

ON THE APPROPRIATION OF CONSUMERISED IT: A TRIAL AND ERROR APPROACH

Research full-length paper

Track N° 0

Zamani, Efpraxia D., Information School, University of Sheffield, UK,
e.zamani@sheffield.ac.uk

Pouloudi, Nancy, Department of Management Science and Technology, Athens University of
Economics and Business, Greece, pouloudi@aueb.gr

Abstract

Consumerized IT devices, such as tablets, are widely adopted and support both personal and professional uses with a wide breadth of applications. Our study focuses on appropriation behaviour in instances of disillusionment, that is, when technology-in-use fails user goals. Building on grounded theory methods, we analyse blog entries that provide narratives on user interaction with tablets to unpack users' efforts to appropriate the tablet through the lens of trial and error theory. In doing so, we identify the conditions for rejection, as well as appropriation. Trial and error is shown to be a variation that extends the appropriation literature. We contribute to understanding the volitional, consumerized use of IT where the use scenarios are determined by the individual and IT use transcends the boundaries between work and personal IT use.

Keywords: post adoption behaviour; trial and error; tablet; case study.

1 Introduction

Information Technology (IT) nowadays pervades personal and professional realms. In addition to diverse personal contexts, smart devices (phones, phablets, tablets, watches or other wearable technologies) are also used in organizations with highly consumerized technology environments (French, Guo, & Shim, 2014), through ‘bring-your-own-device’ schemes (Schmitz, Teng, & Webb, 2016). Unlike earlier IT artefacts, consumerized IT devices transgress individual usage patterns in media, communication, sports, wellbeing, education, work and social networking. They are boundary-spanning across the private and professional contexts, and accommodate different contexts of use, within and across boundaries. Importantly, their use is typically volitional (Tsai, Compeau, & Meister, 2017); the individual user decides and controls their use, rather than the organization. This denotes an extreme heterogeneity of possible uses, as well as user control over the choice to adopt, modify, or reject a technology device (or certain uses of it). These two aspects constitute a novel context of IT use, where user goals pose a significant challenge because, as the user switches between contexts, IT is expected to satisfy the requirements of these changing environments and use patterns.

Within this novel context, volitional use further suggests that the success of an IT artefact depends upon the user finding some benefits in its use and developing personal use scenarios. Such aspects of use are typically examined in the literature through the lens of appropriation, whereby users modify, refine and use IT in ways that meet their needs (Clark, 1987). Studies within this area seek to identify how the IT-task or IT-user fit is achieved (e.g., Barki, Titah, & Boffo, 2007) or focus on the different manifestations of appropriation acts and adaptations. This focus on appropriation is warranted and particularly critical, as appropriation can lead to sustained use, and make for a successful IT artefact. However, a key assumption across this literature is that such a fit can indeed be reached through appropriation acts. Another common denominator is the focus on enterprise-level systems in an organizational context (e.g., Bhattacharjee & Premkumar, 2004; Jasperson, Carter, & Zmud, 2005). While the literature on appropriation focuses on the behaviour of individual users, these users are typically studied as organizational members, while the choice and purpose of technology is set at the organizational level. This focus of extant appropriation studies on the organizational context misses the specificities of consumerized devices, where appropriation acts may not be necessarily side-stepping a prescribed interaction, but an attempt, successful or unsuccessful, to satisfy user needs and goals.

Thus, the research problem we address is: how do individuals appropriate technology in a voluntary setting following disillusionment? Our aim is to focus on how the user attempts to overcome negative disconfirmation through a series of efforts and adaptations out of their own initiative and in order to meet their personal objectives, rather than as an attempt to comply with organizational objectives. We draw attention to highly consumerized technologies, using the tablet as an exemplary case, and employ grounded theory techniques for data analysis, with the expressed aim of building new concepts which can be integrated into appropriation theories (Urquhart, 2012; Walsham, 1995). Our empirical material (blog posts) spans a prolonged period of time (7 years). We analysed this material without having preconceived perceptions of the topic, but instead we entered the field by adopting the practical middle ground proposed by Volkoff, Strong and Elms (2007), drawing iteratively both from our data and existing relevant theories. We examined our empirical material through the views of competing theories, such as coping theory, bricolage and sensemaking, and we have identified patterns in behaviours that led us to the concept of trial and error as a variation of appropriation.

The paper is organized as follows. First, we discuss prior work on appropriation. Section 3 presents our study’s method and empirical material, followed by the analysis and the discussion of our findings in Sections 4 and 5 respectively. Our paper concludes with the contributions of our research to the appropriation literature and our study’s limitations.

2 Background Literature

Appropriation is an essential prerequisite for sustained and lasting adoption of information systems and devices through the habitualization of norms and routines (Dennis, Wixom, & Vandenberg, 2001) while users develop their own use scenarios, making the technology one's own (Mäkelä & Vellonen, 2018; Wu, Choi, Guo, & Chang, 2017). Appropriation is therefore integral for the success of a particular IT artefact. For this reason, and to better understand the concept, in what follows we examine appropriation as well as its different variations proposed within the existing literature.

2.1 Appropriation of IT

Appropriation is seen as the process where the user identifies benefits in using the specific IT artefact and attempts adaptations and modifications in order to use the device as desired (Barki et al., 2007). It may be defined as the "situation where the user starts by recognizing the potential value of a particular IT and manages to narrow the absorption gap between the requirements of the IT and its own limited capacities" (Clark, 1987, p. 156), or as "seeking a relationship with the technology so that it provides benefit to the user through supporting practices, enabling new - and beneficial - practices or removing ineffective practices" (Carroll & Fidock, 2011, p. 4). Researchers further emphasize the impact of IT appropriation on organizational performance (e.g., Beaudry & Pinsonneault, 1998; DeSanctis & Poole, 1994) and focus on delineating the different modes of appropriation, as for example workarounds (Alter, 2014; e.g., Ferneley & Sobreperez, 2006), and adaptations (e.g., Elie-Dit-Cosaque & Pallud, 2010; Sun, 2012; Wu et al., 2017).

Beaudry and Pinsonneault (1998) propose that the process of adaptation ensures a fit between technology and user, with the user changing their habits, enriching their skills, and changing the technology to fit the user's preferences. Schmitz et al. (2016) extend the concept by identifying four modes of adaptation, namely exploitive task adaptation, exploitive technology adaptation, exploratory task adaptation and exploratory technology adaptation. Adaptation may take the form of enhanced use of IT, where users proceed with trial and error to explore additional features, support functions, or even technical manuals (Bagayogo, Lapointe, & Bassellier, 2014). In doing so, user adaptation entails an element of learning (Kwahk, Ahn, & Ryu, 2018) as users identify and use new interaction methods for completing tasks (Barki et al., 2007).

