Use and Non-Use of IT in the Workplace: Studies on Emotions, Identity and Technology

Mari-Klara Stein

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Use and Non-Use of IT in the Workplace: Studies on Emotions, Identity and Technology

Mari-Klara Stein

A dissertation
submitted in partial fulfillment of the
requirements for the degree of

Doctor of Philosophy (PhD) in Business

2013
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DEDICATION

To my wonderful family – my husband, my parents and my sister
ACKNOWLEDGEMENTS

I would like to express tremendous gratitude to my advisor Bob Galliers. I would not be where I am today without his guidance, advocacy, and friendship over the years. He has been exceptionally patient, kind, open-minded and inspirational – even in situations where others may have discouraged me from pursuing some of my more unorthodox ideas. In perfect balance, he has pushed me to become better and reassured me when in doubt. I can only strive to be as good a mentor and academic in my future. In addition, I am profoundly grateful for the time and attention of my dissertation committee members Sue Newell, Lynne Markus and Dan Robey as well as my co-author Erica Wagner. Their incomparable expertise, experience and insightfulness have greatly improved the quality of this work.

I wish to express sincere appreciations to the Bentley IPM and CIS departments and the PhD Office, especially Mike Quinn, for their support. I am indebted to Betsy Rainoff and the Rauch family for their generous financial aid. I also wish thank all of my PhD colleagues – in particular Anna Karpovsky, Art Tomasino, Quang “Neo” Bui and Luisa Melo – for their companionship over the past years.

Last but not least, I want to thank my family for all their love and support. My husband is both my most enthusiastic champion and my calm voice of reason and I could not have done it without his unwavering support and encouragement. My parents instilled in me a love of books and science as well as teaching me great discipline, thus, setting me on this path and providing me with the necessary foundation to successfully complete it. My sister – so like and unlike me at the same time – has always been someone I look up to and her creativity and courage have been my inspiration.
ABSTRACT

Adoption, acceptance and, more recently, continued use of information technology (IT) in workplace contexts have been researched extensively over the last three decades. As acceptance and use of IT underlie its ability to fulfill expected business benefits, it is unsurprising that researchers have sustained a great interest in the topic. While there is a wealth of cumulative knowledge on adoption and the factors affecting adoption, much less is known about specific patterns of use – ranging from extensive and frequent use to complete non-use – and the reasons behind these patterns. Existing research on both use and non-use of IT has, until very recently, emphasized the technical, cognitive and social aspects that may influence human-technology interactions. This has left other aspects – such as emotions and self-identity – of the relationships between social actors and IT relatively unexplored. Accordingly, the goal of this research is to bring people – including their “non-rational” sides – back into Information Systems research, without black-boxing either the IT artifact or the user. Three studies are conducted to achieve this goal; each study focuses on a different aspect of the emotions-identity-IT relationship. Overall, the research contributes to a better theoretical understanding of how social actor emotions and identity influence how and why certain IT systems and specific features of IT systems are used in the workplace, while others are not. The research also contributes to the development of a novel theoretical framework for the study of IT use and non-use from a personalized perspective. From the practical point of view, the research provides novel insights into how to deal with managerially undesirable patterns of use and non-use of IT at work.
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INTRODUCTION

Information technology (IT) is nearing ubiquity in modern workplaces, and expectations of what IT can achieve for businesses are high (e.g., Baltzan and Phillips, 2009; Sward, 2006). However, there are also significant complexities to IT implementation and development projects (Robey et al., 2002; Wagner et al., 2010) that lead to failures (Lyytinen and Robey, 1999); lack of adoption (Venkatesh et al., 2003); resistance to change (Lapointe and Rivard, 2005) and low levels of feature use (Jasperson et al., 2005). Business benefits of IT cannot be realized if IT is not used (Peppard et al., 2007), and concern continues to be expressed by executives and users with regard to disappointing outcomes from IT implementations (e.g., Panorama Consulting Solutions, 2011; 2012).

Despite the critical consequences of non-use behavior, our understanding of the concept of non-use and the reasons behind it remain rather limited (Selwyn, 2003). Much research in this area has focused on the acceptance (Davis, 1989; Venkatesh et al., 2003) and, more recently, on the continued use of IT (Bhattacherjee, 2001; Ortiz de Guinea and Markus, 2009). The assumption that if we know about adoption and use, then we also know about non-use may not necessarily hold, however (Rosen, 2005). Furthermore, considerable cumulative knowledge exists with regard to the technical, cognitive and social reasons behind both use and non-use, for example in human-computer interaction (Oja and Lucas, 2011) and digital divide research (Selwyn, 2003). Such studies of IT use reveal a great deal about interplays between social norms and standards, work goals, collective practices and the technology (e.g., Leonardi, 2011).
However, the point that human agency often works through the reflexive intentionality and motivations of individuals – and what often motivates humans are their emotions and identity (Thompson, 2009) – has received little explicit consideration as part of the *social* reasons. Many such accounts of IT use, thus, offer an under-personalized view, where human emotions and identity seem to play little or no role in the emergence of the complex behaviors that characterize individuals’ work with IT. This state of the field may, in part, be due to the historical roots of Information Systems (IS) in computer science and rational scientific management (Hirschheim and Klein, 2011). Certain aspects of the social setting of people using technology – such as emotions (Ashforth and Humphrey, 1995; Rafaeli and Worline, 2001) and identity (Nach and Lejeune, 2009a) – have, as a result, received little research attention until recently. Both are part of a holistic conceptualization of human beings (Thompson, 2012). In order to comprehensively examine work practices, researchers should pay attention to the “physical character (e.g., body movements)” of practices; “the objects involved (e.g., computer); the related ongoing constitution of practitioners’ identity, and the unconscious background knowledge necessary for performing ... activities”, which includes emotions (Rasche and Chia, 2009: 729). Thus, to better understand human-technology interactions, we should also aim to understand, among other things, the relationships between emotions, identity and IT.

While Orlikowski and Iacono (2001), among others, have called for a more nuanced consideration of IT artifacts in IS research, and more recently, there have been calls for greater focus on the sociomateriality of work practices (Orlikowski and Scott, 2008), the goal of this research, perhaps paradoxically in light of these developments,
is to bring people – including their “non-rational” sides – back into IS research (Ciborra, 2006; Thompson, 2012), but without black-boxing either the IT artifact or the user. Accordingly, this research is driven by one broad question: *What is the role of emotions and identity in how and why people use and do not use IT at work?*

It is important to define the boundaries of the four key concepts – identity, emotions, IT and IT use - as investigated in this dissertation. As a foundation, this research adopts the definition of individual-level IT use as “an individual user’s employment of one or more features of a system to perform a task” (Burton-Jones and Straub, 2006: 6). This task-orientation of use, however, is also seen “as part of a larger social context in which interpersonal relationships are established and maintained” (Agerfalk and Eriksson, 2006: 2). IT use, therefore, is a product of evolving relationships between multiple people, various technology artifacts, and practices (Nardi and O’Day, 1999). Furthermore, to delimit the exploration of IT features, the focus lies on those features that emerge from the data as affording or constraining meaningful *activities* or eliciting symbolic associations for different social actors (Markus and Silver 2008). Accepting the above-mentioned definitions, it follows that IT use should be studied in a manner that allows for the exploration of the broad range of interactions that people have with IT and which tend to involve multiple people, multiple IT artifacts, use of some features and artifacts and non-use of others (cf. Satchell and Dourish, 2009), depending on what makes sense, is habitual or ‘feels right’ for a particular situation, person and activity. In sum, this dissertation sees IT use as a *set of qualitatively distinct patterns of behavior, which are characteristic to particular situations and may involve both elements of use and non-use.*
Second, as the research is interested in exploring IT use and the related phenomena within the social worlds of various workplaces, the conceptualizations of identity and emotions both follow a social approach. In the case of identity, a narrative conceptualization is adopted, seeing professionals as creating and re-creating a preferred self through work-related narratives (Riessman, 2003). Increasingly, such narratives include IT artifacts as landmarks (Raggatt, 2006), in relation to which the self and others are positioned. The narrative viewpoint understands the self as proceeding through time (Polkinghorne, 1991), thus, intimately tying identity performance to dynamic social contexts, rather than seeing identity as a collection of properties (e.g., as a gender- and work role occupant).

In the case of emotions, a component process definition is adopted, seeing emotion as “an episode of interrelated, synchronized changes in the states of all or most of the five organismic subsystems in response to the evaluation of an external or internal stimulus event as relevant to major concerns of the organism” (Scherer, 2005: 697-698). The five subsystems are: cognitive; neurophysiologic; motivational; motor expression and subjective feeling. The focus in this dissertation is on the cognitive, motivational, and subjective feeling components in particular settings (Gross, 2008). Approaching emotions from this more social (rather than a psychological or neurological) perspective draws attention to how emotional responses can express value judgments and produce an ‘emotion culture’ – a collective’s understanding of how emotions should be directed and expressed towards certain social groups, objects, etc. (Fineman, 2008). The definition also takes into account the intimate interplay of emotions, cognitions and motivations in most social situations. Emotional responses in social settings (such as the workplace) can,
therefore, be conceptualized as cognitively “filtered”, or as Weick (1995: 45) puts it, “sensemaking is infused with feeling” and vice versa. The collective sensemaking perspective also attests to the malleability of both emotions and identity, reflecting people’s capacity to work on their own self and emotions as well as others’ (Boudens, 2005; Gross 2008; Fields et al. 2007). As the limited prior research – and this dissertation – demonstrates, emotions and identity are often tightly linked in IT use. For example, technological change may verify or challenge people’s ideas of the self, and initiate emotions, such as existential anxiety or feelings of personal meaninglessness (Walsham, 1998). In other words, this research proposes that we need to pay more attention to the holistic concept of subjective experience of agency – “the elaborate sense of self, which allows a person to position herself relationally against unfolding social [and material] reality [...], which is felt affectively” (Thompson, 2012: 195).

Lastly, a boundary around the concept of IT needs to be set. Across the three studies making up this dissertation, a three-fold definition of IT (Markus and Silver, 2008) is adopted. In essence, this dissertation maintains that “people and technological objects, while no doubt often internally related and sometimes interpenetrating, are nevertheless generally distinct and different things, with their own intrinsic properties (e.g. while people are conscious beings, technological objects generally are not, while people have biological bodily functions, most technological objects do not, and so on)” (Faulkner and Runde 2010: 21). In line with this, three concepts are used to examine the intertwining of technology and humans: technical objects, functional affordances and symbolic expressions (Markus and Silver, 2008). IT as technical objects are real things with physical properties (ibid.). These properties
provide opportunities for socially constructed symbolic expressions – sets of “communicative possibilities of a technical object for a specified user group” (ibid.: 623) and possibilities for “goal-oriented action afforded to specified user groups by technical objects - functional affordances” (ibid.: 622). The relational concepts of functional affordances and symbolic expressions allow this research to link the subjective experience of agency (Thompson, 2012) and the relative immutability of IT as technical objects.

To achieve this, three studies are conducted, each focusing on a different aspect of the emotions-identity-IT relationship in workplace settings (see overview in Figure 1). All three studies subscribe broadly to an interpretive perspective (Walsham, 1993), but also build on recent research on sociomateriality and socio-technical systems1 (Markus and Silver, 2008; Leonardi, 2012) to consider both material and human agency in the emotions-identity-IT relations. The framework leaves room for human agency in terms of how material artifacts are used, described, made sense of, and felt about. But it also recognizes that individuals are socialized into existing, structured social worlds and are given a set of technologies (with real physical capabilities and limitations – the ‘involuntary’ as Maan (2010) calls it) to work with,

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1 Sociomateriality and socio-technical systems (STS) have been argued to represent two different perspectives on technology in management and information systems research (Orlikowski, 2010). Socio-technical systems perspective has been interpreted to adopt the viewpoint that the social and technical systems, while ontologically separate, mutually shape each other and must be jointly designed (ibid.). Sociomateriality perspective, conversely, explicitly argues for the ontological inseparability of the social and the technical, as the two mutually constitute each other (ibid.). Recently, it has also been argued, however, that the conceptualization of the technical sub-system in early STS work (Trist and Bamforth, 1951) bears distinct resemblance to the concept of sociomaterial practice adopted by current scholars (Leonardi, 2012). Both the technical sub-system in STS and sociomaterial practice can be described as “an indeterminate relationship between tasks and technologies such that a technology’s fixed materiality could support multiple task structures depending upon people’s desires and goals” (ibid.).
thus constraining their possibilities of meaning making and influencing their agency and the subjective experience of it.

The first study investigates the relationship between professional identity and IT in a workplace context (Figure 1). The study is guided by two research questions: 1) How does IT play a role in professional identity construction at work? 2) How do identities shaped by IT influence patterns of use and non-use of IT? The study adopts the methodology of a cross-sectional field study, with data collected at a back office of a Big 4 accounting firm in North America. Theoretically, this study contributes to the research on the relationship between professional identity and IT through a more explicit and direct consideration of the role of IT artifacts in identity construction. The findings suggest that IT artifacts — by being continuously present and part of many professional’s everyday work activities — can enter work-related professional narratives as landmarks around which the self and others are positioned and preferred professional identities are performed. In short, the narratives allow the professionals to appropriate the ‘involuntary’ (IT) and express a preferred self (and their subjective agency) around that. The findings also indicate that these preferred professional identities manifest in particular ways of using IT in everyday work activities.

The second study examines the relationship between user emotions and IT in the workplace (Figure 1), guided by two research questions: 1) How do emotions arise during the use of workplace IT? 2) How do emotions around IT influence patterns of use and non-use? Through an in-depth field study and a survey conducted in two North American universities, the paper investigates emotions around the continued use of a faculty productivity system. The findings suggest that social actors respond emotionally to a confluence of cues (material, social and personal) that are more or less salient in a
specific activity involving IT use. The type and strength of the emotional experience (loss or deterrence emotions, relatively weaker or stronger achievement emotions) depends on the nature and content (positive/negative) of the salient cues and their interactions. As people use IT, their dominant emotional experiences (or lack thereof) are expressed in specific IT use patterns. These patterns contain distinct sequences of actions characteristic to the particular pattern and contain elements of both use and non-use. Tracing use patterns back to emotional experiences and the particular cues that elicited these emotions allows researchers to identify the distinct felt quality (cf. Ciborra, 2006) of each use pattern. In short, the felt quality of use patterns describes how people feel their position around the ‘involuntary’ (how they experience their subjective agency in relation to their social and material reality).

Theoretically, the contribution of the study is twofold: first, it offers a better understanding of how particular emotions arise in response to various cues present in an IT use situation. Prior research in this area has focused on relationships between discrete emotions and IT use, for example, the negative effect of anxiety on IT use (cf. Venkatesh, 2000). What it is about a particular technology artifact in a specific use situation that actually elicits emotions (e.g., how anxiety about technology arises) has been relatively unexplored (Beaudry and Pinsonneault, 2010). Second, by conceptualizing and studying IT use as qualitatively distinct patterns with nuanced elements of both use and non-use, the paper shows how emotional experiences lead to certain regularities in people’s continued IT use that go beyond just more or less use.

The third study examines the question of how to deal with specific patterns of use or non-use from a managerial perspective (Figure 1). Using the same dataset as the second study, the
paper explores the nature of technology-use mediation (TUM) (Orlikowski et al., 1995) activities undertaken by more and less senior local managerial, support and IT personnel. The goal of TUM activities is to influence and mediate how users will end up using a new technology and, in general, facilitate the on-going effectiveness of a new technology over time. The findings of this study demonstrate that the technology artifact itself and the information (content and form) disseminated by managers have a symbolic meta component that sends messages to users, helping them interpret and appropriate new technologies in particular ways. Specifically, the study shows that much of the symbolic meta-communication that makes a mediation activity successful is related to how managers can influence how the users position themselves in relation to the new technology (expressions of the self) and how they feel about this position (emotions). Practically, being aware of this symbolic component offers managers a number of guidelines to help them better plan and execute successful TUM efforts. Theoretically, the study helps unpack various TUM activities and outlines the various ways in which the artifact mediates its own use.

Together, the three studies contribute to the theoretical development of a personalized account of technology use (see Figure 1). The first two papers outline how emotions and identity play a role in IT systems use in the workplace, therefore, laying a foundation for this personalized account, which is described at the end of this dissertation. The third paper discusses the practical implications of such a personalized perspective, i.e., the challenges of managing new technologies when the positioning of self and others in relation to the social and material reality of technology use and the feeling of this position is taken seriously. Accordingly, the research provides novel insights into how to deal with managerially undesirable patterns of
use and non-use of IT at work. As use patterns are, largely, an emergent phenomenon, their “management” is closer to trial and error nudging towards desired outcomes. Nonetheless, knowledge of how this nudging can be done is likely to be very useful for practitioners.

Figure 1: Overview of the Research Questions and Contributions
PART I: TOWARDS AN UNDERSTANDING OF IDENTITY AND TECHNOLOGY IN THE WORKPLACE

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ABSTRACT

Despite the ubiquitous presence of information technology (IT) in the workplace and the continued computerization of all kinds of work practices, investigations into how IT artifacts play a role in professional identity construction remain rare. Existing studies tend to emphasize sense-making and discourses around IT. This study attempts to fill some of this gap by offering an empirical investigation of how IT artifacts play a role in professional identity enactment at a back office of a Big 4 accounting firm. Building on the socio-technical school of thought and the concept of self as storied, the paper offers a complementary perspective to existing views on the role of IT in identity formation. Our findings reveal that IT artifacts become part of professional identity performances by acting as landmarks in individuals’ self-narratives around which the self and others are positioned and a preferred professional identity is enacted. The findings also indicate that different types of preferred selves may be expressed in specific patterns of technology use. As such, our study contributes to a better understanding of professional identity construction, workplace behavior and on-going use or non-use of IT at work.

Keywords: Professional identity; Self-narrative; Materiality: Function and Symbolism; Continued use of IT

INTRODUCTION

Questions of identity – “What to do? How to act? Who to be?” – have garnered considerable interest in circumstances of late modernity (Giddens, 1991: 70) and post-modernity (Maan, 2010). Increasingly, individual identity is seen less as something prescribed by one’s role in society and more as a continuous process of
effortful construction – we sculpt ourselves and carve a place for ourselves over time.

Information technology (IT) is a ubiquitous presence in modern life (including modern work life) and, as a result, researchers have increasingly reflected on the relationship between technology and identity in the workplace. For example, studies have examined IT as part of broader societal changes (e.g., what kind of work is valued more or less) that influence identity construction (Brocklehurst, 2001; D’Mello and Sahay, 2007) and the influence that IT has on identity through changes it engenders in work practices and role relations (Davis and Hufnagel, 2007; Lamb and Davidson, 2005; Walsham, 1998). Research has also suggested that IT can influence identity directly by functioning as an identity referent (Ravasi and Canato, 2010) or by satisfying a need for self-definition (Barki et al., 2008). Furthermore, the disappearance of boundaries between humans and machines has been observed, with IT becoming a part of the extended self (Haraway, 1987; Turkle, 2011).

A wide variety of theories has been used in these studies to conceptualize identity. Professional identity is often seen as something constructed in practice – it is in the process of constant becoming (Korica and Molloy, 2010). Alternatively, identity is defined as “the self as reflexively understood by the person in terms of her or his biography” (Giddens, 1991: 53). In this case, a professional person constructs his or her identity through actively creating and revising a personal story (Walsham, 1998). Others have borrowed from identity control theory (Burke, 2007) to define identity as a “set of meanings that define who one is as a person, as a role occupant and as a group member” (Nach and Lejeune, 2009b: 2). Still others have built upon Goffmann (1959) and see professional identity as co-constructed by interactors, and
as a project of self-presentation (where technologies play a significant role) (Lamb and Davidson, 2005; Ma and Agarwal, 2007).

Despite this broad range of research and different conceptualizations, studies on identity and IT still represent a very small proportion in the general stream of literature on identity in the workplace (see Alvesson et al., 2008 for a review). Further, much of the research on the topic of identity and IT considers, for the most part, the indirect influences that technology may have on identity (i.e., the themes that consider IT as part of broader societal changes or as creating changes in work practices and role relations are the most popular). While IT clearly has broader societal effects and can exert major influence on evolving work practices and role relations, IT can also enter identity construction processes much more intimately — for example, by being part of a person’s self-definition and/or even being (perceived as) physically part of the person. Little is known about these more intimate links between IT and identity.

Accordingly, our study is guided by the research question: How does IT play a role in professional identity construction in the workplace? The paper investigates this topic in the specific context of enterprise information systems (EIS) and work practices at a back office of a Big 4 accounting firm. We build on a narrative conceptualization of identity — professionals create and re-create a preferred self through work-related narratives (Riessman, 2003). We argue that, increasingly, such narratives include IT artifacts as landmarks in relation to which the self and others are positioned. We then investigate empirically how IT artifacts become such landmarks. Theoretically, this research complements and extends existing research on IT and professional identity, mainly through contributing to the conceptualization of a direct relationship between
IT and identity. By understanding the different ways in which the self can be expressed in relation to IT, we are better equipped to be aware of the processes that influence how professionals see themselves in the workplace. Based on an emerging theme from our field study, we also offer some initial evidence of a link between professional identity and on-going use (non-use) of IT in the workplace. Practically, understanding this potential role of professional identity in use patterns of IT can shed some light on how differences in use patterns can arise and why purposefully cultivating new use patterns (e.g., through training) can sometimes be difficult.

The rest of this paper is structured as follows: first, we review existing research, focusing on the relationship between identity and IT, as well as limitations of the extant research. This is followed by the introduction of the concept of narrative identity that we adopt in this paper, leading to the description of our analytical framework and the context within which the research was undertaken. Our findings are then presented. The paper is brought to a close by a discussion of the findings and their theoretical and practical implications.

THEORETICAL BACKGROUND: IDENTITY AND IT

Most research that examines the relationship between identity and IT in the workplace has been carried out within the functional, interpretive and critical paradigms (Nach and Lejeune, 2009a), with the interpretive perspective and a social constructivist lens being perhaps the most popular. For example, Ravasi and Canato (2010) demonstrate how foundational technologies can become identity referents for the construction and maintenance of organizational identities. Korica and Molloy (2010) show how IT artifacts feature in identity formation through inter-subjective
meanings associated with artifacts and as occasions for sense-making or as discursive elements. Typically, IT is seen to influence identity through changing work practices and discourses (Lamb and Davidson, 2005; Walsham, 1998). Critical studies of IT and identity have additionally focused on the ability of IT artifacts to challenge identities, produce loss of control and generate acts of resistance from users (Alvarez, 2008).

In general, studies addressing IT and identity in the workplace exhibit one or more of four themes: 1) IT as part of the broader societal changes influencing identity construction; 2) IT as influencing identity construction through work practices and role relations; 3) IT as a direct identity referent for people, and 4) IT as part of the extended self (disappearing boundaries between humans and machines). Table 1.1 summarizes these themes.

Themes in the IT and Identity Literature

First, IT is often examined as part of the broader societal changes that influence individual identity construction processes (e.g., D’Mello and Sahay, 2007). These studies tend not to examine specific IT artifacts but broader computerization movements that result in significant shifts in organizational processes, such as working from home (Brocklehurst, 2001) or globalized software development (D’Mello and Sahay, 2007). These IT-enabled changes are seen to have profound effects on identity construction through changing place/space and time relations.

Second, and perhaps the most common theme, is the study of specific technologies influencing professional identities through changing work practices and roles. For example, Lamb and Davidson (2005) argue that embedded or core IT has a
profound influence on scientists’ identities, because the core IT is increasingly part of scientists’ work practices and how they fulfill their major role in society. Similarly, Walsham (1998: 1083) demonstrates how, after the implementation of a decision-support system, previously autonomous bank managers, who were previously seen as “the pillars of the local community,” start to see themselves as “loan workers, subject to much tighter control and surveillance.” Korica and Molloy (2010) and Mishra et al. (2012) consider the role of new technologies in the identity of medical professionals. Alvarez (2008) shows how an enterprise resource planning (ERP) system restructures the responsibilities and identities of scheduling representatives at an academic institution. Davis and Hufnagel (2007) demonstrate the effects of an automation system on the work roles of fingerprint technicians. Studies in this theme may pay more or less attention to IT artifacts, but most consider the specific technologies and their use only superficially, paying more attention to the broader effects of IT on work practices/role relations and discourses around IT.

The third theme posits a more direct relationship between IT and identity, by conceptualizing IT as an identity referent for people. For example, Ravasi and Canato (2010) illustrate how certain organizational technologies become central, distinctive and enduring, thus contributing to the construction of organizational identity. When a technology functions as an identity referent for people in an organization, it is salient in the strategic decision-making of the organization and in the images the organization projects externally. Therefore, changes to the technology are likely to be resisted. Also related to this theme are studies that deal with the psychological ownership of IT. For example, Barki et al. (2008) propose that information systems, as products of creative human design, are subject to ownership
feelings, which satisfy people’s needs for control, for self-definition and for a space of their own – “a home”. Psychological ownership of IT manifests itself in “individuals appropriating and being psychologically attached to the ideas embedded in a system in terms of what the system does and how it is used” (Barki et al., 2008: 270). These feelings of psychological ownership of IT influence users’ beliefs about the system and their orientation towards change, thus altering continued system use.

Fourth, a few studies have taken the direct relationship between IT and identity a step further by conceptualizing IT as part of the extended self, with boundaries between humans and machines disappearing. For example, Turkle (2011) talks about people “becoming” their devices, feeling better prepared and as better persons – naked without their devices. Schultze and Leahy (2009) examine the relationships between the self and Second Life avatars, suggesting that the relationships vary on a continuum from segmentation to complete integration, where the avatar becomes invisible. Nyberg (2009), in his study of call center work, finds that most of the time call center operators are inseparable from their computers when performing customer service calls. Only when delays or errors occur, are computers and, in this case, the insurance system, represented as actors having a mind of their own. This theme shares assumptions with the recent stream of research on sociomateriality (e.g., Orlikowski and Scott, 2008; Pickering, 1993), which argues that humans and artifacts do not exist independently of each other. Rather, humans are constituted through their relations with various artifacts, while these artifacts are created by human practices (Orlikowski, 2007).
Table 1.1: Overview: Themes in IT and Identity Literature

<table>
<thead>
<tr>
<th>Theme</th>
<th>IT as part of the broader societal changes influencing identity</th>
<th>IT as influencing identity through work practices and role relations</th>
<th>IT as a direct identity referent for people</th>
<th>IT as part of the extended self</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relationshp between IT &amp; Identity</td>
<td>Indirect IT influences how and when work gets done (globalization) and thereby influences identity formation</td>
<td>Indirect IT influences work practices and role relations in an organization, and thereby influences identity formation</td>
<td>Direct IT directly influences identity formation processes</td>
<td>Entangled IT is part of extended self-identity</td>
</tr>
<tr>
<td>Typical Conceptualization of IT &amp; Humans</td>
<td>IT = broad shifts in technology (e.g., mainframes -&gt; PCs -&gt; ubiquitous computing) IT and humans are separate entities</td>
<td>IT = specific artifacts or a category of artifacts (e.g., an ERP system; mobile devices) IT and humans are separate entities</td>
<td>IT = specific artifacts or a category of artifacts (e.g., an ERP system; mobile devices) IT and humans are separate entities</td>
<td>IT = specific artifacts, applications, specific materiality of artifacts (e.g., iPhone, Facebook, possibility to create avatars in SecondLife) IT and humans comprise integrated assemblages</td>
</tr>
<tr>
<td>Limitations</td>
<td>Direct influence is under-theorized Materiality of IT is under-theorized.</td>
<td>Direct influence is under-theorized Materiality of IT is under-theorized.</td>
<td>Cases where human-machine boundaries blur are under-theorized.</td>
<td>Characteristics that are particular to humans or machines may be overlooked (cf. Faulkner and Runde, 2009).</td>
</tr>
</tbody>
</table>
Limitations

First, it should be noted that research on identity and IT represents a very small section of research conducted on identity in workplace organizations in general. IT is not commonly included as something relevant in the professional identity construction process. Studies tend to focus on the role of organizational processes, power relations, conflicts, discourses, and other social factors in identity formation (e.g., see Alvesson et al., 2008 for a review), relegating technology to the background. Similarly, studies that have focused on the relationship between technology and situated work practices, organizational culture or values have typically not included identity as part of these social phenomena (e.g., Igira, 2008; Bunker et al., 2007).

Second, research that does focus on identity and IT has overwhelmingly emphasized the importance of IT in changing work practices, discourses, and role relations, which also influence identity construction. Hence, in many studies of IT and identity, IT is considered to be relevant in identity construction processes only insofar as IT changes more general workplace features such as power relations, how people present themselves to others, how they achieve their main work goals, etc. While such studies provide valuable knowledge of certain kinds of relationships between identity and IT, they leave other kinds of relationships relatively unexplored. Our goal in this study, therefore, is to explore a more direct relationship between IT and professional identity, and we propose to do so through the concept of narrative identity.
Self-identity in organizations has been conceptualized in a number of different ways in prior research. Metaphorically, individuals and their production of a sense of self have been described as “self-doubters, strugglers, surfers, storytellers, strategists, stencils and soldiers” (Alvesson, 2010: 193). Our field study pointed to storytellers and the different kinds of stories that were told. Hence, we chose a narrative conceptualization of identity that generally holds that as “our actions make sense only in the context of our stories, we re-create ourselves through the stories we tell, and narrative is a way to give meaning to or appropriate the involuntary” (Maan, 2010: xx). The narrative viewpoint rose as an alternative to seeing identity as a collection of properties (e.g., as a gender-, work role occupant) and intimately tied identity to time – “a self understood as proceeding through time necessitates a narrative structure” (Polkinghorne, 1991: 144). In other words, narrative inquiry into identity allows the researcher to discern the narrator’s point of view, including how the narrator understands his or her own and others’ actions; organizes events and objects into a meaningful whole, and connects events and their consequences over time (Chase, 2005; Polkinghorne, 1991).

However, the ability of individuals to integrate various experiences pointing in different directions into one coherent whole (McAdams and Logan, 2006) is somewhat questionable (Alvesson, 2010, Maan, 2010). It is more likely that individuals create multiple, sometimes contradictory, life stories, suggesting that storytellers are also self-doubters and strugglers, who have to continuously overcome insecurities and accomplish some form of coherence in their self-narrative (Alvesson,
Our findings confirm this perspective on narrative identity. We adopt the viewpoint that there is no single, definitive storyline, but rather there is a multiplicity of narratives and multiple voices of the self. Furthermore, we assume that “certain people, objects and events act as icons or landmarks (attachments) for these life stories” (Raggatt, 2006: 21). Our emphasis is, therefore, on whether - and how - IT can act as landmarks in life stories, focusing specifically on professional or work-life narratives (and on the voice of the professional self as opposed to, for example, the voices of the community- or family-member self).

IT has been studied on different levels of granularity in prior research (see Table 1.1), ranging from a focus on broad shifts in IT to specific functionality of a particular IT artifact. Stemming from our chosen research setting, our focus in this study lies on the broad category of enterprise information systems, which may include ERP, office software, e-mail, etc. However, we let the level of granularity of IT featuring in professional self-narratives emerge from the data. Specifically, we consider two aspects of IT: function and symbolism.

In line with recent reasoning, we see the materiality of technology as the specific physical or digital properties that are intrinsic to the technology and endure for some period of time (Leonardi, 2012). Yet, not all such properties matter to individuals, who care about what the artifact does (and not so much about what it is). What the artifact does has been variously called the function, material agency or the functional affordances of the artifact (Leonardi, 2012; Markus and Silver, 2008; Faulkner and Runde, 2009). It is clear that the same artifact can communicate different functions both within and across individuals, but the options are also limited by the materiality or form of the technology. Furthermore, IT has also been shown to communicate
different symbolic meanings to different users (Markus and Silver, 2008). The
notions of function and symbolism are, therefore, closely related to the recent re-
conceptualization of interpretive flexibility that sees possible interpretations of a
technology being shaped by “enforcing” and “proscribing” constraints (Doherty et
al., 2006). It has also been argued that the perceived flexibility of the technology
depends on whether the technology is in the development/design or use phase
(Cadili and Whitley, 2005). Thus, it would seem that technology in design phase
presents fewer or less restrictive constraints.

