

Advances in Trust Research: How Context and Digital Technologies Matter

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Abstract

Within the Hawaii International Conference on System Sciences (HICSS), we organize for the seventh time a mini-track on trust and information technologies. This year, the mini-track on Advances in Trust Research focuses on the context where new digital technologies are developed, brought to markets, implemented, and adopted. The context focus also strives to increase our understanding about trust at different levels of analysis, i.e., individuals, teams, organizations, meta-organizations, and society.

1. Introduction

Trust is pivotal in order to effectively and efficiently manage novel digital technologies. Trust is the positive expectation of the conduct of the referent in a specific situation involving perceived risk or vulnerability. For example, trust may decrease reluctance of workers exposed to complex black-box algorithms, or increase the satisfaction among customers of voice assistant devices. Yet it is important to note that the crucial role of trust may differ across different types of technologies, applications, use cases, professional, organizational, and cultural contexts.

In information systems research, there has long been a call for contextualized theories of trust [5]. Not just context changing the role of trust, but also the relationship between technology and trust. Technology can change conditions in terms of their physical or virtual infrastructures, tasks, and social dimensions among others. In addition to the nature of digital technologies, also the use cases can differ considerably with the same technology. For example, trust in a human that uses AI to augment their skills in a health care setting, such as a radiologist distinguishing Covid-19 from pneumonia, is very different from trust in a large tech giant that collects

vast amounts of data about their customers to expose them to targeted content. Trust in the context of self-driving cars may be very different from trust in smart contracts embedded in blockchain technologies. Rather than treating trust and digital technologies as static and isolated concepts, there is a need to increase our understanding of the specifics of respective technologies and the contexts they are embedded in.

To fully unpack trust in the context of digital technologies, it is pivotal to understand its unique properties. For example, trust in AI may be very different from trust in conventional, non-AI digital technologies, such as trust an electronic calculator, or even trust in the Internet [2].

First, the machine learning technologies that sit at the core of many contemporary AI have deeper learning capacity, e.g., based on insights from large scale data collected from the interaction with users [4]. Second, AI exhibits greater autonomy. AI often involves automating some aspect of human decision making, assuming intelligence involves successful goal-directed action [3]. Third, often, AI is very complex, and transparency is low. It is difficult for humans to understand how an AI reaches a certain decision – it is more inscrutable than other IT systems [2].

It is crucial to understand the unique properties of digital technologies as these influence how trust unfolds. For example, the learning ability of AI, may result in constantly changing outputs once new input data is fed into the algorithmic systems. That may convey the perception that AI technologies are being less predictable, likely influencing an individual's trust perceptions about them.

To unpack the “black-box” of different digital technologies it is important that researchers seek to understand how they work and expose themselves to an appropriate level of technology detail. Generally, interdisciplinary research collaborations, such as between information systems management scholars and industry experts or computer scientists/engineers

have great potential, as it allows researchers to uncover the unique properties of digital technologies they seek to research in more depth

This year's mini-track extends the trust research in several areas. The research in this mini-track demonstrates robots can fulfill certain social and emotional aspects of interactions with humans. This helps to satisfy the call from recent research that has noted the importance of non-performance-based aspects of trust in robots, which has received little attention [1]. The current mini-track also expands the literature on moderators of the trust relationship. The burgeoning use of AI/ML in a variety of contexts illustrates the need to understand how users trust the system. The current mini-track expands this literature by exploring potential moderators of the user-AI relationship in autonomous vehicles. The study helps to expand the knowledgebase of areas to focus on for research. In a similar vein, the current mini-track explores trust in cybersecurity, drawing from theoretical backgrounds such as events theory. Lastly, the mini-track explores the nature of trust in ad hoc teams. The increase in computer mediated teams across organizations that are formed quickly and dispersed quickly indicate a need for an understanding of how trust operates in such teams. The current work expands on previous research that theorized antecedents to trust in ad hoc teams. Overall, the mini track present a broad array of research that facilitates both future research and applied applications of trust across disciplines.

2. Accepted Mini-track Papers

The minitrack has four accepted papers:

The first paper is by Paul Fife, Warren Rosengren, and James Gaskin entitled "How Certain Robot Attributes Influence Human-to-Robot Social and Emotional Bonds." The authors of this paper investigate how to design robot companions to facilitate bonds with humans. They conduct a quasi-experimental study (n=115) in which they expose participants to sixteen different robot design configurations, aiming to identify the effect of four specific predictors of human-to-robot relationship development: (1) anthropomorphism, (2) communication, (3) environmental responsiveness, and (4) conveyance. The authors find that humans are more likely to develop social and emotional bonds with robots when those robots are good at communicating and conveying emotions. Interestingly, robots' responsiveness to external cues and appearance in from of anthropomorphic

attributes did not facilitate bonds with between robots and humans.

The second paper is by Maximilian Renner, Sebastian Lins, Matthias Söllner, Sirkka Jarvenpaa, and Ali Sunyaev entitled "Artificial Intelligence-Driven Convergence and Its Moderating Effect on Multi-Source Trust Transfer." The authors examine converged products where AI enriches the base product to offer new innovative functionalities. Autonomous vehicles with AI-enhanced driver assistance and infotainment functions as well as AI-based surgical robots are examples of converged products. The study examines the question of how to establish trust in converged products through the theory of trust transfer. The paper reports on semi-structured interviews with 25 participants in the context of autonomous vehicles. The study sheds light to multi-source trust transfer and how different sources and moderators influence trust transfer. The findings suggest three moderators - users' perceived source control, perceived source accessibility, and perceived value creation share of the sources - moderate trust transfer.

The third paper is by August Capiola, Elizabeth Fox, Arielle Stephenson, and Izz Aldin Hamdan entitled "Is this Even Relevant? Investigating the Relevance of Antecedents to Trust in Ad Hoc Dyads." The authors study different types of antecedents for swift trust in an ad hoc team collaboration. Their work builds on extant swift trust literature. Based on within-subject experiments conducted online, they use a vignette to investigate what antecedents to swift trust participants considered relevant in these ad hoc team formation processes, and how they affected participant trust. The paper is a highly timely for the post pandemic future of work, where work is increasingly technology-mediated and carried through in interdependent ad hoc teams.

The fourth and final paper is by Rosalind Searle and Karen Renaud entitled "Trust and Vulnerability in the Cybersecurity Context." The paper builds from organizational behavior and use of advanced technologies and cybersecurity as a research context. They use cybersecurity breaches as an example of sudden external threat causing trust breaches and present an ambitious and dynamic multi-level model of trust and vulnerability in the context of cybersecurity breach, to discuss its effect on organizational trust.

In these papers, trust researchers build on extant trust theories from traditional context in trying to unpack how the opportunities and threats created by advanced technologies influence human trust, and human-AI trust in different socio-technical contexts.

Researchers study not only on how humans use or adopt advanced technologies, but increasingly also on how humans and advanced technologies collaborate as more equal partners.

Together these papers enrich our knowledge about trust and digital technologies. We expect lively debate.

3. References

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