The Ambivalent Potential of IT Identity: Me, Not-Me, and Conflicted Me in a Digital World

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Completed Research Paper

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Abstract

As information technology pervades all aspects of our lives, researchers have begun to explore it as more than just a tool, but rather as an essential component of our identities. We build on the conceptualization of IT Identity advanced in prior research to explore the meanings that people internalize with respect to IT and the ways in which they interact with the increasingly digital world. Through an ongoing embedded mixed-design grounded theory study, we define key meanings associated with IT identity and anti-ID identity (or positive and negative self-identification with IT) and we uncover the presence of an ambivalent or conflicted identity, where both positive and negative self-identification coexist. Our qualitative and quantitative findings support the existence of four different identity categories and highlight differences in meanings across participants in these categories.

Keywords: Information Technology Identity, Grounded Theory.
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Introduction

Much of the information technology (IT) adoption and diffusion literature focuses on individuals' instrumental beliefs about the effort involved in and benefits of using an IT (Venkatesh et al. 2016). However, with increased connectivity, the nature of individuals' interactions with IT and their social worlds is changing (Carter and Grover 2015). IT artifacts (e.g., mobile devices, social media) have become social objects (Srivastava 2005) around which shared cultural meanings, including expectations for behavior, have developed. Recent work suggests that people internalize these meanings as IT identities – manifest as self-identification with IT (Carter and Grover 2015; Carter et al. 2012) – and that these identities, subsequently, influence thinking and behaviors. Thus, IT identity intercedes between an increasingly digital world and the ways individuals take part in it. Still, while early studies find that IT identities do influence individuals' IT use behaviors (Oyedele and Simpson 2017; Polites et al. 2018), little is known about the meanings that people internalize in relation to the IT they use, or how IT identity influences individuals' interactions with the world around them more broadly. Viewing IT as social objects, rather than as mere tools, requires a fundamental shift in theorizing since the relationship moves from a transactional one, aimed at achieving instrumental ends, to a relationship embedded in a complex network of people and objects, aimed at a variety of different ends. For example, as a tool, a smartphone is a means of communication or information search. As a social object, a smartphone is also integral to of the self (I'm lost without my phone), a means of expressing who one is (using Apple vs. Android conveys different values about design aesthetic, technology openness and social status), and a mechanism for enhancing the self by enabling new action possibilities, new experiences and new relationships.

In this study, we build on prior research, which articulated the concept of IT identity as the extent to which an individual views use of an IT as integral to his or her sense of self (Carter and Grover 2015). That work provided an initial theoretical model of IT identity's influence on IT use behaviors but did not develop the content of IT identity (i.e., internalized meanings and expectations) and stopped short of theorizing how IT identity relates to other identity possibilities –the roles and social groups that people can participate in and the personal qualities they claim. Additionally, while Carter and Grover acknowledged the possibility of negative self-identification with IT (referred to here, as anti-IT identity), they left its theorizing, and relationship with IT identity, to future research. The current study takes up this work.

Exploring the relationship between IT identity and anti-IT identity raises an intriguing possibility: since individuals can hold and deal with conflicting views about social objects (Pratt 2000; Schuh et al. 2016), these apparently incompatible identities may co-exist as conflicted self-identification with IT (a so-called, ambivalent IT identity). To investigate this potential, we conducted a grounded theory study that delves into all (positive, negative, and conflicted) aspects of self-identification with IT. Our goal is to reveal how and why IT identity, anti-IT identity, and ambivalent IT identity matter to being part of a digital world.

The paper unfolds as follows. First, we offer a brief theoretical background on IT identity and its application to IS research. Then, we outline our research methodology and present emergent analysis from our grounded theory study. The paper concludes with limitations and future research directions. Given embeddedness of IT in today's social contexts, we believe this research will interest IS scholars, as well as professionals engaged in IT design, deployment, and management.

Theoretical Background

Across the social sciences, considerable variation exists in the conceptual meaning of self and identity (Stryker and Burke 2000). At the collective level, psychological approaches focus on social (or collective) identities that reflect "we, as a group," and define people in terms of “oneness” with other group members (Tajfel and Turner 1986). At the individual level, sociological perspectives often focus on role and person
identities. Role identities, (e.g., parent, professor) reflect “me, as a role,” while person identities (e.g.,
caring, funny) reflect “me, independent from others,” (Burke and Stets 2009). However, in recent years,
material objects (e.g., places, personal possessions) have also been acknowledged as a source of identity
(Clayton 2003; Dittmar 2011; Proshansky et al. 1983). Role identities define people as to what they do;
person identities, as to who they are, as distinct entities (Burke and Stets 2009), and material identities
define people as to the control they exert over their interactions with material objects (Dittmar 2011).

Regardless of focus, identities are established through a process in which individuals situate themselves
together (self-identification) or apart (self-disidentification) from social objects (McCall 2003). Social
objects include people, categories, processes, material objects, roles, relationships, or any thing around
which social networks form (Latour 2005). Individuals learn and internalize shared meanings associated
with social objects from the cultures in which they exist (Burke 2004). These internalized meanings make
up the content of identities and subsequently act as “benchmarks” for individuals’ attitudes and behaviors
(Burke and Stets 2009; Clayton 2003). Thus, understanding which identities are salient in social
situations can shed light on how and why people think and behave in the ways they do (Clayton 2003).

The central role of IT in all aspects of daily life and social interactions has drawn IS researchers’ attention
to identity issues. To that end, IS researchers have often investigated relationships between IT use and
social, role, or person identities from one of three vantage points: (1) IT use as a medium for
communicating and protecting identities; (2) IT implementation and use as a determinant of identity, or
(3) identity as a determinant of IT acceptance and use (Boudreau et al. 2014; Carter and Grover 2015).
These works highlight the relevance of identity in the IS domain but, in treating IT and identity as
discrete, they overlook IT as a material object that people may identify with. To address this concern,
Carter and Grover (2015) conceptualized IT identity as a new form of material identity (and fourth
perspective of identity within the IS literature). From this viewpoint, those who strongly self-identify with
IT are more likely to engage in richer IT use behaviors than those who do not (Carter and Grover 2015).