Prior research has demonstrated that it is through their material agency or their
constraints and affordances that technologies become part of the narratives that
surround organizational activities and can, thereby, “expand or limit the range of
paths along which a narrative can unfold” (Goh et al., 2011). Narratives around
technologies have also been shown to be about negotiating preferred organizational
outcomes (cf. Wagner and Newell, 2006). Our findings show that both function and
symbolism are key in the process of how specific IT artifacts or their properties are
performed as landmarks in professional self-narratives and around which the
positions of the self and others are then negotiated. As such, our research
contributes to a better understanding of a direct relationship between IT and identity
in the workplace context. If IT is among the landmarks or attachments around which
some of people’s self-narratives are structured and plotted, it supports the argument
that IT is relevant for identity construction beyond its mediating role or influence on
work practices, discourses and role/power relations. This would also suggest a need
for a more careful reflection on the consequences that IT has in the workplace and a
more nuanced understanding of, for example, resistance to IT (see also Ortiz de Guinea and Markus, 2009).

**ANALYTIC FRAMEWORK**

Our analytic framework describes and explains the potential role of IT in the narrative construction of professional identity. While subscribing broadly to an interpretive perspective (Walsham, 1993), we also build on recent research on sociomateriality and socio-technical systems (Leonardi, 2012; Markus and Silver, 2008) to consider both material and human agency in the emerging sense of self. Our framework can best be characterized as a middle position between individualism and holism and between idealism and materialism. The framework leaves room for human agency in terms of how material artifacts are used, described, made sense of, and constructed. But it also recognizes that individuals are socialized into existing patterns of discourse and are given a set of technologies (with real physical properties, capabilities and limitations – the “involuntary” as Maan (2010) calls it) to work with, thus constraining their possibilities of meaning making and storytelling.

**Data Collection**

Towards the end of 2010, two of the authors collected the data during an exploratory field study in the back office of a Big 4 accounting firm located in the United States. We conducted ten semi-structured interviews, all of which were tape recorded and six of which were also video recorded. Two participants were interviewed together in their office; this session was also videotaped. The rest of the participants were interviewed in a conference room equipped with a round table, four office chairs, whiteboards and a flipchart. All participants brought their laptops to the interviews.
to show us aspects of their daily work. We videotaped these sessions depending on the consent of the participant and the situation (e.g., more discussion and less demonstration-oriented interviews were not videotaped). We also had the participants show us around their work areas, for example, their cubicles or offices, the kitchen area and the cafeteria. We kept field notes from such observations.

Although the data collection was limited to ten interviews (due to time and access constraints), we believe our data are detailed enough to provide interesting initial insights into the role of IT in narrative identity construction. Also, our open interview protocol, encouraging participants to expand on stories they considered meaningful in relation to their work and IT use, facilitated the examination of narrative construction of professional identity.

**Data Analysis**

With a focus on narrative construction of professional identity and the role of IT in this process, our main data analysis technique was narrative analysis. We paid particular attention to first-person accounts of the interview participants’ experiences. These accounts have also been shown to reveal much about the larger social and organizational processes (cf. Riessman, 2003): Analysis of personal narratives can illuminate “individual and collective action and meanings, as well as the social processes by which social life and human relationships are made and changed” (Laslett, 1999: 392). Our aim was to analyze an evolving series of topically specific (i.e., work-related) stories. Stories are organized around characters, setting and a plot and are framed through interaction (Riessman, 2003). We analyzed these professional narratives performatively – emphasizing the fact that “when we tell
stories about our lives we perform our (preferred) identities” (Riessman, 2003: 337, based on Langellier, 2001). We found that IT can enter these socially constructed or performed stories as landmarks around which a particular preferred self is expressed.

In order to apply narrative analysis to our interview transcripts, we first identified parts of the transcript where professional work-related stories were told. Often, self-narratives are told as examples, but we also identified narratives through five elements that are present in most narratives: what was done (act); when or where was it done (scene); who did it (agent); how did they do it (agency), and why (purpose) (Myers, 2009). We code some of the background information on the agent, scene and purpose under the terms “narrative setting” and “background, work roles” in the vignettes we use to illustrate our findings (our codes are indicated in bold face in quotes from the interviews below). Additionally, we paid specific attention to how the participants (storytellers) positioned themselves and other characters in their stories, e.g., as active agents, characters in someone else’s story, victims of circumstances (Riessman, 2003). This social positioning throughout a person’s story indicates how they want to be known – their preferred identity. Thus, while a work role can clearly be a part of the agent’s (storyteller’s) background, it is typically not the same as the preferred identity expressed in the story, which develops around how the self (as a role occupant among other things) and others are positioned in a particular setting and over time. Professional self-narratives are by nature built on individuals’ thoughtful reflection on themselves, their work, etc. Hence, they contain expressions of judgment and attitudes towards people and technology. While one could analyze these elements separately, our focus in this paper was on the narratives as a whole.
As people create multiple self-narratives (cf. Raggatt, 2006), it is clear that not all of them will feature IT (or objects in general). For example, our study participants told us many stories about themselves as work community members in which IT played no role. Furthermore, not all IT that people work with will find its way into their self-narratives. As shown above, the material properties of IT that matter to individuals are the ones that constrain or enable what the IT does (or can do) and that symbolize something meaningful for them. Performance of a preferred self is also inherently an interactive and normative process, where there is a constant negotiation between what is socially acceptable and expected (what others think) and what is individually preferred (Wieland, 2010). In our study, we found that IT enters professional self-narratives as a landmark when there is a coincidence of personal preference and normative expectation in relation to something the technology means (symbolism) or that can be done with the technology (function). Our analysis focused exclusively on those work-related narratives in which IT artifacts consistently appeared.

During data analysis, we also noticed how some of the professional identities were linked to specific patterns of IT use. While our exploratory study and limited data set allows us to extrapolate on two such links (see Table 1.2), based on prior research we would argue that IT use patterns are related to professional identity more generally. For example, Mishra et al. (2012) have shown that professional identity reinforcement (triggered by a new technology implementation) influences adoption and the extent of use of the new technology positively, while identity deterioration influences use negatively. Our initial insights, on the other hand, demonstrate how certain identity types are associated with certain use behaviors, which may involve
both use and non-use elements. As such, this emerging theme offers numerous interesting future research opportunities.

The next section introduces the research site and places our findings in an organizational context.

**RESEARCH SITE**

As already noted, this study took place in the back office of a Big 4 accounting firm located in the United States. The back office is responsible for human relations (HR) management, certain financial and accounting work, IT management and support, and in-house IS development, among other things. Back office employees support and handle requests both from the front office and from other back office workers. We interviewed and observed ten back office personnel: four from HR, three from Finance/Accounting, and three from IT services. Their roles ranged widely from associates to directors. Depending on role, the participants used a wide variety of integrated enterprise systems for different purposes. We selected participants from this wide range of roles and different departments to get a reasonable representation of the back office as a whole. This also allowed us to see the similarities and differences in the expressed professional identities (and how IT featured in these) across and within various work roles.

A well-known enterprise resource planning (ERP I) system was used throughout the organization and was implemented in 1999. At the time of our study (2010), the current version of the ERP I system was not the latest rendition, and the back office no longer received any external vendor support for it. Our study participants worked with two main modules of the ERP I system – the human relations (HR) module and
the financial (FI) module. The HR module was accessed through a standard web user interface provided by the external vendor. The FI module was rarely accessed through the original, non web-based, user interface. The back office had developed a homegrown web-based front-end for this system and another umbrella system that exchanged data with the FI module. The umbrella system tied together FI and risk management of client engagements and was also accessed by the front-end workers of the accounting firm. At the time of our study, much of the back office IT effort went into maintaining, supporting and developing all these systems. There was also a global initiative to move all branch firms to a more standardized new ERP II system.

For the US firm (including the back office), this change was planned for 2012. As of fall 2012, the go-live for the FI module was planned for late 2013, and the project was in the integration testing phase. For the HR module, however, the change was not planned for the near future. Instead, the current HR module (ERP I) was upgraded in early 2012 and continued to support the HR, payroll and benefits activities of the firm.

Besides the main ERP I system, the back office worked with a number of other information systems. For example, one of our study participants worked with three different systems: 1) a subscribe-publish system that was used to share data between applications (such as the HR module and smaller custom applications), 2) a business process modeling tool, and 3) an analytics tool used for gathering analytics data from websites throughout the accounting firm. Another study participant worked closely with so-called “partner systems”. The accounting firm in question has approximately 2,000 partners in United States alone; partner systems were needed to help manage the partners’ accounts, taxes, compensation, etc. This partner application suite also
used the subscribe-publish system for data sharing. For example, certain HR data, such as partner names and addresses, were pulled into the partner systems from the main ERP I system.

**FINDINGS: TECHNOLOGY AND IDENTITY PERFORMANCE**

Our findings revealed five distinct types of preferred self (identity) that were performed in individual work-related narratives, suggesting that there are some similarities across individuals in how they express their preferred (professional) selves in relation to IT. Our goal in describing these types is to demonstrate, first, how IT can become landmarks around which professionals position themselves and others to enact their preferred selves and, second, that there are observable similarities across individuals (not always because of similar work roles), suggesting that there are certain common ways in which IT shapes professional identity. Our goal is not, however, to offer a finite set of different types of preferred selves that are potentially expressible in workplace settings. Clearly, the five distinct types that have emerged from our data are not the only possible preferred selves, and in different workplaces people are likely to express various kinds of identities. Exploring these from our proposed perspective of professional self-narratives structured around IT can complement other approaches to studying professional identity and lead to a better understanding of who people are and how they act at work (including how they use technology).

In our research setting, we found that individuals expressed the following five types of preferred identities (in relation to IT) in their professional narratives (see more in Table 1.2):
1. *I create artifacts* ... Preferred self of an *adventurous and empowered creator*, who despite challenges can build new and useful IT systems

2. *I translate artifacts* ... Preferred self of a *helpful mediator*, who can turn opaque IT into useful and transparent tools

3. *I manage artifacts* ... Preferred self of a *gatekeeper*, who knows what is best for business and technology as well as how people should interact with IT

4. *I utilize artifacts* ... Preferred self of an *active agent*, who makes the “world” better little by little through IT

5. *I illustrate artifacts* ... Preferred self of a *wise teacher*, who shows people how to make better use of IT

These five distinct identity types (expressions of a preferred self in narrative) come about through different narrative settings, different ways in which a specific IT artifact enters the narrative, and different ways in which the self and others are positioned within the narrative setting. While the specific artifacts and the characteristics of the narrative setting may be unique to each individual, there are similarities in what kind of landmark the IT artifact becomes in the narrative and similarities in the positioning of the self in relation to others and the IT artifact (based on personal preferences and normative expectations) (see Table 1.2).
Table 1.2: Five Types of Preferred Identities Around IT asExpressed in Self-Narratives

<table>
<thead>
<tr>
<th>Preferred identity expressed in narratives</th>
<th>How is IT performed as a landmark in the narrative?</th>
<th>Positioning of self &amp; others in a narrative setting</th>
<th>Individual Examples</th>
<th>IT Use Patterns</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type I:</strong> I create artifacts...</td>
<td>For Bill: Form: the new ERP system Function: re-work and create new FI and accounting processes. Symbolism: an interesting challenge</td>
<td>Narrative setting: time of challenge (lack of resources; outdated IT) and organizational progress (make things better). Building and creating new IT is a ‘good’ thing (normatively). <strong>Personal preferences:</strong> create something new; “build things”. <strong>Positioning of self:</strong> the empowered and adventurous creator, who has control over the creation of new technology <strong>Positioning of others:</strong> people who will take care of the more mundane things</td>
<td><strong>Bill:</strong> Director in FI &amp; Accounting. Bill is responsible for the move to the global ERP II template in the Finance / Accounting group. His identity is shaped around the challenge that bringing a new system into being poses. <strong>Tom:</strong> Project manager for partner systems. Tom builds enhancements to partner systems. Tom’s identity is shaped by his ability to navigate around limited resources and build “good” (customer feedback) physical artifacts</td>
<td>N/A</td>
</tr>
<tr>
<td>(preferred self of an adventurous and empowered creator)</td>
<td>For Tom: Form: partner systems Function: create new IT capabilities for partners. Symbolism: a construction site</td>
<td>Performed landmark: IT as an object of creation</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Performed landmark:</strong> IT as an object of creation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Type II:</strong> I translate artifacts...</td>
<td>For Ryan: Form: subscribe/publish system Function: extract necessary data to help people create customized views and applications. Symbolism: flexibility</td>
<td>Narrative setting: time of challenge (IT personnel layoffs), where a) one needs to stand out from the crowd of developers or b) contribute to organizational progress. Translating existing IT into useful tools is a ‘good’ thing (normatively). <strong>Personal preferences:</strong> interface between people and technology. <strong>Positioning of self:</strong> the helpful mediator, who can translate opaque technology into useful business tools <strong>Positioning of others:</strong> people with less IT skills, who need help.</td>
<td><strong>Ryan:</strong> Senior business analyst (IT services). Ryan helps people to subscribe to a data publishing system and set up applications that use the published data. He does not develop these application. His identity is shaped around this bridging function. <strong>Mary:</strong> Associate director of HR quality management. Mary manages projects for HR process improvements. She helps colleagues solve problems. Her identity is shaped around being able to bridge between her colleagues and the technology, making it work better for them.</td>
<td>Use of exploration features of IT: Help, technical specifications, trial and error in the test system</td>
</tr>
<tr>
<td>(preferred self of a helpful mediator, who “speaks” both technology and business user’s language)</td>
<td>For Mary: Form: HR module of ERP I Function: improve existing capabilities to allow for better quality HR work. Symbolism: flexibility</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Performed landmark:</strong> IT as an object that needs ‘translation’</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 1.2 continued: Five Types of Preferred Identities Around IT as Expressed in Self-Narratives

<table>
<thead>
<tr>
<th>Preferred identity expressed in narratives</th>
<th>How is IT performed as a landmark in the narrative?</th>
<th>Positioning of self &amp; others in a narrative setting</th>
<th>Individual Examples</th>
<th>IT Use Patterns</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type III: I manage artifacts...</strong> (preferred self of a gatekeeper, who can decide how IT will develop and align with business)</td>
<td>For Jack: Form: HR module of ERP I; Function: align HR work with business goals and policies and material capabilities; Symbolism: integrity</td>
<td>Positioning of self &amp; others in a narrative setting: Narrative setting: time of change (switch to new ERP II; roll-out of new DRMS) and uncertainty. An existing, working system that has been managed well is a ‘good’ thing (normatively). Personal preferences: see a system grow and flourish under “my watch” Positioning of self: gatekeeper, who knows what is best for business and IT Positioning of others: end-users or managers (who either know considerably less or more about the overall business requirements for IT)</td>
<td>Jack: Associate director of HR technology. Jack is responsible for enhancements made to the existing HRM system. Jack’s identity is shaped by him being able to control what kind of data the HRMS contains, and how it will develop. He does not do any developing activities himself. Amy: Project manager (IT services). Amy is responsible for making sure the Document Records Management system (DRMS) project in the US firm is aligned with global requirements. Amy’s identity is shaped by her ability to control the roll-out of the DRMS.</td>
<td>N/A</td>
</tr>
<tr>
<td><strong>Type IV: I illustrate artifacts...</strong> (preferred self of a wise teacher, showing people how to make better use of IT)</td>
<td>For Peter: Form: set of FI/accounting systems; Function: support frontline partners’ work, if used correctly; Symbolism: teaching opportunity</td>
<td>Performed landmark: IT as a set of complex tools, where “everything flows beautifully” if it is done right.</td>
<td>Peter: Associate director of engagement management. Peter is officially responsible for various engagement management activities. Unofficially he also teaches new hires and partners how to better do their work using existing technologies (either by engaging with them personally or through the “new hire toolkit” he created). His identity is shaped by this opportunity and ability to teach others, rather than by his regular work and own use of IT.</td>
<td>N/A</td>
</tr>
</tbody>
</table>
Table 1.2 cont.: Five Types of Preferred Identities Around IT as Expressed in Self-Narratives

<table>
<thead>
<tr>
<th>Preferred identity expressed in narratives</th>
<th>How is IT performed as a landmark in the narrative?</th>
<th>Positioning of self &amp; others in a narrative setting</th>
<th>Individual Examples</th>
<th>IT Use Patterns</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type V:</strong> I utilize artifacts...</td>
<td>For Jill: Form: HR module of ERP I Function: look up data relevant for investigations, which feed into policy improvements. Symbolism: reliability and verifiability For Eve: Form: HR module of ERP I Function: look up and enter accurate HR data. Symbolism: reliability and verifiability For Joe: Form: DRMS Function: keep track of documents, facilitating the use of accurate and up-to-date forms, etc. Symbolism: reliability and verifiability</td>
<td>Narrative setting: organizational progress (need to make things better); human relations. Helping people and providing value to them through IT is a ‘good’ thing. <strong>Personal preferences:</strong> provide people with useful and meaningful information. <strong>Positioning of self:</strong> as an active change agent, making the &quot;world&quot; (organization) better little by little through technology (which sometimes constrains and sometimes supports this) <strong>Positioning of others:</strong> as the &quot;world&quot; out there, counting on them to do their job or as people in charge of IT, who cannot always make IT work as it needs to work.</td>
<td>Jill: HR policies and procedures manager. Jill is responsible for developing new HR policies as well as helping to conduct HR investigations. Jill’s identity is shaped around her efforts to improve policies, where the HRMS functions as a medium for these activities. <strong>Eve:</strong> HR associate. Eve is responsible for supporting other accounting firm employees with their HR issues. Her identity is shaped by her interactions with the people she works for (and with), which usually take place through the HRM system that enables and constrains her activities. <strong>Joe:</strong> FI policies and procedures manager. Joe is working on the Document Records Management system (DRMS) implementation project. Joe’s identity is shaped around his efforts to keep procedures in order and develop policies to retain knowledge in the firm through using the DRMS. Joe also identifies with leading various communities within the firm.</td>
<td>Use of accountability features of IT: Verification of document status, &quot;last edited by:&quot; feature, etc.</td>
</tr>
</tbody>
</table>
For example, in the type “I create artifacts ...”, where the preferred self of an adventurous and empowered creator is expressed, the IT artifact is performed as an object of creation over which the main character (the self) has considerable control. He/she decides how it will come to life or how it will change (see Table 1.2 for more detail). It is necessary to point out that, while in this instance, Bill and Tom share this type of preferred self as expressed in their respective narratives, they have very different formal work roles: One is the director of FI and Accounting, while the other is the project manager for partner systems. In short, what makes Bill and Tom similar is not so much their specific work roles, but rather the way they perform their preferred self. Both individuals position themselves as empowered users of the IT artifact: For Bill, the artifact is the new ERP system; while for Tom it is the partner systems. Both also position others (colleagues, customers) as people who will take care of more mundane things (e.g., maintenance of IT) or as people who need the new IT. In our research setting, both Bill and Tom express this type of preferred self in the context of challenging times and organizational progress. These are the discourses that are part of the normative environment and help to position the creation of new IT as valuable – replacing outdated IT; making things better. The following vignette gives illustrative excerpts from Bill’s professional self-narrative to highlight the details of how this preferred self is expressed:

"I am a director in Finance and Accounting. One of my current responsibilities is to oversee the financial systems today (ERP I FI module). I also oversee the policies and procedures [...]. And my last responsibility is to lead up the ERP II implementation for US' finance and accounting team." (background, work roles)

"We're on an extremely old, out-dated version of ERP I. So we've been looking at a system replacement for quite some time. As the firm moves into more of a global type of
arrangement, leadership made the decision that we were going to be on one platform.”

(-setting: challenge of outdated IT)

“It’s something that I want to do. I like the challenge. Some of the day-to-day responsibilities I would enjoy transitioning to somebody else, because they’re mature and they work. So that to me is a little mundane at this point. (positioning of others)

And the idea of developing or creating something new (IT is performed as an object of creation) that has the potential of being a global project is exciting...”

“It’s interesting, when we went live with ERP I in 1999, the decision was that there will be no shadow systems. As it turns out my career has been built on these shadow systems. But all of these systems help drive down the [...] productivity and efficiency. So I’ve always been taking on challenges and going: how can I use the technology and people to make this system work better?” (personal preference for creating something new; positioning of self in relation to IT)

“One of the things that goes along with the challenges is that there’s the opportunity... It’s gonna be a change management issue, but this is really an opportunity to look at some best practices, not just re-implement or make changes to our current system.” (establishing creating something new as normatively good: making things better)

In the type “I utilize artifacts ...”, where the preferred self of an active agent is expressed, the IT artifact is performed as more of an involuntary object through which the main character can act in the world. In a sense, the IT artifact is a more or less accurate representation of the world. Again, while Jill, Eve and Joe share this type of preferred self as expressed in their respective narratives, they have both different and similar formal work roles: Eve is an HR associate, while Jill and Joe are policies and procedures managers (see more in Table 1.2). This suggests that work roles may, but in no sense must, play a part in narrative identity construction. What matters more is how the individuals manage to establish their personal preferences and position in relation to IT as normatively desirable. All three individuals position themselves as active change agents, who are – through IT – trying to make a difference in a part of their organizational world. For Eve and Jill, the artifact is the HR module of the old
ERP system, while for Joe it is the document management system. For all three, the relevant functions are about looking up, entering and tracking accurate and verifiable data through a reliable IT system. Eve, Jill and Joe also position others (colleagues, customers) as people “out there” who are in need of accurate data, counting on them to do their job properly or, less frequently, as “IT people”, who are in charge of making IT work (e.g., giving proper access). In our research setting, all three individuals also express this type of preferred self in the context of organizational progress. This discourse seems to permeate large parts of the entire back office and helps to, normatively, position IT utilization to support other people as equally valuable as IT creation to replace outdated IT. The following vignette gives illustrative excerpts from Eve’s professional self-narrative to highlight the details of how this preferred self is expressed:

"I’m an associate in HR. Right now, I support 4 managers and 1 director and they each are the HR managers of major processes within the organization. (background, work roles) I think that’s why the software is so important, because when you have so much work, you kind of have to make sure that there are no errors. I like the fact that I can go back and get it off my plate and know that it’s correct. (IT is performed as a media through which goals can be achieved) But I kind of wish that all our programs fed each other. So I will become aware that someone was hired and they need an ID, so instead of me having to do one step and updating it on my end, I now have to send an e-mail to recruiting and say make sure you update your system, which I don’t have access to...” (or not achieved)

“What I enjoy the most is the employee interaction, when an employee reaches out to me and says, hey I have an issue with payroll, can you help me? (positioning of others) And I can then resolve that issue... It’s nice when you feel that your job is meaningful, when you feel that it’s actually doing something...” (establishing helping people through IT as normatively good: making a difference)

“It took some time to find this role and position. I got really lucky. And it’s just perfect to continue moving forward in the right direction. I want to be more of a generalist, like
In the type “I translate artifacts ...”, where the preferred self of a helpful mediator is expressed, the IT artifact is performed as something opaque and complex for many people, who need help in trying to incorporate it in their own work practices (see more in Table 1.2). While Ryan and Mary share this type of preferred self as expressed in their respective narratives, they have different formal work roles: Ryan is a senior business analyst, while Mary is an associate director of HR quality management. Both of them position themselves as helpful mediators, who can bridge between people needing to do something with IT and the technology itself. The need for such mediators stems from the fact that the functions an IT artifact affords are not the same for everyone, especially when it comes to fixing technical errors (Mary) or creating a new logical view of a database (Ryan). For Mary, the artifact is the HR module of the old ERP system, while for Ryan it is the publish/subscribe system. The relevant functions for them are broadly about being able to decipher the functioning of the artifact, tweak that functioning, and explain it to others. Mary and Ryan position others (colleagues) as people with less IT skill and who need IT to do their work (e.g., the utilizers). In our research setting, both of them also express this type of preferred self in the context of challenging times, which helps to position their work of translating IT into useful tools as 1) more valuable than pure IT development/creation work and 2) about “making things better”. The following vignette gives illustrative excerpts from Ryan’s professional self-narrative to highlight the details of how this preferred self is expressed:

"I'm a senior business analyst, supporting 3 products: one proprietary product (X) that is used to share data between applications (and two others). X is a publish/subscribe. So
HR is a publisher, so HR might have a feed, which has 47 fields in it and 22,000 records. Subscribers can request that this data be limited to only 5 fields, for example.” *background, work roles*

“I don’t know if staying completely technical is the way to stay, with all the outsourcing. *setting: outsourcing of IT jobs* IT wants to be closer to the business and that’s something I’d like to be able to do. I can interface with not only the project managers and business owners but also the developers. I fill the gap in understanding what’s available and what you should be going after.” *positioning of self: interfacing between IT and business; personal preference for mediation and establishing mediation as normatively desirable*

“That’s what I find about IT, there’s always something to learn. That’s what I find to be intriguing. Technology is always changing. *IT is performed as something that will always need translating* My brother is a financial advisor and to me that’s fairly boring. All he is learning is ticker symbols.” *positioning of others*

“Basically what happens is, someone would go to the X website, and I give them a 30 min overview of X. And say, okay, what are you looking to do, what’s your application? I gather the requirements, for the subscriber and provide them that information.” *positioning of self and others in relation to IT artifact X*

In the next section, we provide some initial insights into how certain types of preferred identity may be associated with specific IT use. We believe these findings suggest a link between preferred professional identity types and IT use patterns that should be a focus of future research.

**Associated IT Use Patterns**

For two types of identities – the preferred self of a helpful mediator and the preferred self of an active agent in the world – we noticed corresponding IT use patterns.

**Interacting with and making a difference in the world through IT & Accountability**

Despite the differences in their roles, Eve, Jill, and Joe all made use of what can be
called the *accountability features of the IT systems* in a manner that was not characteristic to the other identity types. For example, Eve explains:

“... so, a lot of the time I go in here (HRMS) just to confirm, make sure that the information was updated correctly.”

Similarly, Jill comments:

“I’m always double and triple and quadruple checking stuff that I look up, so for example someone may ask me, ‘well, what was someone’s performance rating this year and who was their performance manager?’ … You have to keep scrolling through them … this was when they put in the performance rating, etc.”

Joe describes related issues with the DRM system:

“We actually did everything from developing the full record retention policy … So, for example, you know, Where do you save it? How do you save it? When does it get destroyed? Who signs off on the record before we destroy it?’ … and, like, the whole process for and procedures for doing that.”

As individuals who position themselves as active agents making their specific “worlds” of HR or document management run smoothly using a variety of IT systems, Eve, Jill and Joe rely heavily on being able to use these systems to double- and triple-check that everything is correct, on time, and done by the right people. After all, peoples’ actual salaries, performance ratings, bonuses, and the like depend on, *inter alia*, their error-free utilization of technology and accurate representations of salaries in the system.

**Mediating between people and IT & Exploration**

Again despite their different roles, Mary and Ryan both express the preferred identity that revolves around the ability to bridge between technology and people. In addition, in both instances, their continued use of IT systems (the subscribe/publish system for Ryan and the HR module for Mary) is characterized by a pronounced exploration of these artifacts that we did not observe in any of the other study
participants. For example, Ryan comments:

“There’s always a time when you don’t know and what you do then is you do your own exploring. So instead of saying: ‘You’re the subscriber, talk to the publisher’, I’ll say: ‘Well let me find out and that way I learn and then I’ll be able to guide the next person.’”

Similarly, Mary specifically mentions the use of the Help feature of the ERP I system to explore new modules:

“(Help function) – everything you want to know about everything that’s in the HRMS … We don’t get a lot of training, so I would go in here and print out everything they have on x and read all of it, so I understand it when we’re implementing it.”

Interestingly, Jill, who sits in the same office as Mary had never used this Help function, despite using the HR module more frequently than Mary. We propose that this is because Jill’s preferred professional identity is that of an active agent interacting with the world through technology, rather than that of a mediator between technology and people. Jill is much more likely to ask a colleague for help with IT as this fits well with how she positions herself, others, and the IT artifact in her narrative (Table 1.2). This demonstrates that use patterns do not arise only through things such as social influence (e.g., how peers use the system), the availability of features or the similarity of work roles (e.g., usefulness of features for specific activities), but also through how people see themselves as professionals in relation to IT, and how they perform IT in their self-narrative (e.g., as a flexible and adaptable object or more as a given medium through which goals must be achieved).

In sum, it is perhaps unsurprising that Ryan and Mary, as individuals whose preferred identities revolve around translating existing, but unknown, artifacts into familiar and useful tools for other people, frequently brush up on their knowledge regarding the systems with which they work. However, to our knowledge, such links between
identity and patterns of technology use have received very little investigation thus far, and therefore provide a future research avenue. Patterns of continued technology use may, hence, be not only influenced by how the users perceive the material properties of these technologies (e.g., as easy to use or not), the intentions and cognitive capabilities of the users, social influences (e.g., peer pressures), etc., but also by how the users identify themselves in relation to the technologies.

**DISCUSSION AND CONCLUSION**

Our findings have demonstrated five different kinds of preferred professional identities performed in self-narratives. These five distinct types of preferred identities around IT are specific to our case. However, we believe that the process of IT artifacts becoming landmarks in identity narratives is in line with, and extends, prior research and is, therefore, generalizable to other contexts. As IT becomes more ubiquitous in workplaces, it also becomes a more common landmark in the self-narratives of professionals. Our findings suggest that the way IT is performed in professional self-narratives depends on the functions and symbolic associations that the IT artifact (the underlying materiality) communicates to these particular individuals. However, not all functions or symbolic associations will matter for self-narratives. We found that IT artifacts become landmarks in self-narratives when particular functions/symbolic signs they present to a professional align with their personal identity preferences and normative expectations (how they want and should be known as a professional). In the narrative, the self and others are then positioned in relation to the landmark IT artifact, and a preferred self is expressed. We argue that this process is likely to unfold in many workplaces where IT is extensively used.
Exploring this process within a particular setting, can, therefore, help researchers and practitioners uncover the types of preferred selves prominent in that organization. Considering the variety and the changing nature of IT, personal preferences, and normative expectations in different organizations and cultures (e.g., Lippert and Volkmar, 2007; Morris and Venkatesh, 2000; Walsh et al., 2010), our findings can only give a glimpse into the process of IT becoming landmarks in the performance of preferred professional selves. However, considering the popularity of standardized enterprise IT systems (Xu and Brinkkemper, 2007), as well as the prominence of certain normative discourses (e.g., progress and value creation) in business organizations (cf. Grant et al., 2009; Hatch and Cunliffe, 2006), it is also likely that the types of preferred selves we discovered in our study are evident in other workplaces.

Understanding these specific types of professional identities can also shed light on specific IT use patterns from a previously unexplored perspective. In our study, we provided some initial evidence that certain IT use patterns are prominent in specific identity types. These initial findings may not provide a conclusive link between identity and continued use of IT, but they do suggest a promising avenue for future research.

**IT Artifacts and the Ongoing Construction of Identity**

Extending the theme of IT artifacts directly influencing identity (e.g., Barki et al., 2008; Ravasi and Canato, 2010), our findings demonstrate the different ways that elements of IT artifacts can become identity referents in people's professional narratives. Our findings indicate that the IT artifacts with which people work (either
as whole artifacts or as particular technical elements of the artifact), present various functions as well as symbolic signs to different users (Markus and Silver, 2008). Not all functions and symbols matter for our investigation of professional identity. Many of the functions or signs presented to an individual are particular to their work role or skill level. However, these are not the emphasis of our study. We found that IT becomes important for professional identity performance when particular signs and functions presented by the IT align with the professional’s personal preferences (what kind of work do they want to do, how they want to be known) and the normative expectations of the professional. Personal preferences are not dictated by work role, status or skill – professionals may share preferences, without sharing any of the other three. But when alignment of IT with identity preferences and expectations is present, IT becomes a landmark in the self-narrative of the professional.

For example, the set of FI systems that Peter uses to do various engagement management activities (prescribed by his work role) communicate many different functions and symbolic meanings to him. One particular system he uses functions as a tool for coding engagement risk. However, this function is irrelevant to his professional self-narrative, where he performs his preferred identity of a teacher (Table 1.2). In this case, his personal preference for “providing adequate in-house training” to new hires and partners, as well as the normative expectation that self-sufficient IT users are better than the ones that need constant hand-holding, align with the FI systems’ function as supportive tools for partners’ work (if used correctly) and their symbolic meaning of a teaching opportunity for Peter. As a result, the FI systems (a set of complex tools, where “everything flows beautifully” if it is
done right) become a landmark in Peter’s self-narrative, around which his preferred self of a teacher is positioned.

