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# Technology-Use Mediation Revisited: A Symbolic Process Perspective

Mari-Klara Stein

*Bentley University, Waltham, MA, United States, stein\_mari@bentley.edu*

Sue Newell

*Bentley University, Waltham, MA, United States, sue.newell@sussex.ac.uk*

Erica L. Wagner

*Portland State University, Portland, Oregon, United States, elwagner@pdx.edu*

Robert D. Galliers

*Bentley University, Waltham, Massachusetts, United States, rgalliers@bentley.edu*

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## **TECHNOLOGY-USE MEDIATION REVISITED: A SYMBOLIC PROCESS PERSPECTIVE**

Stein, Mari-Klara, Bentley University, 175 Forest Street, Waltham, MA 02452, United States, stein\_mari@bentley.edu

Newell, Sue, Bentley University, 175 Forest Street, Waltham, MA 02452, United States & University of Warwick, Warwick Business School, Social Studies Building, Coventry, CV4 7AL, UK, snewell@bentley.edu

Wagner, Erica L., Portland State University, School of Business Administration, 631 SW Harrison Street, Portland, OR, United States, elwagner@pdx.edu

Galliers, Robert D., Bentley University, 175 Forest Street, Waltham, MA 02452, United States, rgalliers@bentley.edu

### **Abstract**

*Successful adoption and use of new information technologies can be notoriously difficult to achieve. Various interventions aimed at fostering or modifying use practices are therefore common in IT implementation projects. Such interventions take various forms ranging from top management mandates to user-led support efforts, and have been collectively named technology–use mediation (TUM). Various types of TUM activities and conditions for their success have been investigated. How TUM activities unfold has received more limited attention. Accordingly, we focus on exploring the nature of mediation activities. Through an in-depth field study we demonstrate that there is a symbolic meta component to mediation activities by which they come to carry meaning for technology users. Specifically, both the technology artefact itself and the information (content and form) disseminated by managers send messages to users, helping them interpret TUM activities in particular ways. Managers who are aware of these symbolic processes are better equipped to plan and execute successful TUM efforts. Theoretically, the study draws attention to the fact that TUM efforts must mediate both the functional and the symbolic dimensions of technology use. The meta-communicative layer of managerial efforts can shape the often over-looked symbolic dimension in particular.*

**Keywords:** *Technology-use mediation, Meta-communication, Symbolism, Field study*

## 1 Introduction

When new information technologies (IT) are implemented in organizations, much effort goes into making sure they are put to use by the target user groups (Orlikowski, et al., 1995; Purvis, et al., 2001). These interventions take on various forms, such as senior management endorsement (Chatterjee, et al., 2002; Purvis, et al., 2001), adaptations to the technology (Tyre and Orlikowski, 1994) and continuous user training (Gallivan, et al., 2005). Orlikowski and colleagues (1995) coined the term *technology-use mediation* (TUM) to capture the notion that these intervention efforts attempt to influence (and so mediate) how users end up utilizing the technology in their specific context. The significant complexities that most IT implementation and development projects face (Robey, et al., 2002; Wagner, et al., 2010) make the success of these TUM activities important.

Different kinds of TUM activities have been researched. For example, Orlikowski, et al. (1995) and Novak, et al. (2012) studied interventions undertaken by administrative and technology support groups, such as customizations to the technology artefact. Sharma and Yetton (2003) looked at TUM activities undertaken by more senior actors – top management – and geared towards setting up an organizational environment facilitative for new technology use. In prior research, the people who oversee and carry out the various TUM efforts have been called *mediators*. We choose the term *intrapreneurs* (cf. Pinchot, 1985) instead to avoid confusion around the term mediator, which may refer to both people and objects. Intrapreneurs, in the traditional sense, are people who engage in the practice of creating new business opportunities within organizations: turning ideas into profitable reality (Pinchot, 1985). We use the term because people undertaking TUM efforts are employees who take (or are given) initiative and responsibility for turning a new IT into a successfully working tool.

While different kinds of TUM activities have been researched quite thoroughly, it has been suggested that the process of technology-use mediation is not well understood, requiring further investigation (Bansler and Havn, 2004). Orlikowski et al. (1995: 438) point out that, “how, by whom, in what situations [...] remain important empirical questions” not covered in their framework. The goal of this research, therefore, is to shed further light on the *nature* of technology-use mediation processes. Building on such literature as Feldman and March (1981) and Markus and Silver (2008), we argue that on a fundamental level, TUM activities are symbolic and our aim is to explore how the TUM “events, words, behaviors, and objects [come to] carry meaning for the members of a given community” (Barley, 1983: 394). Specifically, the research is guided by the following question: *How do technology-use mediation activities unfold as symbolic processes?*

