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## Revisiting User Engagement: Concepts, Themes, and Opportunities

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# Revisiting User Engagement: Concepts, Themes, and Opportunities

Completed Research Paper

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## Abstract

*Given the proliferation of information technology (IT), the growing research interest across diverse disciplines in user engagement with IT is unsurprising. However, defining, designing for, and evaluating user engagement remain complex issues within the information systems community, prompting researchers to call for a systematic understanding of these areas. To bridge this gap, this review presents an analysis of the main themes of 59 empirical studies focusing on the conceptualization, operationalization, antecedents, consequences, and forms of user engagement. Based on the findings of this review, opportunities for future research that address study settings, emerging technologies, the factor structure and forms of user engagement, as well as user engagement frameworks, are presented. As technological advances continue to shape how users engage with IT, the concept of user engagement should be refined and elaborated on according to the research context.*

**Keywords:** User engagement, literature review, thematic analysis, qualitative approach

## Introduction

Given the increasing pervasiveness of information technology (IT) at work and in everyday life, academic and scholarly interest in the concept of user engagement with IT has continued to grow (Oh et al. 2018). In recent decades, researchers have commonly employed the concept of user engagement to explore how users adopt, use, and sustain involvement with IT. However, the complexity and operational inconsistencies of this concept must be overcome if we are to define what exactly what constitutes user engagement and its different facets, with the ultimate goal of operationalizing it in meaningful and useful ways (Cheung et al. 2015; Di Gangi and Wasko 2016; Oh et al. 2018).

In response to this call, the present study assesses the state of the literature on user engagement and identifies the major themes. Relevant articles from the Social Sciences Citation Index (SSCI) were reviewed, and sampling, methods, domains, and related research constructs were coded. Based on this categorization, we analyzed emergent themes and organized them in a systematic way, proceeding from a broad contextual theme incorporating the definition, characteristics, and dimensions of user engagement, to themes related to its antecedents and consequences. After highlighting two themes (i.e., technology and design setting) in this paper, we suggest seven areas as fruitful opportunities for future research. Some key works are noted within each section, but the main focus here is on how research is shaping what we know about user engagement with IT, both practically and theoretically. The results of the study indicate directions for future research.

## Search Strategy

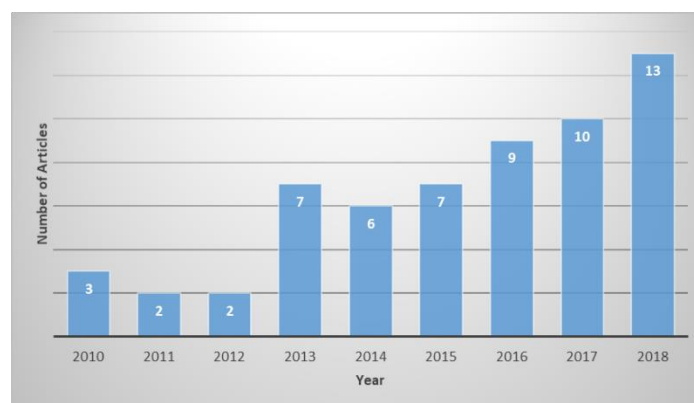
We began by identifying articles that addressed issues relating to user engagement with IT. Following the two-stage approach proposed by Boell and Cecez-Kecmanovic (2015), we used the Scopus database as our key source. To ensure the quality of the searched papers, we targeted peer-reviewed journal articles indexed in the SSCI. As Morschheuser et al. (2017) suggested, differences in search functions and algorithms mean that focusing on one database can help ensure that the search procedure is replicable, rigorous, and transparent. In searching for relevant articles, a broad range of keywords were used, including “user engagement,” “IT engagement,” “engagement with technology,” and “user engagement with IT.” The keywords returned 805 relevant articles published during the period 2010–2018; confining the subject areas to the social sciences, computer science, business and management reduced this to 408 articles. Because the goal was to understand knowledge advances in relation to the concept of user engagement, we targeted articles that clearly referred to the conceptualization and operationalization of user engagement. Based on this further refinement, 97 research articles were selected.

In the second stage, the chosen inclusion and exclusion criteria were applied to select relevant articles for the final analysis. The included studies (1) focused on user engagement and (2) addressed issues of definition and measurement. We excluded papers that examined user engagement with non-IT related objects (e.g., products or brands) and those that did not report empirical results. Based on these criteria, we identified 59 relevant research articles for further analysis.

## Bibliometric Analysis

The 59 relevant articles were coded using the procedures suggested by Webster and Watson (2002) and Boell and Cecez-Kecmanovic (2015). We gathered the following data: (1) bibliometric information (author[s] and publication year), (2) research method and approach, and (3) research domain.

