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IT engagement as a blessing and a curse? Examining its antecedents and outcomes in organizations

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ABSTRACT

Information technology (IT) engagement is defined as a need to spend more time using IT. Practice-based examples show that IT engagement can have adverse effects in organizations. Although users can potentially get more work done through IT engagement, observations show that the users might jeopardize their well-being and hamper their work performance. We aimed to investigate this complexity in the research on IT engagement by examining its potential antecedents and outcomes in organizations. Considering the potentially mixed outcomes, we developed a model to examine the effects of IT engagement on personal productivity and strain. We also aimed to explain the antecedents of IT engagement by drawing on the collective expectations for IT use. In particular, we examined the extent to which normative pressure on IT use drives users' information load and IT engagement. Finally, we sought to understand whether users' attempts to avert dependency on IT use reduced their IT engagement. Several hypotheses were developed and tested with survey data of 1091 organizational IT users. The findings help explain the role of normative pressure as a key driver of IT engagement and validate the positive and negative outcomes of IT engagement in organizations.

1. Introduction

The use of information technology (IT) is a necessity in many organizations. IT devices, such as laptops and smartphones, provide access to a range of applications, which enable employees to handle many of their work tasks and communicate with their peers inside and outside the organization. Owing to the tremendous advantages of IT, users perceive a strong need to increasingly use IT. Indeed, employees feel the need to spend considerable amounts of time monitoring their devices for new and continuously updated work-related information from various sources (Carter & Grover, 2015; Montag & Walla, 2016; Tams, Thatcher, & Grover, 2018). They use IT in a multifaceted way, such as by monitoring their email throughout the day; contributing to real-time, dynamic documents and collective content spaces; and staying connected to work-related social media channels, such as Twitter, Yammer, or Slack (Mazmanian, Orlikowski, & Yates, 2013; Sheikh, Baptista, & Porto de Albuquerque, 2019; Sumecki, Chipulu, & Ojiako, 2011; Teo, Lim, & Oei, 2017). Researchers have referred to an individual's need to spend more time using IT as *IT engagement* (Charlton & Danforth, 2010).

IT engagement has become a prevalent phenomenon in organizations. Although research on organizational IT engagement is limited, studies have suggested that the outcomes of IT engagement can be favorable and unfavorable for users (e.g., Mazmanian et al., 2013; Katidioti, Borst, Van Vugt, & Taatgen, 2016). Favorable outcomes are those that enable employees to strengthen their performance and get more work done (Mazmanian et al., 2013). In this regard, IT engagement can be a major business factor for organizations. However, being intensively connected via IT can result in negative outcomes, making it unfavorable. For example, Katidioti et al. (2016) showed that individuals' concentration levels decreased as they continuously browsed and switched between work-related applications, which, in turn, hampered their task performance. Studies have also found that users who are increasingly engaged with IT can suffer from strain (Mazmanian et al., 2013; Montag & Walla, 2016; Tarafdar, Cooper, & Stich, 2019), which is defined as a negative psychological response to situations that exceed an individual's resources (Moore, 2000). Scholars have established that, in addition to decreasing well-being, strain can hinder the completion of work activities (Buckner, Castille, & Sheets, 2012; Tarafdar et al., 2019; Wajcman & Rose, 2011).

Considering these potentially controversial outcomes and the notion that our understanding of IT engagement is mainly derived from

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practice-based observations in organizations, we argue that IT engagement remains a less understood perspective of organizational IT use. We aim to understand IT engagement in organizations through three interlinked research objectives that can potentially unfold 1) its outcomes, 2) its antecedents, and 3) how users can adjust their usage routines to avoid being overly engaged with their work-related IT. The first objective seeks to validate the current theoretical understanding of IT engagement by empirically examining its two potential outcomes: strain and IT-enabled productivity.

The second objective is to understand what drives IT engagement in organizations. Although information regarding such factors is absent from the literature, studies on organizational IT use have highlighted the critical role of shared norms (i.e., collective expectations of IT use) in individuals' IT use (Bhattacherjee, 2000; Nysveen & Pedersen, 2005; Venkatesh, 2000). This stream of research suggests that employees' need to engage in intensive IT use may be attributable to normative pressure (Mazmanian et al., 2013; Montag & Walla, 2016). Normative pressure is defined as influence from other people that leads an individual to conform to a certain behavior in order to be liked or accepted (Fishbein & Ajzen, 1975). We believe this is a theoretically critical viewpoint on IT engagement because the organizational IT use environment is highly competitive, and IT users compare their behaviors (e.g., IT use practices) to the behaviors of their colleagues (Mazmanian et al., 2013; Montag & Walla, 2016). Thus, we draw from the concept of normative pressure on IT use and aim to examine how collective expectations drive IT engagement.

Prior research has suggested that, owing to such normative pressure, users experience increasing demands to absorb and process new information, which is transmitted via IT (Andreassen et al., 2013; Mazmanian et al., 2013). Such an information load is defined as an individual's evaluation of the effort required to process the disordered information received through IT (Jones, Ravid, & Rafaeli, 2004). Organizational IT users think that they are expected to be continuously connected to IT and seek new information for use in performing their work (Mazmanian et al., 2013; Porter & Kakabadse, 2006). Our study suggests that organizational IT users experience increased IT engagement due to the effects of normative pressure on IT use and information load. The identification of these two key antecedents has practical value because it helps organizations analyze why their employees engage with IT in an intensive way and understand the related implications of such use.

The third objective is to examine what IT users can do to avoid being overly engaged with work-related IT. Practical insights show that users can be highly dependent on IT due to normative pressures (e.g., Mazmanian et al., 2013). By dependence, we refer to a user's reliance on IT to accomplish work. Organizational IT users are often aware of the potential negative outcomes of spending increasing amounts of time using IT for work (Mazmanian et al., 2013; Montag & Walla, 2016). Initial findings in non-work settings show that users attempt to avoid being overly dependent on IT because they experience strain from its use (Salo, Pirkkalainen, & Koskelainen, 2019). Furthermore, in non-work settings, users can attempt to reduce occasions of IT use to avoid its negative consequences (Osatuyi & Turel, 2020; Salo, Pirkkalainen, Chua, & Koskelainen, 2017). Such attempts have not, however, been addressed in organizational settings. This presents an important opportunity for research because the concept of IT engagement posits that individuals are absorbed in using IT for work. Thus, it is likely that they are dependent on IT to handle many of their work tasks. However, from a theoretical point of view, it remains unclear whether users' IT engagement is reduced when they intentionally strive to avoid being overly dependent on IT. This mitigation aspect of IT engagement has practical value because attempts to avoid excessive reliance on IT can make a tremendous difference in fostering its healthy and productive use at work. In sum, we build on prior studies' insights about users' attempts to avoid being overly dependent on IT and to reduce their IT use (Osatuyi & Turel, 2020; Salo et al., 2017, 2019) and examine users' attempts to avert IT use dependency. Here, we define averting IT use dependency as an employee's attempts to avoid becoming too occupied with using IT at work.

The present study reports on the results of a cross-sectional survey of 1091 organizational IT users. The analysis was conducted using structural equation modeling (SEM). This study makes three key contributions to research: 1) providing a holistic perspective on IT engagement in organizations, 2) validating the controversial negative and positive outcomes of IT engagement, and 3) shedding light on collective expectations as key drivers of IT engagement. Together, these perspectives show that IT engagement is not solely a matter of personal or non-work situations. IT users do perceive IT engagement in organizations, and it has implications for their well-being and work performance.

