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Incorporating trust-in-technology into Expectation Disconfirmation Theory

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ABSTRACT

Continued use of strategic information systems is not always a given. This study proposes that users' trust in the system may influence their satisfaction and continuance intention. While trust has been found to have strategic implications for understanding consumers' technology usage, relatively little research has examined how trust's influence operates over time. To gain insight into trust's influence on strategic system usage over time and to explain how trust relates to satisfaction and continuance intention, we integrate trust-related constructs with the Complete Expectation Disconfirmation Theory (EDT) Model. Our results demonstrate that trust plays a central role in the EDT process and that the EDT process helps explain trust's role more completely. The study shows that technology trusting expectations influence trusting intention through performance, disconfirmation, and satisfaction. We also show that technology trusting intention adds predictive power to EDT's satisfaction construct as together they predict usage continuance intention. For research, our results provide a strong combined EDT and trust theory base for future studies that examine expectation management and system development projects. For practice, our study informs systems implementation strategies for technologies that have fewer human-like characteristics and more technology-like characteristics. Our findings underscore that managers need to adopt an EDT process-based view when seeking to build trust, satisfaction, and continuance intention in strategically important information systems.

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1. Introduction

Strategic information systems like ERP systems can enhance operations by allowing lower-level employees to act more autonomously and make decisions that were once relegated to mid- and upper-level management (Bloom et al., 2010). Despite these benefits, workers' satisfaction and continued use of these systems is not always assured. For example, Dorset County Council in the UK recently implemented a multi-million-pound ERP system that staff is unsatisfied with because jobs that used to take only a minute now take an hour (Dorset Echo, 2010). As another example, Infosys Technologies Ltd. implemented a customer relationship management system that sales and delivery personnel initially accepted, but did not continue using because it was difficult to use, and did not provide real-time information sharing (Chatterjee and Watson, 2006).

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These examples illustrate the need to increase satisfaction and continued use of strategic information systems among lower-level, front-line users.

One way in which this might be done is by increasing users' trust in technology. Trust plays an important role in many organizational strategies involving information systems (IS) such as e-commerce (Gefen et al., 2003), virtual teams (Kanawattanachai and Yoo, 2002), and inter-organizational relationships (Nicolaou et al., 2011). Most past IS trust research has examined trust in humans or human organizations such as the e-commerce vendor, virtual team member, or trade partner. However lately, despite differences between human-technology exchanges and interpersonal exchanges, more and more researchers acknowledge that many people also trust the technological artifact itself. This type of trust is what we mean by trust in technology. This view of human-technology relationships has motivated researchers to study trust in strategic IS applications such as online recommendation agents (Wang and Benbasat, 2005), business information systems (Lippert and Swiercz, 2005; Lippert, 2007), m-commerce portals (Vance et al., 2008), and knowledge management systems (Thatcher et al., 2011).

While this emerging research area finds that trust in technology plays an important role in IT adoption, it is unclear <u>how</u> technology trusting expectations and subsequent experiences with the technology contribute to important IT-related outcomes. Understanding how trust relates to outcomes such as satisfaction or continuance intention is important, because they can shape long-term use of strategically important IT. When users' hands-on experience with a technology matches their technology trust expectations, users may express higher satisfaction and continuance intentions. By contrast, unmet expectations may have negative consequences that could lead users to not use or abandon the technology. For example, one reason for the failure of the customer relationship management system for Infosys was unmet user expectations. IS researchers agree that expectation management is a key component of system development and implementation success or failure (Al-Mashari et al., 2003; Brown et al., 2012; Ginzberg, 1981; Lyytinen and Hirschheim, 1987).

In this study, we use Expectation Disconfirmation Theory (EDT) to better understand how technology trusting expectations influence subsequent usage perceptions and outcomes. EDT explains how IS users follow a process of expectation formation, trial, and disconfirmation to form satisfaction and continuance intentions (Bhattacherjee and Premkumar, 2004). IT *expectations* means projections of how the technology will perform in the future in terms of certain attributes (Bhattacherjee and Premkumar, 2004; Spreng and Page, 2003). *Disconfirmation* means the extent to which a technology performs either better or worse than one initially expects on those attributes (Bhattacherjee and Premkumar, 2004). Examining the relationship between expectations and subsequent experiences using EDT is an important area of inquiry in many domains including IS (see Brown et al., 2008 for a discussion). Linking EDT with trust in technology seems natural because trust researchers have described trust-building as an expectation–disconfirmation process (Lewicki and Bunker, 1995; Lewicki et al., 2006). Further, by integrating two research streams—trust-in-technology and EDT, research can provide a richer understanding of both phenomena (Venkatesh et al., 2011). Using all the EDT variables along with trust provides a more complete way of examining how trust and expectations work. Not only can it help explain the technology trust-building process, it can expand the generalizability and applicability of the EDT model. By teasing out these complex relationships, trust-in-technology research could provide practical guidance for software developers and organizations implementing strategic IS.

This study advances our understanding of trust's role in the EDT process for strategic IS by integrating two trust-in-technology components, technology trusting expectations (expectations that the technology has desirable attributes) and technology trusting intention (the willingness to depend on a technology), with the Complete EDT Model (Oliver, 1997). Using both technology trusting components preserves the dual meaning of trust (as beliefs and an intention) as depicted in prominent trust research (Mayer et al., 1995; Rousseau et al., 1985). Also, this research underscores that a technology or IT artifact, rather than an organization or e-vendor, may serve as the EDT trust object.

This integrative research contributes in two ways to the theoretical understanding of trust, EDT, and information systems strategy. First, we incorporate technology trusting expectations into our EDT model. Prior IT EDT literature has examined various IT-related expectations such as usefulness and ease of use (Bhattacherjee and Premkumar, 2004; Brown et al., 2008; Venkatesh et al., 2011), and information, system, and service quality type expectations (Bhattacherjee, 2001; McKinney et al., 2002) (see Table 1 for sample IT EDT studies). One study that examines trust-related expectations uses *human-like* technology-trust attributes (integrity, competence, and benevolence) (Venkatesh et al., 2011). We build on this research by using *technology* trusting expectations (see McKnight et al., 2011) that are based on system-like technology trusting attributes (reliability, functionality, and helpfulness). We demonstrate that these system-like technology trusting attributes conceptually relate to the more human-like attributes and argue that they may be more appropriate to use for less human-like technologies like business information systems. Our research contributes by being the first that connects system-like trust expectations to EDT.

Second, we incorporate technology trusting intention into EDT. We empirically investigate how technology trusting expectations influence technology trusting intention *through performance, disconfirmation, and satisfaction*. While IT trust research finds a direct relationship between trusting expectations and trusting intention (Lowry et al., 2008), this study contributes by examining the indirect relationship between trusting expectations and trusting intention through EDT variables. Individuals first assess the technology's performance and whether the performance was better or worse than initially expected before deciding their willingness to depend on the system. By including disconfirmation and performance in the research model, we examine this process. We also demonstrate that usage continuance intention is predicted by both satisfaction <u>and</u> trusting intention toward the system. While EDT research finds the first effect and trust research the latter, this is the first study to our knowledge to hypothesize and show how their effects complement each other.