Organizational Change as a Contributing Factor to IS Failure

Heidemarie Winklhofer

School of Computing and Information Technology
Griffith University
Brisbane, Australia
H.Winklhofer@mailbox.gu.edu.au

Abstract
The reasons for information systems (IS) failure are numerous, frequently difficult to determine and may include organizational factors that are outside a project’s control. This paper describes research in progress, which explores the effects of organizational change on the development, implementation and operation of IS. A human resources system (HRS) project is discussed in detail and the link between organizational change and the project outcome examined.

It appears that the collective and cumulative effects of minor organizational changes on IS project outcomes could be as significant as the influence of radical organizational restructuring. It is suggested that organizational changes, even those that appear initially insignificant need to be identified and their potential influence on IS projects assessed as part of any strategy that aims to increase the likelihood of IS success. The implications of these findings for IS project management are discussed.

1. Introduction

This paper outlines research in progress for a Ph.D. in Information Systems. The research explores the effects of organizational change on the development, implementation and operation of information systems (IS). The findings suggest that organizational change contributes to IS failure. Moreover, it appears that even minor changes influence IS project outcomes and that their collective effect is significant.

The paper starts with an overview of the problem under investigation. An outline of the research approach follows. The HRS project, which is used to explore the effects of organizational change on IS development, implementation and operation, is introduced. Findings from the case study are presented and the implications for project management discussed. The paper concludes with a preview of the next steps in the research program and suggestions for further research.

2. IS failure

Despite the best efforts of researchers and practitioners IS failures continue to occur [21]. The factors affecting an IS project are numerous and extensively discussed in the literature [4, 33]. In real situations it is often difficult to determine why a project was not successful. Rarely is it possible to either pinpoint with confidence the point at which the process started to go wrong or which factor or factors were responsible for its failure. Frequently the various groups of participants differ in their opinion concerning the causes of failure and may even disagree on their assessment of the overall outcome. Despite the numerous methods and strategies designed to ensure IS project success such as IS development methodologies, risk and project management techniques and software process improvement, it is still not possible to ensure a successful project outcome for all interested parties.

The strategies, for example traditional project management techniques and many IS development methodologies that are recommended for achieving a successful outcome seem to focus on the IS project and the process itself, while ignoring the organizational and social setting. The realization that factors that are outside the project’s control can contribute to the outcome [13, 39] has led to the development of approaches that consider an understanding of the organization essential if IS projects are to succeed [7].

IS projects are not carried out in isolation from the organization and organizational factors can influence the project outcome. A significant body of research concerning the impact of IS/IT on organizations exists [13, 10, 40, 26, 19, 32]. Some authors acknowledge the impact of organizational change on IS [23, 30]. Nevertheless the possibility that organizational change could influence IS development, implementation and have an effect on the continued usefulness and suitability of existing systems has not been researched in depth.
3. Organizational change as a contributing factor to IS failure

Organizational change continues to preoccupy managers and is extensively discussed in organizational literature [31, 18, 35, 25]. Change and adaptation are regarded as inevitable and vital for organizational survival [10]. A volatile environment, increased competition and particularly IT are accepted as the main catalysts and enablers for organizational change. Significantly many technologies, for example groupware, are adopted as a means of controlling and facilitating organizational change [8, 28]. Triggering in fact a cycle where organizations deploy technology in order to absorb the effects of change and having to adapt organizational processes to the new technologies [40].

IS research is still largely based on the assumption that the organizational environment is stable [17]. Equally, the goals of most of the approaches and strategies that are advocated to ensure IS success are built on the notion of a stable organization [38]. As a consequence they do not allow the project participants to monitor and assess the effects of organizational change. It is the aim of this ongoing research to explore the effect of organizational change on the development, implementation and operation of IS, particularly the potential influence of minor organizational changes on IS project outcomes and the implications for IS project management.

4. Research approach and strategy

4.1. Research approach

Since the organizational context of IS development, implementation and operation is the focus of the research, a qualitative rather than quantitative research method is appropriate [6]. The researcher chose an interpretive approach since various subjective perspectives need to be taken into account and because of the complexities of the context. The research strategy is built on an action research learning cycle adapted from Avison and Wood-Harper [2, 41]. Action research encourages the researcher to reflect upon his or her influence on the situation and associates theory and practice, which are aims of the study.