The present study is divided into the following sections. Section 2 describes the related research on IT engagement, normative IT use pressure, and how individuals deal with high information load in organizations. Section 3 describes the research hypotheses, and Section 4 describes how the research was conducted. Section 5 presents the key contributions, research limitations and steps for future research. Finally, Section 6 provides the conclusion of the study.

2. Theoretical background

2.1. IT engagement and its outcomes in organizations

IT engagement refers to IT users' strong need to use IT. They feel drawn to IT and enjoy its use (Charlton & Danforth, 2010; Kuss & Griffiths, 2012). Practically, this means that users spend more time with IT and pay substantial attention to its use. IT engagement has generally been associated with personal and non-work uses of IT, such as social networking and online gaming (Charlton & Danforth, 2010; Kuss & Griffiths, 2012). It has been seen as a favorable aspect of IT use because IT engagement exposes users to new information and other people (Charlton & Danforth, 2010; Sharafi, Hedman, & Montgomery, 2006). It also helps individuals develop various skills, such as mastering the mechanics of online games (Cowley, Charles, Black, & Hickey, 2008) or solving daily problems (Sharafi et al., 2006). Meanwhile, IT engagement can also be unfavorable because drawing boundaries on the use of IT can be difficult when users feel drawn to it (Weinstein & Lejoyeux, 2010). The use of IT can even escalate to the point that users are unable to reduce the amount of time they spend using IT, hampering their well-being and interpersonal relationships (Beard & Wolf, 2001; Bian & Leung, 2015).

The concept of IT engagement emerged from research that attempted to distinguish the desire to use IT from the pathological use of IT. The latter refers to IT addiction, which can be defined as a maladaptive dependency on IT that manifests in obsessive-compulsive patterns of IT use with symptoms (such as withdrawal and relapse) (Robinson & Berridge, 2001; Turel, Serenko, & Bontis, 2011; Xu, Turel, & Yuan, 2012). IT addiction is a pathological behavioral addiction; thus, it can potentially be diagnosed. The symptoms and outcomes of IT addiction are typically negative in terms of individual well-being (Turel et al., 2011) and work performance (Cao & Yu, 2019). In the early research of IT engagement, desires, such as wanting to spend an increased amount of time chatting with others online were, at times, labeled as IT addiction (Griffiths et al., 2016). Researchers attempted to distinguish IT engagement from IT addiction by showing how IT engagement manifests as the need to spend more time using IT (Charlton, 2002). Furthermore, IT addiction has several severe key symptoms, such as anxiety when not using IT, which could be used to diagnose it (Charlton & Danforth, 2010; Griffiths et al., 2016). Through these research activities, the measures of IT engagement were distinguished from those of IT addiction by relating the former to the user's excitement about the use of IT instead of a pathological addiction.

Regarding the conceptual distinction between IT engagement and IT

Table 1
Comparison of IT engagement and IT addiction.

Key factors	IT engagement	IT addiction
Positive reinforcement Using IT for positive mood enhancement (Robinson & Berridge, 2001)	*"Liking"* engagement, which is understood as the need to increasingly use IT, and perceiving positive emotions from its use (Robinson & Berridge, 2003)	*"Wanting"* engagement due to an attention bias that manifests as an urge to perceive positive emotions from IT use (Robinson & Berridge, 2001; Chen et al., 2017), leading to withdrawal (Elhai et al., 2017) when it is not used
Negative reinforcement Averting negative emotion by using IT (Robinson & Berridge, 2001)	Not applicable (Elhai et al., 2017)	Essential to the development of IT addiction (Elhai et al., 2017)
Psychopathology The role of a mental disorder (Charlton & Danforth, 2010)	Not applicable (Charlton & Danforth, 2010)	An underlying pathology (e.g., depression) is essential to the development of IT addiction (Charlton & Danforth, 2010)
Reassurance seeking Using IT for relief and comfort due to an inability to handle uncertainty (Elhai et al., 2017)	Not applicable (Billieux, Maurage, Lopez-Fernandez, Kuss, & Griffiths, 2015)	Essential to IT addiction (Billieux et al., 2015)
Impulsivity Lack of self-control and regulation in using IT (Billieux et al., 2015)	IT engagement entails that self-control may not always be maintained (Billieux et al., 2015; Charlton & Danforth, 2010)	Lack of self-control due to attention deficits (Billieux et al., 2015)
Symptoms Manifestations of the behavior (Charlton & Danforth, 2010)	Euphoria (excitement from using IT) and tolerance (increasing need to use IT) (Charlton & Danforth, 2010)	Withdrawal (anxiety when not using IT), salience (thinking about IT when not using IT), conflict (IT use interferes with other activities), and relapse and reinstatement (failing to get sleep due to IT use) (Charlton & Danforth, 2010)

addiction, researchers have suggested that IT engagement is not a mental disorder (Griffiths et al., 2016) and should not be presumed to be a sign of pathological addiction (See Table 1; e.g., Elhai, Dvorak, Levine, & Hall, 2017; Weinstein & Lejoyeux, 2010). The main difference comes from the lack of underlying pathology (e.g., depression) and withdrawal symptoms because the user engages in IT use for enjoyment and does not experience anxiety from not using it (Charlton & Danforth, 2007). IT addiction and its symptoms have been researched to a large extent in previous information systems and user behavior studies (for an overview, see Andreassen, 2015; Kuss, Griffiths, Karila, & Billieux, 2014).

Research has implied the relevance of IT engagement for organizations, and two views have enabled a better understanding of IT engagement in the organizational context. The first view concerns the extent to which the use of IT is effortless. Studies have found that users become absorbed in using IT when they consider the applications or devices relatively easy to use (Cenfetelli & Schwarz, 2011; Agarwal & Karahanna, 2000; Charlton & Danforth, 2007). Conversely, a user is unlikely to continue pursuing the use of IT for his/her work if he/she struggles with IT (Al-Jabri & Roztocki, 2015; Hsieh & Wang, 2007). The second view concerns IT as an enabling factor for work-related outcomes. Here, studies have found that the use of IT is intensified when individuals feel that IT is a helpful asset in their work tasks, and the intensification of use consequently enables them to get more work done (Mazzetti, Schaufeli, & Guglielmi, 2014; Porter & Kakabadse, 2006). Engagement is, therefore, essentially about the dedication to pursue the use of IT for work purposes (Schaufeli, Bakker, & Van Rhenen, 2009). Studies have also shown that users who perceive positive emotions from IT use are likely to adjust their work routines to ensure that IT can be effectively integrated into them (Beadry & Pisonneault, 2010). The aforementioned insights, therefore, posit that IT engagement in organizations is characterized by the perceived enjoyment of IT, which comes rather free of effort, such that the user is devoted to pursuing new ways of using IT for their work activities. These studies indicate that IT engagement is different in non-work and organizational contexts. In a non-work context, users seek pleasure from using IT in daily activities (e.g., Charlton & Danforth, 2010; Sharafi et al., 2006; Van Koningsbruggen, Hartmann, Eden, & Veling, 2017). This essentially represents a hedonic aspect of IT use. The organizational use of IT is different. Although individuals may derive pleasure from its use, IT gives them the means to handle their work activities (e.g., Mazzetti et al., 2014; Schaufeli et al., 2009). This perspective is closer to the utilitarian aspect of IT use.

