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Framing Implementation Management

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Abstract

The research reported in this paper explores IS implementation in the early stages of a project as a process of social translation of ideas about technology. The research employs a technological frames analysis to examine how human agents translate public or global accounts into things that they are familiar with and are of interest, filter out alternative meanings, and engage in social interaction in order to pursue their images of a technology coming into use. The paper is based on a case study of the early stages of a new e-mail system in an international banking institution. The findings of the case study suggest that a translation process, which takes place at both the individual and the organizational level at the initial stage of an IS project, can have significant consequences for the overall implementation process.

Keywords: Implementation management, technological frames, translation process, case study

1. INTRODUCTION

This paper offers a distinct perspective on implementation, one that is less well represented in the literature, which focuses on the early stages of a project as ideas and notions of what is to be achieved, and what technology offers, are explored and shaped. If information artefacts are seen as independent entities with functional and planned uses, but no wider impacts on or responses from host organizations, implementation is a technical and project bound issue with a scope limited to questions such as preparation of data, training, acceptance testing, and conversion (Avgerou and Cornford 1998). Such a simple view of implementation management has been challenged both by academic studies and by reported experiences in recent years. For example, alternative accounts of implementation can be found in the literature on resistance to change (Keen 1981, 1991), IS failure (Lyytinen and Hirschheim 1987; Poulymenakou and Holmes 1996), escalation (Drummond 1996; Keil 1995; Markus and Keil 1994), incremental development (Gallivan et al. 1994; Jackson 1995; Orlikowski 1996) and drifting (Ciborra 1996, 2000). In each case, the narrative of implementation of a system is seen as problematic, at times conflictual, and bound up in a complex set of political actions and reactions, situated accommodations, and learning. This paper examines the issue from a contrasting perspective and argues that implementation management is a process of managing social translations of technology (see also Whitley and Pouloudi 2000). This is achieved through a social cognitive approach that provides important countervailing insights when contrasted with more techno-managerialist accounts of implementation.

Various distinct theoretical positions underpin all these more complex accounts of implementation activity. The school of *technological determinism* assumes that these artefacts are potent external forces with instrumental power over organizational and social properties (King 1991; Siegel et al. 1986; Sproull and Kiesler 1986). Technological determinism sees implementation as a part of a larger process of historically driven organizational change achieved through the characteristics of available information artefacts. Implementation management is then about facilitating the initial entry of the technology. The related school of *organizational imperativism* sees the artefacts as equally potent but capturable, as a means to an end, with their power at the disposal of wise planners, managers or reformers (Hammer and Champy 1993). This views implementation as the introduction

of changes via a choice of new artefacts with the purpose of creating strategic and sustainable links between the business environment, business processes, and organizational forms (Porter and Millar 1985; Randall et al. 1995; Taylor 1995). In contrast to the above, the school of *socio-technical interactionism*, consider information artefacts as (to some degree) multi-valent and plastic, as needing refinement, shaping, and situating within the social structures of the organization (Lin and Cornford 2000; Mumford 1987), with implementation as, ideally, an explicit, creative and contextual process of linked and mutually sustaining social and technological shaping negotiated within the organizational setting (Ackoff 1967; Kling 1980; Markus 1983). Managing implementation then means to sustain and harness changes simultaneously in both the social and technological arena.

More recent *structurational* work, influenced by the work of Giddens (1984) suggests that the above approaches all provide an incomplete view of implementation and change and emphasizes that changes in either organizational *or* technological properties are the consequences of situated human actions (Barley 1986; Jones 1999; Orlikowski 1991; Poole and DeSanctis 1990; Riley 1983; Walsham 1995). Structurationism gives a more prominent role to agency (human action) and the modalities (including information artefacts) through which agency influences, and is influenced by, organizational structures. The assumption is that information artefacts themselves are socially constructed, and the uses found for such artefacts depend on meanings that human agents assign to them (Grint and Woolgar 1997). The premises of technology made by structurationism (Orlikowski 1991) are twofold: that technology is created and changed by human action and that technology is interpretively flexible and its use (consequences and trajectories) depends on human agents. Because the structures of both organizations and technologies pose the capability to produce and reproduce, and human agents posses the capability to make sense of their surrounding environment and to reflect their knowledge in their behaviors, the distinction between intended (inevitable, planned, predicted, or managed) and unintended (emergent, unplanned, unpredicted, or unmanaged) narratives become far less clear.

