FROM ACCEPTANCE TO OUTCOME: TOWARDS AN INTEGRATIVE FRAMEWORK FOR INFORMATION TECHNOLOGY ADOPTION

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Complete Research

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Abstract

Decades of research on information technology (IT) adoption have resulted in a large number of different models and theories. While the number of theoretical models has significantly increased our knowledge on IT adoption, we lack an integrative view of the different stages of the adoption process. In this paper, we review the primary theories from both the acceptance and post-acceptance stage of IT adoption. In addition, we synthesize the different theories and their constructs in a reference framework for IT adoption. We conceptualize individual IT adoption as a dynamic process, in which use patterns, beliefs, and individual motivations change over time. Our framework provides an end-to-end view of IT adoption, spanning the adoption process from acceptance antecedents to outcomes. Eventually, we suggest opportunities for future research based on the different stages of our framework. We believe that our framework will be helpful to develop more complete and actionable theories, and to provide clarity on the concepts and stages related to IT adoption.

Keywords: IS Theories, IT Adoption, IT Use, IT Continuance, IT Diffusion, Technology Acceptance.

1 Introduction

Investigating the factors that determine the economic value of information technology (IT) in organizations is a fundamental objective of IS research (Wixom and Todd, 2005). Originally driven by a large number of failing IT implementations (Bussen and Myers, 1997; Newman and Sabherwal, 1996) and more recently by high resistance rates towards new organizational IT implementations (Rivard and Lapointe, 2012), the adoption of IT on an individual level has become one of the most studied phenomena in the field of IS, encompassing several parallel research streams today (Agarwal, 2000; Venkatesh et al., 2003). While the large number of theories has significantly increased our knowledge on IT adoption, we lack an integrative view of the different approaches and stages of the adoption process (Schwarz and Chin, 2007).

On the one hand, research provides a broad set of determinants and antecedents of technology use and use intentions. Integrative studies on technology acceptance have summarized the antecedents of IT use in a variety of different contexts, including human factors, IT related variables, and external characteristics (e.g. Dillon and Morris, 1996; Gefen and Straub, 2000; Legris et al., 2003; Taylor and

Todd, 1995; Venkatesh et al., 2003; Wixom and Todd, 2005). On the other hand, the scope of IT adoption has been expanded through research on use patterns and use behavior that focus on the post-acceptance stage during which IT is integrated in work processes (e.g. Bhattacherjee, 2001; Bhattacherjee and Premkumar, 2004; Jasperson et al., 2005; Karahanna et al., 1999). Compared to initial use during the acceptance stage, the post-acceptance stage is characterized by deeper, more effective use dimensions that entail a tighter link to performance and IT's creation of economic value (Burton-Jones and Grange, 2013; Jasperson et al., 2005; Schwarz and Chin, 2007). For example, individual adoption and use patterns at later stages of the adoption process differ from early stages as users' gain first-hand experience and engage in exploration and leveraging the information technologies' features (e.g. Deng and Chi, 2012; Li et al., 2013). However, the technology acceptance's determinants often fail to predict use and performance in the post-acceptance stage as individual beliefs and motivations change over time (Agarwal and Karahanna, 2000; Bhattacherjee, 2001; Karahanna et al., 1999; Venkatesh et al., 2011). As a result, our knowledge is fragmented as to how both phases of IT adoption interact over time, and as to how the determinants of technology acceptance lead to "deep" or effective use and IT enabled performance (Benbasat and Henri, 2007; Chin and Marcolin, 2001; Kim and Malhotra, 2005).

Our paper's objective is to synthesize the different streams of research on IT adoption by (1) classifying constructs into categories of beliefs, motivations, and behavior, and by (2) structuring the determinants and factors that relate to the adoption process into one reference framework that spans the acceptance and post-acceptance stage. We argue that such an end-to-end perspective is instrumental for a deep understanding of the transition from the acceptance to the post-acceptance stage and the transformation of motivations, beliefs, and IT use. In developing our framework, we draw on Cooper and Zmud's (1990) stage model of IT implementation as well as on Rogers' (1983) innovation diffusion theory to structure the different stages of the IT adoption process.

The goal of this article is to offer a meta-theory on the IT adoption process. In doing so, our research adds on recent attempts of other IS researchers who started to show how beliefs and use behaviors are transformed over time (Kim and Malhotra 2005; Kim 2009; Wixom and Todd 2005). We therefore do not aim to provide a complete model of the determinants of IT adoption (for respective reviews, see e.g. Petter et al., 2013 and Venkatesh et al., 2003). Rather, we contribute to research by integrating the different stages of IT adoption and by relating the most influential factors of the IT acceptance and post-acceptance stage. As a result, we hope to provide guidance for both practitioners and researchers who wish to link the diverse stages of IT adoption. We believe that our framework will be helpful to provide clarity on the concepts and stages related to IT adoption and, eventually, to develop more complete and actionable theories.

In the subsequent section, we introduce the theoretical foundations of IT adoption, and summarize important theories from this field. In the next section we draw out our research method for developing our framework. Then we synthesize the theoretical base of acceptance and post-acceptance research in a reference framework on IT adoption. Finally, in the concluding section we discuss implications of our research and suggest directions for future research.

2 Foundations

Research on information technology (IT) adoption is concerned with the reasons, the nature and the consequences of people's IT use in different social and organizational environments (Chin and Marcolin, 2001; Venkatesh et al., 2003). While early research has mainly focused on an individual's intention to use and initial use of IT innovations (Agarwal, 2000; Venkatesh et al., 2003) recent research has acknowledged IT adoption as an evolutionary process, during which individuals proceed through different stages of technology use "salient in certain temporal usage contexts" (Schwarz and Chin, 2007, p. 233). We therefore define adoption as the process of taking and following a course of

action, and refer to acceptance as "demonstrable willingness" (Dillon and Morris, 1996, p. 4) to use technology for its designed purpose.

To set the theoretical background for our research, we review and compare prominent theories on IT adoption comprising both research on technology acceptance and post-acceptance. We thereby base our approach on Venkatesh et al's (2003) review of IT acceptance research and our own review on IT post-acceptance (see the method section). To limit the complexity of our framework we intentionally focus on nine established models from IT adoption research. We organize the selected theories based on the stage model of IT implementation (Cooper and Zmud, 1990; Saga and Zmud, 1994) and innovation diffusion (Rogers, 1983) which we introduce in the second part of this section.

2.1 Theories on information technology adoption

The field of research on IT adoption has progressed both in depth and breadth over the last two decades. Depth has been increased through extending and refining core theories from reference disciplines in social psychology. The most prominent of these streams is grounded in the theories of reasoned action (TRA) (Fishbein and Ajzen, 1975) and planned behavior (TPB) (Ajzen, 1991; Ajzen and Madden, 1986). Underlying both theories is the concept that the perception of future consequences predicts future actions. In adapting these theories to the IS context, the technology acceptance model (TAM) (Davis, 1989; Davis et al., 1989) has become the leading model to explain an individual's intention to use and use of an IT. Various modifications and updates of the original TAM have drawn on constructs of TRA and TPB, and added additional beliefs and belief antecedents to the original model (Taylor and Todd, 1995; Venkatesh, 2000; Venkatesh and Bala, 2008). Underlying this stream of research is a causal chain from individual beliefs and behavioral dispositions to intention as direct determinant of behavior (Ajzen and Fishbein, 2005; Ajzen and Madden, 1986). A second stream of research on IT acceptance draws upon social cognitive theory (Bandura, 1989). Authors adhering to this stream investigated the personal and environmental antecedents of technology acceptance such as computer self-efficacy (Compeau and Higgins, 1995) and task complexity (Bolt et al., 2001). A third approach, based on Rogers (1983) theory of innovation diffusion, assumes an information-centric view of IT adoption. Accordingly, individuals receive and process information concerning the innovation through different communication channels and develop beliefs concerning the innovation's attributes. Based on a meta-analysis on a variety of different innovations, Rogers (1983) developed a set of individual beliefs concerning the innovation's characteristics and about using the innovation in a specific context. Moore and Benbasat (1991) refined and extended this set of beliefs to the context of IT innovation adoption, a process that has informed a large number of IT adoption research (e.g. Agarwal and Prasad, 1998; Karahanna et al., 1999; Zhu and Kraemer, 2005). Many of these theories have been subsumed in the unified theory of acceptance and use (UTAUT) (Venkatesh et al., 2003), which synthesized the factors of eight theories into four core determinants of IT acceptance and use.