We demonstrate that all TUM efforts have a meta-communicative component that facilitates the emergence of symbolic associations around the new technology for the users. Humans have the ability to communicate (send messages that impart information), but also to send *messages-about-messages* (meta-communication) that contextualize and assist participants in understanding the communication event (Wilmot, 1980), more or less as intended. For example, tone of voice as well as verbal comments (e.g., “It was a joke”) communicate something about the exchanges between people and help them interpret the meaning of the messages (ibid.). In TUM, intrapreneurs communicate about specific activities (e.g., there is a training event on Tuesday), and also engage in meta-communication to help end-users interpret the efforts in ways that will lead to successful technology use (e.g., intrapreneurs may indicate that the CEO has approved the training, thus sending a meta-message that everyone is expected to attend). We argue that how this meta-communication is executed is critical in the success of TUM efforts. Theoretically, we contribute to unpacking mediation activities, drawing attention to the processes of categorization and signification that are often overlooked when assessing managerial interventions. Practically, we show that understanding the symbolism of intervention efforts can help intrapreneurs plan their TUM activities with greater care.

## 2 Technology-Use Mediation

Technology-use mediation has been defined as “a set of deliberate, ongoing, and organizationally-sanctioned activities ... that help to adapt a new ... technology to [a specific] context, modify the context as appropriate to accommodate use of the technology, and facilitate the ongoing effectiveness of the technology over time” (Orlikowski, et al., 1995: 424). Orlikowski et al. (1995) proposed four general types of TUM efforts: establishment; reinforcement; adjustment and episodic change. Sharma and Yetton (2003) adapted this framework to explore top management efforts specifically. We combine these frameworks to distinguish between different kinds of local TUM activities undertaken at different levels of the organizational hierarchy – for example, top management rarely engages in activities such as direct technology customization, thus, their TUM activities tend to be related to the organizational environment (see Table 1).

While senior and less senior intrapreneurs can facilitate new technology use in a specific context, we argue against unquestioningly treating only the existence or non-existence of such intrapreneurs as one of the causes of implementation success or failure. Rather, our findings show that it is the *execution* of the TUM efforts, while being aware of their symbolic meta component, that is important in the success or failure of the implementation effort.

| <b>Technology-Use Mediation</b> (local, deliberate and organizationally-sanctioned intervention efforts)   |
|--|
| <p><b>Typically undertaken by less senior actors (Orlikowski, et al., 1995):</b></p> <ul style="list-style-type: none"> <li>- Establishment (intrapreneurs set up the technology, introduce it to the end-users; the way users should adopt and use the new technology is also articulated)</li> <li>- Reinforcement (intrapreneurs “help users to incorporate the new technology into their work practices, providing advice, demonstration...”, etc.)</li> <li>- Adjustment (intrapreneurs undertake changes to the technology and/or the usage rules to facilitate incremental changes to use practices)</li> <li>- Episodic change (intrapreneurs significantly re-design the technology and/or the organizational setting)</li> </ul> <p><b>Typically undertaken by more senior actors (Sharma and Yetton, 2003):</b></p> <ul style="list-style-type: none"> <li>- Creation of new structures (CNS), e.g., intrapreneurs establish organizationally-sanctioned support, training and lower-level intrapreneur groups</li> <li>- Creation of new performance control systems (CNPC), e.g., establishment of mechanisms that reward behaviours consistent with new IT adoption</li> <li>- Creation of new coordination mechanisms (CNCM), e.g., articulation of new patterns of workflow</li> <li>- Creation of changes to performance goals, e.g., establishment of long-term orientation tolerant of short-term performance declines</li> </ul> |

Table 1. Different types of technology-use mediation activities

### 2.1 Symbolism in Technology-Use Mediation

People’s use of technology (both in everyday and workplace contexts) can be broadly seen as having two dimensions: a symbolic/experiential (where people take some time out to experience the technology for its own merits and reflect on their experiences) and a functional/integrated (where people use IT as part of their usual routine activities to achieve particular ends) (Bodker, et al., 2012; Nandhakumar, et al., *forthcoming*) component. TUM activities clearly need to mediate both dimensions in order to successfully facilitate the effectiveness of technology over time. Most of existing research on TUM has, however, explicitly focused only on the functional aspect (e.g., technology adaptation and training of users are typically geared towards faster and easier routinization of the new technology) (cf. Novak, et al., 2012). The symbolic/experiential aspect has received only implicit consideration and we know very little about how intrapreneurs can influence it. By focusing our study on the meta component of TUM activities, which we show is largely related to influencing the experiential/symbolic dimension of use, we hope to fill some of this gap.

At their core, TUM activities are about communication and meta-communication. Therefore, intrapreneurs have the difficult task of, first, sending effective messages related to their efforts, and, second, sending effective *messages-about-messages*, to ensure that their efforts are interpreted in ways that will lead to improved system use. Based on extant research, we argue that intrapreneurs' communication has a meta component that receivers interpret in particular ways, depending on a) intrapreneurs' verbal and non-verbal behaviour (e.g., by their choice of communication media), and b) the IT artefact (e.g., how well the artefact meets user needs). The meta-communicative function of verbal and non-verbal behaviour of decision-makers is described as *signalling* (Feldman and March, 1981). The argument is that much of information gathering, usage and dissemination in organizations is not directly linked to better decision making per se, but rather provides "a ritualistic assurance that appropriate attitudes about decision making exist" (Feldman and March, 1981: 77). Hence, these information-related behaviours function as meta-communication, sending messages about managerial interventions aimed at ensuring that these are interpreted as legitimate and 'good'. The more credible the sender and the message, the more likely it will have an impact on the receiver's attitudes and use behaviour (Rivard and Lapointe, 2012).