The research reported in this paper is broadly within this structurational school and explores implementation management as a process of social translation of ideas about technology, with human agents translating public or global accounts into things that they are familiar with and find to be of interest, filtering out redundant meanings and engaging in social interactions in order to pursue their images of a technology in use. Within this research framework, we employ technological frames analysis to examine human agents' knowledge of and experiences with technology, and the meanings which they assign to it. Our study, carried out in an international financial institution, reveals how, through social interactions, human agents translate, attenuate, and eliminate meanings of technology to meet their own agenda. The study aims to provide pertinent implications for the management of implementation, both in theory and in practice.

2. RESEARCH APPROACH

Various research studies in information systems have drawn on models that might be described as contributing to a school of social cognitive theory (SCT). Such studies have addressed individual reactions to and beliefs about information technology, as well as systems' outcomes (Boland et al. 1994; Bostrom and Heinen 1977; Ginzberg 1981; Orlikowski 1992; Orlikowski and Gash 1994; Swanson and Ramiller 1997; Weick and Bougon 1986). A recent methodological contribution to SCT is technological frames analysis (TFA), a generic conceptual approach for examining cognition when a new technology is encountered (Bijker 1995; Orlikowski and Gash 1994). Orlikowski and Gash define technological frames as:

> a set of assumptions, meanings, knowledge, and expectations that people use to understand the nature and role of technology in organizations. This includes not only the nature and role of the technology itself, but the specific conditions, applications, and consequences of that technology in particular contexts.

Bijker provides a contrasting definition, emphasizing technological frames as a group phenomenon, a dynamic account of a technology formed and shared through interaction.

> A technological frame structures the interactions among a relevant social group. A technological frame is built up when interaction "around" an artefact begins.

Orlikowski and Gash argue for the importance of understanding people's technological frames as references to their interpretations of technology, which then shape behavior. In this, they quote Weick and Bougon (1986): "cognition and micro-level processes are keys to understanding the organizational impact of new technologies," and offer technological frames as a "crisp and powerful lens for focusing…on how people make sense of particular aspects of the world." For Bijker, technological frames offer "a theoretical concept…used by the analyst to order data and to facilitate the interpretation of the interaction within a relevant social group" (Bijker 1995).

The underlying assumption behind TFA is essentially structurational: people (or groups) act according to the meanings that technologies have for them, and their actions shape the meaning of technologies for others and for institutions. As such, frames can be both enabling and constraining. They are enabling when they "structure organizational experience, allow interpretation of ambiguous situations, reduce uncertainty in situations of complexity and change, and provide a basis for action"; they are constraining when they "reinforce unreflective reliance on established assumptions and knowledge, distort information to make it fit existing cognitive structures and inhibit creative problem solving" (Orlikowski and Gash 1994). They argue that technological frames analysis, as a research construct, allows researchers to understand the thought processes and cognitive resources (frames) behind individuals' behavior, in contrast to research approaches that only record happenings.

TFA's ability to expose the production and reproduction of individuals' or groups' experiences, in relation to their attitudes toward technology and organizational understanding, provides a powerful framework to examine the process by which individuals try to make sense of technology. In order to examine how individuals' technological frames and their attitudes toward the technology develop in relation to others' and in an organizational context, we borrow here the concept of translation. Translation, as introduced by Latour (1987) is a process that offers new interpretations of a statement (a technology) and channels people in different directions. As defined by Latour (1999), a translation is "the work through which actors modify, displace, and translate their various and contradictory interests." Latour's use of the word translation is intended to convey a complex notion of ideas and facts moving and changing among a community; in part as a linguistic restatement in a new language, but also as a move in space or time, from one place to another. Latour (1987) further argues that an initial statement would (potentially) no longer be the same as an increasing number of interest groups become involved in a chain of translations, and he calls this phenomenon "translation drift." Each translation associates with a transformation and after a series of translations and transformations an artefact becomes what it is now.