Trying to innovate with IT has been proposed as another variation of appropriation (Ahuja & Thatcher, 2005), where users seek to find new ways of using IT (Tams, Thatcher, & Craig, 2018). Workplace innovation with IT suggests that users try to integrate IT within their work processes (Wu et al., 2017) by attempting to overcome impediments and limitations imposed by it (Schmitz et al., 2016) where the actual behaviour is influenced by one's goals about the outcome of their IT interaction (Ahuja & Thatcher, 2005). Therefore, trying to innovate with IT can be seen as one's behavioural coping during which they are able to identify new uses for their existing systems and ways to support new tasks (Wu et al., 2017).

Improvisation is closely related to trying to innovate with IT, and to date it has been quite influential within the Information systems field (e.g., Ciborra, 1999; Elbanna, 2006; McGann & Lyytinen, 2008; Verjans, 2005). It suggests that individuals and organizations try out different things in order to solve problems by casting a wide net that may go beyond what is known, and therefore there is greater room for novelty and innovation (Scheiner, Baccarella, Feller, Voigt, & Bessant, 2016). Improvisation may seem random and unpredictable because individuals and organizations need to work with whatever is available in the here and now (Ciborra, 2002), because it entails thinking and acting "simultaneously and on the spur of the moment" (Ciborra, 1999, p. 78). As a result, the emerging problem and the conditions themselves may not allow for a carefully selected course of action, but rather one that appears better than the other options in a compressed time interval.

Enhanced use of IT (Bagayogo et al., 2014) and deep structure usage (Burton-Jones & Straub, 2006) are two additional variations of appropriation, closely related to each other. Enhanced use suggests that the user tries to identify novel ways of employing the technological features of a system, which

may include using previously unused or underused features (Bagayogo et al., 2014). Deep structure usage captures the use of a given system for a particular task, as well as the quantity, nature and the extent to which IT features are used in order to complete the said task (DeSanctis & Poole, 1994). Because it necessitates that users understand the deep structure of the system itself (Burton-Jones & Straub, 2006), Tams et al. (2018) argue that deep structure usage is a very rich, highly sophisticated and demanding form of usage.

Appropriation studies suggest that users revise IT use as a result of emerging situations, discrepancies and deliberate initiatives (Sun, 2012), with the aim to meet one's needs and overcome inadequacies (Lee, Panteli, Bülow, & Hsu, 2018). Users may change their IT use as a result of e.g., newly introduced features, that allow them to use new and/or unused features and extensions, and to use the same IT for more tasks (Bagayogo et al., 2014). This suggests that users wish to take advantage of the technological features (Sun, 2012).

The final variation of appropriation is workarounds. Technology is not always used as originally designed (Schmitz et al., 2016), and modifications may be faithful or unfaithful to the spirit of the original design (DeSanctis & Poole, 1994). Such modifications may encompass workarounds (Alter, 2014), which are the result of users engaging with a technology outside the scope of the prescribed rules of use (Ferneley & Sobreperez, 2006). In this respect, workarounds are also related to improvisation as they tackle shortcomings of the systems they use (Morrison, 2015), and numerous studies showcase that workarounds, especially those that are stable over time, are integral for day-to-day activities (e.g., Azad & King, 2011) when the system is seen as inadequately designed (Ferneley & Sobreperez, 2006).

2.2 Common threads and limitations in the extant appropriation literature

Despite the breadth of studies of the different facets of appropriation, the majority exhibit some common features. First, there is a common recognition that the actual use of the technology may be different from the originally designed instrumental use (DeSanctis & Poole, 1994). In this sense, there is some element of exploration and adaptation, with appropriation entailing a degree of engagement from the user's side (Lapointe & Beaudry, 2014).

Second, adaptations, adjustments, revisions and improvisations seek to identify a fit between technology and user or task, by changing either the technology, one's workflow, or the task itself (Beaudry & Pinsonneault, 1998). The assumption is that there is indeed a fit that can and will be identified through appropriation. However, our study focused on the multiple occasions where users fail to find a fit, despite their appropriation efforts, which to date has been under investigated.

The third common characteristic is the focus on enterprise-level systems in an organizational context. For example, improvisation studies in the IS field adopt an organizational lens (e.g., Elbanna, 2006; Molnar, Nandhakumar, & Stacey, 2017), in order to examine the improvisational capability of an organization (e.g., Chatterjee, Moody, Lowry, Chakraborty, & Hardin, 2015), its importance for responding to highly turbulent environments (e.g., Pavlou & El Sawy, 2010), as well as the improvisation practices of organizational members rather than individuals (e.g., Cram & Marabelli, 2018), while they tackle fire-fighting situations (Alblas & Langerak, 2015; Repenning, 2001). The frequent use of an organizational perspective is not unexpected, considering that many of the investments in commercial enterprise software are costly (Bagayogo et al., 2014) and the reluctance of individual users to adopt an enterprise application as designed, or at all, can endanger organizational performance and profitability. The research presumes that users, while exploring and adapting IT, consider their own requirements as well as those of the organization. Moreover, they enter this exploration modality with a restricted set of IT devices and systems which has been chosen by the organization. In this sense, even when seen as individuals, they are assessed as organizational members (Ahuja & Thatcher, 2005; Azad & King, 2011; Barki et al., 2007; Beaudry & Pinsonneault, 2005; Choudrie, Zamani, Krepel, & Stewart, 2016; Cram & Marabelli, 2018), under the assumption that their commitment to 'making IT work' may be low.

In contrast, individuals, under their own volition, may proceed at their discretion towards IT appropriation with as many adaptations and modifications required (Schmitz et al., 2016), without time constraints, and stopping the process when they have identified a good enough solution (Miner, Bassoff, & Moorman, 2001; Rerup & Feldman, 2011). Alternatively, they could abandon the process altogether if they consider that a solution is too difficult to discover or non-existent (Swann, 1999). However, the literature has awarded less attention to the appropriation of consumerized IT where users identify beneficial use scenarios rather than adopting a top-down definition of appropriate use (Schmitz et al., 2016). Under such circumstances, exploration, adaptation and eventual appropriation (or not) of IT can be more flexible; as time progresses, users may unearth previously unexpected use scenarios that feed into their level of satisfaction with the device. Therefore, it is critical that research focuses on use context beyond the organizational one in order to understand and appreciate how IT artefacts may be adapted when use is not mandatory and users have at their disposal a wide range of potential actions.

3 Method

In this study, our research question is the following: “How and why do users appropriate or reject an IT artefact?” This research question entails a focus on what sort of ‘problems’ users encounter while attempting to fulfil a task, and how they enact different solutions using the tablet or any other IT device at their disposal. We approach our research question through the perspective of interpretivism (Walsham, 1995). Adopting the interpretivism tradition allows us to better understand and explain the subjective meanings assigned to the IT artefact and other concepts (Orlikowski & Baroudi, 1991), without discarding our own preconceptions, but rather using them as a point of reference towards refining our understanding (Boland, 1997).

Within this context, a case study using grounded theory techniques is considered an appropriate strategy of inquiry, where the unit of analysis is that of disillusionment with IT. It is further particularly pertinent for building theories and developing descriptions of phenomena that are context-based and process-oriented (Urquhart, Lehmann, & Myers, 2010). Most importantly, the method of grounded theory offers well-defined procedures for the collection and analysis of empirical material in a way that supports the emergence of theory and rich findings from the data themselves, whereby both may be guided by prior theory (Urquhart, 2012). In this sense, we followed the processes frequently employed by other information systems researchers who use grounded theory methods (e.g., Barrett & Walsham, 1999; Boudreau & Robey, 2005; Volkoff et al., 2007).