The meta-communicative function of IT artefacts has been researched by considering all software systems as "designer-sent messages to users about the variety of messages that can be exchanged between users and systems" (Souza, 2005: 317). Markus and Silver (2008) introduce the concept of symbolic expressions, which assumes "that users engage in processes of interpretation and social construction with respect to systems [and] also assumes that something in IT artefacts can contribute to (but not determine) users' impressions of systems" (Markus and Silver, 2008: 622-623). This "something in IT artefacts" can be their interface; functionality; the information content of the IT, etc. Software tools are often based on some kind of category system – pre-configured "buckets" for entering different kinds of data, often based on 'best practices' (Wagner, et al., 2006). Such categories communicate informative content (e.g., the data that should and should *not* be input into the system), and also meta-communicate something about how to interpret these different kinds of data (e.g., as more or less valuable). As such, the information structure within an IT artefact comes to carry significant connotations for various users (Bowker and Star, 2000; Langer, 1989) and, if users interpret this negatively, may even lead to users refusing to work with a technology (Wagner, et al., 2006). This review suggests that both the IT artefact and the intrapreneurs' activities have a meta-communicative component and our empirical research seeks to examine this further.

### **3 Methodology**

This study was conducted across two sites – a large state university ("State") and a small private university ("Private") in North America – both of which have purchased and implemented the same Faculty Productivity software package (FP) in order to improve efficiency in gathering faculty activity data. By conducting our field study across two different organizations, we are able to demonstrate that the symbolic nature of the TUM activities is of critical importance in understanding TUM success in organizations of *many* kinds. Limiting our study to one organization (or more similar ones) would not have allowed us to uncover this general importance of certain symbolic components. Overall, we conducted 47 semi-structured interviews over an 18-month period. Interviews were conducted with a range of stakeholders, including university administrators, faculty members and staff responsible for implementing FP. Additional data (e.g., meeting recordings; university-wide memos; e-mails) were collected and examined. We also collected 17.5 hours of observational data, including documentation of faculty members using FP in filling out annual activity reports, used for performance evaluation. A survey that probes the use of and responses to FP was carried out in both settings as well.

We analyzed the collected data utilizing two approaches from semiotic analysis: *paradigmatic analysis* and the *identification of rhetorical tropes* (Chandler, 2002). A basic tenet of semiotics is that signs (e.g., words; images; objects) have both denotative and connotative meanings – i.e., a literal meaning, and a socio-cultural/personal meaning (Chandler, 2002). The aim of paradigmatic analysis is

to understand the significance of the chosen signifiers (positive or negative connotations of each) by comparing and contrasting the signifiers present in the text with those that are absent. A major technique of paradigmatic analysis is the identification of binary semantic oppositions (e.g., good/bad; self/other). The aim of analyzing rhetorical tropes or figures of speech in text is to identify the “imagery” that the text is trying to generate (Chandler, 2002). In our data, we found that metaphors and irony were most commonly used. Metaphors are used to express an “understanding and experiencing [of] one kind of thing in terms of another” (Lakoff and Johnson, 1980: 5). For example, the phrase “comparing apples to oranges” helps us understand an invalid comparison in any domain as similar to the futile effort of comparing different kinds of fruit. Irony is typically used to express the opposite of what the writer or speaker is actually thinking or feeling (Chandler, 2002). In sum, both types of analysis focus on identifying the socio-cultural and personal meanings of signifiers and can, therefore, help to understand the *meta component* of TUM efforts.

Another basic tenet in semiotics is that signs (with multiple literal and connotative meanings) have a broad interpretational scope. This draws attention to the active role of an interpreter (receiver) in all signification processes. While our emphasis lies on unpacking the TUM efforts from the intrapreneur (sender) side, we focused our analysis iteratively on each TUM activity to analyze: 1) what the intrapreneurs were attempting to communicate and meta-communicate (the sender side), and 2) how the end-users interpreted the effort (the receiver side) (see Figure 1). First, we used the two analytic techniques to understand the positive and negative connotations potentially present in various mediation activities undertaken by intrapreneurs. We identified the use of such pairs as us-them (administration-faculty) or unified term “colleagues”, and of rhetorical tropes, often used as aids in persuasion. We then applied the analytic techniques to understand the positive and negative connotations that end-users had around the TUM activities. We noted the frequent use of metaphors by end-users to generate imagery that would become associated with FP (e.g., putting square pegs into round holes). We also identified common signifiers that end-users chose to describe FP (e.g., abnormal, horrible) to discern emerging symbolic expressions. We complemented the insights drawn from the interviews and observations with survey data, which we analyzed using descriptive statistics.

