

7-1-2013

Technoidentology: Towards An Explication Of Individual Relationships With IS/IT

Jason Simpson

University of New South Wales, Sydney, NSW, Australia, jason.simpson@unsw.edu.au

Patrick Finnegan

University of New South Wales, Sydney, NSW, Australia, p.finnegan@unsw.edu.au

Kenneth J. Stevens

University of New South Wales, Sydney, NSW, Australia, k.stevens@unsw.edu.au

Follow this and additional works at: http://aisel.aisnet.org/ecis2013_cr

Recommended Citation

Simpson, Jason; Finnegan, Patrick; and Stevens, Kenneth J., "Technoidentology: Towards An Explication Of Individual Relationships With IS/IT" (2013). *ECIS 2013 Completed Research*. 81.

http://aisel.aisnet.org/ecis2013_cr/81

This material is brought to you by the ECIS 2013 Proceedings at AIS Electronic Library (AISEL). It has been accepted for inclusion in ECIS 2013 Completed Research by an authorized administrator of AIS Electronic Library (AISEL). For more information, please contact elibrary@aisnet.org.

TECHNOIDENTOLOGY: TOWARDS AN EXPLICATION OF INDIVIDUAL RELATIONSHIPS WITH IS/IT

Simpson, Jason R., Australian School of Business, University of New South Wales, Sydney, 2052, Australia, jason.simpson@unsw.edu.au

Finnegan, Patrick, Australian School of Business, University of New South Wales, Sydney, 2052, Australia, p.finnegan@unsw.edu.au

Stevens, Kenneth J., Australian School of Business, University of New South Wales, Sydney, 2052, Australia, k.stevens@unsw.edu.au

Abstract

This paper argues that IS theories should not ignore or background the relationship between individuals and technologies in explaining concepts such as adoption, innovation, diffusion, and practice. The relationships that individuals have with technologies should, arguably, be a core interest of IS because of the centrality of people and IT to the discipline. The neglect of individual relationships with IS/IT is surprising given the growth of customisation and personalisation of systems, as well as the increasing prevalence of devices such as smartphones and tablets that blur the boundary between corporate and personal. Other disciplines recognise the importance of relationships in explaining core concepts, for example, the relationship between individuals and brands in marketing, individuals and others in sociology, and individuals and their thoughts in psychology. This paper draws on such work to consider the relationships between individuals and IS/IT, which we refer to as 'technoidentology', in examining the immediacy of individuals' reactions to technology. Having done so, we conclude that theoretical work in the area of personal construct theory and terror management theory is likely to prove fruitful in helping IS researchers address key aspects of technoidentology.

Keywords: technoidentology, individual relationships, innovation, diffusion, personal construct theory, terror management theory

1 Introduction

IS theories continue to background what is arguably a vital part of most information systems: the relationships between individuals and the various technologies that provide the raw material for information systems. Instead, aspects of the relationship (e.g. attitude, beliefs, enjoyment, etc.) and frequently the technology itself are ‘blackboxed’ in pursuit of the convenient calculation of correlations that might indicate a relationship. The fundamental problem with ‘blackboxing’ is that many of the core questions of interest to the IS field include a technology that can be considered to have agency (cf. Latour, 2005), and all of them include individuals. Each individual has unique prior experiences, including experiences with technologies, which affect how these individuals react to various technologies; reactions that may or may not be assumed to be ‘rational’. IS researchers draw on psychology to help understand beliefs and attitudes, and on sociology to understand the impact of others on technology adoption. We do however tend to ignore the fact that in working with technology and making decisions about technology, individuals are building a relationship with technology and that these relationships are not explicitly recognised in the literature. For example, the innovation and diffusion literature reveals that innovation (the process and the artefacts) is actively fought by organizations and individuals (Ellen and Bearden, 1991; Ram and H. Jung, 1991; Rogers, 2003; Bao, 2009; Joseph, 2010). The technology acceptance literature (e.g. Davis, 1989; Venkatesh et al., 2003) reports that an individual will adopt a technology if it is useful, and that perception, emotions, etc., can be blackboxed with attitudes. But *why* do some individuals consider a technology to be useful, or *why* do some individuals have certain attitudes toward particular technologies? Indeed, Benbasat and Barki (2007) point out that Perceived Usefulness and Perceived Ease of Use “*have largely been treated as black boxes that very few have tried to pry open*” (p. 212). We argue that understanding the relationships that individuals have with these technologies is necessary in order to understand the ‘why’, and that understanding these relationships is necessary to help us better understand the factors that bound and shape how particular individuals work with, and make decisions about, particular technologies.

A relationship can be thought of as the ways in which two entities (individuals, objects, concepts, etc.) are connected (Oxford English Dictionary, 2012), or the state that becomes enacted, or re-enacted, due to such connections (cf. Latour and Woolgar, 1986; Barad, 2007). Inter-personal relationships between humans and other humans are considered to be the primary building blocks of society, and are the fundamental concept of interest in the field of sociology (Prattis, 1978). Intra-personal relationships between an individual and their thoughts are considered central to understanding many aspects of psychology, such as cognition, emotion, mental health, etc. (Fransella, 2003). Relationships involving technology and social constructs have given rise to interest in Actor Network Theory (e.g. Latour, 2005) and sociomateriality (e.g. Orlikowski and Scott, 2008). Arguably, humans can be considered as part of the social fabric in these contexts; however, the focus is typically on the relationships between technology and the social constructions that a human constitutes, as evident in sociology, rather than the relationships between technology and the things that constitute a human in a psychological sense, which we consider our primary matter of concern.