It should thus be noted that, we did not follow a top-down approach aiming to confirm or disprove a certain scheme. Instead, the concept of trial and error emerged from the data, during the stage of analysis, and functioned as a lens for framing in a reflective and recursive manner the data collection and analysis and the interpretation of findings.

The timing of the beginning of our study (2010) coincided with the launch of the first tablets into the mass consumer market (i.e., the iPad). It therefore sparked our interest to look deeper into how the device was actively being used across a number of contexts. During data collection and analysis, we realized that users were eager to identify a fit for this new device into their everyday activities. Further exploration led us to realize that the process was rarely straightforward. Instead, users seemed to be trying out different use scenarios, and quite often developing quite novel ways of incorporating the tablet into their IT device portfolio. These preliminary findings suggested that users follow a trial and error behaviour, where appropriation and even rejection are the result of the user trials, accepting one or a combination of solutions, or rejecting others.

3.1 Data Collection

Our empirical material consists of blog posts, authored and published by tablet users. We collected our empirical material in two stages, between March 2011 - August 2012, and between January 2017 - July 2017, through a Google search using ‘experience’, ‘iPad’ and ‘blog’ as keywords. We initially

conducted this research in a non-discriminatory manner, in order to get an idea about the themes bloggers tend to discuss. Next, we focused specifically on the main blogging platforms (i.e., wordpress, medium, blogger, tumblr, posterous (now discontinued)), where we used the search field and the keyword/hashtag functions in order to identify additional posts. In order to ensure that our empirical material included solely unsolicited, personal blog posts, we excluded all technical reviews, blogs and websites that could be considered as being affiliated directly or indirectly with Apple Inc.

We then examined each blogpost against our inclusion criteria. Each blogpost had to satisfy the following: a) it contained a rich description of the blogger's interaction with the tablet, b) it described voluntary use of the device, c) it contained a description of negative disconfirmation i.e., the user attempted to use the device in a particular way but for some reason failed to do so, and d) it described an underlying effort to overcome disconfirmation and appropriate the device. These criteria were selected so that the content of the blogposts addressed our research question, went beyond purely descriptive blog entries regarding one's interaction with the tablet, and contained contextual and processual information that would allow our investigation into the appropriation process.

The second stage of data collection was necessary for theoretical saturation following the preliminary analysis of the empirical material. The chronological difference between our two stages of data collection means that during the first stage, the tablet was a novel device, whereas during stage 2, users were directly or indirectly familiar with it and they had formed some goals with regards to the device as a result of, for example, past experiences, observing others and advertising. However, the purpose of this study is not to document nor compare goals, where the 'starting point' of each experience would be undoubtedly critical. Instead, we are only interested in examining trial and error behaviour at times of disillusionment and how they go about overcoming negative disconfirmation through trials, regardless of the technical features that prompted disillusionment.

Our final pool contains 136 blog posts, authored by 86 unique English-speaking tablet users. Of them, 76 bloggers were male and the remaining 10 were female; 96 were based in North America (USA and Canada), while the majority of the remaining blog posts were by Europe-based bloggers (e.g., UK and The Netherlands). Most users hold upper-level managerial positions or are freelancers (e.g., consultants, editors, writers).

3.2 Data Analysis and Interpretation

We began our analysis with open coding blog posts, studying the material line-by-line, and coding one or two sentences at a time or full paragraphs, assigning labels in many cases using the bloggers own words (in vivo) or drawing from existing literature. Coding at this level was done by the first author in consultation with the other authors, discussing the relevance and the content of the assigned labels, in order to ensure consistent coding. All open codes were later re-examined in light of the developing coding scheme. Selective coding entailed delimiting our coding to those codes that seemed to relate to the core categories, while identifying their variants, the dimensions or the properties, and while revisiting the original empirical material and the literature (Hekkala & Urquhart, 2013; Urquhart, 2012). It was at this stage that our core categories (Table 1) started surfacing as substantive codes. We were then able to scale up our analysis by developing relationships between the different selective codes and categories through cross case analysis.

Category	Selective Codes	Open Codes (examples)
<i>Disillusionment:</i> Initiated by gaps between goals and perceived realities in use; negative disconfirmation.	Goals	"skeptical" (e.g., B5, B8, B78), "what always wanted the iPhone to be" (e.g., B92)
	Comparing	"comparing to paper" (B98, B99), "comparing to books" (e.g. B8, B62)
<i>Trial and Error:</i> When faced with disillusionment, users seek to	Tentative solutions	"Using a smaller keyboard" (B23), "to record notes during patient interviews, both by typing and with a stylus" (B99)
	Error	Error: "aggressively reload apps" (B17)

overcome it. Following the tentative solution, the user may experience another problem, or 'error'		Tolerable error: "there wasn't enough power" (B23)
<i>Outcome:</i> The result of trying, the end of the process	Appropriating	"At first, I used SimpleNote to sync with Scrivener. Eventually, I found a better solution, using Scrivener, Dropbox, and Elements. This last solution has worked well for me since I discovered it." (B67)
	Rejecting	"I gave up and borrowed laptops (one per continent) to do all of my posts, including when I was covering our keynotes at TNW Conference. (...) However, in the near future at least, I will haul my laptop on any trip I go on where I'll be blogging" (B1)
	Identifying Benefits	"wonderful opportunities for "social" internet surfing" (e.g., B80, B11), "a screen that connects me with people" (B17), "Once you get used it that, you realize how efficient you are with the lack of distraction." (B81)
	Feeling restricted	"Apple will sit and control what you can do with the advice" (B111)
	Feeling tethered	"it's always been about the Apps" (B5), "most of my Apple experience is actually powered by Google" (B90, B16, B80)

Note: numbers in brackets denote the ID number of the blog post.

Table 1. Descriptions of Categories, Selective Codes and Open Codes

4 Findings

In what follows, we describe the trial and error process through which users deal with this disillusionment and the outcomes that ensue. Based on our findings, users can be classified in four groups, depending on their initial goals (i.e., users expect to use the tablet within a specific use scenario or they wish to experiment with the device) and the two types of outcomes (appropriation or rejection) of the trial and error process. To present our findings, we chose one blog from each group of users, as inspired by other researchers (Korica & Molloy, 2010), in order to ensure continuity in the description of the trial and error process and the corresponding outcome.

4.1 Trying and Identifying Errors

In our study, trial and error is seen as the (sequence of) attempts for bridging the gap between goals and experience (disillusionment), as the user tries out different tentative solutions to overcome the initial problem (unmet goals).