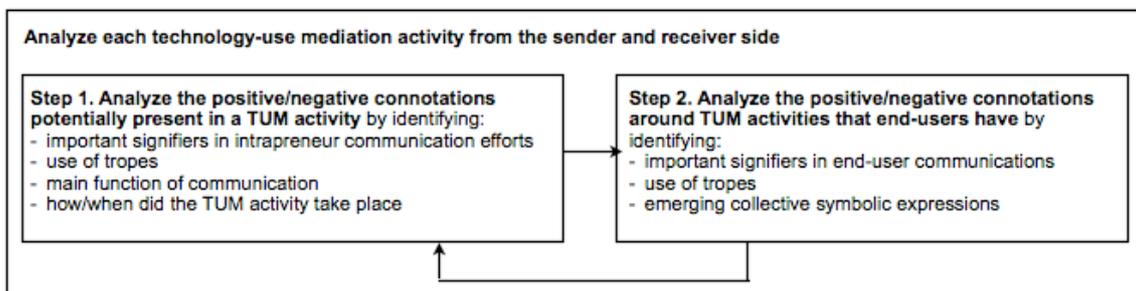


Figure 1. Data Analysis Steps

### 3.1 Research Setting

The FP software was first offered by the vendor in 1999. Currently, there are approximately 3,000 FP adopters in over 25 countries. The software package offers a solution for managing faculty activities. Faculty input their research, teaching and service activities into FP through a web user interface and the data are stored on the vendor’s cloud-based repository. “State” is a large state university that employs approximately 1,500 faculty members (900 full-time), and enrolls about 40,000 students. The decision to purchase FP was made by the Provost and was mainly driven by the need for some kind of central faculty vitae database that would allow for easier productivity reporting and feed into a performance-based budgeting approach. “Private” is a small private university emphasizing business education, but also offering programs in the arts and sciences (A&S). It has approximately 5,500 students and 280 full-time members of faculty. At Private, the decision to purchase FP was made by a

committee, comprising administrators, faculty representatives and technology support personnel (see Table 2). Standardized web profiles for all faculty members were created by pulling data from FP.

| Intrapreneur Type  | State  | Private  |
|--|--|--|
| Top management intrapreneurs (in charge of organizational-level TUM activities)          | Provost (now former). The Provost approved the purchase of FP, assigned the implementation project to a central administrative (CA) office and, in collaboration with the CA office, created policies around FP use.                     | Provost, Deans, Associate Deans. The Provost had a largely symbolic role - communicating major project milestones to faculty to demonstrate top management support. Policies around FP were largely created by lower level administrators.                 |
| Intrapreneurs (in charge of lower-level TUM activities, such as adapting the technology) | CA office: CA office head (also faculty) + 1 staff. In charge of the technical, vendor and faculty liaising sides of the project (e.g., provide training to and resolve faculty problems, improve FP and work with the software vendor). | Central Technology (CT) office: CT office head (also faculty) + 3 staff. In charge of the technical, vendor and faculty liaising sides of the project (e.g., provide training to and resolve faculty problems, improve FP, work with the software vendor). |

Table 2. Intrapreneurs and their roles at State and Private

#### 4 Case Findings: Implementing FP at State and Private

At State, the search for a tool that could facilitate the collection and reporting of faculty activity data began in 2003 and FP was purchased in 2009. The institutional research office (CA), assigned to be in charge of the project by the Provost, was relatively reluctant to take on that role (see Figure 2).