Complementary, the breadth of research on IT adoption has been extended by analyzing different stages of IT adoption and use. To date, research has introduced a variety of models and theories relating to acceptance, post-acceptance, continuance and diffusion of IT in organizations and society (Chin and Marcolin, 2001; Williams et al., 2009). While these models unanimously address the use of IT, they differ in their theoretical structures and in their focal stage of the adoption process. Research focusing on the post-acceptance stage expands the original use construct towards alternative dimensions such as effective use (Burton-Jones and Grange, 2013; Deng and Chi, 2012), innovative and routine use (Li et al., 2013), and extended use measures (Jasperson et al., 2005). This suite of different behavioral patterns results from a series of individual decisions to continue using an IT application (Limayem et al., 2007). Building on Oliver's (1980) expectation confirmation theory, Bhattacherjee (2001) develops a model on users' continuance intention for post-acceptance use. Unlike the previously discussed streams that focus on technology acceptance, this theory posits that initial beliefs change over time as individuals reevaluate their intention towards further use with actual

use experience. Once an innovation has been accepted and used, individuals compare their use experiences with their initial expectations (beliefs) regarding the innovation. The extent to which initial expectations are confirmed determines the level of satisfaction with the technology and users' continuance intention. Bhattacherjee and Premkumar (2004) and Venkatesh et al. (2011) extend this model by elaborating on how users' beliefs change over time as they move from the acceptance to the post-acceptance stage. Eventually, research has also investigated outcomes of IT use in terms of performance impacts of which the IS success model (DeLone and McLean, 2003) and the task-technology fit (TTF) model (Goodhue and Thompson, 1995) are the most prominent. Both models cover different dimensions of IT use and outcomes including individual and organizational performance impacts, the degree to which technology assists in accomplishing tasks, IT use, and user satisfaction. Table 1 summarizes seminal theories on individual IT adoption together with the original models' theorized constructs. Based on Bagozzi's (2011) theoretical framework, we categorize the constructs into antecedents, focal constructs, and consequential factors to reflect the broad scope of research on IT adoption. Overall, the theories comprise 42 different constructs that span the complete lifecycle of IT adoption.

Theory	**Antecedents**	**Focal constructs**	**Consequences**
Theory of Reasoned Action (TRA)	Attitude, subjective norm	Intentions to use	Use
Theory of Planned Behavior (TPB)	Attitude, subjective norm, Perceived behavioral control	Intentions to use	Use
Technology Acceptance Model (TAM)	Perceived usefulness, perceived ease of use	Intentions to use	Use
Innovation Diffusion Theory (IDT)	Compatibility, complexity, relative advantage, trialability, observability visibility, results demonstrability, voluntariness, image	Adoption (use) decision	Rate of adoption (use) within a social system
Model of Computer Self-efficacy	Encouragement, other's use, support	Self-efficacy, outcome expectations, affect, anxiety	Use
Unified Theory of Acceptance and Use (UTAUT)	Performance expectancy, effort expectancy, social influence, facilitating conditions	Intentions to use	Use
IS Continuance Model	Expectation, confirmation	Perceived usefulness, user satisfaction	Continuance intention
IS Success Model	System quality, information quality, service quality	Use, user satisfaction	Individual and organizational performance impact
Task-technology Fit Model	Task characteristics, technology characteristics	Task-technology fit, use	Individual performance impact

Table 1. Overview of Seminal Theories on Individual IT Adoption

2.2 Stages of information technology adoption

IT adoption involves several stages through which an IT is implemented within a social system and among the members of a user community (Baskerville and Pries-Heje, 2001; Cooper and Zmud, 1990). From an individual perspective, adoption consists of a series of decisions and actions that reflect the different cognitive states individuals move through when adopting an innovation (Rogers, 1983). In moving through these stages, individuals update, confirm, and transform their initial

adoption decisions, thereby "institutionalizing the innovation as part of their regular work" (Agarwal, 2000, p. 90). Rogers (1983) conceptualized innovation adoption as a five stage process of decision making and action during which individuals move from gaining initial knowledge about an innovation, to forming attitudes, to deciding to adopt or reject the innovation, to using the innovation, and confirming the initial adoption decision. Cooper and Zmud (1990) and Saga and Zmud (1994) introduced the stage-based process to IT innovation adoption, consisting of the stages of pre-acceptance, acceptance, and post-acceptance (Fichman, 2001; Hameed et al., 2012).

The acceptance stage is preceded with the awareness or the need for an innovation (Cooper and Zmud, 1990; Fichman, 2001; Rogers, 1983). Needs develop out of tensions between individual desires and circumstances, and motivate individuals to acquire knowledge about the innovation's characteristics (Rogers, 1983). In receiving knowledge about an innovation, individuals evaluate the innovation and begin forming beliefs about the innovation's advantages, taking into account technological, organizational and environmental factors that represent antecedent and contextual factors of IT adoption (Hameed et al., 2012; Rogers, 1983).

During the acceptance stage of technology adoption, users decide to accept (or reject) the innovation and commit themselves to actively deploy the IT in work processes (Cooper and Zmud, 1990). Decisions are made based on initial beliefs or perceptions that translate into positive or negative attitudes towards and use of the innovation (Rogers, 1983). Saga and Zmud (1994) operationalized behavior during the acceptance stage as frequency and duration of use. However, the acceptance stage is only an interim step towards multiple more intensive forms of use and further assimilation, and does not preclude rejection of the innovation in subsequent stages (Rogers, 1983; Zhu et al., 2006). Contrasting TAM-based streams which utilize intentions and (initial) use dependent variables (Agarwal, 2000; Venkatesh et al., 2003), this view argues that acceptance is insufficient in predicting the attainment of desired outcomes from technology use.

In the post-acceptance stage, users seek confirmation for their initial acceptance decisions and may either reverse their initial adoption decision or continue to use and derive benefits from an innovation (Rogers, 1983). In order to use the innovation effectively, users integrate and deeply embed the technology as part of their work processes (Saga and Zmud, 1994). Cooper and Zmud (1990) distinguish between routinization and infusion as different levels of post-acceptance behavior. Routinization refers to a state where the IT is integrated into regular work processes and used in a normal or standardized way (Agarwal, 2000; Cooper and Zmud, 1990). Infusion describes the state where the IT innovation becomes deeply embedded into work processes and is employed to its fullest effectiveness (Cooper and Zmud, 1990; Hsieh and Wang, 2007). This last stage integrates different forms of comprehensive or innovative use behavior, such as a) extended use, in which additional features of the IT application are used; b) emergent use, in which the use of the IT application is expanded to new tasks; and c) integrative use, in which the IT application is used to link different work tasks (Li et al., 2013; Saga and Zmud, 1994). Although routine use precedes infusion, both stages can occur simultaneously rather than in sequence (Li et al., 2013). It is however infusion that typically leads to effective goal-oriented use and individual and organizational performance outcomes (Burton-Jones and Grange, 2013).