Since this research focuses on the organizational context of IS development and implementation, it may at times be difficult to establish the boundaries of the project. This makes the use of a case study appropriate [42]. During the case study extensive opportunity for informal contact with members of the organization existed and participant observation was possible. The researcher was also conscious of the historical aspects of the situation. Ethnography, which also supports the exploration of context, is therefore a suitable approach [14].

4.2. Exploratory case study

From August to November 1998 the researcher carried out a consultancy within GBR, the regional office of AIM. AIM is one of 3 divisions of a state government department comprising 6 regions that had been created in 1991 by amalgamating a large number of independent branches. GBR is divided into 5 areas with each area manager responsible for 6 to 9 branches and employs approximately 500 staff. Although there is considerable independence from AIM, decisions made at state level as well as outside influences over which neither the state organization nor the regional office have control can have a significant impact on the way in which the core business activities are carried out. The researcher's task was to identify the information needs of operational management within GBR, to investigate the current regional and state information systems for their capability to satisfy these needs and to propose strategies to overcome any deficiencies.

AIM had recently undergone another major restructure. Power bases shifted and the restructure left in its wake a great deal of resentment at all levels of the organization. The intent of the restructure had been to assist the organization in carrying out its mission statement more successfully. In addition it was hoped that a leaner organizational structure would allow the organization to deploy its limited resources more effectively and efficiently. Despite the completion of the restructure the organization was still in the process of change during the case study. New positions were created, existing ones abolished and roles and responsibilities redefined.

An information systems audit revealed that a great number of state and regional IS in varying stages of development, implementation and operation existed. At the same time the attitude among staff towards their usefulness and their future success was largely negative. This paper explores the effects of organizational change on the development and implementation of one of the statewide IS, the Human Resources System (HRS) and discusses the implications of the findings for project management.

4.3. Data collection

More than 60 unstructured and semi-structured interviews with both AIM and GBR staff at all levels were conducted. Transcripts of the interviews are the primary source of data. It has been argued that “post hoc rationalizations tend to emphasize particular causes, perhaps to simplify the lessons learned” ([5] p. 86). However the memories and anecdotes of project participants are often the only way to gain access to a complete project history. Internal documents including IS project documentation and internal audit reports were
that included risk and quality management strategies.

Implementation was to occur in four phases and GBR

5. The HRS project

HRS was put into operation in 1995 as one of several strategic systems. It allowed the organization not only to replace various incompatible local systems, but also to facilitate the alignment of the HR function of the three divisions. HRS was to provide:

- A response to the need for faster, reliable regional and head office human resources practices;
- A decentralized personnel and payroll system; and
- A strong management information system (HRS project documentation 1995).

Benefits of HRS' implementation were targeted at three levels within the organization:

- Executive management by providing a strategic management tool;
- Middle management by supplying accurate and reliable information for management decisions; and
- Operational personnel and line management through improved and efficient data processing and flexible reporting facilities (Operational Plan 1995/98).

The system was implemented in a top down approach with AIM management as the major sponsor. Implementation was to occur in four phases and GBR acted as pilot site for phase one. Development of HRS was outsourced, but the project team included regional and state HR officers who would use the system, AIM and GBR managers and regional staff. IS support for GBR and the other regions was located at state headquarters (HQ) and under the direct control of AIM. Project documentation revealed a sound management approach that included risk and quality management strategies.

Discussions with regional HR staff and managers revealed a largely negative attitude to HRS. Managers in particular considered it “useless”. The regional HR manager confirmed that delivery of expected modules was late, but was still optimistic that full implementation of HRS in 12 to 18 months time would lead to significant improvements. The Regional Executive Director (RED) commented on one occasion that HRS had been promoted as the system that would “provide all the answers”, but failed to deliver on the promises. He was therefore distrustful of any new IS development led by HQ and believed that GBR needed to take the initiative by developing regional IS. An evaluation of HRS by the researcher and the internal post implementation audit report (HRS Post-Implementation Review 1998) confirmed that significant problems existed. Moreover, it appeared that the recent and ongoing organizational changes contributed and in many instances caused the difficulties associated with the system.