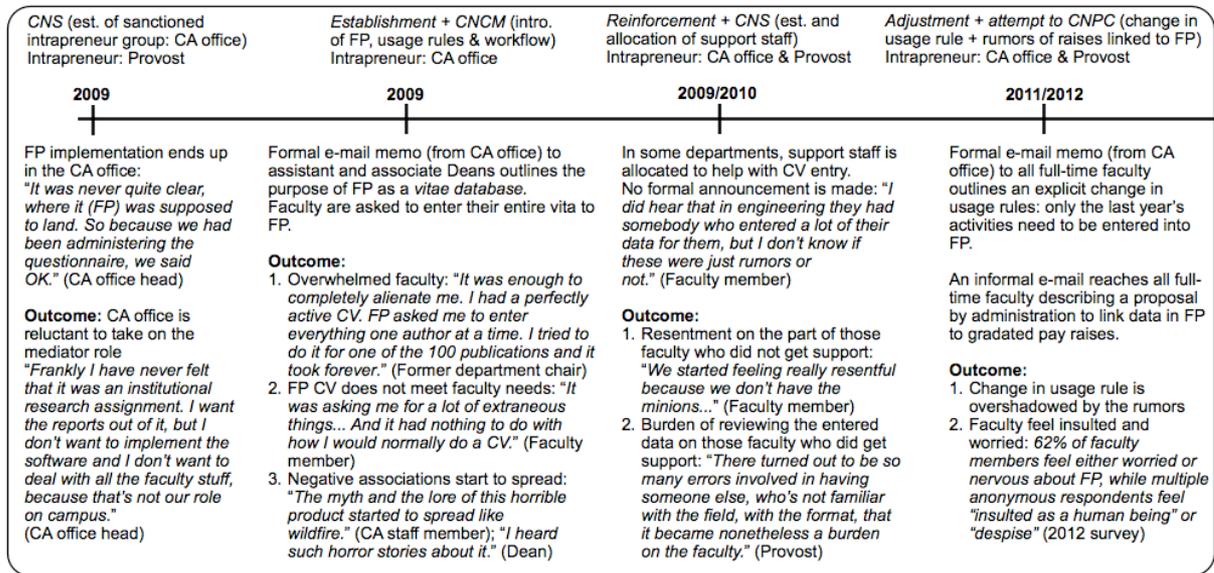


Figure 2. Overview of TUM Activities at State

Nonetheless, FP was rolled out in 2009: "[FP] creates a faculty vitae database that can be used by individual faculty for maintaining CV information ... Academic Affairs will use the product to generate reports in support of planning activities. [FP] has been customized according to the terms used specifically by [State]."

Faculty were asked to enter their entire vita into FP. As FP offers no way for individual faculty to import their MS Word or PDF vitae into the system, faculty had to manually re-enter all of their data. The standardized CV generated by FP also did not meet the needs of the diverse faculty:

“You develop your own unique ways of making yourself look good. And [FP] is trying to frame it all into an assembly line...” (faculty member). “It’s demoralizing to have to put things in the ‘Other’ category. It makes it seem like it’s not as important as those things that have a category.” (faculty advisory group session, May 2010).

Over time, these negative experiences began to consolidate and spread (Figure 2). To address these “horror stories”, the CA office and the then Provost decided to reinforce FP usage by making staff available for CV entry. The support was not consistently allocated, however, and news of this among faculty spread through rumour. The effort did not have the expected positive influence on use (Figure 2). In response to continued discontent, the CA office and Provost decided to adjust the usage rules:

“FP is an online CV management system ... Activities are aggregated and reported ... and represent evidence of program or department-level productivity. All full-time faculty are expected to provide updated information annually, reflecting only the most recent academic year ... Provision of the complete vita is not required ... Faculty may request assistance by contacting [X]...” (formal e-mail memo by CA office).

In conjunction with the formal reframing of FP came another, informal rumour of a proposal to link performance evaluations based on the data in FP to graduated pay increases:

“Do you remember [FP]? The program that required us all to quantify our work “output?” Administration is now proposing to use the data generated through FP to initiate a graduated pay increase. [...] This proposal is unacceptable for three main reasons: 1. It demonstrates administration’s basic lack of respect for faculty. 2. It fails to recognize meaningful standards of quality in academic work. FP only assesses the quantity of [activities]; it can’t measure quality; 3. Their proposal would lead to hostile relations in the workforce.” (e-mail to all full-time faculty from a faculty member).

The 2012 survey results reflect the influence of these adjustments (Figure 2).

At Private, the search for a systematic way of capturing faculty activity data was triggered by an accreditation visit in 2005. While Private had a faculty research database for internal use, the data were not easily convertible to a format useful for accreditation reporting. A search for a third party solution began and a decision was made to put the CT office (rather than IT support) in charge of the project, because “they were more faculty-friendly” (Figure 3).