3 Method

Our objective in this paper is to bring together the different streams of IT adoption research and to clarify their commonalities, differences, and future potentials. Consequently, we structured our research process into two phases. First, we identified and documented the relevant foundations, models, theories, and constructs related to IT adoption. Second, we combined the theories and models, and arranged the respective constructs within our framework. Both phases will be described briefly in this section.

To be as comprehensive as possible in selecting which constructs to include in our framework, we started by searching for previous reviews on IT adoption. Subsequently, we performed a meta-review on these to gain a first understanding of the relevant factors and constructs during the stages of technology adoption (Cooper 1998). In doing so, we identified three recent review articles. Each of these reviews accounts for different aspects of the state of research. First, we revisited Venkatesh et al's (2003) review on technology acceptance underlying the development of the unified theory of acceptance and use of technology. Second, we consulted the review by Williams et al. (2009), who analyzed 345 papers on IT adoption and diffusion between 1985 and 2007 to identify the most popular theories used in IT adoption research. Third, we included the review by Hameed et al. (2012) on 152 different articles on IT adoption and user acceptance published between 1981 and 2011. In all three reviews, the technology acceptance model emerged as the most prominent model, followed by the theories of reasoned action, planned behavior, and innovation diffusion. Eventually, we consulted the list of constructs identified by Larsen (2003) and, more recently, by Petter et al. (2013) and Wu and Lu (2012) in their reviews on different dimensions of technology use and success. Together, these reviews provide a comprehensive list of theories and constructs that have been frequently used and tested. To keep the number of identified constructs manageable, we decided to include only those constructs that were found to be relevant in the majority of studies.

The resulting list of 71 constructs was extended by an additional keyword search (no time limit) in the databases EBSCO, ScienceDirect, and JSTOR using the keywords "post (acceptance OR adoption)," and "(IS OR IT) continuance." The rationale for this step was to assure that we would not miss relevant research on IT adoption in the post-acceptance stage, which had only been partially accounted for in the reviews discussed above. This process added ten additional constructs to the original set. Finally, we presented the construct list in a joint workshop to three other IS researchers, asked them to evaluate the constructs' relevance, and identify further constructs that might be relevant in the given context. We intentionally chose IS researchers with different research backgrounds to ensure that our list of constructs was as complete as possible. While no further constructs were identified, the input helped us to group very similar constructs from the list such as "use" and "system utilization." Eventually, we came up with a list of 74 different constructs on IT adoption.

After identifying the relevant constructs on IT adoption, we examined how the various constructs are theoretically related (Bacharach, 1989) and arranged them in our framework accordingly. First, we categorized the constructs together in another workshop into antecedent and contextual factors, user beliefs, motivational and attitude factors, intentions, and outcomes according to how they were used in their original IS context. Second, based on this categorization and the constructs' definitions in the seminal articles, we placed the constructs and the related theories into the different stages of the adoption process. To assure the nomological correctness of our analysis, we also considered recent integrative conceptualizations of motivation and commitment theory to structure the underlying dynamics of our framework (Colquitt et al. 2000; Klein et al. 2012; Locke and Latham 2004). These integrative models describe the underlying psychological mechanisms of goal setting, decision making, and long-term behavior (i.e. an individual behaves not in an ad-hoc fashion but follows a certain course of action over time, Ajzen et al. 2004; Ajzen et al. 2009). In the following section, we synthesize the IT adoption constructs and present our framework that emerged from this process.

4 Synthesis

Looking at the existing theories on technology acceptance leads to a large, complex set of both different and related constructs and approaches. Nevertheless, different theoretical aspects of technology adoption can and should be integrated to uncover the depth and breadth of research in this field (Wixom and Todd, 2005). Our research aims to bring together different theories on IT adoption, and illustrate the nomological network underlying these theories. We assign different antecedent and contextual factors, beliefs, motivational factors, behavioral factors, and outcomes into an integrative

framework of IT adoption that spans the acceptance and post-acceptance stages. For each stage, we point out relevant constructs, which, however, are not meant to represent an exhaustive list.

In summary, our framework (see Figure 1) illustrates a system of various antecedent and contextual factors that determine initial beliefs and personal perceptions of using an IT across two stages of IT adoption: acceptance and post-acceptance. We conceptualize individual IT adoption as a two-stage cycle that spans both acceptance and post-acceptance stage. Each stage of the cycle is based on a causal flow from individual beliefs, to motivation, and, eventually, to behavior. The first cycle is initiated by a system of task-related, technology-related, individual, interpersonal, and situational characteristics and concludes with initial use of a technology. In the second cycle, representing the post-acceptance stage, initial beliefs, motivation, and behavior are adjusted as individuals gain experience with first-hand use of the technology (Bhattacherjee and Premkumar, 2004). Continuation and effective use determine possible outcomes of IT adoption. Outcomes, in turn, cycle back to influence subsequent beliefs and behavior. The process from beliefs to motivation and to behavior is well supported in research on human behavior (Ajzen et al., 2009; Ajzen and Fishbein, 2005). Similar relations have been derived in motivation and commitment research (Locke and Latham, 2004; Klein et al., 2012). Eventually, we relate the stages in our framework to the original theories (summarized in Table 1) as indicated by the arrows in Figure 1. We continue by describing the processes for each stage in our framework.

4.1 Antecedents and contextual factors of information technology adoption

Research has investigated numerous antecedent and contextual factors that influence psychological processes at different stages and in different contexts of IT adoption. We conceptualize antecedent and contextual factors as independent, relatively stable external or internal characteristics that influence different personal beliefs on IT adoption. Although the antecedents are assigned to the acceptance stage, we expect that factors are potentially relevant for both stages of IT adoption. Also, depending on the specific situation of IT use (e.g. voluntary versus mandatory use) the influence of individual factors can differ.

We classified the factors that emerged from our framework development into five categories consistent with the categories of Petter et al. (2013) and Klein et al. (2012). Task characteristics encompass all factors that are associated with the work tasks that are supported by the IT. Work tasks can differ both in general terms depending on an employee's work position or function, and in terms of the relationship to a specific IT. General task characteristics are reflected in factors such as task complexity, while IT specific task characteristics are described by factors such as task virtuality or task variability that measure the closeness or consistency between task and IT (Petter et al., 2013). Technology characteristics specify antecedents that derive from an IT's attributes or capacities. We also included factors such as system or information quality within this class since they refer to technical or content related aspects of an information system rather than beliefs (DeLone and McLean, 2003). Further technical antecedents are described by Wixom and Todd (2005). Individual characteristics encompass a large class of relatively stable personal traits and abilities that influence individual cognition and motivation (Agarwal, 2000; Colquitt et al., 2000). Research on IT adoption includes numerous individual difference characteristics that are linked to self-efficacy and motivation (e.g. computer anxiety, Compeau and Higgins, 1995; Venkatesh, 2000), individual predispositions (e.g. technology readiness, Lin et al., 2007), demographic factors (e.g. gender, Ahuja and Thatcher, 2005), and personal circumstances (e.g. prior experience or use with the IT, Jasperson et al., 2005). Eventually, interpersonal and organizational factors refer to characteristics of the social and professional environment (e.g. team climate, Maruping and Magni, 2012, facilitating resources, Thompson et al., 1991; Jones et al., 2002, and organizational climate, Maruping and Magni, 2012) that influence individual belief evaluations.