IT identity has already served as a theoretical basis for behavioral research in diverse IT contexts,
including online consumer behavior (Oyedele and Simpson 2017), IT for development (Gomez 2016), and
the dark side of IT use (Polites et al. 2018). These works suggest that the concept holds rich promise for
extending understanding of IT use behaviors. Still, IT use may not be the most important aspect of
identifying differentially with IT. Identity is an essential mediator between the social worlds in which
people are embedded and their ensuing actions (McCall and Simmons 1978). Thus, uncovering the
meanings and expectations for behavior that comprise IT identity, anti-IT identity, and ambivalent IT
identity serves two purposes: (1) it represents an important first step in explaining why, in what ways,
when, and where people engage with their increasingly digitalized social worlds, and (2) this foundational
understanding can help promote patterns of engagement that respond to the needs of individuals,
organizations, and society.

Research Methodology

In pursuit of our goals, we have been involved an ongoing research program, conducted using a grounded
theory (GT) approach (Charmaz 2014; Urquhart et al. 2010). We used GT because, while a lot of work has
focused on the extent of self-identification with IT, little research has examined the content of IT identity,
making theory development necessary. GT is an approach to theory development that builds and tests
theory in an iterative process of data collection and analysis to uncover theoretical concepts and their
relationships to one another, and then further evaluate those concepts and relationships through
additional data slices. GT uses theoretical sampling to “maximize opportunities to develop concepts in
terms of their properties and dimensions, uncover variations, and identify relationships between
concepts” (Corbin et al., p. 134). While GT is most commonly associated with qualitative methods of data
gathering, our team embraces the perspective espoused by Glaser (2003) that “all is data” and that GT can
use either, or both, qualitative and quantitative data in pursuit of theoretical saturation. Thus, our first
data slice involved in-depth semi-structured interviews. Through these interviews, along with reviews of
various other texts including other studies of identity (Carter 2012), we identified a variety of potential
meanings that individuals ascribe to technology, and to the self in relation to technology. We used these to
develop a questionnaire and collect a second slice of data from a broad range of individuals. The
quantitative data collected were subsequently used to explore positive self-identification, negative self-
identification, conflicted self-identification, and the various meanings that individuals might attach to
their relationships with IT. Our approach represents an embedded mixed-design GT study, where “quantitative and qualitative data, methods and techniques are mixed and supplement each other within a single project” (Walsh 2015, p. 535). The following sections describe both data collections and analyses in more detail.

**Qualitative Data Collection and Analysis**

In our qualitative data collection phase, we conducted semi-structured interviews to uncover meanings that participants had internalized about IT and to develop an initial conceptualization of identities that are constructed around technology.

We interviewed six individuals (four men and two women) and who were employed as knowledge workers in social enterprises, i.e., organizations focused on addressing social needs. Participants’ ages ranged from early 20’s to mid-to-late 50’s. IT use permeated each of our participants’ professional and personal lives. Our rationale for focusing on social enterprises was threefold. First, we sought consistency among participants’ work role identities so we could focus on their relationships with IT, rather than their respective work contexts. Second, we wanted to explore self-identification with IT in an under-represented context of growing concern in IS research: namely, for-profit organizations that are looking to include socially valuable activities in their business practices. Third, individuals working in social enterprises engage in activities to solve social problems and/or create social change; however, these individuals may or may not think to use IT to achieve such aims. As Carter and Grover (2015, p. 952) note, IT identity influences how people tend to approach problem-solving situations, whereby “those with IT identities would think to use IT to solve all kinds of problems,” while, in the same circumstances, those without IT identities may not. Thus, our sampling strategy provides a salient social context to explore our phenomena of interest. Still, while this slice of qualitative GT data collection is complete, as our research program unfolds, we expect our quantitative findings to lead to further qualitative GT, involving a greater diversity of participants.

**Qualitative Data Collection**

Before their respective interviews, each participant was asked via email to complete a 20 Statements Test (TST) (Kuhn and McPartland 1954). The TST instructs the participant to answer the question “Who Am I?” twenty times in twenty different ways, and is used to determine a set of identities held by a participant. Participants were instructed to answer quickly and not worry about prioritizing or editing their lists.

After reviewing a participant’s answers to the TST, pairs of researchers met with the participant to conduct a two-part interview. Part one involved discussion of the participant’s TST answers, exploring the meaning of most of the identities listed by the participant and probing for ways in which IT interacted with these meanings. The subset of identities chosen by the researchers for discussion aimed to include a range of role, group, personal and material identities, as well as any identities that seemed related to IT. Beginning the interview by focusing on a participant's self-described identities allowed us to situate questions about technology in the context of a participant’s self-concept.

The second part of the interview focused more closely on IT, with questions about IT use on a typical day, situations or periods when IT was not available, and participants’ perceptions of how IT helped or hindered identity expression. Interview audio was recorded, with permission, and one researcher took hand-written notes. The audio recording, hand-written notes, and TST, were transcribed for thematic analysis.

As a preliminary test of the data collection method, all research team members independently performed the TST to estimate the difficulty and amount of time required to complete it. Additionally, one member performed two test interviews on non-members, and all team members reviewed the recorded audio to discuss and revise the interview script. No data gathered from these tests were retained for analysis.

All interviews were transcribed, anonymized (participant names in this report are pseudonyms), and stored in NVivo v.11, along with participants’ matching TST answers.
Qualitative Data Analysis

We followed an interactive and reflective process that included holding regular meetings to debrief, share notes, and consider revisions to the interview protocol. Initial analysis involved parallel open coding of transcripts, TST worksheets, and other documents. Emerging categories were iteratively compared, sorted, and grouped. This process allowed us to identify core concepts as they existed for participants.