Recently, observations have shown that the intensive use of IT for work can have adverse effects on the user. The intensification of the use of IT as a mechanism to increase productivity usually involves the perception of IT engagement as a positive factor. For example, studies have observed that IT engagement can increase overall satisfaction with IT (Trevino & Webster, 1992), willingness to collaborate in a virtual environment (Chandra, Srivastava, & Theng, 2012), and work effectiveness (Mazzetti et al., 2014; Porter & Kakabadse, 2006). These studies did not typically address the extent to which the use of IT could simultaneously have negative effects on the user or the organization. Observations from related studies showed that users can harm their well-being by being continuously connected to their work through IT. They can feel strained from browsing work emails before going to sleep and attending to work-related conversations through IT during family time (Ayyagari, Grover, & Purvis, 2011; Mazmanian et al., 2013; Montag & Walla, 2016). They can also feel strained from spending too much time on IT use (Tarafdar, Tu, & Ragu-Nathan, 2011). These findings, drawn from IT use-related studies, have not been examined for IT engagement in particular. Thus, despite these potential positive and negative outcomes of IT engagement, empirical research on IT engagement is highly limited in the context of work-related use of IT.

2.2. Dealing with normative pressures on IT use in organizations

In the present study, we aim to extend the theoretical understanding of the antecedent factors of IT engagement in organizations. The concept of normative pressure has been found to be a significant driver of IT use behavior (Bhattacherjee, 2000; Nysveen & Pedersen, 2005; Venkatesh, 2000). In their personal and non-work use of IT, individuals can perceive pressure to use IT in a certain socially-accepted way from friends and family members (Karahanna, 1999), whereas, in work-related use of IT, individuals can perceive pressure from colleagues and superiors (Bhattacherjee, 2000).

Normative pressure is a critical factor for understanding IT use in organizations. The use of portable IT devices, such as laptops and mobile devices, has enabled access to work-related information and communication regardless of time and place. Consequently, IT use for work has become flexible, as users can choose when and where to do their work. Engaging in this behavior has contributed to the general expectations for the use of IT for work (Mazmanian et al., 2013; Montag & Walla, 2016). For example, users often send work-related emails late at night and answer their colleagues' instant messages outside of office hours. Each activity sets an example of how IT is actually used for work, gradually building norms for IT-enabled working.

Furthermore, IT users are assumed to have positive attitudes toward the use of IT for work (Leung & Zhang, 2017; Mazmanian et al., 2013). This assumption could be partly explained by the nature of work;

employees are generally thought of as competent individuals who are capable of using IT to solve complex tasks in a ubiquitous manner (Mazmanian et al., 2013). Due to these collective expectations, we argue that the normative pressure on IT use can provide a critical view on the theoretical understanding of IT engagement.

2.3. Dealing with increasing information load in organizations

Related to normative pressures, organizational IT users are exposed to large amounts of information via the devices they use for work. Users who rely on IT for their work commonly apply the information that they come across in various emails, organizational reports, online conversations, and websites (e.g., news or blogs). Although such information is vital for accomplishing work activities, individuals are known to possess limited capacities to handle information (Addas & Pinsonneault, 2015; Malhotra, 1982; Sumecki et al., 2011). An individual's cognitive capacity is tested by the amount of information they can absorb (Jackson & Farzaneh, 2012; Cenfetelli & Schwarz, 2011) and the effort required to organize potentially scattered pieces of information (Jones et al., 2004). The concept of information load deals with an individual's evaluation of the effort needed to process such disorganized information (Jones et al., 2004). Researchers have stressed that the use of IT sets a new challenge for users because relevant work-related information is typically scattered over numerous applications within the Internet, extranet, and intranet environments, and a considerable amount of work-related information is created and shared via email and online messaging conversations (Addas & Pinsonneault, 2015; Jones et al., 2004; Sumecki et al., 2011).

Information load is often viewed negatively because it can burden an individual, such as when the effort needed to process disorganized information exceeds the individual's cognitive capabilities, resulting in a perception of overload (Cenfetelli & Schwarz, 2011). Interestingly, the ubiquitous nature of IT use and the availability of a vast amount of online information reveal alternative explanations. For example, those who want to spend increasing amounts of time using IT do not necessarily see the constant discovery and organization of information as a threat to their well-being. In contrast, they believe that utilizing the information enables them to achieve more at their workplace (Buckner et al., 2012; Mazmanian et al., 2013). Overall, information load can add an important organizational perspective to the study of IT engagement.

Examples of the potential risks associated with increased IT use have been reported in the literature. For example, one critical workplace-related issue arises when excessive use of IT starts to hinder an individual's work performance (i.e., reduced quality of work; Buckner et al., 2012). Interestingly, such intensified IT use does not have to be personal or non-work-related (such as chatting with friends on social networking sites); users might spend that increased time solely on information acquisition and knowledge sharing related to key work activities (Buckner et al., 2012; Pitichat, 2013). Scholars have argued that individuals, organizations, and societies should find a balance for IT use so that technological benefits are obtained without sacrificing personal well-being (Pirkkalainen & Salo, 2016; Tarafdar, Gupta, & Turel, 2015, 2019).

Individual actions to mitigate the negative effects of IT use are an emerging research stream (e.g., Tarafdar et al., 2015); however, little is known about how employees try to keep their use of IT within healthy boundaries. Initial insights have shown that individuals try not to be overly dependent on IT for work-related (Galluch, Grover, & Thatcher, 2015; Pirkkalainen & Salo, 2016) and non-work-related (Salo et al., 2017) purposes. Despite the importance of understanding how to keep IT use within healthy limits, to the best of our knowledge, studies have not examined the effectiveness of organizational IT users' attempts to avoid being overly dependent on IT use. We added this perspective in our examination because it can potentially uncover whether IT engagement is reduced when users intentionally strive to avoid being overly dependent on IT.

3. Research model

In this section, describe the hypotheses in the research model, which were validated in the present study. First, we elaborate on the outcomes of IT engagement. Second, we discuss the antecedents of IT engagement driven by normative pressure.

Prior literature suggests that the outcomes of IT engagement can be unfavorable for the user. The increased amount of time spent using IT has been shown to have psychological and physiological effects, which can be negative. A typical example is the active use of IT in the evening before going to sleep (Elhai et al., 2017), which can negatively affect the quality of sleep (Salo et al., 2019). Consequently, individuals feel tired and strained when they are not well-rested (Ayyagari et al., 2011; Salo et al., 2019). Another example is increasing IT use to such a degree that it pushes the user beyond his/her limits (Kuss et al., 2014). For instance, a user can feel inspired while solving work-related problems by browsing the Internet or participating in conversations on work-related social networking sites. However, users do not necessarily detect if the time they spend using IT surpasses their psychological resources. Therefore, they can become strained because of excessive IT use (Tarafdar et al., 2011, 2019). Considering that users who are experiencing IT engagement perceive a strong desire to spend more time with IT, even if they have fewer opportunities to recover and rest, we argue that IT engagement can contribute to strain. Thus, we hypothesize the following:

Hypothesis 1 (H1). IT engagement is positively associated with strain.