The failure to explicitly recognise psychological relationships that individuals form with technology in explaining core IS concepts is surprising given increasing customisation and personalization of software and IT; the premise of which is that future enactments are dependent on historical connections and realities (cf. Al-Natour and Benbasat, 2009). This situation contrasts with that in other disciplines such as marketing, where Fournier's (1998) study on individuals' relationships with brands has become one of the most influential studies in that field as it is seen to provide support for practices where organisations create strong brands by identifying with the individual as much as possible, and striving to create strong inter-personal type relationships.

This paper aims to stimulate discussion on the significance and nature of the relationship between individuals and technology, an area of study which we refer to as *technoidentology*, in explaining the immediate reaction of individuals to technology. In order to explore these issues, a literature review

was conducted that included over 250 publications across the information systems, marketing, interpersonal relationship, psychology, and social psychology disciplines. Within these publications, we uncovered literature on how individuals might view, see, feel, etc., about certain technologies, as well as literature that might help to explain the relationships people form with technologies. First we reviewed relationships in general with respect to technology. Next, we reviewed the topics that might make up or influence these relationships. We uncovered a need for further insight on relationship types, the reasons why individuals feel the need to protect their identities and worldviews, and why information itself could possibly be seen as an asset or threat, depending on whether it supports or conflicts with one's worldview. Furthermore, we exposed the impact of validation and invalidation on individual identity and worldview in explaining the relationships that individuals form with IS/IT. Based on these revelations, we conclude that personal construct theory (Kelly, 1955) and terror management theory (Greenberg et al., 1986) offer IS researchers useful approaches for exploring aspects of technoidentity, as these two theories directly address all of the topics uncovered in the review, while no other known theories were able to do so.

2 In Search of Relationships with IS/IT

Imagine introducing a non-Apple computer to a 'diehard' Apple user, where the only goal was to get the person to acknowledge the alternative piece of technology as viable. What typically happens in that moment of introduction? This is, of course, a rhetorical question; we all know what happens, but the point is to think about *why* it is happening. What does an Apple computer represent to someone? Typical responses include "higher quality", "fewer bugs/malware", etc.; responses that are typically used to ward off attacks on the user's choice in product purchase. However, for the sake of argument, and to show why we consider these only surface 'reasons', let us imagine that it was possible to create and introduce a technology, to the same user, that was unequivocally 'better' than their existing Apple computer, and this technology does in fact meet every single hedonic, functional, and other goal and dream of that individual. What happens at *that* crucial *moment* of introduction? Presumably, it is anything but "sure, I'll start using it straight away".

For a less brand-oriented scenario, imagine an IS manager who has spent their career implementing ERP systems. How would we recognise whether he or she has developed a relationship with that particular technology? They might be able to speak at some length on the benefits of ERP systems over ad-hoc systems, explain why the technology is important to business, enthuse over their particular history with the technology, how they feel about it, and so on. Now imagine that the same manager is on a failing project and a colleague approaches them with an idea to save the project. However, this idea not only requires their ERP system to be scrapped, but a technology to be implemented that renders all ERP systems in general, obsolete. What do you think the manager would do? Reject the idea outright? Discuss it? Become violent? As with the Apple example, the answer could be dependent on many things, which is our point. In either of these situations, some individuals may be violently opposed to the alternative, some may be excited, and others may have little or no reaction at all. There are a number of pseudo-rational explanations, but is the response rational?

Scott (2012), in explicitly acknowledging relationships between people and IT, poses several exploratory questions such as "*How do you react to being separated from your email? How do you feel when you can't find your mobile phone? How do you react when a piece of software is updated and no longer operates the way you're used to it operating?*" In considering such questions, Scott (2012) suggests that it may be possible that individuals interact with technology just as they do with other people with whom they have interpersonal relationships. This possibility is echoed in the form of concepts related to social interactions by Al-Natour and Benbasat (2009).

While the IS literature has not thoroughly explored the concept of a technological relationship being equivalent to an interpersonal relationship, we can draw on the aforementioned work of Fournier (1998) on relationships with brands. The two conclusions from Fournier (1998) that we consider most significant with respect to relationships with IT are:

- (i) “*themes that people use to define themselves can be played out in the cultivation of brand relationships*” (p. 359), and
- (ii) “*those relationships, in turn, can affect the cultivation of one’s concept of self*” (p. 359).

Both conclusions point to the nature of relationships being closely related with individual identity and representations of ‘self’. More importantly, they point to the importance of a complex interplay of factors that both comprise and affect identity, and, in turn, the relationships that people form. Using this perspective as a lens, we turned to the IS literature. We began our review by focusing on literature that examined emerging or novel technologies. The purpose of doing so was because individuals are more likely to have strong feelings or emotions around such technologies that would be more easily determinable through secondary analysis. Having done so, it would become easier to ‘seed’ our analysis of studies of technologies with which people have grown accustomed.

Our search uncovered discussions on several topics that signalled a relationship with technology through the impact of IT on individual identity and representations of self. Discussions of trust, risk, control, worldview, and identity were the most prevalent, with fear being the dominant theme. These discussions point to strong emotions and indicate that relationships with technology are potentially identifiable with deep psychological views or feelings affected by prior experience and affecting future connections with IS/IT.