We first examined the bibliometric data of the 59 papers. The number of papers included in the review indicates that research on user engagement has been growing, and this can be attributed to the proliferation of social media, mobile technologies, and interactive technologies. Figure 1 shows the number of articles published from 2010 to 2018. In terms of research domains, 21 papers (36%) related to user engagement in information systems, 13 centered on communication and media, 11 examined in marketing, seven papers related to computer science, three papers related to education; and four papers were categorized as “other.”



**Figure 1. Research on User Engagement**

Diverse methods have been used to study user engagement. Among them, surveys are the most popular research method (39%,  $n = 23$ ), followed by experiments (25%,  $n = 15$ ), content-coded data analysis (20%,  $n = 12$ ), and interviews (8%,  $n = 5$ ). Of the selected studies, 7% ( $n = 4$ ) employed a multimethod

approach. Figure 2 presents the research method(s) employed by the selected papers and the number of associated articles.

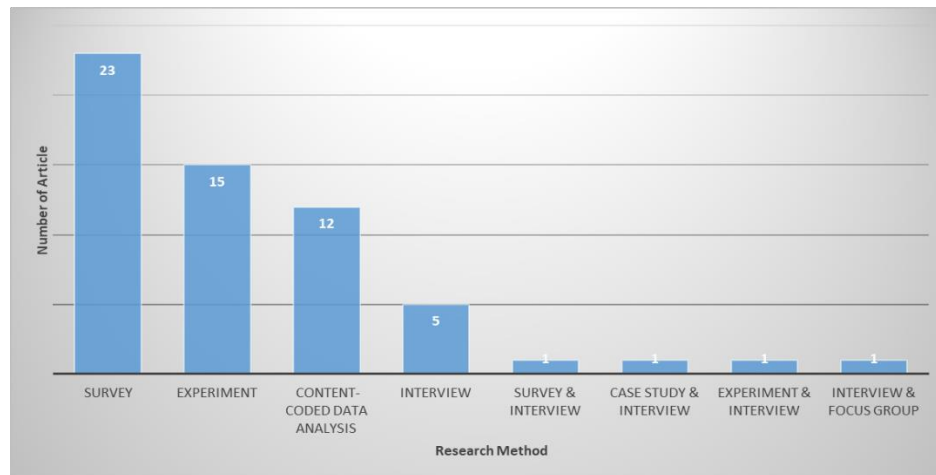


Figure 2. Research Method

## Thematic Analysis

### Theme 1—What is User Engagement?

Some researchers have noted that the term *user engagement* has been inconsistently applied, resulting in many different conceptual models that lack clear definition (O’Brien & Toms, 2008; Ray, Kim, & Morris, 2014, Cheung et al., 2015), and our review of the relevant literature confirmed this. As shown in Table 1, user engagement has been defined variously as (1) a mental state in which people are deeply involved in the use of IT, (2) the intrinsic motivation to interact with IT, (3) the behavioral experience in which a user physically interacts with the interface, (4) an affective state involving a feeling of attachment to IT, (5) a process of involving users in ways that promote behavioral change, and (6) the overall quality of users’ experiences of IT.

Table 1. Definitions of User Engagement

Category	Definition	Reference
A mental state	· To be engaged “is to be involved, occupied, and interested in something”	De Oliveira et al. (2016), Blazquez Cano et al. (2017), Kim et al. (2013)
	· “A holistic psychological state in which one is cognitively and emotionally energized to behave socially in positive ways that exemplify how group members prefer to think of themselves”	Ray et al. (2014), Smith and Taylor (2017), Suh et al. (2017)
	· “A positive and fulfilling state of mind involving vigor, dedication, and absorption”	Cheung et al. (2015), Suh et al. (2018a)
	· “A cognitive and affective commitment to an active relationship with the technology in question”	Fan et al. (2017)
	· “A user’s desire to be involved in the social media platform”	Di Gangi and Wasko (2016)
Motivation	· “A participant’s intrinsic motivation to interact and cooperate with community members and to contribute voluntarily to the online community or its members”	Jin et al. (2017), Vigil and Denis Wu (2015)
	· “The point of engagement corresponds to the beginning of an engaging experience; in this context, it relates to users’ motivation to read news”	Lehmann et al. (2017)
	· “User engagement is defined as Likes, comments, shares, and click-through related to messages”	Lee et al. (2018), Tsay et al. (2018)

Behavioral experiences or activities	· “Individual engaging activities (continuance use, referral/word-of-mouth) and socialization and active community participation (discussions, content sharing and problem solving); conceptually, continuance usage is a subset of behavioral engagement”	Fang et al. (2017)
	· “The degree to which individuals are engaged with various interactive SNS activities (i.e., posting, sharing, commenting, or responding) in relation to a specific topic”	Kim and Jung (2017), Yarchi et al. (2018)
	· “Behaviors or click-based interactions (participation), as well as simple content viewing and reading (consumption)”	Khan (2017)
An affective state	· “A positive affective state involving a feeling of attachment to the use of IT”	Li et al. (2016)
A process	· “A process of involving users in health content in ways that promote change in health behaviors”	Craig et al. (2010)
Quality of user experience	· “A quality of user experience characterized by the depth of an actor’s cognitive, temporal, and/or emotional investment in an interaction with a digital system” · “A quality of user experience describing a positive human-computer interaction” · “User satisfaction”	Li et al. (2016; O’Brien and Lebow (2013), O’Brien (2010), O’Brien (2017), O’Brien et al. (2018), O’Brien and Toms (2013)
Others	· “...a user-initiated action that leads to co-creation of value”	Khan (2017)
	· A “psychologically based willingness to invest in the undertaking of focal interactions with particular engagement objects”	Simon and Tossan (2018)

