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Alison Parkes
University of Melbourne

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A Case Study of Workflow Implementation Success Factors.

Alison Parkes
Department of Accounting and Business Information Systems
University of Melbourne
Melbourne, Australia
Email: aparkes@unimelb.edu.au

Abstract

This paper explores factors related to the successful implementation of workflow systems. The paper is based on literature drawn from areas as diverse as technology enablement, change management, process reengineering and modelling and political social and organisational aspects. Case study observations related to these factors are recounted in a semi-structured discourse, and impacts on the workflow project under observation are appraised.

Keywords

Workflow; technology; implementation; success factors; case study.

Introduction

Workflow systems are systems that support business and information processes (Allen 2001; Jablonski and Bussler 1996; Kobielius 1997). This case study is about understanding the successful implementation of workflow systems. A set of success factors was derived from the existing literature and is summarised below. Contact was established with an organization that was undertaking a trial implementation of a workflow process and the researcher had an opportunity to observe onsite the implementation of a workflow system. This paper identifies potential success factors, and describes the experience and observations of the researcher in relation to those factors.

Summary of Success Factors

Process Modelling. One of the key requirements for workflow implementation is successful creation of a process model. Related issues identified include incorporation of domain knowledge (Shaft and Vessey 1998), specification of workflows and business processes (Bajaj and Ram 1996; Datta 1998; Reddy and Tagg 1998), process delineation (Murphy and Staples 1998) and technology skew (Davenport and Short 1990).

Change Management. Workflow engenders changes which affect both individuals and the organization itself, as workflow fundamentally alters the way tasks are conducted and managed. The issues examined were chosen either because of their well documented significance i.e. management commitment (Broadbent and Butler 1995; Clarke and Garside 1997), need for explicit planning (Markus and Benjamin 1997; Orlikowski and Hofman 1997) and communication (Clarke and Garside 1997), or their alignment with previously identified workflow issues, i.e. mode of change (Cooper and Markus 1995; Scott 1999), level of change (Stoddard and Jarvenpaa 1995) and power redistribution (Thach and Woodman 1994).

Political Aspects. Major change or restructure in an organization like that engendered by a workflow implementation often leads to behaviour that is commonly called 'political', or 'playing politics'. Christiansen et al (1997) defines political behaviour as attempts to influence others that is perceived to be self-serving in nature. Failure to identify and appropriately manage political issues can lead to those issues sidetracking the true purpose of the project. This review examined four issues: participation (Clegg et al. 1997; Hornby et al. 1992; Mumford 1993), competition for resources (Drory and Romm 1990), group interactions (Chaffey 1998), and feelings of loss of control (Boersma 1994).

Organisational Impact. Successful introduction of technology often requires redesign of organisational structures (Orman 1999). In the case of workflow systems, this issue is particularly pertinent, due to the propensity of workflow to impact on job design. Primary issues considered relevant are organisational structure re-design (Bhattacharjee and Hirschheim 1997), centralization (Kobielius 1997; Orman 1999), devolution of power (Blackler 1992), and corporate memory retention (Kock and McQueen 1996).

Process Reengineering. Process reengineering addresses the issue of how a business should design its processes (Hammer 1990; Hammer and Champy 1993). Workflow issues relating to process reengineering include the techniques adopted (Butler 1996; Kettinger et al. 1997), the interrelationship between process reengineering and workflow (Sillince and Harindranath 1998), and the availability of suitably skilled resources (Grover et al. 1995; Murphy and Staples 1998).

IT enablement. Workflow requires a technological platform characterised by standardized architecture, extensive communications capabilities and shared database access. An inadequate IT platform will constrain the workflow effort (Broadbent et al. 1998; Grover et al. 1995). Martinez (1995) also notes that failure to involve IS in the process project team increases the risk of overlooking creative technical solutions. Primary issues identified from this literature are: availability of a suitable IT infrastructure (Butler 1993; Lancaster 1994), process management information availability (Davenport and Beers 1995), and the role of technology as a catalyst/enabler/implementer (Davenport and Stoddard 1994).

Social Impacts. Clegg et al (1997) point out that over 80% of IT investments do not meet their performance objectives, largely for non-technical reasons. Hand-overs between users of workflow systems occur within the confines of the computer and interactive discussions at hand-over time may not be supported, with a resulting loss of information (Chaffey 1998). Other social issues that relate directly to workflow implementation are the impact of job redesign (Broadbent and Butler 1995; Mumford 1993) and changed access to information (Antonucci 1997).

