Summer 10-6-2011

AFFECT AND MATERIALITY IN ENTERPRISE SYSTEMS USAGE: SETTING THE STAGE FOR USER EXPERIENCE

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Abstract

Drawing on the fields of organisational theory, information systems and human-computer interaction, this paper proposes a novel perspective for studying information systems usage by individuals in organisations – in this case, in the back office of a major US-based accounting firm. By conceptualising usage as a holistic user experience – a situated and temporally emergent inseparable mesh of behaviour, bodily movements, perception, cognition and affect – the researcher can avoid misleading reductionism and the overly simplistic reasoning of technological or social determinism. To demonstrate empirically the value of this perspective, the paper focuses on the intertwining of two aspects commonly ignored in prior information systems literature – the affective and the material. Building on Pickering's (1993) "mangle of practice", and on the literatures on moods (Bless and Fiedler, 2006), identity (Ashforth and Mael, 1989) and sociomateriality (Orlikowski, 2010), the entanglement of human identity, affective states and enterprise systems materiality is examined, based on observational and interview data. The findings suggest that adopting this theoretical perspective facilitates understanding of the complex, situated nature of enterprise systems usage.

Keywords: Enterprise Systems Usage; User Experience; Disposition; Sociomateriality; Mangle of Practice; Identity; Interpretative Field Research

1 Introduction

Enterprise information systems usage is a complex phenomenon not easily or fully describable by concepts such as behavioural intent, attitude towards use, or satisfaction. To explore enterprise systems (ES) usage more deeply, studies have moved towards the *dynamic practice* view (e.g., Boudreau and Seligman, 2005), recognising that usage is emergent, with user and system both playing their part in practice.[1] While the dynamic practice view incorporates some notion of situatedness, there is a disregard of the emotional aspects of ES usage (Ciborra, 2006; McGrath, 2006). Because studies thus far have addressed the situatedness of technology usage as emerging circumstances of action, ignoring the "inner situation" or disposition of the person (Ciborra, 2006) – their very identity – it remains largely unknown how this "inner situation" with which a person approaches an ES, plays a role in its usage. This paper proposes that ES usage should be studied as a holistic user experience – a temporally and situatedly emergent, inseparable mesh of behaviour, bodily movements, perception, cognition and affect – the social *with* the material in other words (e.g., Orlikowski, 2010). Thus, and due to the immense complexity of human experience, this study will limit its focus to the entanglement[2] of the affective and the material. The main goal is to answer the question: how is ES user experience influenced by user affective states, identity, and system materiality? By doing so, this paper fills something of the current theoretical gap in IS literature related to affective aspects of ES usage (and their entanglement with artefact properties), as well as contributing to a more complete understanding of how situatedness could be addressed in IS research. It extends the HCI literature (e.g., Hassenzahl and Tractinsky, 2006) and the IS literature that calls for greater focus on the IT artefact (e.g., Orlikowski and Iaconno, 2001), proposing a new, more holistic theoretical approach towards studying ES usage. The results of the study may also provide practical insights for both ES designers and implementers.

In line with such as Heath and Hindmarsh (2002) and Suchman (2007), we used video technology for field observation at a major accounting firm; additionally, we conducted semi-structured interviews for gathering data on recalled experiences. We followed an inductive and iterative process of coding and data collection and then drew on the conceptual lens of materiality, especially the notion of "mangle of practice" (Pickering, 1993). From our perspective, ES usage is characterized by a series of resistances and accommodations that negotiate the permanence and objectivity of certain human dispositions, which are given durability and value through stabilisation in the ES artefact (Tuan, 1980). Further study should incorporate temporality of user experience with ES in longitudinal research (Pettigrew, 1990), building on the results of this early work. The paper is structured as follows: first, existing perspectives on ES usage are introduced, followed by an explication of the perspective of usage-as-user-experience that is adopted in this study. The paper goes on to discuss literature on affect and materiality in ES practice and theory. These strands of literature feed into our research framework. The chosen methodology and data analysis techniques are then introduced, followed by a presentation of our findings, and a discussion that brings the paper to a close.

