

# Analysing a Workflow Management System: Three Levels of Failure

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## ABSTRACT

In this paper we report on a case study of the introduction of a workflow management system for travel management in a higher education organisation. We identify and reflect on the change of the process induced by the system, the functionality of the system, and the usability of the system. Combined with a socio-technical perspective, our findings provide a checklist for systems designers.

## Categories and Subject Descriptors

H.5.2 [Information Interfaces and Presentation]: User Interfaces – Graphical User Interfaces, User-Centred Design; H.5.3 [Information Interfaces and Presentation]: Group and Organisation Interfaces – Computer-Supported Cooperative Work.

## General Terms

Management, Measurement, Documentation, Performance, Design, Economics, Experimentation, Human Factors.

## Keywords

Workflow Management System; Computer-Supported Cooperative Work; Empirical Study; Public Administration.

## 1. INTRODUCTION

In this case study of the introduction of a workflow management system (WfMS) for travel management in a higher education organisation we aim at addressing two central questions. Firstly, why did a WfMS, which was initially welcomed, create so many complaints? And secondly, why did users regard this WfMS and its introduction as a failure? The answers we found are valuable lesson learned for the designers of user-friendly WfMS. And, they have implications to the general organisational resistance discussion [7].

In the remainder we provide the background of the study. We characterise the setting of the study and present our findings. We discuss the lessons learned and draw conclusions.

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## 2. BACKGROUND

WfMS are software systems that support the management of processes in organisations, particularly business processes [9]. They provide support for the definition and modelling of workflow processes, the management of the workflows at runtime, and the interaction of users with the respective applications at runtime.

Typical key groups of WfMS users have been identified: managers, users, and technologists. Whereas previous literature has emphasised the individual interpretations and the differences among users, more recent publications point out that 'shared cognitive structures' within key groups [6, p. 176].

Several studies on users and organisational issues related to WfMS can be found in the literature; they are based on various theories. The theories can be divided into variance theories that are based on studies of independent and dependent variables, and into process theories that are based on the analysis of preceding circumstances and occurrences in order to explain the actual outcome [5].

## 3. CASE AND SETTING

This *study* is based on our observations from a WfMS supporting travel management in a higher education organisation. We studied the introduction and use of the system in an organisation over a period of one year. The subjects were employees working in this higher education organisation, using this system in their daily work; they were thus not paid for the study. Relevant activities are travelling, creating, accepting, and passing documents. We collected data from system logs and captured experiences, complaints, praises through numerous informal interviews and coffee-table discussions. In addition, six formal theme interviews to get hard-data and confirm our log and informal findings were conducted.

The *WfMS* is a commercial Web-based system to support the management of travel claims on all organisational levels. At the time of purchase, it is tailored to fit into the organisation and its processes, and some processes were tailored respectively. A consultant made field studies in the target organisation and tailored the system accordingly.

The *workflow before the introduction of the WfMS* had travel plans (i.e., requests for permission to travel) and travel claims for refunding (i.e., demands for the payment of personal costs) with a paper form. The form and several attachments were circulated in a process of ten specific steps, where the

travellers, their project managers, their secretaries, and their head of department are involved. Overall this process includes several overlapping tasks and complicated processes, thus requiring a considerable amount of unnecessary work. For instance, travellers sometimes had to wait for their travel claim to be approved and paid for more than two months. It was evident that a WfMS to manage and speed-up the process would be of great help.

The *workflow with the commercial WfMS* for managing travel plans and travel claims in higher education organisations was quite different. The consultants from a supplier studied the organisation and tailored a version for a trial use in two different departments and in the central administration. They gathered feedback and adjusted the system. After six months, the system was introduced into the whole organisation. The central administration informed the employees that no travel plans or travel claim would be dealt with on paper after a certain day. The introduction of the new system changed the aforementioned process as intended. Yet, it was impossible to get rid of paper forms. Legislation required that a person, who checks and approves plans and claims, could be juristically identified. Electronic signatures were not regarded to as juristically approvable. This resulted that all the forms were created by entering information into the WfMS and then printing out a copy for signing it. Handling the plans and claims as administrative activities, both versions, the paper and the one in the system, were treated simultaneously. The adapted process and its steps were slightly simpler regardless of the two versions of plans and claims that are handled hand-in-hand. However, from the users' perspective, the workload was heavier for all users involved—that is, the travellers, their project managers, their secretaries, and their head of department as well as the secretaries in the central administration.