All team members listened and reviewed transcripts of audio recordings, checking for accuracy of transcription. Listening to audio recordings helped understand the pacing of interviews, points where participants took time to reflect on questions, and nuanced meanings that could only be discerned from vocal cues. These sorts of pauses and inflections were noted in the transcripts for future analysis.

Initially, our focus was on uncovering meanings associated with IT identity (i.e., positive self-identification with IT). To that end, each team member attempted to identify whether participants made any claims to one or more IT identities and the ways in which IT aided or hindered expression of other identities. We conducted analysis of the first interview within 48 hours and used preliminary findings to inform our interview process for the second. As we analyzed the second, we looked for similarities and differences with the first. We followed the same constant comparative, iterative process as we conducted and analyzed subsequent interviews.

After initial coding of the six interviews, the team performed focused coding, around themes of positive self-identification (IT identity); negative self-identification (anti-IT identity); dis-identification; self-verification; technology meanings; and technologies used. Each researcher was assigned a theme (e.g., self-verification) and given the task of reviewing all participant transcripts with respect to that theme. Researchers wrote memos summarizing each theme for each participant and then high-level memos were written that summarized each theme across participants. All memos were reviewed and discussed by the entire team in synchronous online meetings.

Through writing and discussion, our participants were identified as falling into three categories, representing positive, negative, and dis-identification, with IT and a framework emerged of the relationship between IT identity and anti-IT identity. Rather than existing as one entity on a continuum from strong positive self-identification to strong negative self-identification, with dis-identification serving as the midpoint between the two, our qualitative analysis suggested that IT identity and anti-IT identity are orthogonal. Moreover, among our participants we found that positive and negative self-identification at the level of individual technologies or technological brands, may co-exist as conflicted self-identification with IT, at a collective level. We termed this conflicted self-identification, ambivalent IT identity. The emergent qualitative framework is shown in Figure 1. For the sake of parsimony, much of the findings from our qualitative analysis are not presented here; however, each identity possibility is discussed briefly, next.
Qualitative Findings

All our participants (identified by pseudonyms) were heavy users of IT, meaning that IT use permeated their daily professional and personal activities.

“Yesterday I woke up about 4:30. I picked up my iPad and looked at the weather” –Alex

“... the first thing I do after I wake up is get the iPad out and check Facebook, check Google News” –Andrew

“I spend all day every day on Google Talk with my best friend and on Slack with my co-workers” –Rachel

“I think yesterday, I spent 80 or 85% of my waking day, using IT” –Kevin

**IT Identity:** In our interviews, we saw evidence of IT identity as a separate identity that people hold about IT at the level of the application, brand, and device. This lends support to the view that IT and identity are not always discrete. In Rachel’s case, her calendar application is integral to who she is.

“I am my calendar [...] And the calendar is also how I organize my life [...] it is an anxiety soother. [...] I don’t feel that way about my texting or my email as much as my calendar.” –Rachel

Rachel is personally involved with technology to the point that she expresses nostalgia for IT she never had a chance to use, for IT she no longer uses, and for the person she was in relation to the IT she used.

“I do love old technology... I really love the future of the 50’s.”

“Do you remember WordPerfect? (laughs)...I miss macros!”

“Because I use Google Calendar more now I don’t use the task list in Outlook as much anymore. I miss being that person.” –Rachel

She is also a proud early adopter of popular technologies:

“I was one of the first people who had an email address...”

“I got an Alexa right when they were released.”

“I was the first one to say, start a Facebook page.”
Kevin is almost entirely positive about IT, in general, and has a deep appreciation of its expansive ability:

“Sometimes I just reflect on how insanely valuable it is. I feel like I’ve been massively enriched... Now you have ... pretty much... basically the entire sum of human knowledge, or like 98% of it. In the size of something you can fit in your pocket. So, it’s amazing to me. When people grumble about how smartphones are ruining the way we live... I don’t agree at all.” – Kevin

He identifies himself through how he uses IT, not because he uses technology. In doing so, he highlights a potential challenge in trying to uncover the content of IT identity in today’s world:

“I think about myself as an information addict because that is what I like to do with my phone but some people also just like gossip with their friends in group chats on Facebook all day. So, I think about myself and distinguishing myself by how I use technology but I didn’t even think to identify myself as someone who uses technology, because it is so automatic.”

“It’s just a question of ubiquity. It’s like, it’s like you know, I live in [location] and I am a wearer of coats.” – Kevin

Nevertheless, Kevin has a well-defined understanding of the importance of IT to his sense of self, to the point where he has a hard time considering who he would be if he hadn't grown up with IT:

“If I had never had access to those things, like my whole life so far, I don’t even know what kind of person I would be.” – Kevin

Dis-identification: Still, being a heavy IT user does not imply that a person identifies with the technologies s/he uses (Carter and Grover 2015). Despite working with IT daily, Alex does not define himself in relation to IT. Alex is a problem solver who is interested in helping people and IT just happens to be what he uses:

“I could probably deliver similar value to myself and the surrounding universe by helping people navigate political systems, or working their way through all of the hoops one has to jump through to get help for homeless issues. It seems like there are lots of ways that that commitment or inspiration to helping people could be expressed. IT is just the way I do it.” – Alex

Further, when asked to imagine the loss of IT, Alex envisaged feelings of frustration but expressed confidence that his sense of self would endure:

“It would have increased my level of frustration in a couple of spots. I would have either randomly missed or otherwise have been stuck in traffic. I would have felt less well-informed, I would have felt less well-entertained, but in most of the ways I consider meaningful, I don’t know that it would have had that huge impact. [...]” – Alex

“So, your caring, your commitment, your cooking, and some of the other things [...] that are very important fundamentally to who you are would endure?” – Interviewer

“Yes. To varying degrees of apocalypse. If we could lose the higher end digital IT functions and not lose access to electricity, I’m there. I can outlast that one for years.” – Alex

Dis-identification is also evident in Chris’ lack of connectedness with the technologies he uses daily:

“It's just Netflix. I just want to have some noise in the background. I don't pay attention to it, really.”