2 Perspectives on Enterprise Systems Usage

Enterprise systems (ES) usage has been studied from various perspectives, employing different methods and analytical lenses. The following sections delineate three perspectives on ES usage: usage as behavioural intent, attitude and satisfaction; usage as dynamic practice, and usage as user experience.

[1] The dynamic practice view in IS mirrors in some way the strategy as practice literature in management studies (e.g., Whittington, 2006) and in IS "strategizing" (e.g., Galliers, 2004).

[2] What Pickering (1993) refers to as the "mangle" of practice.

The *usage as behavioural intent, attitude and satisfaction* perspective is characterised by attempts to study actual ES usage through surrogate measures. For example, a number of studies have tried to identify antecedent factors to user acceptance of ES, based on the technology acceptance model (TAM) proposed by Davis, 1986 (e.g., Amoako-Gyampah, 2007; Bueno and Salmeron, 2008). Others investigate adoption of, and user satisfaction with ES, which are often regarded as indicators of overall implementation success (Sedera and Tan, 2005; Law and Ngai, 2007). Most of these studies do not measure actual usage; rather, user self-reports on behavioural intention to use, attitude towards use, etc. are utilised as surrogate measures for usage. While such studies have provided insight into both organisational and individual factors impacting ES usage, their practical relevance is somewhat limited – behavioural intent does not tell us much about actual usage practices. Furthermore, failures of ES (and generally IS) projects, and unanticipated consequences (e.g., Robey and Boudreau, 1999), have led to an understanding that implementation and usage cannot be fully controlled or designed (Ciborra, 2004).

In line with the dynamic, often unanticipated view of ES usage – the *usage as dynamic practice* perspective – Boudreau and Robey (2005) show how an ES that is regarded as a significant constraint on human action can be resisted and reinvented in a process of "improvised learning". Scott and Wagner (2003) investigate how an ES emerges, and work practices are created, through negotiations between various agents during different time periods, while Wagner et al. (2010) consider post-implementation actions that facilitate the incorporation of ES into everyday work practices. Such studies inform readers about what may happen during ES implementations and usage, where human and material agencies intertwine to reinforce and re-structure existing work practices. However, they largely neglect the emotional aspects of everyday work and how these may play a role in ES usage. Furthermore, the materiality of ES usage – how human usage is constituted by the material, from office furniture to the source code of an ES, which in turn are produced by human practices – is often disregarded.[3]

This paper proposes that, by adopting a holistic user experience view of ES usage (*usage as user experience* perspective), consisting of an inseparable mesh of the kind introduced above, a better understanding can be achieved of how and why people use ES. Usage, as user experience, emphasises the experiential aspects of ES use, its situatedness and temporality (Hassenzahl and Tractinsky, 2006). User experience may refer to both the immediate experience and the recalled/reconstituted experience. According to Tuan (1980), the immediate has ephemeral value and no permanence, while the recalled has certain durability and meaning in our minds, because we reflect on it and are conscious of it. Our emphasis in this paper is on the recalled experiences and how their durability and meaning are stabilised in ES artefacts. We focus on the under-developed affective and material aspects of usage (and their entanglement), and do so in the hope that we will contribute to the creation of a more complete picture of ES usage. Throughout the paper, the term disposition is used to denote the entanglement of affective states (e.g. moods), identity and materiality. These dispositions *set the stage* for the study of the user experience.

3 Affect in Enterprise Systems Usage

Much of IS research ignores the emotional dimensions of human existence, focusing rather on rational behaviour and cognitive aspects (McGrath, 2006). Some "*dynamic practice*" studies do address the notion of situatedness[4], but often the concept has been robbed of some of its original meaning. Frequently, situatedness is reduced just to the "context or emerging circumstances of action and knowledge" (Ciborra, 2006: 131). This reduction excludes emotions or moods – essential to a holistic

[3] Exceptions include Scott and Wagner, (2003).
[4] Originally defined by Heidegger (1969) as the emergent circumstances and the inner situation, disposition or mood of a person.