Based on our analysis, 39% (n = 23) of the reviewed papers conceptualized user engagement as a state of involvement and connectedness between the user and IT, viewing it as the motivational force that makes something happen.

About 32% (n = 19) of the reviewed papers conceptualized user engagement as user activities or behaviors. Research building upon this view equated user engagement with usage behaviors/activities and assumed that users exhibit behavioral manifestations of engagement with different intensities and valences when using IT. These studies defined user engagement as the extent of individual engagement with various interactive activities (e.g., posting, commenting, responding, liking, sharing, technology-based social interaction). Accordingly, researchers have examined user engagement in terms of click-based interactions (i.e., participation) as well as simple content viewing and reading (i.e., consumption). For example, Ksiazek et al. (2016) conceptualized user engagement as user–content and user–user interactivity, focusing on the production, consumption, and dissemination of information on YouTube. Park et al. (2016) measured user engagement in terms of mobile health app usage, and Srivastava et al. (2018) examined the number of likes, shares, and comments as a measure of user engagement with social media. To measure engagement in an online community, Thompson (2011) captured user actions such as managing exposure, force-feeding, and navigating multi-purpose spaces.

Finally, 12% (n = 7) of the reviewed papers conceptualized user engagement as both psychological and behavioral (Bhattacharjee et al. 2018; Blazquez Cano et al. 2017; Cheung et al. 2015; Kim et al. 2013; Oh et al. 2018; Pellas 2014; Sundar et al. 2014). For example, Bhattacharjee et al. (2018) defined user engagement as (1) a psychological state in which the user feels passionate and/or enthusiastic about IT use; and (2) usage beyond required use to discover new features. Arapakis et al. (2014) combined measures of affect (i.e., psychological) and eye movement (i.e., behavioral) to capture user engagement, while Blazquez Cano et al. (2017) proposed that the construct of user engagement should be understood as a combination of the user’s behavioral, cognitive, and affective responses when using computer-based tools. Oh et al. (2018) also argued that researchers should include both users’ physical interactions and psychological states to understand their engagement with IT. In their proposed model to explain user engagement with a mobile travel app, Fang et al. (2017) distinguished between psychological and behavioral engagement, whereas Sundar et al. (2014) measured user engagement in terms of the number of user actions and self-reported absorption. Cheung et al. (2015) distinguished conceptually between psychological and behavioral engagement and found that these two factors differ in terms of their effects on sales of online games.

**Theme 2—What Constitutes User Engagement?**

Given the breadth and complexity of users’ engagement with IT, many researchers believe that a multidimensional account can best capture the construct’s meaning. In other words, engagement is a context-dependent, psychological state characterized by varied intensity levels comprising cognitive, emotional, and/or behavioral dimensions (De Oliveira et al. 2016). Our review reiterated that no consensus has been reached in understanding what constitutes user engagement; some researchers have called for further research for the construct’s composition and how to assess it (Cheung et al. 2015; O’Brien and Toms 2010; O’Brien and Toms 2013; Suh et al. 2017).

Among the different perspectives on what constitutes user engagement, 15% (n = 9) of the papers adopted O’Brien’s (2010) subdimensions of user engagement, which included perceived usability, aesthetics, focused attention, novelty, felt involvement, and endurability. About 7% (n = 4) of the reviewed papers employed cognitive adoption theory and its subdimensions, including focused attention, loss of awareness, time distortion, and heightened enjoyment, to capture user engagement. Some researchers (Cheung et al. 2015; Fang et al. 2018; Suh et al. 2018a) used the three dimensions of vigor, dedication, and absorption to measure psychological engagement. Di Gangi and Wasko (2016) proposed the two dimensions of involvement and personal meaning, while Pallas (2014) suggested three: emotions, usage, and cognitive effort. On the other hand, Pagani and Mirabello (2011) referred to two elements: personal engagement (i.e., enjoyment, simulation, temporal, utilitarian) and social interactive engagement (i.e., intrinsic, socializing, community). Table 2 summarizes the divergent approaches to the composition of user engagement.

