the executive board. Many of the members in the implementation team do not have a common understanding of the objective of the IS project, neither do they care to know what is going on at the project group level. Only the project group leader communicates with the steering group. The new project group after 1996 recognized that the project was too big, and therefore they recommended that only the essential modules should be developed first. The first prototype was available in October 1997 and it was tested in one of the plants.

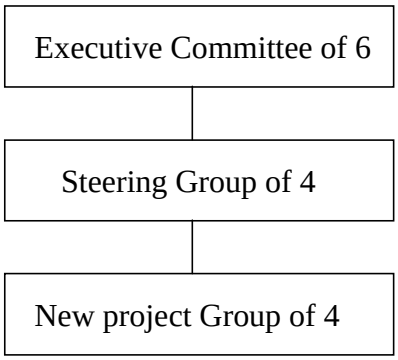

Figure 4. Project group from 1996 to 1999.

The prototype includes at least order processing, invoicing, and sales statistics as defined in the new business processes. During the prototype testing, the project group realized that they have developed a system that supports the new business process but the organization has not been prepared for the new business process. The problem now was what should be done. It was October 1997, and the management group wanted a system running by January 1998. However, the project group knew that the new system was not usable in the organization as it was even if it was ready by January 1998. To make the situation worse, the users resisted the new system very much for reasons which include an unfamiliar new platform, a new and totally different way of thinking and operating. Previously, they worked with an old character-based system where the only requirement was simply to press F1, F2, etc. Therefore, they were unable to link the two systems together.

The only alternative for the project group was to re-modify the prototype back to work like the old system, at least with the same kind of operations. In March 1998, the final system was installed. It was a new hardware architectural platform but with almost the same old way of operation. The re-modifying of the system back to the old way of working cost the organization a lot but that was the only solution because the old system was already on its way out. Training of the end user has started and business "profit season" is about to start. It is important that the organization can take in orders for the season and invoice and deliver the products, because the business is seasonal.

5 Analysis, Lessons and Challenges

Some of the expected results from the implementation of the project in ABC were not achieved. An in-depth analysis of this project reveals that there was only one clear objective for initiating the project, which was to replace the old system. The second objective (i.e. redesigning of the organizational business processes) was never agreed upon among the executive committee, nor was it unanimously shared even at the project level. Nevertheless, the second objective was generally considered the key goal for the development of the project in ABC. While there are many good reasons for considering the second objective of the project as important, a lot of resources (manpower, management's personal involvement, money, training, seminars etc.) are needed to successfully achieve it.

In this project a lot of resources (human, and especially financial) were invested into the redesigning of the old business processes, and finding the appropriate application that could support the redesigned business processes. The idea of redesigning the old business processes has existed in ABC since the beginning of the 1990s. However, there was very little effort made towards the implementation of the redesigned business process in practice. This became evident in October 1997, when the prototype was tested at one of their plants. It turned out that the end users at this site were totally unable to use the system. One of the most important reasons was that the prototype was designed in accordance with the newly designed business process, but the operational people were still working according to the old business processes.

The problem experienced at the plant during the prototype testing led to a radical change of the system in order to make it similar to the old system, which the end users knew how to use. This process turned out to be an expensive investment for the organization. With hindsight, the project provides useful lessons for ABC which could

be drawn on when embarking on any project with significant financial investment. The lessons will be especially useful if the investment is related to an information systems project. Some of the major outcomes and challenges are described below.

5.1 Management Involvement in IS project.

The role of the top management is to support and partly drive the IS process and thereby keep the project focused on the business benefits (i.e. the broader view of quality) set during the IS planning. An IS of this nature is considered to be of strategic importance especially if it affects almost all parts and processes of the organization, including service to customers. The overall success of a strategic system depends on how close the delivered system is to the business objectives and the benefits expected from the system. The project studied in ABC started like any business process reengineering project (BPR) which is characterized by the implementation of deliberate and fundamental changes in business processes to achieve breakthrough improvements in performance (Grover, et. al. 1995).

A fundamental change in any organization is strategic and it requires among other things the support, commitment, and practical involvement of top managers in the change process. BPR implementation problems are complex and multidimensional, involving elements of both planned and emerging issues. Top management vision, goals, and understanding of the business benefits are important in leading the projects in the right direction. There are some similarities between IS projects and BPR projects in the sense that most of the BPR projects include the development of an IS. The major difference lies in the deeper depth (i.e. the dimension of change required for process reengineering) and breadth (i.e. processes that span different functional boundaries) of BPR projects as compared to IS projects.