understanding of human action. In the field of HCI, on the other hand, user experience researchers are very "interested in understanding the role of affect as an antecedent, a consequence and a mediator of technology use" (Hassenzahl and Tractinsky, 2006: 93). It is relevant here to distinguish between two types of affect: emotions and moods. Emotions are related to a particular object (Frijda, 1994), meaning that we are happy about something, angry at someone. Moods, on the contrary, are non-intentional, not directed at anything specific and "experienced as more diffuse, global and general" (Brave and Nass, 2002: 9). Moods are the grounding, background and bias of our functioning in the world; they set the stage for how we perceive situations and how we choose to act (Ciborra, 2001; 2004). In this paper, we view such affective states not as antecedents, mediators or consequences of ES usage, but rather as part of the continuous staging of user experience. We focus on individual affective states and individual usage of ES.

Mood functions as a regulator of information processing and behaviour (Bless and Fiedler, 2006). In short, Bless and Fiedler (2006) find that positive mood facilitates assimilation (imposition of internal structures onto the external world), while negative mood enhances accommodation (modification of internal structures according to the external world). Largely, moods tune the cognitive process to the situation at hand, so that sad mood, informing the person of a problematic situation, fosters systematic, bottom-up, detailed processing with limited creativity. Conversely, happy mood, informing the person of an unproblematic situation, fosters more general, top-down, less focused processing with more creativity (Schwarz and Clore, 2003).

Ciborra (2001, 2004) promoted the study of improvisation as a mood in IS usage, where improvisation can lead to more creative use and can result in drift, unanticipated consequences and rejection. Based on the general findings of Bless and Fiedler (2006), as well as Schwarz and Clore (2003), it is reasonable to expect that positive mood, as a setting, may be accompanied by more creative ES usage (exemplified by work-arounds, exploration), while a negative mood setting may be accompanied by less creative ES usage (exemplified by strict task execution, avoidance). In ambiguous situations (e.g., knowledge work), where evaluation of skills and outputs is difficult, expertise and problem-solving become a matter of managing impressions (i.e., one's image and identity), expectations and negotiating meaning (Alvesson, 2001). ES usage and user identity are also tied more directly, because technologies can be identity referents for people (Ravasi and Canato, 2010), just as much as organisations or social groups (Ashforth and Mael, 1989). In sum, the relations between moods, identity and technology are more complex than many existing IS studies have shown; hence, paving a way to our study of dispositions (i.e., the intertwining of moods, identity and technology-in-use).

4 Materiality in ES Practice and Theory

In the mainstream rationalistic tradition, understanding human existence is related to understanding the relationships between the mental and the physical, the subjective and the objective. This view maintains that subjective human mental states (representations of 'reality') are separate from objective physical reality and is preoccupied with studying the relations between the two (Zahorik and Jenison, 1998). Much of IS research adopts this dualistic perspective – what Orlikowski (2007; 2010) calls the "ontology of separateness": the study of technology as an exogenous object that influences human experience or as a subjective interpretation. Alternatively, human existence could be understood as "tied to our normal, everyday physical interaction with the physical environment", which, in its normal state, involves no representational processing (Zahorik and Jenison, 1998: 79). In a simplified sense, conscious mental representation steps in when things go wrong. For example, Nyberg (2009) found that, while call centre operators were inseparable from their computers, meaningful boundaries around human and non-human actors were created when delays or errors occurred. Computers were represented as actors having a mind of their own, being unhappy or not nice. This view does not support pure determinism or pure voluntarism (Leonardi and Barley, 2008); rather it points to the complex nature of the entanglement of the human and the non-human.

From a theoretical perspective, Orlikowski (2007: 1436) reminds us that "every organizational practice is always bound with materiality", and calls for researchers to take seriously the "recursive intertwining of humans and technology in practice". We adopt the analytical 'lens' of the "mangle" of practice (Pickering, 1993) to try to get at this recursive intertwining. According to Pickering (1993: 567), "material and human agencies are mutually and emergently productive of one another", through a dialectic of resistance and accommodation. Orlikowski (2007) calls this "constitutive entanglement", while Sassen (2002) speaks of "imbrication" – humans and artefacts do not exist independently of each other: humans are constituted through their relations with various artefacts, while these artefacts are created by human practices.