Extending interpretive or social constructivist studies of identity and the theme of IT influencing identity through work practices and role relations, our findings demonstrate that IT artifacts play a role in identity formation, above and beyond the inter-subjective meanings associated with artifacts or the roles of IT as occasions for sense-making or discursive elements (as in, for example, Korica and Molloy, 2010 and Alvarez, 2008). Artifacts as technical objects can enter professional self-narratives through the artifact-human relations visible in the functions and symbolism that artifacts present to different individuals. Further, our findings suggest that IT is not only important to identity during shifts in technology, when new technologies can challenge or reinforce existing work practices and roles, but that IT can be continuously present in professional identity formation at work by becoming a landmark in self-narratives and part of the performance of preferred professional selves.

With respect to the ‘extended self’ theme, our findings indicate that varying levels of disappearing boundaries between people and core workplace technologies are present in professional narratives. For example, when active agents (e.g., Eve) describe how they successfully achieve something through the IT they use, they do not differentiate between the digital HR data in the tool and the actual employee working for the firm. However, when the IT hinders their work in any way, the IT is clearly distinguished from the work practice (e.g., when the various HR systems do not “talk” to each other as Eve suggests). This confirms prior research findings (cf. Nyberg, 2009).
The next section discusses what our findings reveal with regard to the link between professional identity shaped around IT and continued use of IT.

**Identity Around IT Artifacts and Continued Use of IT**

IT use in the workplace and identity-related concepts have been linked before (e.g., Barki et al., 2008; Lamb and Davidson, 2005; Walsham, 1998). Typically, technology use is seen to influence identity through work practices and role relations (Lamb and Davidson, 2005; Walsham, 1998). Less often is identity around an IT artifact (e.g., psychological ownership of IT) hypothesized to influence further use behaviors (Barki et al., 2008). Our study extends the latter efforts by seeing professional identity (constructed in self-narratives, where the self and others are positioned in relation to each other, IT artifacts and the context) as manifesting itself in specific patterns of use or working with IT. Due to our limited dataset, we can only offer some initial insights into this area of research, but we can hope to provide a basis for future studies. We found evidence that two of the five preferred identity types — mediating between technology and other people and interacting with the world through technology — directly corresponded to prominent and specific IT use patterns.

Our claim is in line with Ortiz de Guinea and Markus (2009), who suggest a number of alternative theoretical foundations for the study of continued IT use as more habitual, automatic, or emotional than previously recognized. For example, they suggest the application of practice theory, activity theory (Kaptelinin and Nardi, 2006), and environmental psychology to the study of IT use. Our notion that functions of an IT artifact, if aligned with personal preferences and normative expectations, influence how an IT artifact becomes a landmark in professional self-
narratives builds indirectly on environmental psychology (Gibson, 1977), where the concept of affordance found its beginning.

Our findings indicate that prominent patterns of IT use across individuals are not only influenced by their similar conscious intentions and reasons (e.g., stemming from similar work roles), but also, by their preferred professional identity around the IT artifacts. For example, individuals sharing the preferred self of a helpful mediator between technology and other people (and a way of viewing the different systems as open, modular and flexible), also share a common way of exploring their respective IT artifacts. Their reasons and intentions may differ from each other, but they still share a pattern of doing their own technology exploration, as opposed to asking a colleague or the IT department for help when an unknown issue arises.

In contrast, individuals expressing a different preferred identity (e.g., that of an active agent interacting with the world through IT) may be unlikely to adopt this use pattern, because asking a colleague fits much better with how they position themselves, others, and the IT artifact in their narrative. This also points to a potential difficulty that organizations face when trying to mandate certain use practices. For example, to get users to solve their minor technical issues themselves by using a “Help” feature, organizations must not only overcome a potential negative reaction from the users along the lines of “this is not my work role”, but also the much less visible hurdle of trying to change how people see themselves in relation to IT.
In short, the specific links between professional identity around IT artifacts, occupational roles, reasons, and intentions and patterns of IT use, remain to be explored in future research.

**Moving Forward**

Our study investigated identity and IT artifacts in the workplace, focusing on how IT shapes who we are and how we work. Our data consisted of interviews and observations at a back office of a North American Big 4 accounting firm. Theoretically, our findings contribute to the research on the relationship between professional identity and IT through a more explicit and direct consideration of the role of IT artifacts in identity construction. Our findings suggest that IT artifacts – by being continuously present and part of many professional’s everyday work activities – can enter work-related professional narratives as landmarks around which the self and others are positioned and preferred professional identities are performed. Our findings also indicate that these preferred professional identities influence how IT is used in everyday work activities. As workplace IT becomes ever more ubiquitous, it is likely to enter professional self-narratives in new and unanticipated ways, not only during times of change, and in a manner above and beyond what is prescribed by work roles alone.

Despite the exploratory nature of this study, we believe our findings contribute to the general theoretical understanding of professional identity formation and also, potentially, to a broader understanding of continued use of IT in work organizations. Theoretically, our study extends a narrative perspective on professional identity construction in modern workplaces by suggesting how IT artifacts become
landmarks in the self-narratives of professionals. Practically, knowing how professionals construct their identities around IT artifacts can help organizations understand common IT use practices, including why some IT use practices may be difficult to mandate.

Our research also points to numerous further research opportunities. For example, future studies could investigate narrative identity formation around IT artifacts across different contexts and for longer periods of time. Our exploratory study has not been able to demonstrate how narratives, including negotiations between personal preferences, normative expectations and IT capabilities, may change over time. Furthermore, situations where such negotiations are difficult (e.g., no alignment is achieved) require more detailed investigation. In short, our study provides examples of IT as a positive element in professional self-narratives. The possibility that IT might be a negative element of professional identities should be explored in future research. Additionally, different kinds of IT (not just enterprise systems) and their role in professional self-narratives should be explored in future studies. Last, but not least, more work remains to be done in theorizing and empirically investigating the links between identity around IT and continued use of IT.
PART II: ON THE NATURE AND ROLE OF EMOTIONS IN IT USE
AND NON-USE PATTERNS

3 Under first round review at *MIS Quarterly.*
ABSTRACT

Achieving the promised business benefits of an IT system is intimately tied to the continued incorporation of the system into the work practices it is intended to support. While much is known about different social, cognitive and technical factors that influence initial adoption and use, less is known about the role of emotional factors in users’ choices and how these factors influence more specific use and non-use patterns. Through an in-depth field study conducted in two North American universities, we examine the nature and role of emotions in how specific use patterns emerge. We find that, in an IT use situation, people respond with different classes of emotions to three kinds of cues: material, social and personal. Based on loss, achievement or deterrence emotions associated with IT use, people develop various patterns of use that include both use and non-use of different system features and functions. Each use pattern is characterized by a unique felt quality that can be identified by tracing the pattern back to emotion classes and cues. As a result, we contribute to theory development in relation to the gap that currently exists regarding a more nuanced account of the role of emotions in continued technology use.

Keywords: Emotions, continued use of IT, non-use of IT, qualitative, field study

INTRODUCTION

Continued (i.e., post-adoption) use and non-use of information technology (IT) is a topic of increasing interest in the Information Systems (IS) literature (Kane and Labianca, 2011; Limayem et al., 2007; Ortiz de Guinea and Markus, 2009). Existing research typically conceptualizes post-adoption use as an individual’s employment of
various technology features to accomplish a task, including the various learning and
exploration activities that may be necessary for successful IT-supported task
accomplishment (Barki et al., 2007; Burton-Jones and Straub, 2006; Saeed and
Abdinnour, 2011). Non-use of IT is typically described in terms of user resistance
(Lapointe and Rivard, 2005), but with increasing recognition that not all resistance is
counter-productive (Rivard and Lapointe, 2012), and that various forms of non-use
exist (Satchell and Dourish, 2009). In this paper, we propose to examine both use
and non-use, recognizing that there will be various use/non-use patterns that may
vary over time, such as: embracing the technology and using it as developers
intended; ignoring a technology as long as possible in the hope that it will go away;
putting minimal effort into the use of a technology, or using some features but not
others. Hereafter, we refer to these behaviors simply as patterns of use, to include
the full range of use/non-use outcomes.

Many models have been proposed that attempt to predict continued use, with the
technology acceptance model (TAM) (Davis, 1989) often serving as a foundation
(e.g., Bhattacherjee, 2001; Kim, 2009; Venkatesh et al., 2008). The practice-oriented
and sociomaterial explanations of technology use, such as in Orlikowski (2000; 2007)
are also increasingly common (e.g., Oborn et al., 2011). Despite these different
theoretical explanations for technology use, there is agreement that the role of
emotions in IT use has been understudied (Bagozzi, 2007; Beaudry and
Pinsonneault, 2010; Ortiz de Guinea and Markus, 2009), even though anecdotal
evidence indicates their importance. In particular, there is a lack of theory that
explicitly addresses the role of emotions in the continued use of IT (Bagozzi, 2007;
Thompson, 2012). In the case of technology acceptance research, a few empirically-
grounded extensions of TAM with emotional elements exist (e.g., Venkatesh, 2000), but there is a dearth of systematic theory development on the effects of emotions on technology use (Bagozzi, 2007). In the case of practice-oriented explanations of technology use, while processes of “subjective creativity and meaning-making” are illuminated, the “subjective experience of agency” – how human agents feel about themselves and their circumstances – tends to be devalued (Thompson, 2012: 189). However, it is precisely the “biographical awareness (elaborate sense of self) that allows a person to position herself relationally against unfolding social reality, [and] this juxtaposition occurs within consciousness, which is felt affectively” (Thompson, 2012: 195). In essence, as individuals use IT in a work setting that includes other people and tools, they cannot help but reflect consciously on and feel their position in relation to this setting (Stein et al., 2012b).

As a result of this lack of attention to emotions, our theories around IT use – and, just as importantly, our practical solutions geared towards encouraging certain use patterns – tend to emphasize either an overly technical orientation, or are based on the idea of purely rational, goal-oriented individuals, and hence, do not explicitly consider the subjective experience of agency (Bagozzi, 2007; Thompson, 2012). In this paper, we address this limitation by considering how patterns of use represent complex sequences of behavior, cognitions and emotions associated with how individuals see themselves. Thus, this study focuses on two main research questions: 1) How do emotions arise during workplace IT use? 2) How do emotions around IT influence patterns of use? The research builds on the limited number of studies that have addressed the role of emotions in the uptake of IT (Beaudry and Pinsonneault, 2010); emotions research in organizations (Elfenbein, 2007; Scherer, 2005), and
research on the continued use of IT (e.g., Leonardi, 2009). Through a multi-site, in-depth field study, the paper investigates the use of a faculty productivity system in two North American universities.

Theoretically, our contribution is twofold: first, we offer a better understanding of how particular emotions arise in response to various cues present in an IT use situation. Prior research in this area has focused mostly on demonstrating relationships between discrete emotions and IT use, for example, the negative effect of anxiety on IT use (cf. Venkatesh, 2000). However, what it is about a particular technology artifact in a specific use situation that actually elicits emotions (e.g., how anxiety about technology arises) needs further investigation (Beaudry and Pinsonneault, 2010). Second, we explore the role that emotions play in users’ choices on whether and how to continue using an IT system after initial adoption. By conceptualizing and studying IT use as qualitatively distinct patterns with nuanced elements of both use and non-use, we show how emotional experiences lead to certain regularities in people’s continued IT use that go beyond just more or less use. Practically, understanding the various cues that lead to emotional experiences and use pattern formation can help managers of IT systems nudge the emerging use patterns in desired directions, for example, through strategic communication, or planning for post-implementation changes (cf. Wagner et al., 2010).

The rest of this paper is structured as follows: the next section introduces the theoretical foundation for the study and is followed by an explanation of the methodology adopted. We then present our findings and close the paper with a discussion of key insights from the study.
CONTINUED USE OF IT

Research has shown that successful initial adoption of technology does not necessarily lead to its successful continued use (Kim and Malhotra, 2005). Existing conceptualizations and measurements of IT use, which have tended to focus on “intentions to use”, are, therefore, not adequately capturing the phenomenon of continued use. Moreover, research has demonstrated that users may not employ all system functionality as expected (Ferneley and Sobreperez, 2006). In response, feature-centric definitions and models of IT use have been developed (e.g., Jasperson et al., 2005), which denote a significant shift from the ‘black-box’ IT system view inherent in technology acceptance research (Davis, 1989; Venkatesh et al., 2008). This line of reasoning has led to a definition of individual-level IT use as “an individual user’s employment of one or more features of a system to perform a task” (Burton-Jones and Straub, 2006: 6) as well as a suggestion to expand the IT use concept to include use-related activities, such as the learning of new features (Barki et al., 2007: 173).

The feature-centric approach helps to overcome the limitations of the black-box approach to IT that is criticized by Orlikowski and Iacono (2001), among others (e.g., Benbasat and Zmud, 2003), and can help to describe actual IT use behaviors rather than just intentions. It may suffer, however, from the problem of “repeating decomposition”: if “there are features within features ... how far must the analysis go to bring consistent, meaningful results?” (DeSanctis and Poole, 1994: 124). To avoid this problem, we focus on those features that emerge from our data as affording or
constraining meaningful activities or eliciting symbolic associations for different social actors (Markus and Silver, 2008).

Scholars have recognized that IT use is related to how far the IT facilitates individual goal or task achievement (Burton-Jones and Straub, 2006). In this paper, while recognizing the importance of goal-seeking behavior based on means/ends rationality, we take this further and see goal-seeking “as part of a larger social context in which interpersonal relationships are established and maintained” (Agerfalk and Eriksson, 2006: 2). In line with this more social conceptualization of use, we adopt the concept of “social actor” instead of “user” to capture the notion that IT users are first and foremost people going about their lives, which may include the utilization of various IT artifacts (Lamb and Kling, 2003). This draws attention to the fact that IT use should not be construed as just an individual interacting with an IT artifact, separate from the social context. Rather, we take an ecosystem view, seeing IT use as a product of evolving relationships between multiple people, various technology artifacts, and practices (Nardi and O’Day, 1999).

In general terms, research on continued use and non-use of IT has proceeded relatively separately, with the latter being less frequently investigated (Selwyn, 2003). Research on resistance (Hirschheim and Newman, 1988; Kane and Labianca, 2011; Lapointe and Rivard, 2005; Markus, 1983; Rivard and Lapointe, 2012; Selander and Henfridsson, 2012) has come the closest to examining non-use. Prior literature on resistance has found different categories of such behavior, including apathy, and passive, active and aggressive resistance (Coetsee, 1999). Because the term resistance can evoke a somewhat negative image, something to be overcome in order to realize the full potential of IT (Hirschheim and Newman, 1988; Rivard and Lapointe, 2012),
we adopt a more neutral term — non-use — to indicate a broader set of interactions that people have with IT, as well as the possibility that not all forms of non-use are negative or the result of individual deficits (Selwyn, 2003). This approach recognizes that, similar to use, social actors’ “non-use of technologies is a complex, fluid and ambiguous issue guided by ‘goodness-of-fit’ with their lives” (Selwyn, 2003: 110). Different forms of non-use, such as avoidance (Kane and Labianca, 2011); cynicism (Selander and Henfridsson, 2012); lagging adoption; disenchantment; disinterest (Satchell and Dourish, 2009), and non-compliance (Sobreperez, 2008) have been identified. These categories describe various patterns of behavior over time, rather than a simple use/non-use dichotomy; for example, initial enthusiastic use turning into non-use because of disenchantment.

We now turn to extant research that has considered emotions in continued use of IT.

**EMOTIONS AND CONTINUED USE OF IT**

Studies examining the role of emotions in continued use of IT remain rare, despite the calls to pay more explicit attention to the topic (McGrath, 2006; Ortiz de Guinea and Markus, 2009), and a longtime recognition that new technologies can trigger strong emotions because of the interruptions that they bring to working lives (Weick, 1990). There have been some efforts made in an attempt to incorporate emotions into existing models of technology acceptance and use (for a comprehensive review, see Beaudry and Pinsonneault, 2010). Users’ satisfaction with initial IS use has been found to be positively related to their intention to continue using the system (Bhattacherjee, 2001), while anxiety during initial use has been shown to be negatively related to perceptions of ease of use and, indirectly, to continuance.
intentions (Venkatesh, 2000). Both positive and negative emotions during initial use have been found to influence usage intentions directly and indirectly, through effects on perceptions of ease of use (Cenfetelli, 2004). Negative emotions have also been shown to influence beliefs and usage intentions more significantly than positive emotions (ibid.). Beaudry and Pinsonneault (2010) find that emotions are associated with IT use through their influence on adaptation behaviors. For example, they find that anxiety has a negative direct effect on IT use, a positive indirect effect on IT use through users seeking social support, and a negative indirect effect on IT use through psychological distancing.

The above-mentioned studies have focused on how emotions can explain (either directly or indirectly) IT use or usage intentions. However, little attention has been paid to exploring how emotions (which then influence IT use) arise in the first place (Beaudry and Pinsonneault, 2010). Our first research question aims to fill this gap. Our second research question extends the current research on the influence of emotions on IT use by conceptualizing IT use as a set of qualitatively distinct patterns, allowing us to examine how various emotions link to various patterns of use rather than just more or less use or stronger or weaker intentions to use.

In examining these issues, we adopt a component process definition of emotion as “an episode of interrelated, synchronized changes in the states of all or most of the five organismic subsystems in response to the evaluation of an external or internal stimulus event as relevant to major concerns of the organism” (Scherer, 2005: 697-698). The five subsystems are: cognitive (appraisal); neurophysiological (bodily); motivational; motor expression (facial and vocal); and subjective feeling (emotional experience). Traditional “folk” understanding equates emotions only to the subjective feeling
component. For the purposes of this paper, with its focus on the study of emotions in IT use, the neurophysiological and the motor expression components are not of primary interest. Rather, we adopt a more social approach (Fields et al., 2007), focusing on the cognitive, motivational, and subjective feeling components in particular settings (Gross, 2008). Approaching emotions from a social perspective draws attention to how emotional responses can express value judgments and power, thereby producing an ‘emotion culture’ – a collective’s understanding of how emotions should be directed and expressed towards certain social groups, objects, etc. (Fineman, 2008). The component definition of emotions, with its inclusion of a cognitive appraisal component, aligns well with the idea that there is an intimate interplay of emotions and cognitions in most social situations. Emotional responses in social settings (such as the workplace) can, therefore, be conceptualized as cognitively “filtered”, or as Weick (1995: 45) puts it, “sensemaking is infused with feeling” and vice versa. The collective sensemaking of emotions attests also to the malleability of emotions, reflecting people’s capacity to work on their own and others’ emotions (Gross, 2008; Fields et al., 2007). Indeed, cognitions and emotions are difficult to separate since it is the cognitive appraisal of the situation that leads to a particular cultural label (e.g., “satisfaction”, “joy”) being applied to the feelings that are experienced (Thoits, 1989). Hereafter, therefore, when we use the term ‘emotion’ we are referring to this blurred cognitive/motivational/feeling experience.

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4 Being anchored and elicited by specific events as well as their relatively short-term duration most clearly distinguish emotions from the related concepts of moods and attitudes. Moods are more diffuse, are characterized by a predominance of specific subjective feelings and need not necessarily be linked to specific stimuli. Attitudes are relatively enduring beliefs (with a cognitive, affective and behavioral component) that also need not be triggered by specific events, although may become more salient during such events (Scherer, 2005: 703-705).
While emotions are typically seen as arising in response to various stimuli or triggers (Elfenbein, 2007; Scherer, 2005), there has been very little research on the specific triggers that elicit emotions during IT use. One theory posits that individuals evaluate or appraise an IT event (e.g., the implementation of new software) along two dimensions: first, to determine whether the IT constitutes a threat or an opportunity and, second, to assess how much control individuals have over the expected consequences (Beaudry and Pinsonneault, 2010). Depending on the evaluative assessment, one of four classes of emotions may be triggered: loss (anger, dissatisfaction, frustration), activated by appraisals of threat and low control; deterrence (anxiety, fear, worry), initiated by appraisals of threat and high control; achievement (satisfaction, enjoyment, relief), sparked by appraisals of opportunity and low control; and challenge (excitement, hope, playfulness), triggered by appraisals of opportunity and high control. While this provides a very useful start in understanding the links between emotions and IT use, Beaudry and Pinsonneault do not explore specifically what it is in an IT event or IT artifact that is appraised and elicits these emotions.

Prior research in other contexts, however, suggests some plausible possibilities as to what aspects of an IT use event might trigger emotions. For example, Affective Events Theory argues that workplace emotions are often activated by interactions with co-workers, customers or supervisors (Weiss and Corpanzano, 1996). Such interactions are also part of continued IT use experiences. Physical artifacts have been shown to elicit emotions in three ways (Rafaeli and Vilnai-Yavetz, 2004): instrumentally (by supporting or hindering task achievement); symbolically (by association with ideas); and aesthetically (through sensory reactions to the artifact’s
presentation in a particular context). Emotions are also triggered by identity work (Boudens, 2005). For example, organizational change often elicits emotions because it challenges or verifies people’s identities (Kiefer and Müller, 2003), or leads to reflexive self-comparisons (Obodaru, 2012). Technological change may initiate emotions, such as existential anxiety or feelings of personal meaninglessness, for similar reasons (Walsham, 1998).

In addition to this prior research about what triggers emotional responses, studies have also considered what influences the strength and direction (i.e., positive versus negative) of emotional responses. In this respect, it has been argued that people have the strongest emotional responses to the most central concerns in their life (Elfenbein, 2007) and, in workplace contexts, more negative than positive emotions have been observed (Dasborough, 2006). It is not unreasonable to assume, then, that social actors’ emotional experiences related to IT use will be stronger when negative and when technology use is of central concern to them.

Summarizing, it would appear that emotions are elicited by various categories of triggers (elements of an IT event), such as instrumental constraints or affordances; human interactions; symbolism; self-reflections; change, and the like. However, the term trigger may imply a universal pattern, where ‘A always triggers B’. This is not consistent with our understanding that emotions are malleable and infused with sensemaking. Accordingly, we adopt the term cue, which we define as a specific aspect of a situation that functions as a signal to which social actors respond emotionally. Because workplace technologies are part of organizational routines (Goh et al., 2011), we argue that IT use is emotional not only because of the IT artifact itself, but also through all the associated interactions and reflections present.
in a situation of IT use. The goal of our empirical work is to explore the nature of these cues in more detail.

While situations are full of cues that social actors make sense of (involving subjective feeling as well as cognitive and motivational elements), it is also clear that emotional experiences influence subsequent interactions with an IT artifact. As discussed above, prior studies have shown how various positive and negative emotions influence subsequent IT use (or intentions to use) (cf. Cenfetelli, 2004). We explore the influence of emotional experiences on specific and nuanced use patterns, rather than intentions to use or just more or less use.

**RESEARCH METHOD**

We chose a multi-site field study to investigate the nature and role of emotions in IT use; this allows for an in-depth investigation of the relationship between IT use and emotions. In selecting a research site, we looked for a context where users would have considerable discretion over their use patterns and where emotions were likely to be elicited. Moreover, we needed sites where we could get unrestricted access to various stakeholders. These criteria led us to identify two North American universities – a large public state institution and a small private institution – both of which have purchased and implemented the same software package, Faculty Productivity (FP)⁵, in order to improve the efficiency of faculty productivity assessment, accreditation submissions, and other administrative functions. While FP is officially recognized in both cases as the system of record, the university context, with its powerful faculty user base, provides an opportunity to explore how users

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⁵ FP is a name we have given to the package to ensure confidentiality of the software vendor.
choose to comply with such requirements and, more importantly, how this is tied to emotion. Since FP is linked to performance evaluations (a relatively central concern for faculty), we deemed it likely to elicit various emotional responses, allowing our exploratory study to go beyond examining just the instrumental concerns around new IT.

We conducted forty-seven semi-structured interviews across the two research settings (overview in Table 2.1) over an 18-month period, allowing for data collection and analysis to iteratively inform each other over multiple rounds (Corbin and Strauss, 1990). Of the 47 interviews, eight were follow-up interviews with individuals. Interviews were conducted with a wide range of stakeholders, including university administrators, faculty members, and staff responsible for implementing FP (see further details in Table A1 in Appendix A). All of the interviews were tape recorded, transcribed and shared among the research team via cloud-based storage. Additional data, in the form of meeting recordings; informal conversations with faculty; university-wide memos, and e-mails, were collected and examined. We also collected a total of 17.5 hours of observational data including fly-on-the-wall documentation of faculty members using FP to fill out annual activity reports that were being used for performance evaluation (Table A1). In addition, at State we observed faculty advisory group sessions that discussed issues around FP and its use. A satisfaction survey that probes the use and responses to the software has also been carried out in both settings as part of each implementation project. We use these survey data to provide some contextual information and an overall account of how FP was viewed in the two sites.
Table 2.1: Research Methods across Settings

<table>
<thead>
<tr>
<th>Methods</th>
<th>State</th>
<th>Private</th>
</tr>
</thead>
<tbody>
<tr>
<td>Field work</td>
<td>Interviews and observations over 18 months</td>
<td>Interviews and observations over 12 months</td>
</tr>
<tr>
<td>Timing</td>
<td>Implementation and post-implementation</td>
<td>Same</td>
</tr>
<tr>
<td>IT systems in use (relevant for study)</td>
<td>Packaged software system for faculty CV management / productivity evaluations (FP); MS Office software, MS Outlook.</td>
<td>Same</td>
</tr>
<tr>
<td>Narrative interviews</td>
<td>29 with 23 stakeholders: 4 interviews with 3 implementation team members 8 interviews with 7 administrators 17 interviews with 13 faculty In total, approx. 25 hours of audio data.</td>
<td>18 with 30 stakeholders: 4 interviews with 3 implementation team members 6 interviews with 6 administrators/chairs + 1 meeting recording with 21 administrators/chairs present 7 interviews with 7 faculty In total, approx. 20 hours of audio data.</td>
</tr>
<tr>
<td>Observations</td>
<td>2 faculty advisory group sessions + limited observations of faculty use during interviews. In total, approx. 7.5 hours of observations.</td>
<td>4 sessions with faculty filling out their annual reports + limited observations of faculty use during interviews In total, approx. 10 hours of observations.</td>
</tr>
<tr>
<td>Documentation</td>
<td>E-mails; Help documentation; Aggregated system use reports</td>
<td>Same</td>
</tr>
<tr>
<td>Survey</td>
<td>2011: 137 respondents (15% response rate) 2012: 158 respondents (17% response rate)</td>
<td>2012: 109 respondents (36% response rate)</td>
</tr>
<tr>
<td>Follow-up contact</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Data Analysis

The data collected were analyzed in five steps (see Figure 2.1). For the qualitative data we followed the coding procedures of grounded theory (Corbin and Strauss, 1990), as outlined below. We used a web-based tool (Dedoose) for the purposes of coding.
This grounded approach enabled us to first describe and develop our core categories – the central phenomena under study – and to explore variations in these. We have illustrated the processes of abstraction towards our core categories of emotion classes, cues and continued use of IT (patterns) in Appendix A. Second, the procedures of grounded theory allowed us to systematically explore the relationships between these core categories in order to develop a processual understanding (Corbin and Strauss, 1990) of how cues give rise to emotions that lead to particular use patterns. Abstraction allows our core categories, and the suggested relations between them, to be applied to other settings as theoretical devices, thereby, facilitating the theoretical generalizability of our findings.

1. Classifying Emotional Responses to IT Use
When analyzing the data to identify emotional experiences, we were looking for how the study participants described situations in emotional terms (e.g., pleased; angry; worried), but also the way people “talked to” or about the system while using it or discussing it in meetings in the observational data. Our classification of emotional responses followed two analytical steps:
1. We used open coding (Corbin and Strauss, 1990) to compare and contrast similar and different emotional experiences evident in our data, and to group similar experiences into an affect category (Scherer, 2005: 714-715). For example, experiences of fury, resentment, etc. were grouped into the anger category, whereas experiences described with terms such as nice, good, etc. were grouped into the satisfaction category (see Figure 2.2 and Table A2 in Appendix A for further detail).

2. We then examined each emotional experience using Beaudry and Pinsonneault’s (2010) framework as a sensitizing device. In so doing, we found that affect categories elicited by IT use could be further grouped into the broad classes that these authors identified, depending on how the IT use event is appraised on the opportunity-threat and perceived control dimensions (we outline the details of this in our findings, see Figure 2.2). For example, experiences categorized into the anger, dissatisfaction, disappointment and irritation groups were classified as loss emotions, while experiences categorized into the anxiety and fear groups were classified as deterrence emotions (see Figures 2.2 and 2.3).
We also noted the differential intensity of the experiences in the audio-recordings and our field notes. For example, terms, like anger and fear, tend to be used by people when describing relatively more intense negative experiences, while terms, such as dissatisfaction and concern, are used in descriptions of less intense negative experiences (Scherer, 2005: 720, see Table A2). We next considered whether a particular appraisal of an IT use event (as a threat or an opportunity) and its consequences (as controllable or not) and the corresponding emotion class were cued by a particular element of that IT event (we demonstrate this in our findings). We next describe how we analyzed the content of the different cues to create a classification of the cues.

2. Classifying Cues

To identify the relevant cues, we analyzed the various reasons people gave for their emotions in their descriptions of past experiences, or we noticed different events
preceding a particular emotional reaction during observation. Our classification of cues followed three analytical steps:

1. We used open coding (Corbin and Strauss, 1990) to compare and contrast similar and different events, interactions, reflections, etc. evident in our data, and to group similar elements into a type of cue. For example, we coded different interactions between people (that were related to an emotional response) with terms such as inclusion, exclusion or sales-pitch. When coding the different instrumental factors that elicited emotions, we were guided by the concept of functional affordances (Markus and Silver, 2008: 622). We, therefore, looked for both actualized “possibilities for goal-oriented action” (coded as affordances or situations where the tool supported goal achievement) and non-actualized possibilities (coded as constraints when the tool hindered goal achievement or as non-actualized functionality when a relevant feature was purposefully ignored) (Table A3 in Appendix A).

2. We then used axial coding (ibid.) to further group these open codes, alternating between insights from prior research (Boudens, 2005; Rafaeli and Vilnai-Yavetz, 2004; Weiss and Corpanzano, 1996) and the specifics of our data. We found evidence of instrumental; symbolic; identity work-; interaction-, and change-related cues.

3. Lastly, we applied selective coding (Corbin and Strauss, 1990) to group the cues into more generalizable types. Some of the cues are material in nature (related to features of the technology), while others are social or personal in nature (see Table A3 for more detail).
We then undertook further analysis of our data to examine whether social actors with particular emotional experiences (elicited by specific cues) also adopted distinctive FP use patterns when undertaking particular activities.

3. Classifying Distinct IT Use Patterns

To describe the particular use/non-use patterns present in our data, we looked for descriptions of specific ways of using the FP system (or actual use behaviors). Our classification of use patterns followed two analytical steps:

1. Again, we used open coding (ibid.) to compare similar and different descriptions of use and to group similar interactions with the system into categories, such as opt out; ignore; pick and choose; everything in, etc. (see Table A4 in Appendix A). Whenever possible, we identified the temporal and logical sequence of actions or steps that made up a distinct use/non-use category. In doing so, we were, again, aided by the concepts of functional affordances and symbolic expressions (Markus and Silver, 2008). By looking for the actualized and non-actualized possibilities for goal-oriented action, we were able to identify both those features/tools actually used in the pattern as well as those that were purposefully ignored (but still constituted a meaningful element in the pattern). By looking for heeded or perceived symbolic expressions, we were able to identify the particular messages that the system expressed to the social actors (e.g., the system being better at capturing certain kinds of data), which helped us to discern meaningful use patterns from just sequences of activities. Once we had coded the meaningful sequences of activities, we aggregated data across multiple individuals (Pentland and Feldman, 2007). For example, the category of *pick and choose*
emerged from aggregating across three individual, but similar stories (see Table A4) of people using FP to input data by going through each section of the annual report/Curriculum Vitae (CV) in FP and entering data selectively according to what is important to them.

2. We applied axial coding (Corbin and Straus, 1990) to further group conceptually similar sequences into patterns. This process resulted in the identification of five distinct use patterns: personalization; gaming the system; being a good citizen; exercising discretion, and opting out (Table A4).

