

ENABLING OR DISABLING WITH OLD SPECIFICATIONS

A New Information System Based on Old Specifications

Raija Halonen

Department of Information Processing Science, University of Oulu, P.O.Box 3000, FIN-90014 University of Oulu, Finland

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Abstract: This research concentrates on the development of an information system that was based on previously made specifications. We study the influence of before-made specifications and discuss the difficulties in adopting them. In our case we had several universities involved in the development project and the aim was to implement a joint information system to be used by student affairs officials and students in universities. Implementing information systems by several organisations is highly dependent on collaboration between the organisations. We discuss how the collaboration was managed in our case and show what the role of previous specifications was. We conclude that despite the specifications, the information system was finalised.

1 INTRODUCTION

Implementing information systems has been described in several studies. Our aim is to analyse the importance of specifications when a new information system (IS) is implemented in the context of several organisations participating in the development project. Our research concentrates on the importance of specifications and the influence of them in a case when the specifications were made in a previous project by other owners and participants. Our research shows that even if the specifications were evaluated to be perfect enough, their influence was not only positive on the development of the new IS project.

The research material is gathered from an IS project where an interorganisational IS was implemented in the context of several universities participating in the project. The aim of the project was to pilot an IS in order to support the management of student mobility between universities. Universities represent a special environment (Hearn, 2004). Hearn continues that academic organisations have their own cultural and national context, where science is practiced, organised and managed in specific, nationally-based institutions, with specific cultural and national characteristics.

The biggest user group consisted of students who wanted to perform studies in other universities as a

part of their academic degrees. However, the main user group consisted of student affairs officials who managed the student mobility, supporting or rejecting rights to study.

We have chosen action research and related methods in our study relying on Baskerville and Wood-Harper (1988) when they evaluate that action research is ideal for studying information systems in practice.

Collaboration is always needed when there are people involved in one project (Barki and Hartwick, 2001; DeChurch and Marks, 2001) but our research shows that the importance of collaboration is not only needed but sometimes even fundamental. When developing an interorganisational IS the role of collaboration even increases.

2 DEVELOPING INFORMATION SYSTEMS

IS as a concept has many descriptions and meanings. In this paper it is discussed a wholeness that consists of database, users, data collection device, data sharing devices, interpretation of information, organisational structures and processes. Lyytinen and Lehtinen (1987) see that the information systems development is both a political and a symbolic process.

The literature recognises research about implementing information systems in distributed organisations (e.g. Munkvold, 1999; Kotlarsky and Oshri, 2005) but there is not much literature about IS acquisitions made by several users representing different organisations.

Interorganisational information systems differ from an internal or distributed IS by allowing information to be sent across organisational borders (Johnston & Vitale 1988). Johnston and Vitale have studied user participation and they note that in intraorganisational systems involving users slows the design but pays back during implementation. Further, involving a cross-section of company employees helps developing new ideas and builds support for the new system. Johnston and Vitale continue that most organisations are accustomed to justifying new applications of information technology only through cost reductions, never on the basis of increased revenues.

Organisations are ever more developing technological tools to be used when seeking solutions to manage knowledge (Schultze & Boland Jr., 2000). Modern information society presumes that knowledge is easily and quickly transferred between participants that need that knowledge (Loebbecke et al. 1999). Ragowsky et al. (2000) state that information systems are vital to the operation and management of every organisation. The authors have studied how to analyse the benefits of using information systems. They found no significant relationship between organisational characteristics and the prevailing benefit from the IS. Further, the authors argue that organisations should expect to gain benefits from the information systems e.g. cost reduction and increases in competitive capability.

Developing and implementing an IS are instances of organisational change (Davis & Olson 1985, Lyytinen 1987) and they often lead to changes in work processes and structures of the personnel (Eason 1988, Sahay & Robey 1996). Markus (2004) has reported about three different ways to carry out the organisational change when implementing information systems: 1) letting users not notice the change, 2) users noticing the new information systems and 3) both IS and process change and users notice that.