Attempts to apply the materiality perspective to the study of ES usage have been very few. Dery, et al. (2006) applied Orlikowski's (2000) "technology-in-practice" framework to show that various users enact the same ES in different ways, influenced by both the material properties of the artefact and non-material factors (such as time to learn and availability of work-arounds). Wagner and Newell (2010) found that users and the ES system become inseparable following a period of accommodation. Having said that, representation and analytical boundary-drawing arise when reliable coupling fails (i.e., when the user's and the system's emergent capacity to act shift in relation to each other).

5 Theoretical Framework

To study the entanglement of affective states, identity and materiality (what we call "dispositions"), a better understanding of this co-constitution is necessary. Based on Arendt's (1958) work, Tuan (1980) describes material artefacts as stabilisers of life, giving permanence and objectivity to ever-changing feelings and thoughts. Artefacts have different values, depending on their durability and utility. Everyday things, such as chairs and forks, quickly become invisible through habitual daily usage; artworks, on the other hand, resist absorption into the habitual and are highly visible and permanent in people's awareness. An ES, as a physical artefact, gives durability and permanence to certain types of feelings and thoughts (those of its creators and users); it manifests itself in terms such as integration; automation; efficiency and complexity. Its structure facilitates habit formation and absorption into daily activity. But it is also an artefact to be controlled, replaced. These dispositions, entanglements of affective states, continuously set the stage for ES user experiences – how people feel, think, behave and talk. To summarise, the theoretical framework underpinning this study builds on two strands of literature – one related to human moods (affective states) and their potential role in ES usage, and the other related to the materiality of the ES artefact. We propose that a "mangle of practice" lens (Pickering, 1993) can be applied to study this process of co-constitution. We see the series of resistances and accommodations during ES usage as negotiating the permanence and objectivity of certain moods (affective states), identities and work practices that are given durability and value through stabilisation in the ES artefact. For example, it may happen that a user with a generally positive stance and self-image, trying to solve a problem using an ES and encountering an unexpected obstacle (material resistance), will creatively try to overcome this obstacle (through exploration, trial-and-error). If successful, a (positive) disposition may emerge from this intertwining, giving permanence and objectivity to the user's positive mood, certain identity, specific material nature of the ES artefact, and certain work practices. Conversely, a user with a generally negative stance, in similar circumstances, may less creatively decide to give up or delay finding a solution. Even if the problem is solved, a different kind of disposition may emerge, giving permanence and objectivity to more negative moods, a different kind of self-image and materiality, as well as less self-sufficient work practices. This simple example demonstrates how the findings from the two strands of literature may combine in a specific case: user mood (affective state) does not influence ES usage independently of the material nature of the artefact; rather, mood, user identity and the artefact intertwine in the situated use of the system. Thus, the various human and material resistances and accommodations, as well as the stabilised dispositions, can be examined to answer the main research question: "How is the ES user experience influenced by the intertwining of user affective states, identity and the system-in-use?"

6 Research Method

Stemming from the research question and the phenomenon under study, qualitative field research of an interpretive nature appears to be an appropriate methodological approach (Walsham, 1993), with a view to producing "thick descriptions" (Geertz, 1973). Data were collected through field observations, audio-visual recordings and semi-structured interviews, and analysed iteratively through descriptive and interpretive coding (Myers, 2009). The study seeks "validity…not [from] the representativeness of the case in a statistical sense, but on the plausibility and cogency of the logical reasoning used in describing the results and in drawing conclusions from them" (Walsham, 1993: 15). During the research study, we followed the principles for conducting and evaluating interpretive field studies in IS (Klein and Myers, 1999). The unit of analysis was the individual disposition. The focus was on understanding how user moods (affective states), identity and materiality intertwine to form dispositions and how these dispositions become a stage for the user experience.