In our findings, we present the typical sequence of actions characteristic for each use pattern as a narrative network – “a set of stories (performances) that have been, or could be, generated by combining and recombining fragments of technology in use, i.e. people using tools to do tasks” (Pentland and Feldman, 2007: 781). Because the sequence of actions characteristic to a pattern is based on aggregated data, the narrative network does not contain any direct quotes. However, a narrative network does present the generalized sequence of actions in first person, because it depicts a typical use pattern for all the individual actors whose stories it is based upon (see Table 2.2). This gradual process of abstraction allowed us to hone in on a set of qualitatively distinct use patterns each containing elements of both use and non-use. Hence, an individual social actor’s IT use is not characterized by either use or non-use, but by a specific pattern that includes both use (of some features and IT tools) and non-use (of other features and IT tools) (cf. Table A4).

To describe the relationship between cues, emotions and emerging use patterns, we observed how an individual’s emotional experiences (elicited by cues) around FP lead
to specific patterns of FP use. In order to do that, we analyzed IT use situations holistically to identify: a) the cues present (as described in section 2 above), b) the emotion classes present (as described section 1), and c) the use patterns present (as described in section 3). The emerging relationship between cues, emotion and use patterns is outlined in detail in our findings (Table 2.3).

**RESEARCH SETTING**

The Faculty Productivity (FP) packaged software implementation was examined in two US universities (‘State’ and ‘Private’). Broadly, both universities can be divided into areas of arts and sciences (A&S) and professional schools (PS), where the latter is focused on educating students for specific professions such as law; business; engineering; fine arts; medicine, etc. FP offers two main solutions – one for capturing and managing faculty activities, and the other for course evaluations and learning assessment. The FP vendor first offered the package in 1999. Currently there are about 3,000 organizational adopters across more than 25 countries.

**Setting I: State**

State is the largest and fastest growing of the seven public universities that reside within its state borders. It comprises three colleges and four schools; employs approximately 1,500 faculty members (900 full-time), and enrolls about 40,000 students. In the past six years, State has hired a new President and two new Provosts. The President and former Provost had a long-term goal to implement a performance-based budgeting approach and also be able to report, at the institutional level, what members of faculty were doing in the community.
The decision to purchase FP was mainly driven by the need for some kind of central faculty vitae database as a prerequisite to achieving these strategic goals. Driven by the former Provost, FP replaced a very simple homegrown web form that had been used for gathering faculty activity information. FP has been in use at State since 2009, when it was introduced to the faculty as a vitae database, and faculty were asked to enter their entire vita into the system. In hindsight, the former Provost considered this to have been a mistake, as faculty members were overwhelmed with how much time and effort it took to manually re-enter all the data contained in their CVs into FP. In light of this, in 2011, faculty members were requested to enter only the most recent academic year’s publication activities into FP. Nonetheless; faculty reactions to FP generally veer on the negative side (from the 2012 survey, 70% thought FP was not useful for recording their work-related activities). FP was considered unhelpful for generating a vita, resulting in many faculty members simply not complying with requests to enter their data (only 25% of the survey respondents had generated a vita report in 2012). In the summer of 2012, with the arrival of a new Provost, State administration began planning a complete overhaul and reframing of FP – moving away from its purpose as a CV management tool towards a new, yet to be determined, purpose designed to make FP more useful for faculty.

Setting II: Private

Private is a small private university emphasizing business education, but also offering programs in the arts and sciences. Private has approximately 5,500 students and 280 full-time members of faculty. The institutional environment at Private has changed
significantly over the last 20 years. Starting out as a primarily teaching-oriented institution, it now emphasizes both research and teaching.

At Private, the decision to purchase FP was made by a special committee, comprising administrators, faculty representatives and technology support personnel. FP replaced a homegrown database that had become increasingly difficult to maintain. The need for a new system was due mainly to the perceived need for more efficient accreditation reporting. A small faculty advisory group was involved in the initial customization/configuration phase, and was periodically asked for feedback. FP has been used at Private since 2010 when it was rolled out as a pilot; its use was voluntary initially. A campus-wide e-mail from the Provost delineated the advantages of the new system, including the ability to maintain a more attractive public profile webpage, generate a standardized CV, and do annual activity reports more easily. Most of the data in the old system were migrated into FP automatically. In 2011, after improvements to the software, all faculty members were asked to prepare their annual reports in FP (in early 2012, 81% of the survey respondents perceived FP use to be mandatory). Reactions to the software differed across faculty: 42% of survey respondents thought it took more time to prepare for the annual review process using FP than using the previous process (basically a Word document), with 51% not liking FP, because it was not user-friendly. Despite this, there was a high level of compliance with the request that annual reports be prepared in FP (89% of the survey respondents had generated an annual report in FP in 2012).
ANALYSIS AND FINDINGS

The following sections present the analysis of the findings of this study, addressing the two research questions: 1) How do emotions arise during use of workplace IT? 2) How do social actor emotions around IT influence patterns of use?

Emotions Around IT Use

In response to our first research question, we first offer a description of the different kinds of emotional responses to IT use situations that were present in our data. Our findings show that emotions elicited by IT use can be categorized into four broad classes (see Figure 2.3), depending on how the IT event is appraised on the opportunity-threat and perceived control dimensions (Beaudry and Pinsonneault, 2010).

Confirming the previous work of Beaudry and Pinsonneault, we found that loss emotions (anger, frustration, etc.) were evident when the IT event is appraised as a threat (e.g., as requiring additional work) and the users perceive a lack of control over the expected consequences (e.g., “if we don’t do it, we’re going to lose”). Achievement emotions (satisfaction, pleasure, etc.) were evident when the IT event is appraised as an opportunity and the users perceive a lack of control over the expected consequences. For example, users felt FP was a “nice tool” and “loved the idea of rolling up data”, despite their lack of control over who gets to see and manipulate the data entered into FP. Deterrence emotions (worry, fear, etc.) were evident when the IT event is appraised as a threat and the users perceive a level of control over the expected consequences. For example, users feel concerned or worried about what will happen to the data entered into FP, because FP is appraised
as a potentially threatening evaluation tool, but faculty also perceive they have some control over the quality and quantity of data they input into FP (see Figure 2.3). Notably, there was a stark lack of challenge emotions (excitement, hope, etc.) in our data. The potential for excitement is mentioned in a setting of user control and where FP would be appraised as an opportunity – using the data in FP for easier accreditation reporting. However, this appraisal would only be possible during the time of actual accreditation and if the data in FP were adequately maintained and accurate. Either one of these or both conditions were not present at Private and State during our study.

Figure 2.3: Examples of Emotions Around IT Use (framework by Beaudry and Pinsonneault 2010)

While our findings confirmed that IT events are appraised according to two dimensions and result in different classes of emotional experiences (Beaudry and Pinsonneault, 2010), the question as to what it is in an IT event that cues a particular
appraisal and emotional response remains open. Thus, we now turn to exploring how emotional responses arise.

**How Do Emotions Arise During IT Use? Material, Social and Personal Cues**

As a result of iterating between our data and existing theory, we identified six different types of cues that were present in IT use situations that served as a signal to which social actors responded emotionally: *IT instrumentality; change from established practices; interactions with others; involvement in change; identity work and IT symbolism*. These different cues can broadly be categorized as related to the *material* (*IT* instrumentality and change from established practices); *social* (interactions with others and involvement in change), and *personal* (identity work and *IT* symbolism) elements of *IT* use. Our analysis revealed that each of the cues was associated with a particular class of emotions (as discussed below). Next, we describe these different cues and provide quotes from our data to illustrate the associated emotional responses.

**Material Cues associated with using the technology to input data**

Materiality of the technology was the most salient cue when the social actor was engaged in an activity that involved inputting data into FP. Our analysis revealed two such material cues: *IT instrumentality* and *change from established practice*. First, the *IT instrumentality* cue was apparent when the social actor perceived FP as helping or hindering completion of an activity:

“Two most **annoying** things about FP: I can’t edit a publication entered by a co-author and I can’t see what I have entered (a report preview)” (Tenured faculty member [PS] – Private)

“Scientists are **frustrated**, because everything is available in sort of [EndNote, MEDLINE, etc.], right? […] It seems very generically written to try to appeal to
everyone, but it just pisses off most people” (Vice Provost, former department chair [A&S] – State).

Second, the change from established practice cue was apparent when the social actor became aware of differences between the current and previous systems that had been used to complete the same task:

“What if we replace FP with another product? That’s the big uncertainty for me with going with that …” (Tenured faculty member [A&S] – State)

“There was some grumbling early on because so much data needed to be entered - some of it got migrated but a lot of new things had to go in.” (Tenured faculty member [A&S] – Private)

“As far as generating my own report— it’s much easier to keep track of what you’re doing. All the things come up pretty nicely.” (Former department chair [A&S] – Private).

Our analysis suggests that relatively weaker loss or achievement emotions, e.g., frustration and satisfaction (Beaudry and Pinsonneault, 2010) are prevalent in response to these material cues (see Figure 2.4). This suggests that instrumentality of a technology, and changes to technology – as elements of an IT event – are typically perceived by end-users as something over which they have little control, and are responded to with loss or achievement emotions, depending on whether they appraise this as, respectively, a threat or an opportunity. As expected, loss (negative) emotions tended to be stronger than achievement (positive) emotions.

Social Cues associated with relations with the implementation project team

The social aspects of the situation were particularly salient when undertaking an activity that prompted consciousness about the implementation of the FP and the project team’s involvement in this. We coded two types of cues here: interactions with others about IT, and involvement in change cues. First, our data revealed how various forms of communication create the background of second-hand experiences with IT so
that the social actor responded to using the system based on what they had heard others say about the technology, in particular the administrative sponsors and the IT project team (interactions with others cue):

“They’re not doing a good job of communicating the value of that. You don’t get punished; you don’t get rewarded. It’s like, why should we do this?” (Department chair [PS] – State)

“I think they did a good job of saying that this is a next integration of something we need” (Former department chair [A&S] – Private).

Our data show that weaker loss or achievement emotions, e.g., either dissatisfaction or satisfaction (Beaudry and Pinsonneault, 2010) are prevalent in response to this cue (see Figure 2.4). This suggests that interactions with others about IT, as an element of an IT event, can signal either that the new system is a threat or an opportunity, over which users have little control.

Second, our data revealed that some social actors responded emotionally based on their personal experiences of being involved (or not) in the IT project itself (involvement in change cue):

“I think they passed up some feedback, but nothing happened… And nobody is talking about departmental differences and what the categories in [FP] should be, which is why there are some concerns as to where [FP] will lead” (Department chair [A&S] – State)

“I’m very gratified with the results; I was glad I was part of it. The (implementation) staff was super-responsive about everything we brought to their attention. My impression now as a user is very positive.” (Tenured faculty member [A&S] – Private)

Our data demonstrate that weaker deterrence or achievement emotions (cf. Beaudry and Pinsonneault, 2010) are prevalent in response to this cue. This suggests that involvement in the implementation of new IT may signal either that the new system is a threat over which users could have control (but are not being allowed to exercise this control), leading to deterrence emotions or that the new system is an
opportunity, leading to achievement emotions. Positive emotions seem to be in the achievement class in this case and not in the challenge class (associated with high control and opportunity). This may be because, despite being involved and seeing the new IT as an opportunity, end users appraise their level of control over the new IT still to be minimal as their level of involvement is not at their discretion.

**Personal Cues associated with the use of the data for personal evaluations**

The personal aspects of situated IT use elicit emotions through the cues of IT symbolism and identity work. First, IT symbolism refers to the various ideas and messages that using the IT artifact for a particular purpose brings up. At both State and Private, there were various symbolic associations elicited by FP, including associations of:

**Bureaucracy:** “[FP] is an administrative requirement. It’s time consuming, clumsy and it provides no value. So other than that, it’s great…” (Department chair, [A&S] - Private);

**Surveillance:** “It’s another step in a culture of monitoring us. And if it’s not FP, it’s some other thing that’s gonna make us all angry. What we object to is the culture at this point… the software just makes it visible” (Department chair [PS] - State);

**Standardization:** “Everyone’s frustration is – those numbers are meaningless, so, are no numbers better than really bad numbers? […] Now FP forces the standardization, rather than the Provost being the ‘bad guy’” (Department chair [A&S] - State).

Relatively stronger loss emotions (cf. Beaudry and Pinsonneault, 2010) are prevalent in response to this cue (see Figure 2.4). This suggests that the symbolic associations around the new technology tend to cue appraisals of the new IT as a threat and the perception that there is little users can do to influence the consequences. Faculty clearly recognize that the symbolism, while associated with the specific technology of FP, also has a social element to it. FP is seen as a product of a certain culture, such as managerial decision-making, greater control and surveillance, number crunching, etc.
Second, the identity work cue refers to the ways in which the social actor using the IT associated it with particular aspects of their own status, power and performance:

“It does feel sort of yucky when you have a lot of blank categories, because you feel like you have failed to achieve ... FP feels connected to all of these issues, the library isn’t very valued, we’re losing tenure lines. Please do this form, so we can take away more money from you. No wonder people are suspicious of it.” (Tenure-track faculty member [A&S] - State).

“Being a faculty member — you develop your own unique ways of making yourself look good. And this [FP] is trying to frame it all into an assembly line. So I think that’s some of the distrust ...” (Tenured faculty member [A&S] - State).

In response to this cue, relatively stronger deterrence emotions (cf. Beaudry and Pinsonneault, 2010) are prevalent. This suggests that the self-reflections arising around new technology tend to cue appraisals of the new IT as a threat, over which users do have some control (see Figure 2.4). This confirms prior research, which suggests that identity work is especially emotional when there is a perceived challenge or threat to one’s identity (Kiefer and Müller, 2003). Furthermore, while people have little control over FP being used as a surveillance tool (see above), they do have some degree of control over their own status and performance.

In sum, we have shown that specific types of cues are linked to certain classes of emotions (Figure 2.4). For example, material cues elicit either loss or achievement emotions in end-users, depending on whether the cue content is negative or positive. However, we did not find examples of material cues eliciting deterrence emotions in end-users. Our argument is that some links between cues and emotion classes make more sense than others for particular user groups. For example, for end-users (such as faculty members), materiality of the technology is likely to be perceived as something over which they have little control, but depending on the cue content (e.g., constraints versus affordances) the materiality can be appraised as either a threat
(leading to loss emotions) or an opportunity (leading to achievement emotions). Self-reflections in relation to the IT artifact, on the other hand, are likely to be perceived as under the control of the end-users, therefore, when the new IT is perceived as a threat or a challenge to identity, strong deterrence emotions result. Nonetheless, we do not suggest that a particular cue would *never* elicit a particular class of emotions.

Figure 2.4: Overview of How Different Classes of Emotions Arise during IT Use

Turning specifically to our first research question — *How do emotions arise during IT use?* — our findings reveal that individuals respond emotionally to a complex confluence of cues salient in a particular IT use situation. We will describe this in more detail in the next section. Our analysis also demonstrates that the strength of the emotional response is related to whether the cue is a central concern for that individual, confirming prior research findings (Elfenbein, 2007). As shown above (Figure 2.4),

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we found that emotional responses to the material cues were weaker than responses to the personal cues. This suggests that, in IT use, there is a certain separation of the task at hand (e.g., inputting data into FP) and “what it means” (e.g., how the data reflect the faculty member’s identity), with emotions generally running higher around the “what it means” cues related to IT use. However, the centrality of concerns is also specific to particular social actors. For example, we found that performance evaluations (identity work cue) were of more central concern for tenure-track and of less concern for tenured faculty:

“I’m tenure-track, so I’m following the rules ... I’m not sure my colleagues are as concerned about this, but for me, it’s definitely about the ramifications of the little boxes you choose to fill in” (Tenure-track faculty member [A&S] - State).

In sum, our findings suggest that emotions arise during use-related activities through the confluence of a variety of situation-specific cues. We find that these cues elicit emotions of varying intensity and of different classes, such as weaker or stronger loss, deterrence and achievement emotions (Beaudry and Pinsonneault, 2010). We now turn to our second research question: How do social actor emotions around IT influence patterns of use?

**Emerging Patterns of IT Use: Linking Cues, Emotions and Patterns**

Our analysis of how emotions arise suggests that an individual social actor typically has a particular (weaker or stronger) emotional experience that is signaled by the particular cues that are associated with FP use. In other words, during IT use, social actors may have strong emotional responses (to particular cues) that dominate other, less prominent responses (elicited by other cues). It is the particular confluence of cues that influences the particular pattern of use behavior – *how* the social actor
chooses to engage with IT. Analysis of our data (Table A4 in Appendix A) suggested five distinct patterns of use that were associated with particular cues and emotional responses: patterns of personalisation; gaming the system; being a good citizen; exercising discretion, and opting out. Three of these patterns were observed in both research settings. Table 2.2 gives an overview of the patterns, including the characteristic use and non-use behaviors for each pattern:\(^6\).

In our research settings, FP was mainly used for annual report related activities (inputting data; generating the report; submitting the report) or for CV maintenance purposes (inputting data; generating a CV, etc.). Our identified use patterns are, therefore, described in relation to these activities (Table 2.2). However, the use patterns emerge as a result of a particular confluence of cues (and corresponding emotions) not as a result of the particular activity undertaken per se. Hence, the identified patterns could apply to other activities with FP (not evident it our settings), provided that these activities presented the social actors with similar confluences of cues. The results from our analysis of how each pattern emerged is summarized in Table 2.3.

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\(^6\) Quotes illustrating the characteristic action sequences for each pattern are given in Appendix A, Table A4.
<table>
<thead>
<tr>
<th>Personalization pattern (use data in FP to generate an annual report/CV, then edit it in MS Word and use the MS Word version for subsequent purposes (State &amp; Private))</th>
<th>Gaming the system pattern (only fill in the data in FP that really matters to the administration, half-hearted use of FP) (State and Private)</th>
<th>Exercising discretion pattern (use FP as intended, filling in all data, but tweak it to fit your needs) (State and Private)</th>
<th>Good citizen pattern (use FP as intended, fill in all requested data, use FP version for subsequent purposes) (only Private)</th>
<th>Opting out pattern (FP is not used at all) (only State)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1. I enter all of my data into FP (cf. B1-B3; C1-C3; D1-D5)</td>
<td>B1. I log into FP B2. I go through those sections of the annual report/CV that administration will look at (e.g., I do not enter academic / Prof. positions; I do not enter professional memberships; I do not enter community service, I do not enter other things normally found on a CV. I look up the information in my MS Outlook inbox. I enter journal articles and other scholarly activities. I copy-paste authors, dates, title and publication outlet from my MS Word CV)</td>
<td>C1. I log into FP C2. I go through each section of the annual report/CV and enter data selectively according to what is important to me (e.g., I do not enter much in the departmental service section; I do enter scholarship and professional service. I copy and paste the authors, dates, title and publication outlet from my MS Word CV. I do not enter abstracts for publications. I do not enter submitted and accepted dates for publications.)</td>
<td>D1. I log into FP D2. I read the instructions for filling out the annual report (MS Outlook) D3. I look over last year's report. D4. I go through each section of the annual report and enter most of the requested data (e.g., I enter abstracts for publications; I look up (Google) and enter publisher location for each publication D5. I am done with all sections D6. I generate the report in MS Word and check the report for accuracy and typos D7. I go back to edit the report in FP D8. When satisfied, I certify my report is complete in FP and submit it through FP (or A2-A4).</td>
<td>E1. I maintain my CV/do my annual report using MS Word, EndNote, etc.</td>
</tr>
</tbody>
</table>
Table 2.3: Overview of how use patterns emerge based on emotional responses elicited by a confluence of cues

<table>
<thead>
<tr>
<th>Confluence of Cues (particular IT use situation/IT event)</th>
<th>Emotional Experiences (elicited by a confluence of cues)</th>
<th>Use Patterns (IT use reflects emotional experiences)</th>
</tr>
</thead>
</table>
| *IT instrumentality* (both positive and negative cue content)  
*Identity work* (negative cue content) | Lack of strong emotions (balance of weaker achievement and loss emotions)  
*Deterrence* emotions (worry, distrust) | *Personalization* (overcome the threat to identity) |
| *Involvement in change* (negative cue content)  
*Identity work* (negative cue content) | *Deterrence* emotions (concern)  
*Deterrence* emotions (worry, distrust) | *Game the system* (overcome the threat to identity + beat administration at their own game) |
| *IT instrumentality* (both positive and negative cue content)  
*Identity work* (negative cue content) | *Lack of strong emotions* (balance of weaker achievement and loss emotions) | *Exercising discretion* (make the best out of the tool available) |
| *Interactions with others* (positive cue content)  
*IT instrumentality* (both positive and negative cue content) | *Achievement* emotions (satisfaction)  
*Lack of strong emotions* (balance of weaker achievement and loss emotions) | *Good citizen* (take advantage of the opportunity; comply full with instructions and requests from administration) |
| *Interactions with others* (negative cue content)  
*IT symbolism* (negative cue content) | *Loss* emotions (dissatisfaction)  
*Loss* emotions (anger, resentment) | *Opt out* (avoid or ignore the threat) |

We found that the *personalization* pattern emerged as a result of the *identity work* and *instrumentality* cues interacting. First, the software’s inability to represent what each faculty member viewed as their distinctiveness led to strong emotions of discomfort and anxiety. These emotional experiences butted-up against two instrumental factors: being able to generate an MS Word annual report or a CV from FP but yet not being able to directly format those reports/CV in the FP software. This interaction of cues and corresponding emotions resulted in a use pattern of *personalization* (see Table
FP is used for giving the “facts”, while these facts are composed into a personal story in MS Word:

“I like to mediate the interpretations someone has of me. And in FP, faculty are not sure what this mediation is in all instances. The system is connected to a faculty member’s sense of how they are being measured by their chairperson. And then having it used second-hand without knowing who is using it, maybe a little bit uncomfortable. I think the concern that the faculty have that their stuff is misused is not necessarily selfish either. [...] I got no faculty reports that were generated directly out of FP that were not re-processed in Word. Different faculty want the documents to be their signature, presentation and organization. Having all of the ‘facts’ coming out of FP is wonderful, but the narratives are a personal expression of the faculty member’s interpretation of the facts.” (Department chair [PS] - Private)

Editing their report in MS Word allows social actors to exercise control over the threatening consequences that FP has on their ability to present themselves favorably either for external purposes (CV) or for internal evaluation (annual report).

The pattern of gaming the system emerged as a result of the interplays between the identity work and involvement in change cues. In this case, stronger emotional experiences of discomfort and anxiety related to FP not supporting faculty expressions of distinctiveness interacted with the less intense concern around the lack of faculty involvement in FP design. This resulted in a use pattern of minimal, but strategic effort when inputting data into FP (see Table 2.3):

“The subtleties of what we do are not collected. I was fearful that, just because of how I think administration looks at things, it (FP) was going to be another way that they boil it down to this number. I was afraid that was going to be the end of the discussion. At the beginning, there was talk about it [engaging faculty in FP configuration], but I haven’t heard anything. So there was a report that showed what admin was going to be looking at and even though they had all these other fields that you usually have in a CV, I said well, if they’re only looking at seven fields, then all I’m going to do is put in seven fields. I’m going to try to figure out minimally which buttons I’m going to have to choose, but I’m not going to spend a lot of time trying to massage it into being meaningful.” (Tenured faculty member [A&S] – State)
When individuals are not given the chance to get involved in a potentially threatening IT effort that has a direct influence on something as important as their performance evaluation, they find a way to control the consequences of that IT effort, but also try to beat the administration at their own game (e.g., inputting the data used for evaluations, but purposefully neglecting to input other data into FP that could be useful for the university).

The pattern of exercising discretion emerged mainly as a result of the instrumental cue being salient and, therefore, is not based on any particularly strong emotional experiences. We found that this pattern emerged when both constraints and affordances were present (negative and positive cue content). Furthermore, the cost of overcoming constraints needed to be acceptable for the social actor (cf. Griffith and Northcraft, 1996). In response to an acceptable balance between instrumental constraints and affordances, faculty members developed a use pattern of making FP work for themselves by exercising discretion in their use (see Table 2.3):

“I’m pleased with how it worked out. I can still see there’s an excess of data fields, but if you’re selective about the ones you use, then you don’t have to invest a lot of time in it. I can see if someone published six or seven articles a year this might be frustrating. [...] I think [FP] works to the benefit of individual faculty. People realized that it made their lives easier if they just had to put everything in one place. [...] I don’t fill out the abstracts... Date accepted, date published, date submitted; I usually end up filling out only one of those.” (Tenured faculty member [A&S] – Private)

However, when the constraints were overly costly, the inclination to opt out or game the system was much bigger:

“I personally find it very difficult to use ... And the only way that I can change these things is to learn an enormous amount and I frankly don’t care to learn a whole lot about how [FP] operates” (Department chair [A&S] - Private).
The pattern of *being a good citizen* was observed only at Private. It emerged mainly as a result of the *interactions with others* cue. In this case, more positive and satisfying experiences, related to communication between project sponsors and the faculty, interacted with the relatively unemotional responses to various instrumental constraints and affordances. This confluence of cues resulted in a use pattern, where faculty members put considerable effort into their activities with FP, including overcoming or working around instrumental constraints (see Table 2.3):

“I think they [administration] did a good job of saying that this is a next iteration of something we need … there was a lot of ‘we hear you’ in the message. I got the instructions that got sent to us for doing the activity reports. So I’m gonna read those instructions before I do it. As long as I’ve updated my FP, my papers are in there, so they’ll come up. There are a lot of things I have to re-enter even though they are the same answer as previously. So if there was some sort of copy and edit not just save and add another… but generally, it’s a tremendous time saving when you do annual reports, because the stuff comes out in the right form. That is sort of my bigger picture.” (Former department chair [A&S] — Private)

The pattern of completely *opting out* of FP use for any activity emerged only at State and as a result of a confluence of the symbolic and interaction cues. Stronger emotional experiences of anger and resentment related to negative symbolic associations (e.g., FP used for surveillance) interacted with less intense dissatisfaction with a lack of communication between project sponsors and faculty (e.g., about the importance and value of FP). These negative emotions were then expressed in a pattern of non-use: *opting out* (see Table 2.3):

“It was pretty clear to me that there’s no-one looking to see if vitas have been entered. No-one’s ever contacted me and they’re not doing a good job of communicating the value of FP - either carrot or stick, so as a chair it’s very difficult to convince your faculty. You wonder why we’re doing it and then it’s simply another step in a culture of monitoring us. It feels like the software is allowing a level of monitoring that would not have been so easy before. And if it’s not FP, it’s some other thing that’s gonna make us all angry. […] And
faculty members have learned over the years that if you just ignore it, it will go away. And they're right. So I admit, I didn't do it [use FP].” (Department chair [PS] – State)

Clearly, these patterns of use are not static, because salient cues and emotional experiences change over time. For example, the IT instrumentality cue may become more salient than on a previous occasion of use, because a social actor has experimented with new features, which have elicited an emotional response that will in turn modify the subsequent use patterns:

“One of the reasons I didn’t use it last year was because you can’t send your chair a list of seven papers when it doesn’t show what’s going on … so this year they show the status [of the papers] on the report. Plus they have some nice features – like this – ‘to present’. A lot of the service stuff continues year after year, so you don’t have to retype it, but just put ‘to present’ [as the end date] and it’s done.” (Tenured faculty member [PS] – Private)

This suggests that opting out, if due to unfamiliarity or instrumental constraints, can potentially shift to other patterns, such as discretionary or good citizen use. One individual can also adopt multiple patterns in their FP use. For example, a social actor may follow the pattern of exercising discretion when preparing her annual report (inputting data) and switch to personalization or good citizen use when finalizing the report (see Table 2.3). We were also able to observe how one tenured professor (A&S) at State started out by trying to game the system when inputting data into FP (see above). Next year, the same person opted out of using FP for any activity, because it did not really seem to matter and he felt resentful about not being treated equally with other faculty, who had been given support to enter data:

“I’m tenured. Last year, I just didn’t do it because the basic tenor was: it doesn’t really matter, half the school’s not doing it anyway. And we started feeling really resentful because we didn’t have the minions that other departments have [to help enter the data].”
In sum, our findings indicate that a confluence of cues (associated with a particular IT use event) and the corresponding emotional experiences are reflected in particular IT use patterns, such as opting out, being a good citizen, or trying to game the system. These patterns can change over time, depending on changes in the relevant cues, for example, the instrumentality of the artifact.

The next section discusses the theoretical and practical implications of our findings.

**DISCUSSION: EMOTIONS IN IT USE**

Much of the prior research on emotions in IT use has focused on discrete emotions (such as anger, anxiety) and their effect on IT use (directly and through mediating activities, such as venting or distancing) (Beaudry and Pinsonneault, 2010; Cenfetelli, 2004). In contrast, our research 1) demonstrates how discrete emotions around IT use arise and, 2) theorizes the effect of emotional experiences on IT use – not just in terms of more or less use, but in terms of qualitatively distinct use/non-use patterns. As such, our study answers the calls made by Bagozzi (2007) and Ortiz de Guinea and Markus (2009) for more theorizing on how emotions enter decision-making in IT use. While the distinct content of cues, emotional experiences and use patterns are specific to our research settings, the concepts and the process through which use patterns emerge are in line with, and extend, prior theory (e.g., Beaudry and Pinsonneault, 2010; Weick, 1990), and are theoretically generalizable to other contexts.

Our findings suggest that emotions enter the process of pattern formation and modification through various cues that elicit a specific appraisal of the IT use event and a corresponding emotional response (a specific emotion class). We confirm the
research by Beaudry and Pinsonneault (2010), that proposes that IT events elicit four classes of emotions (loss, achievement, deterrence and challenge), depending on how the IT events are appraised. We extend their work by identifying the specific elements of IT events (i.e., cues) that are appraised and then elicit these different classes of emotions. Dominant emotions are then (often strategically) expressed through specific use and/or non-use behaviors. For example, people may avoid use based largely on their interactions with others (a cue). In one of our research settings, “horror stories” (e.g., the basic tenor of ‘it doesn’t really matter’; frustrating experiences recounted to others) elicited negative emotions that the system must be “bad”, leading many faculty members to a use pattern of opting out as long as possible and the continued propagation of the “horror stories”, creating an emotion culture that started to prescribe how to feel about FP.

We also demonstrate the usefulness of conceptualizing continued IT use as a set of qualitatively distinct patterns. These effectively capture the notion that IT use and non-use are about the technology’s “goodness of fit” with social actors’ work activities, interpersonal relations, other technologies in the ecosystem, and the like (Selwyn, 2003). For example, we see clearly that as a CV management tool, FP is not a good fit with faculty lives at State – it is not a good replacement for MS Word and it does not fit with the standard way of doing one’s CV. As an annual reporting tool at Private, however, the fit is a little better – some faculty find rolling their activities up “nicely” into a report using FP is better than using MS Word. Interpersonal relations and consistent communication play a very important, facilitating role in creating this “goodness of fit”. Also, “goodness-of-fit” is felt as much as it is reasoned. The fact that FP is not a good fit with faculty lives at State is visible in
both reasoned arguments around excessive time that CV maintenance in FP takes, but also in the intensely emotional outbursts of anger and worry evident in our data.

Considerable care needs to be exercised when determining the level of analysis for IT use. Our data reveal that a feature-level analysis would unnecessarily break down IT use into lower-level components, which, separately, cannot convey the distinct and nuanced quality that characterizes a use pattern. Only the unique combination (sequence) of actions (involving both use and non-use of features and various IT tools that are part of an ecosystem) can portray a distinct pattern that is recognizable across individuals and situations. For example, the pattern of personalization shows how using FP for finalizing one’s annual report or CV involves the use of the functionality that generates the report (as an MS Word document) based on data in FP. It also involves the non-use of the functionality of “certify complete” (which would indicate the report is final in FP; see pattern of good citizen). Instead, MS Word is used to format and finalize the report/CV. As pointed out earlier in the paper, in uncovering these distinct use patterns (containing both use and non-use of features/tools), while avoiding the problem of “repeating decomposition”, we were aided by the concept of functional affordances (Markus and Silver, 2008). In particular, this concept helped us to identify potential uses of FP that were actualized as well as potential uses that were not actualized (e.g., when a feature was purposefully ignored or an important feature was missing).