In line with other critiques (Brown and Capdevila 1999; Lee and Brown 1994), we hesitate at the indiscriminate treatment that some accounts of the notion of translations gives to subjects (people-actors) and objects (artefacts), and the positioning of entities (both subjects and objects) in a network. Our interest in translation is limited to its underlying semiotic approach, which tells us that artefacts achieve their form as a consequence of how and by whom they are interpreted. That is, we are interested in how translators' positions and situations in relation to others' affect their interpretation of the artefact. This process, by which individuals or groups try to make sense of an idea or artefact according to their relation with others, is termed here a process of *social translation of technology*. This notion is used in conjunction with TFA to conceptualize the management of implementation as a process in which various interest groups are keen to construct and communicate their own interpretations of a technology as *the* definition of the technology.

3. RESEARCH SITE AND METHOD

Our research was conducted in an international financial institution, the Bank (a pseudonym), and studied a project to replace an old e-mail system with a new one. Data came from a number of sources including semi-structured interviews, documentation, memoranda, informal conversations, observations, and follow up e-mail questionnaires. Six people were formally interviewed and each interview lasted one to two hours. Each interview was tape-recorded and transcribed. Over 163 documents and memorandums were also reviewed. Lunch in the canteen provided another research opportunity to meet and talk to members of the staff. It was natural that people were more relaxed in the canteen than in a meeting room, and discreet observations were made of conversations between colleagues. After the fieldwork period, some follow-up questions were sent via e-mail to the interviewees.

Data was interpreted cautiously within the research framework chosen, thereby preserving openness to the data gathered in the field and remaining sensitive to the context studied (Walsham 1995). We are aware of the limitations associated with this analytical approach and have no intention to claim gross generalization of the findings. Nevertheless, we believe that the findings from this case study can help us to look at implementation management differently.

4. RESEARCH STUDY

In 1993, the Bank was thinking of replacing its old e-mail software, in use since 1988. The old system had been selected at the same time as a new network operating system as part of the establishment of a desk-top office automation platform. In 1988 it had been judged as the best suited to the Bank's requirements, but the coming of Windows made this MS-DOS based and command driven package to be seen as increasingly problematic. Users had not found the software intuitive and this demotivated them to explore the system further; many knew only how to read and send messages although many other functions were

available. As new employees came to the Bank and saw the system they often remarked negatively in terms of "What is this? Where I worked before, the systems could do such and such…," creating further pressure for a new "modern" system.

It was not only users who complained; so too did IS personnel, since the system posed a significant workload for them. The mail and appointment call programs and the printer drivers had to be developed at the Bank since the features were not available or did not run properly. The security and reliability of the e-mail database also caused concern: regular corruption, loss of mail, unauthorized database access, and service unavailability were evident, partly because the system database could not be properly protected at the network operating level. Among all the technical problems and user complaints, it was perhaps the instability of the system that drove the Information Systems Department (ISD) to decide to launch a project to provide a replacement. For example, ISD needed to spend at least one working day per week to maintain the system and sort out system crashes.

4.1 Research Findings

In this abbreviated account, three interest groups involved at the early stages of implementation are identified: office information systems (OIS); the user group (UG); and the management group (MG). OIS was the division within the ISD responsible for providing office automation applications and formally owned the project. The UG was set up to contribute to the project and consisted of 10 representatives from user departments with a role as a bridge between OIS and the wider user community. The role of the MG in the project was to assess and allocate the required budget to the project, and to demonstrate its support for the project to the rest of the Bank.

In analyzing our research material, documents, and transcripts, four domains of technological frames held by these interest groups were identified. As in Orlikowski and Gash's (1994) work, we used our data to generate these domains.

- *The nature of problems*: understandings of organizational and workplace problems in relation to technology.
- *Requirements for the system*: positive expectations of the technology in organizational and workplace terms.
- *Images of implementation*: understandings of the process of change that brings technology into the organization
- *Issues of use*: concerns about technology in use and impact on work activities.