6. Identified problems

Several problems were identified in the HRS project, many of which could in time be overcome. None of them by itself caused the project to fail, but collectively they created major obstacles for the usefulness and usability of the system. Many were either a direct consequence of or aggravated by organizational changes.

6.1 Lack of up-to-date, accurate and reliable data

The failure to deliver a user friendly system and several essential components had a significant impact on the usefulness of HRS and the accuracy and reliability of its data. The GBR’s Health and Safety Officer for example, considered the Workers Compensation component of HRS too complex and was in the process of building an Access database that met his requirements.

A roster component had been planned as part of phase two of the HRS project, but was never implemented. Regional offices such as GBR continued to use their own roster systems. All regional staff were adamant that the roster system is critical for successful and efficient operations. Rosters for all branches had to be prepared in advance of operations making accurate data on staff availability essential. On HRS employees could only be registered after they had commenced work. Leave was planned 12 months in advance, but only entered on HRS when it was actually taken. HR staff could therefore not provide complete and accurate data on staff availability. Staff, conscious of the importance of rosters to GBR’s operations, informed the roster team of changes to personal details, but rarely HR. Establishment data was therefore duplicated in the roster system and differed from that on HRS. Since neither the roster system nor HRS was...
available at branch level operational managers maintained their own spreadsheets and databases for staff details.

As a result of the restructure and because of staff absences due to illness or leave a number of staff at all levels acted on higher duties. On HRS higher duties were only recorded if the period exceeded 3 months. Temporary higher duties were entered in the “experience field” to ensure payment for the staff member. It was therefore impossible to determine from HRS which staff members within an area or branch worked at which level.

Several HRS characteristics increased the error rate during data entry and added to HR staff’s irritation with the inadequacies of the system. For example, HRS was still based on 9 regions, while only 6 remained. Look-up tables were therefore confusing, which resulted in errors and made report generation tedious. HRS developers had assumed that establishment data would only rarely change. Due to ongoing internal restructuring and the subsequent creation and abolition of positions modifications were, however, common. Due to the complexity of this feature errors occurred frequently.

The system’s failure to provide accurate and up-to-date data affected its usefulness and usability and resulted in duplication of data in regional and branch systems. It appeared that assumptions about organizational stability had been built into HRS and organizational change therefore seems to have been a contributing factor for the problems staff encountered.

6. 2. Lack of management information

As a result of the latest restructure area managers were accountable for the operations of the branches under their control. Management information that would support decision making and that helped operational managers in the day-to-day running of the branches was therefore critical. Cost overruns were a major concern for the RED, putting operational managers under pressure to control and monitor expenditure. Several managers wanted to compare the performance of branches and to analyze trends. Regional managers therefore needed up-to-date data on staff availability and salary expenditure. However, HRS did “not provide adequate analysis such as trends, graphs, and comparisons” (Strategic Review of IS 1997). While management information from HRS was available, the reports were considered inadequate and difficult to understand.

HRS did not meet one of its critical success factors, the provision of management information for decision making. Due to the restructure a larger, more diverse group of managers whose accountability had increased relied on information for effective decision making. Organizational change therefore aggravated the shortcomings of HRS in this regard.

6. 3. Lack of training and support

While the development of HRS had been outsourced, ongoing support was mainly provided by the IS team at HQ. During a review of documentation the researcher discovered that a number of additional HRS reports were available. HR staff was unaware of their existence and complained that their training had been inadequate. As a result of the restructure IS support staff moved from HRS to other projects. Rather than requesting assistance from the new HRS helpdesk, HR staff continued to phone the original HRS project members when problems occurred. When questioned about this, HR staff expressed the view that new staff was not knowledgeable about the system and less than helpful. On the other hand helpdesk staff complained during interviews that because they had no regular contact they remained unfamiliar with many of the problems regional HR staff encountered. HR staff was also often not aware of new features and problem fixes. HRS “is not being used to its full capacity as a management information tool. There is a lack of knowledge of how to extract data […] and awareness of the potential information that could be extracted. This is mainly due to the loss of the skill base, because of staff departures, after initial training was given and a lack of follow-up and ongoing training” (HRS Post-Implementation Review 1998).