4.1.1 Peter, the musician: specific goals, appropriation

The first case is Peter Deming (B23)¹, an Australian musician and music editor. He has been using his MacBook Pro, together with a specialized application (MainStage) in order to use "the sounds of pro keyboards like Roland RD pianos and synths when playing live". When playing at home, Peter uses the iPad live keyboard rigs instead of the MacBook Pro. His aim was to see whether he could use this last setup for live performances as well. In short, Peter wanted to substitute his laptop with the tablet for live performances.

¹ All names replaced for anonymity purposes.

He did not want to use a virtual keyboard, but “a decent “real” MIDI controller keyboard”. He thus had to find a way to connect the iPad to a physical keyboard. Yet, “iPads have neither USB nor MIDI inputs”, and larger keyboards require batteries or to be powered externally (disillusionment). That meant that Peter needed an adaptor to connect a keyboard to the tablet, and a smaller keyboard, that could be powered up through the tablet (tentative solution). “This worked well, and the iPad was able to power the keyboards for hours”, but Peter “encountered a small glitch when [he] first plugged in [his] MIDI controller”, receiving a message from the tablet that “there wasn’t enough power” (tolerable error). Being confident and intuitively thinking this “was meant to work”, he “started experimenting” (trying). What he discovered was that the error was due to the sequence of plugging in the cables and the adaptors. Having solved this, he discusses latency, being quite good. Yet, there is a delay (“hardly noticeable, or unnoticeable”) (tolerable error) and he does “have the occasional problem (error) [...] [b]ut resetting the iPad makes it responsive again”.

Next, Peter needed to map his keyboard controls in the application, in order to be able to control sounds and effects. He described this as the “flexibility” he needs to fiddle with parameters as he plays. Comparing the iPad-focused setup with the more traditional MacBook Pro-focused one, he understands that “there doesn’t seem to be a way of mapping all of those useful buttons, knobs and sliders on my keyboard to do anything useful” (disillusionment) and mentions that perhaps it is a problem with the application, or something that will be addressed in the future (no solution).

With respect to music applications, Peter highlights that he wants “some better sounds” than what GarageBand affords (disillusionment), which is why he spent quite some time in investigating and trying out different applications (tentative solution). However, he states that comparing the two setups, it is not “easy for [him] to mix and match [his] favourite instruments”, because “[m]ultitasking and running multiple apps concurrently has never been [the tablet’s] strong points” (error). To this shortcoming, he identified another application that can function as a tentative solution, leading however to yet another error, as he “find(s) [himself] having to swap between the different apps to tweak settings and levels”, which is not the experience he’s been having with the MacBook Pro (no solution).

He goes on identifying other problems as well, such as the difficulty of getting high quality audio out and the inability to connect the tablet to power, as long as external keyboards are connected. All of these emanate out of the unavailability of more than one hardware ports. He concludes his post by underlining that the tablet promises to become a digital source that can provide multiple instruments, sounds, and last all day, but he also discusses that it does not deliver on this promise yet (“Does it deliver? Yes and no.”).

4.1.2 Michael, the medical student: specific goals, partial appropriation

Michael J. Anderson (B99) is an American medical student who has been using the tablet during his clinical year. He has been finding the tablet to be both useful and versatile. He has also incorporated the tablet into patient care, too. This means that oftentimes he needs access to medical records that are stored securely into a dedicated content management system. However, he cannot access this system directly via the tablet (disillusionment). Instead, he needs to go through the Citrix receiver that allows him to access the application in the centralised host, and “tap into [the] EMR² system”. Having said that, Michael mentions that “[t]here are some ways where [he’s] been less than impressed with iPad”. Specifically, he highlights that it is “not a very good input tool” (disillusionment) and that having tried “to record notes during patient interviews, both by typing and with a stylus” (comparing), he posits that neither solution is satisfactory. The source of his disappointment is the lack of speed and accuracy in capturing information (error). In addition, during patients’ interviews, Michael considers the tablet to be a barrier between the patient and himself (error), because he is “too busy making sure that the [...] notes [...] were accurate”. Therefore, and mentally comparing the tablet to a notepad, he arrives

² EMR: electronic medical record.

at the conclusion that “[p]aper and pen is still superior in a lot of cases”, and, for now, he has stopped using the device during interview time.

4.1.3 Harriett, the litigator: exploration, rejection

Harriett Hayward (B55) is a litigator, a consultant and podcaster. Fairly recently, she switched from the iPad mini to the iPad Pro, trying to identify whether she could “be doing more with [the] iPad”, such as using it for note taking while meeting with clients. She mentions that the mini version “has never been [her] preferred device” for “productivity related activities”, such as preparing a presentation, or a legal brief. Having switched to the iPad Pro, the larger screen and the multitasking features “make these types of tasks easier [...] than they ever were before”; yet, she adds that the experience is still “compromised” when compared to using a laptop.

She goes through her experience with the iPad Pro and her efforts to use it for being more productive with it. She argues that, “the biggest problem with the iPad Pro was it was just too darn big” (disillusionment), affording to be used only while “at a table or another flat service [surface, sic]”. The tablet was as large as a laptop and carrying it around required some effort (“It wasn’t something that could be thrown in a purse and taken on a whim”). These observations made less sense to choose the tablet over the laptop (“If I was going to go the trouble, I personally would have preferred to have my Mac”).

Next, Harriett reflects meeting with clients and how she felt while typing her notes on the on-screen keyboard. She describes “typing directly on the glass [as] a clunky experience” (disillusionment), which can be improved by pairing the tablet to an external keyboard. This would make the tablet even more similar to a laptop setup, where there’d be a “physical barrier” (error) between her and her client, which is “the situation [she] was trying to avoid by using the iPad in the first place”. Harriett did not actually test whether these two setups perform similarly, but makes this judgement intuitively, drawing from experience.

For taking legal notes, she compares the use of the tablet with a stylus, to a legal notepad, and describes the former as “more fatiguing compared to pen and paper” (error), potentially “due to having less friction and having to apply more pressure to control the pencil”.

Other issues related to the translation and optimization of iOS applications for the iPad Pro’s format and capabilities. Based on this, Harriett got discouraged when she realized that “only certain apps supported split screen view” (error), while switching between applications was “clunky” as copy-pasting had to be done manually, rather than using “a more intuitive drag and drop”. Further, only few applications would use the improved on-screen keyboard (error), and accessing non-optimized applications she “wanted to scream”. For the above reasons, and despite seeing some merits in the iPad Pro, Harriett decided to return it after two weeks of use.

4.1.4 Russ, the freelance designer: exploration, appropriation

Russ Tamblyn (B119) is an independent design professional who is using the tablet as his “primary machine”. He managed to do this by using a Bluetooth external keyboard and a camera connection kit. Having tried to type using the on-screen keyboard, Russ mentions he “can type quite quickly on it”. Yet, he prefers the external keyboard in order to get the necessary extra accuracy that he considered as one of the main problems that could potentially prohibit him from adopting the tablet (disillusionment). This suggests that Russ exhibits a sense of intuition as to what may be the potential impediments in reaching his original objective. He next discusses that he needs a camera connection kit for importing photos from an SD card, which was important to him and needs to edit and manipulate pictures and videos in order to completely adopt the tablet as his primary device (disillusionment). With respect to image formatting and manipulation, Russ underlines that “the biggest issue is image resizing” (error), suggesting that it has found resizing to be impossible (“I’ve found it impossible to resize an image to a specific pixel value without also having to calculate the height value too”), which, for his line of business, is vital. He has attempted to solve this by trying out different applications, none of which seems to work.