IT engagement is generally seen as a positive aspect of IT use (Charlton & Danforth, 2010). Although the effect of IT engagement on individual productivity at work has not been specifically examined, we believe that this relation is likely to exist. The concept of IT engagement (Charlton & Danforth, 2007; Charlton, 2002) is similar to that of employee engagement (MacCormick, Dery, & Kolb, 2012), which describes how individuals can be highly absorbed in their work, working longer hours and working more intensively. Employee engagement has been shown to enable users to be successful at work because they can accomplish more (MacCormick et al., 2012; Ng, Sorensen, & Feldman, 2007). Similarly, the use of IT for work purposes can enable employees to accomplish more (Agarwal & Karahanna, 2000). IT engagement entails devotion to the use of IT and enjoyment of its use (Charlton & Danforth, 2007; Schaufeli et al., 2009). When the use of IT is relatively effortless and enjoyable, users tend to start looking for ways to make use of IT in their work (Beaudry & Pinsonneault, 2010; Mazmanian et al., 2013; Porter & Kakabadse, 2006). This builds up their desire to continue using IT for work, and the intensification of that use consequently enables them to get more work done (Mazzetti et al., 2014; Porter & Kakabadse, 2006). Thus, we suggest the following:

Hypothesis 2 (H2). IT engagement is positively associated with IT-enabled productivity.

Prior studies have acknowledged the limits of individuals in terms of their ability to function properly when strained. Psychology researchers have emphasized how physical and psychological resources are required for proper functioning at home or at work (Folkman & Moskowitz, 2004). Strain is commonly seen as a manifestation of distress and an indication that an individual has limited resources to cope with the demands he/she faces (Folkman, 1984). Workplace studies have shown that strained individuals are less productive than those who are not strained (Cameron & Webster, 2013). In terms of IT engagement, studies have suggested that the intensification of IT use can result in strain (Tarafdar et al., 2011) and that using IT while feeling burdened will lead to reduced work performance (Tarafdar et al., 2015, 2019). We based the following hypothesis on these empirical findings:

Hypothesis 3 (H3). Strain is negatively associated with IT-enabled productivity.

Normative pressure on IT use is a perception that IT use, regardless of the extent, is a positive and favorable aspect of work that users should cherish (Bhattacherjee, 2000). Such collective expectations (Mazmanian et al., 2013) emanate from IT users' comparisons of their own ways of working with IT to those of others (Yellowlees & Marks, 2007). In general, IT users want to compare well with others. They see their colleagues using IT actively and flexibly, which eventually becomes the expected method for working with IT (Leung & Zhang, 2017). Researchers have indicated that normative pressure can even escalate an individual's IT engagement. Specifically, collective expectations about the benefits of IT push users toward a positive mindset about IT, leading them to adopt new ways to use IT for work (Nysveen & Pedersen, 2005). Such normative pressure can create a strong motivation to emphasize the positives of the work-related role of IT (Porter & Kakabadse, 2006) and lead users to increase their IT engagement (Mazmanian et al., 2013). Thus, we hypothesize the following:

Hypothesis 4 (H4). Normative pressure on IT use is positively associated with IT engagement.

Furthermore, the perception that IT use is positive and expected can lead individuals to attempt to perform more work-related tasks using IT (Buckner et al., 2012). For example, they might feel pressured to follow all work-related online conversations and constantly check what their colleagues are doing online (Andreassen et al., 2013; Boswell & Olson-Buchanan, 2007). IT users may do so because of insecurity about maintaining their jobs and because employees commonly want to compare well with their colleagues. Furthermore, in attempting to do more work with IT, users encounter increasing amounts of information online. This increase in information can be attributed to the nature of their work, that is, conveying and converging information from multiple work-related sources (i.e., email, intranet, and profession-related news sites) to accomplish their work tasks (Parise, Whelan, & Todd, 2015). The collective expectations of availability via IT make these sources an integral part of such information-sharing activities (Mazmanian et al., 2013). In addition, the increased information flow can be attributed to the dispersed nature of information. IT users need to be creative when they retrieve information, and, in many cases, relevant sources of information lie beyond the organization's intranet and firewall (Parise et al., 2015; Pitichat, 2013). IT users must also be able to make sense of and absorb the information they come across on various profession-related sites, news pages, or even social networking sites (Addas & Pinsonneault, 2015; Jones et al., 2004). To this end, the information load resulting from normative pressure can be substantial. Thus, we hypothesize the following:

Hypothesis 5 (H5). Normative pressure on IT use is positively associated with information load.

Users who perceive a strong need to increasingly use IT often actively seek and exchange work-related information online (Mazmanian et al., 2013). They know that the active use of IT is a way to get more work done and that exposing themselves to new profession- and task-related information is a way to steer their work forward (Parise et al., 2015; Porter & Kakabadse, 2006). Thus, individuals need to increase their IT use to reach that goal. Such intensive IT use entails immense online information traffic, which is shared by co-workers and superiors even after work hours (Leung & Zhang, 2017; Sumecki et al., 2011). Employees increasingly use IT despite the load on them caused by keeping up with the work-related information they need to assimilate from various online sites (Mazmanian et al., 2013; Montag & Walla, 2016; Wiltermuth & Gino, 2013). To summarize, information load can be associated with the experience of IT engagement, whereby employees use IT and identify snippets of information that are potentially relevant for their ongoing work tasks. The information load caused by the processing of unorganized snippets of information can function as a trigger (Porter & Kakabadse, 2006) and enable employees to solve their work tasks in potentially new ways. This makes them devote more time to making sense of how IT can be used for work. Thus, we hypothesize the following:

Hypothesis 6 (H6). Information load is positively associated with IT engagement.

The concept of information load holds that individuals need to absorb and organize the information they come across (Malhotra, 1982). Although IT users in organizations cherish the information they find, individuals' limited capacity to absorb information (Addas & Pinsonneault, 2015; Jackson & Farzaneh, 2012; Malhotra, 1982) can pose a threat to them. The increasing amount of disordered information received through IT used for work can be a burden and lead users to risk overloading themselves (Jones et al., 2004; Sumecki et al., 2011). This happens when the disordered information coming from various IT applications interrupts work and makes IT users feel pressured to capture relevant insights from the incoming information streams in a way that they get their work done on time (Galluch et al., 2015; Sumecki et al., 2011). Initial related findings showed that users who are exposed to vast streams of IT-mediated information try to keep the load caused by the information flow manageable and prevent any possible harm to their well-being (Galluch et al., 2015; Pirkkalainen & Salo, 2016). They consider the threat for themselves and evaluate the options to accomplish their work without triggering unnecessary distractions coming from their work-related IT applications (Galluch et al., 2015). Thus, we propose that the risk of overloading themselves makes IT users aware of negative consequences of IT use so that they equip themselves with ways to reduce occasions of IT use and try not being overly occupied with the use of IT for work.

Hypothesis 7 (H7). Information load is positively associated with averting IT use dependency.

Individuals who are aware of the potential harm by being too occupied with IT use take multiple precautions to avoid the negative outcomes. Previous findings related to non-work IT use show that users try to avoid becoming excessively dependent on IT use by adjusting the settings of technology or the ways they use it (Salo et al., 2017, 2019). In organizations, IT users emphasize proactive measures, such as deciding when and where to use IT, to prepare for IT threats that may lead to strain (Pirkkalainen, Salo, Tarafdar, & Makkonen, 2019; Pirkkalainen, Salo, Makkonen & Tarafdar, 2017). These examples show that IT users strive to adjust their mindset on IT so that they would not use it excessively just for the sake of gaining some additional benefits from the excessive use that can, simultaneously, harm them. It is likely that such mindset to avert overdependence on IT use would also reduce their need to use IT in an increasing manner. Considering that IT engagement entails that users perceive excitement from the use (Charlton & Danforth, 2007; Schaufeli et al., 2009) and want to explore new ways of using IT in their work (Mazmanian et al., 2013), we posit that individuals who try to avert IT use dependence perceive reduced IT engagement.

Hypothesis 8 (H8). Averting IT use dependency is negatively associated with IT engagement.

The research model explaining IT engagement in organizations is shown in Fig. 1.