As summarized in Table 1, each of the groups identified had their own technological frames, with distinct content in each of the four domains. For reasons of space, the rest of this section only examines in detail the technological frames of the OIS as these operated at the early stages of the project.

Table 1. Comparison of the Key Elements of Technological Frames at the Early Stages of the Project

	OIS	User Group	Management Group
The nature of problems	Technological, with user voices at some distance.	Operational, old fashioned, unusable.	Organizational.
Requirement for the system	Fit to the current infrastructure, overcome current problems; rapid deployment, user training, and management support.	User friendly, easy to learn; require minimum new skills; modern, up-to-date.	Cost effective, achieving what had been offered by the old system and offering enhanced facilities.
Images of Implementation	Speed is the essence; stock of skills; support in depth; training as transition.	Getting in the way; we have real jobs to do.	Risk.
Issues around use	Easier to manage; reduced complaints from users; secure.	Seamless.	Official communication channel, no misuse of the technology.

The nature of problems. OIS respondents saw the project as a solution to technical problems embedded in the current system such as "not robust enough," "instability," "unreliability," and "MS-DOS based." OIS were also upset about a situation in which users continually complained to them and they spent much time on repeatedly fixing the same problems. The project coordinator recollected:

> [The old system] could just about manage the internal e-mail requirements all the time. It was just running the DOS Box within Windows, [but] it was not stable enough. I had to spend half a day to a day a week to keep the system active. And you could not put external mail on it because of the large number of users and traffic which would break…the system. So we realized that the system was not robust enough to meet the requirements of today's situation.

A survey carried out by the UG demonstrated users' contrasting understandings of the problems:

- The current e-mail system is not user friendly and is difficult to understand
- The current e-mail system is out of date.
- The current e-mail system is unstable and crashes.
- Users expect to receive a replacement soon and expect the new system to be easy enough for them to pick up *without* investing time or effort because they have other real jobs to do.

Viewing the current problem as technological, OIS naturally sought technological solutions, but at the same time they had to make some sense of users' complaints. OIS's conclusion was that a new e-mail system was needed. On the basis of this understanding, the WORKGROUP project was initiated.

Requirements for the system. OIS had a clear and specific vision of what the future system needed to achieve, and had a strong feeling that the new system needed to be compatible with the existing IT infrastructure since they considered incompatibility of the current system as the origin of the problems that the Bank had encountered. Since OIS understood the problems as being technological and infrastructural ones, the requirements they put forward were naturally technologically oriented, too:

- To overcome current weaknesses of the existing mail system in the areas of availability and security.
- To provide a robust platform for future development.
- To simplify and automate the administration and maintenance of the system.
- To provide a proper integration with the Windows environment in order to take full advantage of the data interchange and to link with other applications.
- To simplify the use of the overall package (electronic mail, filing, diary, to-do list, etc.).
- It was noted that users' understandings were not strongly incorporated as part of these requirements.

Images of implementation. OIS believed that managing the change implied in adopting the new technology (in their words, roll-out) was critical for a successful project, including having sufficient technical skill and knowledge of the new system, user training, vendor's ability to provide local technical support, and management endorsement. These criteria, which were strongly reflected in the OIS team members, were formed on the basis of past experiences. For example, concern with rapid system roll-out originated from earlier experience of introducing PCs into the Bank when a delay between training and delivery of PCs meant that, by the time the PCs arrived, users had either lost enthusiasm or could not remember what they had learned in training.

The issue of implementation (roll-out) was so key in the minds of OIS that most of their actions within the early project might be seen as driven by a concern with this "moment of use" and haunting images of failure. This led them to take some very deliberate actions to shape and control the project's progress, as described below. However, we do not wish to place these actions within any strongly managerialist-translation model. We do not suggest that they "attempted controlled translation"; rather, that we can see their situated actions in terms of shaping technological frames through translation.

Issues of use. OIS had a firm idea of how e-mail should be used and for what purposes. OIS explained their view in project documentation:

> Electronic mail is appropriately viewed as a store-and-forward transport for electronic objects across a heterogeneous environment, among people, among people and applications, and among applications.