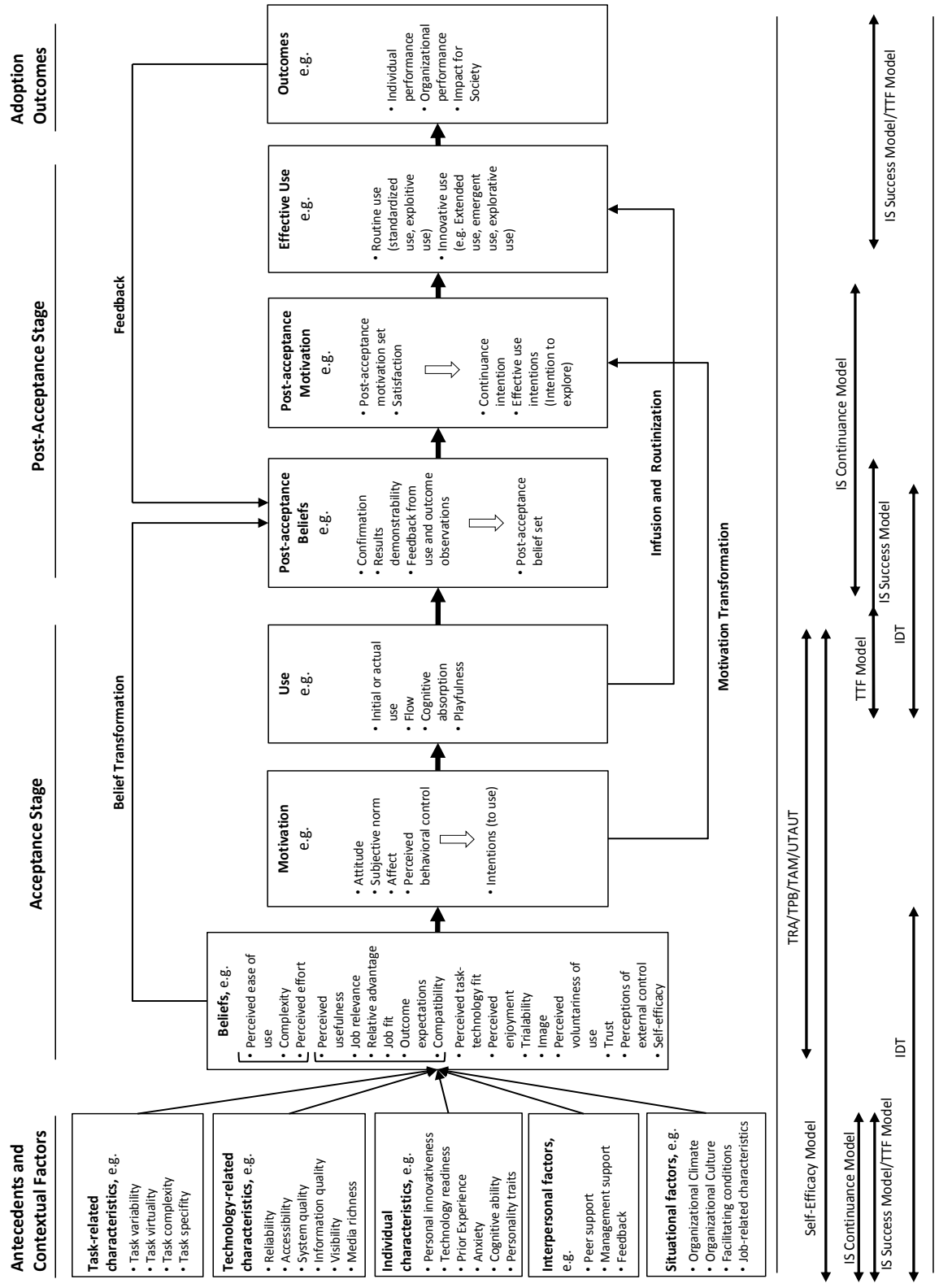

Figure 1. Reference Framework for IT Adoption

4.2 Acceptance stage of information technology adoption

The effect of antecedent factors on behavior is mediated by cognitive beliefs and motivations or attitudes that fall into the acceptance stage of technology adoption (Ajzen and Fishbein, 2005; Zmud, 1979). The key outcome of this stage is personal commitment to use and initial use of an IT (Saga and Zmud, 1994). In the following, we briefly introduce the classes of individual beliefs, motivations, and use. More detailed descriptions of psychological processes during this stage can be found in Agarwal (2000) and Ajzen and Fishbein (2005).

Beliefs: Beliefs are described as an individual's "cognitive evaluation of the consequences of a particular behavior" (Agarwal, 2000, p. 92) (i.e. using an IT application), based on perceptions of the IT's characteristics and the environment within which the IT is used. Depending on the target, beliefs can be distinguished into behavioral, normative, object-based, and control-based beliefs (Ajzen and Fishbein, 2005; Wixom and Todd, 2005). We identified several similar beliefs associated with an IT's perceived usefulness for job related performance as well as regarding an IT's perceived ease of use, which we grouped in our framework's figure (visualized by brackets) to highlight their similarity. As a second class, normative beliefs refer to perceptions that relate to influences of the social environment (Eckhardt et al., 2009) and lead to perceived social pressure or subjective norms (Ajzen and Fishbein, 2005). In contrast, object-based beliefs (e.g. trust in the technology, Lankton et al., 2013, or perceived trialability, Moore and Benbasat, 1991) have only limited impact on behavior but rather shape perceived usefulness and ease of use (Wixom and Todd, 2005). Eventually, control related beliefs refer to perceptions about one's capabilities to succeed in performing a behavior including self-efficacy and perceptions of external control (Ajzen and Fishbein, 2005; Venkatesh, 2000).

Motivations: Personal motivation is attributed to internal and external factors that initiate, energize, and direct individual behavior (Latham and Pinder, 2005). We included the constructs proposed in the theories of reasoned action and planned behavior (i.e. attitude, subjective norm, perceived behavioral control, behavioral intentions, see Ajzen and Madden, 1986) as important motivational factors that initiate subsequent behavior. Ajzen and Madden, (1986, p. 454) note that the constructs used in their theory of reasoned action are "fundamentally motivational in nature." Ajzen et al. (2009) report a positive effect of motivation – assessed as attitude, subjective norms, and intentions – on individual task performance. Other studies, however, report an overall low correlation between attitudes and behavior and between intentions and behavior, conjuring conclusions that motivational factors are limited predictors of behavior (see Ajzen et al., 2009; Ajzen and Fishbein, 2005). As a result, attitude was excluded from the original technology acceptance model. Similarly, personal attitude is found to be insignificant for intentions when accounting for perceived usefulness (Venkatesh et al., 2003). Nevertheless, recent research suggests that low correlations between motivational factors and behavior result, first, from a low stability of these factors over time, and, second, from a lack of compatibility between motivations and the target behavior (Ajzen et al., 2009; Ajzen and Fishbein, 2005).

Use: Original theories on technology acceptance typically measure use through frequency and duration of use (e.g. Compeau and Higgins, 1995; Davis, 1989; Iivari, 2005; Thompson et al., 1991). Burton-Jones and Straub (2006) developed a rich measure of IT use based on different dimensions of the system, task, and context within which the IT is employed. We propose that lean measures of use (e.g. use/non-use, duration, and frequency of use) are appropriate to investigate initial use in the acceptance stage, while rich use measures (e.g. the extent to which an IT is used to carry out tasks) need to be applied to account for use in the post-acceptance stage. We also included measures for cognitive involvement (e.g. flow and cognitive absorption) in this stage since they have been typically used in theories on IT acceptance (e.g. Agarwal and Karahanna, 2000; Hausman and Siekpe, 2009) but recognize their importance also for the post-acceptance stage.