He concludes his post saying “it’s definitely possible to use the iPad as a primary computer”, and that despite that some issues require rather “cumbersome methods to achieve the desired results”, his productivity does not suffer due to using the tablet. In addition, he refers to the lack of real multitasking and that this has worked to his advantage being able to “[focus] more on the work in hand, because there’s nothing that’s distracting you across the screen”. Having said that, it is important to note that while the lack of multitasking has been identified by the user as a shortcoming, there is no attempt to tackle it; instead it is taken as a given, and the user quickly proceeds with identifying perceived benefits (i.e., enhanced focus).

4.2 Outcomes: Appropriating and Rejecting

From the presented cases above, Russ is the user that arrived at appropriating the device by migrating all his computing activity to the tablet. He has done so by implementing a series of adjustments and modifications, i.e., he is not using the device as designed. He highlights “[f]or nearly two years [he’s] been an iPad user”, and despite that “[t]here are a few areas, such as image resizing, which it severely lacks (...) [he hasn’t] found much issue with productivity either”. Instead, he’s “finding new ways of using [it] more” and would only “like [original emphasis] then to have a Mac as a secondary computer (...) to add some final polish to something, but even that could be put aside in favour of the iPad”. The result of this process, on the one hand, has been his augmenting the IT device using external accessories, third-party applications, and making compromises, with the aim to use the device within the context of his original goals. Most importantly, however, the appropriation of the tablet is primarily evident in how Russ evaluates the lack of multitasking. Russ compares his past customary use of a computer to the new workflow, and concludes that the tablet allows him to switch to a more focused interaction, where “there’s nothing that’s distracting you across the screen”.

Therefore, we consider that there are two important elements with regards to the appropriation of an IT device. First, when initial goals are unmet, the user will perceive this as a problem. Assuming that the user considers there is some potential in the device, she/he will then persist with using it in order to make its integration possible. This may lead to two different outcomes. First, the user may adopt a trial and error behaviour so as to identify a way to overcome the problem (e.g., using external accessories), and arrive at a situation where the new device succeeds in supporting more beneficial practices. Second, the user may accept that adjustments and modifications are not possible (e.g., in the case of the lack of multitasking), in which case, under the initial assumption with regards to the device’s potential, she/he will consider that the new workflow is more beneficial and therefore ineffective practices are removed (e.g., focus more on the work at hand, behavioural/habit changes). In other words, the user changes their perception of the artefact.

Goals and past experiences with other forms of IT, and even with other comparable solutions, have a significant impact on how an interaction is evaluated and how experience is understood, because these influence users in how they think and act about technology (Orlikowski & Gash, 1994). This appears particularly relevant with respect to users rejecting the device, partially or entirely. From the cases presented above, two of the users did not appropriate the device in the way they originally hoped for. Each of these two cases illustrate the different degrees of rejection; it is clear that Michael rejected the tablet as a “replacement” device for specific use scenarios, and Harriett rejected it entirely for all use scenarios. The common denominator across all these cases is that users eventually regressed to the old ways of completing their tasks.

Michael has been using the tablet in different scenarios for his studies and clinical year quite satisfactorily. To do so, he has been using third party applications and has implemented workarounds. Michael considers the device “invaluable” as it has allowed him to take advantage of every available moment. However, he has been less satisfied with how the tablet can serve him while interviewing patients, primarily because it feels like a barrier between them and him. Ultimately, he prioritizes the sense of restrictiveness when communicating with his patients over using a more convenient technology (“Who wants a medical student (someday physician) who focuses more on a computer than on the person?”). As a result, while the tablet has enabled some new and more beneficial

practices (e.g., studying while on the go, accessing information), it has equally proved to lead to ineffective practices as well, which is why he “put[s] away the iPad” when being with patients.

Harriett, having been a tablet user for years, wished to experiment with a larger tablet, so as to potentially uncover new uses. In other words, she did not have a specific use in mind, but wished to increase her tablet use in general. The larger form factor proved to be the central error she came across while attempting to integrate the new tablet in her workflow. Having to use a larger machine meant for her more restrictions along the lines of portability (“It wasn’t something that could be thrown in a purse and taken on a whim”), ergonomics (used only while “at a table or another flat service [surface, sic]”) and connectedness (“physical barrier”), all of which were obstacles to her productivity. In addition, some possible tentative solutions could only intensify the form factor error, as e.g., a keyboard. Harriett could not identify a good enough solution, simple or elaborate, nor did she pinpoint a benefit in tablet use. While trying to do so, she kept comparing the new tablet to her laptop or her legal notepad or to her previous tablet. In both cases, the new tablet meant restrictions and “a compromised experience”, which resulted in her returning the tablet.

4.3 Conditions for Appropriation and Rejection

As users learn how to use the new IT device, identifying some beneficial use is of paramount importance and is the tipping point for eventually appropriating or rejecting the device. If the user fails to identify any benefits or new use scenario, the trial and error process does not lead to appropriation but to rejection. Rejection means that the tablet cannot satisfactorily replace a previously owned device and/or does not necessarily improve one’s workflow. In some instances, rejection (or appropriation) may be partial, i.e., the device is considered inappropriate for a set of particular tasks, but adequate enough for others. The conditions under which rejection is the chosen route, relate to perceived restrictions, and sense of tethering, but most importantly the extent to which any shortcomings manage to balance out any benefits relating to supporting old or enabling new IT uses. In these situations, these conditions are the underlying reasons for gaps between goals and reality, i.e., they prohibit users from using the tablet according to their initial goals.

For example, drawing from Harriett’s case, the general form factor of the tablet led to her feeling restricted, with the tablet being a distraction to the primary activity. Similarly, Michael experiences the same inhibitor (feeling restricted) that leads him to reject the tablet for one of the envisaged use scenarios. Existing theory suggests that connectedness, or relatedness, is a social need that is an essential and universal motivational factor across most if not all human motivation models (Kushlev, Proulx, & Dunn, 2017; Ryan & Deci, 2000). It is therefore safe to assume that if users consider IT to restrict them from experiencing these, they will then feel less inclined to actively use it. As far as tethering is concerned (to an external keyboard, to third-party solutions etc.) and for Harriett in particular, this suggests a need to carry additional weight while being on the go. Therefore, the tablet, as designed or as potentially augmented, could not support her and was in conflict with the envisaged scenario or any other scenario where the old workflow could be improved. Lastly, Peter experiences certain restrictions due to the device’s nature. Comparing the two configurations (tablet versus laptop), he considers the familiar solution based on a laptop-centred configuration more reliable, however, based on his narrative, he has not rejected the tablet, because the device’s portability balances out the perceived shortcomings.