4. Method

4.1. Data collection

The data used to validate the research model was collected via a survey. Given the focus of our study, we chose to recruit participants from organizations. Moreover, we did not want to restrict the study to a certain profession because prior studies have highlighted the pervasive nature of IT use across different industries (e.g., Ayyagari et al., 2011; Mazmanian et al., 2013). Considering that collecting data from multiple

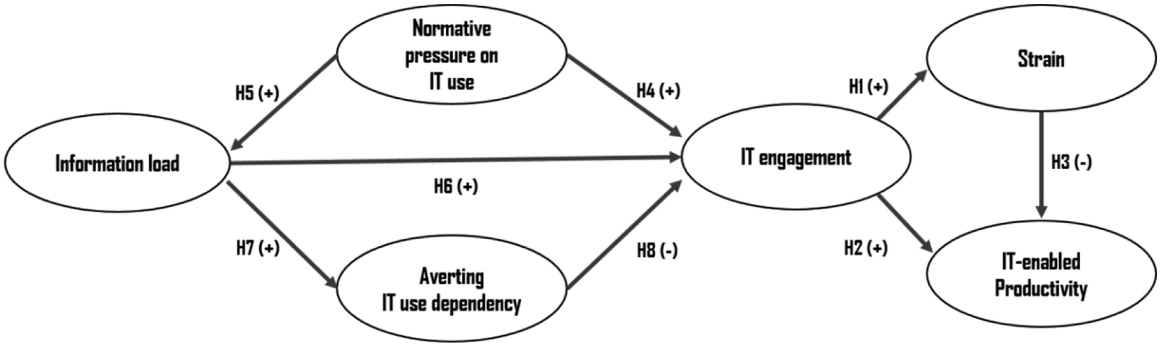

Fig. 1. Research model.

industries requires significant amounts of resources and time (Lowry, D'Arcy, Hammer, & Moody, 2016), we asked an online panel of employees in the United States to collect the data. We used SurveyGizmo because it reaches employees in multiple professions. Our intention was not to capture the views of the organizations but to understand the subjective perspectives of the organizational IT users. The use of online panels has been shown to have many benefits for data collection. For example, the respondents remain anonymous, they are not drawn from a limited set of organizations, and they come from different backgrounds (Lowry et al., 2016).

Given our focus on IT engagement, we did not limit the focus of the survey to a particular software application. Instead, we asked the respondents to name their most frequently used IT device (such as a laptop, smartphone, or tablet) and keep the selected device in mind when answering the questions. Furthermore, we wanted to reach respondents who actively use IT for work. We ensured this criterion by preparing three questions for screening purposes ("I use this IT to support my work activities," "I use this IT in my work," and "I use this IT to accomplish my work tasks"). These statements were evaluated against the frequency of use (a five-point scale ranging from "never" to "a great deal"). If any of the responses were less frequent than the midpoint ("occasionally"), the respondent was politely informed that he/she could not proceed with the survey. We made the decision to exclude respondents who used IT for work "rarely" or "never" because they would not fit our sample due to their limited experience using IT for work. We also informed the participants that the data would be analyzed with full anonymity and used for research purposes only. Initially, survey data from 1201 respondents was collected in October 2016. We carefully screened the data against non-conscious responses (e.g., removing responses with close to zero standard deviation), which resulted in a final sample size of 1091 respondents. The sample demographics are presented in Table 2.

Table 2
Sample characteristics (N = 1091).

	N	%
Gender		
Male	472	43.3
Female	619	56.7
Age		
Younger than 29 years	231	21.2
30–39 years	460	42.2
40–49 years	220	20.2
50 years or older	170	16.5
IT experience		
Less than 10 years	356	32.6
10–19 years	428	39.2
20–29 years	238	21.8
More than 30 years	69	6.3
Education		
Did not graduate high school	1	0.1
Graduated high school	74	6.8
Trade/technical school	34	3.1
Some college, no degree	170	15.6
Associate degree	150	13.7
Bachelor's degree	430	39.4
Master's degree/Ph.D. or M.D.	232	21.3
Industry		
Services	165	15
Healthcare and medical	129	12
ICT and software	125	12
Education	102	9
Finance and banking	69	7
Manufacturing	68	6
Military	64	6
Construction and real estate	55	5
Other (< 50 respondents) (biotech, agriculture, education, military, pharmaceutical)	314	28

4.2. Measures

We adapted most of the measures based on existing scales. The IT engagement scale was adapted from Charlton (2002), and the strain scale was adapted from Moore (2000) and Ayyagari et al. (2011). The IT-enabled productivity scale was adapted from Tarafdar, Tu, Ragu-Nathan, and Ragu-Nathan (2007). The normative pressure scale was adapted from Bhattacherjee (2000), who extended Taylor and Todd's (1995) measures. The information load scale was operationalized based on the definition of individual perception of receiving excessive amounts of disordered information through IT by Jones et al. (2004). The averting compulsive IT use scale was operationalized as a mitigation action for individuals' compulsive need to participate in IT-related activities, as characterized by Peters and Bodkin (2007). Only minor modifications were made to the scales. We mostly adjusted the wording by reflecting the use of IT at work. All of the items used in the study are presented in Table 3.

4.3. Data analysis and results

We used SPSS version 24 software to prepare the data and Mplus version 7.11 software to test our research model through covariance-based SEM. Before reporting the results of the model estimation, we evaluated the reliability and validity of its constructs and their indicators, the potential common method variance (CMV), and common method bias (CMB), as well as the overall goodness-of-fit of the estimated model with the data.

4.4. Indicator and construct reliability and validity

The reliability and validity of the model indicators were analyzed using standardized confirmatory factor analysis (CFA) loadings. We expected that the standardized loading of each indicator would be statistically significant and greater than or equal to 0.707 (Fornell & Larcker, 1981). As can be seen in Table 3, the loadings of five items were lower than 0.707. Of these, one had loading below 0.600 (0.553). Although the loadings were relatively high, we believe that a potential

Table 3
Items, standardized CFA loadings, means, and standard deviations.

Item	Loading	Mean	SD
IT engagement (ITE)			
ITE1: I want to spend increasing amounts of time using work IT	0.693***	3.101	1.256
ITE2: When I see an IT device, I feel drawn towards it	0.752***	3.279	1.254
ITE3: I would hate to go without using work IT for more than a few days	0.605***	3.485	1.271
ITE4: I often experience a buzz of excitement while using work IT	0.753***	3.155	1.284
Strain (STR)			
STR1: I feel drained from activities that require me to use IT at work	0.823***	2.626	1.327
STR2: I feel tired from my IT activities at work	0.879***	2.592	1.318
STR3: Working all day with IT at work is a strain for me	0.848***	2.650	1.338
STR4: I feel burned out from my IT activities at work	0.877***	2.468	1.305
IT-enabled productivity (PRO)			
PRO1: Work IT helps to improve the quality of my work	0.786***	4.154	0.941
PRO2: Work IT helps to improve my productivity	0.844***	4.172	0.965
PRO3: Work IT helps me to accomplish more work than would otherwise be possible	0.796***	4.067	0.997
PRO4: Work IT helps me to perform my job better	0.776***	4.165	0.938
Normative pressure on IT use (NOP)			
NOP1: People important to me think I should have a positive attitude to using IT at work	0.669***	3.715	1.057
NOP2: It is expected that people like me react positively to using IT at work	0.768***	3.942	0.952
NOP3: People I look up to expect me to react positively to using IT at work	0.809***	3.817	0.999
Information load (IL)			
IL1: I am confronted with an increasing rate of information coming from my work IT	0.816***	3.518	1.187
IL2: I am often facing situations where I have to assimilate information from my work IT	0.755***	3.488	1.169
IL3: I am confronted with an increasing amount of notifications (such as emails, personal messages) coming from my work IT	0.613***	3.525	1.239
Averting IT use dependence (AVD)			
AVD1: I try not to become too occupied by thoughts about using IT at work	0.553***	3.537	1.201
AVD2: I try to avoid my use of IT at work from interfering with my other work or social functions	0.850***	3.363	1.293
AVD3: I try to avoid my use of IT at work from becoming a compulsion	0.771***	3.309	1.280

explanation for the loadings below 0.707 is that many of the constructs had not been validated in the cross-sectional studies conducted before this study. We considered this result acceptable and chose to retain the five items because the five loadings were conceptually closely related to the intended meaning of the corresponding constructs. Further, standardized loadings as low as 0.400 have been considered acceptable in previous survey studies (Gefen, Straub, & Boudreau, 2000).