A request by GBR for further restructuring had been made shortly before the start of the case study. It was generally accepted that the request would be approved. The restructure would result in the region employing its own Manager Business Support, rather than sharing the position with another division. The current manager planned to retire and withdrew more and more from active involvement in regional affairs. However, AIM support services were unaware of this and continued to channel all IS information through him. HR staff considered the Manager Business Support “a black hole”. Information would disappear instead of being passed on. The Manager Business Support was for example, the only person at regional level aware of the imminent availability of a HRS data extract that could be analyzed with the help of an Executive Information System (EIS). This could have met some of the managers’ information requirements. Only one area manager used the EIS to analyze data from another IS. Several managers were aware of the availability of the EIS, but they had never received training in its use and were unsure of its applicability.

Many GBR managers were new to their positions or only acting on higher duties. They were still trying to come to terms with their increased responsibility and accountability. Most were therefore not able to specify their information requirements or to ask appropriate questions of HR staff. HR staff on the other hand was unsure what information mattered most to managers. Many of the staff changes and movements were the result of the
restructure. At a time of heightened need for training and support by the various user groups these areas had been adversely affected by the restructure.

7. Discussion

Sillince and Muakket suggest that there is no overall criterion for IS success. “It succeeds according to the agent whose interests are served, and is pronounced a failure with reference to the agent whose interests are not served” [36]. Whether a project is classed as success or failure depends on the perceptions of the people concerned [37] and their role in and their view of the IS development process [20]. “There are no generally acceptable measures available to quantitatively and objectively assess an information system’s success” ([33] p. 116).

Opinions on whether or to what extent HRS was a success or failure differed among the various groups within AIM and GBR. From the perspective of IS support staff HRS was a success. User complaints were easily explained since “users always complain because they do not understand how to use the system properly”. Technically the system was sound and provided the functionality required.

AIM management considered the use of one HR system across the divisions an improvement. Since processing had been relocated to the regions the envisaged decentralization of the HR function had been achieved. There was, however, dissatisfaction and disapproval of GBR management over the proliferation of regional systems. AIM management believed that the regions should wait for IS strategies and systems to be initiated across the entire organization.

According to HR staff HRS was working as required. Many of the problems they encountered were explained through inadequate training and support. Report generation had only recently become an issue as the restructure took full effect and GBR managers became more demanding in their quest for useful information. The major problems were experienced and voiced by regional managers, the group of employees that had been most effected by the restructure.

HRS seems to have failed according to the project success criteria and did not deliver all of the expected benefits. No single factor appears to have been responsible for the project outcome. Most of the reasons for problems associated with IS development and implementation such as user resistance, project politics, ineffective communications, differing technological frames and cultural presumptions have been discussed in the literature [22, 4, 11, 29, 27]. Many of these seem to have played a role in the project’s lack of success.

AIM imposed HRS on GBR and its use was mandatory. Resistance was evident in those areas where users could simply ignore its existence. As a consequence more reliance was placed on regional IS, which in turn affected the usefulness of HRS. Communication problems between the groups and the failure of IS developers to understand the operations of the organization also contributed to the outcome. Neither the IS developers nor AIM management appreciated the effect that non-delivery of essential system components would have and how it would influence the attitude of staff at all levels towards future IS projects and IS staff. Several other factors, including organizational change had a significant influence on the HRS project outcome.

7. 1. Inhibiting top management attitude

HRS had been initiated as a strategic system. However, as time progressed, other systems took priority and its status seemed to have become that of an operational system. Management and support appears to differ for the various types of IS [34]. As the system’s status appeared to change so did the level of importance AIM management and IS support accorded to user concerns.

HRS had been implemented as a means to facilitate decentralization of the HR function. At the same time AIM management was reluctant to hand over control to the region in other areas. This ambivalent attitude can in part be explained by the organization’s history. For several years AIM had tried to unify a large number of independent local branches into one cohesive organization. The restructure was designed to increase efficiency and effectiveness by pushing responsibility to the regions. While decentralization of HR was desirable, IS support was to remain firmly under the control of AIM. Decentralization was therefore carried out half-heartedly and HRS imposed from above which created resentment.

Although responsibility for HR was moved to the regions there was no sense of system ownership (HRS Post-Implementation Review 1998).