Background to the case study

The organisation involved is a university which prides itself on innovative use of technology. The university was upgrading their

existing financial systems; the intention of the university management was to attain maximum leverage from this upgrade, and to incorporate the usage of any new tools and applications that may accrue to them by virtue of the upgrade. The upgrade project was a complex multi stream project, involving a platform change from AS/400 to a Unix/Oracle platform, a move to full client server architecture, and a business processes review and workflow subproject. As well as this major project, the university was concurrently implementing a new student records system, and a substantial upgrade of the payroll system. The university supports a mixed end-user platform consisting of both PC's and Macintoshes.

The university was in a situation familiar to many organisations in that the current financial systems were starting to lack necessary functionality, however the financial climate generally was not supportive of large-scale expenditure in the IT area. Successive governments were reducing tertiary funding, and the need to support research and teaching activities was seen as more important than that of an administrative systems upgrade.

In addition, the University was engaged in a round of wage negotiations at the time the upgrade was being mooted. The decision to allocate \$A1.5 million to the project in such a climate was unpopular in areas outside of the finance office. These forces created an environment where it was important to demonstrate some finite return from the investment, or show some "runs on the board". The university had decided to upgrade their existing financial software to an ERP version and workflow formed part of the toolset provided. Senior management attended a seminar on the use of workflow, and became quite supportive of a trial of workflow within the upgrade project. The project steering committee felt that a review of business processes along with workflow implementation held the key to demonstrating a positive return on investment.

The workflow project team achieved a result in the form of a pilot deployment of the cheque requisition process described in this case study. In addition, several other processes have been prepared and deployed, in the areas of Purchasing and Accounts Receivable. During the span of the project the project manager of the team and the composition of the team members altered, however the initial goals and guidelines for the project were adhered to. The project manager indicated that they felt that an acceptable degree of success was attained with the pilot deployment; users who processed the majority of invoices were successfully using the workflow version of the process.

Case Study Observations

The researcher conducted two site visits during the project and observations of events that related to success factors identified from the literature. A summary of these observations follows.

Factor 1 - Process Modelling

The project team needed to identify a suitable process with which to trial the workflow tools. Senior management expressed a desire to find a process that had large transaction flows but was currently inefficient, as it was felt that improving this type of process would potentially deliver high benefits. After some initial discussion within the project team, a proposal was made to examine a sub-process within the accounts payable section; that of payment for goods where no purchase orders had been raised. This process was commonly known as a cheque requisition, and accounted for approximately 23,000 transactions per annum.

The process problem was described by project team members as

"The processing of cheque requisitions is a very slow and time consuming process with much time wasted by the movement of paper through the internal mail".

The project team had no previous exposure to any formal modelling methods. As a starting point, the team used a simple trigger model (Joosten 1994). Previous research identified this as the most complete model for workflow modelling and also easy for end users to understand and create (Reddy and Tagg 1998). The users accepted this model and were keen to utilize and extend the modelling technique. As a result of team discussion and senior management requests, a revised version of the model was created, which included details about activity costing and timing. In addition to the graphic version of the process, a narrative explanation was included.

There was some initial dissent as to whether the model was being created for informing the users, or defining the technical requirements and it became apparent that a single model would not suit all purposes. The project team finalized a modified version of the trigger model for use within the project team and team management. It was felt that this model was not suitable for either end user discussions, or for technical development of the proposed process. The project team eventually elected to utilize separate models for each of the stakeholder groups.

The difficulty of accurately modelling the process was also a problem as attempts to model differing activity paths were not totally successful, perhaps limiting the value of the final process model. Although a simplistic process was selected for the trial, the project team were unable to confirm that the model accurately represented current practice.

. In addition to modelling the selected process, there was the issue of selection of a process. Before a decision could be taken, it was necessary to be able to show stakeholders models of the various processes they were being asked to select from. Finding an agreed start and end for processes also caused some difficulty for the project team.

Factor 2 - Change Management

Senior management were supportive of the project team and the project steering committee regularly received progress reports, and provided a forum for exploration of ideas and problem resolutions. No formal change management techniques were discussed or utilized during the pilot stage of the project. This is possibly reflective of the fact that end user involvement was limited, and senior management did not wish the early stages of the project to be publicized or promoted to the user population. There was a very clear understanding on the part of the project team leader and the senior managers involved that it would be necessary to ensure that the project objective was released in a sensitive manner. The level of change proposed was not radical, the process was a small part of many people's daily work, and the changes undertaken would not impact upon their working style to a large extent. What was more far-reaching was the possibility that a successful trial would trigger a large-scale expansion in the use of workflow resulting in radical change in the workplace.