All shortcomings that impede successful outcome of the development process lead to stress and change-resistive behaviours (Lorenzi & Riley, 2003). E.g. adopting information systems may face problems (Halonen, 2004). The quality of specifications is essential to the IS that is to be

implemented (Lyytinen & Lehtinen, 1987). Halonen and Heiskanen (2005) have described in their study on managing the process of acquisition how previously made specifications can slow down IS procurement.

Further, specifications are connected with the success of the IS project, even if their role can be discussed (Wateridge, 1998). Wateridge continues that it is too simply to suggest that a project is a success if it is delivered on time and to budget. Later in this paper we discuss how the specifications influence on time.

3 RESEARCH METHOD AND STUDY MATERIAL

This study is qualitative research enabling the researcher to explain and understand social and cultural phenomena. Baskerville and Wood-Harper (1998) have assessed action research to be ideal for studying information systems in practice. Schön (1983) points out that action research is applicable in different environments. Action research is characterised by 1) its multivariate social setting, 2) its highly interpretive assumptions about observation, 3) intervention by the researcher, 4) participatory observation and 5) the study of change in the social setting (Baskerville and Wood-Harper, 1998).

Greenwood and Levin (2000) describe action research by four definitions:

1. *Action research is inquiry in which participants and researchers cogenerate knowledge through collaborative communicative processes in which all participants' contributions are taken seriously.*
2. *Action research treats the diversity of experience and capacities within the local group as an opportunity for the enrichment of the researcher/action process.*
3. *Action research produces valid research results.*
4. *Action research is context centred; it aims to solve real-life problems in context.*

In addition, an academic action-researcher (Lallé, 2003) as a concept belongs to this study by meaning the researcher working in an organisation and generating new scientific knowledge. Ayas and Zeniuck (2001) emphasised “*effective collaboration between academics and managers, thus benefiting both practice and theory, enhancing the significance*

of research, informing both practitioners' and academics' views and actions".

Besides action research, the means of case study (Yin, 2003) are strongly emphasised in this research. An exemplary case study is characterised by five features: 1) significance, 2) being "complete", 3) considering alternative perspectives, 4) displaying sufficient evidence, and 5) composed in an engaging manner (Yin, 2003). The benefit of case research is in its extension of experience of the researcher (Stake, 2000). Stake continues that it is essential to choose a case that offers possibilities for learning and getting better understanding about implementation. Therefore this case is a pertinent choice in this paper. Stake (2000) writes: *"Knowledge is socially constructed [---] case study researchers assist readers in the construction of knowledge."*

This research is described as a case bearing in mind the idea of van der Blonk (2003) when he states that cases are written with a purpose that heads to the goal of the research project. He continues that the researcher is interpreting the case when writing it down. Writing has also been very personal and the approach is linked with experiences of the researcher, following the notes by van der Blonk (2003).

The research material consists of memorandums from meetings, emails to the project manager and a personal diary (Coghlan and Brannick, 2002) written by the researcher. The nature of the diary is personal research diary in contrast of being a project protocol. In the diary there are notes from about 350 days including personal observations from meetings and encounters and copied SMS's from vendors.

In qualitative research studies the benefit of diaries is realised when writing out the cases (Newbury, 2001). In addition, the researcher has made observations when working in the project. The approach is subjective and interpretative (Walsham, 1993) because the observations and findings reflect strongly on our personal presence. Mason (2002) states: *"Writing autobiographical and other notes, keeping a journal, and mentally re-entering salient moments can assist professional development and be integral to research."*

4 EXPERIENCES FROM AN INFORMATION SYSTEM IMPLEMENTATION

Our empiric material comes from an implementation project where a joint IS called MoSu was designed and taken into use by three universities. The goal of the project was to implement and to pilot the IS that was to be taken into nation-wide use after the piloting phase. The aim of the IS was to support the student affairs officials when they managed student mobility in their universities, and to enable students to apply for rights to study using electronic system. Student mobility happens when a student performs studies as a part of his or her academic degree in another university. This right is subject to licence.