We assessed the construct reliabilities by checking whether the composite reliability (CR) of each construct was greater than or equal to 0.7 (Fornell & Larcker, 1981; Nunnally & Bernstein, 1994). The CR of each construct is reported in the first column of Table 4. As shown in the table, all constructs met this criterion. We assessed the construct validities by examining the convergent and discriminant validity of the constructs using the two criteria suggested by Fornell and Larcker (1981). The convergent and discriminant validity were based on the average variance extracted (AVE) of the constructs, which refers to the average proportion of variance that a construct explains in its indicators. To exhibit acceptable convergent validity, the first criterion required that each construct should have an AVE greater than or equal to 0.5, meaning that, on average, each construct should explain at least half of the variance of the construct's indicators. The AVE of each construct is reported in the second column of Table 4. As shown in the table, all constructs met this criterion. To exhibit satisfactory discriminant validity, the second criterion required that each construct should have a square root of AVE greater than or equal to its absolute correlation with the other constructs. This means that, on average, each construct should share at least an equal proportion of variance with its indicators as it shares with the other constructs. The square root of AVE of each construct (on-diagonal cells) and the correlations between the constructs and their statistical significance (off-diagonal cells) are reported in the remaining columns of Table 4. As shown in the table, all constructs met this criterion.

4.5. Common method variance and Bias tests

As we collected data using self-reported measures, we tested for potential CMV and CMB with two different tests. First, we applied Harman's single-factor test (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003) by estimating a model in which all the model indicators were loaded on a single factor. This test suggested the absence of serious CMV in the model indicators, as indicated by a bad fit with the data ($\chi^2(189) = 5{,}851.213$, $p < 0.001$, comparative fit index (CFI) = 0.321, Tucker–Lewis index (TLI) = 0.246, root mean square error of approximation (RMSEA) = 0.166, and standardized root mean square residual (SRMR) = 0.224.

The second test applied was Williams, Hartman, and Cavazotte's (2010) widely acknowledged CFA marker technique. As a theoretically unrelated marker variable, we used the fashion consciousness construct, which was used as a marker variable in the information systems context by Malhotra, Kim, and Patil (2006). As a criterion for model fit, we used the chi-square difference test, in which the $\Delta\chi^2$ value was corrected with the Satorra–Bentler scaling correction factor owing to the use of the MLR estimator for estimating the models (Satorra & Bentler, 2010). First, we compared the baseline model, which had zero constrained

Table 4
Reliability and validity of the model constructs (N = 1091).

	CR	AVE	ITE	STR	PRO	NOP	IL	AVD
IT engagement (ITE)	0.806	0.512	0.716					
Strain (STR)	0.917	0.734	0.213	0.857				
Productivity (PRO)	0.877	0.641	0.521	−0.200	0.801			
Normative pressure (NOP)	0.794	0.563	0.655	0.125	0.353	0.751		
Information load (IL)	0.776	0.539	0.524	0.114	0.271	0.457	0.734	
Averting IT use dependency (AVD)	0.774	0.540	0.142	0.032	0.072	0.128	0.282	0.735

loadings between the marker variable and model indicators, and the Method-C model, which had equally constrained loadings between the marker variable and model indicators. The comparison results suggested that the Method-C model fit the data better than the baseline model. This suggests that there was some CMV in the model indicators. Second, we compared the Method-C model to the Method-U model, which had no constraints for the loadings between the marker variable and the model indicators. The comparison results suggested that the Method-U model fit the data better than the Method-C model. This means that the CMV in the model indicators seemed to be congeneric rather than non-congeneric (Richardson, Simmering, & Sturman, 2009). Based on this finding, we compared the Method-U model to the Method-R model in which the construct correlations were constrained equally to those of the baseline model. The results suggested that the Method-R model did not fit the data better than the Method-U model. This finding suggests that the CMV in the model indicators did not result in CMB in the model estimates. Thus, after a thorough examination, we considered neither CMV nor CMB to be a concern in this study.

4.6. Model estimation

In accordance with Gefen, Rigdon, and Straub's (2011) guidelines, we assessed the goodness of fit of the estimated model using the chi-square test of model fit and four alternative fit indices recommended in methodological literature (Hooper, Coughlan, & Mullen, 2008; Hu & Bentler, 1999): CFI, TLI, RMSEA, and SRMR. Combining these tests provided a comprehensive test of the model fit from relative (CFI and TLI) and absolute (RMSEA and SRMR) perspectives (Hooper et al., 2008). First, the chi-square test of model fit rejected the null hypothesis of the model fitting the data ($\chi^2(213) = 684.507$, $p < 0.001$). This is typical for models estimated using large samples (Gefen et al., 2011), particularly in the case of multivariate non-normality (Hooper et al., 2008). Second, all four fit indices (CFI = 0.946, TLI = 0.936, RMSEA = 0.045, and SRMR = 0.067) suggested an acceptable fit by clearly meeting the respective cut-off criteria (CFI ≥ 0.90, TLI ≥ 0.90, RMSEA ≤ 0.06, and SRMR ≤ 0.08) suggested by Hu and Bentler (1999), as well as Gefen et al. (2011).

The model estimation results in terms of the standardized size and statistical significance of the effects, as well as the proportion of explained variance (R^2), are reported in Fig. 2 and summarized in Table 5. As can be seen, all of the direct effects (H1–H7) were statistically significant, with the exception of the effect of averting IT use dependency on IT engagement, which was not statistically significant (H8).

We also tested for potential indirect effects to account for potential mediating effects. The indirect effect of IT engagement on IT-enabled productivity via strain (−0.061, $p < 0.001$) and that of normative pressure on IT engagement via information load (0.118, $p < 0.001$) were statistically significant, thus decreasing the total effect of IT engagement on IT-enabled productivity to 0.538 ($p < 0.001$) and increasing the total effect of normative pressure on IT engagement to 0.655 ($p < 0.001$). The R^2 values of the endogenous constructs were as follows: IT engagement = 51.7 %, strain = 6.1 %, IT-enabled productivity = 37.6 %, information load = 23.4 %, and averting IT use dependency = 8%. Here, the difference of the R^2 values of the outcome constructs should be noted (i.e., strain and IT-enabled productivity). The lower R^2 value of strain in comparison to IT-enabled productivity can potentially be explained from theoretical and empirical perspectives. From a theoretical perspective, it can be explained by the nature of IT engagement, which makes individuals dedicated to finding new ways to apply IT for work (Schaufeli et al., 2009). IT engagement, thus, promotes beneficial performance outcomes, which may overweigh negatively-associated psychological outcomes, such as strain. From an empirical perspective, it can be explained by the crossover effect of strain on IT-enabled productivity and the finding that IT engagement had a much weaker effect on strain than on IT-enabled productivity. However, in spite of this relatively weak effect, we chose to retain strain in the model because it not only enabled the empirical validation of the relationship between IT engagement and strain but also revealed that, although IT engagement had a positive direct effect on IT-enabled productivity, this effect was partly offset by the negative indirect effect of IT engagement on IT-enabled productivity via strain.