**Table 2. Composition of User Engagement (Psychological)**

Composition 1	Composition 2	Composition 3	Composition 4	Composition 5	Composition 6
<ul style="list-style-type: none"> <li>· Usability</li> <li>· Aesthetics</li> <li>· Focused attention</li> <li>· Novelty</li> <li>· Felt Involvement</li> <li>· Endurability</li> </ul>	<ul style="list-style-type: none"> <li>· Focused attention</li> <li>· Loss of awareness</li> <li>· Time distortion</li> <li>· Heightened enjoyment</li> </ul>	<ul style="list-style-type: none"> <li>· Vigor</li> <li>· Dedication</li> <li>· Absorption</li> </ul>	<ul style="list-style-type: none"> <li>· Physical interaction</li> <li>· Interface assessment</li> <li>· Absorption</li> <li>· Digital outreach</li> </ul>	<ul style="list-style-type: none"> <li>· Involvement</li> <li>· Personal meaning</li> </ul>	<ul style="list-style-type: none"> <li>· Emotional engagement (interest, achievement orientation, anxiety, frustration)</li> <li>· Cognitive engagement (surface strategy, deep strategy, reliance)</li> </ul>
Arapakis et al. (2014), Blazquez Cano et al. (2017), O'Brien and Cairns (2015), O'Brien (2010), O'Brien (2017), O'Brien et al. (2018), O'Brien and Lebow (2013), O'Brien and Toms (2013), Wiebe et al. (2014)	Barker et al. (2015), Craig et al. (2010); Suh et al. (2017), Sundar et al. (2016)	Cheung et al. (2015), Fang et al. (2017), Suh et al. (2018a)	Oh et al. (2018), Sundar et al. (2014)	Di Gangi and Wasko (2016), Suh et al. (2017)	Pellas (2014)

Note: Blazquez Cano used four of the five dimensions (excluding aesthetics).

In contrast to the approaches that emphasize psychological engagement, others have conceptualized user engagement in terms of behavioral patterns, looking beyond technological features to users’ interactivity (e.g., liking, commenting, sharing), as well as passive content consumption (e.g., reading and viewing). As shown in Table 3, our review revealed that the composition of behavioral engagement varies according to the research context. Some research focused on usage behavior, including frequency of interaction (Khan, 2017; Lee et al. 2018; Kim and Jung, 2017; Arapakis et al. 2014; Kim et al. 2013), whereas Lehmann et al. (2017) calculated the average number of page views and user dwell time per provider session to describe users’ reading behaviors during the period of engagement. Other studies included dwell time, usage duration, and recentness (Cheung et al., 2015; Lee and Shin 2016; Sundar et al. 2014; Sulaiman et al. 2018).

**Table 3. Composition of User Engagement (Behavioral)**

Type of measure	Dimension	References
Objective	-Click-based interactions (liking, disliking, commenting, sharing, uploading videos) -Content viewing and reading (viewing videos, reading comments)	Khan (2017) Lee et al. (2018)
Objective	Posting, sharing, commenting, or responding	Kim and Jung (2017)
Objective	-Producing information -Consuming information -Disseminating information	Arapakis et al. (2014)
Objective	-User-content interactivity -User-user interactivity	Kim et al. (2013)
Subjective	-Usage duration -Frequency -Recentness	Cheung et al. (2015) Lee and Shin (2016)
Objective	-Average number of page views - User dwell time per provider session	Lee and Shin (2016)
Subjective	-Duration of use -Length of use -Number of friends	Sulaiman et al. (2018)
Objective	User action: frequency of mouse-based input when interacting with hotspots (to open hidden content)	Sundar et al. (2014)
Subjective	-Attentiveness -Diligence -Time spent	Pellas (2014)

### ***Theme 3—The Antecedents of User Engagement***

Our review showed that the antecedents of user engagement have been broadly examined in terms of technology, social, content, and individual characteristics. The characteristics of technology relate mainly to design features that facilitate interactivity (Blazquez Cano et al. 2017; Fang et al. 2017), controlling privacy (Di Gangi and Wasko 2016; Fang et al. 2018), and ease of use (Fang et al. 2017). While these studies considered specific technical features as drivers of user engagement, O'Brien (2010) noted the influence of media type (e.g., video, audio, narrative text, transcript text). The social characteristics addressed in the reviewed studies related to user-to-user interaction (Cheung et al. 2015; De Oliveira et al. 2016; O'Brien 2017; Sundar et al. 2016), perceived contingency (Sundar et al. 2016), social accessibility (Di Gangi and Wasko 2016), social acculturation (Sulaiman et al. 2018), social capital affinity (Barker et al. 2015), social enhancement (De Oliveira et al. 2016), social identity (De Oliveira et al. 2016; Jin et al. 2017), and social ties (Fang et al. 2018; Jin et al. 2017; Li et al. 2013). The content characteristics included sentiment (Arapakis et al. 2014), interest (Arapakis et al. 2014), novelty (Arapakis et al. 2014), information vividness (Fang et al. 2018), customization (Cheung et al. 2015; Di Gangi and Wasko 2016), and prior comment length (Fang et al. 2018). Individual characteristics comprised self-efficacy (Pellas 2014; Ray et al. 2014), self-esteem (Pellas 2014), self-identity verification (Ray et al. 2014), personal traits (Sulaiman et al. 2018), self-regulation (Pellas 2014), self-discovery (De Oliveira et al. 2016), and subjective norms (De Oliveira et al. 2016). In addition, overall user perceptions of technology related to satisfaction (Cheung et al. 2015; Ray et al. 2014; Simon and Tossan 2018), relative advantage (Fang et al. 2017), and perceived value (De Oliveira et al. 2016) as antecedents of user engagement.