OIS saw e-mail as primarily a formal, business communication channel and not for personal use; behavior such as distributing private and non-business messages around the Bank was not to be encouraged. However, OIS was prepared to create some spaces, discussion groups, within the system to allow people to post general announcements.

4.2 A Translation Process

The above outline of OIS' technological frames at the initiation of the project illustrates the issues which concerned OIS at that time. As such, OIS took necessary steps to act upon their interpretations of these issues. It is notable that, in general, the three interest groups did not share the same view, explained by Orlikowski and Gash as an incongruence of technological frames. Incongruence refers to differences in important expectations, assumptions, or knowledge about some key aspects of the technology. According to their research findings, the existence of incongruence is likely to cause failure, or at least a less successful technology adoption, but this is not the case here. This project was reported by senior ISD managers as being the most successful one in the Bank's IT history. The different outcomes of the two case studies can be interpreted as being the result of the two organizations having different attitudes toward a translation process at the early stages of the project. The translation process in Alpha was loose and not closely monitored and managed, while the process at the Bank was carefully managed with active intervention by OIS to make sure that the progress of the project was (in their terms) on track. Here, we illustrate how OIS actively intervened to reshape different views between the interest groups by translating them into something else.

The issue of usability versus infrastuctural fit. Based on these distinct technological frames, the UG and OIS selected different software for the new e-mail system. The UG chose what they saw as a user-friendly package, Beyond Mail, whereas OIS chose a technologically fit system, GroupWise. The OIS were happy to admit that Beyond Mail was more user friendly than their choice, an acknowledgment of the technological frames of others, but they then set out both overtly and covertly to change the frames. The overt action was to lobby UG members and to talk confidently and in technological language (jargon), about the superiority of their preferred product. Users were inclined, in the face of such confidence and such mystification, to defer. The covert action was to set up formal evaluation criteria that expressed their own interests in an exaggerated way. Thus issues of diary and calendar functions emerged as critical criteria (and once selection was undertaken, never reappeared). In its conclusion to the evaluation exercise, the OIS suggested that GroupWise was better in terms of maintenance, costs and benefits, security, etc., even though Beyond Mail was judged as considerably easier to use. At the end of the evaluation exercise the UG members, in an example of the Stockholm syndrome, felt that the OIS obviously "knew what they were doing" and had better judgement compared to them, and hence agreed to the OIS' choice.

Thus OIS deliberately and actively set out to engineer a process (through talk and evaluation criteria) to change the UG's frames and expected that the UG's initial criteria for a successful system would be changed. This is the first major conflict that the OIS and UG came across at the initiation stage and was resolved as the different versions of the project were translated and reduced to the one that the OIS had in mind, occupying their territory.

Three in one: managing different understandings. The three groups studied approached the issue of the Bank's e-mail from different perspectives: technological (OIS), operational (UG), and organizational (MG). To manage these different perspectives, and at the same time to make sure that the project remained under control, OIS needed to work on translation in two different languages: to translate operational requirements into technological requirements for the UG, and to translate technological requirements into organizational requirements for the MG.

OIS did not have much power in the institution. It was identified as a support activity and associated with a number of failed projects going back over decades. Hence, in order to push the project forward on the basis of its interests, OIS deliberately translated users' operational requirements into technological ones and reframed users' problems as technological ones. By doing so, people would be less able to challenge OIS' decisions about the project, giving an impression that their authority was being challenged in their own area of expertise. When OIS was confronted with users' questions about their actions, they spoke in technological terms in order to de-motivate further discussion.

In contrast, in facing the MG, OIS could not speak its own language but had to translate to the language of the MG, to translate technical rationales into organizational abstractions in order to make a link to business operations. For example, the project name was purposely chosen to reflect a current management theme, as the manager pointed out

> When the project was initiated, the idea of "working together" was regarded as one of the most popular themes within organizational studies. The term "WORKGROUP" was chosen purposely to draw the attention of the MG.

Yet, at the same time it was made clear during the research that OIS had no intention of introducing the concept of "working together" into the Bank, despite suggesting to the MG that the project was about enhancing group work in the Bank. The project manager said:

> The notion of "working together" may be considered in DOIS' next IS project, but it was definitely not a part of the WORKGROUP project.