The project in ABC was a BPR project, but it was executed as an IS project because the top management saw it as an information technology (IT) project rather than a BPR project. One explanation for this is that the top management may not have fully understood the potential benefits obtainable from the project for the organization (see Appendix A). This turned out to be one of the biggest problems in this project. There are several reasons for this. For example, the IT department may have had difficulties in communicating these business benefits in an understandable language to the top management. If the top management had understood the business benefits, they might have initiated the change process in such a way that the business benefits embedded in the system would have been achievable at the beginning of 1998. It should be noted that the two objectives for implementing the project came from the IT manager and the project group. This is not a bad thing on its own. However, it becomes a problem when the top management does not agree on the objectives.

Therefore, the top management assumed that the benefits from the project would be reaped after the system was installed, without any preparation apart from end user training, which is the responsibility of the project group. *Some of us [top managers] are now realizing that it was more of a change management problem than an IT problem and there is an important role for the top management group to play in achieving the business benefits (Interviewee).* The top management's lack of support and involvement could be explained as a lack of clear understanding of the business benefits from the project. In figure 2, there is a feedback arrow (a loop) that goes from user to developers to top management. In this case, this feedback loop was not followed in practice. If this loop had been used, the top management would probably have realized that they have to

get the organization ready for the new system before it was installed.

Almost all the 13 managers interviewed shared the opinion that there was no concrete action towards getting the organization ready for the newly designed business processes. Top managers assumed that the project implementation group of about four people will make the changes. This will happen when the system is delivered, and the end users are trained to use the new system. Unfortunately, an organizational IS is not a substitute for changing the actual business process, nor will it by itself provide a company with any sort of competitive advantage if the organization is not prepared to make use of the benefits embedded in the system.

The results of the study seem to indicate that the top managers should decide on the goals and objectives of every investment project including IS investment, especially if it costs the organization several millions. In this project the top managers did not make any concrete decision concerning the business objectives of the project. This is because there was no general consensus on the business objective of the IS project among the top management, the steering committee, and the project group. Despite the fact that the several business benefits were identified, none of these business benefits were agreed upon as targets. While some members of the top management argued that the project objective was just to replace the old system, others were of the opinion that the business processes were meant to be changed as well, because they were overdue for changing. This confusion among the executives contributed towards their lack of personal involvement in directing and supporting the change processes.

One of the challenges in ABC today seems to be getting the top managers to better understand the potential business benefits in the new system. Another important challenge is practically changing the organization in order to enjoy the business benefits and other potential benefits embedded in the system.

5.2 The Technical Involvement in IS Project Development

High-quality project management is necessary for all IT projects. The IS project in ABC actually enjoyed good project management. Nevertheless, most of the project group members did not have experience in implementing a project of this size (i.e. it was too big a system for the project group to handle at once). The use of prototype in the system development process was beneficial in that it brought out most of the hidden problems, e.g. important tiny details that were forgotten, and most especially the need for a change in management process.

Looking back we could say that the project did not succeed as well as it could have done. There are still a lot of technical problems. For example, all the 10 end users interviewed noted that *the system is very slow, almost as slow as the old system (interviewees)*. Furthermore, the system crashes at least once every day, and the users find this to be quite irritating. The system also presents other applications in some departments from working properly. For example, some Microsoft application, like Excel cannot be running when the system is being used, but the user needs to run the two applications at the same time. Despite the technical problems, the system has been in use for about one year and there are plans for improving the system technically.

The analysis of this project reveals that even if the system is running without any technical problem the top management will still not be satisfied. This is because there are plans to take the *basic GJT system and develop the system all over again (Project manager)*. This is because it is probably cheaper to customize the basic system than to modify the present system to support the original redesigned business processes.

5.3 System Use and End User Satisfaction

User satisfaction is about the most widely used single measure of IS success. One reason for this is that it is hard to deny the success of a system that is liked by its users. In other words, it is easy to realize the shortcoming of a system rejected by its users. Another reason is that the business benefits and any other kinds of benefits expected from an IS can be realized only if the IS is used. Therefore, it is important to make sure that the users' requirements are adequately satisfied. However, the users' needs must be viewed in a proper perspective with the needs of other users and with the overall goals and objectives of the organization.

One of the most significant problems in the project was that the users' needs and the organizational needs were in conflict. This conflicting view formed the basis for the rejection of the system (prototype) by the users. The users' rejection of the prototype caused the organization a lot of financial expenses, because the organization spent a lot of money to re-modify the prototype to look like the old system. These expenses would have been avoidable in this project if the end users' work practices and the operational processes had been changed to support the newly designed business processes. We identify three explanations for the end users' reaction to the system:

- New way of thinking: The operational processes in the new system require a completely new way of thinking. Most of the end users had been using the old system for over 10 years without a need to understand the implication of what they were doing. Now the new system requires them to understand the implication of what they are doing, which is a completely different way of thinking from what they are used to (management interviewee). Moreover, this could be a difficult undertaking if they are suppose to master it in a relatively short time.
- New Platform: Most of the end users are not familiar with "Windows client-server environment"– the operating environment for the new system. Previously, they simply had to press F1, F2 etc. to get their job done on a mainframe system. Although some kind of training was provided, it was too little and too early because when the system was installed, most of the users had forgotten what they had learned already.
- Fear: One contributing factor may be the age of some of the users. Among the older employees there seems to loom a fear that this is an attempt to get rid of them if they do not master the new system in a short time. On the other hand the system provides an opportunity for incoming employees (younger in most cases) to secure a job position. In general, a negative feeling seems to radiate around the end user working environment with respect to the new system when it was just taken to use. At some sites there still exists some negative feelings about the system, but this is not as bad as it was in 1996.