#### ***Theme 4—The Consequences of User Engagement***

Our literature analysis identified four categories addressing the consequences of user engagement: (1) extended technology use, (2) social interaction, (3) task efficiency, and (4) overall IT appraisal. First, our review showed that engaged users are motivated to actively explore the technical functions of the given IT, which may influence active usage (Pagani and Mirabello 2011), continued intention to use (Suh et al. 2017; Sundar et al. 2014), and technology dependence (Fan et al. 2017). Second, we found that engaged users seek to harness their full energies for interpersonal purposes, including enhanced collaboration (Dodgson et al. 2013), knowledge contribution (Ray et al. 2014), and social acceptance (Sulaiman et al. 2018). Third, our analysis revealed that engaged users are more effective in pursuing instrumental goals. Task-related consequences examined in previous studies included learning performance (Barker et al. 2015; O'Brien 2017; Oh et al. 2018; Tsay et al. 2018), knowledge retention (O'Brien 2017), task performance (Bhattacharjee et al. 2018), and personal development (Bhattacharjee et al. 2018). Finally, researchers have found that engaged users are more likely to form positive attitudes toward IT (Oh et al. 2018; Sundar et al. 2016), experience positive emotion (Bhattacharjee et al. 2018), and have greater satisfaction (Barker et al. 2015; Fan et al. 2017) than less engaged users.

#### ***Theme 5—The Forms of Engagement***

This review showed that researchers have examined different forms of user engagement. Some researchers focused on the depth of engagement characterized by absorbing, stimulating, and attention-grabbing behaviors (Barker et al. 2015; Blazquez Cano et al. 2017; Di Gangi and Wasko 2016; Fang et al. 2017; Sundar et al. 2014), which is based on the assumption that engaged users generally focus on performing tasks to accomplish their desired outcomes, leading to immersed concentration in their immediate context (Agarwal and Karahanna 2000). These studies sought to capture users' hedonic involvement with IT (O'Brien and Cairns 2015; O'Brien and Lebow 2013). Other researchers focused on the instrumentality of engagement characterized by the efficiency, convenience, usefulness, and functionality of the technology (Kim 2016). Instrumentally engaged users who want to gain task-related benefits from the use of IT focus on how they can perform their tasks at hand using the technology. Credibility, usability, and convenience were suggested as core elements of user engagement (Craig et al. 2010; O'Brien and Lebow 2013; O'Brien and Toms 2010; O'Brien and Toms 2013)

Although most the studies in this review examined user engagement from hedonic and instrumental perspectives, some researchers attempted to distinguish the state of involvement from personal meaning derived from the involvement (Di Gangi and Wasko 2016). Researchers have argued that user engagement should reflect the psychological state in which the user feels that they are engaged in doing something meaningful (Fan et al. 2017; Nyberg 2018; Ray et al. 2014). Suh et al. (2017) claimed that meaningful engagement should be considered as one unique aspect when examining user engagement with IT. They also argued that, whereas hedonic engagement leads to immersion only in the moment, meaningful engagement expands beyond the current moment and influences future behavior, leading to a state of reflection.

#### ***Theme 6—Technology***

This review revealed that different technologies play different roles in forming user engagement. Of the selected paper, 29 % (n = 17) examined user engagement with social media (e.g., Facebook, Twitter, Reddit), 12% (n = 7) of the papers used virtual worlds (e.g., video games and the Second Life) as their research context, and 10% (n = 6) of the papers examined mobile apps (e.g., healthcare, travel, shopping). Apart from these technologies, online communities (Ray et al. 2014; Suh et al. 2018a), news websites (O'Brien and Cairns 2015), shopping websites (O'Brien and Toms 2010), image interactivity technologies (Blazquez Cano et al. 2017), and patient order entry system (Bhattacharjee et al. 2018) were examined. As with social media, we found that researchers focused on how actively individuals were involved in posting, liking, sharing, commenting, and viewing activities (De Oliveira et al. 2016; Gerlitz and Helmond 2013; Lee et al. 2018; Li et al. 2013). Researchers who examined virtual worlds focused on the user's perceived playfulness, duration, frequency, and recentness of game participation (Dodgson et al. 2013; Jin et al. 2017; Wiebe et al. 2014; Zheng et al. 2015). Research on mobile apps



examined how app design features (e.g., interface, privacy, portability) and app performance (e.g., ease of use, compatibility, relative advantage) influence a user's psychological engagement (Fang et al. 2017).