The research took place in the back office of a major accounting firm, where ES use (depending on the user) ranges from the relatively infrequent (involving responding to ad hoc queries, for example) to the very frequent (e.g., continuous monitoring of client engagements), and from the very specific (e.g., updating personnel data) to the very broad (e.g., accounts payable). A focused field visit (videographies, interviews and observation) facilitated capture of the recalled experiences of individual users; their work setting; their identification with the organisation and the ES; their work practices; affective states, and the material properties of the ES (Heath and Hindmarsh, 2002). We placed the video camera out of the direct field of vision of the participants and review of the recordings showed that most participants rarely looked into the camera (i.e., noticed it) during the sessions. Focusing on the recalled experience, our aim was to understand how the users themselves interpreted their work and interactions with ES. In a sense, during interviews and videographies the users were reflecting on and constructing their experiences both for themselves and us. The interviews and videographies were transcribed verbatim; non-verbal cues were added to the video transcripts (Ruhleder and Jordan, 1997). Our data analysis was exploratory and inductive - we used descriptive and interpretive coding techniques (Myers, 2009), with a view to identifying themes related to ES usage in this particular setting. Analysis and data collection took place iteratively, throughout the study. New questions arising from the analysis could then be examined *in situ*.

7 Findings

First, the research site is quickly introduced to place our findings in context, followed by vignettes that illustrate the experience of five ES users (space precludes further illustrations). The focus is on depicting how these users' affective states, identity, and the materiality of ES artefacts, intertwine into various stabilised dispositions that influence their user experience (usage). The vignettes represent the users' own and the researchers' interpretations of this entanglement and influence.

7.1 Research Site

As noted, the study took place in the back office of a major accounting firm. The back office is responsible for human relations (HR) management, some financial and accounting work, IT management, and in-house IS development. Back office employees support and handle requests both from front office and other back office workers. We interviewed and observed ten back office personnel: four from HR, three from Finance/Accounting, and three from IT. Their roles ranged widely: HR associate; business analyst; policy and procedures controller; engagement management controller; project manager, and director. Videographies were conducted with six of these workers. Depending on role, the participants use a wide variety of integrated ES. A well-known enterprise resource planning (ERP) system functions as the backbone across the organization. This backbone system was implemented back in 1999 as a result of a planned merger. The current version of the

backbone system is not the latest one and the back office no longer receives any external support for the system. There is a global initiative in the works, which should result in all of the branch firms across the world moving to the SAP ERP system. For the US firm (including the back office) this change is planned for 2012.

HR uses the current backbone system directly (referred to as HRMS from here on), while in Finance/Accounting, the system is used for baseline data storage and most work is done using the user-friendlier, web-based front-end. Because of the specific and complex needs of the firm, a large amount of home-grown customisations, additional front-ends and separate systems (integrated data flow) are available for both back and front office use. Much of the back office IT effort goes into maintaining, supporting and developing all these systems. Details of these different systems and their users (names changed in both instances for anonymity) are discussed in the vignettes that follow.

7.2 Dispositions and User Experience

Vignette 1: The "Miner"

Lucy works in HR, mostly in relation to policies and procedures. She shares an office with Mary (Vignette 2). Lucy's daily tasks include developing new HR policies as well as helping to conduct HR investigations using a web-based 3rd-party system. She also uses the HRMS on a weekly basis, mostly to check for additional employee data, such as performance ratings, birthdays, etc. Lucy has mixed feelings about how well the HRMS supports her work. On the one hand, she has useful customisations developed by IT services to help her data mining: *"I recently had a … report built for me to pull that data en masse, rather than go in for each person separately … It works great."* On the other hand, she feels that often it takes too much effort to get at the specific information she needs: *"I do find that a lot of time I'm flipping through a lot of different screens to get what I want; it's not right there … Sometimes digging down to get what someone's marital status or spouse's name is … I feel like it takes me a lot more deep digging than it really should.*"

Aside from the investigations, Lucy also deals with policies and procedures development. This seems to bring Lucy greater satisfaction than conducting detailed investigations, which require deep digging in data. Lucy and Mary support each other in their work and both seem very family-oriented. "*We build good energy off each other… Making things better is in our nature; that gives you the twinkle … We have a good family life*."