Communication with end-users was extremely limited; most of the university community were unaware of the proposed trial. Communications within the team, and between team members and other project teams, was quite open and exchange of ideas and issues common. Communication between the project team and the university IT operations department was not quite as open. The

need to support existing production applications was primary to the operations department, leading to some tension when requests to provide support for the project team were given low priority.

Project team members had some difficulty with financial delegations, largely because of the need of the technology to have a pre-defined hierarchy for approval of payments. Within the university, traditionally the HOD or Dean had granted approval, however many of the incumbents had delegated this authority to other suitable people. As a result, the introduction of a system that utilised the formal university delegations would minimise the ability of delegates to work informally as they had become accustomed to. In addition, the pre-planned nature of the escalations process was seen as taking choice relating to acceptable work standards away from individual managers and tying it to a pre-determined level.

Although the need for change management was recognized, there was no planning effort or resourcing allocated to deal with this factor. It is difficult to gauge the impact of this; however, it appears that the lack of formal change management may have caused some tension around the project implementation. The project plan “... *does not address any organisational issues we have encountered to date, but culturally there have been (and will be) a few*”.

Factor 3 - Political Aspects

The university was in the middle of a round of enterprise bargaining (i.e. salary negotiations). Senior management was concerned that the awareness of a workflow trial may lead people to conclude that job losses would inevitably follow. As a result, the project planning and documentation of the selected process was conducted entirely without end-user interaction or knowledge. This not only blocked a potentially valuable source of information, it caused an air of secrecy to appear around the project team.

One of the primary changes introduced by the workflow pilot was the devolution of tasks performed by finance office staff to departmental staff. It was felt that if this became known at an early stage that the workflow trial would be compromised, and possibly unable to proceed; so the effect of these resource usage changes had not been discussed with departmental staff. During the modelling phase, a model was drawn of the existing process, and a revised model created to indicate changes to make the process more effective. The revised model was accepted; however, a request was made to remove headings from the columns, as they clearly indicated that a currently centralized workload was to be devolved out to end user departments. It was felt that such a clear indication of intent might not be palatable to all stakeholders.

Finance office staff wished to develop a flexible process model, with a range of paths available to suit different work styles and preferences, whereas the desire of the IT professionals was to minimise complexity in the model. This may have been due to the fact that this was a trial of the technology, and the minimization of complexity would give the technology a better chance of success; however, the two viewpoints did not seem to reach a clear reconciliation point.

These issues did cause concern to team members and involved stakeholders. A team member commented “*I feel that the term workflow, whilst encompassing a great many principles to senior management, is most likely seen as something sinister by general staff and line managers*”.

Factor 4 - Organizational Impact

An identified area of impact was the informal organisational structure. Given the nature of a university campus, a degree of informality existed in the academic faculties, which was not mirrored in the administration sector. The propensity of workflow to enforce the formal structure by means of the formalisation and definition of processes was more noticeable where the informal structure deviated from the formalised version. The question of whether to design the technology to suit existing informal organisational structures was discussed, but it appeared that the opportunity to redefine some parts of the organisation using workflow as the justification was seen as opportune. Although the formal management chart showed a centralised structure with devolved responsibilities to line managers this proved illusory when tested. Informal delegations of power were impacted by the introduction of workflow technology. As an example, some people with funding delegations were seen as more likely to approve spending within a department than others, and hence they were more frequently sought to provide payment approvals. The introduction of workflow would reduce the power of individuals to select the approver who they felt was most likely to prove sympathetic to their request.

Factor 5 - Process Reengineering

Reengineering of the selected process was a vital part of the early team discussions and work. The project team generally seemed to accept that simply automating an existing dysfunctional process would not result in a positive benefit creation, and therefore it was important to consider process reengineering prior to approaching the workflow tools. The training provided supported this strongly and the product vendor emphasised repeatedly the importance of correcting process deficiencies prior to automation. Resources were difficult to secure – the product vendor sourced their support from a diverse range of locations and, due to this shortage, there was not a lot of continuity when vendor representatives worked on-site with the workflow team. It seemed clear that the success or otherwise of the reengineering exercise would affect the acceptance and uptake of the workflow system.

Factor 6 - IT Enablement.