These three reasons were sufficient to resist the new system no matter how "good" it was. There are still other problems associated with the use of the system. For example, the system is slow, as mentioned earlier. While this is not a serious problem it limits the usefulness of the system and it affects the users' ability to efficiently service the customer. One significant point about the system's slowness is that it seems to cut across the various functions in the business process (from ordering to delivering). This study shows that the users' opinion about the system is an important dimension for the IS success. It is important to note that user satisfaction measurement is not a measure for the whole IS success but it is a measure of the users' satisfaction. Furthermore, the measurement does not discuss the usefulness of the system. This is because most of the

users still think that the system is more useful than the old system even though it still has a number of technical problems.

5.4 Managing Expectation over Time

Projects which run over several years between conception and fulfillment run the risk of losing touch with users and management. Consistent expectations have to be generated and periodically renewed in the various interest groups. The strategic potential of the system was highly sold to the top management and this created high expectations towards the system. Therefore, there was a sense of disappointment towards the end of the project when the strategic benefits had not materialized. This points to the importance of clear and consistent communication among all interest groups, especially to and from the top management group.

6 Discussion

Information technology projects, in particular those that cross functional boundaries create the foundations for new organizational structures and processes by having an impact on what individuals do and how they do it. Planning of the long-term organizational changes could be better in this project. Most of the time the implementation seemed to be bogged down to technical details. Thus, there was a greatly diminished feeling of achievement of business benefits when the system was finally implemented. Changes in working structures and practices should be researched and agreed upon early in the project, and top management's support and active involvement should be ensured for the implementing of the recommended organizational changes. This was especially important in the ABC case, given the old traditions and cultural practices. There is no doubt that one of the most important challenges is to make these organizational changes.

It is clear from this case that resolutions of problems connected to technical correctness and project planning were necessary, but not sufficient, conditions for IS project success, especially if it is of strategic importance to the organization. Other problems that are perceived to be less difficult, like deciding the business and organizational targets, preparing the end users for the system, and communication among the various interest groups prove to be highly related to the project success. Figure 2 shows that there is a need to determine the business objectives for an IS project and to make sure that the set business objectives are actually implemented in the system development. The figure also shows the need to communicate users' requirement to the top management and the developers. One of the objectives of this communication in figure 2 is that the communication process will reveal some of the conflicting interests that might exist between the management, the developer and the user. The limitation of this model as revealed in this case includes is that it does not illustrate the need to prepare the end users for the new system. It also does not illustrate the need to change the organizational business process practically by changing some of the ways of working at the operational level.

6.1 Conclusion

Despite many problems, the system is in use today, operating in every location in

Finland. The focus of the system is shifting from technological development to organizational. The system will still be extended to include other functions and processes in the long run (e.g. electronic data interchange, EDI). On the technological front there are opportunities both for changing and expanding the system. It is clear from this case study that a focus on technical performance and end user satisfaction without linking it with the organizational goals is not sufficient for the success of an IS project.

The two objectives in the project came from the bottom up, from the IT department and the project group up to the top management. While this is not bad in itself, it becomes a problem if the senior management does not agree to these objectives and give them the necessary support they need. While the project group works on implementing the agreed system, management should work on getting the organization ready for the new system by changing the work practices.

7 References

Braa, K. "*Beyond Formal Quality In Information Systems Design*". Doctoral Dissertation, University of Oslo, 1995.

Bahn, D., and Paper, D. “BPR vs BPI: Contrasting Two Constructs” *Proceedings of the Fourth Americas Conference on Information Systems*, 1998, pp.104106

Clemons, C. "Successful Implementation of an Enterprise System: A Case Study" *Proceedings of the fourth Americas Conference on Information Systems*, 1998, pp.1091106

DeLone W.H., and McLean, E.R. "Information Systems Success: The quest for the dependent Variable" *Information Systems Research*, Vol. 3, No. 1, March, 1992

Eriksson, I. and Törn, A. “ A model for IS Quality” *Software Engineering*, July, 1991, pp. 152158

Grover, V., Jeong, E.R., Kettinger, W.J., and Teng, J.T.C. “The Implementation of Business Reengineering”, *Journal of Management Information Systems*, (12,1), 1995, pp.109144

Salmela, H.(1997) From Information Systems Quality to Sustainable Business Quality. *Information and Software Technology* (39:12), p.819-825