Different Views and Evaluations of IT Artifacts

Sameh Al-Natour, Izak Benbasat

Abstract—The introduction of a multitude of new and interactive e-commerce information technology (IT) artifacts has impacted adoption research. Rather than solely functioning as productivity tools, new IT artifacts assume the roles of interaction mediators and social actors. This paper describes the varying roles assumed by IT artifacts, and proposes and distinguishes between four distinct foci of how the artifacts are evaluated. It further proposes a theoretical model that maps the different views of IT artifacts to four distinct types of evaluations.

Keywords—IT adoption, IT artifacts, similarity, social actor.

I. INTRODUCTION

ELECTRONIC commerce (e-commerce) has changed the research emphasis associated with the adoption and use of information technology (IT) artifacts, due to the very unique nature of the online shopping context. In this online setting, the IT artifact itself became an instrumental player whose design can affect not only its adoption and level of usage, but also the nature of the unfolding relationship between the customer and the online store.

While initially adopting a transactional perspective, early research in e-commerce has focused on the study of e-commerce exchanges and ways of improving their speed, accuracy, and efficiency. This limited focus on transactions that are characterized by distinct beginnings, short durations, and clear endings [1], has quickly shifted in recent years towards an increased focus on relationship-building strategies, which include a range of ongoing processes encompassing all activities directed toward establishing, developing, and maintaining successful relational exchanges between customers and online stores.

Online stores as well, due to the high costs of attracting and retaining customers, have realized the importance of building ongoing steady relationships with their customers, as well as providing them with a gratifying shopping experience. Consequently, a multitude of new IT artifacts were introduced that support different aspects of the customer-online store relationship, by focusing on all interactions ranging from the pre-purchase to the post-purchase stages [2]. Instead of the narrow focus on artifacts that support the exchange itself, practitioners and researchers alike, have shifted their attention to investigating the issues related to new IT artifacts, which can often be customized to meet the customer's specific needs, through focusing on issues of communication between a customer and the online company, including the personnel and

other customers of this company [3]. Hence, while initially focusing on the customer's interaction with a website (as an IT artifact), and being more concerned with the traditional goals of efficient and effective exchanges, adopting a relational view has shifted the focus to customers' interactions with all types of IT artifacts on a website, or interactions with personnel (e.g., live help) and other customers (e.g., product reviews) that are mediated by IT artifacts that are available through the website.

These two perspectives are not so much contradictory as complementary. Ideally, e-commerce researchers and practitioners alike should understand how to design e-commerce interfaces that facilitate both the execution of transactions and the development of relationships with customers by creating tools for utilizing and communicating information [3].

Our first major concern with the studies conducted to date is that while many of them have focused on the relational and experiential aspects of online shopping, the theories they have utilized pay exclusive attention to the cognitive beliefs of adoption. The proposed models are often based on such theories as the Theory of Reasoned Action (TRA) [4] or the Technology Acceptance Model (TAM) [5], both of which focus on the more extrinsic determinants of customer intentions to accept and adopt e-commerce IT artifacts, including perceived usefulness, ease of use, subjective norm, and perceived behavioral control.

In an effort to adapt traditional theories of adoption to better suit the e-commerce context, a substantial amount of recent e-commerce research has attempted to resolve the first restriction imposed by traditional theories of adoption, that of paying exclusive attention to cognitive beliefs (adopting a utilitarian focus), by supplementing them with one or more types of social or relational constructs that were often confined to interpersonal context.

For example, trustworthiness, a social attribution often confined to human-like entities, has been studied in regards to IT artifacts, such as websites [6] and online recommendation agents [7]. Additionally, researchers have attempted to study other social dispositions, such as social presence manifested by avatars representing service personnel [8], and the role of the IT artifact's design characteristics in affecting perceptions of telepresence and interaction enjoyment when communicating with other shoppers [9] or human service personnel [8].

The remainder of the paper proceeds as follows: First, we different types of beliefs that are used to evaluate IT artifacts. Second, we describe the different views of IT artifacts, and make general propositions on these views determine the types of salient evaluations.

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II. THE DIFFERENT EVALUATION FOCI

Driven by the changing nature of user-artifact interactions, researchers have started supplementing traditional models of adoption with new types of behavioral beliefs. In addition to adopting a utilitarian focus, in which cognitive beliefs are proposed to determine adoption and use, additional foci are introduced that help researchers capture the relational and experiential aspects of these interactions. The resultant new belief types can be classified into three categories [10]: 1) social beliefs, which are beliefs about the social outcomes of using the system, excluding any outcomes pertaining to the exchange itself (e.g., social presence, [8]), 2) emotional beliefs, which are beliefs regarding users' affective states while using the system (e.g., perceived enjoyment [11]), and 3) relational beliefs, which are beliefs concerning the exchange aspects of the customer's interaction with the IT artifact (e.g., trust, [7]).