Although never referred to as a *relationship* with technology in the IS literature, it is evident that the general public approach a new technology in a similar way that they approach an unfamiliar person; mostly they have no idea of what to make of them and thus seek guidance from those they trust in order to assess risk (Am, 2011; Anderson et al., 2012). The literature also reveals that the media have a role to play in shaping initial views of new technologies (Scheufele and Lewenstein, 2005; Anderson et al., 2012). Evidence that people are conscious of themselves in their initial interaction with technology is evident in results concerning fear of technology stemming from control issues (Longo et al., 2003; Tabachnick, 2007; Sims, 2009). Control, as it relates to technology, is conceptualized from the perspective of the individual as losing autonomy (Longo et al., 2003), technology becoming so advanced that it controls people (Sims, 2009), technology controlling our destiny (Tabachnick, 2007), or technology controlling the biological makeup of humans (Bakewell, 2012). From all of these perspectives, emerging technologies are, first and foremost, generally seen as something that should be viewed with suspicion.

In a similar vein to the development of inter-personal relationships, evidence reveals that cultural norms and values have an impact on how individuals view emerging technology (Wildavsky and Dake, 1990; Dake, 1991; Kahan et al., 2009). These works reveal that individualist societies are more inclined to accept emerging technologies, whereas egalitarian societies are more opposed. The argument presented is that the egalitarian societies are more concerned with reducing harm to the environment; thus individuals in that society are more suspicious (ibid). Scott (2012) takes this argument further by posing that the manner in which people view technology is related to the social exchange tendencies of the individual; suggesting that the way in which people engage with other people will determine their tendencies to try new technology.

Many acceptance and adoption studies allude to the importance of individual relationships with certain technologies without explicitly stating so. For example, Wu (2012) studied the acceptance of a technology (a campus alerts system) in which the constructs of usefulness, intention, and behavior were dependent on key inter-personal relationship dimensions: historical interaction (Berk and Andersen, 2000) and control (Chatterjee, 1972; Kemper, 1973). Students felt that the system might be useful, but their intention to use the system was dependent on their past experiences with other campus systems. These intentions were also shaped by whether or not the students felt that they could control and personalize the system (Wu, 2012).

In a stream of literature reflecting similar work to Fournier (1998) on brands, the technology literature (e.g. Butryn and Masucci, 2003; Barrett and S. Scott, 2004; Lloyd, 2010; Thompson, 2012) suggests

that an individual's relationship with various technologies depends on technologies with which that person identifies. For example, an individual's "biographical identity", with respect to technologies, is composed of individual historical interaction (Thompson, 2012), which may have affected the prominence of interaction and control since interaction will depend on things or concepts with which the person identifies (cf. Weinreich and Saunderson, 2003). Such findings, when considered in light of work revealing that perceptions of trust, risk, control, cultural values and social norms affect how an individual reacts to, and works with, technology, suggest that relationships with technology may have a lot in common with relationships with brands and, indeed, with other people. Individuals who look to those they trust to assess emerging technologies presumably trust those individuals because they can identify with them (Weinreich and Saunderson, 2003; Maguire and Phillips, 2008). Individuals whose views are shaped by the media are presumably only reading or watching media outlets with which they identify. All of this activity, and the resulting views, equates to forming what has been called an individual's "worldview", referring to a view or set of views that composes an individual's entire perceived existence, including knowledge, emotions, philosophies, values and morality (cf. Palmer, 1996), which can be seen as similar in nature to the concept of self or identity. Each time that an individual's worldview is queried and validated, by sources with which the individual identifies, the relationship is strengthened. Research from psychology and sociology (e.g. Meissner, 1970) reveals that this is exactly what one would expect to observe when new individuals are introduced to people.

We therefore conclude that the consideration of identity, referring to "*the totality of one's self-construal, in which how one construes oneself in the present expresses the continuity between how one construes oneself as one was in the past and how one construes oneself as one aspires to be in the future*" (Weinreich, 1986, p. 317), appears to be the precursor for action involving technology. Identity is strengthened by relationships with technology, and such relationships are developed through interaction with both technology and those that affect views about technology. Identity, thus, is a multi-layered concept (Stryker and Burke, 2000) incorporating varying relationship types as well as relationship strengths (Brewer and Gardner, 1996). While many aspects of relationships with technology (e.g. perception, trust, risk, attitude, influence of others, etc.) have been considered in the IS literature, a holistic approach that sees such aspects as reflecting varying types and strengths of relationships stemming from an individual's identity is missing from the literature.

3 Exploring the Effects of IS/IT Personalization

Trends towards increasing personalization, also known as IS consumerization (Niehaves et al., 2012), suggest that IS research could increasingly become more focused on an individual, rather than groups or organisations, as the unit of analysis. The industry trends towards IS/IT personalization are hard to ignore as even large corporations are moving from massive applications with menus and access controls to personalized applications that simply let the user do what they need to do (MSDN, 2012). Research in Affective Computing suggests that very soon these applications and interfaces will change on the fly, depending on what the individual wants to do (Reynolds and Picard, 2001; Davern et al., 2012). Every day electroencephalography (EEG) technology is getting smaller, lighter, and more sophisticated, giving way to the possibility that the affective computing could incorporate an individual's unique brainwaves. Topics, such as Bring Your Own Device (BYOD) (Boomer, 2012; Niehaves et al., 2012), technology as a fashion accessory (Wang, 2010), augmented reality (Kurzweil, 2005; Metz, 2012), and sleep pattern analysis (Isaacson, 2012), all suggest the increasing importance of personalization.