In our analysis we focused on Lucy's investigator role, as it involved interactions with an enterprise system. Overall, we found that Lucy's mixed affective stances towards the HRMS artefact; her identification with her policies-related work, rather than her investigatory work and the materiality of the system (its deep hierarchical structure, multiple tabs for similar information), entangle into a stabilised disposition for Lucy, which we labelled "*miner*". This disposition gives permanence and objectivity to Lucy's mixed feelings towards mining for data (including her preference for policies work); her expectation that this mining should be easier, and to work practices, where Lucy has to use extra reports to overcome the material resistance of the HRMS.

Vignette 2: The "Explorer"

Mary has been involved in HR quality and management for over five years and manages the use and enhancement of HR systems as well as projects for process improvements. As already mentioned, Mary and Lucy sit in the same office and Mary, like Lucy, identifies with *"making things better"*. Mary uses the HRMS only when problems arise or when her team is short on resources and she helps out. Problems associated with the system usually reach Mary via e-mails. Determining whether problems are actually system problems or process problems requires testing the problem scenarios in a test environment of HRMS and checking relevant reports (logs) in the production environment. "*We had a slew of e-mails and we said, 'OK, we've got about 20 or 25 e-mails now, that's just too many e-mails on one topic; let's have a meeting'. So we had a 30-minute meeting and one person said, 'Well, I had an issue with employee ID xyz', so we took that employee ID in the test environment and tried the*

same transaction, and said, 'Well, the program works'. So, we went back into production and ran the audit report of the entry of that person, saw who did the entry, went back to that person and said, 'Where's your communication that requested that person be changed?' "

In general, Mary finds HRMS helpful in her work: "*If we didn't have the audit report, I don't think we could've figured it out as easily… If you didn't try it in the system, you wouldn't know if it was a system issue or a process issue to begin with.*" When she doesn't know how one or another thing works, Mary likes to explore it in depth to get a better understanding: "*[Help function] – everything you want to know about everything that's in the HRMS version that you're in … We don't get a lot of training, so for implementing a new module, 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.*"

Overall, Mary's positive emotions towards the HRMS artefact; her identification with work that "*makes things better*", and the accommodating materiality (for Mary) of the system (the help function; test environment; reports, and logs), entangle into a stabilised disposition for Mary, which we labelled "*explorer*". This disposition gives permanence and objectivity to Mary's feeling that she "explores" the system while trying to fix problems or understand new things, and to her usual work practices – trying things out in the test environment, "exploring" the help tool, and so on.

Comparing Lucy and Mary, it is clear that their dispositions are quite different, despite the fact that they use the same HRMS. Their different emotions, Lucy's non-identification with her mining work and Mary's identification with her exploratory work intertwine with different material properties of the same artefact to form two very different durable dispositions: "*miner*" and "*explorer*", which influence how self-sufficient Lucy and Mary are, how they feel about their work, how they interact with the system, etc. – in short, their user experiences.

Vignette 3: The "Teacher"

Peter has been with the back office for over 10 years and works as an engagement management controller. Engagements have to follow a number of rules: they must be properly coded, accepted, risk assessed, and billed. Peter works with a number of different systems: the [financial engagement] baseline system; the web-based frontend for this system, and another umbrella system that exchanges data with the baseline system. "*So we went from that cumbersome [baseline system] to the very user-friendly [web-based frontend] and now [the umbrella system]. While it's slightly more cumbersome, it's very powerful in terms of what it does for the whole firm … It's bringing risk and financial services together and with the off-shoring we're doing, it's also making things easier for me as a user, because I'm not doing these kind of tedious processes.*"