It is noteworthy that researchers currently tend to regard physical interaction with technological artifacts as an important facet of user engagement. Particularly, it has been highlighted that physical interactivity with IT enables users to not only process information but also to control the flow and content of incoming information, which leads to enhanced engagement (Oh et al. 2018; Sundar et al. 2014). That is, users first interact with the IT interface (i.e., behavioral engagement) before appraising the content or technology (i.e., psychological engagement). Accordingly, users' behavioral engagement through actions, including scrolling, swiping, and/or zooming in/out objects, influences their preliminary appraisal of the quality of the interface, which in turn shapes their mental state, reflecting their absorption in the content delivered by the interface (Oh et al. 2018). In this sense, some researchers consider physical interaction (i.e., behavioral engagement) as an antecedent of psychological engagement (Li et al. 2016; Oh et al. 2018; Sundar et al. 2014).

### ***Theme 7—Research Design***

Several key points emerge in our review. First, we found that user engagement with IT is now being examined in diverse disciplines, such as information systems, media and communication, education, marketing, and computer science. Second, despite the variety of disciplines, the majority of studies employed quantitative research approaches, including surveys, experiments, and content-coded data analysis. Only 15% (n=9) of the selected papers employed qualitative research methods, among which five papers used the interview method and four papers combined interview or case study methods with quantitative methods. Third, most studies examined user engagement in a cross-sectional research setting, whereas three papers studied user engagement qualitatively in order to explore various constructs over time (Bhattacharjee et al. 2018; Park et al. 2016; Tsay et al. 2018).

While the majority of the empirical research used student samples for data collection, we observed more diverse sample characteristics. For example, researchers used mixed samples with respondents from different age groups (e.g., between 18 and 64 years old [O'Brien and Toms 2013], between 18 and 47 [Arapakis et al. 2014], between 18 and 45 [Sundar et al. 2016], and between 19 and 59 [Kim and Jung 2017]). However, their results raise questions regarding the use of student samples as these may inhibit the generalization of the research findings. In response, we outline in Research Opportunity 7 in the next section how research can benefit by diversifying sample characteristics.

## **Opportunities for Future Research**

Our literature review supports the claim made by O'Brien et al. (2018) that “user engagement is an abstract construct that manifests differently within different technological contexts, and this has made it challenging to define, design for, and evaluate” (p.1). In this section, we link the opportunities to unresolved conceptual and methodological issues as well as to insights discussed within the user engagement literature.

### ***Opportunity 1—Process vs. Product***

Although some the researchers in our review conceptualized engagement as a psychological experience, others attempted to broaden its conceptualization by including the physical dimension. It is noteworthy that some researchers viewed physical interaction with IT as a facet of user engagement in the initial stage (i.e., engagement as process), whereas others regarded it as an outcome of psychological engagement (i.e., engagement as product). Although most studies regarded behavioral engagement as an outcome of psychological experience, our literature review indicated that users' actions—clicking, commenting, viewing, zooming in/out, and exploring interactive features—may themselves define psychological engagement. Accordingly, researchers could benefit from examining the interplay between the psychological and behavioral dimensions of user engagement in distinct stages (e.g., the initial stage of IT use, during sustained use of IT, and during reengagement with IT).

### ***Opportunity 2—The Composition of User Engagement***

As shown in Table 2, there is little consensus on the composition of user engagement. Although its proposed composition of the six subdimensions (i.e., focused attention, perceived usability, novelty, aesthetics, felt involvement, endurability) put forth by O'Brien and Toms, (2010) has been widely used, recent research has questioned its effectiveness across different technological contexts (O'Brien et al. 2018). Despite the acknowledgement that engagement is multifaceted, the question of what comprises the nature of engaging IT remains a persistent challenge. Accordingly, we see opportunities to uncover precisely what aspects of users' interactions with IT are indicative of user engagement.

### ***Opportunity 3—The Factor Structure of User Engagement***

Our literature analysis revealed that researchers implicitly agree that user engagement is a multifaceted concept that captures an IT user's (1) physical interaction with the interface, (2) their cognitive absorption in IT use, and (3) the outcomes of this involvement. However, some researchers have called for attempts to advance our knowledge regarding the relationship between these different facets by modelling a factor structure outlining the elements that form user engagement. O'Brien and Toms (2010) tested the relationships between the six engagement factors (i.e., aesthetics, novelty, felt involvement, focused attention, usability, and endurability). The results showed that aesthetics and novelty predicted other factors (i.e., felt involvement and focused attention) in the model, while endurability was found to be an outcome variable of the model. Oh et al. (2018) also tested the relationships between the engagement factors and found that physical interaction with, and the overall assessment of, the interface predicted cognitive absorption, which in turn influenced behavioral engagement intention. This structure does not remain stable across research settings, however (O'Brien and Toms 2013). The relationships between the factors can further be shaped by the needs of the user (e.g., pragmatic or hedonic goals). We see opportunities to test the structure of user engagement by considering user motivations involving IT.