As is evidenced from the basic sequences we have identified and described in our findings (Table 2.2), a narrative network (Pentland and Feldman, 2007) or other sequencing techniques (cf. Gaskin et al., 2010) can successfully depict the combination of use and non-use behaviors distinct for a pattern, but the felt quality
(Ciborra, 2006; Feigl, 1967) of the pattern (e.g., cynicism behind it) is not communicated. The felt quality is visible, however, when tracing the pattern back to emotional experiences and salient cues, as we have done in this paper. For example, while cynicism (cf. Selander and Henfridsson, 2012) can be seen in the *game the system* pattern, it is absent in the *exercise discretion* pattern, even though the specifics of used and non-used functionality and the ecosystem of artifacts may be very similar.

Our findings also lend further support to the notion that IT use is not only goal-oriented, but socially (and personally) conditioned (Agerfalk and Eriksson, 2006; Lamb and Kling, 2003). This is evident from the point that many of the cues are about general associations, self-reflections and interactions between people that are part of IT use – rather than about the material aspects of IT use. Emotional responses also tend to be stronger to these cues, because they are related to central concerns in people’s lives (Elfenbein, 2007).

In sum, we have demonstrated that continued use of IT is indeed an emotional phenomenon (see overview in Table 2.4). Social actors decide how and when to use IT based on their emotional experiences arising from a variety of cues. Such cues include not only the IT system itself, but also *who* is implementing the system, *how* has the implementation effort been communicated to relevant social actors, *what* associations the system brings up, and so on. Separating the study of IT use from this socio-emotional context would leave us with impoverished accounts of human-technology interactions.
Table 2.4: Overview of Theoretical Contributions

<table>
<thead>
<tr>
<th>Prior Research</th>
<th>Our Contribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT events elicit emotions of four classes (loss, achievement, deterrence and challenge), depending on how the IT event is appraised (Beaudry and Pinsonneault, 2010)</td>
<td>We confirm prior research, but, additionally, demonstrate what elements of the IT event (i.e., cues) specifically are appraised and elicit these emotion classes.</td>
</tr>
<tr>
<td>Discrete emotions (or emotion classes) influence IT use positively or negatively. IT use is measured by intentions to use / more or less use (cf. Beaudry and Pinsonneault, 2010; Cenfetelli, 2004)</td>
<td>We demonstrate the emergence of distinct IT use patterns, distinguishable by their unique sequences of actions, which involve elements of both use and non-use. We also show how different emotions matter for different kinds of unique patterns.</td>
</tr>
<tr>
<td>Use and non-use are about the “goodness-of-fit” of the technology with social actor lives (Selwyn, 2003)</td>
<td>We confirm prior research but add that “goodness-of-fit” is felt as much as it is reasoned.</td>
</tr>
<tr>
<td>Feature-level analysis of IT use (Burton-Jones and Straub 2006) versus black-box analysis of IT use (Venkatesh et al., 2008)</td>
<td>We show that when studying patterns of use, the appropriate level of analysis is focusing on meaningful sequences of actions, which may involve both use and non-use of various features within IT as well as different IT tools in general. Breaking the pattern down to feature-level or ‘black boxing’ the IT tools involved would both miss the unique sequences that make a use pattern distinct and recognizable. We also demonstrate that the felt quality of use patterns is not typically captured with existing sequencing techniques (cf. Pentland and Feldman, 2007). Tracing back the use patterns to emotional experiences and cues, as we have done, allows us to uncover and describe this felt quality and can provide a useful addition to identifying action sequences of use patterns (or routines).</td>
</tr>
<tr>
<td>IT use is both goal-oriented and socially (and personally) conditioned (Agerfalk and Eriksson, 2006)</td>
<td>We confirm prior research. We show that the cues present in an IT use situation that elicit emotions and influence IT use patterns are related not only to successful goal achievement through IT (e.g., instrumentality), but also to interpersonal relations, self-reflections, etc.</td>
</tr>
</tbody>
</table>

Practical Implications

From a practical perspective, our findings confirm insights from prior research that some post-implementation changes (and negotiations around which changes to accommodate) are unavoidable (Wagner et al., 2010). At Private, many improvements were planned and made to FP during pilot and post-pilot roll-outs, resulting in an acceptable fit between required work practices and the software’s
capabilities. At State, the negotiations were fraught and resulted in more modifications to the required work practice (how much data had to be entered), because of a lack of fit between the practice of CV management and FP capabilities. Such negotiations are a combination of changes to the technology and attempts to address the social and personal needs of users. These aspects are difficult to separate and should be considered together by managers.

To illustrate, alterations to the technology based on user feedback establish an emotional connection with the users (users may be more or less gratified with the results, but at least satisfied to be involved or even just listened to), while not involving users (or lack of communication) lead to deterrence and loss emotions (e.g., concern, dissatisfaction). In our case, we showed how lack of faculty involvement, in combination with other cues, then lead to minimal effort use behaviors, such as the *gaming the system* pattern. Second, technology alterations can break cycles of non-use based on other cues and prior emotional experiences. As shown above, simple design changes (e.g., showing the status of publications on the annual report) can provide instrumental affordances that change a use pattern from *opting out* to *discretionary* or *good citizen* use.

However, decisions about how to implement IT and how to address the social and personal needs of users also color the technology in ways that can be difficult to change with design modifications. This is most clearly demonstrated by the *IT symbolism* cue. New technology becomes a ‘lightning rod’ or a ‘scapegoat’ for many negative associations brought forth by the project and the decision-making around it. At State, FP, rather than the Provost (who was behind the decision to standardize CVs), is blamed for trying to make “one size fit all”. FP is also blamed for increased
surveillance, even while it is recognized that such “surveillance” is an artifact of the changing culture in higher education. One way to counteract this coloring is to purposefully facilitate distinctions between technology use for a particular task and “what it means”. As shown above, emotional responses to material cues are much less intense and, without the presence of other cues, lead to organizationally desirable use behaviors, such as discretionary use where people make the best out of the new tool. While symbolic associations tend to muddy this distinction, leading to intense emotional responses, getting users to focus on the instrumental aspects can neutralize at least the task at hand (i.e., putting data into a system). At State, this was accomplished, for example, by hiring a graduate student as the faculty liaison who helped to train the faculty. Not being part of the faculty or the administration (the decision-making around FP), this person could remain neutral and technology-oriented and help faculty fill out their data without getting into heated discussions about the “hidden agenda”.

IT use cannot be nudged into some desired direction by attending to problem situations and cues in isolation. As our evidence shows, cues work together and attending to just one or two can lead to unintended consequences (Robey and Boudreau, 1999). For example, the administration at State responded to faculty complaints about the unreasonable amount of effort and time required to input their entire CV into FP by providing assistance – at least in certain instances. This intervention was geared towards helping people overcome the instrumental constraints of FP, and through that, make them more likely to use FP. However, providing help may appease the users who opted out (or gave up), but it also unjustly “punishes” the individuals who put in the effort in the first place, especially if such
help was not afforded to them. In sum, making sure that the intervention is congruent and rectifies the actual problem and, thereby, reduces user resistance (Rivard and Lapointe, 2012) should involve a detailed consideration of how the problematic use pattern emerged in the first place. Accordingly, before deciding on a plan of action (How to provide support? How to change the design? Who to involve in feedback sessions?), decision-makers can benefit from considering all the cues and the possible content of cues involved in the emergence of use patterns in their specific setting.

**FUTURE RESEARCH AND CONCLUDING THOUGHTS**

There are many promising further research avenues that could extend this study. For example, future examinations of IT use in other (non-academic) contexts may suggest different types of cues and the differential importance of such cues, therefore, extending our findings. In an environment with a powerful user base (such as faculty) and an IT artifact intimately tied up with performance evaluations (such as FP), the cue of identity work emerged very clearly and in relation to the most intense emotional experiences. In other environments this may not be the case.

Additionally, the salience of different cues is likely to depend not only on the broader context, but also on the specific conditions of technology use. For example, Markus (2001) has demonstrated that people’s use of knowledge repository tools differs depending on whether they are documenting the knowledge for themselves, for similar others or dissimilar others. In the situation of documenting knowledge for dissimilar others, for example, people exhibit emotions of worry (e.g., about the use of information out of context) and adopt specific use behaviors, such as trying to
make the records sound objective, withholding certain information, etc. These observations are in line with our findings – for example, faculty members preparing reports for administration exhibited similar use behaviors (e.g., withholding information) and emotions in *gaming the system* pattern. This would also suggest that the identity work cue may be particularly salient under conditions where a tool is used to provide information to third party, dissimilar others. However, as we have not examined such conditions in this paper, further research is needed to understand their influence on the salience of cues.

Furthermore, extended *longitudinal* examinations of cues, emotions and use patterns should be undertaken to reveal more about the conditions under which cues change over time and the influence of these changes on resulting emotions and use patterns. Individual differences in users’ emotional responses to IT use need further investigation as well. For example, the role of skills, personality, gender, etc. in the differential influence of cues on emotional responses is one such interesting avenue for future research. Lastly, more detailed examination of the managerial interventions (over time) that accompany IT implementation projects is needed to better understand the influence of such interventions on the presence and salience of cues, as well as the resulting emotional experiences and possible changes in use patterns.

From a broader perspective, our study has limited its focus to studying emotions and IT use/non-use on the individual level. Therefore, group, organizational and institutional level accounts of the cases could significantly expand our insights and remain to be explored in future research. In particular, attention is drawn to the importance of various power relations that permeate the academic context and are closely linked to the history and development of the various ranking systems used in
that context. Below, we outline two themes that we feel would warrant particular further investigation.

First, emotions and their expression around IT use are influenced by the particular workplace and institutional environment (in this case, academia). This environment, to some extent, dictates the kinds of emotions that can and cannot be expressed (as well as how they should be expressed) (cf. Sutton, 1991). Together with their general historical development (e.g., the changing importance of unions; rise and fall in university rankings, such as by *Times Higher Education*; the creation of new rankings; the changing funding structures, etc.), academic institutions also develop particular ‘emotionologies’ or ‘emotion cultures’ (Fineman, 2008). “Emotionologies are the building blocks of ‘organization’ and its emotion culture, infusing interactions with predictability, order, and meaning. For instance, deriding an enemy’s political, economic, or religious system, while feeling commitment or pride for one’s own, has long reinforced ‘the reason’ for a conflict. The corporate world has institutionalized such sentiments in its philosophy of marketplace wars and battles […]. In casting competitors as enemies, it follows that they can be derided and ‘crushed’, and their defeat celebrated” (ibid.: 3). The academic world has its own institutionalized sentiments around tenure and promotion (which are inextricably linked to issues of ranking and funding). It is important, thus, to better understand how systems like FP and their use become incorporated within such emotionologies. Critical Discourse Analysis (cf. Phillips and Hardy, 2002) may be particular helpful in describing and explaining these issues.

7 See more at: http://www.timeshighereducation.co.uk/world-university-rankings/2012-13/world-ranking
Second, group-level power imbalances form another important aspect in understanding FP use and emotions around it. For example, our research suggests that differences between various departments or schools within universities, and how these differences become reflected in the new IT (e.g., Arts & Sciences faculty members have to classify their publications according to rules constructed by Business accreditation agencies) are crucial in understanding the various emotions and IT use/non-use patterns.

Notwithstanding the above-mentioned limitations, our research makes a number of contributions to the understanding of emotions in individual-level IT use. To summarize, our research suggests that social actors respond emotionally to (and make sense of) a confluence of cues (material, social and personal) that are more or less salient in a specific activity involving IT use. The type and strength of the emotional experience (relatively weaker or stronger achievement, loss or deterrence emotions) depends on the nature and content (positive/negative) of the salient cues and their interactions. As people use IT, their dominant emotional experiences (or lack thereof) are expressed in specific IT use patterns. These patterns contain distinct sequences of actions characteristic to the particular pattern and contain elements of both use and non-use. Tracing use patterns back to emotion classes and the particular cues that elicited these emotions allows researchers to identify the distinct felt quality of each use pattern and to better understand how and why users make the IT use choices that they do.
PART III: TECHNOLOGY-USE MEDIATION REVISITED – A SYMBOLIC PROCESS PERSPECTIVE

8 Being prepared for journal submission.
Earlier version: Accepted for presentation at, and inclusion in the Proceedings of, the 2013 European Conference on Information Systems, Utrecht, Netherlands (June 5-8, 2013).
ABSTRACT

Successful adoption and use of new information technologies (IT) 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 and with what consequences – intended and unintended – have received more limited attention. Accordingly, in this paper, we focus on the nature of mediation activities. Through an in-depth field study we demonstrate that there is an inherent symbolic meta component to mediation activities by which they come to carry meaning for technology users. Specifically, both the technology artifact itself and the information (content and form) disseminated by managers send messages to users, helping them interpret and appropriate the new technology in particular ways. Theoretically, the study helps unpack various TUM activities and outlines the mediating role of the artifact itself. From a practical perspective, managers who are mindful of these symbolic processes and their consequences are better equipped to plan and execute successful TUM efforts.

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

When new information technologies (IT) are implemented in organizations, much effort and many resources go 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 technology championing (Beath, 1991); senior management endorsement (Chatterjee et al., 2002; Purvis et al., 2001); adaptations to the technology (Tyre and Orlikowski, 1994); continuous training of users (Gallivan et al., 2005); facilitating the emergence of expert users, who can provide guidance and tips (Eveland et al., 1994), etc. Orlikowski et al. (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 artifact. Sharma and Yetton (2003) examined TUM activities undertaken by more senior actors – top management – 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 to use the term intrapreneurs (cf. Pinchot, 1985) in order to avoid confusion concerning the term mediator, which may refer to both people and objects (Nicolini, 2011).
Intrapreneurs, in the traditional sense, are people who engage in the practice of creating new business opportunities and innovations within organizations: turning ideas into profitable reality (Pinchot, 1985). We chose this term because people undertaking TUM efforts (at both lower and senior management levels) 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 and the consequences of technology-use mediation are not well understood, requiring further investigation (Bansler and Havn, 2004). A sensemaking perspective (Weick, 1995) has shown the process of TUM to be more open-ended and emergent than previously theorized. Because technologies are equivocal and allow for multiple interpretations, intrapreneurs must continuously make sense of them in their local contexts (Bansler and Havn, 2004: 75-77). Orlikowski et al. (1995: 438) point out that, “how, by whom, in what situations, and with what intended and unintended consequences 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 and outcomes. Building on such literature as Feldman and March (1981) and Markus and Silver (2008), we argue that all TUM activities have a symbolic component; 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 two questions: 1) how do technology-use mediation activities unfold as symbolic processes and 2) with what consequences?
We explore these two questions in the context of two North American universities implementing the same standardized CV management tool. We demonstrate that all TUM efforts have a meta-communicative component, consisting of the meta-messages that human intrapreneurs send and the meta-messages that artifacts express. First, 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, body language, 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 they hope will lead to successful technology use (e.g., intrapreneurs may add that the meeting is not mandatory, but indicate that the CEO has approved the training, thus, sending a meta-message that in effect everyone is expected to attend). We will refer to these intrapreneur-sent meta-messages as signals (cf. Feldman and March, 1981).

Second, technology artifacts themselves can also express messages and meta-messages (Markus and Silver, 2008). For example, a particular artifact’s user interface and database structure communicate something about the data that should and should not be input into the system, but they also meta-communicate something about how to interpret different kinds of data (e.g., which types of data are considered more or less valuable). We will refer to these artifact-sent meta-messages as symbolic expressions (cf. Markus and Silver, 2008).
In sum, we show that both types of meta-messages influence how users will appropriate the new technology and, thus, their execution is critical to the success of TUM efforts. Theoretically, we contribute to unpacking mediation activities, drawing attention to the processes of meta-communication and their influence on technology use. We also outline the critical role of the IT artifact, as an infrastructural, boundary, epistemic and activity object (cf. Nicolini et al., 2011), in mediating its own use. IT artifacts, in their different roles, send particular meta-messages to users. For example, the use of a specific tool for academic CV maintenance is mediated, first, by the various \textit{signals} that intrapreneurs send with their efforts, and second, by the various \textit{symbolic expressions} that the tool itself conveys to the users. These symbolic expressions will differ for different user groups, but also according to the different roles the tool plays. For example, as an infrastructural object, symbolic expressions around the seamlessness of CV maintenance are likely to be relevant. As an activity object, on the other hand, symbolic expressions around the contradictions in the tool (e.g., if a natural science CV is used as the “ideal type” in the tool, it may create a conflict with social science CV formats) are likely to be relevant. As a boundary object, the tool’s meta-messages are likely to be related to the systems of meanings around the usual way of writing academic CVs (e.g., which design and formatting elements are valued in the tool), as well as the institutional processes of evaluating academic productivity (e.g., which metrics, such as publications, external funding are valued).

Practically, we show that understanding the symbolism of intervention efforts can help intrapreneurs be more mindful (Langer, 1989) regarding the possible consequences of their efforts and, thereby, plan their TUM activities with greater
care. Next, we outline the ideas that make up the technology-use mediation framework, moving on to the extant research that has explored symbolic processes in technology implementations. We then introduce our chosen methodology, describe the findings and bring the paper to a close with a discussion of the theoretical and practical implications of our findings.

TECHNOLOGY-USE MEDIATION

Organizational interventions and the guiding of IT use in certain directions have been shown to be undertaken both by top management (Chatterjee et al., 2002; Ein-Dor and Segev, 1978; Sharma and Yetton, 2003) and by various administrative and user groups (cf. Novak et al., 2012; Orlikowski et al., 1995). Technology-use mediation (TUM) 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). As such, TUM activities are characterized by the goal of facilitating technology use in a specific local context.

Orlikowski et al. (ibid.) proposed four general types of TUM efforts: establishment; reinforcement; adjustment and episodic change. This framework was later adapted specifically to explore top management efforts (Sharma and Yetton, 2003). 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 3.1).

Table 3.1: Different types of technology-use mediation activities

<table>
<thead>
<tr>
<th>Technology-Use Mediation (local, deliberate and organizationally-sanctioned intervention efforts)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Typically undertaken by less senior actors (Orlikowski et al., 1995):</strong></td>
</tr>
<tr>
<td>- 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)</td>
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<tr>
<td>- Reinforcement (intrapreneurs “help users to incorporate the new technology into their work practices, providing advice, demonstration...”, etc.)</td>
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<tr>
<td>- Adjustment (intrapreneurs undertake changes to the technology and/or the usage rules to facilitate incremental changes to use practices)</td>
</tr>
<tr>
<td>- Episodic change (intrapreneurs significantly re-design the technology and/or the organizational setting)</td>
</tr>
<tr>
<td><strong>Typically undertaken by more senior actors (Sharma and Yetton, 2003):</strong></td>
</tr>
<tr>
<td>- Creation of new structures (CNS), e.g., intrapreneurs establish organizationally-sanctioned support, training and lower-level intrapreneur groups</td>
</tr>
<tr>
<td>- Creation of new performance control systems (CNPC), e.g., establishment of mechanisms that reward behaviors consistent with new IT adoption</td>
</tr>
<tr>
<td>- Creation of new coordination mechanisms (CNCM), e.g., articulation of new patterns of workflow</td>
</tr>
<tr>
<td>- Creation of changes to performance goals, e.g., establishment of long-term orientation tolerant of short-term performance declines</td>
</tr>
</tbody>
</table>

In short, all TUM activities are largely about intrapreneurs trying to improve system usage (Davidson and Heslinga, 2007; Sabherwal et al., 2006). While top management efforts are geared towards creating a facilitative organizational environment, the lower-level mediation efforts engage in more hands-on training of users, adaptations of usage rules, adaptations to the technology and general problem-solving around the new IT (Novak et al., 2012).

While TUM generally refers to activities undertaken by human intrapreneurs, we argue that the technology artifact itself can also facilitate and accommodate its effective use over time. Both human mediation and artifact mediation rely on the fact that human activities and technical objects can serve as signs (Barley, 1983; Markus and Silver, 2008). As we will outline in detail in the next section, this means that both humans
and artifacts have the ability to express messages to users (both direct messages and messages-about-messages) and, thus, facilitate the effective appropriation of new technology.

**Symbolism in Technology-Use Mediation**

At their core, TUM activities are about communication and meta-communication. 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. We argue that intrapreneurs’ communication has a meta component that receivers interpret in particular ways, depending on intrapreneurs’ verbal and non-verbal behavior (e.g., by their choice of communication media) (cf. Feldman and March, 1981). Secondly, intrapreneurs’ meta-communication interacts with the meta-messages expressed by the IT artifact itself (e.g., by its choice of categories, the artifact expresses to users that some kinds of information are more important than other kinds) (cf. Markus and Silver, 2008).

**Intrapreneur Signals**

The meta-communicative aspect of the verbal and non-verbal behavior of decision-makers has been described as signaling (Feldman and March, 1981) to denote how much communication 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” (ibid: 77). In other words, information-related behaviors (e.g., typing some words in bold) send messages about managerial communication with the aim of ensuring that such communication is interpreted as
legitimate and ‘good’ or accurate. What is communicated contains signs that convey the literal (i.e., informative) meaning of the content, but also convey a connotative meaning and function as expressions of feelings, tools of persuasion or ways to establish or maintain social relationships (cf. Chandler, 2002). Communicators can, thus, gather, manipulate and use information in ways that signal more or less competence and credibility in themselves as well as signal more or less legitimacy in the decision-making process about which they are communicating. The more credible the sender and the more legitimate the message (content) is seen to be, the more likely it will have an impact on the receiver’s IT-related attitudes and use behavior (Rivard and Lapointe, 2012). Hereafter, we refer to all kinds of meta-messages that human intrapreneurs send as signals.

**Artifact Symbolic Expressions**

To capture the meta-communicative function of IT artifacts, we adopt the concept of symbolic expressions, i.e., “communicative possibilities of a technical object for a specified user group”, introduced by Markus and Silver (2008: 623). Symbolic expressions capture the notion that different elements of the technology artifact express particular messages to users, some of which are intended by designers and others, which are not (ibid.). These different elements of the technology can be its interface; functionality; the information content of the IT, and the like. Not all of the messages need to be heeded or perceived by the users. For example, an academic CV management system (as the one examined in this paper) that can capture a wide variety of academic activities across different disciplines can express this intended message of general suitability to the users. However, the faculty users, in particular, may not heed this message and instead perceive the unintended message that the
system is trying to fit ‘square pegs into round holes’. At the same time, administrators may perceive a message that the system allows for a more unbiased comparison of CVs, which is more in line with what the designers intended. These heeded symbolic expression are the result of interactions between the technical object (e.g., standardized categories capable of capturing a wide variety of activities) and user perceptions/interpretations of this object.

Symbolic Expressions and Artifact Roles

We extend our consideration of these interactions by taking into account the different roles that technical objects can play in different situations. Prior research (Nicolini et al., 2011) has shown that IT artifacts can play infrastructural; boundary spanning; motivational, and contradictory roles. First, many IT artifacts are, or strive to be, material infrastructures for the work practices they support. The aim is that they become taken-for-granted and invisible – a part of ‘this is how we do things around here’ (ibid.: 13). Second, many artifacts also strive to function as boundary objects, the aim of which is to satisfy the concerns of multiple social worlds, translate the knowledge and concerns across multiple worlds and facilitate collaboration (Star and Griesemer, 1989). IT can also function as an epistemic ‘thing’ (Nicolini et al., 2011). Epistemic things embody ‘what one does not yet know’, and therefore, by virtue of their unknown character, are a source of interest and motivation (ibid.: 7).

For example, when building a new software product, the product (despite having detailed specifications) remains to some extent unknown and emergent to the designers and developers. As they write the programming code and design interface elements, the tool itself (as an ‘unknown’, still emerging thing) motivates developers and designers through the possibilities it entails. Lastly, as objects of activity, artifacts
motivate and sustain the interest of humans by creating contradictions and conflicts (ibid.: 10).

We argue that depending on their role, systems are also likely to express different kinds of messages to users through linking places, events and processes on different timescales (Lemke, 2000; Star and Griesemer, 1989). For example, for faculty members, the CV management system is likely to play an infrastructural role – it should seamlessly support their CV maintenance activities (cf. Nicolini et al., 2011). The standardized categories of the technical object may hinder this seamlessness for some faculty members and lead to the perceived symbolic expression of fitting ‘square pegs into round holes’. On the other hand, for administrators, the CV management system is likely to play a boundary spanning role – it should translate individual faculty member CVs into aggregate information useful for accreditation (cf. ibid.). The standardized categories of the technical object, in this case, may facilitate this translation and lead to the perceived symbolic expression of unbiased comparisons. In sum, the technical object, in its different roles, not only prescribes how to input data, but also meta-communicates those data that are seen as valuable and meaningful (cf. Lemke, 2000). Where the perceived symbolic expressions are negative, users may even refuse to work with a technology (Wagner et al., 2006).

**Technology-Use Mediation: Heeded Signals and Symbolic Expressions**

The above review suggests that both the IT artifact and the intrapreneurs’ activities mediate technology use: both send meta-messages to users that can facilitate their effective appropriation of the new technology. Our empirical research seeks to examine this further. We focus particularly on the *heeded or perceived signals* and *symbolic*
expressions — as outlined in the methodology below. We contend that the meaning of the signals and the symbolic expressions is achieved relationally, in the interplay between the sender (i.e., intrapreneurs or the IT artifact) and the receiver (i.e., users).

The next section outlines our research methodology.

**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 and other administrative functions. A multi-site field study was chosen to investigate the unfolding of the different TUM activities undertaken during the projects and the varied outcomes.

We conducted 47 semi-structured interviews across the two research settings over an 18-month period (overview in Table 3.2). Interviews were conducted with a range of stakeholders, including university administrators, faculty members and staff responsible for implementing FP. All interviews were tape recorded and transcribed. Additional data (e.g., meeting recordings; university-wide memos) 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. The survey functions as another data collection instrument allowing for data triangulation (Denzin, 2009). The survey instrument was developed based on the insights from the broad range of interviews and was pilot tested on faculty members.
before wide dissemination in October 2010 and April 2012 (at State) and in February 2012 (at Private). The survey included both categorical items (e.g., Which word best describes how you generally feel about [FP]?) and interval-scale items (e.g., [FP] is very useful for recording my own work-related activities). The survey was disseminated online, using Qualtrics online survey software, which enables survey creation and dissemination as well as initial analysis of the collected data.

Table 3.2: Data Collection Methods across Settings

<table>
<thead>
<tr>
<th>Methods</th>
<th>Setting I: “State”</th>
<th>Setting II: “Private”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Field work</td>
<td>Interviews and observations over 18 months</td>
<td>Interviews and observations over 12 months</td>
</tr>
<tr>
<td>Timing</td>
<td>Implementation and post-implementation</td>
<td>Same</td>
</tr>
<tr>
<td>Study participants</td>
<td>University personnel: administrators (provosts, deans, associate deans), department chairs, faculty members, implementation team members</td>
<td>Same</td>
</tr>
<tr>
<td>IT systems in use</td>
<td>Packaged software system for faculty CV management / productivity evaluations and learning assessment (FP); MS Office software</td>
<td>Same</td>
</tr>
<tr>
<td>Narrative interviews</td>
<td>29 with 23 stakeholders:</td>
<td>18 with 32 stakeholders:</td>
</tr>
<tr>
<td></td>
<td>o 4 interviews with 3 implementation team members</td>
<td>o 4 interviews with 3 implementation team members</td>
</tr>
<tr>
<td></td>
<td>o 8 interviews with 7 administrators</td>
<td>o 6 interviews with 6 administrators + 1 meeting recording with 21 administrators present</td>
</tr>
<tr>
<td></td>
<td>o 17 interviews with 13 faculty</td>
<td>o 7 interviews with 7 faculty</td>
</tr>
<tr>
<td></td>
<td>Recorded and verbatim transcriptions. In total, approx. 25 hours of audio data.</td>
<td>Recorded and verbatim transcriptions. In total, approx. 20 hours of audio data.</td>
</tr>
<tr>
<td>Observations</td>
<td>2 faculty advisory group sessions; limited observations of IT use during interviews. In total, approx. 7.5 h of observations.</td>
<td>4 sessions with faculty filling out their annual reports (video recorded); limited observations of IT use during interviews. In total, approx. 10 h of observations.</td>
</tr>
<tr>
<td>Documentation</td>
<td>E-mails; Help documentation; System use reports</td>
<td>Same</td>
</tr>
<tr>
<td>Survey</td>
<td>Yes 2010: 137 respondents (15% response rate)</td>
<td>Yes 2012: 109 respondents (36% response rate)</td>
</tr>
<tr>
<td>Follow-up contact</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

9 http://www.qualtrics.com/
Data Analysis

We analyzed the collected data utilizing two approaches from semiotic analysis: paradigmatic analysis and the identification of rhetorical tropes (Chandler, 2002; Myers, 2009). 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, but could have been chosen. A major technique of paradigmatic analysis is the identification of binary semantic oppositions (e.g., good/bad; self/other). It is also important to identify how such pairs of signifiers become associated with other signs in specific contexts, such as “bad” with the color black and “good” with the color white, for example. 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). We found that metaphors and irony were most commonly used in our data. 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 paradigmatic analysis and the identification of rhetorical tropes focus on identifying the socio-cultural and personal meanings of signifiers and can, therefore, help to understand the meta-messages that intrapreneurs and the IT artifact send.
Another basic tenet of 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. Our emphasis in this paper lies on understanding the meta-communicative component of TUM activities (including both the signals that human intrapreneurs send and the symbolic expressions artifacts express) as well as the consequences of these on TUM success. Because we contend that the meaning of the signals and the symbolic expressions is achieved relationally, we must understand TUM efforts from the perspective of an interplay between the sender (intrapreneur/artifact) and the receiver (user). Accordingly, we focused our analysis iteratively on each TUM activity (or multiple activities, if happening simultaneously) to: 1) analyze what the intrapreneurs/artifact were attempting to meta-communicate (the sender ‘side’) and the end-user interpretations of this (the receiver ‘side’), 2) describe the resulting heeded signals and symbolic expressions and 3) analyze the consequences of that particular mediation effort on system use, feeding into the next TUM activity (see Figure 3.1).

Figure 3.1: Overview of Data Analysis Steps
First, we used the two analytic techniques to understand the positive and negative connotations potentially present in various mediation activities undertaken by intrapreneurs (see Table B1 in Appendix B). We identified the use of such pairs as us-them (e.g., administration-faculty) or unified terms (e.g., “colleagues”), and the use of rhetorical tropes, often used as aids in persuasion. In addition, we also noted the main function of intrapreneurs’ communication efforts, such as imparting information, expressing feelings, influencing behavior (persuasion) or establishing/maintaining social relationships (cf. Chandler, 2002). Furthermore, we analyzed how, when and whether the information was disseminated by intrapreneurs. We noted the use of different information channels (e-mails; personal conversations; meetings, etc.) and the formality of the TUM activity. We also examined the software artifact for its main characteristics (e.g., interface, functionality and information structure) and the different potential symbolic expressions emerging from these (see Table B2).

We then applied the analytic techniques to understand the positive and negative connotations that end-users had around the TUM activities (see Table B3 in Appendix B). We noted the frequent use of metaphors by end-users to generate imagery around FP and its implementation (e.g., assembly line). We also identified various signifiers that end-users chose to describe FP (e.g., excuse to not solve the problem; demoralizing; valuable).

To describe the heed signals and symbolic expressions, achieved through the interplay of the sender and receiver side, we identified those particular metaphors and signifiers that users utilized to describe more general meta-messages that they perceived the
intrapreneurs, the artifact or the overall situation (new technology implementation by particular intrapreneurs) to express. These tended to repeat across different user groups (e.g., members of faculty; administrators) and across time. For example, one of the heeded messages for faculty members was that of ‘abnormality’ (the situation of using FP for CV management was abnormal compared to doing so in MS Word). Faculty members described this expression repeatedly – each time described as a variation on the ‘abnormality’ theme (e.g., taking forever; demoralizing; assembly lining faculty). One of the heeded intrapreneur signals was that of intrapreneur (in)competence (visible, for example, when faculty members comment on the responsiveness, or otherwise, of the intrapreneurs).

To understand the influence of the meta-communicative components in TUM activities on actual system use, we analyzed interview and survey data to identify use behaviors at various points in time, following specific mediation efforts. We used descriptive statistics to analyze the survey data. The survey data were used to complement insights gained from interviews and observations and not to test any hypotheses. Accordingly, descriptive statistics were deemed appropriate and sufficient for the purposes of this paper. First, we obtained the raw data from the Qualtrics online survey software. We used MS Excel to clean and analyze the data. We removed respondents who had not completed the survey. The number of respondents given in Table 3.2 reflects only completed responses.