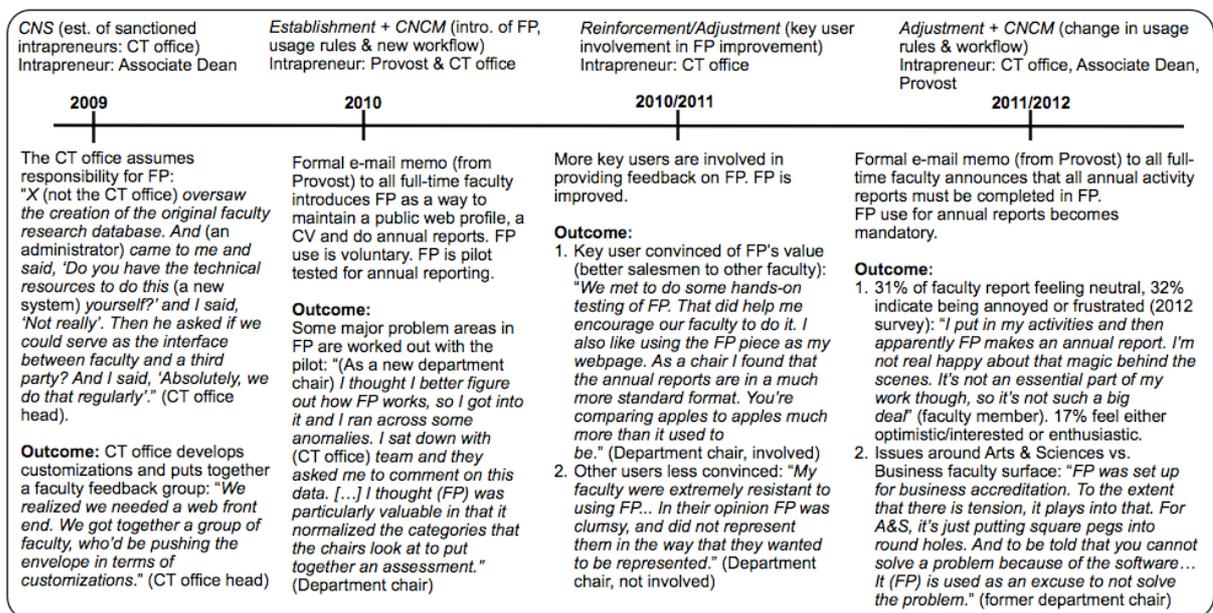


Figure 3. Overview of TUM Activities at Private

FP was rolled out in 2010; most data in the old system were migrated into FP automatically:

“Last year we decided to transition our existing Faculty Research Database to a new system hosted by [FP] (used by 1,500 colleges and universities, including [list of prestigious universities]). [A list of faculty members] and the CT office worked with the company to ... add desired functionality. The new system will enable faculty to: a) Maintain a more attractive public profile webpage ... b) Generate on-demand standardized CVs ... and c)

*Automatically incorporate publications, etc. into the Annual Activity Report (this functionality should be in place later this year...). If you have questions, feel free to call/email [X]*" (campus-wide e-mail from the Provost)

In order to reinforce FP use at Private, the CT office informally involved a number of key users to give feedback on the system: *"We got together a smaller group of faculty that we thought were fairly representative... It was just a matter of availability and, frankly, who is easy to work with"* (CT office head). In some cases, this successfully convinced the key users (e.g., department chairs) of FP's value, while users not involved in this effort remained sceptical. Following the relatively successful introduction and reinforcement of FP at Private, in late 2011 the use of FP for annual reporting became mandatory: *"Department Chairs are asking all faculty to complete their ... Reports in [FP]. The system has had over a dozen improvements based on faculty feedback. Benefits of completing your ... report in [FP], include: a) No need to re-enter publications... you've already entered into [FP], b) All courses will be automatically input, c) All your narratives will be saved ... so you can update/edit them next year, similar to what most faculty currently do in Word. Updating your information ... will also help colleagues ... in preparing for [Accreditation] Visit... You can contact [X] for assistance..."* (formal e-mail memo by Provost).

As a result, the workflow around annual reporting changed. Before, faculty could choose to enter data into FP, but submit their report as an MS Word document; now, faculty were required to submit the report via FP (see Figure 3).

## **5 Analysis: Symbolic Processes in Technology-Use Mediation**

We now analyze our findings from a symbolic perspective, with the main aim of exploring the meta components of the various TUM activities (see Table 3).

Both implementation projects began with the creation of new structures - establishing mechanisms in the organization that promote the learning of a new technology by end-users (Sharma and Yetton, 2003). Two such structures were created: the organizationally-sanctioned intrapreneur groups (the CT and the CA offices) and, second, at State, the data entry support structure was created at a later time. From a *symbolic* perspective, creation of new structures is crucial, because the information (or lack of it) disseminated about the implementation team is a signal to the users as to the competence and skills of the intrapreneurs (Table 3) – thereby underlying their credibility and authority (Feldman and March, 1981). For example, at State, neither the establishment of the CA office as the authorized lower-level intrapreneur nor the availability of support personnel was communicated formally to end users. From a symbolic perspective, this signals lack of clear project leadership both on the senior (administration) and lower (CA office) levels. This ambiguity influences all further TUM efforts.

Along with the set-up of intrapreneur groups, the projects engaged in establishment activities – the detailed introduction of the technology to the end-users and the articulation of the way users should adopt the technology (Orlikowski, et al., 1995). This was accompanied by the creation of new coordination mechanisms, aimed at articulating changes in the workflow. For example, at Private, there was an expectation that the workflow around annual reporting would change. However, this was not introduced as mandatory until after FP had become widely used. While we have separated different mediation activities in Table 3 for clarity, in our research settings, they were often undertaken simultaneously (e.g., the first memos serve the purposes of articulating new structures of the CA/CT offices, establishing usage rules and articulating changes in the workflow).

We found that activities of establishment and the creation of coordination mechanisms were jointly undertaken by both lower-level and top management intrapreneurs. For example, at Private, the formal memo introducing FP setting up first usage rules came from the Provost. However, the CT office was articulated as the contact point, taking over the establishment activities. This communicates to end-users that the top management intrapreneurs' competence lies in decision-making, while the lower-level intrapreneur competence lies in faculty liaising and problem solving. At State, the first memo introducing FP came from the CA office, despite the implementation decision being made by the Provost. This introduces inherent ambiguity as to the role of the CA office and a lack of clarity around

decision-maker competency. This led to concerns later in the project as to what exactly was to be done with data inputted into FP, when rumours around new performance control system circulated.