### ***Opportunity 4—The Forms of User Engagement***

We found that most studies characterized user engagement from both the pragmatic (i.e., usability) and hedonic (i.e., fun, absorption, attention-grabbing) aspects of user experience. One emerging trend is that researchers frequently focus on personal meaning as a facet of engagement (as we discussed in section *Theme 5*). Meaningful engagement refers to the extent to which individuals find the activities they are involved in to be worthwhile, important, and in accordance with their values and sense of self (and hence meaningful) (Bundick 2011). Liu et al. (2017) conceptualized meaningful engagement to emphasize the dual outcomes of gamified systems (i.e., experiential and instrumental outcomes). Although Liu et al. (2017) highlighted the experiential value of IT systems, including meaningfulness, self-fulfillment, and satisfaction, they did not operationalize the concept of meaningful engagement itself. Accordingly, we see opportunities to conceptualize meaningful engagement and to empirically test the role of personal meaning in characterizing user engagement.

### ***Opportunity 5—A Framework for User Engagement***

Although previous studies have examined the antecedents and consequences of user engagement, our review revealed that no comprehensive framework has been developed to explore the relationships between these factors, including the technological, social, content, and individual characteristics related to user engagement and its consequences. We propose a comprehensive framework that accounts for the interplay between the key elements associated with user engagement, as shown in Figure 3. Researchers may benefit from considering this list of factors when developing a model to explain a user's engagement with IT.