With these trends towards personalization comes increased personal power, which allows an individual greater control over his or her life, environment, and social interactions. While emerging IS/IT *allows for* increased sociability, it also *allows for* decreased sociability as well. Prior to technology, social ties and norms were a large determiner of survival (cf. Stanton and Mann, 2012). Now a person can almost completely shut out all social interaction if he or she chooses to do so. Before modern IS/IT and the Internet, a large scale business was only possible by many people

physically working together. Now an individual simply needs an idea, a device, and an Internet connection (cf. Ferriss, 2009). While we still ultimately depend on each other for survival, individual trends in IS/IT are gradually driving this dependency closer and closer to non-existent (cf. Kurzweil, 2005). This does not mean that an individual cannot *choose* to socialize, but when that individual does, the personalized nature of newer technologies and systems allows for the individual to *control how* he or she socializes, so that the individual can do it on his or her own terms (e.g. Facebook and Second Life). So who chooses to control what and why?

These trends toward personalization also complicate matters of technology adoption and innovation. On one hand, personalization allows for an individual to customize work which should lead to increased affordances. It would intuitively follow that that person would then have the opportunity to be more innovative. On the other hand, the personalized nature most likely creates stronger ties with particular systems or technologies, thus possibly increasing the tendency to outright reject a newer technology, idea, or perspective; which may also have led to increased innovation. While it would make intuitive sense that the more a person becomes involved with technologies, the more open he or she would probably be to technology in general, this does not mean that individual would necessarily be open to all technologies. As IS becomes more and more personalized, it stands to reason that specific technologies become more and more a part of an individual's identity, worldview, or the apparatus (cf. Boell and Cecez-Kecmanovic, 2012) with which the individual gets specific things done. Therefore, the very trends allowing for increased levels of innovation could also be allowing for decreased levels of innovation; the very trends allowing for greater perspectives could be allowing for more narrow perspectives.

These trends in many ways echo the themes in the preceding section; such as control, trust, risk, identity, inter-personal relationships. By becoming more personalized the technologies are easier to control as the user can simply reconfigure them. Trust with the technology is also more easily established since the ability to reconfigure decreases the possibility of the technology 'doing something wrong' to the individual. Finally, individuals can reconfigure the technology so that it becomes something with which they can identify. However, just as in inter-personal relationships, some individuals will be more trusting than others (Kosfeld et al., 2005), some open themselves up to greater risk by interacting with anyone (K. Scott, 2012), and some individuals may construe identity in such a way that they could possibly identify with anyone.

4 Towards a More Holistic View of Individual Relationships with IS/IT

Previous sections have argued that relationships that individuals have with technology comprise psychological aspects (such threat, fear, devotion), sociological aspects (such as peer recognition, influence, etc.), and technological aspects (such as functionality, usefulness, etc.). In attempting to promote discussion on an area of interest that we refer to as technoidentology, we propose that we need an understanding of the relationship between individuals' thoughts and feelings about IS/IT and their relationships with others with respect to that technology, in addition to the cognitive usefulness of such technology. In considering how we might usefully extend IS research to incorporate such concepts we draw on the work of psychologist George Kelly and sociologist Bruno Latour - both of whom have already influenced much IS research - as well as the work of social psychologists working with terror management theory. In doing so, we propose that a technoidentologist perspective might usefully foreground the relationship between individuals and technology; thereby explaining 'hidden' aspects of intensions, emotions and reactions.

4.1 Technoidentology

We conceptualise technoidentology as how and why: (1) People form relationships with IS/IT. (2) These relationships help form an individual's personal and social identity. (3) Identity helps to form

these relationships. (4) These relationships tie in with both the cognitive and the social. We argue that this perspective may help with both practical and theoretical IS issues that have been previously addressed in a less holistic manner. By understanding the psychological and sociological relationships that individuals have with various technologies, we should be better able to understand the identities formed in conjunction with these technologies and how they relate to both the psychological and social. By understanding identities, we posit that we should be better able to understand how individuals may react in encounters with familiar and unfamiliar IT; thereby proving helpful for many areas of IS.

The primary difference between our proposed area of study and the work of behavioural IS theorists is that we recognize the exponentially increasing number of IT artefacts. Consider the possibility that relationships that people form with technologies may be similar to the relationships that people form with other people (K. Scott, 2012; Al-Natour and Benbasat, 2009). Now step back in time to consider when humans living in tribes of only a handful of people might be met by a single individual from outside of the tribe. As there were only a handful of individuals, and survival was paramount, this new individual introduced may have been adopted, or accepted into the tribe based on his or her ability to be useful to the group, or how well he or she would conform to the social norms of the group. Presumably each of these notions was straightforward at the time. Now fast forward to our current age where 7 billion people inhabit the planet and each is fairly free to interact with any other. Do we determine our acceptance of others based on one or two factors? Of course not, and the inter-personal relationship literature (e.g. Lewis, 1998) examines 'acceptance' accordingly.