A similar ambivalent attitude towards the organizational restructure was evident within GBR. While area and branch managers were more accountable, they were still unsure of their roles and responsibilities and were also not given the necessary autonomy to carry out their tasks effectively. As a consequence consultation was inadequate and the information needs of this group only superficially addressed.

7. 2. Limiting view of user groups

Direct users such as HR staff and indirect users such as regional managers participated to some extent in the HRS project. However, one group of users that appears not to have been represented was operational staff. Alter [1] refers in relation to DSS to this group as “feeders” of a system. The term “uninvolved users” of IS seems also appropriate. “Feeders” or “uninvolved users” never use a
system directly, but supply the data that is essential for the system’s operation. Many operational staff was oblivious to the system’s existence and significance. Since the regional roster system was more relevant to their work, they communicated frequently with the roster team and most would contact them rather than HR staff when their personal details changed. As a result data in HRS was incomplete and often incorrect. Failure to involve this group in the project had a direct impact on the usefulness of HRS. Lack of participation in the HRS project was recognized as one of the major causes of its failure (HRS Post-Implementation Review 1998). The seriousness of the problems regional managers encountered was highlighted by the researcher’s employment as information analyst.

7. 3. Failure to take organizational change into account

The failure of HRS can be attributed to a number of reasons, but it appears that organizational change acted as a contributing factor. The major restructure increased the need of managers for accurate, timely and complete information. The ongoing redefinition of roles, the number of people that were acting on higher duties, the continued creation and abolishment of positions resulted in frequent modifications to establishment data which had not been anticipated. Training and support suffered when priorities changed and staff was reassigned. Some stakeholder groups had only limited opportunities to participate in the project. The example of HRS indicates not only that the major organizational restructure influenced the project outcome, but that ongoing minor changes exposed and highlighted shortcomings of the IS and affected its usability and usefulness. The cumulative and collective effect of the minor, seemingly insignificant organizational changes proved in fact to be more detrimental to the HRS project than the major restructure.

8. Implications for Project Management

The importance of the “fit” between organizational structure and technology for the success of the organization as well as for the development and operation of IS has frequently been pointed out [15]. But the concept of “fit” is based on the assumption that the organization will remain unchanged once this “fit” has been found. Some researchers have recognized that the assumption of a stable environment is no longer tenable and that the concept of “fit” needs to be expanded to include IT flexibility [17]. Organizational design is an emergent process and due to the persistence of change organizations can be characterized as “emergent” rather than as stable or unstable [3]. In the case of HRS assumptions about the stability of the organization and the seat of organizational control were built into the system and proved detrimental to its success.

Increasingly researchers are recognizing the importance of organizational change as a factor in IS development and implementation [23, 30] and that traditional approaches to IS development and implementation are in the current climate of constant change no longer adequate [38]. While HRS project management seemed adequate, it did not address the issues arising from organizational changes. It was in fact unclear whether the IS developers were fully aware of the changes that took place.

While the lack of user involvement in the HRS project can to some extent be attributed to the fact that development was outsourced and a communication gap between IS support and regional staff existed, organizational restructure makes participation more difficult [30]. During most IS projects stakeholders may leave the project or organization, while others join. Minor organizational changes occur frequently when new positions are created, others abolished and different users need access to or information from a system. The HRS project illustrates that ignoring the effect of these changes can be detrimental to the project outcome.

Organizational change is not completely predictable and may result in unanticipated outcomes [28]. Incremental change may pose less risk and build upon the status quo [26], however the cumulative effect of these minor changes seems to increase their influence on IS. While it is possible to plan for major change minor changes may go unnoticed precluding thus any effective actions. Minor organizational changes can therefore pose a greater problem for IS project management than a major, planned restructure.

Good communication is critical to organizational change [25] and reliance on informal communication can significantly increase during organizational change [9, 16]. During the HRS project there was a significant interplay between the formal and informal organization. It appears that the informal organization either tried to maintain existing or to establish new information flows in the face of frequent organizational changes. Before the actual restructure took place the informal organization seemed to compensate for a potential gap if the position was either not immediately filled or staff was unsure how the new formal structure would work. As formal communication channels failed, the informal organization played an increasing role. Liaison between HR staff and the roster team for example, occurred only on an informal basis, but was critical to the operation of the region. Similarly HR staff and managers negotiated the production of reports on a one on one basis. Due to frequent staff and role changes informal communication remained, however, fragile. HRS project management seemed to have taken no steps to improve communications. Project managers need to be
conscious of the crucial role communication and coordination play not just during IS development and implementation, but also during its operation. Organizational change makes well-designed hand-over procedures and change management strategies imperative.