Student mobility is increasing between universities. In June 2003 all universities in the country agreed that they will allow students to pass exams in other universities as a part of their master's degree. In addition to that, 33 European Ministers agreed on a unified educational system in Europe (Bologna, 2003). That is expected to extend the student mobility over national frontiers in the future. Furthermore, unified studies may increase student mobility also nation-wide.

4.1 Background of MoSu

Student mobility had been specified in another project by other participants and the output of this previous project was to be used when implementing this new IS (memorandum September 12, 2003). The targets of this previous project were to produce specifications for an IS and to implement and pilot the designed IS. However, due to lack of resources, the total output was never achieved and it is out of the scope of this paper.

The project manager wrote her diary in August, 2003: *"When reading the memorandums from the pilot phase of the IS ("Students' mobility") I understood that I should have read them more often and more carefully in order to realise what has been done and what was to be done during the next years. So far I could not see any pilot and I was the one to execute the implementation of this IS to be used by three universities in the first phase."*

The most important document that the previous project had done was the specification of the process of student mobility. This description of the mobility was available and useful when starting with the actual IS implementation. The description included actions needed by students, student affairs officials

and invoicing affairs, added with issues connected with data administration offices in universities. In addition, also actions connected in registering into universities and signing in the courses were described in the process document. The document appeared to be very useful later when the diversified nature of managing student mobility was introduced in several seminars and it realised the high-felt need of MoSu that was built later.

In parallel with the MoSu project there was a project that produced a joint application form to be used nation-wide when applying for rights to study in other universities. That appeared to be an effort but the output was thanked and it acted as a basis for the electronic form that was produced in our project.

4.2 MoSu and Specifications

The first meeting of MoSu was called in June 2003. The new project was established in order to produce an interorganisational IS to support student mobility in universities. The starting point was to pilot the IS in three universities (Alfa, Beta and Gamma) and according to the output, enable start-ups also in other universities nation-wide (memorandum in June 2003). A fourth university (Delta) was called in to act as a process university. These universities had already had mutual student mobility and they had developed processes of their own to manage it.

Knowledge about information technology and information systems was scarce in the project group. IS view was introduced mainly by the vendor who tried to explain what the decisions meant "in IS". *"If anybody mentions 'interface' I'll scream"*, warned one official in a meeting.

Further in October 2004 there was discussion about codes in the electronic application form. The vendor had to explain the differences between electronic and paper files and how they had to be considered when implementing the process into the IS.

Occasionally several discussions about the functionality and coding them into the process were felt annoying by the student affairs officials: *"You may do yourself an IS that you can learn to use and manage the mobility of students for us."* (Diary notes from a project meeting in March, 2005).

The process of student mobility that was specified in the earlier phase by other stakeholders was described using the view of student affairs offices and the process was specified to include all actions and functions related to student mobility. However, the current IS MoSu was designed only to support student affairs officials and students in

applying for rights to study and to enable the participants to follow the process. In addition, the information concerning accepted rights and passed studies was offered to the student affairs by MoSu.

This project produced specifications on the application process from the perspective of the IS. In practice, this meant that the project members had to specify the process how the application was managed in their universities.

The process appeared to be difficult to specify. The project group had to discuss several times in the meetings about the arrows in the picture and about the principles that lead to next steps in the process. Several times the project group had to change the decisions that had been earlier made (e.g. the possibility to change information concerning studies in the target university: disabled in May 2004 and enabled in February 2005). However, finally MoSu was coded according to the process and it was taken into use in spring 2005.

There were controversies about descriptions and specifications in the project meetings because some of the project members expected details about the process (memorandum in June 2004) and the implementer responded that the old specifications cover these details. However, the more the implementer got acquainted with the old specifications, the bigger grew the need to specify and update them. Deficiencies in the old specifications caused delays in the project (memorandum in April, 2005) and finally the schedule was changed to meet the work load when finalising the specifications (memorandum in May, 2005).

It also happened that when MoSu was in use, the student affairs officials sent emails to the administrator asking him to perform actions that were against the process. *"Could you please restore the application No. xxxx that I rejected back to the process?"* (September 2005). The users could not do the actions themselves because they had to follow the procedure that was coded in the IS. With legacy system, they had only taken the application back from the waste paper basket.