Table I describes the main features of the four evaluations foci. First, cognitive evaluations are distinguished by their focus on the extrinsic rewards that are obtained at the end of the interaction. In so doing, they take a cross-sectional view of such interactions, which are assumed to be transactional in nature.

The relational view of user-artifact interactions, however, emphasizes both the user experience and the outcomes of the interaction. In essence, this view assumes that the interaction itself is rewarding, yet also facilitates the attainment of extrinsic benefits at the end of the interaction. Similarly, both the social and emotional foci emphasize the role of the user experience in determining her adoption and use decisions. Yet, unlike the relational view, the social and emotional views assume that users are intrinsically motivated, and the benefits they hope to obtain are intangible in nature, and are attained only during the interaction.

The following section describes how the different views of IT artifacts can be mapped to these different types of evaluations.

III. DIFFERENT VIEWS OF IT ARTIFACTS AND RELEVANT EVALUATIONS

The theoretical model in Fig. 1 posits that e-commerce IT artifacts can be viewed in different ways. More specifically, when mediating interactions between a customer and another entity (e.g., other customers, service personnel, the company), the artifact is viewed as an *interaction mediator*.

Alternatively, the same e-commerce artifact can also be used in ways other than that of facilitating communication with the company, its employees, or other shoppers. More specifically, these artifacts can perform the function of supporting the customer when performing a certain task and enhancing her performance, thus, acting as a *productivity tool*. For example, whilst a website serves to mediate a customer's interaction with an online vendor when the placing an order, it also functions, through its informational content and search functionality, as a productivity tool that enhances the customer's performance in choosing the right product.

TABLE I
DIFFERENT FOCI FOR IT ARTIFACT EVALUATIONS

Focus	Characteristics
Utilitarian	• **Premise:** Using e-commerce technological artifacts (behavior) can be rewarding (outcome). • Focus on utilitarian benefits. • Uses "**cognitive**" beliefs to predict adoption (e.g., PU). • Users are assumed to be **extrinsically motivated**. • Benefits achieved at the end of the interaction. • **Cross-sectional** focus (ignores post-adoption behavior and repeated use). • Emphasizes the "**exchange**" part of the interaction, and hence, the "**transactional**" aspects of the interaction.
Relational	• **Premise:** Using e-commerce technological artifacts (behavior) allows customers to form relationships (outcome). • Focus on **relational benefits**. • Uses "**relational**" beliefs to predict adoption (e.g., Trust). • Users are both **intrinsically** and **extrinsically motivated**. • Benefits achieved **during** or at the **end** the interaction (or even in **subsequent interactions**). • Mainly a **temporal** focus. • Emphasizes the "**relationship**" part of the interaction. While this is formed through the "**experience**", it is manifested through the "**exchange**".
Social	• **Premise:** Using e-commerce technological artifacts (behavior) allows customers to engage in social interactions (outcome). • Focus on **social benefits**. • Uses "**social**" beliefs to predict adoption (e.g., Social Presence). • Users are assumed to be mostly **intrinsically motivated**. • Benefits achieved **during** the interaction. • Some **temporal** focus (can be connected to post-adoption behavior and repeated use). • Emphasizes the "**customer experience**" part of the interaction, and hence, the "experiential" aspects of the interaction.
Emotional	• **Premise:** Using e-commerce technological artifacts (behavior) can change users' affective states (outcome). • Focus on **hedonic** (emotional) **benefits**. • Uses "**emotional**" beliefs to predict adoption (e.g., PE). • Users are assumed to be **intrinsically motivated**. • Benefits achieved **during** the interaction. • **Cross-sectional** focus (ignores post-adoption behavior and repeated use). • Emphasizes the "**customer experience**" part of the interaction, and hence, the "experiential" aspects of the interaction.