5. CONCLUSION AND IMPLICATIONS

This might be seen as just a typical technology push project, well managed by a competent IS department. However, what our study shows is that there were potentially critical conflicting views and tensions between the technologists and users during the project's initiation. By some accounts, the project should have failed miserably but quite the opposite happened. We argue that this successful outcome is made understandable as a translation process at the project initiation stage.

Traditional accounts of IS implementation refer to a discrete period of time and concrete activities that occur during or after a system is delivered to users. In this paper, we argue that the idea of implementation should be expanded, and the findings suggest that the sense making process surrounding technology, and which is often thought to take place primarily only after a technology is put to use, indeed takes place at the initiation stage of the project. How people think about and evaluate technology at this stage substantially influences the course that the project takes. We describe this as a process of social translation of technology in which interest groups involved make sense of the technology and offer others their interpretations of technology based on their own interests. It is expected that ***the*** definition of the technology will derive eventually during the process. The challenge that IS management faces is how to appreciate the processes of translation that occur, and how to achieve an optimal balance between different versions or translations offered by interest groups. Neglecting this challenge may result in a critical lack of control and a consequence would be that the initial interests and purposes of the project are lost—an acute case of Latour's (1987) "translation loss" that may lead to a system actually acquired being far from any actual needs.

As noted here, OIS constantly pursued their technological frames, how things should be seen and done, and any interests in the technology which diverged from theirs were actively reframed. The intention was that the changes made in frames would subsequently enable people to view the technology in a way compatible to theirs. Altering technological frames in order to enable people to think and act similarly and accordingly is, to an extent, a reiteration of Orlikowski's (1992, p. 367) concluding analysis of the Alpha study: people's technological frames often need to be changed to accommodate a new technology. The approach proved to be quite effective in the Bank.

But could the OIS really claim its victory? Viewing the project in a wider time frame, we found that OIS might have achieved almost full control over the translation process prior to the system roll-out (and minimal translation loss), but it seemed to lose this control (or did not want to retain it) after the system was delivered to users. For instance, formal rules of using e-mail were established to prevent misuse of the system, but in practice people still distributed general and private message around the Bank despite being "educated" during the training and "told" by the General Manager not to do so. Some began to send e-mail messages to senior managers directly instead of going through traditional channels. Such a development of was not planned or articulated by OIS (indeed it was not in their technological frame), but derived from a growing sophistication emerging through an exploration of the new technology, which enabled people to translate the technology differently from the rules.

In this we might see the nature of the translation process as different prior to and after the system roll-out. Prior to the system roll-out, people make sense of the technology according to their needs and their problems, and this will affect their decisions about which technology to adopt and the further direction of the project. After system roll-out, users in particular make sense of the technology in relation to their work, their position within the organization, and their relationship with peers, and what they come up with in this local context will strongly influence their attitude toward the technology (reshape their frames). Thus, IS managers needs to reflect on different strategies to manage different stages in the process. The case study in this paper suggests that managing the process prior to system roll-out can be done by reframing the needs, "reengineering" the technological frames, and engaging in social interactions, even exercising political power. To manage the process in such a way after the system roll-out could be problematic as numerous translations are undertaken by individuals. Orlikowski (1992) suggests using communication and education to ensure individuals think and act similarly. However, this is a short-term strategy since individuals (and disparate groups), through their personal experiences with the technology, will develop different understandings of the technology and seek to use it accordingly, and management action then needs to explore, assess, and evaluate the opportunities provided by users' translations.

In this paper, we have sought to present IS implementation as a process of translation. That people involved in implementation try, on the basis of their frames and interests, to translate a technology into something with which they are familiar. Managing an implementation process means appreciating this translation process as a basis for action. This is not to say that translation, any more than technological frames, can be simply engineered or constructed. But, building on these insights, we do suggest that there is a case for rethinking implementation management: to move beyond the prioritizing of organizational or technological imperatives, and to characterize effective implementation management as the sensitive response to and careful managing of an emergent process of translation.

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