Intrapreneurs' activities (e.g., initial set up of the technology and users' involvement in this) can also communicate to end-users signs about their own competence (Table 3). For example, the pilot testing of FP at Private signalled to the faculty involved that they were the most competent authority to comment on the suitability of FP for their work practices, thereby reinforcing faculty competence (see Figure 3). However, information disseminated by the intrapreneurs also interacts with users' own experiences; their interpretations of the technology and TUM efforts, as well as the *material limitations* of the technology. Signals of both user competence and specific symbolic expressions (Markus and Silver, 2008) can arise from these interactions. We have indicated this in Table 3 by separating the kinds of meta-messages that come only from intrapreneur activities from those that arise from the interactions of intrapreneur efforts and the IT artefact. For example, at State, initial communication from the CA office (setting up FP as a CV management tool) interacted with the technical restrictions (e.g., entering publications taking forever) and lead to FP taking on various symbolic expressions. These collectively described FP as a "horrible" product and an "abnormal" and slow way (as opposed to the normal and quick way) of doing CVs (Figure 2).

Establishment is often followed by reinforcement activities, during which "appropriate use may be promoted through a variety of training and communication sessions" (Orlikowski, et al. 1995: 440). The focus of the intrapreneurs' activities lies in reviewing and reinforcing their communication efforts to maintain and strengthen the positive symbolic expressions of the technology and alter the negative ones (Table 3). For example, at State, the availability of support for data entry was not formally announced and there was no clarity in the allocation of support. The intervention, rather than signalling formal reinforcement of FP, signalled biased decision-making (Feldman and March, 1981), which did not reinforce the already under-established competence of either top management or lower-level intrapreneurs. At Private, the creation of a group of key users to provide feedback on FP was also done informally, favouring people "who are easy to work with". For these key users, the standardized format of FP took on a positive connotation (e.g., the metaphor "comparing apples to apples"). Users not involved in feedback sessions lacked the reinforcement of positive symbolic associations, leading to more negative associations around FP (clumsiness and misrepresentation).

Adjustment activities focus on adjusting the technical features and the usage rules of the new technology to promote use (Orlikowski, et al., 1995: 439). We found that adjustment often takes place to rectify problems arising from the initial establishment activities. As such, adjustments were accompanied by the need to re-establish intrapreneur and decision-making competence, as well as user competence (Table 3). For example, at Private, the formal e-mail memo announcing the mandatory use of FP for annual reporting used terms such as "streamlining" and "similarity to current procedure", implying efficiency, time saving and no drastic change. This outlining of the new annual report workflow also articulates the new coordination mechanism that was left ambiguous during establishment. For some A&S faculty, this change in workflow signalled the implementation teams inability (i.e., lack of competence or desire) to confirm the equal value and recognize the unique needs of A&S faculty (Figure 3). At State, the formal change in usage rules was overshadowed by the informal rumours of a new performance control system. We have not included the creation of a performance control system as a separate TUM activity in Table 3, because it never actually happened. Rather, the informal e-mail constitutes an *unsanctioned* mediation effort attempting to *reinforce* existing *negative* symbolism around FP and persuade faculty to resist FP. The importance of unsanctioned TUM efforts remains to be explored in future research. In our case, the unsanctioned effort perpetuated the "abnormality" symbolism – for example, the strategic use of quotation marks (irony) around the word output suggests that the output FP manages to capture is not representative of what faculty really do at State. The message associates FP with "quantitative" (paired with "less meaningful" and "unacceptable") measures of output, as opposed to qualitative, meaningful and acceptable measures. These paint FP as something that challenges the identity of an academic. There

is also a clear “us versus them” opposition in the e-mail. In sum, FP comes to symbolize lack of respect (towards academics as people), to which faculty respond with overwhelming worry.

In sum, our findings demonstrate that the meta components of the various TUM activities (Table 3) have a significant influence on the symbolic/experiential dimension of technology use. Our analysis reveals numerous cases of intrapreneur and artefact meta-messages leading to both positive and negative reflections around the new technology. Often, intrapreneurs remain unaware of this influence, leading to many unintended consequences (such as in the case of State’s unsuccessful attempt to facilitate FP use through support staff). We discuss the theoretical and practical implications of our findings in more detail in the next section.

| <b>TUM activity</b>          | <b>Source of meta-communication</b> | <b>Symbolic meta component</b>   |
|------------------------------|-------------------------------------|--|
| Creation of New Structures   | Behaviour of intrapreneurs          | - signal competence (credibility and authority) of the intrapreneurs   |
| Establishment                | Behaviour of intrapreneurs          | - signal competence (credibility and authority) of the intrapreneurs<br>- signal competence of decision to buy and implement new IT            |
|                              | Behaviour of intrapreneurs + IT     | - facilitate emergence of (positive) symbolic expressions (SE) for different users<br>- facilitate the emergence of signals of user competence |
| Creation of New Coord. Mech. | Behaviour of intrapreneurs          | - signal new workflow (how new IT usage fits with other existing procedures)   |
| Reinforcement                | Behaviour of intrapreneurs          | - signal reinforcement of expected usage (usage rules)<br>- signal reinforcement of decision and intrapreneur competence                       |
|                              | Behaviour of intrapreneurs + IT     | - facilitate reinforcement of existing (positive) SE-s<br>- facilitate reinforcement of signals of user competence                             |
| Adjustment                   | Behaviour of intrapreneurs          | - signal change of expected usage (usage rules)<br>- signal (re)establishment of decision and intrapreneur competence                          |
|                              | Behaviour of intrapreneurs + IT     | - facilitate the emergence of new (positive) SE-s<br>- facilitate the emergence / reinforcement of signals of user competence                  |