The third role that e-commerce IT artifacts are proposed to assume directly relates to the other two. In addition to enhancing the customer's performance, and thus, acting as a productivity tool, an e-commerce IT artifact can be perceived as a *social actor*, where instead of mediating customers' interactions with the company/shoppers, it acts as an interaction partner in and of itself. In this view, the artifact is assumed to possess a number of social characteristics that allow for evaluations of it to extend beyond those that relate to its function as a productivity tool (e.g., evaluations of its social presence). Thus, the social actor view of IT artifacts extends the view of them as productivity tools, by proposing that an artifact is a social actor that acts as an interaction partner that has the ability to enhance the productivity of its user. In the same vein, while the interaction-mediator view assumes that the artifact is mediating interactions between human entities, the social actor view concerns communications that occur between the customer on one hand, and the artifact on the other, where the artifact is assumed to possess the ability to communicate with its users.
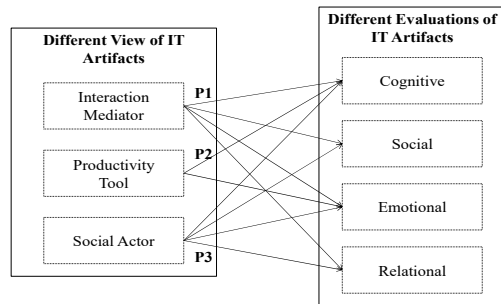
Fig. 1 Different views of IT artifacts and their evaluations

Table II summarizes how the different types of behavioral beliefs used to evaluate e-commerce artifacts are differently conceptualized for the three views of IT artifacts.

A. Technology Artifacts as Productivity Tools

The view asserting that e-commerce IT artifacts primarily function to enhance users' performance has gained early acceptance in e-commerce research. Within this view of e-commerce artifacts, the focus has been typically on beliefs that were proposed to be salient for an extrinsically motivated user, such as, beliefs about the different quality dimensions of the artifact, or characteristics that affect the costs and benefits concerning its use. Adopting this view, researchers have adapted many of the constructs used to assess the quality of traditional information systems to the e-commerce context (e.g., information and system quality, [12]).

Evaluations of artifacts within this view have been typically limited to the cognitive behavioral beliefs, which specifically address the artifact's efficacy in performing the role of enhancing the productivity of its users. Nonetheless, few studies have successfully attempted to include a number of emotional beliefs that address aspects of the experience of interacting with the artifact (e.g., perceived enjoyment, [8], [11]), while others, in similar attempts, have defined a number of emotional beliefs that refer to a behavior other than that of using the artifact (e.g., shopping experience, [13]). Additionally, attempts have also been made to integrate this view of e-commerce artifacts with that of the interaction-mediator view to facilitate the inclusion of some of the relational beliefs, which were conceptualized as evaluations of the interaction partner's relational characteristics (e.g., trustworthiness of an e-vendor, [6]). Understandably, these studies have shied away from conceptualizing their relational beliefs to address outcomes that directly relate to the artifact (e.g., the trust-relevant outcomes of using recommendation agent), since doing so, makes these studies ascribe to the social actor view of IT artifacts.

P1: Perceptions of an IT artifact as a productivity-tool will affect its evaluations across a number of cognitive and emotional beliefs.

B. IT Artifacts as Interaction Mediators

Studies affirming that e-commerce IT artifacts, such as websites, have the primary function of mediating social interactions between inherently social entities often rely on theories of social presence [14] and media richness [15]. These theories presuppose that IT artifacts are interaction mediators, and are not social entities in and of themselves. Social presence theory, for example, addresses how successfully an artifact conveys a sense of the participant being physically present, using face-to-face communication as the standard for assessment [16]. In evaluating the role of technology in mediating communication, an emphasis is not only placed on the words spoken by people, but also on the conveyance of verbal and nonverbal cues, body language, and context. Media richness theory is similar to social presence, but takes a media perspective by describing a medium's capacity to provide immediate feedback, its ability to convey cues, the quantity of senses involved, and the manner in which they are stimulated [15].

TABLE II
IT ARTIFACT EVALUATIONS

	Interaction Mediator	Productivity Tool	Social Actor
Cognitive Beliefs	Beliefs concerning the benefits/costs of using the artifact to communicate with others.	Beliefs concerning the benefits/costs in terms of productivity and performance gains from using the artifact to help accomplish a task.	Beliefs concerning the benefits/costs in terms of productivity and performance gains from interacting with the artifact as a social partner.
Relational Beliefs	Beliefs in regards to the extent to which using the artifact allows the user to make relational evaluations of the interaction partner.		Beliefs concerning the relational aspects of the artifact as an exchange partner based on the experience of interacting with it.
Social Beliefs	Beliefs in regards to the extent to which the experience of using the artifact to communicate with others feels like a real social experience.		Beliefs in regards to the extent to which the experience of interacting with the artifact feels like a real social interaction.
Emotional Beliefs	Beliefs concerning the affective outcomes of the experience of using the artifact to communicate with others.	Beliefs concerning the affective outcomes of the experience of using the artifact to help accomplish a task.	Beliefs concerning the affective outcomes of the experience of interacting with the artifact as a social partner.