By positioning technoidontology in the context of both the cognitive and social, we see the need to position IS enquiry not as drawing on social and psychological theories, but as embracing both the social and the psychological on an IS/IT plane. We can broadly conceptualise psychology as being concerned with relationships that people have with their own thoughts, and sociology as being concerned with relationships people have with other people. Psychology can therefore be broadly construed as being about what is 'in here' and sociology as being about what is 'out there'. But what about what is 'in here' *and* 'out there'? Also, how does the almost infinite customisability of IS/IT make the study of relationships with IS/IT different from other technology studies?

It is important to discuss what we mean by 'in here' and 'out there'. What we mean by 'in here', with respect to psychology, is that thoughts reside in a place that can be completely claimed as personal. Whether or not an individual perceives thoughts to be within his or her control, the thoughts nevertheless occur inside the mind. What we mean by 'out there', with respect to sociology, is that other people are completely outside of the domain of what can be claimed as personal. While an individual may or may not be able to control other people indirectly, other people still have free will and are utterly separate from what is within the personal domain. Technology, however, resides in both domains, as do the relationships with it. Why? Because you cannot materially separate technology from humans (Barad, 2007; Orlikowski and Scott, 2008), and technology has the ability to both do things to people, as well as make people do things (Latour, 2005).

The Agential Realism and sociomaterial literature (e.g. Barad, 2007; Orlikowski and Scott, 2008) purport the impossibility of separating people from technology in understanding social phenomena. Our argument is that the relationship is somewhat more primal. As evidenced by evolution, human beings presumably could not even *exist* without technology as *pre-human* life forms developed tools to solve environmental/survival problems; thus helping the human race evolve. Thus, these relationships formed right alongside our cognitive processes and social relationships. Since technology allows for us to exist, and nearly everything we do *requires* it, it forms at least part of our personal makeup. Since technologies have agency (Latour, 2005), were created via a social process, and have some level of subjective detachment, the same thing that is somewhat a part of our personal makeup is also somewhat outside of our personal realm. This is how technology exists both 'in here' as well as 'out there'. It is the bridge between these two realities, and depending on how it's viewed, can be opened or closed. Therefore, the relationships we have with technologies are *at least as* important as the relationships we have with our own thoughts and with other people.

4.2 Re-enforcing and Challenging Worldviews and Identity

The strength of reactions (fear, devotion, etc.) reflecting relationships with IS/IT uncovered in the literature, the trends towards personalization implying stronger and more mutually affective relationships, and the possibly subconscious and immediate reactions to IS/IT, are not immediately explainable by adoption concepts such as perceived use. Thus, we propose that it becomes necessary to employ theories that get to the core of the human psyche in order to truly understand individual relationships with IS/IT. Earlier in the paper, we pointed to worldview and identity as key concepts in the relationships individuals have with technology. Additionally, the notion that individuals seek to protect themselves against threats to their worldview and identity was also raised. In advancing discussion on how such insights might usefully inform IS research, we draw on theories that IS researchers may find useful to explore the cognitive and social intricacies that characterise individual relationships with IS/IT. While extant behavioural theories are limited in their ability to describe the particular phenomenon in question, this phenomenon lies at the heart of both Terror Management Theory and Personal Construct theory. Additionally, both theories are built upon the idea of relationality, thus aligning with an area concerned with relationships.

Terror Management Theory (TMT) “*posits that cultural conceptions of reality serve the vital function of buffering the anxiety that results from awareness of human vulnerability and mortality. Consequently, people are highly motivated to maintain faith in the cultural conceptions of reality to which they subscribe and to defend these conceptions against threats*” (Rosenblatt et al., 1989, p. 681). The basic postulate of Personal Construct Theory (PCT) is: “*a person’s processes are psychologically channelized by the ways in which he anticipates events*” (Kelly, 1955, p. 7). Both TMT and PCT suggest that new *information* can be seen as a threat to worldviews (Greenberg et al., 1986, 1990; Rosenblatt et al., 1989; Williams et al., 2012, 2010), or threat to an individual’s personal theories/constructs about how the world works or predictions about that world (Kelly, 1955; Fransella, 2003). Both theories are meant to get at the root of deep seated, and often subconscious, psychological issues. These two theories posit that most individuals will do just about anything to keep their worldviews or personal construct systems intact, and that the *view* actually becomes *life itself* to an individual, thus the individual will defend the view (identity) as such (cf. Kelly, 1955; Epting et al., 1993; Leitner and Thomas, 2003). And is this at all surprising? For the moment, consider an individual’s ‘dark thoughts’ or shadow (in the Jungian sense) (cf. Jung, 1969), the types of foods a person refuses to try, the people an individual refuses to associate with, the refusal to travel or live outside of one’s own country, etc. These are all examples of various things and people being rejected outright because they cannot be identified with, and indeed PCT is designed to elicit constructs and relationships regarding these rigidly held views without directly asking about them.

Both TMT and PCT prove potentially useful in uncovering the rigidity of deeply held views and strong relationships. With respect to TMT, Williams et al. (2012) study on worldview affirming or disconfirming information found that most individuals will actively fight any information that may threaten their worldview or identity, and most individuals cannot even *comprehend* the topic at hand when worldview disconfirming information is presented (PCT literature refers to this as “invalidation”). With respect to PCT, Fransella (2003) illustrates numerous examples of individuals faced with having to re-construe superordinate (identity) constructs. In many of these situations the individual fails to move forward despite the individual both desperately seeking help, and understanding the personal, professional, and/or social contradictions that come from not accepting the new information, perspective, person, or object. These situations can also be found in many IS contexts (cf. Lapointe and Rivard, 2007).

