Incorporating Culture into The Theory of IT Affordances

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Abstract
What an IT artifact affords a user depends on the cultural mechanisms of meaning present in the social environment. Despite theoretical arguments and some scant evidence backing up the relationship between organizational culture and IT affordances, research has not aimed at understanding the set of cultural values underlying an organization and how this set shapes the IT affordance actualization process. We propose to fill this gap by studying the effect that IT-culture fit has on IT affordance actualization. The notion of IT-culture fit focuses on comparing an organization's shared values to the set of ideal actualization values: those assumed in the behavioral patterns that would result in affordances to be successfully actualized. We claim that differences in the two sets of values should be negatively reflected in actualization outcomes. We suggest accomplishing our goal by conducting a case study that builds on prior research about affordance actualization of EHR/EMR technologies.

Keywords
IT affordance, IT affordance actualization, organizational culture, IT-culture fit.

Introduction
The theory of affordances initially derived from Ecological Psychology (EP) as an approach to understanding visual perception (Gibson 1986). Gibson (1986) defines an affordance as what an object offers to someone. An affordance implies the complementarity between an object’s qualities and a person’s skills and goals (Chemero 2003; Gibson 1986). The theory of affordances has attracted IS researchers, primarily as a framework to understand IT-driven organizational change (Anderson and Robey 2017; Strong et al. 2014; Zammuto et al. 2007). Adapted to IS research, affordances are defined as the potential for behaviors associated with achieving concrete outcomes and arising from the relation between an IT artifact and a goal-oriented actor(s) (Volkoff and Strong 2013). Researchers studying IT affordances have mainly focused on the actualization process (Anderson and Robey 2017; Strong et al. 2014). Affordance actualization comprises the actions taken by actors as they take advantage of affordances through their use of the technology to achieve concrete outcomes in support of organizational goals (Strong et al. 2014). An affordance is a potential for action, whereas its actualization is the particular use of this potential.

In an organizational setting, IT affordances should be described not only as the relation between the material aspects of an IT and users’ skills and goals but also influenced by the social context in which the user-IT interaction occurs. Affordances should be examined as deriving from the actor’s perception of both physical objects and social norms (Fayard and Weeks 2007). A social factor that we argue is important for the actualization of IT affordances is organizational culture. Organizational culture (OC) is the set of underlying assumptions, shared values, and artifacts that define a group’s rules and context for interaction (Schein 1984). In the case of affordances, Norman (1999) states that along with physical and logical constraints, objects can also impose cultural constraints, which are conventions learned and shared by a cultural group that prohibit some activities and encourage others. Although IS research has acknowledged the importance of considering OC in studying IT affordances (Anderson and Robey 2017; Strong et al. 2014;
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Zammuto et al. (2007), there is a lack of research that examines how specific attributes of an organization’s culture connect to IT affordance actualization. Hitherto the evidence of this relationship rests mainly on logical arguments (Strong et al. 2014; Zammuto et al. 2007). When empirical evidence has been used, it has been just to highlight a single cultural aspect that affects the affordance actualization of certain technology (Anderson and Robey 2017; Zammuto et al. 2007). We still know little about to what extent the process of IT affordance actualization depends on the fit between a group’s cultural values and those values that ideally enable actualization processes. The purpose of our study is to extend IT affordance research by showing how the process of IT affordance actualization depends on shared organizational values. Our research question is: How do the outcomes of IT affordance actualizations depend on the differences between the cultural values shared by an organization and the ideal values that enable actualization processes?

We expect our research to contribute to the theory of IT affordance by helping to elucidate the role that cultural values play in determining the users’ goals when he/she interacts with the technology and tries to actualize its potential for action. We anticipate specifying the role of cultural values, as a central contextual factor, in facilitating affordances to be actualized successfully or in leading to undesired actualizations. The relevance of this study lies in understanding how OC affects IT affordance actualizations and the effective use of IT in turn. Effective use of IT has been described as a mechanism through which users actualize available affordances to accomplish desired goals (Burton-Jones and Volkoff 2017). This research is also relevant because practitioners can benefit from guidelines produced for the process of actualization to help them recognize how and why it is succeeding or failing, and what successful interventions, culture-wise, may be promoted (Volkoff and Strong 2013). Another kind of intervention can be encouraged where actualizations are carried out in a way more compatible with shared organizational values.

Brief literature review: IT affordances and organizational culture

In EP, the role of culture in affordances was outlined by Heft (1989). He argued for the extension of affordances to the culturally-derived meaning of objects by indicating that affordances depended on the body as a means of expressing intentions, not only relative to its physical dimensions. He explained that an individual’s intentional repertoire embodied culturally-driven meaning. Hutchby (2001) states that for humans, objects and their values could be tied in with conventional rules governing their use and that we have to learn some of the affordances certain things offer. Fayard and Weeks (2007) underscored cultural norms as a relevant factor by showing that the photocopier rooms in three organizations afforded social interaction to a different degree depending on the level of social designation culturally attached to them.