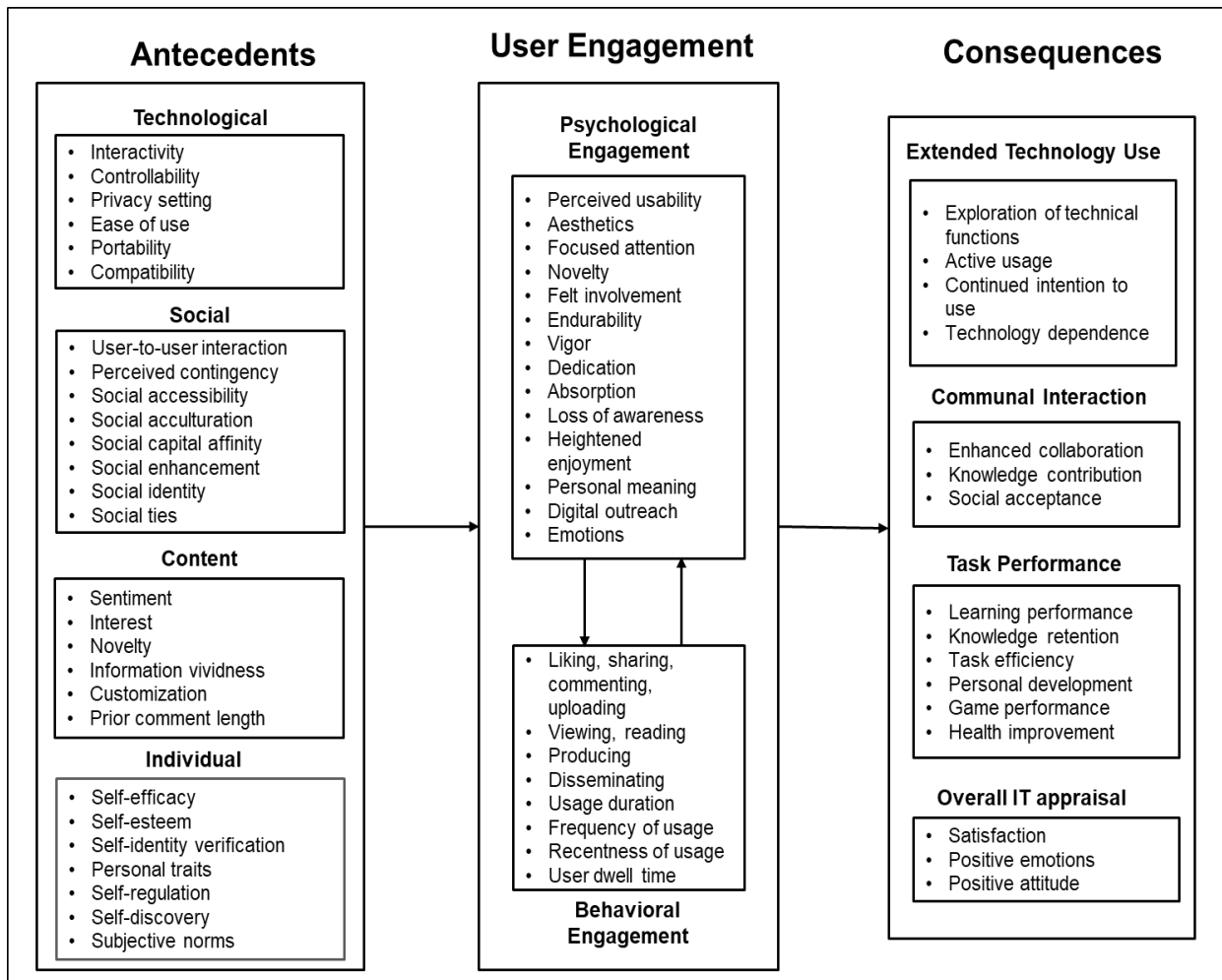


Figure 3. A Framework for User Engagement

### Opportunity 6—Emerging Technologies

The use of IT is an underlying assumption of user engagement research. Our literature analysis revealed that over the past decade a wide range of IT has been examined, including social media, mobile apps, games, online news, enterprise systems, and shopping websites. While this extensive list is pertinent to an understanding of user engagement, newer forms of IT, including virtual reality (VR) and augmented reality, have received relatively little consideration. For example, the 3D virtual environment (3DVE), which is one type of VR, is increasingly pervasive at work (Gilson et al. 2015). However, some researchers have reported that newer IT forms often fail to engage users due to technical problems and the need for an adaptation for them to be useful (Suh et al. 2018b). Such newer technologies have features that are distinct from other types of IT in a way that immerses users, which transcends much of what we know about user engagement (Suh and Prophet 2018). Accordingly, several opportunities exist for future studies to examine these emerging technologies.

### Opportunity 7—Methodological Considerations

Our review indicated that, although great strides have been made in prior research regarding the conceptualization, operationalization, and validation of the concept of user engagement, most studies adopted a cross-sectional research design with a single research method (either quantitative or qualitative). To move forward, researchers may benefit from incorporating longitudinal research designs. Longitudinal research enables researchers to overcome the limitations that reside in cross-sectional designs, such as issues regarding common method variance and causality. We also suggest that researchers adopt a multi-methods approach that combines qualitative and quantitative methods so that they can address the complex nature of user engagement more precisely.

A promising trend within the empirical studies included in this review was the increased application of content analysis using content-coded data or app usage data. For example, Ksiazek et al. (2016) collected a sample of YouTube news videos over a three-month period. The resulting dataset enabled the authors to measure users' behavioral engagements, including their liking, sharing, and commenting behaviors. Similarly, Lee et al. (2018) coded the content of 106,316 Facebook messages across 782 companies; using this data set, they examined the associations between various kinds of social media marketing content and user engagement. The content code method provides a richer understanding of a user's behavioral engagement and physical interaction with interactive technologies. We call on researchers to continue leveraging this technique to further our understanding of user engagement.

Some researchers have used physiological metrics, such as heart rate (O'Brien and Lebow 2013), eye gaze (Arapakis et al. 2014), and mouse clicks (Oh et al. 2018; Sundar et al. 2014), to correlate engagement and observe users' biological and physical interactions. We see opportunities to use these metrics to examine what is taking place during users' interactions with IT. Although they do not address users' cognitive or emotional states, physiological measures can complement self-report efforts.

Finally, we found that 56% (n=33) of the selected papers have used student samples for data collection. Limiting samples to students may inhibit the generalizability of the research findings. Future research should therefore incorporate more diverse samples to overcome this issue.

## **Implications**

### ***Theoretical Implications***

This study makes several important contributions to the literature on user engagement. First, our work helps researchers revisit the concept of user engagement by identifying conceptual and methodological issues. Our literature review presents the state of research in terms of concepts, themes, contexts, and research designs, which will enable researchers to design timely and relevant research to advance knowledge regarding user engagement with IT. Second, by consolidating the antecedents and consequences of user engagement, we have proposed a comprehensive framework. We believe that this comprehensive framework will help researchers develop, revise, and test models that account for user engagement. Finally, based on the findings of our literature analysis, we offer several opportunities further research. Our suggestions may benefit researchers who are seeking to understand how to enhance the quality of users' experiences of IT.

### ***Practical Implications***

The present study provides practical implications for IT designers who want to design more engaging IT. Our literature review revealed the interplay between technological, content, social, individual characteristics in relation to user engagement and performance outcomes. The measures and dimensions of psychological and behavioral engagement identified in this study provide predictive and descriptive guidelines for understanding the user experience. We hope our study will offer practitioners a tool to help empirically assess user engagement when they design and develop engaging IT.

## **Limitations**

This study has several limitations that should be considered when applying its findings. Although we have tried to ensure the comprehensiveness in searching for the relevant papers for the literature analysis, some papers might have been missed in our review. Furthermore, while user engagement is a context specific concept, the current analysis did not consider the variability in specific IT contexts because our main purpose is to identify general themes across research settings.

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