**RESEARCH SETTING**

The FP 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. The package was first offered by the vendor in 1999. Currently, there are approximately 3,000 FP adopters in over 25 countries. At its core, FP is a database, which requires each individual to create their CV and/or annual report according to the same basic classification system, which is fixed and typically not amenable to end-user modification. In order to be able to accommodate CVs and activities across various academic disciplines, FP is based on broad classifications of faculty activities (see more in Table B2 in Appendix B; Figure 3.2). Each individual item on a CV or an annual report needs to be manually entered into FP (either copy-pasted or typed in), making the process quite labor-intensive for faculty members: they need to decide the correct category of academic work to which an item belongs and then fill out all the details of that item, such as its name; date; peer-reviewed or not; sub-type, etc. (see Figure 3.3). Once all or some of the data has been entered into FP, the system also provides reporting functionality. Typically faculty can pull out their entire vita and their annual activity report, while administrators can also run aggregate reports across departments, schools and the whole university.

State

“State” is a large state university that employs approximately 1,500 faculty members (900 full-time), and enrolls about 40,000 students. In the past six years, State has hired a new President and twice appointed a new Provost (the second being hired in 2012). The decision to purchase FP was made under the new President and was the brainchild of the former Provost. The decision was driven mainly 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. FP was, thus, expected to replace existing tools for CV maintenance for faculty (an infrastructural role), while also standardizing the CVs across the university in order to make them translatable for various administrative purposes (a boundary object role).

The Provost assigned a central administrative office (CA), consisting of two people, to be in charge of the FP implementation – one staff member and a senior administrator responsible for the initiative as a whole, but less involved in day-to-day matters. The CA office had always been dealing with institutional research and had no experience with technology implementation. Nonetheless, the people in this office (even if reluctantly) became the lower-level intrapreneurs trying to contextualize and make FP work at State. The Provost represented the higher administration intrapreneur, who set up the CA office as a sanctioned lower-level intrapreneur group (see details in Table 3.3). A small faculty advisory group was created after the implementation to provide feedback about the initiative to central administration.

Private

“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. A small faculty advisory group was involved in the initial customization/configuration phase, and was periodically asked for feedback. The decision was driven mainly by accreditation needs, but the tool was also seen as
useful for annual reporting and for maintaining standardized web profiles for all faculty members, which were created by pulling data from FP. Similar to State, FP was thus expected to fulfill an infrastructural role for faculty (annual report and web profile maintenance), while a boundary object role for administrators (making individual faculty information translatable for accreditation needs).

FP implementation at Private was managed from a central technology office (CT) that offers IT support for instructional and research purposes. The CT team handling the implementation was lead by the director of the CT office and consisted of three people (see more in Table 3.3). The CT office had prior experience with a number of different IT system implementations in an academic context. It, therefore, quite naturally assumed the familiar lower-level intrapreneur role in the FP project. The Provost, Deans and Associate Deans represented the higher administration intrapreneurs, who sanctioned the CT office as the lower-level intrapreneur group (see Table 3.3).

Table 3.3: Intrapreneurs and their roles at State and Private

<table>
<thead>
<tr>
<th>Intrapreneur Type</th>
<th>State</th>
<th>Private</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top management (senior) intrapreneurs (in charge of organizational-level TUM activities, such as creating new structures, etc.)</td>
<td>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.</td>
<td>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.</td>
</tr>
<tr>
<td>Intrapreneurs (in charge of lower-level TUM activities, such as introducing and adapting the technology, etc.)</td>
<td>CA office: CA office head (also faculty member) + 1 staff. In charge of the technical, vendor and faculty liaising sides of the FP project (e.g., provide training to and resolve faculty problems, improve FP and work with the software vendor).</td>
<td>Central Technology (CT) office: CT office head (also faculty member) + 3 staff. In charge of the technical, vendor and faculty liaising sides of the FP project (e.g., provide training to and resolve faculty problems, improve FP, work with the software vendor).</td>
</tr>
</tbody>
</table>
Figure 3.2: Screenshots of FP’s User Interface (Main Menu)

| FP Main Menu at State | FP Main Menu at Private |

<table>
<thead>
<tr>
<th>Activities Database Main Menu</th>
<th>Activities Database Main Menu</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Information</td>
<td>General Information</td>
</tr>
<tr>
<td>□ Personal and Contact Information</td>
<td>□ Personal and Contact Information</td>
</tr>
<tr>
<td>□ Faculty Activity Reporting Status</td>
<td>□ Academic/Professional Positions, Joint External Appointments, etc.</td>
</tr>
<tr>
<td>□ Administrative Data - Permanent Data</td>
<td>□ Administrative Assignments</td>
</tr>
<tr>
<td>□ Academic, Government, Military and Professional Positions</td>
<td>□ Awards and Honors</td>
</tr>
<tr>
<td>□ Administrative Assignments</td>
<td>□ Consulting</td>
</tr>
<tr>
<td>□ Awards and Honors</td>
<td>□ Education</td>
</tr>
<tr>
<td>□ Consulting</td>
<td>□ External Connections and Partnerships</td>
</tr>
<tr>
<td>□ Education</td>
<td>□ Faculty Development Activities</td>
</tr>
<tr>
<td>□ External Connections and Partnerships</td>
<td>□ Licenses, Certifications, and Other Professional Distinctions</td>
</tr>
<tr>
<td>□ Faculty Development Activities Attended</td>
<td>□ Media Contributions</td>
</tr>
<tr>
<td>□ Licenses and Certifications</td>
<td>□ Professional Memberships</td>
</tr>
<tr>
<td>□ Media Contributions</td>
<td>□ Profile Information</td>
</tr>
<tr>
<td>□ Professional Memberships</td>
<td>Teaching</td>
</tr>
<tr>
<td>□ Workload Information</td>
<td>□ Academic Advising</td>
</tr>
<tr>
<td>Teaching</td>
<td>□ Directed Student Learning (e.g., theses, dissertations)</td>
</tr>
<tr>
<td>□ Academic Advising</td>
<td>□ Non-Credit Instruction, Executive Education, Guest Lecture, Seminar, etc.</td>
</tr>
<tr>
<td>□ Directed Student Learning (e.g., theses, dissertations)</td>
<td>Scholarship/Research</td>
</tr>
<tr>
<td>□ Non-Credit Instruction Taught</td>
<td>□ Journal Articles, Books/Chapters, Cases, etc.</td>
</tr>
<tr>
<td>□ Scheduled Teaching</td>
<td>□ Conference/Academic Presentations</td>
</tr>
<tr>
<td>Scholarship/Research</td>
<td>□ Contracts, Grants, and Sponsored Research</td>
</tr>
<tr>
<td>□ Artistic and Professional Performances and Exhibits</td>
<td>□ Research, Artistic, and Professional Performances and Exhibits</td>
</tr>
<tr>
<td>□ Contracts, Grants, and Sponsored Research</td>
<td>□ Patents and Copyrights</td>
</tr>
<tr>
<td>□ Intellectual Contributions</td>
<td>Service</td>
</tr>
<tr>
<td>□ Intellectual Property (e.g., copyrights, patents)</td>
<td>□ Department</td>
</tr>
<tr>
<td>□ Presentations</td>
<td>□ University</td>
</tr>
<tr>
<td>□ Research Currently in Progress</td>
<td>□ Professional</td>
</tr>
<tr>
<td>Service</td>
<td>□ Public</td>
</tr>
<tr>
<td>□ Department</td>
<td>Annual Activity Report</td>
</tr>
<tr>
<td>□ University</td>
<td>□ Teaching Activities - Courses / Instructional Resources and Narrative</td>
</tr>
<tr>
<td>□ Professional</td>
<td>□ Service Resources and Narrative</td>
</tr>
<tr>
<td>□ Public</td>
<td>□ Professional Development Resources and Narrative</td>
</tr>
<tr>
<td>Annual Activity Report</td>
<td>□ Overall Self-Assessment</td>
</tr>
<tr>
<td>□ Certify Complete</td>
<td>Overall Narrative and Profile Request</td>
</tr>
<tr>
<td>Annual Planning Report</td>
<td>□ Certify Complete</td>
</tr>
<tr>
<td>□ Teaching and Curriculum Development Plans</td>
<td>FP Main Menu at Private</td>
</tr>
<tr>
<td>□ Scholarly Activity Plans</td>
<td>Scholarly Activity Plans</td>
</tr>
<tr>
<td>□ Service Plans</td>
<td>Service Plans</td>
</tr>
<tr>
<td>□ Professional Development Plans</td>
<td>Professional Development Plans</td>
</tr>
<tr>
<td>□ Overall Narrative and Profile Request</td>
<td>Overall Narrative and Profile Request</td>
</tr>
<tr>
<td>□ Certify Complete</td>
<td>Certify Complete</td>
</tr>
</tbody>
</table>

133
At State, the search for a tool that could facilitate the collection and reporting of relatively reluctant to take on that role (see Figure 3.4).

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]." (formal e-mail memo by CA office)
At the time of the introduction, faculty were asked to enter their entire vita into FP. However, as FP offers no way for users to import their MS Word or PDF vitae into the system, faculty had to manually re-enter all of their data by typing it in or copy-pasting it from their existing CV. This completely overwhelmed the faculty. The standardized CV generated by FP also turned out not to meet their very diverse needs:

“You develop your unique ways of making yourself look good. [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).

In addition, faculty members perceived there to be a lack of communication from the CA office with regard to the issues they were facing. Over time, these negative experiences began to consolidate and spread, leading many faculty to give up on FP (see illustrative data in Figure 3.4).
To address this non-use behavior, the CA office and the then Provost decided to reinforce the usage of FP by making clerical assistants available for CV entry. The support was not consistently allocated, however, and news of this spread among faculty. The effort did not have the expected positive influence on use. Faculty who did not receive support, felt resentful, while faculty who did receive support, still had the burden of making sure the data entered was correct (Figure 3.4). These continued negative experiences reflected also in non-use of the system. In response to continued discontent and non-use, the CA office and Provost decided to adjust the usage rules around FP, making only the entry of most recent activities mandatory:

“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 rumor of a proposal to link performance evaluations based on the data in FP to gradated 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 gradated pay increase. Based on FP, they estimate that 30% of their employees are currently not meeting their performance requirements. And they want to punish us. Under this proposal, those in the bottom 10% would receive no increase in their next contracts whatsoever… This proposal is unacceptable for three main reasons: 1. It demonstrates administration’s basic lack of respect for faculty and employees. 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 negative influence of these adjustments on faculty usage of FP (see more in Table 3.4; Figure 3.5). The informal rumor, in particular,
also contributed to the growing mistrust of higher administration and their intentions for implementing FP (see Figure 3.4).

Table 3.4: FP Use Statistics for State and Private

<table>
<thead>
<tr>
<th>Use of FP</th>
<th>State</th>
<th>Private</th>
</tr>
</thead>
<tbody>
<tr>
<td>I have logged into FP</td>
<td>92%</td>
<td>94%</td>
</tr>
<tr>
<td>I have added the backlog of my publications</td>
<td>42%</td>
<td>66%</td>
</tr>
<tr>
<td>Administrator/assistant added my backlog of publications</td>
<td>34%</td>
<td>8%</td>
</tr>
<tr>
<td>I have added my current publications</td>
<td>57%</td>
<td>83%</td>
</tr>
<tr>
<td>I have added my service activities</td>
<td>63%</td>
<td>89%</td>
</tr>
<tr>
<td>I have generated the annual activity report</td>
<td>34%</td>
<td>89%</td>
</tr>
<tr>
<td>I have generated the vita report</td>
<td>25%</td>
<td>27%</td>
</tr>
<tr>
<td>I participated in training</td>
<td>14%</td>
<td>11%</td>
</tr>
</tbody>
</table>

Figure 3.5: Prevalent Emotions about FP at Private and State

At Private, the search for a systematic and centralized 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 central IT support) in charge of the project, because “they were more faculty-friendly” (Figure 3.6).

FP was rolled out in 2010; most data in the old system were migrated into FP automatically and a few key users were contacted to provide initial feedback on the system’s functionality:

“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 much more attractive public profile webpage ... b) Generate on-demand standardized CVs in Word ... and c) Automatically incorporate publications, etc. into the Annual Activity Report (this functionality should be in place later this year...). While I’m very excited about this new system, please note that all faculty need to review their profiles and correct the errors inherent in any large data migration. If you have questions, feel free to call/email [list of names/email addresses of CT office staff]” (campus-wide e-mail from the Provost).

Figure 3.6: Overview of TUM Activities and their Outcomes at Private
In order to reinforce FP use at Private, the CT office expanded the number of key users to give feedback on the system:

“\textit{We got together a smaller group of faculty that we thought were fairly representative... It was 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 as well as the capabilities of the CT office to handle the implementation, while users not involved in this effort remained skeptical. Differing use patterns of FP among faculty also emerged (see Figure 3.6). Following the relatively successful introduction and reinforcement of FP at Private, in late 2011 the use of FP for annual activity reporting became mandatory:

\textit{“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 members were required to submit the report via FP. This mandate created frustration and annoyance (see Figures 3.5 and 3.6) amongst faculty members, since they were used to producing their reports – at least the final formatting part – in MS Word. However, because FP was associated with non-essential administrative tasks, it mattered little how exactly the tasks got done in the end. Many faculty members, thus, felt neutral or even positive about FP (Figures 3.5 and 3.6). Making FP mandatory also surfaced issues around the differences between
Business and the A&S faculty, with some A&S faculty feeling they were pushed into something that did not fit their needs. Nonetheless, 89% of the faculty members prepared their annual reports in FP (Table 3.4).

**ANALYSIS: SYMBOLIC PROCESSES IN TECHNOLOGY-USE MEDIATION**

We now analyze our findings from a symbolic perspective, exploring the meta components of the various TUM activities. We found evidence of five TUM activities: establishment, reinforcement and adjustment (Orlikowski et al., 1995), the creation of new structures and coordination mechanisms (Sharma and Yetton, 2003). Our data also surfaced rumors (an unsanctioned TUM effort in its own right) about an effort to create a new performance control system. As shown below, these activities are not independent of one another or temporally linear.

To answer our two research questions (*how do technology-use mediation activities unfold as symbolic processes and with what consequences*?), we have structured our analysis around three elements. First, we describe the meta-communication elements of TUM activities (i.e., the kinds of meta-messages or *signals* that intrapreneurs send; the meta-messages or *symbolic expressions* that the artifact expresses as well as their interactions). Second, we analyze the different types of roles that TUM actors (intrapreneurs; artifact; end-users) take on and how this influences the meaning of signals and symbolic expressions. Last, we analyze how the various meta-communication elements (signals and symbolic expressions) influence the intended and unintended consequences of TUM activities.
Meta-communication in TUM Activities

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 office and the CA office) were established, and, second, at State, the data entry support personnel 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 3.5) – 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. This signals lack of clear and competent project leadership both on the senior (administration) and lower (CA office) levels. This ambiguity influences all further TUM efforts at State.

Alongside 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. For example, at Private, there was an expectation that the workflow around annual reporting would change. While the specific usage rule (review and correct data in FP) is clearly articulated in the first memo, how the workflow will change around annual reporting is left purposefully ambiguous by stating that annual reporting functionality
will become available later. At State, the first memo is relatively ambiguous on both the new workflow (data in FP will be used for planning and budgeting) and the specific usage rules (FP can be used for individual CV management). With new coordination mechanisms left under-established, it is unsurprising that concerns as to what exactly is done with the data inputted into FP arose again later in the project, when rumors around new performance control systems started to circulate.

Beyond intrapreneurs’ activities (e.g., initial set up of the technology) and the various *meta-messages* or *signals* these send, the FP artifact itself also expresses messages or *symbolic expressions* to users. These symbolic expressions interact with intrapreneur signals to facilitate the emergence of general messages that the users perceive the situation (implementation of the system by particular intrapreneurs) to express. For example, at State, initial communication from the CA office (setting up FP as a CV management tool and signaling only one expected purpose for the tool) interacted with the technical restrictions (e.g., standardized categories, data entry taking a long time), which lead to FP taking on various symbolic expressions (e.g., assembly line, demoralizing). These expressions interacted further with the lack of communication from the CA office and doubts about the CA office’s ability to solve faculty problems (Figure 3.4), leading to the general message, where users perceived the situation as “abnormal” (Figure 3.4).
Table 3.5: TUM activities, their symbolic meta components and possible consequences

<table>
<thead>
<tr>
<th>TUM Activity</th>
<th>Symbolic Meta Components</th>
<th>Examples from State &amp; Private</th>
<th>Possible Intended and Unintended Consequences</th>
</tr>
</thead>
</table>
| **Creation of New Structures** (creating mechanisms in the organization that promote the learning of a new technology by end-users such as est. of technical support groups) | Intrapreneur signals:  
- Competence (credibility & authority) of the lower-level and top management intrapreneurs | State: lack of signal (no formal establishment of CA office as sanctioned intrapreneurs; no formal establishment of support personnel) Private: Provost introduces FP and establishes CT team as an authorized point of contact (also describes their work on FP). | State: Intended: CA office gets reports from FP.  
Unintended: CA office has to deal with configuration / faculty. Faculty have no contact point.  
Private: Intended: CT office handles all aspects of the FP project. Faculty are informed |
| **Establishment** (intrapreneurs introduce the technology, the way users should adopt the technology is articulated) | Intrapreneur signals:  
- Competence of decision to buy and implement new IT  
- Purpose and role of new IT (set up distinctions)  
- Expected usage  
Intrapreneur signals + Artifact symbolic expressions:  
- facilitate emergence of (positive) heeded messages for different user groups  
- facilitate the emergence of heeded messages of user value & qualifications | State: lack of signal. Private: listing other prestigious universities that have implemented FP.  
State: FP as single-purpose.  
Private: FP as multi-purpose  
State: CV maintenance.  
Private: online profile, CV & annual report management.  
State: lack of competence signals + single-purpose expectation + technical limits -> negative heeded SE.  
Private: competence signals + multi-purpose expectations + technical limits -> positive & negative heeded SE.  
State: structures in FP express a lack of value placed on faculty uniqueness & qualifications (lack of communication from intrapreneurs signals the same). Private: Faculty included in FP configuration, signaling faculty value (revised structures in FP express the same) | State: Intended: Use of FP for keeping an up-to-date CV. Administration can pull data from FP for various reporting purposes.  
Unintended: Faculty feel insecure about what happens to the data in FP; FP is barely used.  
Private: Intended: Use of FP for keeping an up-to-date CV, incentive of having an automatic web profile and easier annual reporting.  
Unintended: No significant unintended consequences, pilot relatively successful. |
| **Creation of New Coordination Mechanisms** (intrapreneurs articulate new patterns of work flow) | Intrapreneur signals:  
- New workflow (how new IT usage fits with other existing procedures) | State: ambiguous signal; how new system fits with existing practices left unclear. Private: ambiguous signal; expectation that new workflow will be explained at a later time |
One type of these general messages that is of particular importance to TUM is related to whether the situation is perceived to express that users and their qualifications (authority) are being valued (Table 3.5). For example, the inclusion of key users in the configuration of FP at Private signaled to the faculty members concerned that they were the most qualified authority to comment on the suitability of FP for their work practices. This message was reinforced by the fact that the modified information structures in FP (based on faculty feedback) conveyed a similar symbolic expression of supporting particular user needs (see Figure 3.6). At State, faculty members were also involved in feedback sessions, but post roll-out. Furthermore, the standardized information structures within FP (not fitting the needs of the very diverse faculty at a large state institution), again, suggested their own symbolic expressions (see Table 3.5).

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). In our cases, reinforcement activities were accompanied by adjustment (technology adaptation efforts at Private) and by the creation of new structures (data entry support personnel at State). The focus of the intrapreneurs’ activities lies in reviewing and reinforcing their communication efforts to maintain and strengthen the positive messages the technology implementation is sending and alter the negative ones (Table 3.5 cont.). 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 signaling formal reinforcement of FP, signaled 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, favoring people “who are easy to work with”. For these key users, the standardized format of FP conveyed a positive symbolic expression of enabling more valid comparisons of different faculty members—metaphor “comparing apples to apples” (Figure 3.6). However, users not involved in feedback sessions lacked signals of their own value as well as the reinforcement of existing positive symbolic expressions, thus, leading to the formation of more negative symbolic expressions (e.g., FP misrepresents faculty).

Adjustment activities focus on modifying the technical features and the usage rules of the new technology to promote use (Orlikowski et al., 1995: 439). 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 value and qualifications (Table 3.5 cont.). For example, at Private, the formal e-mail memo delineating the benefits of using FP for annual reporting used terms such as “streamlining”; “no need for re-entry”, 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. The term “colleagues” rather than, for example, “administration”, attempts to generate imagery of unity rather than divisions within the university. Despite these efforts, for some A&S faculty, this change in workflow, in conjunction with limited personalization functionality within FP, lead to the symbolic expression of lack of fit. Moreover, the mandatory change in workflow signaled the implementation teams inability (i.e., lack of competence or desire) to address this lack of fit (Figure 3.6),
confirming their view that A&S faculty were not seen to have equal value because there was no attempt to recognize the unique needs of A&S faculty.

At State, the formal change in usage rules was overshadowed by the informal rumors (of a new performance control system). We have not included the creation of a performance control system as a separate TUM activity in Table 3.5, because it never actually happened. Rather, the informal e-mail constitutes an unsanctioned mediation effort attempting to reinforce existing negative messages around FP implementation and persuade faculty to resist the new system. The importance of unsanctioned TUM efforts remains to be explored in future research. In our case, the unsanctioned effort perpetuated the “abnormality” message – 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. There is also a clear “us versus them” opposition, with “administration” (most likely referring to top management) being associated with “them”, who wish to punish “us” – the faculty. FP implementation comes to express a lack of respect (towards academics as people), to which faculty members respond with overwhelming worry.
Table 3.5 cont.: TUM activities, their symbolic meta components and possible consequences

<table>
<thead>
<tr>
<th>TUM Activity</th>
<th>Symbolic Meta Components</th>
<th>Examples from State &amp; Private</th>
<th>Possible Intended and Unintended Consequences</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reinforcement</strong> (intrapreneurs help users to incorporate the new technology into their work practices, providing advice, demonstration, and hand-holding)</td>
<td>Intrapreneur signals: - reinforcement of expected usage (usage rules) - reinforcement of decision &amp; intrapreneur competence</td>
<td>State: inadvertent change of usage rules. <em>Private:</em> reinforcement for key users, no signal for others <em>State:</em> signal of incompetent decisions. <em>Private:</em> reinforcing competence for key users (no signal for others). <em>State:</em> no change + new negative SEs. <em>Private:</em> reinforcing positive SEs for key users, no change for others. State: varying levels of support signal some faculty are more valued than others. <em>Private:</em> faculty value signaled to key users, but not to all end-users.</td>
<td>State: Intended: Reduce backlash, get faculty to use FP for updates. <em>Unintended:</em> Faculty send CVs off and never think about FP again or feel unjustly punished. <em>Private:</em> Intended: Get faculty buy-in; improve FP. <em>Unintended:</em> Some faculty feel ignored &amp; that the system is not designed to represent all of them equally well.</td>
</tr>
<tr>
<td></td>
<td>Intrapreneur signals + Artifact symbolic expressions: - facilitate reinforcement of (positive) heed messages - facilitate the reinforcement of heed messages of user value</td>
<td>State: formal signal of planning &amp; reporting tool, still labeled as CV management; informal signal of link to gradated pay raises. <em>Private:</em> annual reporting tool. <em>State:</em> only one year’s activities required. <em>Private:</em> FP use for annual report is mandatory. <em>State:</em> formal signal lists CA team as contact; informal signal of incompetent admin. decisions. <em>Private:</em> CT team praised for their work &amp; listed as contact. <em>State:</em> addition of negative SEs. <em>Private:</em> emergence of both positive and negative SEs for all users. <em>State:</em> informal signal that about 30% of faculty are not valued &amp; not qualified for a raise. <em>Private:</em> lack of signaling to broader user group (beyond key users); lack of signaling to some A&amp;S faculty.</td>
<td>State: Intended: Get faculty to use FP for yearly updates. <em>Unintended:</em> further strong negative backlash based on rumors of gradated raises. <em>Private:</em> Intended: Get up-to-date data on faculty activities at least yearly. <em>Unintended:</em> A&amp;S vs. business issues surface.</td>
</tr>
<tr>
<td><strong>Adjustment</strong> (intrapreneurs make changes to the technology and/or the usage rules to facilitate incremental changes to use practices)</td>
<td>Intrapreneur signals: - new role of IT (new distinctions) - change in expected usage rules - reinforcement of decision &amp; intrapreneur competence</td>
<td>State: formal signal of planning &amp; reporting tool, still labeled as CV management; informal signal of link to gradated pay raises. <em>Private:</em> annual reporting tool.</td>
<td>State: Intended: Get faculty to use FP for yearly updates. <em>Unintended:</em> further strong negative backlash based on rumors of gradated raises. <em>Private:</em> Intended: Get up-to-date data on faculty activities at least yearly. <em>Unintended:</em> A&amp;S vs. business issues surface.</td>
</tr>
<tr>
<td></td>
<td>Intrapreneur signals + Artifact symbolic expressions: - facilitate reinforcement of existing (positive) messages &amp; the emergence of new ones - facilitate the emergence / reinforcement of messages of user value</td>
<td>State: formal signal of planning &amp; reporting tool, still labeled as CV management; informal signal of link to gradated pay raises. <em>Private:</em> annual reporting tool.</td>
<td>State: Intended: Get faculty to use FP for yearly updates. <em>Unintended:</em> further strong negative backlash based on rumors of gradated raises. <em>Private:</em> Intended: Get up-to-date data on faculty activities at least yearly. <em>Unintended:</em> A&amp;S vs. business issues surface.</td>
</tr>
</tbody>
</table>
Actor Roles in TUM Activities

Overall, we find that there are mainly three kinds of actors involved in TUM — intrapreneurs (both lower-level and top management), the technology artifact itself and end-users. We find that the role that each of these actors plays in a particular mediation situation is essential in understanding the meaning of the meta-communication that is achieved relationally between the interplay of senders and receivers. We outline this argument below.

Intrapreneurs

First, we found that often the mediation activities were undertaken jointly by lower-level and top management intrapreneurs. In such cases, it is crucial for the human mediators to establish and clearly communicate their role in order for their efforts to be successful. For example, at Private, the formal memo introducing FP and setting up first usage rules came from the Provost. However, the CT office was articulated as the contact point, taking over the establishment activities. To end-users this signals that the top management intrapreneurs’ competence lies in decision-making, while the lower-level intrapreneur competence lies in faculty liaising and problem solving. Conversely, at State, this division of roles was left unclear. The first memo introducing FP came from the CA office, despite the implementation decision being made by the Provost. This introduced inherent ambiguity as to the role of the CA office and a lack of clarity around decision-maker competency.

Technology Artifact

Second, mediation also happens through the technology artifact (FP) itself. We have indicated this in Table 3.5 by separating the kinds of meta-messages that come only
from intrapreneurs from those that arise from the interactions of intrapreneur signals and the artifact symbolic expressions. Again, we find that the particular role the artifact plays is important in understanding the kinds of meta-messages it expresses.

For example, our findings show that FP failed in its infrastructural role (cf. Nicolini et al., 2011) at State, while being marginally more successful at Private. At State, it was constantly visible, contested and the ‘abnormal’ way of doing CVs, whereas the previous situation (use of MS Word) took on the role of invisible infrastructure (the ‘normal’ way of doing CVs). At Private, FP was also visible, but increasingly accepted as the ‘new normal’ way of doing annual reports (not of doing CVs, however) (see Figure 3.6).

At State, FP also failed in its role as a boundary object (cf. Nicolini et al., 2011). By design, FP strives to provide a centralized place for all faculty members to record and maintain information regarding their work activities. Faculty members could then use this information to generate a CV; an annual report; build their tenure case, etc. At the same time, FP aims to provide university administrators with a tool to run accreditation reports. In short, during a typical academic year, FP’s role is designed to be mainly infrastructural – it should invisibly support faculty in their efforts to keep track of their activities. During accreditation and annual faculty evaluation time, FP transitions into the role of a boundary object. In order to be a successful boundary object, FP should have a common structure to be recognizable across the social worlds of the faculty, department chairs and administrators, while, at the same time, satisfying the information requirements of all (Star and Griesemer, 1989; Nicolini et al., 2011). In reality, however, rather than satisfying the concerns of
multiple social worlds, FP was perceived rather more as an ‘imperialist’ imposition of administrative information requirements on faculty members that silenced other kinds of possible representations (cf. Star and Griesemer, 1989). As a result, the information collected through FP was not complete or accurate enough for accreditation reporting.

While our findings show no evidence of FP becoming an epistemic ‘thing’ (cf. Nicolini et al., 2011) for faculty in either setting, there is some evidence of FP becoming an epistemic thing for the intrapreneurs, and an interesting transitional link is suggested by our data. At Private, the CT office (intrapreneurs) were motivated and interested in taking charge of FP implementation and serving as an ‘interface’ between faculty members and the software vendor (Figure 3.6). The building of customized web profiles for every faculty member based on FP data also shows interest in exploring the potentials of the new ‘thing’ (FP). We also saw that FP was a more successful material infrastructure and a boundary object at Private. Conversely, at State, the CA office was rather less enthusiastic and motivated in taking on the role of intrapreneur (Figure 3.4) and exploring the possibilities of FP. As a result, we also saw that FP was a less successful infrastructural and boundary object at State.

Lastly, our findings confirm that much of the activity around FP was motivated and sustained by its contradictory nature. As such, FP was often fulfilling the role of an object of activity (cf. Nicolini et al., 2011), even when it failed to fulfill the role of a material infrastructure, boundary or epistemic object. For example, the memo – addressed to all faculty at State – outlining the limitations of FP in capturing the quality of academic work and, in essence, encouraging the boycott of FP, is
motivated by the conflicts between quantitative and qualitative measures inherent in a tool such as FP.

**End-Users**

The importance of end-user roles is not independent of artifact roles. Different groups of end-users interact with FP in different ways, FP plays different roles for them and they interpret intrapreneur activities and the affordances/constraints of FP in various ways. Our findings demonstrate the non-homogeneity of end-users – the heeded messages of FP implementation are considerably different across faculty (including faculty members across different disciplines, e.g., A&S and Business at Private), department chairs and administration. We will return to this issue in the next section as well as in our discussion, where we consider the intended and unintended consequences of meta-communication in TUM.

**Intended and Unintended Consequences of Meta-Communication**

As shown in Table 3.5, each of the mediation activities and its meta components have intended and/or unintended consequences in terms of its influence on users’ attitudes towards and use of the new technology. It is particularly important for intrapreneurs to understand the various consequences that their signaling (as well as the artifact symbolic expressions) may have as this can help them plan better TUM efforts.

First, the signaling of intrapreneur competence allows them to establish their credibility, which in turn allows them to effectively persuade or coerce users to change their opinions towards a new technology (Rivard and Lapointe, 2012). Some of the ways intrapreneurs can establish themselves as competent and credible experts
are related to communicating the nature of their work, the reasoning behind the technology implementation and by involving end-users in technology adaptations. Furthermore, the signaling of intrapreneur competence needs to be reinforced throughout the mediation activities, for example, when usage rules are changed (Table 3.5). It is also important for intrapreneurs not to inadvertently create ‘outsider’ groups (as happened with some A&S faculty at Private). Lack of communication and ignoring the feedback from users (e.g., using the system constraints as an excuse to not meet user needs) are ways of signaling a lack of competence. In such cases, the users are likely to perceive a lack of clarity in who is responsible for the project and be doubtful about the capabilities of the intrapreneurs in solving their issues (see Figure 3.6). Overall, the unintended consequence is the creation of a difficult environment for further mediation activities and for facilitating effective technology use.

Second, the signaling of the distinctive purpose(s) and implied usage practices of the new IT is important because this creates expectations in users in terms of the various roles the artifact is going to play, and interacts with the technical object to produce particular symbolic expressions. For example, at State, FP was categorized by the intrapreneurs only as a CV maintenance tool – for faculty. Thus, FP obtained an infrastructural role. With only one potential role and purpose for FP in their minds, to which FP was less suited than another tool like MS Word, the unintended strong negative attitude (“horrible” system) and general messages of ‘abnormality’ prevailed (cf. Langer, 1989). As a result, FP was used by only a small fraction of the faculty. At Private, FP was categorized by the intrapreneurs as an online tool to help in producing individual profiles and CVs, and annual reports. Thus, at least two roles
were explicitly created (an infrastructural role of helping faculty manage web profiles and activities, and a boundary object role of helping faculty communicate their work to the external world and the administration). The users were able to see multiple potential uses for the system, many different (positive and negative) symbolic expressions emerged, and the majority of faculty members used FP for at least one of its intended purposes (ie., annual reporting).