From our observation, Peter seemed to have no trouble using the various systems; in fact, he managed to show and explain to us the entire process of engagement management across the three systems. However, what Peter enjoys most and identifies with is not his usual work tasks, but rather his teaching activities that he has taken on voluntarily: "*When I was taught to be an EMC (engagement management controller), I was sent away for a week of training, which was fun for me, but expensive for the firm … Over time we had enough people in-house, but what we needed – I'm about to blow my own horn – was an organization structure… how we're going to teach, what we're going to teach first, where are all the resources, etc. So, I actually created our new hire training toolkit. [...] The folks, who I work with regularly, in my self-centred view, are more capable than some other folks, because I don't just get them stuff. I say (to the extent that they have access to these tools), 'Let's take the time now and I'll show you how to do this and then you can do it yourself whenever you want […], but if you are too busy, I will get it for you. And I will do that with partners or administrative assistants.*"

In our analysis, we focused on Peter's teaching activities. Overall, we found that Peter's positive emotions around his teaching role; his identification with support and instruction in relation to these systems, and the materiality of the systems (power, cumbersomeness, cross-company reach) entangle into a stabilised disposition for Peter, which we labelled "*teacher*". This disposition gives permanence and objectivity to Peter's feeling that now, since he no longer has to deal with all the "*tedious*"

processes (i.e., his use of the financial systems during his other work activities), he can do the things he enjoys – spending more time teaching people how to use the software tools in better ways.

Vignette 4: The "Builder"

Jack has been a program manager for a front office systems suite for over five years. His job is to gather requirements for enhancements to the systems; oversee prototype creation; create test plans; conduct end-user testing, and oversee the development of the final product and roll-out. He has a team of five developers working for him. Jack learned all these systems he manages through what he calls "*baptism by fire*": he had no formal training and mostly learned by doing.

Overall, Tom's work practice is made up of a series of back-and-forths between him, business owners, developers, business analysts and the artefact (enhancement) being built. Business owners often resist certain changes, while not every feature of an artefact can be built because of resource constraints. *"I have to work with my different business owners, make sure that they're satisfied with the systems and everything's running fine, that they're well aware of what's going on. […] And we never get as many resources as we really need, because of budget reasons. That's a big frustration."*

The final artefact is an enhancement that has real physical properties – it enables the partners to do certain things (in certain ways), while not allowing them to do others. *"There are certain sections, where you do need to know certain information before going on to the next screen … you can't go to the next screen unless you have a valid function selected… you're gonna get an error message."* For Tom, the final product is a source of great pride and inspiration. Crucially, Tom's disposition is influenced by the business owners' positive feedback about the artefact. *"Ever since I was a kid, I've loved building things, so when a project comes in, that's what inspires me, 'cause I know I'm gonna be able to build this thing [...] When you get something in production, it's a great feeling, especially when the business owner's so happy. 'Thank you, this really helps us', and this and that"*.

In sum, Jack's positive emotions towards building system enhancements that improve end-user work processes; building project plans that end with workable solutions; his interactions with the users and the ES artefacts he creates, entangle into a stabilised disposition that we labelled "*builder*". This disposition gives permanence and objectivity to Jack's feeling that now that he "knows" the system, and the firm (now that he has learned how to overcome the material and human resistances associated with change), and despite resource constraints, he can "build" solutions.

Vignette 5: The "Guide"

Ryan, a senior business analyst, has been working for the accounting firm for two and a half years. He supports three products - the main one is a subscribe/publish type of system, which enables everyone within the accounting firm to get data from the backbone system to implement local applications (75% of which are IT applications supporting the business). *"So HR is a publisher, publishing data onto the [system] for applications to subscribe to […]. HR might have a personal feed, which has 47 fields in it and 22,000 records. Subscribers can request that this data be limited to only 5 fields […]. We can manipulate that data before it gets to the subscriber. I gather the requirements for the subscriber […], I will work with the applications development team and then I will create a subscription for them.*"

Ryan helps people all over the world to subscribe to this system and implement their applications. He identifies with this bridging function, where he has connections to firm employees all over the world and he enjoys interacting with them as well as the different applications he supports. "*We have 80+ applications so I'm always interacting with these people and you get different personalities and it's just […] nice being able to talk to different people, […] so you know, I enjoy it. […] I think I'm heading in the right direction. And you see this moving - IT wants to be closer to the business - and I think that's something I'd like to be able to do.*"