4.3 Post-acceptance stage of information technology adoption

The post-acceptance stage begins with the state where an IT application is used on a regular basis and ends either with the eventual achievement of outcomes or the users' final decision to discontinue use (Cooper and Zmud, 1990). Behavior during the post-acceptance stage is often been assumed to be influenced by the same set of factors that influence the initial acceptance decision (Jasperson et al., 2005). However, beliefs, motivations, and behavior change as a result of users' experiencing with and learning to adapt to various features of the IT. Our framework depicts the dynamics from the acceptance to the post-acceptance stage as transformation processes of individual beliefs, motivations, and use that affect behavior and outcomes of IT adoption.

Belief transformation: Beliefs that are formed during the early adoption phase can change in later stages as users gain first-hand experience with an IT (Bhattacherjee and Premkumar, 2004; Kim and Malhotra, 2005). We use the term transformation to describe the assimilation and fluctuation of personal beliefs during the adoption process. Similarly, Kim and Malhotra (2005) suggest a feedback mechanisms from initial use to future beliefs and use intentions. In the post-acceptance phase, an individual's confirmation of initial beliefs with the IT's characteristics emerge as a new factor that drives transformation of user beliefs (Bhattacherjee, 2001; Bhattacherjee and Premkumar, 2004; Khalifa and Liu, 2003). Among the factors that influence confirmation, we suggest that result demonstrability has an important impact on belief transformation. Result demonstrability, defined as the tangibility of results that are derived from using an innovation (Moore and Benbasat, 1991), is expected to facilitate belief confirmation by increasing the visibility of results (Venkatesh and Davis, 2000). Previous research shows that transformation of beliefs is strongest in the immediate steps following acceptance (Bhattacherjee and Premkumar, 2004), and that users in the early acceptance stage employ a richer set of beliefs compared to later stages of the adoption process (Karahanna et al., 1999). For example, several studies suggest that perceived ease of use becomes less important in the post-acceptance phase as users become accustomed to the IT's features, leading to declining effects of perceived ease of use on attitudes and continuance intention over time (Davis et al., 1989; Hsieh and Wang, 2007; Karahanna et al., 1999; Parthasarathy and Bhattacherjee, 1998; Szajna, 1996; Venkatesh and Morris, 2000). Other determinants of motivation and behavior remain relevant throughout the lifecycle of adoption but are adapted to first-hand experience. For example, past research shows that perceived usefulness remains a significant determinant of users' motivation and intentions in the post-acceptance stage (Bhattacherjee, 2001; Hong et al., 2006; Karahanna et al., 1999). However, an IT's perceived usefulness may change once it is actually used to accomplish work-related tasks. More recently, research has identified additional factors that transform and influence users' continuance intention such as trust in technology (Lankton et al., 2013) and variables proposed in the unified theory of acceptance and use (Venkatesh et al., 2011).

Motivation transformation: Depending on the transformation of beliefs, individual motivation and behavioral dispositions should adjust over time. For example, evidence suggests that the influence of attitudes and subjective norm on users' intentions changes from the pre- to the post-acceptance stage together with users' changing beliefs (Karahanna et al., 1999; Venkatesh et al., 2011). Specifically, use intentions during the post-acceptance stage are strongly determined by users' attitudes towards the technology, while subjective norms become less important as individuals rely more on their own experience rather than on external normative pressure (Karahanna et al., 1999; Venkatesh and Davis, 2000). In addition, satisfactory experiences with using a technology (Bhattacherjee 2001) are a key determinant for intentions in the post-acceptance stage since satisfaction induces repeating the "same course of action" (Limayen et al. 2007 p. 715). Bhattacherjee (2001) conceptualizes IS continuance intention as the subjective probability that users will continue rather than discontinue using a technology. Acknowledging the different dimensions of use during the post-acceptance stage, Maruping and Magni (2012) adopt intention to explore a technology (Nambisan et al., 1999) to predict the individual usage scope. Another view suggests that motivational factors may be replaced by prior

use experience and habit as explanatory factors for behavior during the post-acceptance stage (Jasperson et al., 2005; Kim and Malhotra, 2005; Limayem et al., 2007). Consistent with this view, research has found that use experience and prior use behavior is usually a good predictor of continuance intention and post-acceptance behavior (Karahanna et al., 1999; Venkatesh et al., 2002). However, unlike motivational factors, indicators of past behavior and habit cannot explain how different dimensions of use emerge in the post-acceptance stage (Ajzen and Fishbein, 2005).

Effective use (routinization and infusion): Due to the dynamics of the adoption process, use patterns may change during the post-acceptance stage as users either intensify or extend their use behavior, or reduce and resist to using additional features of the IT (Saga and Zmud, 1994). The term effective use reflects a large suite of different behaviors during the post-acceptance stage including routinization, infusion, and continuance of a technology. Burton-Jones and Grange (2013) define effective use as "using a system in a way to that helps to attain the goals for using the system" (p. 633). It is through this relation to IT performance that effective use extends the concept of initial, or actual IT use (Schwarz and Chin, 2007). DeLone and McLean (2003) argue that research on technology use needs to consider the nature and depth of use in order to "capture the relationship between usage and the realization of expected results" (p. 16). Drawing on the stage model of IT implementation, we propose that effective use can be differentiated into routinization and infusion of technology into work processes. Whereas routinization aims at standardizing and exploiting technology use to improve efficiency and leverage existing work practices (Subramani, 2004), infusion refers to innovative and creative use scenarios (Li et al., 2013; Sundaram et al., 2007). Research has conceptualized a variety of dimensions that relate to infusion, including emergent or explorative use of the IT to support work processes (Ahuja and Thatcher, 2005; Maruping and Magni, 2012; Nambisan et al., 1999; Saeed and Abdinnour, 2011) and extended use, or use of additional system features to support a given task (Hsieh and Wang, 2007; Jasperson et al., 2005). These different use dimensions are a key for understanding and studying outcomes of IT adoption.

4.4 Outcomes of information technology adoption

Many studies on IT adoption stop short of addressing individual and organizational outcomes that result from using an IT over a certain time period. Nevertheless, the available evidence suggests that effective use generates IT-enabled performance, and that infusion has a stronger impact on performance than routinization of use (Sundaram et al. 2007). Although some studies report a link between actual use and outcomes (e.g. Devaraj and Kohli, 2003), more recent results support our view that the achievement of outcomes operates through forms of effective use (Hsieh et al. 2011; Sundaram et al. 2007). In line with DeLone and McLean (2003), our framework also includes a feedback loop from outcomes back to post-acceptance beliefs and confirmation reflecting the dynamic nature of the adoption process.

On an individual level, outcomes are conceptualized as IT-enabled administrative performance (measured in terms of improved work quality) and general task performance (measured in terms of the improved ability to produce key results in a job, e.g. Sundaram et al. 2007; Goodhue and Thompson, 1995; Iivari, 2005). Other outcomes of individual IT adoption are more distal and follow from individual performance. Such outcomes could be enhanced performance and productivity on an organizational level (Devaraj and Kohli, 2003) or impacts for society (e.g. access to and transferrig of information, Seddon, 1997). DeLone and McLean (2003) summarize different impacts of IT use as net benefits; a term that includes both costs and potential negative consequences of IT adoption. For example, Roy Sarkar (2010) reports that significant financial or legal consequences may result from non-adherence or resistance to corporate terms of IT use. In addition, short and mid-term individual outcomes may result from addictive use, which is related to techno-stress, and may have long-term negative effects (Turel et al., 2011).