Third, the activities of both lower-level and top management intrapreneurs interact with the functional and material limitations and affordances of the technology, leading to the emergence of various symbolic expressions (Markus and Silver, 2008) of the technology for different user groups. For example, establishment of FP as a purely CV management tool jointly with the standardized nature of the tool lead to the symbolic expression of ‘assembly line’ at State. These artifact symbolic expressions then interact with intrapreneur signals (related to intrapreneur competence, etc.) to send messages to users related to whether the users perceive that they and their qualifications (authority) are being valued.

To illustrate - data categories in a standardized software tool valorize 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 – as happened at Private. If faculty members then also perceive that the intrapreneurs lack the desire or capability to address this issue, the dangerous unintended consequence is that FP comes to place 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. In attempting to be a boundary object, FP creates people on the margins, who need to resolve the conflict between how they want to be presented as academics in their social world (e.g., in natural sciences) and how FP as a standardized form that needs to be recognizable across multiple disciplines (e.g., natural sciences, arts and business) can actually present them. As our data show, categorizing one’s work as ‘Other’ can also be problematic, because it is more “demoralizing” than trying to make it fit into unfamiliar, but at least, named categories. This remains an under-studied, yet important theme for future research.

**DISCUSSION: THEORETICAL AND PRACTICAL IMPLICATIONS**

Prior research on technology-use mediation (TUM) has demonstrated that the effectiveness of the mediation activities is influenced by a number of factors, including the level of understanding the intrapreneurs have with regard to users’ practices and norms as well as the technology in use; the credibility of the intrapreneurs with the users; the influence the intrapreneurs have on system developers and organizational authorities, organizational size (availability of resources), organizational environment (e.g., industry), 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. For example, intrapreneurs not only facilitate use and interpret the technology for users, but also actively create the technology by enacting their ideas of it (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 intrapreneurs engaging in TUM activities meta-communicate: their own (in)competence; (in)competence of the decision to implement the new IT, and the distinctive purpose(s) of the new IT. The IT artifact itself, at the same time, meta-communicates various symbolic expressions to different user groups. The interaction of these symbolic expressions and intrapreneur signals is particularly important because it sends to users (more or less positive) messages related to the general implementation situation and the value placed on end-users and their qualifications (Table 3.5).

Theoretically, we extend the TUM framework in two ways. First, we unpack the different TUM activities into specific symbolic meta components to allow for researchers to understand the consequences (and success or failure) of TUM efforts in more detail. Second, we outline four different ways in which the IT artifact mediates its own use. Practically, by identifying this set of meta components (Table 3.5) that are part of different mediation activities, we provide intrapreneurs with a kind of mental checklist of communication elements they should be aware of in order to carry out their mediation activities effectively. We summarize both our theoretical and practical contributions in Table 3.6 below.

**Technology-Use Mediation Revisited: Meta-communication and the mediating role of IT in its own use**

First, we demonstrate that the execution of mediation activities (even with the facilitating factors described above being present) is not unproblematic. In order to understand how mediation actually happens, we need also to understand the details of the (meta-)communication associated with the efforts of the intrapreneurs.
Unpacking the different TUM activities into specific symbolic meta components allows researchers to understand the success or failure (the intended and unintended consequences) of TUM efforts in more detail. For example, a failure to establish a new technology can be traced to specific meta-communication elements, such as elements that convey the devaluation of users and their qualifications (e.g., expressed by an IT artifact that provides no categories for certain types of behaviors, thus rendering these behaviors irrelevant, and so inferring that the faculty member who undertakes them is not doing very important work) and/or intrapreneur incompetence (e.g., signaled by a failure to understand user concerns).

Second, we contribute to the theoretical development of the TUM framework by suggesting that technology-use mediation, which is generally considered something performed by human actors only (cf. Orlikowski et al., 1995; Novak et al., 2012), unfolds both through human interventions and through the medium of the technology itself. The role of the IT artifact as a material object and a sign in mediating its own use has so far been relatively unexplored in TUM literature. However, the mediating role of IT artifacts has been more thoroughly investigated in the literature in terms of boundary objects and other roles that artifacts may play in work situations (e.g., Levina and Vaast, 2005; Nicolini et al., 2011). In our research, we built on Nicolini et al. (2011), who proposed that objects in collaboration can be conceived of in four ways: as boundary devices; infrastructures; epistemic things, and objects of activities. Furthermore, a particular object can transition between these roles over time (ibid.: 14). In our analysis, we utilized this distinction to outline the different roles an IT artifact can play (and, correspondingly, convey different symbolic expressions). Here, we consider the implications of making this distinction
on the TUM framework – in particular, we propose four ways in which an IT artifact can mediate its own use.

First, many packaged software tools (like FP) are, or strive to be, material infrastructures for the work practices they support. The aim is that they become taken-for-granted and invisible – a part of ‘this is how we do things around here’ (ibid.: 13). The insight for TUM framework from this is that as infrastructure, an IT artifact mediates its own use through its level of invisibility and taken-for-grantedness. That is, the extent to which it contradicts or supports the efforts of the intrapreneurs and hinders or supports the work practices of its users. For example, when FP’s capabilities contradict the intrapreneurs’ efforts to frame it as CV management tool (State), FP becomes particularly visible as failing in its infrastructural role. Conversely, when FP’s capabilities support the intrapreneurs’ efforts to frame it as an annual reporting tool (Private), FP becomes less visible and more taken-for-granted as the new infrastructure.

Second, many packaged software tools (like FP) also strive to function as boundary objects, specifically as standardized forms (Star and Griesemer, 1989). The aim of such standardized forms is to satisfy the concerns of multiple social worlds. The insight for the TUM framework from this is that as a boundary object, an IT artifact mediates its own use through the links it evokes to different social worlds and processes inhabiting these worlds and taking place on different timescales (Lemke, 2000). FP as a boundary object (successful or not) links the social worlds of the administrators, the faculty and higher education in general and processes such as faculty self-presentation, the yearly evaluation of faculty productivity and the
changing standards of evaluation taking place over decades. How faculty (as users) interpret FP and begin to use it for self-presentation is, thus, mediated by the systems of meanings related to broader processes and other social worlds that the artifact evokes. At State, the evoked systems of meanings were such that they contributed to creating further boundaries, rather than spanning these.

Packaged software (like FP) can also function as an epistemic ‘thing’ (Nicolini et al., 2011). Epistemic things embody ‘what one does not yet know’, and therefore, by virtue of their unknown character are a source of interest and motivation (ibid.: 7). In the case of FP, it functioned more or less as an epistemic thing to the intrapreneurs in charge of technology-use mediation, but packaged software more generally could also be an epistemic thing to implementation teams, or even to users in the early stages of their training. The insight for the TUM framework from this is that, as an epistemic thing, an IT artifact mediates its own use through the level of motivation it engenders (i.e., its ability to promote exploration and reflection). Also, we find that an IT artifact that is more successful in its epistemic role can lead to it being more successful in its other (infrastructural and boundary) roles. The fact that FP generated more motivation among the intrapreneurs at Private than at State to explore what it could become, also lead to clearer signals of intrapreneur competence, exploration of more potential purposes for FP and, generally, more successful TUM efforts at Private than at State.

Finally, the concept of objects of activity is similar to epistemic things, but proposes that objects not only motivate and sustain the interest of humans through their ‘unknown’ quality, but also by creating contradictions and conflicts (Nicolini et al.,
The insight for the TUM framework from this is that, as an object of activity, an IT artifact mediates its own use through the level of contradiction and conflicts it entails. This is quite opposite to the IT artifact as an infrastructural object that mediates its own use through its level of invisibility and, in essence, the obscuration of conflict. FP, as an object of activity, created multiple conflicts. At Private, its standardized format and use of certain classification systems created contradictions between A&S and Business faculty members. This prompted many A&S faculty to express concern and even opt out of using FP when their concerns were not considered. At State, the same standardized format created contradictions between faculty members and administrators with different understandings of what constitutes ‘meaningful’ measures of productivity. This prompted faculty to undertake their own, unsanctioned mediation effort to encourage user resistance to FP (Figure 3.4).

In sum, we find that an IT artifact mediates its own use in four ways. As infrastructural objects, IT artifacts mediate their own use through their level of invisibility and taken-for-grantedness (i.e., their ability to seamlessly support the work practices they are intended to support). As boundary objects, IT artifacts mediate their own use through the kinds of links they create to different social worlds (i.e., their ability to evoke systems of meanings that allow users to make partial sense of related social worlds). As epistemic objects, IT artifacts mediate their own use through the level of motivation they engender (i.e., their ability to promote exploration and reflection). As objects of activity, IT artifacts mediate their own use through the level of contradictions and conflict they entail (i.e., their inherently partial representation of a particular social world/practice). Interacting with this ensemble of mediating roles of
the IT artifact itself, are the here-and-now activities of the intrapreneurs. Intrapreneurs’ efforts can influence both artifact functionality (i.e., its invisibility) and the kinds of symbolic expressions that become evoked for the users (e.g., by describing FP as “streamlining” annual reporting, intrapreneurs evoke the link between FP use and higher education institutions becoming more business-like).

Table 3.6: Overview of Main Contributions

<table>
<thead>
<tr>
<th>Prior Research</th>
<th>Our Contribution</th>
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<tbody>
<tr>
<td>Mediation process is <em>open-ended and emergent</em>. Intrapreneurs actively create the technology by enacting their ideas of it (Bansler and Havn, 2004).</td>
<td>We <em>unpack</em> the open-ended and emergent TUM process. We show that intrapreneurs engaging in TUM activities meta-communicate the: (in)competence of the intrapreneurs; (in)competence of the decision to implement the new IT; distinctive purpose(s) of the new IT. The IT artifact meta-communicates various symbolic expressions to different user groups. The interaction of these symbolic expressions and intrapreneur signals, then, sends to users (more or less positive) messages related to the general implementation situation and the value placed on end-users and their qualifications.</td>
</tr>
</tbody>
</table>
| TUM refers to *human activities* - “a set of deliberate, ongoing, and organizationally-sanctioned activities ... that help to adapt a new ... technology to [a specific] context, [...], and facilitate the ongoing effectiveness of the technology over time” (Orlikowski et al., 1995: 424). | We argue that technology-use mediation unfolds both through human interventions and through the *medium of the technology itself*. How users interpret and begin to use a new IT is mediated by the different roles of the artifact and the, correspondingly, different *symbolic expressions* it conveys. In short, the IT artifact mediates its own use in four different ways:  
1. IT artifact in infrastructural role mediates its own use through its invisibility and taken-for-grantedness in supporting work practices  
2. IT artifact in boundary object role mediates its own use through the links it creates to other social worlds and systems of meanings  
3. IT artifact in epistemic thing role mediates its own use through motivating exploration and reflection  
4. IT artifact in object of activity role mediates its own use through the contradictions and conflict it entails       
Interacting with this complex ensemble are the here-and-now activities of the intrapreneurs, which can influence artifact functionality and which systems of meanings are evoked for the users. |
| Effectiveness of the mediation activities is influenced by the *credibility of the intrapreneurs* with the users (Novak et al., 2012; Orlikowski et al., 1995). | We confirm prior research and outline how credibility can be achieved through signaling of intrapreneur competence. We also outline practical suggestions on how intrapreneurs can signal their own competence. |
We now offer a brief practical discussion on why the different meta components we identified in our study matter in TUM.

**Practical Implications**

Practically, by identifying the different kinds of meta components important in TUM, 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.

First, we confirm prior research that has shown the critical importance of intrapreneur credibility in the success of technology-use mediation (cf. Novak et al., 2012; Rivard and Lapointe, 2012). By signaling their own competence, intrapreneurs establish their authority, power and credibility. Credibility is what allows intrapreneurs to create a “regime of truth” (Foucault, 1980) to support their intervention and build a legitimate domain of knowledge that supports use (Avgerou and McGrath, 2007). Accordingly, intrapreneurs are also better able to effectively persuade or coerce users to change their opinions towards a new technology (Rivard and Lapointe, 2012). Some of the ways intrapreneurs can establish themselves as competent and credible experts are related to communicating the nature of their work and the reasoning behind the technology implementation.

By facilitating the emergence of the message of users and their qualifications being valued, intrapreneurs indirectly reinforce their own competence. Intrapreneurs can facilitate the emergence of this message by directly involving users in the configuration of the software or changing the information structures based on user requirements (Andersen, 2001). Changing information structures based on user requirements also facilitates the emergence of positive symbolic expressions for
various users. Stein et al. (2012a) demonstrated that symbolic expressions of IT are cues to which users respond with specific emotions and distinct use patterns. One of the aims of intrapreneur efforts, thus, should be influencing the creation, maintenance and alteration of these expressions to discipline use of technology in ways that align with managerial intentions for the technology.

Lastly, (non)use behaviors, as well as other ways users express opinions about new IT, function as a feedback signal to the intrapreneurs. However, by overly focusing on outcomes, intrapreneurs may have a tendency to “attribute all [their] troubles to a single cause [and] limit the range of solutions [they] might seek” (Langer, 1989: 51). For example, we saw this at State in how intrapreneurs responded to user perceptions of FP as ‘horrible’ and the limited use of FP. No consideration was given to the kinds of meta-messages that intrapreneurs and the IT artifact had been sending (lack of competence signals from intrapreneurs; information structures within FP expressing devaluation of user uniqueness). This lead the intrapreneurs to see all the backlash and non-use (Figure 3.4) as exclusively caused by the excessive time it took to enter data into FP. An obvious solution was to offer data entry support (thus, reducing the burden on faculty). However, without appreciating the meta-messages their activities were sending, intrapreneurs offered the support inconsistently (Figure 3.4). In consequence, while before there was a lack of signal of intrapreneur competence, there was now a signal of biased decision-making. Further, this did nothing to address the messages of undervalued user uniqueness coming from the information structures within FP. In sum, the intrapreneurs’ response was not targeting all of the source causes — a non-congruent and incomplete rectification — which increased user resistance (Rivard and Lapointe, 2012).
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 *intra*-organizational IT implementation projects. The complexities of *inter*-organizational projects, therefore, need further investigation. It is likely that in projects with multiple partner organizations there will be many diverse, both sanctioned and unsanctioned, intrapreneur groups present. This can lead to conflicting signals, making the management and planning of TUM efforts more difficult. We saw some initial evidence of conflicting signals at State, where sanctioned usage rule change conflicted and was over-shadowed by unsanctioned rumors of possible change in performance control systems. This suggests that the impact of such conflicts under different conditions and the role of unsanctioned intrapreneur activities are important avenues for further research. Furthermore, our research settings permitted the detailed investigation of five types of TUM activities (establishment; reinforcement; adjustment; creation of new structures, and creation of new coordination mechanisms) – the symbolic meta components of the unexplored activities, therefore, need further examination.

In conclusion, 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 will lead intrapreneurs to mono-causal explanations of user resistance and, accordingly, to incomplete rectification and unsuccessful persuasion efforts (Rivard and Lapointe, 2012). For IS researchers, we expand current theories
of technology–use mediation. We outline a number of meta-communication processes that are critical in understanding the successful or unsuccessful unfolding of mediation efforts. Importantly, we extend the TUM framework by describing the role the new IT artifact plays in mediating its own use. In sum, how users interpret a new IT and begin to use it for particular activities is mediated by the activities of the intrapreneurs, and by the artifact itself. Specifically, the artifact mediates its own use by what it allows the users to do, by the contradictions and ‘unknown’ mysteries it entails, and by the systems of meanings related to broader processes that it evokes.
PART IV: DISCUSSION – TOWARDS A PERSONALIZED CONCEPTUALIZATION OF IT USE AND NON-USE
This dissertation started out by commenting on the under-personalized nature of many existing accounts of IT use and non-use in the workplace. It set out to fill some of this gap by exploring the role of emotions and professional identity in technology use. The findings across the three papers confirm that the inter-linked nature of emotions and identity and their role in technology use is best captured by the notion of subjective experience of agency – “the elaborate sense of self, which allows a person to position herself relationally against unfolding social [and material] reality [...], which is felt affectively” (Thompson, 2012: 195). In this section, the aim is to describe more broadly what a personalized account of IT use and non-use would look like.

Building on the insights gained from the empirical studies outlined above, this section lays out a sketch of a descriptive theory (cf. Gregor, 2006), integrating the different concepts introduced in the three papers, supported by empirical evidence across different research settings.

Building on extant research and various conceptualizations of IT use, this program of research defined IT use as a set of qualitatively distinct patterns of behavior, which are characteristic to particular situations and may involve both elements of use and non-use. This definition formed the foundation from which the exploration of the role of users’ emotions and self-identity in IT use began. Based on the three studies, each exploring this topic from a different angle, an integrated picture of a personalized conceptualization of IT use and non-use can be drawn. In short, this conceptualization consists of three elements: 1) the distinct sequences of action that make up a pattern and involve the use and non-use of various IT artifacts/features within artifacts in a particular context; 2) the unique felt quality of each pattern; and 3)
the positioning of self (focal user) and others in relation to the social and material reality of the use pattern. Each of these elements is considered in more detail below.

**DISTINCT SEQUENCES OF ACTION OF A USE PATTERN**

The conceptualization of the distinct sequences of action making up a use pattern is, in essence, based on a synthesis of prior research and the empirical evidence gathered during this research. The contribution of this dissertation, therefore, lies in the theorizing of the other two elements – the felt quality of use patterns and the positioning of the self and others in relation to the patterns – and their integration with what can be called the pattern-perspective on IT use.

As outlined above, the pattern-perspective on IT use is founded on the understanding that social actors’ use and non-use of particular IT systems (and features within systems) always happens within a specific context (Agerfalk and Eriksson, 2006; Nardi and O’Day, 1999). This builds on the notion that IT use is both goal-oriented (most of IT use at work is about trying to achieve some kinds of work tasks) and socially-conditioned (these work tasks are part of broader practices, conditioned by social norms, expectations, etc.). The concept of social actor (Lamb and Kling, 2003) allows the capturing of the idea that IT users are first and foremost people going about their lives, which may include utilization of various IT artifacts. Therefore, IT use always unfolds within a set of evolving relationships between people, technology and practices and is never just about one individual using one IT artifact in isolation. Context-specificity also suggests activity-centrism in that the IT features relevant in a particular use pattern are those that afford (or do not)
meaningful symbolic and instrumental activities for the social actors (Markus and Silver, 2008).

Combining these insights from prior research with the empirical evidence presented in this dissertation suggests that in order to understand social actor’s meaningful, contextual use of IT as it unfolds in the workplace, the first step is to identify the unique combination (sequence) of actions, involving both use and non-use of features and various IT tools that are part of a broader infrastructure. Restricting the study of IT use to individual, isolated IT artifacts (even if on a feature-level) cannot portray the point that IT use is about patterns of behavior around meaningful activities. For example, as researchers, we all have distinct patterns of use involving a text editor (e.g., MS Word), a citations management system (e.g., EndNote) and a research database (e.g., Google Scholar) around the activities of paper writing and paper reviewing. Describing the details of these patterns can demonstrate their distinctiveness, which makes them recognizable across individuals and situations and draws out the relationship between people, technologies and practices, which remains invisible when equating IT use to intentions to use or the breadth, depth and frequency of use of a particular technology. Adopting a pattern-level of analysis for IT use also has significant methodological implications, which will be considered later in this discussion.

**FELT QUALITY OF A USE PATTERN**

The second element of a personalized account of IT use is the felt quality (cf. Ciborra, 2006; Feigl, 1967) of each use pattern. In essence, as individuals use IT in a work setting that includes other people and tools, they cannot help but reflect consciously
on and feel their position in relation to this setting (Thompson, 2012; Stein et al. 2012b). While the first step in understanding social actors’ meaningful, contextual use of IT was to identify the unique sequences of actions making up the patterns, the second step is to make the felt quality of the patterns visible. This can be done by tracing a particular use pattern back to the emotional experiences of the social actors and the cues that elicited these emotions in the first place, as demonstrated in the second study. The felt quality of a use pattern describes one part of the subjective experience of agency – how the social actor affectively feels their position in relation to the material and social reality of the use pattern – that this research set out to explore. The material and social reality of the use pattern is described well through identifying the distinct sequences of meaningful action involving multiple IT artifacts and features, as described above. However, what is missing in such an approach is the recognition that there are feelings associated with how social actors carry out these sequences of actions, with their individual idiosyncrasies and local variations.

Returning to the example of researchers writing papers, first, there are most likely multiple use patterns associated with this activity. For example, there might be a few distinct patterns for the writing itself and another pattern for creating the bibliography. These patterns will also have distinctly unique felt qualities about them. The writing patterns may all have broadly similar sequences of action – typing text into a text editor, making edits and tracking the changes, adding comments, etc. – but it feels quite different to write the first draft of a paper compared to writing the 10th revision. These differences in the felt quality will also reflect in the nuances of the IT artifacts and features used and not used, but, more importantly, they reflect
the differences in the *subjective experience of agency* (Thompson, 2012) of using the text editor to write that first draft or the 10th revision.

While the nuances of a researcher's text editor use may not be critically important, similar nuances in an accountant's use of an ERP system and in an academic's use of a productivity evaluation system are very important and business-critical. A good example emerged in the second study considered in this dissertation. The findings showed that the activity of completing annual activity reports could be done by faculty members, either by following a pattern of exercising discretion or a pattern of gaming the system (among others). The specifics of used and non-used functionality of artifacts were similar for these two patterns, but the patterns were, nonetheless, distinct, because they differed in their *felt* qualities: cynicism (cf. Selander and Henfridsson, 2012) could be seen in gaming the system pattern, but was absent in the exercising discretion pattern. The different use patterns with their distinct felt qualities had direct consequences on the accuracy and level of detail of data inputted into the system and indirect consequences on the ability of administrators to run valid accreditation reports in it. Exploring the felt quality of each use pattern, again, has significant methodological implications, which will be considered later.

**POSITIONING OF THE SELF AND OTHERS IN A USE PATTERN**

The third element of a *personalized* account of IT use is the *positioning of the self and others* in relation to the social and material reality of the use pattern. As described above, while individuals use IT in a work setting that includes other people and tools, they cannot help but not only feel, but also reflect on their own and others position in relation to this setting (Thompson, 2012). The third step in
understanding social actor’s meaningful, contextual use of IT, therefore, is to make this sense of self and others, in relation to the use pattern, visible. As demonstrated in the first study, this can be done by exploring the narratives of the social actors around use patterns. This involves identifying and describing the narrative setting, positioning of the self and others and how (if at all) the various technologies are performed as landmarks in the narratives (Raggatt, 2006; Riessman, 2003).

However, the first study only examined situations where technologies became positive landmarks in professional self-narratives around which the self and others were positioned in different ways. In short, these were situations dominated by use patterns with positive felt qualities and in which the self was positioned in an empowered role in one way or another (e.g., the satisfaction of being able to explore new features of a technology and explain them to others). As outlined in the first study, in these situations, there is a coincidence of personal preference (what kind of work the professional wants to do; how they want to be known) and normative expectations (what is expected of the professional) in relation to something the technology means (symbolism) or that can be done with the technology (function).

What happens in situations where this is not the case? While the second paper did not specifically explore this topic, a re-reading of the findings from this perspective reveals a few examples of such situations. The most drastic of these was the pattern of complete non-use – a deliberate choice not to engage with a particular IT artifact at all as part of one’s work activities. In such instances, there is an effort on the part of the social actors to purposefully exclude an IT artifact from their professional narratives, because it does not align with their personal preferences or normative
expectations (academics do not want to be under surveillance and/or have the considerable flexibility that is part of their professional lives restricted). *Gaming the system*, on the other hand, is an effortful, yet cynical (cf. Selander and Henfridsson, 2012), pattern of using the system for annual reporting or CV maintenance in a way that fills the minimal requirements, makes the faculty member look good, but does not, purposefully, convey the full extent and nature of their work. In this instance, there is visible tension between the personal preferences of faculty and the normative expectations placed on them and the IT artifact’s symbolism and functions not aligning with the first, but aligning with the second. The result is that the IT artifact becomes more of a negative landmark, around which the self is positioned as the ‘gamer’ and empowerment is drawn from being able to appear to be filling the normative expectations, while also rebelling against these in line with one’s own preferences. The IT artifact, therefore, becomes an object through which to fool the higher administration.

In short, the positioning of the self and others in relation to the social and material reality of the use pattern describes the second part of the subjective experience of agency that this research set out to explore. The felt quality of a use pattern and the positioning of the self and others in relation to that pattern were explored in two separate papers in this dissertation. This allowed each paper to examine the relevant phenomenon in detail without introducing too much complexity that would potentially obscure the particular relationships (between identity and IT; emotions and IT) that were explored. However, as the insights from the papers and this integrative discussion indicate, the felt quality of a use pattern and the positioning of the self and others in relation to it go hand in hand. The two also have a joint
influence on the accuracy and level of detail of data inputted into the system and an indirect influence on the broader success of the system in its organizational context.

Before considering the methodological implications of the three identified elements, the next section outlines the practical implications of adopting the proposed personalized perspective on IT use.

PRACTICAL IMPLICATIONS

Adoption and continued use of IT have garnered significant research interest over the past two or three decades, primarily because they underlie successful achievement of business benefits from IT implementations in work organizations (Peppard et al., 2007). Organizational capacity to influence IT use behaviors, either through managers, support or IT staff, has, therefore, received considerable scrutiny as well (cf. Orlikowski et al., 1995; Sharma and Yetton, 2003). Accepting the personalized perspective on IT use also holds consequences for these practically-oriented, technology-use mediation activities. As shown above, all three elements of a personalized conceptualization of IT use are reflected in the accuracy and extent of system of use and the overall success of the new system in its organizational context. Therefore, technology-use mediation (TUM) (Orlikowski et al., 1995) activities should also be geared towards establishing, reinforcing and adjusting all three elements.

The establishment, reinforcement and adjustment of particular use behaviors (sequences of action) have been most widely researched by existing studies (e.g., Davidson and Chiasson, 2005; Novak et al., 2012; Orlikowski et al., 1995). Particular use and non-use behaviors as well as user satisfaction form the usual measures of
system success (cf. Gable et al., 2003) and function as manifestations of user resistance (Rivard and Lapointe, 2012), therefore, also becoming the target for intervention efforts in attempts to steer a new system implementation in managerially desirable directions. Prior research has shown that communication of clear usage rules; adaptations to the technology; continuous training of users and ‘hand-holding’ (Gallivan et al., 2005; Orlikowski et al., 1995; Tyre and Orlikowski, 1994) can all facilitate effective technology use over time. The third study that contributes to this dissertation demonstrates that the process through which this influence takes place is largely meta-communicative. The technology artifact itself and the information (content and form) disseminated by managers send messages to users, helping them interpret and appropriate the new technology in particular (both intended and unintended) ways. Furthermore, the findings reveal that much of this meta-communication is related to managers attempting to influence how the users position themselves in relation to the new technology (expressions of the self) and how they feel about this position (emotions). The establishment, reinforcement and adjustment of use behaviors, therefore, goes hand-in-hand with the establishment, reinforcement and adjustment of the felt quality of use patterns as well as the positioning of the social actor’s self and others.

The positioning of the social actor’s self and others in relation to their social and material reality is most open to influence through the meta-message of social actor (user) value that the managers, jointly with the IT artifact, can send. The structure of the information stored in the technology as well as the users’ ability to have input into these matters convey to users the extent to which they are valued in the implementation project. Managers can facilitate the emergence of the message of
user value by directly involving users in the configuration of the software or changing the information structures based on user requirements (Andersen, 2001). These interventions are likely to create ownership feelings in the users, satisfying their need for control, for self-definition and for a space of their own, thus, also influencing their orientation towards change and altering continued system use (Barki et al., 2008). Furthermore, these interventions are likely to influence the ways in which social actors associate the new IT with particular aspects of their own status, power and performance – the identity work cue discovered in the second study. This cue was found to elicit strong emotional responses in social actors, supporting further the argument that a personalized account of IT use must examine the subjective experience of agency holistically – exploring both the social actor’s position in relation to the social and material reality (sense of self) and how this position is felt affectively. While reflection (identity work) may be found to precede feeling in a particular snapshot (as in the second study), they are always infused in the whole experience (Weick, 1995).

The felt quality of a use pattern (i.e., how the social actor feels their position in relation to the use pattern) is open to influence through all of the cues found in the second study. As described above, interventions geared towards the use behavior or the positioning of the self and others are also likely to influence the felt quality of the use pattern. One cue that is particularly important for the felt quality is IT symbolism, as both the second and third studies reveal. Manager behavior interacts with the functional and material limitations and affordances of the technology, leading to the emergence of various symbolic expressions (Markus and Silver, 2008) of the technology for different user groups. These symbolic expressions reflect a
system of meanings associated not only with the short-term processes the new IT was designed for, but also the longer timescale organizational, societal and institutional processes within which the short-term processes make sense. Furthermore, symbolic expressions of IT are cues to which social actors respond with specific emotions, which are reflected in distinct use patterns. The aim of technology-use mediation efforts is to create, maintain and alter these expressions to discipline use of technology in ways that align with managerial intentions for the technology.

Overall, the third study outlines a meta-communicative process, where the meaning of the intrapreneur signals and the artifact symbolic expressions is created jointly in the interplay between the senders (intrapreneurs and the IT artifact) and the receivers (end-users) of the communication. Theses signals and symbolic expressions then influence how end-users make sense of and appropriate the new technology. We argue that this meta-communicative process is one layer of the broader technology-use mediation process, but meta-communication can also be seen as a layer of framing (Davidson, 2006; Orlikowski and Gash, 1994). Framing and technology-use mediation bare distinct resemblances. In both cases, intrapreneurs (managers) can facilitate the emergence of particular technological frames (Orlikowski and Gash, 1994: 175) – “assumptions, expectations, and knowledge of the technology” – that users have and which shape their subsequent actions toward it. However, to align with our findings, the concept of technological frames would have to be extended to also include emotions towards the technology and the positioning of the self (the user) and others in relation to the technology.
METHODOLOGICAL IMPLICATIONS

As described above, a personalized account of IT use and non-use would consist of three elements: 1) the distinct sequences of action that make up a pattern and involve the use and non-use of various IT artifacts/features; 2) the unique felt quality of each pattern; and 3) the positioning of self (focal user) and others in relation to the social and material reality of the use pattern. Each of these elements has methodological implications.

First, in order to successfully describe the distinct sequences of action characteristic to a use pattern, some form of a qualitative field study is necessary. If intentions to use or actual use (in terms of breadth, depth and frequency) of particular features can be successfully explored using survey methods (cf. Beaudry and Pinsonneault, 2010; Kim and Malhotra, 2005), identifying patterns of behavior and the distinct sequences of action making up that pattern requires detailed data that can demonstrate repetitive behavior in particular situations over time across and within individuals. From the studies conducted for this program of research, a combination of narrative interviews (Jovchelovitch and Bauer, 2000; Bates, 2004) and observation techniques (Myers, 2009) seems well suited for the task.

Narrative interviewing (Jovchelovitch and Bauer, 2000) is a qualitative research method that takes the form of a conversation, where interviewees are encouraged to discuss whatever they consider to be relevant and express their experience and viewpoints through telling stories. The aim of this form of interviewing is to “reconstruct social events from the perspective of informants as directly as possible” (Jovchelovitch and Bauer, 2000: 59). A specific technique of narrative interviewing,
called episodic interviewing (Bates, 2004; Flick, 2000), is particularly valuable in studying IT use, because episodic interviewing is structured to be open enough to let the participants select the episodes or stories they wish to convey, but also structured enough to allow for researchers to invite interviewees to recount particular events relevant to the phenomenon under study. Such interviews can reveal a great deal about the social and material reality of the social actor, both in its current form and historically. Analysis of personal narratives can illuminate “individual and collective action and meanings, as well as the social processes by which social life and human relationships are made and changed” (Riessman, 2003, based on Laslett, 1999: 392).