In contrast, for Michael, the condition of tethering is not of significant importance, and not enough to balance out the identified benefits (always available for looking up and capturing information) and the newly adopted IT uses (share information with others); therefore, the device’s shortcomings are not as impactful for him and transitions to the new workflow for some scenarios.

5 Discussion

In this paper, we introduce the concept of trial and error and its role in the possible outcome of rejection, when appropriation attempts do not lead to adaptation and adjustments that can satisfy user

goals. Figure 1 presents a visual representation of the construction of the two core categories, trial and error and outcomes, and their relationship.

This process of trial and error where users attempt to overcome the breach in their goals seems to resonate well with the existing concepts in the appropriation literature. Research suggests that once users begin using a particular device, they proceed with updating their perceptions, either adapting themselves, the system or the task (Barki et al., 2007; Beaudry & Pinsonneault, 2005), exploring what they can do with the IT and how they can do it (Bagayogo et al., 2014; Sun, 2012). With respect to revisions in IT use in particular, it is suggested that the adaptation cycles may or may not address whatever discrepancies the user experienced initially. This validates our findings with respect to errors that may be the trigger of initial disillusionment, but equally so, the result of a given trial that can lead to additional, and even intolerable errors. These subsequent errors may be addressed through subtle tweaks in the device's settings, the use of third-party applications, or other fixes, all of which are essentially types of workarounds found within the literature (Choudrie et al., 2016; Ferneley & Sobreperez, 2006; Koopman & Hoffman, 2003).

The outcome of this trial and error process takes the form of appropriation, partial appropriation or rejection, where users may use the tablet exactly as they initially required, for certain tasks only and reject it for all others or reject it entirely. These findings are reminiscent of the outcomes put forth by coping theory (Beaudry & Pinsonneault, 2005), in the sense that each of them results into different flavours of appropriation and different effects on IT use. For example, in our study, we showcased that appropriation is subject to the user identifying some benefits in tablet use, by making their workflow easier, increasing their productivity, identifying novel cases that seem to align well with their personal desires and so on and so forth. This further fits well with four modes of adaptation introduced by Schmitz et al. (2016) within the volitional context and at the individual level.

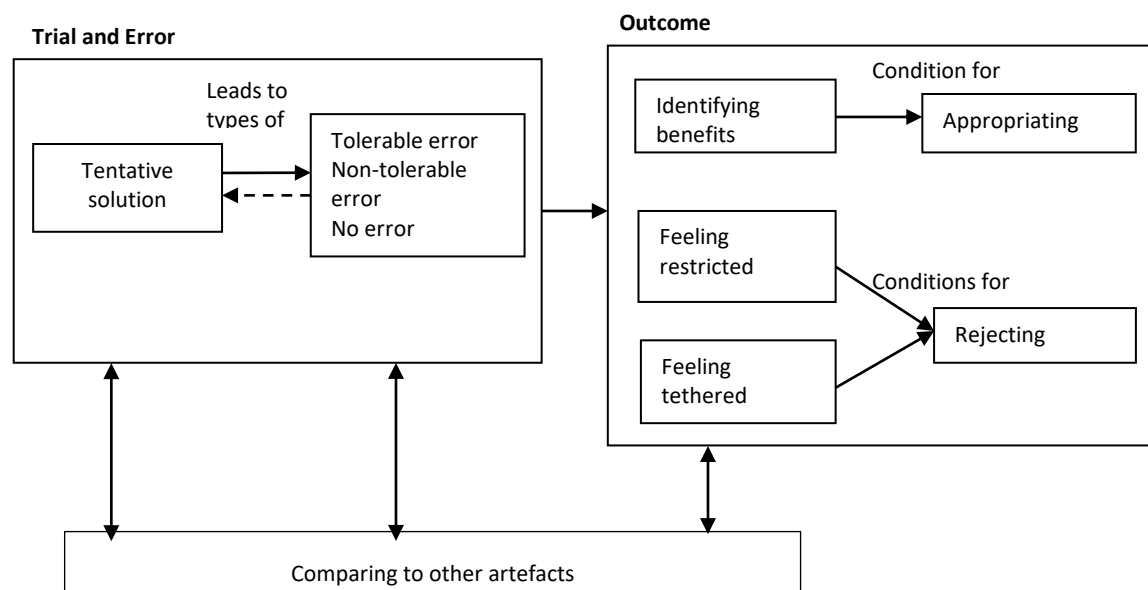


Figure 1. Linking trial and error and outcomes following disillusionment

The difference in trial and error, however, lies along two dimensions. First, we explicitly showcase that trial and error, as a variation of appropriation, emanates out of disillusionment which may range from inability of the user to complete a certain task, to simply wishing to explore how the device can potentially serve existing or lead to new workflows. Second, trial and error formally accounts for the possibility of the user identifying new or additional errors following a trial, and the subsequent possibility of rejecting the device. Equally, we illustrate that should the user feel restricted or tethered in any way, considering that the tablet cannot serve their workflow, the tablet gets rejected. Within this context, we can see that Beaudry and Pinsonneault (2005) identify that the impacts on the user may be

that of improving user effectiveness and efficiency in the task at hand, as a result of the coping strategy adopted, where users may attempt to increase the benefits they receive from IT use. Further, especially with respect to the appropriation outcome rather than the rejection, our findings are in line with the theory of workarounds, where sophisticated or simplistic solutions are employed on the basis of continuing work (Alter, 2014). Therefore, our approach draws attention to triggers of disillusionment, and accommodates both positive (appropriation) and negative (rejection) outcomes.

6 Conclusions

In this study, we have explored how users approach and interact with a newly introduced IT artefact and respond to moments of disillusionment. We look at consumerized technologies to investigate patterns that are individual and volitional, not organizationally mandated. Using grounded theory methods, we unpacked the trial and error process that users go through towards exploring whether and how a new device (namely the tablet) fits into their personal and professional lives in a larger portfolio of multiple IT artefacts.

We have focused on how and why trial and error may lead to either appropriation or rejection of a consumerized IT device with a number of specific characteristics. First, the use of the device is volitional and not organizationally mandated. This means that users have every right to abandon the device if other options are superior. Second, in contrast to organizational IT such as ERP systems, consumerized devices transgress an extremely heterogeneous universe of professional and private uses. This extreme heterogeneity can positively influence appropriation, yet, likewise negatively affect it if the search and learning costs are too high. Third, consumerized devices such as tablets are normally used in a portfolio of other IT devices such as wearables, mobile phones and computers. This suggests that the device can replace, complement, or be replaced, by extant devices. Relatedly, consumerized devices such as tablets are platform-based technologies, found at the locus in large ecosystem of users, complementors and apps. This offers the benefits of other users' trial and error learning, as well as the availability of novel hardware extensions and software apps that can further expand usability options. Finally, the trial and error learning with consumerized devices is normally not conditioned by external stakeholders that impose temporal, or other restrictions, on use. As a result, trial and error is an iterative, sequential behaviour that can continue unrestricted until the user is adequately satisfied or excessively disillusioned by the device.