5 Discussion and Conclusion

Research on technology adoption has cumulated in a large number of theories that cover different aspects of the adoption process. Given the dynamics of individual IT adoption, single theories typically explain only a small portion of the entire IT adoption process. Hence, there is room for integrating different theoretical approaches in a homogenous framework (Wixom and Todd, 2005). The framework we suggest intends to help classifying and comparing different theoretical approaches on IT adoption. While a complete comparison is beyond our scope here, we lay a fundament for developing more complete and actionable theories on IT adoption. In the remainder of this article, we discuss how our framework relates to previous theories on IT adoption, point out our paper's limitations, and provide guidance for future research.

Looking at the scope of the original theories summarized in the foundation section allows for two observations. First, theories have mainly focused on constructs within the acceptance stage of IT adoption as well as on antecedent and contextual factors (see Figure 1). Of the eight original theories, only the IS continuance model (Bhattacherjee, 2001; Bhattacherjee and Premkumar, 2004) specifically considers the post-acceptance stage. Although the IS success model (DeLone and McLean, 2003) and the innovation diffusion theory (Rogers, 1983) refer to the post-acceptance stage in their consequences (see Table 1), both theories' focal constructs are linked to the acceptance stage and do not consider direct antecedents of outcomes. Second, several theories exhibit a conceptual gap between different stages of the adoption process. For example, the IS success model (DeLone and McLean, 2003) and task-technology fit model (Goodhue and Thompson, 1995) propose a direct relationship between IT use and performance impact without considering the role of individual motivations during the post-acceptance stage. The absence of behavioral attitudes in the IS success literature has also been noted by Wixom and Todd (2005). Similarly, innovation diffusion theory neglects the mediating role of motivation between initial beliefs and use. While the absence of mediating constructs does not diminish the theory's practicality, gaps in our understanding of the underlying psychological processes may account for "equivocal relationships" within the adoption process (Wixom and Todd, 2005 p. 89).

The presented framework is not an exhaustive model. Rather, we have limited our synthesis to models and constructs that have been well established in IT adoption research. The comprehensiveness as well as the complexity of the framework can and should be extended by integrating further theories from the IS field (e.g. the PC utilization model, Thompson et al., 1991, the theory of interpersonal behavior, Triandis, 1977, or appropriation theory, Mendoza et al., 2010) as well as from neighboring disciplines (e.g., from motivation or commitment theory, Locke and Latham, 2004; Klein et al., 2012). We also focused our analysis on the models in their original forms. Recent extensions of some of these models (e.g. the UTAUT, Venkatesh et al., 2011) cover additional aspects of both acceptance and post-acceptance stages. Moreover, our framework is based on the dominant positivist research paradigm that looks at the quantitative aspects of innovation (i.e. the "extent" of adoption). Fichman (2004), for example, proposed a more innovative approach that also considers aspects such as the quality of the innovation as dependent variable of IT adoption.

Our framework touches several issues that remain open for future research. We summarize possible questions in Table 2. As a first field for future research, we see a broadening set of antecedent and contextual factors linked to IT adoption that we categorize in our framework into five classes. Nevertheless, the influence of these factors on different individual beliefs, motivation, and behavior across different stages of the adoption process provides further research opportunities. For example, research has found that prior experience and habit influence post-acceptance behavior suggesting that the importance of these factors increases in later stages of the adoption process (Jasperson et al., 2005; Kim and Malhotra, 2005; Limayem et al., 2007).

As a second category, research opportunities emerge from the overlapping of different theoretical beliefs and motivations during the acceptance stage. During the development of our framework, we

noted the similarity of different constructs relating to perceived usefulness of an IT application for work purposes. One possible path would therefore be to re-conceptualize the dimensions related to an IT's perceived usefulness and provide clarity on the constructs in line with Suddaby (2010). Moreover, while some beliefs have transitory effects on users' motivation, others are more persistent and also influence the post-acceptance stage. However, we lack understanding of which beliefs transform due to conscious updating mechanisms, which are influenced by prior use, and which remain relatively stable over time. A further question concerns the role of personal commitment to use a technology. Commitment, defined as an internal bond that binds an individual to a course of action, has recently been conceptualized as a mediator between beliefs and motivation (Klein et al., 2012). While commitment is also emphasized as a characteristic force of the acceptance stage (Cooper and Zmud, 1990), we found no evidence that commitment has been explicitly considered in IT adoption research.

Antecedent and Contextual Factors	• Which contextual factors have continuing effects on individual post-adoption beliefs, and which factors are transitory, with effects fading over time?
Acceptance Stage	• What is the relationship between overlapping individual beliefs, such as perceived usefulness and job fit? • Which beliefs have distal in addition to proximal effects on post-acceptance motivation and use? What is the role of personal commitment for individual technology acceptance?
Post-acceptance Stage	• How do personal beliefs (such as perceived ease of use) and motivations (such as intentions) change over time as individuals move from the acceptance to the post-acceptance stage? • Why do use patterns change over time as users move from the acceptance to the post-acceptance stage?
Outcomes	• What is the effect of different use dimensions for individual (and organizational) performance outcomes?

Table 2. Areas for Future Research

A third research perspective relates to the transformation of beliefs, motivation, and behavior during the post-acceptance stage. For example, there is evidence that individual beliefs such as perceived ease of use change over time. However, while the majority of studies concludes that perceived ease of use becomes less important (to the point of being insignificant) in the post-acceptance stage, research has also found positive effects of perceived ease of use on users' continuance intentions and extended use (Hsieh and Wang, 2007; Liao et al., 2009; Venkatesh et al., 2011). Similarly, changes in IT use over time are attributed primarily to satisfactory or unsatisfactory use experiences during the post-acceptance stage that either led to confirmation or disconfirmation of the initial use decision. Again, the concept of habit (Limayen et al., 2007, Kim and Malhotra, 2005) offers an additional perspective on (un-)changed use behavior which could be used to investigate the drivers of use patterns over time. Eventually, very little research has addressed the relationship between different dimensions of effective use and performance outcomes. Rather, research examining the effects of IT adoption on individual or organizational performance has focused on initial use measures, without considering more complex use forms (see e.g. DeLone and McLean, 2003; Iivari, 2005). Future research might thus put effort into exploratory studies on these more complex use forms.

In conclusion, this article contributes to research in three ways. First, we synthesize different theoretical models and stages of IT adoption and use, covering the adoption process from acceptance to outcomes (end-to-end view). The resulting framework helps researchers to classify and consolidate different determinants of acceptance and post-acceptance behavior. Second, our framework conceptualizes the nomological network and the dynamics of the adoption process through the transformations of users' beliefs and motivations from the acceptance to the post-acceptance stage. Third, our integrative view on IT adoption reveals determinants and aspects of adoption and use that are conceptually similar (e.g. beliefs regarding the usefulness) or distinct (initial versus effective use).

References

Agarwal, R. (2000). Individual acceptance of information technologies, in: Framing the domains of IT management research: Glimpsing the future through the past, (R.W. Zmud ed.), Cincinatti, OH: Pinnaflex, 85-104.

Agarwal, R. and Karahanna, E. (2000). Time flies when you're having fun: Cognitive absorption and beliefs about information technology usage. MIS Quarterly, 24 (4), 665-694.

Agarwal, R. and Prasad, J. (1998). A conceptual and operational definition of personal innovativeness in the domain of information technology. Information Systems Research, 9 (2), 204-215.

Ahuja, M.K. and Thatcher, J.B. (2005). Moving beyond intentions and toward the theory of trying: Effects of work environment and gender on post-adoption information technology use. MIS Quarterly, 29 (3), 427-459.

Ajzen, I. (1991). The theory of planned behavior. Organizational Behavior and Human Decision Processes, 50 (2), 179-211.