Table 5
Summary of the findings and hypothesis support.

	Effect	Hypothesis support
H1: IT engagement (+) Strain	0.191***	Supported
H2: IT engagement (+) IT-enabled productivity	0.599***	Supported
H3: Strain (−) IT-enabled productivity	−0.319***	Supported
H4: Normative pressure (+) IT engagement	0.538***	Supported
H5: Normative pressure (+) Information load	0.457***	Supported
H6: Information load (+) IT engagement	0.258***	Supported
H7: Information load (+) Av. dependency	0.279***	Supported
H8: Averting IT use dependency (−) IT engagement	−0.008 (ns)	Not supported

The analysis included two control variables: gender and age. The effects of these variables on the endogenous constructs are reported in Table 6. As shown in the table, gender had statistically significant effects on IT engagement and information load, suggesting that women had slightly lower levels of IT engagement and information load than men. In contrast, age had statistically significant effects on IT engagement and strain, suggesting that the levels of IT engagement and strain decreased with age. In other words, younger individuals experienced higher levels of IT engagement and strain from IT use.

5. Discussion

The present study aimed to explain the antecedents and outcomes of IT engagement, which have constituted a less understood perspective on IT use in organizations to date. Indeed, the understanding of IT engagement has mainly emanated from personal and non-work use of

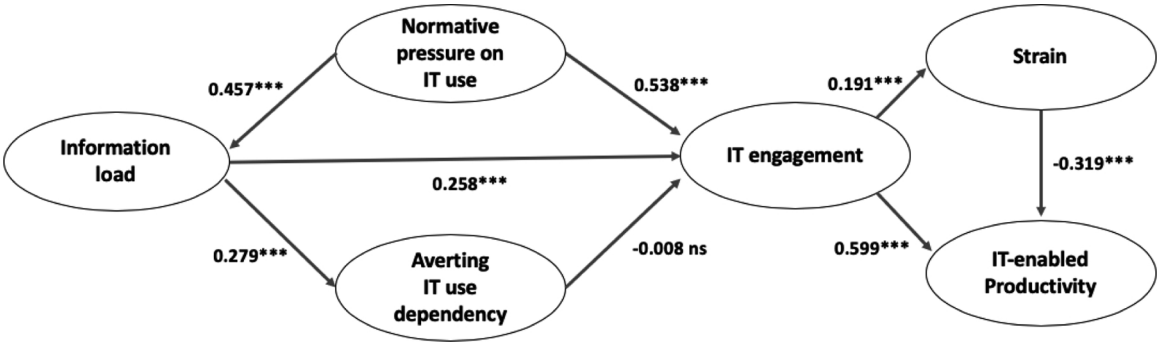

Fig. 2. Model results.

Table 6
Findings in relation to the control variables.

	Gender	Age
IT engagement	−0.110***	−0.118***
Strain	−0.051	−0.120***
IT-enabled productivity	0.032	0.047
Information load	−0.147***	−0.062
Averting IT use dependency	−0.019	0.000

IT. Prior studies have acknowledged and provided initial observations of IT engagement in work-related use of IT (e.g., Mazmanian et al., 2013; Porter & Kakabadse, 2006), indicating that individuals can be drawn to using IT applications and devices for work purposes. In this regard, observations from prior studies have suggested both negative and positive outcomes of IT engagement. Our study conceptualized these relationships and empirically validated them by showing that IT engagement positively affects both strain (0.191***) and IT-enabled productivity (0.599***). In other words, the two controversial outcomes suggested in prior studies do indeed exist. However, our findings indicate that the positive direct effect of IT engagement on IT-enabled productivity outweighs the negative indirect effect via strain (-0.061***), resulting in a clearly positive (0.538***) total effect of IT engagement on IT-enabled productivity.

Furthermore, prior studies have not provided a theoretical or empirical explanation of the reason for IT engagement in organizations. Although they established that, conceptually, IT engagement is a matter of being driven to increased use of IT to accomplish more work (e.g., Mazzetti et al., 2014; Montag & Walla, 2016), the work-related antecedents remained unaddressed. In our study, we validated the perspective of normative pressures as a potential key driver of IT engagement. The findings showed that normative pressure was a strong predictor of IT engagement (0.538***) and that the antecedent factors accounted for over 50 % of the overall variance in IT engagement. The variance was mainly accounted for by the two antecedent factors of normative pressure on IT use and information load, and IT users' attempts to avert IT use dependency did not have a statistically significant effect on IT engagement (−0.008). We believe that one possible explanation for this non-significant effect is that users are content with their increased use; thus, their enthusiasm for IT use overpowers their worry about it, and their worry relates to compulsive use instead of their IT engagement. Researchers have previously shown that, as users increase their use of IT for work, their attention is drawn to the benefits of IT use, and, consequently, they find it hard to disconnect from it (Mazmanian et al., 2013). Such cases have been found to lead to strain and IT being used during family time. Therefore, users identifying the risks associated with increased IT use and feeling like they are doing something about it might not be sufficient. Users most likely need other ways of mitigating the negative effects of IT engagement. Next, we discuss the implications of these findings for research and practice.

5.1. Research contributions

This study makes three contributions to the literature. The first contribution is in terms of theorizing and validating a model for understanding IT engagement in organizations. We addressed the concept holistically by showing its potential antecedents and outcomes. This view was missing in the literature because the study of IT engagement has typically been associated with personal and non-work use of IT (Charlton & Danforth, 2010), and only practical examples have illustrated the importance of IT engagement in organizations (e.g., Beaudry & Pinsonneault, 2010; Mazmanian et al., 2013). Related concepts from work settings, such as employee engagement (MacCormick et al., 2012), align with IT engagement to the extent that the individual is absorbed in the particular behavior of working or using IT. However, prior literature posits that organizational IT use is theoretically distinct from work behaviors because the IT use environment includes factors that are specific to technology and its use (Bhattacherjee, 2000; Venkatesh, 2000). Examples of such factors include IT's ability to enable communication at any time and place, access to unlimited amounts of information in real time, and use of highly personalized computing tools for various activities. These capabilities have a tremendous influence on individuals' perceptions and behaviors in the workplace (Montag & Walla, 2016; Venkatesh, 2000).

Our model provides evidence on IT engagement and its outcomes in organizations. Moreover, it helps explain why IT users experience IT engagement in organizations. IT use for work is ubiquitous, and collective expectations play an important role in the organizational use of IT (Mazmanian et al., 2013; Porter & Kakabadse, 2006). The availability of large amounts of data and related expertise give IT users the opportunity for sense-making and problem-solving by converging in online information retrieval and communication processes. At the same time, employees compare their use of IT with that of their colleagues. The model presented in this paper highlights one of the key issues in this regard: users become absorbed in using IT and feel a strong need increase their usage, leading to controversial outcomes.