“If I don't have access to Google News, I don't get anxious at all. It's-- it's totally fine by me.”

“Last year I traveled for almost five months straight. I did not listen to the radio at all. I could have streamed NPR, but I did not. It just didn't occur to me to.” – Chris

Anti-IT identity: In conceptualizing IT identity as positive self-identification with IT, Carter and Grover (2015) suggested that people could negatively identify with technology (termed, anti-IT identity here), whereby IT is viewed as “alien” or “in opposition” to the self. The concept of negative self-identification is
The Ambivalent Potential of IT Identity

not the same as ascribing a negative (often called, deviant) identity to oneself (McCall 2003). For example, in the social media context, “I am an internet troll,” is a negative identity, while viewing oneself as hostile to being an internet troll would be considered negative self-identification. Thus, while negative identities and negative self-identification are both descriptive of the self, they are qualitatively different concepts.

We did find evidence of anti-IT identity among our participants. Miriam expresses negative self-identification through avoidance and apparent disdain for “screens.”

“I actually read books. I don't look at screens. I don't like e-readers. I don't like audiobooks. So, I read hard books.”

“And usually I'm not on my phone before I go to bed. Because again, I don't like being on screens.”

“I'm not driven for screens. I'd rather be doing something physical. I like working on the house. I like -- you know, "like" running errands. But I'd rather just not be sitting there on a screen. I just -- I just don't like it.”

“I'd rather be doing something with my mind and my hands that's not looking at a screen.” –Miriam

Miriam’s attempts to avoid IT are not confined to her own behavior; she also tries to get her husband to behave similarly and views his IT use as a source of conflict:

“It's like this -- it kind of takes over. And I have to say, OK, you know what? We're eating dinner now. If you don't put down your phone, I'm eating without you, or we're eating without you. So, he just kind of goes on these tangents, or he's on his Scrabble game, or he's doing something online rather than participating with whatever's going on. And he knows he does it, but I have to tell him. And he does usually thank me for telling him, because he doesn't know he's doing it. (long pause) But I don't think it's a conflict. Yeah, I'd say it's a source of conflict sometimes, because he'd get a little irritated. But I'm not going to wait around for it and I don't avoid it. Because I think that if he's having dinner, he needs to be off his phone.” –Miriam

Miriam prides herself on slow adoption of technology, claiming to use it for purely utilitarian purposes or when required, and fantasizes about technological disasters leading to societal improvements:

“The only reason I have [my smartphone] with me right now is because ... in case a co-worker needs to get a hold of me, or something.”

“What if, you've got an electrical bomb that goes off over your city, right? [...] That would be kind of cool. I mean, it would be bad for maybe emergency services and things like that, because so much relies on IT, and just the electrical grid relies on IT. So, it would screw things up, but it might be a relief in some ways, for people to actually have to communicate together.” –Miriam

Ambivalent IT identity: The interconnected nature of IT use in today’s world gives rise to conflicted self-identification with IT, whereby individuals can hold IT identities and anti-IT identities simultaneously. For example, Andrew is hostile to Apple products, because he grew up in an anti-Apple environment. Still, while he is loath to cede control to Apple by becoming “locked into the Apple ecosystem,” he rationalizes defining himself as an “Android User”:

“... I didn't like the idea of kind of ceding control over my purchasing habits to a company.”

–Andrew

“Like Apple.”–Interviewer

“Like Apple. Yeah. You know, they kind of force your hand [...] And I don't know -- I felt like Android, you know, it's an operating system. And so, it provides you more flexibility. Although it's still, you know, giving power to Google. Uh, yeah.” –Andrew

Rachel accepts interruptions and prompting from the calendar application, with which she positively self-identifies, in ways she does not accept from other IT:
"I tried a Fitbit... and I didn’t care for that. And really, like Apple watches... they seem really awful to me. Because it is too much... I do enjoy ... as much as I said I am my calendar... I try very hard to not be my calendar from 9 to 6 ... so that was just why the Fitbit is weird because it is on you all the time and it caused me to walk around and around the kitchen and get to my 10,000 steps at the end of the night. And I didn’t want to be ruled that way."

"I am my calendar [...] In the olden days, I had a beeper [...] and when the site went down they called me... so that’s annoying, and being beholden to the beeper. Even though the calendar is my brain, I still mostly feel like I am the boss of the calendar I guess I would say. The calendar bosses me after I’ve told it what I want to tell me what to do, whereas something like a Fitbit [is] just bossing me.

"I have feelings about what iPhones signify. [Laughter] I feel like they are somewhat exclusionary and it is symbol of a higher economic level and status level and appreciation for design, or prioritization for designing over utility. I have bad feelings about them.” –Rachel

These qualitative findings support the view that IT identity and anti-IT identity are distinct, orthogonal, entities. Further, direct quotations from our participants indicate that holding both simultaneously, regarding specific technologies or technological brands, may manifest as ambivalent IT identity at the level of IT, in general. To explore this emergent understanding further, with a broader range of individuals, we engaged in quantitative data collection and analysis, described next.

**Quantitative Data Collection and Analysis**

In the quantitative phase, we used a cross-sectional web-based, survey to ask participants about their technology use behaviors and the social norms they internalize in relation to the IT they use. Specifically, we asked participants about the technologies they used, meanings they ascribed to technology, IT identity (adapted from Carter (2013), anti-IT identity, meanings they ascribed to themselves with and without IT (adapted from Carter et al. 2012), identity labels, and their opinions about using technology. Except for IT identity and meanings ascribed to the self, with and without technology, survey items were developed based on insights from our qualitative data.