The software was a version that was becoming obsolete by the time the project went live and the workflow tools were considerably less well developed than later versions of the software. The vendor provided all training and documentation in the later version, and was quite clear about their reluctance to support development or use of the workflow tools in the earlier version. This caused some tension between members of the workflow team and technical support staff, as the technical staff exhibited considerable resistance to the idea of upgrading an ERP suite that had not yet been fully implemented in the production environment.

The workflow tools tested were not fully compatible with Macintoshes. Users on a Macintosh were unable to send or receive attachments to file messages, and were unable to access the ERP software directly via a workflow message shortcut. In addition, the ERP software included an internal email system, which was accessible at desktop level only after entering the application suite. In order to optimize the use of workflow, it was desirable to have the workflow-generated messages pushed out to the existing end user email client. During initial familiarization with the software, it became apparent that the workflow tools were incapable of communicating correctly with the email client. This left the project team with a choice of either attempting to gain support for a change of email client within the university, or implementing a workflow system which was incapable of messaging directly to the most commonly used email desktop client. The interim decision which was taken for the pilot process was to not use third party

messaging, users had to actively log into the application suite to interact with the workflow.

The software utilized a central address book, which was accessed by all applications. The needs of workflow addressing are that the individual, their role and their financial delegation level are required in order for the workflow software to make correct choices about addressing process instances. As the ERP suite was not inclusive of the university human resources or payroll systems, information required for workflow addressing would need to be manually entered and maintained. The solution adopted was to appoint a coordinator to the role of gathering and maintaining address information, with a view towards creating an automated version later.

Workflow software has the ability to escalate an instance of a process where an activity has been inactive for a pre-defined period. Control of the escalation functionality required definition of appropriate timing for escalation. During product familiarisation it was found that the ability to set escalation timeframes was definable only in terms of hours and there was no ability to set a global calendar listing non-working days. As a result, it was thought that the escalation functionality was virtually unusable in the supplied toolset. Without escalation, it would be more difficult to ensure that all initiated instances of processes were completed within a reasonable timeframe, as process cycle times would need to be manually controlled.

The IT enablement factor seemed to generate the most observations and discussions of all the proposed factors. Issues of version migration, mixed platform support, third party e-mail support, message addressing and instance escalation potentially covered the most damaging problems within the observed project. Although many of these issues could be resolved, given enough time and money, the inability of the existing IT platform to readily support workflow was seen as a major inhibitor to progress.

Factor 7 - Social Impacts

The process model revealed several instances where social interaction which currently took place between staff members would be replaced by a workflow generated email message; team members expressed reservations about the willingness of end users to accept this. The project team discussed the wording of these pre-formatted email messages extensively, as they were aware of the possibility of misinterpretation of the messages. Additionally the project team expressed concerns about formalisation of the escalation process; the current process was largely informal and varied between departments. In addition, it was felt that some clerical staff may see escalation as a threat to their work style, with failure to promptly attend to messages resulting in a notification to their manager, creating an impression of sub-standard performance.

Concern was also expressed at the thought of replacing the current face-to-face handover of tasks with a pre-scripted email message. The workflow toolset allowed an ad-hoc note to be attached to the scripted email which was thought to be sufficient, although the tacit information currently conveyed during task handover discussions would be lost.

The proposed devolution of tasks would result in job redesign for two groups of people. For finance staff the change would result in job enrichment, freeing them from the task of data input and validation and allowing them to spend more time in an analytical or management role. Departmental staff however would become responsible for keying in data which was viewed as a mundane and unrewarding task. It was acknowledged that this devolution would be difficult politically to sell, and that discussions would need to be held at a suitable level prior to releasing this information.

It was clear that information produced from instances of processes would form a pattern enabling management to assess the workload and skills of individuals. Additionally, process monitoring would readily identify when and where escalation was necessary, and compare average times for activities. This all contributed towards a far more in-depth picture of work rates and results than was currently possible. There was some concern within the project team that workflow would be seen as a sort of time and motion project, where activity completion within a short timeframe was the goal rather than completion to a satisfactory quality standard.

Conclusion

The study took place over seven months. The researcher was on-site for a total of three weeks, divided into two visits. The remainder of the time correspondence between the researcher and the project team was conducted via email. The importance of the proposed success factors is supported by the case study observations recorded. These observations took place immediately prior to implementation of the software. The factors observed may be related to the success of the project, however in order to determine their impact another set of observations is necessary. As the product is now in mainstream use at the site it is anticipated that these visits will be conducted in the near future and findings that are more conclusive will be obtained.

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