The other side of this discussion is one of validation, or confirmation of one’s worldviews. Validation can be seen where evidence suggests that the individual was indeed correct about their assumptions or predictions, thus reinforcing relationships, worldview, and identity. For example, scheduling representatives using an enterprise enrolment system in Alvarez (2008) identified with being “arbiters of fairness”. Initially the system was met with resistance as it took on this role by automating resource

allocation, which was perceived by the representatives as something *only they* had the judgement to properly perform. However, once the representatives found a workaround that restored control of allocation (and thus their identity as arbiters of fairness), resistance faded. In these situations the individual's worldviews have been strengthened, which will undoubtedly affect the relationship with these technologies going forward. It is evident that the relationships with these technologies are completely dependent on the individual, and future reactions certainly depend on the validation being contextualised within their history of interaction with the same, or similar, technologies. Thus, validation and invalidation as explanatory forces in IS/IT relationships are very individual. Therefore, the concept of acceptance comes down to the individual, his or her particular views, how open the individual is to invalidation (Pope, 2003; Winter, 2003), or how that individual may derive self-worth (Williams et al., 2010), amongst many other things that comprise a relationship with IS/IT.

5 Conclusion

This paper has articulated the need to explicate the relationship between individuals and IS/IT in Information Systems research, and has proposed conceiving of such relationships as forming a techno identity that transcends both cognitive and social conceptualisations of connections. We believe that this perspective may provide a more holistic perspective of innovation, adoption, and use of IS/IT in various organisational and societal settings, by allowing us to better explore questions relating to how individual relationships with IS/IT affect firm strategy, innovation, performance, teamwork and decision making. In addition, we advocate exploring more novel questions such as the connection between techno identity and personal characteristics such as personality. For example, change management in the context of innovation may be better managed if there is understanding of individual perspectives and reactions to IT. HR training systems could be designed, as the research could inform algorithms for effective training systems that might allow for changes in presentation of material, or the interface itself, depending on each unique user's views/constructs. IS leadership and management research could be informed by suggesting that certain relationships might lead to certain actions in different contexts, allowing the IS leader to better manage organizational or project structure. Implementations of systems could indeed become a very organizational, firm, or team specific endeavour. Even start-ups and entrepreneurs can benefit from this type of understanding as it may allow for more efficient recruiting, as the technologies employed by smaller businesses are usually quite specialized.

In order to address such issues, we propose that researchers start with applying Personal Construct Theory (PCT) informed by Terror Management Theory (TMT), although other approaches are certainly welcomed. PCT is a useful theory in exploring how people view, perceive, and make sense of the world around them, particularly when a specific thing or topic is involved in a discussion or interview. Tan & Hunter (2002) discuss at length the opportunities for PCT in understanding how "*IS professionals make sense of IT within their organizations*" (p. 40), and suggest the use of the repertory grid technique (RepGrid) in order to understand these views. Tan & Hunter (2002) describe RepGrid as the methodological extension of George Kelly's PCT work, and that it serves as a cognitive mapping technique.

In addition to using PCT and RepGrid to uncover views, we also suggest leveraging Actor Network Theory (ANT) in order to stay on track and resist the urge to 'blackbox'. ANT advocates tracing the networks (i.e. the relationships) surrounding controversies or matters of concern, and incorporating anything that could possibly be related. While this is typically used for the social, here our controversy is an individual's relationships with different technologies. We should seek to push the understanding of these relationships as far as we possibly can, regardless of whether we end up in neuroscience or quantum physics, and therefore require cross-discipline collaboration. By being as myopic as possible, we maintain complexity (rather than attempting to reduce it), and only then can we understand why particular relationships persist.