**Quantitative Data Collection**

A market research company recruited and administered the online survey to a panel of technology users. We received 145 completed responses. Six of these were removed for failing quality checks, leaving a usable sample of 139 responses that were retained for further analysis.

<table>
<thead>
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<th>Variable</th>
<th>Value</th>
<th>Frequency</th>
<th>% Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>How would you describe your gender?</td>
<td>I am a man</td>
<td>37</td>
<td>26.6</td>
</tr>
<tr>
<td></td>
<td>I am a woman</td>
<td>101</td>
<td>72.7</td>
</tr>
<tr>
<td></td>
<td>I am transgender</td>
<td>0</td>
<td>0.0</td>
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<tr>
<td></td>
<td>I prefer to describe myself as</td>
<td>1</td>
<td>0.7</td>
</tr>
<tr>
<td>Employment Status</td>
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<td>58</td>
<td>41.7</td>
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<tr>
<td></td>
<td>Unemployed</td>
<td>37</td>
<td>26.6</td>
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<tr>
<td></td>
<td>Retired</td>
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<td></td>
<td>Some College or University</td>
<td>42</td>
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<td>College or University Degree</td>
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<td>Some Graduate School</td>
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As Table 1 shows, our sample included many more women (72.2%) than men (26.6%). Participants’ ages ranged from 18 – 83 years, with a mean age of 48 years. On average, participants in our survey had been
using IT for 17.46 years but had a wide range of experiences with IT. Some participants had very little experience (five reported using IT for one year, or less), while others had been using IT for decades (six participants reported using IT for 40 years, or more). 41.7% of participants were employed. Our sample also included a sizable number of retirees (28.1%) and unemployed people (26.6%). Less than 40% of participants had at least a College degree.

Quantitative Data Analysis

IBM SPSS Statistics for Windows V24.0 was used for quantitative analysis. First, because our dataset contained several measures for IT identity (nine items (Carter 2013)) and anti-IT identity (10 items, developed for this study), we conducted exploratory factor analysis (EFA) to verify the preliminary hypotheses developed in our qualitative analysis. As an initial step, we conducted parallel analysis (using principal components extraction) to compare observed eigenvalues to eigenvalues from random data. In this analysis, the eigenvalue of component three (1.292) was less than the eigenvalue of the random data based on the 95th percentile (1.557), indicating a two-factor solution. Thus, we ran the analysis again, using principal axis factoring with Promax oblique rotation, specifying two factors to identify good and bad indicators of each construct. We chose oblique rotation over orthogonal rotation, because it allows factors to be correlated but does not force them to be, thereby providing a test of the two factors’ orthogonality.

Next, we inspected communalities to see whether measurement items were well defined by the solution. Then, we examined how well the items loaded on each factor, using the pattern matrix. Two items, measuring anti-IT identity (“taken over by,” and “opposed to”) were removed at this stage, leaving nine measures of IT identity and eight measures of anti-IT identity. As Table 2 shows, all items loaded at greater than .67 on their theoretical construct and cross-loaded at less than 0.11. The factor correlation matrix indicated a correlation of -0.088. Taken together, these results provide support for the hypothesis that IT identity and anti-IT identity are distinct, orthogonal, factors.

Second, we tested the reliabilities of IT identity and anti-IT identity, to create aggregate variables of each. IT identity had a Cronbach Alpha of 0.907, while the Cronbach Alpha of anti-IT identity was 0.873. The resulting IT identity variable was normally distributed with a mean value of 3.050, minimum value of one, and maximum value of five. The anti-IT identity variable, in contrast, was right skewed, with a mean value of 1.446, a minimum value of one and maximum value of 3.63.

<table>
<thead>
<tr>
<th>Table 2. Pattern Matrixa</th>
<th>Factor Loadingsb</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>IT identity</td>
</tr>
<tr>
<td>Counting on</td>
<td>.827</td>
</tr>
<tr>
<td>Enthusiastic about</td>
<td>.807</td>
</tr>
<tr>
<td>Energized by</td>
<td>.795</td>
</tr>
<tr>
<td>Linked with</td>
<td>.790</td>
</tr>
<tr>
<td>Pumped up by</td>
<td>.783</td>
</tr>
<tr>
<td>Connected with</td>
<td>.779</td>
</tr>
<tr>
<td>In coordination</td>
<td>.732</td>
</tr>
<tr>
<td>Dependent on</td>
<td>.727</td>
</tr>
<tr>
<td>Reliant on</td>
<td>.702</td>
</tr>
<tr>
<td>Hostile towards</td>
<td></td>
</tr>
<tr>
<td>Irritated by</td>
<td></td>
</tr>
<tr>
<td>Upset by</td>
<td></td>
</tr>
<tr>
<td>Diminished by</td>
<td></td>
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<tr>
<td>Dismayed by</td>
<td></td>
</tr>
<tr>
<td>Drained by</td>
<td></td>
</tr>
<tr>
<td>Threatened by</td>
<td></td>
</tr>
<tr>
<td>Wanting to avoid</td>
<td></td>
</tr>
</tbody>
</table>

a. Extraction method: Principal axis factoring with Promax rotation; b. All items cross-loaded at less than 0.11

Third, we conducted two-step cluster analysis of both variables, in turn, allowing SPSS to select the number of clusters. Although continuous variables are assumed to be normally distributed, IBM SPSS
Statistics V24.0 documentation notes that two-step cluster analysis is robust to violations of distributional assumptions (IBM Corp. 2016). Thus, despite the skewness of the anti-ITID variable, the procedure was deemed appropriate for uncovering natural groupings within the dataset. Data about technologies used, meanings ascribed to technology, meanings ascribed to the self with and without IT, identity labels, and opinions about using technology were used as evaluation fields, to uncover characteristics of each cluster. This sort of exploratory analysis allows us to consider similarities and differences between naturally occurring clusters in a way that is consistent with GT principles of constant comparison. The difference being that, rather than comparing thematic statements in textual data, we examine and re-examine associated characteristics with the emergent clusters.