Organizational change does seem to influence IS development, implementation and operation and it is vital that project managers respond appropriately to the arising challenges.

9. Guidelines for project managers

At a time when organizational change is so prevalent project managers have to respond to unexpected events and deal with uncertain outcomes. “An ongoing change process requires dedicated support over time to adapt both the organization and the technology to changing organizational conditions, use practices, and technological capabilities” ([28] p. 17). Based on the analysis of the HRS project it appears that project managers could take several steps that may help reduce the negative effects of organizational change on IS projects.

The following guidelines suggest actions project managers can take to avoid the pitfalls associated with organizational change during an IS project.

- Be aware that change is the rule rather than the exception. Even minor organizational changes, such as the resignation of a staff member or the re-definition of a position, can have an effect on an IS project.
- Determine to what extend planned organizational changes are supported by top management. If there is a separation of accountability and control the IS may not fully support the new structure.
- Constantly monitor the stakeholder groups of the IS project. Minor organizational changes will affect the composition of groups and new stakeholders with different requirements may emerge throughout the duration of a project. Organizational analysis therefore needs to form part of any development and implementation strategy [24].
- Evaluate the extent of participation. This is particularly important when IS development is outsourced.
- Accept that user needs are always changing [38] and make regular evaluation of the IS part of the development and implementation and particularly the maintenance process.
- During organizational change communication is crucial. Procedures for example for change management that remain relevant during the system’s operation can serve as useful means of communication.

Adhering to some of these guidelines may increase he chances of achieving IS project success.

The role of management is increasingly becoming one of coordination rather than control [12] and continuous analysis of the IS application as well as the organization is becoming critical. Any steps taken by the project managers need to be constantly reassessed and evaluated for their usefulness and contribution towards a successful project outcome. Above all the measures should remain in place throughout the system’s entire life.

10. Conclusion

Organizational change is usually viewed as a planned process with predictable outcomes that are beneficial for the organization. This may, however, not be the case. Organizational change can also occur in seemingly insignificant stages that are often unintentional and may have a negative effect on IS project outcomes and ultimately also on the organization as a whole. Frequent or continuous minor restructuring can change the organization as fundamentally as a major restructure and the consequences of such changes are difficult to predict. Frequently these changes appear initially to be insignificant and are consequently ignored. This research suggests that such “creeping” or “sneaking” changes not only influence IS projects, but that these changes collectively could have a more profound effect than the radical changes that are the result of business process re-engineering.

Organizational change increases the complexity of IS [30] and of IS project management. While it may be possible to plan for major organizational change, small “creeping” changes during IS development and after the system’s implementation seem to be the most difficult to deal with. The exploration of the collective effect of these minor, often unpredictable organizational changes on the development, implementation and operation of IS, their influence on IS project outcomes and the implications for project management is the focus of the ongoing research.

11. The next step and future research

Other IS within the case study organization, such as the regional roster system will be examined next. This could reveal a pattern of the effects of organizational change on IS development, implementation and operation. Investigation of areas such as user participation and organizational memory will be conducted in search of an appropriate theoretical framework. The implications for project management could then be investigated in greater depth.

Another step in the research program is a close examination of the various approaches and strategies such as IS development methodologies and project management
techniques that are advocated to ensure project success. The extent to which they may hinder or support IS development and implementation of IS during organizational change needs to be closely examined. If the goals of many of these approaches are no longer adequate [38] future research should be aimed at developing suitable alternatives that assist IS project managers to assess and monitor the constantly changing organizational context.

The guidelines for project managers proposed in this paper require suitable tool support. Further research is required to define appropriate techniques and methods to assist project managers in their successful implementation.

Most importantly, however, future research needs to address the problem of how project managers can be adequately prepared for their task. Frameworks for teaching IS project management should be developed that help future project managers to identify and address the issues and problems that are a consequence of organizational change.

12. References