In the IS literature, logical arguments have been put forward to indicate the expected effect that culture should have on how IT affordances are taken advantage of. For instance, Zammuto et al. (2007) identified five generic IT affordances and observed that they would be enacted as IT features were coupled with organizational characteristics. They remarked how for the affordance of “visualizing entire work processes” to be actualized, one necessary condition would be the existence of cultural norms encouraging executives to assist others to ensure that sub-processes were not optimized at the expense of the complete process. (Strong et al. 2014) also hypothesized what cultural values should enable the actualization of six of the electronic health record system (EHR) affordances they identified:

- Affordance 1: Capturing and archiving digital data about patients. Culture should support patient data as a clinic resource, rather than belonging to individuals.
- Affordance 2: Accessing and using patient information anytime from anywhere. Culture should support informed clinical decision making.
- Affordance 3: Coordinating patient care across sites, facilities, and providers. Culture should support documentation of, and open access to, care coordination activities.
- Affordance 4: Monitoring operations. Culture should support accountability of individuals’ actions.
- Affordance 5: Substituting healthcare professionals for each other. Culture should support not delaying work waiting for a particular individual.
- Affordance 6: Incorporating rich information into clinical decision making. Culture should support providing the best care possible and information supporting such care.

Strong et al. (2014) also noticed that some clinical sites were better at exploring how best to actualize the affordances, while others struggled with the EHR. They conjectured that at the former sites, this was in part a result of a culture that supported innovation to a larger degree than at the struggling clinics. Evidence

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about the connection between affordance actualization and OC was presented in Anderson and Robey's (2017) research about affordance potency. They explained that potency was conditioned by the social characteristics of the social context. They described how the affordance of documenting care with an EMR sometimes failed to be actualized because using a computer in front of the patients created tension with the cultural component of the nursing profession of meeting the patients’ expectations for attention. Another piece of evidence can be found in Zammuto et al. (2007) when they remarked that actualizing the IT affordance of “simulating” required organizations where there was acceptance of simulation for other purposes. They exemplified the case of NASA which had effectively used simulations because these methods were congruent with the engineering culture.

As the above discussion illustrates, only logical arguments and limited empirical evidence have characterized the discussion about OC and IT affordance actualization. Only single aspects of the culture (rather than a detailed account) have been considered. Research has not aimed at deriving the set of cultural values underlying the affordance actualization practices under investigation. Consequently, it has also failed to assess how this set of values fits those that represent the ideal one that would facilitate successful actualizations. A good fit between the values assumed in procedures and technologies and those part of the culture at the organization that implements them leads to satisfactory outcomes (Leidner and Kayworth 2006). IT assumed values are those underlying the work practices and behaviors that it is meant to inculcate (Leidner and Kayworth 2006). How well OC fits these assumed values is a good indication of successful IS use (Leidner and Kayworth 2006). Culture fit represents the fit between organizational culture values and those assumed (or espoused by) people, methodologies, and technology. The notion of culture fit has been applied to study organizational outcomes expected from hiring new employees (O’Reilly et al. 1991) as well as from adopting new software development methodologies (Dubé 1998).

**Proposed framework**

Affordance actualization represents the exact way in which the user and system interact in use (Burton-Jones and Volkoff 2017). As observable behaviors, affordance actualizations reflect the cultural assumptions and values of the organization (Schein 1984). We propose to fill the aforementioned research gap by empirically deriving the values that underlie actualization practices and comparing them with the set of ideal “actualization values”: those assumed in the behavioral patterns that would result in affordances to be successfully actualized. We will then examine how discrepancies in the two sets of values may be reflected in unsuccessful actualizations. Strong et al. (2014) advance three measures to assess satisfactory IT affordance actualizations: consistency, extent, and alignment. The consistency of actualization assesses the horizontal aggregation across individual actions to capture how well they jointly serve to actualize organizational affordances (Strong et al. 2014). The extent of actualization assesses how far the actualization process goes toward achieving desired organizational level outcomes (Strong et al. 2014). The alignment of actualization assesses how well the actions of individuals support achieving organizational goals. Alignment takes a vertical view by linking the immediate individual and organizational level outcomes to longer-term organizational goals (Strong et al. 2014). Figure 1 presents our framework about the association between OC and IT affordance actualization.