#### 4. FINDINGS

The findings can be classified into three categories: technological frames that can be identified and should be dealt with; socio-technical requirements that should be met and balanced; and technology in use and its ongoing adaptation.

From the *technological frames* [6] perspective, the WfMS was created for secretaries in the central administration. The system did not produce 'shared cognitive structures' but remained as a perception of an individual user group. This resulted that the functionality and use of a system was clear to the technologists and secretaries, but less clear to other users.

From the *socio-technical requirements* perspective of Sarker and Lee's [8] on WfMS and the redesign of business processes, the WfMS was techno-centric emphasising the developers' idealism of technological determinism and separating the social component from the technical.

From the *technology in use* perspective the ongoing adaptation of the technology throughout its use should be possible [2]. Since in most organisations the context of application of the WfMS is continually changing and since generally exceptions should be expected, technology-use mediation should check if technology is still adequate and eventually adjust it. Unfortunately, this technology-use mediation was not done in the case reported.

#### 5. DISCUSSION AND SUMMARY

We presented a case of a WfMS supporting travel management in a higher education organisation. This study provides insight from the real-life introduction and use of a WfMS. These insights demonstrate that—although the technical systems was properly designed—the neglect of organisational and user-centric issues inflicted the whole system to fail on three levels: processes, functionality, usability. Such an analysis shows the complexity of developing user-friendly systems. Focusing primarily on the user interface and overlooking organisational or functional issues, can lead to an unusable system.

The case emphasises the need for an integrated approach in human-computer interaction in general, following the early definitions of the computer-supported cooperative work (CSCW) discipline and how the relationship between organisations and systems was seen. For instance, Grudin [4, p. 19] writes: 'building technology was not enough. d... practitioners need to learn more about how people work in groups and organisations and how technology affects them'.

WfMS and their usage have been discussed in particularly in CSCW. Often those studies focus either on the or technical issues (such as access control or coordination mechanisms [e.g., 1], or on the WfMS's relationship to organisational processes [e.g., 3]). Studies where WfMS are analysed in the light of their use in organisational settings can offer new understanding about the challenges and practice of using and introducing WfMS in organisations.

#### REFERENCES

- [1] Agostini, A. and De Michelis, G. A Light Workflow Management System Using Simple Process Models. Computer Supported Cooperative Work: The Journal of Collaborative Computing 9, 3-4 (2000). pp. 335-363.
- [2] Bansler, J.P. and Havn, E. Technology-Use Mediation: Making Sense of Electronic Communication in an Organisational Context. In Proceedings of Group 2003. pp. 135-143.
- [3] Dourish, P. Process Descriptions as Organisational Accounting Devices: The Dual Use of Workflow Technologies. In Proceedings of Group 2001. pp. 52-60.
- [4] Grudin, J. Computer-Supported Cooperative Work: History and Focus. IEEE Computer 27, 5 (May 1994). pp. 19-26.
- [5] Kim, H.-W. and Pan, S.L. Towards a Process of Information Systems Implementation: The Case of Customer Relationship Management (CRM). ACM SIGMIS Database 37, 1 (Winter 2006). pp. 59-76.
- [6] Orlikowski, W.J. and Gash, D.C. Technological Frames: Making Sense of Information Technology in Organisations. ACM Transactions on Office Information Systems 12, 2 (Apr. 1994). pp. 174-207.
- [7] Piderit, S.K. Rethinking Resistance and Recognising Ambivalence: A Multidimensional View of Attitudes Towards an Organisational Change. Academy of Management Review 25, 4 (Oct. 2000). pp. 783-794.
- [8] Sarker, S. and Lee, A.S. Using a Positivist Case Research Methodology to Test Three Competing Theories-in-Use of Business Process Redesign. Journal of the Association for Information Systems 2, 7 (Jan. 2002).
- [9] van der Aalst, W. and van Hee, K. Workflow Management: Models, Methods, and Systems. MIT Press, Cambridge, MA, 2001.