Ajzen, I., Brown, T.C. and Carvajal, F. (2004). Explaining the discrepancy between intentions and actions: The case of hypothetical bias in contingent valuation. Personality and Social Psychology Bulletin, 30 (9), 1108-1121.

Ajzen, I., Czasch, C. and Flood, M.G. (2009). From intentions to behavior: Implementation intention, commitment, and conscientiousness. Journal of Applied Social Psychology, 39 (6), 1356-1372.

Ajzen, I. and Fishbein, M. (2005). The influence of attitudes on behavior, in: The handbook of attitudes, (D. Albarracín, B.T. Johnson and M.P. Zanna eds.), Mahwahm, NJ: Lawrence Erlbaum Associates, 173-222.

Ajzen, I. and Madden, T.J. (1986). Prediction of goal-directed behavior: Attitudes, intentions, and perceived behavioral control. Journal of experimental social psychology, 22 (5), 453-474.

Bacharach, S.B. (1989). Organizational theories: Some criteria for evaluation. Academy of Management Review, 14 (4), 496-515.

Bagozzi, R.P. (2011). Measurement and meaning in information systems and organizational research: Methodological and philosophical foundations. MIS Quarterly, 35 (2), 261-292.

Bandura, A. (1989). Human agency in social cognitive theory. American Psychologist, 44 (9), 1175-1184.

Baskerville, R. and Pries-Heje, J. (2001). A multiple-theory analysis of a diffusion of information technology case. Information Systems Journal, 11 (3), 181-212.

Benbasat, I. and Henri, B. (2007). Quo vadis TAM? Journal of the Association for Information Systems, 8 (1), 211-218.

Bhattacherjee, A. (2001). Understanding information systems continuance: An expectation-confirmation model. MIS Quarterly, 25 (3), 351-370.

Bhattacherjee, A. and Premkumar, G. (2004). Understanding changes in belief and attitude toward information technology usage: A theoretical model and longitudinal test. MIS Quarterly, 28 (2), 229-254.

Bolt, M.A., Killough, L.N. and Koh, H.C. (2001). Testing the interaction effects of task complexity in computer training using the social cognitive model. Decision Sciences, 32 (1), 1-20.

Burton-Jones, A. and Grange, C. (2013). From use to effective use: A representation theory perspective. Information Systems Research, 24 (3), 632-658.

Burton-Jones, A. and Straub, D.W. (2006). Reconceptualizing system usage: An approach and empirical test. Information Systems Research, 17 (3), 228-246.

Bussen, W. and Myers, M.D. (1997). Executive information system failure: A new zealand case study. Journal of Information Technology, 12 (2), 145-153.

Chin, W.W. and Marcolin, B.L. (2001). The future of diffusion research. ACM Sigmis Database, 32 (3), 7-12.

Colquitt, J.A., LePine, J.A. and Noe, R.A. (2000). Toward an integrative theory of training motivation: A meta-analytic path analysis of 20 years of research. Journal of Applied Psychology, 85 (5), 678-707.

Compeau, D.R. and Higgins, C.A. (1995). Computer self-efficacy: Development of a measure and initial test. MIS Quarterly, 189-211.

Cooper, H.M. (1998). Synthesizing research: A guide for literature reviews. Sage, London.

Cooper, R.B. and Zmud, R.W. (1990). Information technology implementation research: A technological diffusion approach. Management Science, 36 (2), 123-139.

Davis, F.D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. MIS Quarterly, 319-340.

Davis, F.D., Bagozzi, R.P. and Warshaw, P.R. (1989). User acceptance of computer technology: A comparison of two theoretical models. Management Science, 35 (8), 982-1003.

DeLone, W.H. and McLean, E.R. (2003). The DeLone and McLean model of information systems success: A ten-year update. Journal of Management Information Systems, 19 (4), 9-30.

Deng, X. and Chi, L. (2012). Understanding postadoptive behaviors in information systems use: A longitudinal analysis of system use problems in the business intelligence context. Journal of Management Information Systems, 29 (3), 291-326.

Devaraj, S. and Kohli, R. (2003). Performance impacts of information technology: Is actual usage the missing link? Management Science, 49 (3), 273-289.

Dillon, A. and Morris, M.G. (1996). User acceptance of new information technology: Theories and models. Annual Review of Information Science and Technology 31, 3-32.

Eckhardt, A., Laumer, S. and Weitzel, T. (2009). Who influences whom? Analyzing workplace referents' social influence on it adoption and non-adoption. Journal of Information Technology, 24 (1), 11-24.

Fichman, R.G. (2001). The role of aggregation in the measurement of IT-related organizational innovation. MIS Quarterly, 25 (4), 427-455.

Fichman, R.G. (2004). Going beyond the dominant paradigm for information technology innovation research: Emerging concepts and methods. Journal of the Association for Information Systems, 5 (8), 314-355.

Fishbein, M. and Ajzen, I. (1975). Belief, attitude, intention and behavior: An introduction to theory and research. Addison-Wesley, Boston.

Gefen, D. and Straub, D.W. (2000). The relative importance of perceived ease of use in IS adoption: A study of e-commerce adoption. Journal of the Association for Information Systems, 1, 1-28.

Goodhue, D.L. and Thompson, R.L. (1995). Task-technology fit and individual performance. MIS Quarterly, 213-236.

Hameed, M.A., Counsell, S. and Swift, S. (2012). A conceptual model for the process of it innovation adoption in organizations. Journal of Engineering and Technology Management, 29 (3), 358-390.

Hausman, A.V. and Siekpe, J.S. (2009). The effect of web interface features on consumer online purchase intentions. Journal of Business Research, 62 (1), 5-13.

Hong, S., Thong, J.Y. and Tam, K.Y. (2006). Understanding continued information technology usage behavior: A comparison of three models in the context of mobile internet. Decision Support Systems, 42 (3), 1819-1834.

Hsieh, J.P.-A., Rai, A. and Xu, S.X. (2011). Extracting business value from IT: A sensemaking perspective of post-adoptive use. Management Science, 57 (11), 2018-2039.

Hsieh, J.P.-A. and Wang, W. (2007). Explaining employees' extended use of complex information systems. European Journal of Information Systems, 16 (3), 216-227.

Iivari, J. (2005). An empirical test of the DeLone-McLean model of information system success. ACM Sigmis Database, 36 (2), 8-27.

Jasperson, J., Carter, P.E. and Zmud, R.W. (2005). A comprehensive conceptualization of post-adoptive behaviors associated with information technology enabled work systems. MIS Quarterly, 29 (3), 525-557.