6 References

- Al-Natour, S. & Benbasat, I., 2009. The Adoption and Use of IT Artifacts : A New Interaction-Centric Model for the Study of User- Artifact Relationships. *Journal of the Association for Information Systems*, 10(9), pp.661–685.
- Alvarez, R., 2008. Examining technology, structure and identity during an Enterprise System implementation. *Information Systems Journal*, 18(2), pp.203–224.
- Am, T., 2011. Trust in Nanotechnology? On Trust as Analytical Tool in Social Research on Emerging Technologies. *Nanoethics*, 5, pp.5–28.
- Anderson, A.A. et al., 2012. The Role of Media and Deference to Scientific Authority in Cultivating Trust in Sources of Information about Emerging Technologies. *International Journal of Public Opinion Research*, 24(2).
- Bakewell, S., 2012. Technology for the body on the road to cyborgs? *Sydney Morning Herald*. Available at: <http://www.smh.com.au/digital-life/digital-life-news/technology-for-the-body-on-the-road-to-cyborgs-20121003-26ytg.html>.
- Bao, Y., 2009. Organizational resistance to performance-enhancing technological innovations: A motivation-threat-ability framework. *Journal of Business & Industrial Marketing*, 24(2), pp.119–130.
- Barad, K., 2007. *Meeting the Universe Halfway: Quantum Physics and the Entanglement of Matter and Meaning*, Duke University Press.
- Barrett, M. & Scott, S., 2004. Electronic trading and the process of globalization in traditional futures exchanges: A temporal perspective. *European Journal of Information Systems*, 13(1), pp.65–79.
- Benbasat, I. & Barki, H., 2007. Quo vadis, TAM? *Journal of the Association of Information Systems*, 8(4), pp.211–218.
- Berk, M.S. & Andersen, S.M., 2000. The impact of past relationships on interpersonal behavior: Behavioral confirmation in the social-cognitive process of transference. *Journal of Personality and Social Psychology*, 79(4), pp.546–562.
- Boell, S.K. & Cecez-Kecmanovic, D., 2012. Conceptualizing Information Systems: From “Input-Processing-Output” Devices to Sociomaterial Apparatuses. *Proceedings of the 20th European Conference on Information Systems*.
- Boomer, J., 2012. Are You Ready for BYOD ? *CPA Practice Advisor*, 22(6).
- Brewer, M.B. & Gardner, W., 1996. Who is this “We”? Levels of collective identity and self representations. *Journal of Personality and Social Psychology*, 71(1), pp.83–93.
- Butryn, T.M. & Masucci, M.A., 2003. It’s Not About The Book: A Cyborg Counternarrative of Lance Armstrong. *Journal of Sport and Social Issues*, 27(2), pp.124–144.
- Chatterjee, P., 1972. Familingual and Familinear Relationships : Two Patterns of Control by the Invoking of Family Roles. *American Anthropologist*, 74(1), pp.231–241.
- Dake, K., 1991. Orientating Dispositions in the Perception of Risk: An Analysis of Contemporary Worldviews and Cultural Biases. *Journal of Cross-Cultural Psychology*, 22(1), pp.61–82.
- Davern, M.J., Shaft, T. & Te’eni, D., 2012. Cognition Matters: Enduring Questions in Cognitive IS Research. *Journal of the Association for Information Systems*, 13(4).
- Davis, F.D., 1989. Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), pp.319–339.
- Ellen, P.S. & Bearden, W.O., 1991. Resistance to Technological Innovations : An Examination of the Role of Self-Efficacy and Performance Satisfaction. *Journal of the Academy of Marketing Science*, 19(4), pp.297–307.
- Epting, F.R., Probert, J.S. & Pittman, S.D., 1993. Alternative strategies for construct elicitation: Experimenting with experience. *International Journal of Personal Construct Psychology*, 6(1), pp.79–98.
- Ferriss, T., 2009. *The Four Hour Workweek: Escape the 9-5, Live Anywhere and Join the New Rich*, Crown Publishing Group.

- Fournier, S., 1998. Consumers and Their Brands: Developing Relationship Theory in Consumer Research. *Journal of Consumer Research*, 24(4), pp.343–353.
- Fransella, F., 2003. *International handbook of personal construct psychology*, J. Wiley & Sons.
- Greenberg, J. et al., 1990. Evidence for Terror Management Theory II : The Effects of Mortality Salience on Reactions to Those Who Threaten or Bolster the Cultural Worldview. *Journal of Personality and Social Psychology*, 58(2), pp.308–318.
- Greenberg, J., Pyszczynski, T. & Solomon, S., 1986. The causes and consequences of a need for self-esteem: A terror management theory. In R. F. Baumeister, ed. *Public self and private self*. New York, NY: Springer-Verlag, pp. 189–212.
- Isaacson, B., 2012. Mind Control: How EEG Devices Will Read Your Brain Waves And Change Your World. *The Huffington Post*. Available at: http://www.huffingtonpost.com/2012/11/20/mind-control-how-eeeg-devices-read-brainwaves_n_2001431.html [Accessed November 24, 2012].
- Joseph, R.C., 2010. Individual resistance to IT innovations. *Communications of the ACM*, 53(4), pp.144–146.
- Jung, C.G., 1969. *Psychology and religion: West and east*, Routledge & Kegan Paul.
- Kahan, D. et al., 2009. Cultural cognition of the risks and benefits of nanotechnology. *Nature Nanotechnology*, 4.
- Kelly, G.A., 1955. A brief introduction to personal construct theory. In *International handbook of personal construct psychology*. J. Wiley & Sons, pp. 3–20.
- Kemper, T.D., 1973. The Fundamental Dimensions of Social Relationship: A Theoretical Statement. *Acta Sociologica*, 16(1), pp.41–60.
- Kosfeld, M. et al., 2005. Oxytocin increases trust in humans. *Nature*, 435(7042), pp.673–6.
- Kurzweil, R., 2005. *The singularity is near : When humans transcend biology*, New York: Viking.
- Lapointe, L. & Rivard, S., 2007. A Triple Take on Information System Implementation. *Organization Science*, 18(1), pp.89–107.
- Latour, B., 2005. *Reassembling the Social: An Introduction to Actor-Network-Theory*, OUP Oxford.
- Latour, B. & Woolgar, S., 1986. *Laboratory Life: The Social Construction of Scientific Facts*, Princeton University Press.
- Leitner, L. & Thomas, J., 2003. Experiential Personal Construct Psychotherapy. In *International handbook of personal construct psychology*.
- Lewis, J.M., 1998. For better or worse: Interpersonal relationships and individual outcome. *American Journal of Psychiatry*, 155(5), pp.582–589.
- Lloyd, M.M., 2010. There, yet not there: Human relationships with technology. *Journal of Learning Design*, 3(2), pp.1–13.
- Longo, B. et al., 2003. The poetics of computers: Composing relationships with technology. *Computers and Composition*, 20(1), pp.97–118.
- Maguire, S. & Phillips, N., 2008. “Citibankers” at Citigroup: A Study of the Loss of Institutional Trust after a Merger. *Journal of Management Studies*, 45(2).
- Meissner, W.W., 1970. Notes on identification: I. Origins in Freud. *The Psychoanalytic Quarterly*, 39(4), pp.563–589.
- Metz, R., 2012. Google Game Could Be Augmented Reality’s First Killer App. *MIT Review*. Available at: <http://www.technologyreview.com/news/507681/google-game-could-be-augmented-realitys-first-killer-app/> [Accessed November 24, 2012].
- MSDN, 2012. Design case study: Enterprise line of business Windows Store app (Windows).
- Niehaves, B., Köffer, S. & Ortbach, K., 2012. IT Consumerization – A Theory and Practice Review. *Proceedings of the 18th Americas Conference on Information Systems*.
- Orlikowski, W.J. & Scott, S. V., 2008. The Entangling of Technology and Work in Organizations. *Working Paper Series. Department of Management, Information Systems and Innovation Group, London School of Economics and Political Science*.
- Oxford English Dictionary, 2012. *Oxford Dictionaries Online*,
- Palmer, G.B., 1996. *Toward a theory of cultural linguistics*, University of Texas Press.
- Pope, M., 2003. Construing Teaching and Teacher Education Worldwide. In *International handbook of personal construct psychology*. pp. 303–310.