In the project meeting in May 2005 there were severe discussions how the invoices should be managed in MoSu. In the old specifications it was specified as *"the system should be able to combine the information concerning students, studies and invoices"*. However, the current opinion was that MoSu must not be developed as an invoicing system but to support the management of student mobility and to enable electronic application process. This caused changes to the old specifications. Because

MoSu should not invoice anything, all interfaces concerning invoicing had to be removed from the specifications (memorandum in May 25, 2005).

In addition, also the information concerning right to study had to be specified and formulated in order to be saved in the database. That caused discussion about the student's right to see all information concerning the studies. *"Damned, sometimes this visibility of information is ridiculous! This kind of interaction as in this case belongs only to those officers that are interacting. I prefer leaving the possibility out of the system. Let's interact with the old phone or an ordinary email."* (Email to the project manager February 9, 2005).

We gathered feedback from the users during the piloting phase. The feedback was mostly very positive: *"Really much better than filling and sending paper forms!"* (Student in May, 2005). *"Thank you for the good service with student mobility!"* (Student in May, 2005). However, we got also some negative feedback: *"That was not a user-friendly application form!"* (Student in June, 2005).

5 DISCUSSION

IS literature recognises the importance of relevant specifications on the successful IS implementation (e.g. Lyytinen and Lehtinen, 1987). Our MoSu project was a special case because it was to be implemented using specifications that had been made in an earlier project by other project participants. Our research shows that using specifications that are "ready-made" is not always a positive issue but may slow down the implementation project.

The IS was developed keeping in mind the possible changes in the process and the users were involved in the change process, following notes by Markus (2004), Eason (1988) and Sahay and Robey (1996). The interorganisational learning ladder introduced by Ciborra and Andreu (2001) was used when the different processes of the universities had to be modified to meet a joint IS that was under design.

In the beginning the project personnel thought that the previously made specifications were good enough to be used when implementing the IS. However, even in the first meetings the project manager had thought that there are deficiencies in the specifications (Diary in August, 2003). Despite that, the prevailing opinion was that the specifications should be used when implementing the new IS. The vendors were informed about the

decision and they started their work according to that decision.

The more the vendors got involved in the specifications, the more they were convinced that the specifications needed to be fulfilled and considered carefully before designing on them. This was discussed in project meetings where changes were made to the old specifications. However, all these decisions based on carefully made estimations and all these actions spent resources of the vendors.

The application process was discussed in several project meetings and it was taken into use looking forward to the comments from the users. The piloting phase gave good feedback and the process was to be changed according to the need.

The role of collaboration was emphasised in every project meeting. E.g. the interfaces between course information systems in universities and MoSu were under discussion and the earlier made specifications on interfaces were removed from the implementation (memorandum August 24, 2005) because the student affairs officials told that their universities are not able to offer the information.

According to Loebbecke et al. (1999), it is common to wait for information to be easily and quickly transferred between participants that need that information. This was the case also in our project. The student affairs officials needed the information concerning student mobility when they made decisions on applying or rejecting rights to study. Before this IS, the process easily lasted for weeks.

From the feedback received from both the student affairs officials and students we could see that the implementation had been a success so far. One reason for this success can be seen in the high-felt need of both the officials and the students. Even if the main goal was to support the student affairs officials in managing the student mobility, also the relief felt by the students was highly appreciated by the project owners.

We believe that this case serves both practice and science, giving better understanding about IS implementations and the importance of specifications that are used. Further, if specifications are done in another project by other stakeholders, the influence of them is not only positive. Our case shows that getting acquainted with the specifications spent resources that could have been useful otherwise. In our case it would have been wiser to start "on a clean table".

However, this kind of proceeding is wise if there is any fear of "one-vendor-trap". We would like to emphasise that this fear pays. Because our project

was decided to be based on earlier made specifications, we had to act according to those decisions. We want to conclude that despite those decisions, our project appeared to be a success so far.

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