In two-step cluster analysis, the silhouette measure assesses cohesiveness (i.e., how well items within a cluster fit together) and separateness (i.e., how different from each other the clusters are) of the solution. An average silhouette of between 0.2 to -1.0 implies poor cohesion/separation and 0.5 – 1.0 represents good cohesion/separation. Analysis of the IT identity variable revealed three clusters, representing low IT identity (31 cases, (22.3%)), medium IT identity (61 cases, (43.9%)), and high IT identity (47 cases, (33.8%)), i.e., positive self-identification with IT. The average silhouette was 0.7. Analysis of the anti-IT identity variable revealed two clusters, representing low and high levels of anti-IT identity, i.e., negative self-identification with IT. One hundred-twelve (80.6%) cases were placed in the low anti-IT identity group, while twenty-seven (19.4%) were placed in the high anti-IT identity group. The average silhouette was 0.8. Thus, solutions for both variables indicated good cohesion within and good separation among clusters.

Finally, we conducted cluster analysis on the IT identity and anti-IT identity variables, together. Allowing SPSS to select the number of clusters automatically led to a 3-cluster solution of IT identity (57 cases, (41%)), anti-IT identity (33 cases, (23.7%)), and dis-identification (49 cases, (35.3%)). The average silhouette for the solution was 0.6, indicating good cohesion/separation. Since our qualitative findings point to a 4-cluster solution, we ran the cluster analysis again, this time with a fixed number of four clusters.

Fixing the number of clusters to four, revealed the presence of an ambivalent IT identity (28 cases, (20.1%)), i.e., ambivalent self-identification with IT, in addition to IT identity (50 cases, (36%)), anti-IT identity (16 cases, (11.5%)), and dis-identification (45 cases, (32.4%)). While the 4-cluster solution exhibited a higher ratio of sizes (3.12) than the 3-cluster solution (1.73), the average silhouette was 0.6. This corresponded to the average silhouette for the 3-cluster solution, meaning the 4-cluster solution was equally good in terms of cohesion and separation. Since the 4-cluster solution allowed for a more nuanced understanding of the relationship between IT identity and anti-IT identity, it was selected for analysis. For comparison, both solutions are shown in Figure 2. Our findings are presented next.
Quantitative Findings

IBM SPSS Statistics provides several displays to help understand the content of clusters and the importance of variables in forming clusters, including boxplots for all the data with superimposed boxplots for each of the clusters. Because IT identity and anti-IT identity are continuous variables, we used this feature to understand the composition of clusters. We examined the boxplots of all variables to see where median values among the clusters were different and similar, and where these were different than the median value for all clusters. For example, the median value of “with IT, I am stressed” for IT identity was 1.01 (lower than the median value for all clusters) and the values at the first and third quantiles were 1.00 and 2.01, respectively. For anti-IT identity, the median value of 4.00 was higher than the median value for all clusters, and the values at the first and third quantiles were 3.01 and 4.00. These differences indicated that IT identity holders are less likely, and anti-IT identity holders more likely, to feel stressed with technology.

Likewise, we looked for similarities in values to uncover shared meanings among clusters. The median and quantile values of “with IT, I am isolated” for the ambivalent IT identity and the anti-IT identity clusters are very similar (median: 3.00 vs. 3.01; first quantile: 2.00 vs. 2.01; third quantile: 3.26 vs. 4.00) and higher than the median value among all clusters, meaning that those with anti- or ambivalent IT identities are more likely to report feeling isolated with technology. Table 3 presents cluster comparisons based on our examination of the boxplots. This comparison extends understanding of the meanings that people internalize in relation to IT and how they associate differentially with the IT they use.

**IT Identity:** Individuals in the IT identity group are more likely to consider technology calming, appealing, essential, and to feel connected when it is available to them. Consistent with Carter and Grover’s (2015) conceptualization, we found evidence that IT identity holders are energized by and depend on their interactions with IT. Moreover, IT identity holders enjoy talking about the IT they use and are more likely to describe themselves (and expect others to describe them) as techies, tech savvy, and tech addicts. Cluster analysis also provides insights into how being without IT affects those having IT identities. Not only are individuals in this cluster more likely to feel bored and less connected without IT, they are more likely to feel uncomfortable, insecure, lost, and isolated.

**Dis-identification:** Carter and Grover (2015) conceptualized dis-identification as “use of the [target IT] is completely unrelated to my sense of self (who I am)” (p. 938). This implies that those who do not identify with IT (positively or negatively) will not describe themselves (or expect others to describe) in relation to IT. As Table 3 indicates, cluster analysis verified this assumption. Still, even those who dis-identify with IT ascribe some meanings to themselves with and without technology. Specifically, individuals in this cluster are likely to experience less negative emotions when IT is absent and less positive emotions (i.e., excited or empowered) when IT is present. By indicating fewer negative emotions in the absence of technology, individuals in this cluster display an unenthusiastic stance in relation to IT.

**Anti-IT Identity:** Individuals in the anti-IT identity cluster find technology frustrating, controlling, and manipulative. Further, where those who dis-identify with IT are unenthusiastic, anti-IT identity holders take an oppositional stance in relation to technology. Individuals in this group report feeling more worried, stressed, anxious, and uncomfortable, and less available, in control, and empowered, around IT. In addition, anti-IT identity holders are more likely to tell others to put tech away and to describe themselves (and expect others to describe them) as dinosaurs.