As the second contribution, we demonstrate the controversial negative and positive outcomes of IT engagement. IT engagement is generally viewed as a positive aspect of IT use because engagement demonstrates users' interest in and devotion to using technology (Beaudry & Pinsonneault, 2010; Charlton & Danforth, 2010). This is relevant for organizations because individuals perform better when their attention is focused on work-related behaviors (MacCormick et al., 2012). This study suggests that increased work-related use of IT can benefit employees. The results confirmed prior insights (e.g., Mazzetti et al., 2014; Porter & Kakabadse, 2006) that IT engagement can lead to IT-enabled productivity at work. Furthermore, the findings illustrate the multifaceted nature of IT engagement; in addition to its favorable effects, it strains individuals. Researchers have previously suggested that the increased use of IT can strain individuals (Mazmanian et al., 2013; Montag & Walla, 2016; Tarafdar et al., 2011). However, the relation between IT engagement and strain had not been theoretically or empirically addressed. The observed positive relation between these concepts enables us to understand the "dark side" of IT engagement, as the present study shows that the resulting strain takes its toll on individual productivity.

The third contribution is in understanding a key workplace-related antecedent of IT engagement: normative pressure on IT use. Although IT users can be considered autonomous in their use behavior, researchers have shown that the external influence on the mindsets and actions of IT users in organizations is substantial (Bhattacherjee, 2000). Prior studies have also suggested that the perception of IT engagement can be attributable to normative pressures emanating from the workplace (Mazmanian et al., 2013; Montag & Walla, 2016). The results of this study illustrate that IT engagement is dependent on the user's perception that he/she should have a positive attitude toward the use of IT for work. Moreover, they show that this normative pressure drives the user to absorb more work-related information online. These results are important because they indicate that IT engagement should be addressed separately from work engagement, as the former is explained by factors related to the IT use environment. Specifically, the results demonstrate the role of external influence on work-related IT engagement and show that the increased information load intensifies the use of IT instead of reducing it. The latter enriches our understanding of an individual's cognitive capacity for information, which is generally viewed in terms of overload and negative consequences (Cenfetelli & Schwarz, 2011).

5.2. Practical implications

This study has implications for organizations and individual users who utilize IT at work. Organizations need to consider that IT

engagement is not the same as IT addiction. Employees' enthusiastic use of IT for work should be seen in a positive light because of the increased productivity that the use of IT supports. Sharing positive experiences of IT use can foster enthusiastic engagement with IT and help employees utilize their information load for increased engagement. However, IT engagement has its caveats, as we demonstrated. Employees can feel burdened by increased IT use, and strain can directly weaken their productivity. However, it is possible to practically address this strain by emphasizing workplace well-being. Organizations need to identify ways to actively remove the potential burden that employees can experience. For example, organizations could increase employees' awareness of strain related to IT engagement by providing educational training to help them identify the signals of strain via archetypal examples and tools for monitoring strain experiences in relation to use (e.g., with physiological measures of stress, such as smart rings or other wearables).

The findings of this study can help individual IT users understand how IT engagement relates to their work and what they can do about it. We consider both the positive and negative aspects related to IT engagement below. We conclude by recommending how users may monitor that their enthusiastic use of IT does not turn in to addiction.

The positive aspect of IT engagement is that users can harness it to accomplish their work goals more effectively. IT engagement allows them to find new ways of using IT to improve the quality of work outputs and accomplish more work. Our findings suggest that young men are more likely to experience IT engagement and higher levels of information load. We believe that collective expectations on IT use can be used for the advantage of employees. We recommend that employees share good practices with their peers how they have retained the pleasures from IT use without suffering from continuous interruptions. This way, they are likely to find ways how to balance information load and IT engagement for effective working.

The negative aspect of IT engagement is that it can strain individuals. Higher levels of strain were observed particularly among young users. We recommend that these enthusiastic young users actively monitor their well-being and respond seriously to any signals of strain. Although organizations might, in some cases, draw overall boundaries around work-related IT usage expectations (such as for email and intranet), employees have plenty of freedom in deciding how they actually use specific IT applications and devices for work. Prior research showed that brief moments of rest from the use of IT can have tremendous positive effects on work (Park, Fritz, & Jex, 2011). We recommend that individuals cherish such moments in order to reduce the information load they receive via IT use. They should also devote themselves to taking regular pauses from work, such as by meeting colleagues for non-IT related discussions.

Finally, we hope that IT users do not blindly follow the pleasures brought to them by IT engagement. They should keep a watchful eye out that their feeling on IT use is about "liking" instead of "wanting". As explained before, liking manifests as excitement of using IT whereas wanting shows as an urge to feel positive emotions from the use of IT. In the latter case, a dire warning sign would be that the users feel anxiety when they are not using IT. This would entail IT addiction, which users should try to avoid. However, if for some reason users feel anxiety for not using IT and their thoughts are continuously centered around the use of IT for work, they may need the mentality of averting IT use dependency. It was shown to be ineffective for reducing IT engagement but may well be an essential asset for reducing IT addiction.

5.3. Limitations and future research

This study has certain limitations. First, we acknowledge other forms of collective expectations also play a role in IT engagement. For instance, as future research, it would be interesting to examine the differences between the pressures emanating from work (e.g., colleagues) and non-work settings (e.g., society) and to distinguish between direct (e.g., a word of advice from a colleague) and peripheral (e.g., observed behavior at large) forms of pressure.

Second, this study used self-reported survey data to derive an understanding of the antecedents and outcomes of IT engagement. It could be useful to use other methods (such as longitudinal studies) to study the causes and effects of IT engagement. For example, one interesting research avenue could investigate IT use patterns related to IT engagement in order to reveal different pathways to positive or negative outcomes.

Third, this study addressed averting IT use dependency as a potential mitigating factor. In light of the findings, we acknowledge that this behavior is insufficient for studying individuals' attempts to keep their IT use within healthy boundaries. It would be interesting to examine such potential methods in a qualitative study or with observations to help us understand how users balance their use of IT during workdays. Furthermore, it is possible that such findings could reveal certain trade-offs in retaining personal health and reducing work engagement with the help of IT.

Future research could also look at the thresholds at which IT engagement can escalate to the point of strain. Understanding when negative outcomes start overpowering the positive ones is important. It is also possible that some forms of IT use behavior that emerge in the workplace resemble IT addiction. Experimental research designs could tap into the continuously increasing use of IT over time and measure the different symptoms of such use. Such research could potentially establish boundaries between IT engagement and IT addiction in the work-related use of IT.

6. Conclusion

This study examined three previously unaddressed aspects of IT engagement in an empirical cross-sectional study. The results firstly validated two outcomes of IT engagement, namely, increased IT-enabled productivity and strain. The results secondly indicated that the two antecedents, normative pressure on IT use and information load, have a positive effect on IT engagement. The results also indicated lack of support for the third aspect, which was the mitigation effect of averting IT use dependence on IT engagement. As the nature of work is and will continuously be transformed by the potentials of IT and its use, understanding IT users during this transformation is critical. Only then can we derive the true value of IT for work, as well as its potential to hinder current and future organizational work. We believe that this study serves this critical objective by examining IT engagement in organizations.

CRediT authorship contribution statement

Henri Pirkkalainen: Conceptualization, Writing - original draft, Writing - review & editing, Methodology, Visualization, Supervision. **Markus Salo:** Conceptualization, Methodology, Writing - original draft, Writing - review & editing. **Markus Makkonen:** Methodology, Formal analysis, Writing - original draft, Writing - review & editing.

Appendix A. Supplementary data

Supplementary material related to this article can be found, in the online version, at doi:https://doi.org/10.1016/j.ijinfomgt.2020.102130.

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