The existing literature on appropriation of technology tends to place the emphasis either on the reasons or the outcomes of the appropriation process. In doing so, studies appear more concerned with the specific modifications or adjustments employed on the investigated technology; its misuse or non-use. The discourse of workarounds traditionally entails theorizing and research in how a single IT device or an information system – typically within an organizational context – is being worked around; that is, different levels of deviation from the 'technology as designed' use (e.g., Alter, 2014). As an extension, our view of trial and error entails both exploration and possible adaptations (Carroll & Fidock, 2011), with users attempting to augment their tablet with additional complements, such as connection kits and accessories.

Our study comes with some limitations. First of all, our study is focused specifically on iPad, therefore our findings should be treated with caution when considering other devices. Second, we have focused on the two main outcomes of the trial and error behaviour, where users either reject or appropriate the device. In doing so, we haven't investigated into the impact of disillusionment or subsequent errors on user satisfaction and experience, which could have provided equally interesting results.

Acknowledgements

Nancy Pouloudi acknowledges the financial support of the Research Centre of the Athens University of Economics and Business.

References

- Ahuja, M. K., & Thatcher, J. B. (2005). Moving beyond intentions and toward the theory of trying: Effects of work environment and gender on post-adoption information technology use. *MIS Quarterly: Management Information Systems*, 29(3), 427–459.
- Alblas, A. A., & Langerak, F. (2015). The impact of design debugging on new product development speed: the significance of improvisational and trial-and-error learning. *POMS 26th Annual Conference - Production and Operations Management Society (POMS)*. Presented at the POMS 26th Annual Conference - Production and Operations Management Society (POMS), Washington D.C., USA.
- Alter, S. (2014). Theory of Workarounds. *Communications of the Association for Information Systems*, 34, 1041–1066.
- Azad, B., & King, N. (2011). Institutionalized computer workaround practices in a Mediterranean country: an examination of two organizations. *European Journal of Information Systems*, 21(4), 358–372.
- Bagayogo, F. F., Lapointe, L., & Bassellier, G. (2014). Enhanced use of IT: A new perspective on post-adoption. *Journal of the Association of Information Systems*, 15(7), 361–387.
- Barki, H., Titah, R., & Boffo, C. (2007). Information System Use-Related Activity: An Expanded Behavioral Conceptualization of Individual-Level Information System Use. *Information Systems Research*, 18(2), 173–192. <https://doi.org/10.1287/isre.1070.0122>
- Barrett, M., & Walsham, G. (1999). Electronic Trading and Work Transformation in the London Insurance Market. *Information Systems Research*, 10(1), 1–22.
- Beaudry, A., & Pinsonneault, A. (1998). Appropriation of Information Technology: A Requisite for Improved Individual Performance. *Americas Conference on Information Systems (AMCIS 1998)*. Presented at the Maryland, USA. Retrieved from <http://aisel.aisnet.org/amcis1998/238>
- Beaudry, A., & Pinsonneault, A. (2005). Understanding User Responses to Information Technology: A Coping Model of User Adaptation. *MIS Quarterly*, 29(3), 493–524.
- Bhattacharjee, A., & Premkumar, G. (2004). Understanding Changes in Belief and Attitude toward Information Technology Usage: A Theoretical Model and Longitudinal Test. *MIS Quarterly*, 28(2), 229–254. <https://doi.org/10.2307/25148634>
- Boland Jr, R. J. (1997). Information: as understanding. In L. D. Introna (Ed.), *Management, Information and Power: A Narrative of the Involved Manager* (pp. 48–81). MacMillan.
- Boudreau, M.-C., & Robey, D. (2005). Enacting Integrated Information Technology: A Human Agency Perspective. *Organization Science*, 16(1), 3–18.
- Burton-Jones, A., & Straub, D. W. (2006). Reconceptualizing System Usage: An Approach and Empirical Test. *Information Systems Research*, 17(3), 228–246. <https://doi.org/10.1287/isre.1060.0096>
- Carroll, J., & Fidock, J. (2011). Beyond Resistance to Technology Appropriation. *44th Hawaii International Conference on System Sciences (HICSS 44)*, 1–9. <https://doi.org/10.1109/HICSS.2011.82>
- Chatterjee, S., Moody, G., Lowry, P. B., Chakraborty, S., & Hardin, A. (2015). Strategic Relevance of Organizational Virtues Enabled by Information Technology in Organizational Innovation. *Journal of Management Information Systems*, 32(3), 158–196. <https://doi.org/10.1080/07421222.2015.1099180>
- Choudrie, J., Zamani, E. D., Krepel, B., & Stewart, M. A. (2016). Understanding Individual User Resistance and Workarounds of Enterprise Social Networks: The Case of Service Ltd. *Journal of Information Technology*, 31(2), 130–151. <https://doi.org/10.1057/jit.2016.9>
- Ciborra, C. (1999). Notes on improvisation and time in organizations. *Accounting, Management and Information Technologies*, 9(2), 77–94. [https://doi.org/10.1016/S0959-8022\(99\)00002-8](https://doi.org/10.1016/S0959-8022(99)00002-8)
- Ciborra, C. (2002). *The Labyrinths of Information: Challenging the Wisdom of Systems*. Oxford: Oxford University Press.
- Clark, P. A. (1987). *Anglo-American Innovation*. New York: Walter de Gruyter GmbH & Co KG.
- Cram, W. A., & Marabelli, M. (2018). Have your cake and eat it too? Simultaneously pursuing the knowledge-sharing benefits of agile and traditional development approaches. *Information & Management*, 55(3), 322–339. <https://doi.org/10.1016/j.im.2017.08.005>
- Dennis, A. R., Wixom, B. H., & Vandenberg, R. J. (2001). *Understanding Fit and Appropriation Effects in Group Support Systems via Meta-Analysis*. 25(2), 167–193.
- DeSanctis, G., & Poole, M. S. (1994). Capturing the complexity in advanced technology use: Adaptive structuration theory. *Organization Science*, 5, 121–147.
- Elbanna, A. (2006). The validity of the improvisation argument in the implementation of rigid technology: The case of ERP systems. *Journal of Information Technology*, 21(3), 165–175.