*Table 3. Analysis summary: Symbolism of TUM activities*

## **6 Discussion: Theoretical and Practical Implications**

Prior research on technology-use mediation has demonstrated that the effectiveness of the mediation activities is influenced by a number of factors, including the level of understanding intrapreneurs have with regard to users’ practices and the technology in use; the credibility of the intrapreneurs with the users; organizational size (availability of resources) and the like (Davidson and Chiasson, 2005; Novak et al., 2012; Orlikowski et al., 1995). Prior research has also shown that the mediation process is open-ended and emergent (Bansler and Havn, 2004). Our paper confirms and extends this prior research on TUM. Instead of looking at factors influencing the effectiveness of TUM, we look at the mediation activities themselves – examining these activities on a meta-communication level. Our analysis shows that TUM activities unfold as symbolic processes by meta-communicating the: (in)competence of the intrapreneurs; (in)competence of the decision to implement the new IT; distinctive purpose(s) of the new IT, and (in)competence of the end-users. Further, TUM activities facilitate the emergence of collective symbolic associations around the new IT.

Theoretically, we extend the TUM framework by unpacking the different TUM activities into specific symbolic meta components to enable researchers better to understand the success or failure of TUM

efforts. We demonstrate that the execution of mediation activities (even with the facilitating factors described above being present) is not unproblematic. By understanding the different symbolic meta components of TUM efforts, successes and failures of mediation can be theorized with more nuance. For example, a failure to establish a new technology can be traced to specific meta components, such as elements that signal user incompetence (e.g., signaled by an IT artifact that provides no categories for certain types of behaviours, thus rendering these behaviours irrelevant, and so inferring that the faculty member who undertakes them is incompetent) and/or intrapreneur incompetence (e.g., signalled by a failure to understand user concerns).

Practically, by identifying the set of meta components (Table 3), we provide intrapreneurs with a kind of mental checklist of elements they should be aware of in order to carry out their mediation activities effectively. For example, by signalling their own competence, intrapreneurs establish their authority, power and credibility. Credibility is what allows intrapreneurs to effectively persuade or coerce users to change their opinions towards a new technology (Rivard and Lapointe, 2012). By signalling users' competence, intrapreneurs indirectly reinforce their own competence and also shape the user reflections around the new IT. Intrapreneurs can facilitate the signalling of user competence by directly involving users in the configuration of the software or changing the information structures based on user requirements (Andersen, 2001). Information structures in a standardized software tool valorise some points of view and silence others (Bowker and Star, 2000: 31; Wagner, et al., 2006). For example, the requirement to classify all scholarly contributions according to AACSB rules (a business accreditation institution) silences other rules that may be more important to A&S faculty. The dangerous consequence of this is that FP invisibly places more value on the work of business faculty than the work of A&S faculty, while the tool is advertised as streamlining activity reporting for *all*. Further, the signals that intrapreneurs send interact with the functional limitations of the technology, leading to the emergence of various symbolic expressions of the technology for different user groups. Stein et al. (2012) have demonstrated that symbolic expressions of IT are cues to which users respond with specific emotions and distinct use patterns. Through specific meta components TUM efforts can create, maintain and alter these expressions and discipline the symbolic/experiential dimension of use in ways that align with managerial intentions for the technology.

## **6.1 Limitations, Future Work and Conclusion**

Our study points to numerous further research avenues that can address the limitations of this work. First, our study examined TUM efforts taking place within organizational IT implementation projects. The complexities of inter-organizational projects, thus, need further investigation. It is likely that the presence of multiple, both sanctioned and unsanctioned intrapreneur groups will lead to conflicting symbolic meanings and signals. The impact of such conflicts under different conditions and the role of unsanctioned intrapreneur activities are important avenues for further research.

In sum, our research demonstrates that all technology-use mediation efforts have a symbolic meta component. For practitioners, understanding this symbolism is essential for undertaking successful TUM efforts. A lack of understanding of the symbolic nature of TUM can lead intrapreneurs to monocausal explanations of user resistance and, accordingly, to incomplete rectification and unsuccessful persuasion efforts (Rivard and Lapointe, 2012). By adopting a symbolic perspective, we also expand current theories of technology–use mediation. We outline a number of meta-communication processes that are critical in understanding the unfolding of mediation efforts.

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