Ryan's positive emotions and his mediator identity influence how Ryan approaches the technical limitations (resistances) of technologies – "*if it's not working the way I expected it to, I either figure out why it's not working and just deal with it or, you know, work around it.*" Crucially, his disposition

is influenced by his ability to overcome these constraints in order to be able to continue to guide his 'customers': "*There's always a time when you don't know and then 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.' "*

To sum it up, Ryan's identification with guiding people in their interactions with a system, his enjoyment of this process and the material resistances he is easily able to overcome intertwine into a stable disposition that we named "*guide*". This disposition sets the stage to how Ryan approaches his everyday work, his interactions with the subscribe/publish system and his 'customers' – in short, the stage for his user experience. The disposition gives durability and value to Ryan's mediator identity, his pleasure from the mediating process, and the system as manageable.

8 Discussion: Implications, Limitations and Future Work

Naturally, the implications that we have drawn from what is a limited set of interviews and observations require further testing. Nonetheless, the findings are useful in guiding further field research over time and in different settings. Studying the situated nature of ES usage from the perspective of the affective states and identity of the user, and their intertwining with artefact materiality, lends itself to forming insights into the holistic nature of ES user experience. Seeing the findings in deterministic terms, one could argue that, for example, the help function of HRMS directly influences usage in some positive and/or negative manner, or that the positive or negative nature of the help function is a purely user-constructed perception of the system. On the contrary, we argue that such simplistic approaches to studying and analysing ES usage can be misleading and incomplete: the user and the artefact cannot be neatly separated. A user approaches system usage with certain affective stances, which then, through a series of resistances and accommodations (from both the user and the artefact), may be transformed into something different, or may remain largely the same. The result of this entanglement will be stabilised in what we call a disposition – something that is seen as the atmosphere or ambience surrounding a particular experience. This ambience gives permanence and objectivity to the user's mood and identity, the material nature of the artefact, and the work practices that emerge. As such, this paper contributes to theorising user experience in a manner that avoids the pitfalls associated with, and the limitations of, prior studies that focus on system acceptance on the part of users, and on user satisfaction, as a surrogate measure for system success and usage. The nature of both the human being and the ES ensures that user experiences tend to repeat and form a pattern. This is why one user may always refer to entering sales orders as "frustrating", to an ES as "horrible", and to the process of entering an order as "inefficient", for example, while another may see it as "simple", the system as "well-structured", and the process as "fool-proof", and even "edifying".

Notwithstanding data limitations, our findings suggest that studying the entanglement of human affective states, identity and ES materiality is valuable in terms of understanding the situated use of ES more completely. For example, we see that Lucy relies on external IT support, rather than self-exploration for her mining work, because she does not really identify with her work; Mary, on the other hand, spends hours reading the Help file, because she enjoys and identifies with "making things better"; Peter voluntarily takes on the teacher role to overcome the tediousness of his everyday tasks and system use; and Ryan learns everything he can about the publish/subscribe system to be able to make it accessible to others and continue to enjoy his mediator role. For practice, our findings also point to the kinds of organizational and system support from which different users could benefit. For example, it is clear that Lucy would not be able to overcome HRMS's limitations in "mass digging" without the extra report that the in-house IT services built for her. Alternatively, a more flexible HRMS would, for example, allow Lucy to create such a customised report herself. However, as pointed out earlier we do not see ES artefacts as something that can be completely controlled or designed to achieve specific kinds of usage or user experience. Hence, our findings do not attempt to offer universal design principles or managerial control techniques; rather, our aim would be to inform the design practice itself and designers' understanding of potential system usage. Future studies could

explicate these connections in more detail. The current study is limited to presenting a novel theoretical framework as food for thought and some initial empirical support that hopefully will contribute to further research in this area.

In the future, we hope to conduct further interviews and observations over time (through longitudinal ethnographic study) and examine a larger vista of users, their affective states and identities, and how these enmesh with ES materiality in different ways, making it possible to construct a more elaborate "thick description" (Geertz, 1973).

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