![Figure 1. Connection between OC and IT affordance actualization from a culture fit standpoint.](image-url)
When an organization’s underlying shared values do not strongly manifest the ideal actualization values or when they do reveal values conflicting with this ideal set, we expect this divergence to reflect on the way the IT potentials for action are actualized. Existing differences between actual and ideal values should be reflected on affordances to be realized somewhat inconsistently, not to their full extent, and with some misalignment in terms of achieving organizational-level outcomes.

**Methodology**

IS research on affordance actualization has been performed mainly in the context of healthcare IT implementation (Anderson and Robey 2017; Burton-Jones and Volkoff 2017; Strong et al. 2014). Therefore, we aim at extending the knowledge in the IT affordance healthcare context by performing our study focusing on some of the already examined EHR/EMR affordances. We propose to follow Schein’s (1984) advice to ground cultural analyses in the contextual interpretations of observable behaviors so that patterns of underlying values could be revealed. To gain access to these contextual interpretations, we propose to conduct a case study. Schein (1984) mentions visible behavior patterns as well as stories as two of the visible artifacts that can be inspected to learn about cultural patterns.

We chose to examine visible behavior patterns by focusing on the six affordances from Strong et al. (2014) mentioned in the previous section. These authors suggest “ideal cultural values” that should be coupled with these potentials for their successful actualization. We will carry out observations of potential actualization episodes for each of these affordances. Potential actualization episodes are those where users interact with the system and can potentially actualize one or more affordances. As an illustration, take the case of a nurse caring for a patient. This nurse has the potential to access the patient’s information from previous examinations (affordance 2 actualization), she may record the interaction with the patient in the system (affordance 1 actualization), and she may also leave a note about important issues to consider in future interactions with the patient (affordance 3 actualization). From the observations, we will collect information describing interactions between users and the system, among users, as well as among users and patients. Participants’ interpretations of the observed events should also be recorded. The information gathered from this exercise will be the first source to obtain an evaluation of the shared cultural values (bottom right of figure 1). The second source of cultural values could be interviews for gathering stories about events in the context of using the EHR system (Dubé and Robey 1999). Respondents should not be specifically asked to tell stories, but we can expect them to choose the story as a form of discourse (Dubé and Robey 1999). Afterward, transcripts of the interviews should be analyzed to identify instances of stories where the use of the system is being described since this would allow us to focus on information relevant to the actualization of the six selected affordances. The last steps should be to assign a content theme to each identified story and reducing these themes to fewer categories reflecting cultural themes (Dubé and Robey 1999). Content themes may express characteristics, values, beliefs, norms, and emotional responses to commonly experienced events (Dubé and Robey 1999); nevertheless, we should focus on those reflecting values, beliefs, and norms.

The ideal set of actualization values (bottom left of figure 1) are those suggested by Strong et al. (2014) to be appropriate for enabling the actualization of the six affordances we focus on. The fit between these referential values and the organization’s values should be assessed. Contradictions between the two sets can be indicated by two situations. The organization may not cherish the ideal values to a sufficient degree. For instance, for a successful actualization of affordance 2, the culture should appreciate informed decision making. If there is a shared norm to rely primarily on the physicians’ judgment, this may hinder successful actualizations. A second situation could be the existence of a value conflicting with an ideal one. Using as an illustration affordance 2 again, even when the culture cherishes informed decision making, if there is a norm that discourages employees from taking attention off the patient for entering data in the system, the right data may not be available when needed to make decisions. The observation of potential actualization episodes and the interviews for gathering stories about the system use should also serve as the basis for evaluating the three actualization outcomes: consistency, extent, and alignment. We should be looking for actualization episodes yielding positive outcomes and how it connects to the existence of enabling cultural values. In addition, cases of unsuccessful actualization should be scrutinized to find out if cultural contradictions play a role. We are not interested in instances of failed actualization where only factors different from culture are involved, e.g., system features malfunctioning, users with insufficient skills, ineffectively designed processes, and so on.
Conclusion

When examining the affordances of an IT artifact, the culture shared by the group of people using it is a relevant factor shaping how the artifact's potential for actions is used, i.e., how the affordances are actualized. In this paper, we argued for adding the notion of OC to the theory of IT affordances by pursuing an understanding of the effect that IT-culture fit has on the process of actualization. IT-culture fit fails to occur when an organization's shared values do not sufficiently manifest the set of ideal “actualization values”: those assumed in the behaviors that would result in affordances to be successfully actualized. We claim that differences between the two sets of values should be negatively reflected in affordance actualization outcomes (consistency, extent, and alignment). We propose to find evidence for our claims by carrying out a case study that builds on prior research on EHR/EMR technologies. Observations of potential actualization episodes and interviews for gathering stories about the system use form the foundation for discovering the shared values that underlie IT affordance actualization processes.

REFERENCES