- Elie-Dit-Cosaque, C., & Pallud, J. (2010). *User Adaptation and IS Success: An Empirical Investigation among French Workers*. Presented at the International Conference of Information Systems (ICIS 2010). Retrieved from http://aisel.aisnet.org/icis2010_submissions/158
- Ferneley, E. H., & Sobreperéz, P. (2006). Resist, comply or workaround? An examination of different facets of user engagement with information systems. *European Journal of Information Systems*, 15(4), 345–356.
- French, A. M., Guo, C., & Shim, J. P. (2014). Current Status, Issues, and Future of Bring Your Own Device (BYOD). *Communications of the Association for Information Systems*, 35, 191–197.
- Hekkala, R., & Urquhart, C. (2013). Everyday power struggles: living in an IOIS project. *European Journal of Information Systems*, 22(1), 76–94. <https://doi.org/10.1057/ejis.2012.43>
- Jasperson, J., Carter, P. E., & Zmud, R. W. (2005). A Comprehensive Conceptualization of Post-Adoptive Behaviors Associated with Information Technology Enabled Work Systems. *MIS Quarterly*, 29(3), 525–557. <https://doi.org/10.2307/25148694>
- Koopman, P., & Hoffman, R. R. (2003). Work-arounds, make-work, and kludges. *IEEE Intelligent Systems*, 18(6), 70–75.
- Korica, M., & Molloy, E. (2010). Making sense of professional identities: Stories of medical professionals and new technologies. *Human Relations*, 63(12), 1879–1901. <https://doi.org/10.1177/0018726710367441>
- Kushlev, K., Proulx, J. D. E., & Dunn, E. W. (2017). Digitally connected, socially disconnected: The effects of relying on technology rather than other people. *Computers in Human Behavior*, 76, 68–74. <https://doi.org/10.1016/j.chb.2017.07.001>
- Kwahk, K.-Y., Ahn, H., & Ryu, Y. U. (2018). Understanding mandatory IS use behavior: How outcome expectations affect conative IS use. *International Journal of Information Management*, 38(1), 64–76. <https://doi.org/10.1016/j.ijinfomgt.2017.07.001>
- Lapointe, L., & Beaudry, A. (2014). *Identifying IT User Mindsets: Acceptance, Resistance and Ambivalence*. 4619–4628. <https://doi.org/10.1109/HICSS.2014.568>
- Lee, J. Y.-H., Panteli, N., Bülow, A. M., & Hsu, C. (2018). Email adaptation for conflict handling: A case study of cross-border inter-organisational partnership in East Asia. *Information Systems Journal*, 28(2), 318–339. <https://doi.org/10.1111/isj.12139>
- Mäkelä, S., & Vellonen, V. (2018). Designing for appropriation: A DIY kit as an educator's tool in special education schools. *International Journal of Human-Computer Studies*, 118, 14–23. <https://doi.org/10.1016/j.ijhcs.2018.05.004>
- McGann, S., & Lyytinen, K. (2008). The Improvisation Effect: A Case Study of User Improvisation and Its Effects on Information System Evolution. *International Conference of Information Systems*. Retrieved from <http://aisel.aisnet.org/icis2008/209>
- Miner, A. S., Bassoff, P., & Moorman, C. (2001). Organizational Improvisation and Learning: A Field Study. *Administrative Science Quarterly*, 46(2), 304. <https://doi.org/10.2307/2667089>
- Molnar, W. A., Nandhakumar, J., & Stacey, P. (2017). A Paradox of Progressive Saturation: The Changing Nature of Improvisation over Time in a Systems Development Project. *Journal of the Association for Information Systems*, 18(11), 814–836.
- Morrison, B. (2015). The problem with workarounds is that they work: The persistence of resource shortages. *Journal of Operations Management*, 39–40, 79–91. <https://doi.org/10.1016/j.jom.2015.07.008>
- Orlikowski, W., & Baroudi, J. J. (1991). Studying Information Technology in Organizations: Research Approaches and Assumptions. *Information Systems Research*, 2(1), 1–28.
- Orlikowski, W., & Gash, D. C. (1994). Technological frames: making sense of information technology in organizations. *ACM Transactions on Information Systems*, 12(2), 174–207.
- Pallud, J., & Elie-dit-Cosaque, C. (2011). User Responses to New System Implementation: A Bricolage Perspective. *International Conference Information Systems (ICIS 2011)*. Retrieved from <http://aisel.aisnet.org/icis2011/proceedings/humanbehavior/19>
- Pavlou, P. A., & El Sawy, O. A. (2010). The “Third Hand”: IT-Enabled Competitive Advantage in Turbulence Through Improvisational Capabilities. *Information Systems Research*, 21(3), 443–471. <https://doi.org/10.1287/isre.1100.0280>
- Repenning, N. P. (2001). Understanding fire fighting in new product development. *Journal of Product Innovation Management*, 18(5), 285–300. <https://doi.org/10.1111/1540-5885.1850285>
- Rerup, C., & Feldman, M. S. (2011). ROUTINES AS A SOURCE OF CHANGE IN ORGANIZATIONAL SCHEMATA: THE ROLE OF TRIAL-AND-ERROR LEARNING. *The Academy of Management Journal*, 54(3), 577–610.
- Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, 55(1), 68–78. <https://doi.org/10.1037/0003-066X.55.1.68>

- Scheiner, C. W., Baccarella, C. V., Feller, N., Voigt, K.-I., & Bessant, J. (2016). Organisational and Individual unlearning in identification and evaluation of technologies. *International Journal of Innovation Management*, 20(02), 1650017. <https://doi.org/10.1142/S1363919616500171>
- Schmitz, K. W., Teng, J. T. C., & Webb, K. J. (2016). Capturing the Complexity of Malleable IT Use: Adaptive Structuration Theory for Individuals. *MIS Quarterly*, 40(3), 663–686. <https://doi.org/10.25300/MISQ/2016/40.3.07>
- Sun, H. (2012). Understanding user revisions when using information system features: Adaptive system use and triggers. *MIS Quarterly: Management Information Systems*, 36(2), 453–478.
- Swann, J. (1999). What Happens When Learning Takes Place? *Interchange*, 30(3), 257–282. <https://doi.org/10.1023/A:1007652708139>
- Tams, S., Thatcher, J. B., & Craig, K. (2018). How and why trust matters in post-adoptive usage: The mediating roles of internal and external self-efficacy. *The Journal of Strategic Information Systems*, 27(2), 170–190. <https://doi.org/10.1016/j.jsis.2017.07.004>
- Tsai, H., Compeau, D., & Meister, D. (2017). Voluntary use of information technology: an analysis and synthesis of the literature. *Journal of Information Technology*, 32(2), 147–162. <https://doi.org/10.1057/jit.2016.6>
- Urquhart, C. (2012). *Grounded Theory for Qualitative Research. A Practical Guide*. UK: SAGE Publications Ltd.
- Urquhart, C., Lehmann, H., & Myers, M. D. (2010). Putting the ‘theory’ back into grounded theory: guidelines for grounded theory studies in information systems. *Information Systems Journal*, 20(4), 357–381.
- Verjans, S. (2005). Bricolage as a way of life – improvisation and irony in information systems. *European Journal of Information Systems*, 14(5), 504–506. <https://doi.org/10.1057/palgrave.ejis.3000559>
- Volkoff, O., Strong, D. M., & Elmes, M. B. (2007). Technological Embeddedness and Organizational Change. *Organization Science*, 18(5), 832–848. <https://doi.org/10.1287/orsc.1070.0288>
- Walsham, G. (1995). Interpretive case studies in IS research: nature and method. *European Journal of Information Systems*, 4(2), 74–81.
- Wu, Y., Choi, B. C. F., Guo, X., & Chang, K. T.-T. (2017). Understanding user adaptation toward a new IT system in organizations: A social network perspective. *Journal of the Association of Information Systems*, 18(11), 787–813.