Jones, E., Sundaram, S. and Chin, W. (2002). Factors leading to sales force automation use: A longitudinal analysis. The Journal of Personal Selling and Sales Management, 145-156.
Karahanna, E., Straub, D. and Chervany, N. (1999). Information technology adoption across time: A cross-sectional comparison of pre-adoption and post-adoption beliefs. MIS Quarterly, 23, 183-213.
Khalifa, M. and Liu, V. (2003). Determinants of satisfaction at different adoption stages of internet-based services. Journal of the Association for Information Systems, 4 (1), 12.
Kim, S.S. and Malhotra, N.K. (2005). A longitudinal model of continued is use: An integrative view of four mechanisms underlying postadoption phenomena. Management Science, 51 (5), 741-755.
Klein, H.J., Molloy, J.C. and Brinsfield, C.T. (2012). Reconceptualizing workplace commitment to redress a stretched construct: Revisiting assumptions and removing confounds. Academy of Management Review, 37 (1), 130-151.
Lankton, N., McKnight, D.H. and Thatcher, J.B. (2013). Incorporating trust-in-technology into expectation disconfirmation theory. The Journal of Strategic Information Systems, in press.
Larsen, K.R.T. (2003). A Taxonomy of Antecedents of Information Systems Success: Variable Analysis Studies. Journal of Management Information Systems, 20 (2), 169-246.
Latham, G.P. and Pinder, C.C. (2005). Work motivation theory and research at the dawn of the twenty-first century. Annual Review of Psychology, 56, 485-516.
Legris, P., Ingham, J. and Collerette, P. (2003). Why do people use information technology? A critical review of the technology acceptance model. Information & Management, 40 (3), 191-204.
Li, X., Hsieh, J.J.P.-A. and Rai, A. (2013). Motivational differences across post-acceptance information system usage behaviors: An investigation in the business intelligence systems context. Information Systems Research, 24 (3), 659-682.
Liao, C., Palvia, P. and Chen, J.-L. (2009). Information technology adoption behavior life cycle: Toward a technology continuance theory (tct). International Journal of Information Management, 29 (4), 309-320.
Limayem, M., Hirt, S.G. and Cheung, C.M. (2007). How habit limits the predictive power of intention: The case of information systems continuance. MIS Quarterly, 705-737.
Lin, C.H., Shih, H.Y. and Sher, P.J. (2007). Integrating technology readiness into technology acceptance: The TRAM model. Psychology & Marketing, 24 (7), 641-657.
Locke, E.A. and Latham, G.P. (2004). What should we do about motivation theory? Six recommendations for the twenty-first century. Academy of Management Review, 29 (3), 388-403.
Maruping, L.M. and Magni, M. (2012). What's the weather like? The effect of team learning climate, empowerment climate, and gender on individuals' technology exploration and use. Journal of Management Information Systems, 29 (1), 79-114.
Mendoza, A., Carroll, J. and Stern, L. (2010). Software Appropriation over Time: From Adoption to Stabilization and Beyond. Australasian Journal of Information Systems, 16 (2), 5-23.
Moore, G.C. and Benbasat, I. (1991). Development of an instrument to measure the perceptions of adopting an information technology innovation. Information Systems Research, 2 (3), 192-222.
Nambisan, S., Agarwal, R. and Tanniru, M. (1999). Organizational mechanisms for enhancing user innovation in information technology. MIS Quarterly, 23 (3), 365-395.
Newman, M. and Sabherwal, R. (1996). Determinants of commitment to information systems development: A longitudinal investigation. MIS Quarterly, 20 (1), 23-54.
Oliver, R.L. (1980). A cognitive model of the antecedents and consequences of satisfaction decisions. Journal of marketing research, 17 (4), 460-469.
Parthasarathy, M. and Bhattacherjee, A. (1998). Understanding post-adoption behavior in the context of online services. Information Systems Research, 9 (4), 362-379.
Petter, S., DeLone, W. and McLean, E.R. (2013). Information systems success: The quest for the independent variables. Journal of Management Information Systems, 29 (4), 7-62.
Rivard, S. and Lapointe, L. (2012). Information technology implementers' responses to user resistance: Nature and effects. MIS Quarterly, 36 (3), 897-920.
Rogers, E.M. (1983). Diffusion of innovations. The Free Press, New York.

Roy Sarkar, K. (2010). Assessing insider threats to information security using technical, behavioural and organisational measures. Information Security Technical Report, 15 (3), 112-133.
Saeed, K.A. and Abdinnour, S. (2011). Understanding post-adoption is usage stages: An empirical assessment of self-service information systems. Information Systems Journal, 23 (2), 219-244.
Saga, V.L. and Zmud, R.W. (1994). The nature and determinants of IT acceptance, routinization, and infusion, in: Diffusion, transfer, and implementation of information technology, (L. Levine ed.), Pittsburgh, PA: Software Engineering Institute,Carnegie Mellon University, 67-86.
Schwarz, A. and Chin, W. (2007). Looking forward: Toward an understanding of the nature and definition of it acceptance. Journal of the Association for Information Systems, 8 (4), 230-243.
Seddon, P.B. (1997). A respecification and extension of the DeLone and McLean model of IS success. Information Systems Research, 8 (3), 240-253.
Subramani, M. (2004). How do suppliers benefit from information technology use in supply chain relationships? MIS Quarterly, 28 (1), 45-73.
Suddaby, R. (2010). Editor's comments: Construct clarity in theories of management and organization. Academy of Management Review, 35 (3), 346-357.
Sundaram, S., Schwarz, A., Jones, E. and Chin, W. (2007). Technology use on the front line: How information technology enhances individual performance. Journal of the Academy of Marketing Science, 35 (1), 101-112.
Szajna, B. (1996). Empirical evaluation of the revised technology acceptance model. Management Science, 42 (1), 85-92.
Taylor, S. and Todd, P. (1995). Assessing IT usage: The role of prior experience. MIS Quarterly, 19 (4), 561-570.
Thompson, R.L., Higgins, C.A. and Howell, J.M. (1991). Personal computing: Toward a conceptual model of utilization. MIS Quarterly, 15 (1), 125-143.
Triandis, H.C. (1977). Interpersonal behavior. Brooks/Cole Publishing Company, Monterey.
Turel,O., Serenko, A. and Giles, P. (2011). Integrating technology addiction and use: An empirical investigation of online action users. MIS Quarterly, 35 (4), 1043-A18.
Venkatesh, V. (2000). Determinants of perceived ease of use: Integrating control, intrinsic motivation, and emotion into the technology acceptance model. Information Systems Research, 11 (4), 342-365.
Venkatesh, V. and Bala, H. (2008). Technology acceptance model 3 and a research agenda on interventions. Decision Sciences, 39 (2), 273-315.
Venkatesh, V. and Davis, F.D. (2000). A theoretical extension of the technology acceptance model: Four longitudinal field studies. Management Science, 46 (2), 186-204.
Venkatesh, V. and Morris, M.G. (2000). Why don't men ever stop to ask for directions? Gender, social influence, and their role in technology acceptance and usage behavior. MIS Quarterly, 24 (1), 115-140.
Venkatesh, V., Morris, M.G., Davis, G.B. and Davis, F.D. (2003). User acceptance of information technology: Toward a unified view. MIS Quarterly, 27 (3), 425-478.
Venkatesh, V., Speier, C. and Morris, M.G. (2002). User acceptance enablers in individual decision making about technology: Toward an integrated model. Decision Sciences, 33 (2), 297-316.
Venkatesh, V., Thong, J.Y.L., Chan, F.K.Y., Hu, P.J.H. and Brown, S.A. (2011). Extending the two-stage information systems continuance model: Incorporating utaut predictors and the role of context. Information Systems Journal, 21 (6), 527-555.
Williams, M.D., Dwivedi, Y.K., Lal, B. and Schwarz, A. (2009). Contemporary trends and issues in IT adoption and diffusion research. Journal of Information Technology, 24 (1), 1-10.
Wixom, B.H. and Todd, P.A. (2005). A theoretical integration of user satisfaction and technology acceptance. Information Systems Research, 16 (1), 85-102.
Wu, J. and Lu, X. (2013). Effects of extrinsic and intrinsic motivators on using utilitarian, hedonic, and dual-purposed information systems: A meta-analysis. Journal of the Association for Information Systems, 14 (3), 153-191.

Zhu, K. and Kraemer, K.L. (2005). Post-adoption variations in usage and value of e-business by organizations: Cross-country evidence from the retail industry. Information Systems Research, 16 (1), 61-84.

Zmud, R.W. (1979). Individual differences and mis success: A review of the empirical literature. Management Science, 25 (10), 966-979.