Within this view of e-commerce IT artifacts, the emphasis is typically on beliefs that address the characteristics of the interaction-mediator artifact that are relevant (salient) within the context of using it as a tool to enable effective communications with others. Examples of such beliefs are the artifact's level of interactivity and vividness [8], the artifact's ability to support immediacy of feedback, multiple cues, and

language variety [15], or its ability to convey a vivid and accurate representation of the product [17].

Cognitive, social, as well as emotional beliefs have been used to assess users' evaluations of interaction-mediating e-commerce IT artifacts. More specifically, while the cognitive behavioral beliefs have been typically used to assess users' perceptions in regards to the utilitarian benefits and costs of using the artifact to communicate with others (e.g., the perceived usefulness of a website when communicating with the company, the perceived usefulness of a collaborative shopping medium when shopping with a friend in a distant location), the social and emotional beliefs have been used to assess users' perceptions of factors that are salient throughout the interaction experience (e.g., telepresence when using a communication medium, interaction enjoyment when using a collaborative shopping medium). On the other hand, while relational beliefs (e.g., trust) have been used to assess users' evaluation of e-commerce IT artifacts when these are used to mediate interactions (e.g., the use of a website to place an order), the conceptualizations of these beliefs typically do not explicitly refer to a specific behavior, or when they do, they refer to a behavior different from that of using the artifact. We believe that relational beliefs are important evaluations to consider when studying interaction-mediating IT artifacts. Their role, as we see it, is that of addressing the relational-based outcomes of the behavior of using the system. For example, trust in the context of using a medium to communicate with a serviceperson should refer to the extent to which using the artifact allows the user to make relational evaluations of the interaction partner (e.g., using the artifact allows the user to detect deception on the part of the interaction partner, [18]).

P2: Perceptions of an IT artifact as an interaction-mediator will affect its evaluations across a number of cognitive, social, emotional and relational beliefs.

C. Technology Artifacts as Social Actors

In addition to mediating social interactions between human entities or acting as productivity tools, IT artifacts can be seen as social actors in and of themselves. Under the "Computers Are Social Actors" paradigm (CASA) [19], researchers have consistently demonstrated that individuals unconsciously attribute human-like characteristics (e.g., gender) to technology and media representations, and apply social rules and expectations when interacting with IT artifacts. The application of these social categories and rules has been demonstrated to affect judgments about, and responses to, IT artifacts [20].

Empirical research suggests that the primary characteristics of media that seem to cue these social responses are the use of language [21], interactivity [22], and voice [23]. The most accepted explanation of this phenomenon asserts that when interacting with IT artifacts, users experience a state of mindlessness, which occurs as a result of conscious attention to a subset of contextual cues [24]. These cues trigger various scripts, labels, and expectations on the part of human individuals, which in turn focus attention on certain information while diverting attention away from other information [22].

Studies adopting this paradigm have: 1) investigated the types of social characteristics that can be manifested by IT artifacts, and the conditions under which these manifestation are likely (e.g., [25]), or 2) examined the ways in which users process their perceptions of these characteristics, and the effects of that on user's evaluations (e.g., [26]).

Within the first stream of research, researchers have used a number of characteristics that were shown to be salient within the context of interpersonal interaction. These beliefs can be categorized into two groups [27], [28]: 1) person-level constructs, which are beliefs concerning specific characteristics of the target individual (e.g., physical appearance), and 2) relationship-level constructs, which are beliefs concerning specific characteristics of the of the target individual within the context of the relationship (e.g., openness, leadership). The predictive power of these different types of beliefs when used as antecedents to evaluations of others in interpersonal contexts were shown to depend largely on the relationship type and stage [27].

Within the second stream of research, studies have focused on investigating the ways in which these perceptions are processed by users, and are likely to affect their subsequent evaluations. In social psychology research, both person-level and relationship-level beliefs have been investigated using either individualistic (focusing on one person's unilateral awareness of another) or dyadic (focusing on reciprocal behaviors between the interacting partners) approaches. In an individualistic approach, beliefs about characteristics that the target is perceived to possess, inherently (person-level) or in the context of the interaction (relationship-level), are assumed to act as direct antecedents to subsequent evaluative beliefs. For example, in an individualistic approach, both a target's physical appearance as well as her perceived level of openness in the context of her interaction with the evaluator act as individualistic beliefs that are proposed to be direct antecedents to evaluations. On the other hand, within a dyadic approach, beliefs about characteristics of the target, whether at a person or a relationship level, are assumed to be processed by the evaluator in relation to her own characteristics, resulting in dyadic beliefs that we term interpersonal variables. For example, in a dyadic approach, it is the similarity of the physical appearance between the target individual and evaluator that is assumed to affect subsequent evaluation, rather than beliefs about the physical appearance of the target alone. Similarly, within this approach, beliefs about characteristics of the target within the context of the interaction, such as the target's perceived level of openness, are assumed to be assessed by the evaluator in relation to her own characteristics before they affect subsequent evaluations.