The technique also takes seriously the socially rich concept of the ‘social actor’ (Lamb and Kling, 2003), therefore, avoiding the ‘black-boxing’ of the user. This is key when the goal is to explore the subjective experience of agency in IT use. In addition, narratives also reveal much about the material setting of a story – for example, the constraints and affordances of technologies “expand or limit the range of paths along which a narrative can unfold” (Goh et al., 2011).

Observation techniques can expand the insights garnered from narrative interviews. Specifically, the use of video recording can be very helpful when studying IT use from the personalized perspective. Using video recordings for observation has been recognized to be particularly valuable when studying the material settings in which action and interaction arises (Heath and Hindmarsh, 2002). Video allows researchers to have a permanent record of their observations, which they can analyze to see the nuances and the ‘situatedness’ of everyday work practices – people writing documents; reading e-mails; using telephones and computers; inputting data into software, etc. Furthermore, video also captures the details of human conduct – both
talk and bodily movements. The technique, therefore, takes seriously the ‘material’ as advocated by socio-technical and sociomaterial perspectives on studying IT in organizations (e.g., Markus and Silver, 2008; Orlikowski and Scott, 2008). It allows for the capture of the distinct sequences of action involving both use and non-use of multiple IT artifacts and features that make up a use pattern. In addition, video captures emotional talk and gestures, enriching the data provided by narrative interviews. Jointly, then, narrative interviewing and video observations can offer sufficient coverage of the three elements under study when exploring IT use from a personalized perspective.

Of course, other research methods can complement these two techniques. Documentation (e.g., e-mails; training materials) review, surveys and meeting recordings were used in this research, because, in addition to studying IT use from a personalized perspective, this dissertation also examined the nature of managerial interventions aimed at influencing IT use. This required the inclusion of the different stakeholders of the IT implementation project as interviewees, but also the review of managerial communication as well as a broader understanding of the reception of a new technology in an organization – achievable, for example, through a survey. The methodological implications considered above, however, were limited to those that follow directly from adopting the proposed personalized theoretical perspective on IT use.

LIMITATIONS, FUTURE WORK AND REFLECTIONS

There are many promising further research avenues that could extend this work. Broadly, these cover three areas: methodology, macro dynamics and micro dynamics.
First, future research could expand on the methodological implications of the proposed personalized perspective on IT use. While this research provides a commentary on the types of data collection methods that a personalized perspective calls for, it does not expound a full methodological framework that would allow for the description of all three elements identified in the personalized perspective. Such a methodological framework could build upon existing devices (e.g., narrative networks from Pentland and Feldman, 2007: 781), which can successfully represent “patterns of technology in use”, but are less well-equipped to represent the significance and layers of meaning surrounding these patterns (ibid.: 793). Such a methodological framework would allow for the discovery and description of all three elements of the personalized perspective: the sequences of action, felt quality and positioning of self and others. Importantly, the framework should capture these elements as they are enacted. Sequences of action lend themselves quite naturally for study and description from a practice orientation. However, the felt quality of the use patterns and the positioning of the self and others have been described in more static terms in this research. Future work could explore, in more detail, the enactment of the felt quality and the positioning of the self within the sequences of actions making up a use pattern. This would allow for the capture of the micro-dynamics within patterns (e.g., subtle changes in the felt quality within the current pattern), while also retaining the overall three-element framework for describing use patterns, which enables comparisons across settings and time.

The ability to capture pattern evolution over time is another limitation of the proposed framework in its current state. In short, the proposed personalized perspective on IT use can lead to a static, snapshot-type of representation of use.
patterns – the sequences of action, felt quality and positioning of self and others are described as-is, while the dynamic nature of the patterns may be glossed over. Future research could, therefore, usefully explore the evolution of the different patterns and expand the proposed perspective to explicitly include element(s) to capture and describe these more macro-level dynamics (e.g., a change in the felt quality of a particular pattern over time).

To conclude, the main contribution of this research is the theoretical development of a personalized account of technology use. This account covers three elements: a) the description of the use patterns (sequences of action involving both use and non-use and spanning multiple artifacts); b) the positioning of the focal user’s self and others in particular ways around IT artifacts as landmarks (which becomes expressed in IT use behaviors), and c) the distinct felt quality of each use pattern, which describes how people feel their own and others’ positions around the ‘involuntary’. The research also discusses the practical implications of such a personalized perspective, i.e., the challenges of managing new technologies when the positioning of self and others in relation to the social and material reality of technology use and the felt quality of this position is taken seriously.
## APPENDICES

### Appendix A

<table>
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<tr>
<th>#</th>
<th>Setting</th>
<th>Method</th>
<th>Date</th>
<th>Interviewee(s)</th>
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<tr>
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<td>Private &amp; State</td>
<td>Group interview</td>
<td>09/2011</td>
<td>(Former) implementation team member at State (CA office staff member)</td>
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<td></td>
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<td>Head of the implementation team at Private (head of the CT office)</td>
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<td>Implementation team member at Private (responsible for development, configuration)</td>
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<td>Implementation team member at Private (responsible for training)</td>
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<td>Interview</td>
<td>10/2011</td>
<td>Tenured professor, former department chair, Arts &amp; Sciences (A&amp;S)</td>
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<td>Private</td>
<td>Interview</td>
<td>10/2011</td>
<td>Tenured professor, department chair, Professional School (PS)</td>
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<td>Private</td>
<td>Interview</td>
<td>10/2011</td>
<td>Tenured professor, A&amp;S</td>
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<td>Private</td>
<td>Interview</td>
<td>11/2011</td>
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<td>Private</td>
<td>Interview</td>
<td>11/2011</td>
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<td>11/2011</td>
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<td>Implementation team member at Private (responsible for training)</td>
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<td>Dean (A&amp;S)</td>
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<td>Head of the CT office</td>
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<td></td>
<td>Associate Dean, Academic Affairs</td>
</tr>
<tr>
<td>13</td>
<td>Private</td>
<td>Observ. (repeat)</td>
<td>01/2012</td>
<td>Tenured professor, former department chair, A&amp;S</td>
</tr>
<tr>
<td>14</td>
<td>Private</td>
<td>Observ.</td>
<td>01/2012</td>
<td>Tenured professor, PS</td>
</tr>
<tr>
<td>15</td>
<td>Private</td>
<td>Observ.</td>
<td>01/2012</td>
<td>Tenured professor, PS</td>
</tr>
<tr>
<td>16</td>
<td>Private</td>
<td>Observ. (repeat)</td>
<td>01/2012</td>
<td>Tenured professor, department chair, A&amp;S</td>
</tr>
<tr>
<td>17</td>
<td>Private</td>
<td>Interview</td>
<td>02/2012</td>
<td>Tenured professor, PS</td>
</tr>
<tr>
<td>18</td>
<td>Private</td>
<td>Interview</td>
<td>02/2012</td>
<td>Tenured professor, PS</td>
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<tr>
<td>19</td>
<td>Private</td>
<td>Interview</td>
<td>02/2012</td>
<td>Tenured professor, PS</td>
</tr>
<tr>
<td>20</td>
<td>Private</td>
<td>Interview</td>
<td>02/2012</td>
<td>Tenured professor, department chair, A&amp;S</td>
</tr>
<tr>
<td>21</td>
<td>Private</td>
<td>Interview</td>
<td>03/2012</td>
<td>Tenured professor, former department chair, A&amp;S</td>
</tr>
<tr>
<td>22</td>
<td>Private</td>
<td>Interview</td>
<td>03/2012</td>
<td>Tenure-track professor, PS</td>
</tr>
<tr>
<td>#</td>
<td>Setting</td>
<td>Method</td>
<td>Date</td>
<td>Interviewee(s)</td>
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<tr>
<td>1</td>
<td>State</td>
<td>Interview</td>
<td>04/2011</td>
<td>Administrative staff, A&amp;S</td>
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<tr>
<td>2</td>
<td>State</td>
<td>Interview</td>
<td>04/2011</td>
<td>Instructor, PS</td>
</tr>
<tr>
<td>3</td>
<td>State</td>
<td>Interview</td>
<td>05/2011</td>
<td>Tenured professor, PS</td>
</tr>
<tr>
<td>4</td>
<td>State</td>
<td>Interview</td>
<td>05/2011</td>
<td>Tenure-track professor, A&amp;S</td>
</tr>
<tr>
<td>5</td>
<td>State</td>
<td>Interview</td>
<td>05/2011</td>
<td>Tenured professor, A&amp;S</td>
</tr>
<tr>
<td>6</td>
<td>State</td>
<td>Interview</td>
<td>05/2011</td>
<td>Staff, PS</td>
</tr>
<tr>
<td>7</td>
<td>State</td>
<td>Interview</td>
<td>05/2011</td>
<td>Tenured professor, A&amp;S</td>
</tr>
<tr>
<td>8</td>
<td>State</td>
<td>Interview</td>
<td>06/2011</td>
<td>Tenure-track professor, A&amp;S</td>
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<tr>
<td>9</td>
<td>State</td>
<td>Interview</td>
<td>06/2011</td>
<td>Tenured professor, department chair, A&amp;S</td>
</tr>
<tr>
<td>10</td>
<td>State</td>
<td>Interview</td>
<td>06/2011</td>
<td>Tenured professor, A&amp;S</td>
</tr>
<tr>
<td>11</td>
<td>State</td>
<td>Interview</td>
<td>06/2011</td>
<td>Former dean, tenured professor</td>
</tr>
<tr>
<td>12</td>
<td>State</td>
<td>Interview</td>
<td>06/2011</td>
<td>Tenured professor, PS</td>
</tr>
<tr>
<td>13</td>
<td>State</td>
<td>Interview</td>
<td>06/2011</td>
<td>Dean, A&amp;S</td>
</tr>
<tr>
<td>14</td>
<td>State</td>
<td>Interview</td>
<td>06/2011</td>
<td>Tenured professor, department chair, PS</td>
</tr>
<tr>
<td>15</td>
<td>State</td>
<td>Interview</td>
<td>07/2011</td>
<td>Vice Provost, former department chair, A&amp;S</td>
</tr>
<tr>
<td>16</td>
<td>State</td>
<td>Interview</td>
<td>07/2011</td>
<td>Dean, PS</td>
</tr>
<tr>
<td>17</td>
<td>State</td>
<td>Interview</td>
<td>07/2011</td>
<td>Head of the implementation team at State (head of the CA office)</td>
</tr>
<tr>
<td>18</td>
<td>State</td>
<td>Interview</td>
<td>07/2011</td>
<td>Tenured professor, PS</td>
</tr>
<tr>
<td>19</td>
<td>State</td>
<td>Interview</td>
<td>08/2011</td>
<td>Tenured professor, A&amp;S</td>
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<tr>
<td>20</td>
<td>State</td>
<td>Interview</td>
<td>08/2011</td>
<td>Dean, PS</td>
</tr>
<tr>
<td>21</td>
<td>State</td>
<td>Interview</td>
<td>09/2011</td>
<td>Provost (former)</td>
</tr>
<tr>
<td>22</td>
<td>State</td>
<td>Repeat Interview</td>
<td>07/2012</td>
<td>Head of the implementation team at State (head of the CA office)</td>
</tr>
<tr>
<td>23</td>
<td>State</td>
<td>Repeat Interview</td>
<td>07/2012</td>
<td>Dean, PS</td>
</tr>
<tr>
<td>24</td>
<td>State</td>
<td>Repeat Interview</td>
<td>07/2012</td>
<td>Tenured professor, A&amp;S</td>
</tr>
<tr>
<td>25</td>
<td>State</td>
<td>Repeat Interview</td>
<td>07/2012</td>
<td>Tenured professor, A&amp;S</td>
</tr>
<tr>
<td>26</td>
<td>State</td>
<td>Repeat Interview</td>
<td>07/2012</td>
<td>Tenure-track professor, A&amp;S</td>
</tr>
<tr>
<td>27</td>
<td>State</td>
<td>Interview</td>
<td>07/2012</td>
<td>New implementation team member at State (CA office staff member), graduate student</td>
</tr>
<tr>
<td>28</td>
<td>State</td>
<td>Repeat Interview</td>
<td>07/2012</td>
<td>Tenured professor, A&amp;S</td>
</tr>
<tr>
<td>29</td>
<td>State</td>
<td>Observation (repeat)</td>
<td>04-06/2010</td>
<td>Digital Measures Faculty Advisor Group: 10-12 faculty members per meeting; head of the implementation team at State (head of the CA office), CA office staff member</td>
</tr>
<tr>
<td>Data Examples (excerpts from quotes)</td>
<td>Emotion Category (pertinent words &amp; word stems based on Scherer, 2005)</td>
<td>Emotion Class (Beaudry and Pinsonneault, 2010)</td>
<td></td>
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<tr>
<td>“Trying to do a good job…”</td>
<td>Satisfaction (low intensity)</td>
<td>Achievement emotions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>“Some nice features…”</td>
<td>(good, fine, nice)</td>
<td>(IT event appraised as an opportunity with perceived lack of control over expected consequences)</td>
<td></td>
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<tr>
<td>“I’m very gratified with the results…”</td>
<td>Pleasure (medium intensity)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>“I am very pleased with how it worked out…”</td>
<td>(satisfy*, pleas*)</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>“Was the adoption (of FP) accepted with jubilation and dancing? No”</td>
<td>Dissatisfaction (low intensity)</td>
<td>rna (IT event appraised as a threat with perceived lack of control over expected consequences)</td>
<td></td>
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<tr>
<td>“They’re not doing a good job of communicating…”</td>
<td>(dissatis*, bad)</td>
<td></td>
<td></td>
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<tr>
<td>“Some grumbling early on…”</td>
<td>Disappointment (low to medium intensity)</td>
<td></td>
<td></td>
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<tr>
<td>“Enough to completely alienate me.”</td>
<td>(frustrat*)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>“Everyone’s frustration is…”</td>
<td>Irritation (medium intensity)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>“Two most annoying things about FP…”</td>
<td>(annoy*)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>“They were just furious…”</td>
<td>Anger (high intensity)</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>“It’s some other thing that’s gonna make us all angry…”</td>
<td>(anger, angr*, furious, resent*)</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>“And then we started feeling really resentful…”</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>“There are some concerns as to where FP will lead…”</td>
<td>Anxiety (Tension/Stress) (medium to high intensity)</td>
<td>Deterrence emotions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>“People are suspicious of it…”</td>
<td>(anxi*, worry*, discomfort)</td>
<td>(IT event appraised as a threat with perceived control over expected consequences)</td>
<td></td>
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<tr>
<td>“Because you feel like you have failed to achieve…”</td>
<td></td>
<td></td>
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<tr>
<td>“In my mind, there’s a fear…”</td>
<td>Fear (medium to high intensity)</td>
<td></td>
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<tr>
<td></td>
<td>(fear*, afraid)</td>
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</tbody>
</table>
Table A3. Coding Scheme and Examples for the Concept of Cues

<table>
<thead>
<tr>
<th>Data Examples</th>
<th>Open Coding</th>
<th>Axial Coding</th>
<th>Selective Coding</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FP</strong> asked me to enter everything one author at a time. I tried to do it for one of the publications and it took forever. It was enough to completely alienate me.&quot; (Vice Provost, State)</td>
<td>Non-actualized Functionality Affordance Constraint</td>
<td>IT instrumentality</td>
<td>Material cues (cues associated with using technology for task achievement, e.g., data entry to which social actors respond emotionally)</td>
</tr>
<tr>
<td>&quot;Two most annoying things about FP: I can't edit a publication entered by a co-author and I can't see what I have entered (a report preview)&quot; (tenured professor, PS, Private)</td>
<td>Relative effort Prior process Prior IT</td>
<td>Change from established practices</td>
<td></td>
</tr>
<tr>
<td>&quot;I'd say there is a huge improvement from the faculty database. I think it (FP) is very easy to use.&quot; (tenured professor, A&amp;S, Private)</td>
<td>Inclusion Exclusion</td>
<td>Involvement in change</td>
<td>Social cues (cues associated with relations with the implementation team, other users, etc. to which social actors respond emotionally)</td>
</tr>
<tr>
<td>&quot;Faculty had developed some convenient system of how they normally did it (annual report). So was the adoption (of FP) accepted with jubilation? No.&quot; (department chair, PS, Private)</td>
<td>Rumors and myth Sales-pitch</td>
<td>Interactions with others</td>
<td></td>
</tr>
<tr>
<td>&quot;The outreach gave me the impression that they were trying to do a good job and for that reason I'm probably less averse to it than my faculty.&quot; (department chair, PS, Private)</td>
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<tr>
<td>&quot;I think they passed up some feedback, but nothing happened]...And nobody is talking about what the categories in FP should be, which is why there are some concerns as to where FP will lead.&quot; (department chair, A&amp;S, State)</td>
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<tr>
<td>&quot;I don't know first hand how difficult it is. I heard such horror stories - faculty and chairs tell me that it was typing it all in yourself.&quot; (dean, State)</td>
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<tr>
<td>&quot;They did a good job of saying that this (FP) is a next integration of something we need.&quot; (former department chair, A&amp;S, Private)</td>
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<tr>
<td>&quot;The initial chairs' response - they were just furious, because the software application very much does seem to be a &quot;one size fits all&quot; (department chair, A&amp;S, State)</td>
<td>Dominant association Metaphor</td>
<td>IT symbolism</td>
<td>Personal cues (cues associated with the personal or symbolic meaning of technology to which social actors respond emotionally)</td>
</tr>
<tr>
<td>&quot;Many people view it as just another bureaucratic requirement they have to fulfill.&quot; (department chair, A&amp;S, Private)</td>
<td>Performance Status Uniqueness</td>
<td>Identity work</td>
<td></td>
</tr>
<tr>
<td>&quot;My faculty were extremely resistant to using FP, because it did not represent them in the way that they wanted to be represented either to me or to the outside world.&quot; (department chair, A&amp;S, Private)</td>
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<tr>
<td>&quot;Being a faculty member - you're an artisan. [...] So in my mind, there's a fear of the false certainty of quantifying things. Do I need to be focusing my activities so that I look good on FP or in a way that I look good on the self-crafted CV?&quot; (tenured professor, A&amp;S, State)</td>
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</tbody>
</table>
### Table A4. Coding Scheme and Examples for IT (Non-)Use Patterns

<table>
<thead>
<tr>
<th>Data Examples</th>
<th>Open Coding</th>
<th>Axial Coding</th>
<th>Selective Coding</th>
</tr>
</thead>
<tbody>
<tr>
<td>“I had all my data in FP, but when I generated a report, I had to edit it, because when you have the final report, you want to get it to look nice, but the basic information – the articles, etc. – is coming from the system.” (department chair, PS, Private)</td>
<td>“Bones vs. embellishment”</td>
<td>“Personalization” pattern</td>
<td>Continued use of IT: a set of qualitatively distinct patterns that have elements of both use and non-use</td>
</tr>
<tr>
<td>“I use the CV. I try to update it as I do things. So I output the CV and then I write descriptions (like duties, etc.) in Word. My publication record came out fine though. My concern is not that someone will generate my CV, because I don’t have anything to hide, but I don’t have any of the descriptive stuff on FP. It’s great to have it output, but then I still have to do stuff afterwards. Totally reformating, taking stuff off.” (tenured professor, A&amp;S, State)</td>
<td>Minimal effort (only put in the “meat”)</td>
<td>Make yourself look good</td>
<td></td>
</tr>
<tr>
<td>“Now we’re getting to the nuts and bolts – it’s the journal articles, etc. I mean this is the meat of what they give a crap about. Keep in mind that this will be used to determine the distribution of raises in the area of 2%. And that sense is not lost on people, like who cares, what’s this for.” (department chair, A&amp;S, Private)</td>
<td></td>
<td>“Game the system” pattern</td>
<td></td>
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<tr>
<td>“There was some report that showed what admin was going to be looking at. If they’re only looking at seven fields, then all I’m going to put in is this year’s seven fields. And I’m going to try to figure out minimally which buttons I’m going to have to choose but I’m not going to try to massage it into being in any way meaningful.” (tenured professor, A&amp;S, State)</td>
<td>Everything in</td>
<td>Follow the instructions</td>
<td>“Being a good citizen” pattern</td>
</tr>
<tr>
<td>“I always look at last year’s just because I figure it’s a good starting point. It’s sort of a completion check for me. I just throw everything up there that might be relevant. I like to keep track of what I’m doing. I’m just taking it one step at a time.” (tenured professor, PS, Private)</td>
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<tr>
<td>“The first thing to do is I know in my e-mail I got the instructions that got sent to us for doing the faculty activity reports. So I’m logged into DM, so I think I’m gonna go back and read those instructions once, before I do it. The other thing I haven’t done yet, is I didn’t look up finding my report from last year. I just kind of go by the… (instructions) – student-focused activities… departmental committees…” (former department chair, A&amp;S, Private)</td>
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<tr>
<td>“I’m seeing stuff in here (FP) that I don’t recognize, that is not reconciled with this (CV), that is not reconciled with anything over here (e-mail). So I’m trying to figure out how to reconcile these things.” (department chair, A&amp;S, Private)</td>
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</table>
“So there are things that repeat every year so you just edit the year and the specifics…” (tenured professor, PS, Private)

“I don’t fill out the abstracts. ‘Date accepted’, ‘date published’, ‘date submitted’ - I usually end up filling out one of those and in the end I go back and change it to date published, so there is a few too many fields.” (tenured professor, A&S, Private)

“Departmental service is not important for me, the review is totally based on my scholarship. So I kept only professional service and scholarship. I might have left my classes on. Our courses are just pulled from our university system.” (tenured professor, A&S, State)

“I think last year, I just didn’t do it because the basic tenor around here was like it doesn’t really matter, probably half the school’s not doing it anyway. So why are we beating ourselves over the head.” (tenured professor, A&S, State)

“There’s a substantial number of faculty members who have learned over the years that if you just ignore it, it will go away. And finally it got so embarrassing they hired people to do it for us. So, in effect, it did disappear.” (department chair, PS, State)

<table>
<thead>
<tr>
<th>Pick and choose</th>
<th>“Exercise discretion” pattern</th>
</tr>
</thead>
<tbody>
<tr>
<td>Opt out</td>
<td>“Opt out” pattern</td>
</tr>
<tr>
<td>Ignore</td>
<td></td>
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</tbody>
</table>
### Appendix B

<table>
<thead>
<tr>
<th>Illustrative examples of human mediation efforts (excerpts from data)</th>
<th>Paradigmatic analysis (signifiers/missing signifiers that create categories, send signals &amp; facilitate the emergence of symbolic expressions around FP)</th>
<th>Rhetorical tropes</th>
</tr>
</thead>
</table>
| "[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 and budgeting activities. [FP] has been customized according to the terms and data elements used specifically by [State]. [...]" (2009 memo at State) | Important signifiers:  
- Individual CV maintenance tool (as opposed to annual activity reporting tool, for example)  
- Customized (as opposed to standard vanilla version)  
- No signifier to signal of who is in charge of the FP project / who to contact in case of questions  
Main function of memo: mostly informative | N/A |
| "Last year we decided to transition [...] 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 import test data, [...] and add desired functionality. The new system will enable faculty to: a) maintain a much more attractive public profile webpage [...]; b) generate on-demand standardized CVs in Word [...]; c) automatically incorporate publications, teaching schedules, etc. into the Annual Activity Report (which will now be done via [FP]; this functionality should be in place later this year). [...] If you have questions, feel free to call/email [list of names and email addresses of people in the CT office]" (2010 memo at Private) | Important signifiers:  
- Individual web profile maintenance tool  
- CV maintenance tool  
- Annual activity reporting tool  
- much more attractive (as opposed to no signifier or less attractive)  
- automatically (as opposed to manually)  
- Customized functionality (as opposed to standard vanilla functionality)  
- Used by 1,500 other universities (as opposed to used by only Private)  
- CT office worked with the company (signal of who is in charge of the project)  
- feel free to call/e-mail (as opposed to no contact information given)  
Main function of memo: informative, maintain social relationships, persuasive | N/A |
| "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. Based on FP, they estimate that 30% of their employees are currently not meeting their performance requirements. And they want to punish us. Under this proposal, those in the bottom 10% would receive no increase [...]" | Important signifiers:  
- quantify work “output” (as opposed to measure the quality of work; quantified output is not real work output)  
- Administration (as opposed to colleagues)  
- Punish us (as opposed to reward or protect, administration = them, faculty = us)  
- Unacceptable (as opposed to acceptable)  
- Fails to recognize meaningful | Irony (use of quotation marks around the word output) |
| This proposal is *unacceptable* for three main reasons: 1) It demonstrates administration's basic lack of respect for faculty and employees. 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 inevitably lead to *hostile relations* in the workforce.” (2012 e-mail to all full-time faculty from a faculty member at State) | *Main function of memo:* mostly persuasive |  |
| --- | --- | N/A |
| *Main function of memo:* mostly informative, maintain social relationships, persuasive | *Important signifiers:*  
- *Streamline* (as opposed to disperse and complicate)  
- *Improvements based on faculty feedback* (as opposed to no signal of faculty involvement)  
- *Benefits* (as opposed to no signifier or disadvantages)  
- *No need to re-enter* (as opposed to duplicate work)  
- *Automatically* (as opposed to manually)  
- *Similar to what faculty currently do in Word* (as opposed to significantly different from current practice)  
- *colleagues* (as opposed to “administration”)  
- *contact X for assistance* (as opposed to no contact information provided) |  |
| "To *streamline* the preparation of Annual Activity Reports, Department Chairs are asking all faculty to complete their [...] Reports in FP [system’s URL]. The system has had over a dozen *improvements based on faculty feedback*. *Benefits* of completing your [...] report in FP, due January 20th [2012], include:  
  o No need to gather, print, or email any materials to your department chair [...]  
  o *No need to re-enter* publications, [...] you've already entered into FP for 2011  
  o All courses you've taught, including teaching evaluations, will be *automatically* input  
  o All your narratives will be saved in the system so you can update/edit them next year, *similar to what most faculty currently do in Word*  
Updating your information in FP [...] will also help your *colleagues* in preparing material for our [Accreditation Agency] Visit. [...] The CT office will be offering *workshops* [...] You can *contact X for assistance* from your home or office [phone #; e-mail].” (2011 memo at Private) |  |  |
Table B2. Data Analysis: Examples

<table>
<thead>
<tr>
<th>Illustrative examples of artifact mediating its own use (artifact characteristics)</th>
<th>Potential Symbolic Expressions</th>
</tr>
</thead>
</table>
| **User Interface**: digitized paper form, providing sets of fields for data entry with corresponding labels (some fields require to be filled with pre-defined content selected from a dropdown list, while other fields allow free text entry). At Private: Main activities menu grouped into the following areas: general information, teaching, scholarship/research, service, annual activity report, annual planning report (Figure 3.2) | - FP may express it is a bureaucratic / administrative tool  
- FP may express it is a systematic way for faculty to organize and keep track of their activities, facilitating their reporting duties  
- At Private, FP may express it is tailored for both entering activity data (CVs) and for annual reporting  
- At State, FP may express it is tailored for entering activity data (CVs) |
| **Information Structure**: FP is based on broad classifications of faculty activities. For example, service work is classified into department; university-wide, professional, and public service. When adding an item of professional service, users are further required to specify their role by picking it out from a dropdown list (that includes various editorial, chairing and reviewing roles). At Private: Scholarship activities are classified into the following types: journal articles/books/book chapters; conference presentations; grants/sponsored research; artistic performances; exhibits; patents. Each of these has further sub-types (e.g., books may be scholarly, non-scholarly or textbooks) and also need to be classified as peer-reviewed or not. If no suitable sub-type can be found, faculty can also use the type “Other contribution”. All journal articles/book chapters/books need to be classified according to AACSB (accreditation agency for business schools) classification (Figure 3.3) At State: Scholarship activities are classified into the following types: artistic and professional performances and exhibits; contracts, grants and sponsored research; intellectual contributions; intellectual property; presentations; research currently in progress. Intellectual contributions include books, book chapters, journal articles, reports, software, conference proceedings, broadcast media, study guides, etc. Category of “Other” is also provided. Conference presentations (incl. keynotes) go under presentations, not intellectual contributions (Figure 3.3) | - FP may express it standardizes activities data to facilitate easier, more transparent and fair comparisons across faculty  
- FP may express it cannot support the capturing of data that makes faculty members unique  
- FP may express it places more value on certain kinds of activities than others (“Other contributions” may seem less valuable than named contributions)  
- At Private, FP may express it is more tailored towards business faculty needs |
| **Functionality** (Private and State):  
- each individual item on a CV or an annual report needs to be manually entered into FP (either copy-pasted or typed in) | - FP may express it is an administrative tool that doubles the administrative load on faculty  
- FP may express it is more tailored towards administrative needs than faculty needs |
- there are no options to format data entered into FP (no italicizing, bolding, etc.)
- there is no spell-check in FP
- there is no preview of how the entered data will look like to someone who generates a report based on that data

Table B3. Data analysis: Examples

<table>
<thead>
<tr>
<th>Illustrative end-user interpretations of both human and artifact meta-communication (excerpts from data)</th>
<th>Paradigmatic analysis (signifiers/missing signifiers that show interpretations of categories, signals &amp; the actual emerging symbolic expressions around FP)</th>
<th>Rhetorical tropes</th>
</tr>
</thead>
</table>
| “Being a faculty member - you develop your own unique ways of making yourself look good. And this [FP] is trying to frame it all into an assembly line. So I think that’s some of the distrust…” (faculty member, State). | Important signifiers:
- Unique (as opposed to common/standard)
- Distrust (as opposed to trust)
- Demoralizing (as opposed to comforting, encouraging)
- ‘Other’ category (as opposed to a named category)
- took forever (as opposed to took no time at all; slow vs. quick)
- nothing to do with how I would normally do a CV (i.e., an abnormal way of doing a CV as opposed to a normal way) | Metaphor (describing FP as an assembly line – something the produces standardized products, rather than personalized products) |
| “It is a demoralizing process 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, State) | | |
| “I had a perfectly active CV. FP asked me to enter everything one author at a time. I tried to do it for one of the 100 publications and it took forever.” (Former department chair, State) | Important signifiers:
- rumors (as opposed to formal announcement) | |
| “It was asking me for a lot of extraneous things… And it had nothing to do with how I would normally do a CV.” (Faculty member, State) | | |
| “I did hear that in engineering they had somebody who entered a lot of their data for them, but I don’t know if these were just rumors or not.” (Faculty member, State) | | |
| “We started feeling really resentful because we don’t have the minions…” (Faculty member, State) | | |
| “(As a new department chair) I thought I better figure out how FP works, so I got into it and I ran across some anomalies. I sat down with (CT office) team and they asked me to comment on this data. […] I thought (FP) was particularly valuable in that it normalized the categories that the chairs look at to put together an assessment.” | Important signifiers:
- anomalies (as opposed to regularities)
- they asked me to comment (as opposed to no perception of user involvement)
- particularly valuable (as opposed to useless)
- normalized (as opposed to made irregular) | Metaphor (describing support personnel as minions – subordinates or slaves that only the powerful get) |

Metaphor (describing FP annual reports as comparing apples to apples – enabling a valid comparison of different
"As a chair I found that the annual reports are in a much more standard format. You’re comparing apples to apples much more than it used to be."

"My faculty were extremely resistant to using FP... In their opinion FP was clumsy, and did not represent them in the way that they wanted to be represented."

(department chairs, Private)

"I put in my activities and then apparently FP makes an annual report. I’m not real happy about that magic behind the scenes. It’s not an essential part of my work though, so it’s not such a big deal"

(faculty member, Private).

"FP was set up for business accreditation. To the extent that there is tension, it plays into that. For A&S, it’s just putting square pegs into round holes. And to be told that you cannot solve a problem because of the software... It (FP) is used as an excuse to not solve the problem."

(former department chair, Private)

<table>
<thead>
<tr>
<th>Important signifiers:</th>
<th>Metaphor</th>
</tr>
</thead>
<tbody>
<tr>
<td>- magic behind the scenes (as opposed to clearly visible procedures)</td>
<td>(describing annual reporting in FP as putting square pegs into round holes – A&amp;S activities ill-fit into the report format in FP)</td>
</tr>
<tr>
<td>- not an essential part of my work (as opposed to an essential part of work)</td>
<td></td>
</tr>
<tr>
<td>- excuse to not solve the problem (as opposed to a real reason for the inability to solve the problem)</td>
<td></td>
</tr>
</tbody>
</table>
BIBLIOGRAPHY


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