This cluster revealed an interesting contradiction. Those with anti-IT identities view themselves as anti-social and experience feelings of guilt, awkwardness, and panic, with and without IT. That anti-IT identity is also associated with excitement in the absence of IT, may indicate that these individuals are aware of social expectations tied to IT use and feel stigmatized by their negative self-identification with technology.
### Table 3. Cluster Comparison

<table>
<thead>
<tr>
<th></th>
<th>IT identity</th>
<th>Disidentification</th>
<th>Ambivalent IT identity</th>
<th>Anti-IT identity</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Technology is...</strong></td>
<td><strong>More:</strong></td>
<td></td>
<td></td>
<td><strong>More:</strong></td>
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<tr>
<td></td>
<td>● Convenient</td>
<td></td>
<td>● Frustrating</td>
<td>● Frustrating</td>
</tr>
<tr>
<td></td>
<td>● Appealing</td>
<td></td>
<td>● Interfering</td>
<td>● Interfering</td>
</tr>
<tr>
<td></td>
<td>● A lifeline</td>
<td></td>
<td>● Manipulative</td>
<td>● Impersonal</td>
</tr>
<tr>
<td></td>
<td>● Essential</td>
<td></td>
<td>● Helpful</td>
<td>● Controlling</td>
</tr>
<tr>
<td></td>
<td>● Helpful</td>
<td></td>
<td></td>
<td>● Frivulous</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>● Time-Wasting</td>
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<td></td>
<td></td>
<td>● Shallow</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>● Manipulative</td>
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<tr>
<td><strong>With IT, I am...</strong></td>
<td><strong>More:</strong></td>
<td></td>
<td><strong>Less:</strong></td>
<td><strong>More:</strong></td>
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<tr>
<td></td>
<td>● Excited</td>
<td></td>
<td>● Empowered</td>
<td>● Excited</td>
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<td>● Empowered</td>
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<td>● Empowered</td>
<td>● Empowered</td>
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<tr>
<td></td>
<td>● Reachable</td>
<td></td>
<td>● Connected</td>
<td>● Connected</td>
</tr>
<tr>
<td></td>
<td>● Connected</td>
<td></td>
<td>● Safe</td>
<td>● Safe</td>
</tr>
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<td></td>
<td>● Safe</td>
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<tr>
<td></td>
<td><strong>Less:</strong></td>
<td></td>
<td></td>
<td><strong>More:</strong></td>
</tr>
<tr>
<td></td>
<td>● Frustrated</td>
<td></td>
<td></td>
<td>● Bored</td>
</tr>
<tr>
<td></td>
<td>● Stressed</td>
<td></td>
<td></td>
<td>● Anti-social</td>
</tr>
<tr>
<td></td>
<td>● Awkward</td>
<td></td>
<td></td>
<td>● Frustrated</td>
</tr>
<tr>
<td></td>
<td>● Anxious</td>
<td></td>
<td></td>
<td>● Stressed</td>
</tr>
<tr>
<td></td>
<td>● Insecure</td>
<td></td>
<td></td>
<td>● Guilty</td>
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<td></td>
<td>● Uncomfortable</td>
<td></td>
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<td>● Awkward</td>
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<td></td>
<td>● Worried</td>
<td></td>
<td></td>
<td>● Anxious</td>
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<td></td>
<td>● Panicked</td>
<td></td>
<td></td>
<td>● Uncomfortable</td>
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<td></td>
<td>● Lost</td>
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<td>● Worried</td>
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<td>● Panicked</td>
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<td>● Lost</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>● Isolated</td>
</tr>
<tr>
<td><strong>Without IT, I am</strong></td>
<td><strong>More:</strong></td>
<td></td>
<td><strong>Less:</strong></td>
<td><strong>More:</strong></td>
</tr>
<tr>
<td></td>
<td>● Bored</td>
<td></td>
<td>● Stressed</td>
<td>● Guilty</td>
</tr>
<tr>
<td></td>
<td>● Frustrated</td>
<td></td>
<td>● Guilty</td>
<td>● Excited</td>
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<tr>
<td></td>
<td>● Insecure</td>
<td></td>
<td>● Anxious</td>
<td>● Bored</td>
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<tr>
<td></td>
<td>● Uncomfortable</td>
<td></td>
<td>● Uncomfortable</td>
<td>● Awkward</td>
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<td></td>
<td>● Lost</td>
<td></td>
<td>● Worried</td>
<td>● Anti-social</td>
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<td></td>
<td>● Isolated</td>
<td></td>
<td>● Panicked</td>
<td>● Lost</td>
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<td></td>
<td></td>
<td></td>
<td>● Lost</td>
<td>● Isolated</td>
</tr>
<tr>
<td></td>
<td><strong>Less:</strong></td>
<td></td>
<td></td>
<td><strong>More:</strong></td>
</tr>
<tr>
<td></td>
<td>● Reachable</td>
<td></td>
<td>● Frustrated</td>
<td>● Guilty</td>
</tr>
<tr>
<td></td>
<td>● Connected</td>
<td></td>
<td>● Uncomfortable</td>
<td>● Excited</td>
</tr>
<tr>
<td><strong>I am likely to describe myself as...</strong></td>
<td><strong>More:</strong></td>
<td><strong>Less:</strong></td>
<td><strong>More:</strong></td>
<td><strong>More:</strong></td>
</tr>
<tr>
<td></td>
<td>● Techie</td>
<td></td>
<td>● Stressed</td>
<td>● Dinosaur</td>
</tr>
<tr>
<td></td>
<td>● Tech savvy</td>
<td></td>
<td>● Guilty</td>
<td></td>
</tr>
<tr>
<td></td>
<td>● Tech addict</td>
<td></td>
<td>● Anxious</td>
<td></td>
</tr>
<tr>
<td></td>
<td>● Nerd</td>
<td></td>
<td>● Uncomfortable</td>
<td></td>
</tr>
<tr>
<td><strong>Others are likely to describe me as...</strong></td>
<td><strong>More:</strong></td>
<td><strong>Less:</strong></td>
<td><strong>More:</strong></td>
<td><strong>More:</strong></td>
</tr>
<tr>
<td></td>
<td>● Techie</td>
<td></td>
<td>● Frustrated</td>
<td>● Dinosaur</td>
</tr>
<tr>
<td></td>
<td>● Tech savvy</td>
<td></td>
<td>● Guilty</td>
<td></td>
</tr>
<tr>
<td></td>
<td>● Tech addict</td>
<td></td>
<td>● Anxious</td>
<td></td>
</tr>
<tr>
<td><strong>Opinions about using technology</strong></td>
<td><strong>More:</strong></td>
<td><strong>Less:</strong></td>
<td><strong>More:</strong></td>
<td><strong>More:</strong></td>
</tr>
<tr>
<td></td>
<td>● Like talking to others about the tech I use</td>
<td></td>
<td>● Fondly remember IT used before</td>
<td>● Try to convince others to use the same technologies as me</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>● Get others to put tech away</td>
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</table>
Ambivalent IT identity: The 4-cluster solution revealed the ambivalent potential of IT identity — where positive and negative self-identification co-exist as ambivalent IT identity. Evidence of this is provided in ambivalent IT identity holders’ ability to ascribe conflicting meanings both to technology and to the self in relation to technology. For example, individuals in this cluster view IT as frustrating, interfering, manipulative, and helpful. Moreover, in the presence of technology, they share meanings of excitement and empowerment with IT identity holders, as well as anti-IT identity holders’ sense of isolation. Similarly, without IT, these individuals share anti-IT identity holders’ contradictory feelings of being simultaneously anti-social, awkward, and excited, together with IT identity’s feelings of boredom, loss, and isolation. Ambivalent IT identity holders are more likely to try and get others to use the same technologies as they do and to describe themselves (and expect others to describe them) as luddites. These findings suggest that when ambivalent IT identity holders find an IT they like, they may be resistant to alternatives.