- Prattis, J.I., 1978. Modernization and the Problem of Abstractive Levels: Situational Logic as a Means of Bridging Group Structural and Inter-Personal Relationships. *American Journal of Economics and Sociology*, 37(4), pp.381–396.
- Ram, S. & Jung, H.-S., 1991. “Forced” Adoption of Innovations in Organizations: Consequences and Implications. *Journal of Product Innovation Management*, 8(2), pp.117–126.
- Reynolds, C. & Picard, R.W., 2001. Designing for Affective Interactions. *Proceedings of the 9th International Conference on Human-Computer Interaction*.
- Rogers, E., 2003. *Diffusion of Innovations* 5th ed., Simon and Schuster.
- Rosenblatt, A. et al., 1989. Evidence for terror management theory: I. The effects of mortality salience on reactions to those who violate or uphold cultural values. *Journal of Personality and Social Psychology*, 57(4), pp.681–90.
- Scheufele, D.A. & Lewenstein, B. V., 2005. The public and nanotechnology: How citizens make sense of emerging technologies. *Journal of Nanoparticle Research*, 7(6), pp.659–667.
- Scott, K., 2012. Individual relationships with technology. *Proceedings of the 18th Americas Conference on Information Systems*.
- Sims, C.A., 2009. The Dangers of Individualism and the Human Relationship to Technology in Philip K. Dick’s “Do Androids Dream of Electric Sheep?” *Science Fiction Studies*, 36(1), pp.67–86.
- Stanton, M. a & Mann, J., 2012. Early social networks predict survival in wild bottlenose dolphins. *PloS one*, 7(10).
- Stryker, S. & Burke, P.J., 2000. The Past, Present, and Future of an Identity Theory. *Social Psychology Quarterly*, 63(4), p.284.
- Tabachnick, D., 2007. Heidegger’s essentialist responses to the challenge of technology. *Canadian Journal of Political Science*, 40(2), pp.487–505.
- Tan, F.B. & Hunter, M.G., 2002. The Repertory Grid Technique: A Method for the Study of Cognition in Information Systems. *MIS Quarterly*, 26(1), p.39.
- Thompson, M., 2012. People, practice, and technology: Restoring Giddens’ broader philosophy to the study of information systems. *Information & Organization*, 22(3), pp.188–207.
- Venkatesh, V. et al., 2003. User acceptance of information technology: Toward a unified view. *MIS Quarterly*, 27(3), pp.425–478.
- Wang, P., 2010. Chasing the Hottest IT: Effects of Information Technology Fashion on Organizations. *MIS Quarterly*, 34(1), pp.63–85.
- Weinreich, P., 1986. The operationalisation of identity theory in racial and ethnic relations. In *Theories of Race and Ethnic Relations*. Cambridge: Cambridge University Press.
- Weinreich, P. & Saunderson, W., 2003. *Analysing Identity: Cross-Cultural, Societal and Clinical Contexts*, London: Routledge.
- Wildavsky, A. & Dake, K., 1990. Theories of Risk Perception: Who Fears What and Why? *The MIT Press*, 119(4), pp.41–60.
- Williams, T. et al., 2012. The effects of existential threat on reading comprehension of worldview affirming and disconfirming information. *European Journal of Social Psychology*, 42(5), pp.602–616.
- Williams, T. et al., 2010. The moderating role of extrinsic contingency focus on reactions to threat. *European Journal of Social Psychology*, 40(2), pp.300–320.
- Winter, D., 2003. Psychological Disorder as Imbalance. In *International handbook of personal construct psychology*. J. Wiley & Sons, pp. 201–211.
- Wu, P.F., 2012. A Mixed Methods Approach to Technology Acceptance Research. *Journal of the Association for Information Systems*, 13(3), pp.172–187.