Adopting a social actor view of e-commerce IT artifacts, a number of studies have shown how both person-level (e.g., ethnicity) and relationship-level (e.g., benevolence) perceptions that are typically used in interpersonal contexts, can act as object-based beliefs predicting a number of evaluative behavioral beliefs concerning users' interactions

with these artifacts. For example, [29] have provided evidence that the perceived expertise and physical attractiveness of an automated sales agent affect perceptions of its effectiveness. Additionally, the similarity between a user and an e-commerce IT artifact (e.g., recommendation agent), a dyadic belief, has been shown to be an influential antecedent of a number of behavioral beliefs that concern evaluations of the utilitarian outcomes of using an artifact (e.g., effects of decision strategy similarity on perceived usefulness [10]; effects of ethnic similarity on usefulness [30]), or those that address aspects of the interaction experience or relational factors (e.g., effects of personality similarity on perceived interaction enjoyment [10]; effects of ethnic similarity on social presence and trust [30]).

A number of challenges have arose as a result of these attempts to incorporate interpersonal constructs as antecedents to evaluative beliefs, especially when it comes to newly introduced constructs that were exclusively studied within interpersonal contexts (e.g., personality similarity, [10], [26], [31]). The skepticism with which these attempts have been met is somewhat justified, because many of these new constructs have been added to adoption models without much care. For such constructs to be meaningful within an adoption model, many of the existing constructs have to first be re-conceptualized to fit the social actor view. For example, in the case of interacting with an recommendation agent, the relationship between perceived similarity and trust is only meaningful if the trust construct is re-conceptualized to refer to trust in the recommendation agent [7] rather than the e-vendor [6].

Similarly, other emotional and social evaluative beliefs need to be re-conceptualized to refer to the salient outcomes of engaging in the behavior of interacting with the IT artifact itself. For example, social presence, which traditionally has been used to assess the degree to which a medium allows its users to establish personal connections with other people in distant locations [14], will need to be re-conceptualized to refer to the extent to which an artifact is perceived as sociable, warm, personal or intimate when interacting with it [32]. This of course forces us to distinguish between the IT artifact that is acting as a social actor (e.g., automated service person), and the interface used in communicating with it (e.g., live chat medium). Likewise, the emotional belief of perceived enjoyment needs to be re-conceptualized to refer to the enjoyment derived from interacting with the artifact [10] rather than the enjoyment derived from the shopping experience [13].

In general, we believe that a large number of the beliefs that have been shown to be salient and influential in the context of interpersonal interaction (both person-level and relationship-level) are relevant to the context of user-artifact interactions. We categorize these beliefs into two categories: 1) behavioral, which are perceptions of the artifact's characteristics that relate to its ability to perform its role, and how it performs that role, and 2) social, which concern inherent characteristics of the artifact that affect the social interaction with its user (e.g., gender, personality type).

Furthermore, these perceptions are proposed to be processed both individualistically, where they are hypothesized to directly affect subsequent evaluations (e.g., physical appearance, gender), or in a dyadic manner, where they are assumed to interact with the customer's own characteristics, subsequently affecting her evaluations of the artifact. The resultant individualistic or dyadic object-based beliefs are proposed to affect subsequent evaluations of the artifact in terms of all four types of behavioral beliefs discussed. Thus, we propose that both individualistic and dyadic object-based beliefs will act as antecedents to cognitive, social, emotional and relational beliefs when the artifact is viewed as a social actor.

P3: Perceptions of an IT artifact as a social actor will affect its evaluations across a number of cognitive, social, emotional and relational beliefs.

IV. CONCLUSION

The changing nature of IT artifacts has given rise to a number of challenges in relation to how these are viewed and evaluated. This paper proposes a theoretical model of the different views users adopt when interacting with IT artifacts. Depending on the view adopted, different artifact characteristic are salient and different relevant beliefs are formed. These subsequently not only drive and affect utilitarian evaluations of the artifact, but likely evaluations of the artifact that are social, relational and emotional in nature.

Of the three views of IT artifacts, the social actor view is most recent and potentially offers the most promise. This view supposes that interactions with IT artifacts are interpersonal in nature. Consequently, it allows for the use of a number of evaluation and adoption determinants that have been traditionally used to assess human interactions. These additional predictors hold the promise to further clarify our understanding of users' adoption and use decisions [33].

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