Discussion

While studies have begun to recognize IT identity’s potential as a determinant of IT use behaviors (Oyedele and Simpson 2017; Polites et al. 2018), little is known about the shared meanings and expectations for behavior that people internalize with regard to technology — that comprise IT identity — or about other forms (negative and conflicted) of self-identification with IT. This has been likened to “seeing ripples in a pond but not the object that made them” (Carter et al. 2017).

This study advances identity research in the IS domain by delving into all (positive, negative, and conflicted) aspects of self-identification with IT. In doing so, we lend empirical support to Carter and Grover’s (2015) conceptualization of IT identity. In our interviews and quantitative techniques, we found evidence that when people identify positively with IT, they will seek out and enjoy opportunities to exercise mastery over it, in ways that are not only self-confirmatory but are also recognizable to others. Moreover, the negative emotions that IT holders express related to the absence of IT supports the view that IT identity holders do view their interactions with IT as an integral part of who they are. Of interest, moving forward, is exploring where meanings contained in IT identity converge and diverge from those involved in less desirable outcomes, such as IT addiction — and how to promote IT identity and desirable outcomes, while avoiding IT addiction and undesirable outcomes.

This study also extends IT identity research by offering a more nuanced understanding of dis-identification and revealing meanings contained in anti-IT identity and ambivalent IT identity. Our finding that those who dis-identify with IT do ascribe meaning to their interactions with IT, suggests that, in digitalized societies, it is unrealistic for IT use to be “completely unrelated” to a person’s sense of self. Over time, it will be interesting to see if increased connectivity of people, data, and things leads to fewer cases of dis-identification among individuals.

Regarding anti-IT identity, we may surmise that individuals who negatively identify with IT feel disconnected from others due to their oppositional stance. The “dinosaur” label that they apply to themselves suggests that these individuals live in the past, technologically-speaking and anti-IT identity holders may be driven by fear of technological change. Such fear may result in these individuals placing themselves in opposition to new social networks and ways of maintaining social relationships that have grown up around IT use. Given that some feel panicked and awkward, with and without IT, contradictions in the meanings associated with negative self-identification warrant further investigation.

Another intriguing avenue for research is to investigate the concept of ambivalent IT identity. In this study, we found evidence that positive and negative self-identification occur at the level of specific technologies or technological brands. Because people interact with many technologies, they situate themselves together or apart from many technologies. As such, it is possible to develop IT identities in relation to some IT and anti-IT identities related to others that conflict at the level of IT, in general. Our qualitative and quantitative findings lend some weight to this proposition. However, given the interconnected and embedded nature of IT use, future work should explore whether it is also possible to
develop ambivalent IT identities related to a single piece of software or whether conflicted self-identification can only occur when two or more IT are involved. This is an important question for research conducted about IT with broad application across social contexts, and that have software applications embedded within them (e.g., smartphones and social media).

Finally, delving into who people are within the social structures they occupy may shed light on the attributes of those who develop IT identities, anti-IT identities, and ambivalent IT-identities. For example, investigating whether those who have grown up with IT are less likely to experience conflicted self-identification, or whether those who are older are more likely to express negative self-identification could have managerial implications. Similarly, it would be interesting to discover to what extent, if at all, positive, negative, and conflicted self-identification are tied to the communities in which people live, their work, education, and/or political views. To promote patterns of engagement with IT that respond to the needs of individuals, organizations and society, it is important for future work to tease out the underlying dynamics of these relationships.

Conclusion

IT identity, anti-IT identity, and ambivalent IT identity are important concepts that need to be explored further, because they are important mediators between the social worlds in which people are embedded and individuals' actions. To that end, this paper presents findings from an embedded mixed-design GT study that sought to uncover meanings associated with positive, negative, and conflicted self-identification with IT. Using qualitative and quantitative data, methods and techniques, in a single project, we developed a framework of the relationship between IT identity and anti-IT identity. Rather than these identities existing on a continuum from strong positive to strong negative self-identification, we found evidence that IT identity and anti-IT identity are orthogonal to one another. Moreover, we uncovered an ambivalent IT identity that results when individuals hold IT identities related to some IT and anti-IT identities related to others, simultaneously. Findings from this study present opportunities for future research and represent an important first step in explaining why, in what ways, when, and where, people engage with their increasingly digitalized social worlds.

References

The Ambivalent Potential of IT Identity


