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# **Uncovering the Trust Transfer Mechanisms in a Blockchain-Based Healthcare Platform: A Mixed Method**

*Emergent Research Forum (ERF)*

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## **Abstract**

Drawing on a mixed-method, this study aims to explore, identify, and investigate the various trust targets and their transfer mechanisms in a blockchain-based healthcare mutual aid platform. A qualitative online interview is first conducted to potential users in the online healthcare platform. Particularly, we identify three types of trust: trust in technology, trust in members, and trust in platform, that play salient roles in promoting users' behavioral intention towards the online healthcare platform. Moreover, we find out that the three trust targets are formulated through different platform mechanisms. A preliminary research model is developed and a following-up research agenda is proposed for subsequent quantitative study.

## **Keywords**

Blockchain, platform mechanisms, trust transfer, intention to participate.

## **Introduction**

Blockchain technology is recognized as one of the most prominent technology innovation over the past decade, which has gained rapid development and has been widely applied in various contexts, including healthcare, finance, and supply chain management (Swan, 2015; Treiblmaier and Beck, 2019). Particularly, the blockchain technology allows the disintermediation, decentralization and transparency of online transactions between various parties on a global basis (Swan, 2015). The key features of blockchain distinguish it from traditional technologies associated with human interactions, such as social media applications and enterprise information systems (Swan, 2015; Drescher, 2017). Thus, how do individuals react towards the emerging technology and its corresponding application has become a research focus in the IS literature.

Notably, trust was identified as an important research term that needs to be re-clarified in the context of blockchain technology and its applications (Auinger and Riedl, 2018; Queiroza and Wambab, 2019; Schuetz and Venkatesh, 2019). Despite a great attention having been paid to trust issue in the blockchain-based applications, to the best of our knowledge, the relationship between blockchain technology and trust is still unclear and inconsistent (Risius and Spohrer, 2017; Niederman et al., 2017; Auinger and Riedl, 2018; Hawlitschek et al., 2018). Several scholars posit that blockchain technology is trust-free, and it may replace trust in platform to some degree (Hawlitschek et al., 2018). Whereas another research stream is in contrast to the trust-free notion, and argues that blockchain technology plays a significant role in reducing potential risks and providing more trustworthiness (Cao et al., 2017; Siira et al., 2017; Auinger and Riedl, 2018). Particularly, trust in IT artifact/technology is identified as a dominant research topic in the blockchain situations (Ostern, 2018). Considering that blockchain is a non-user-facing technology that does not require direct interactions with users (Ostern, 2018), it is essential to conduct an

in-depth investigation to explore the specific trust targets and reveal their nomological relationships in the emerging new context (Breward et al., 2017; Ostern, 2018).

Overall, this study aims to: 1) identify the significant trust targets, and their formulation mechanisms in a blockchain-based healthcare mutual aid platform; 2) develop a theoretical model to comprehensively understand users' attitudes and behavioral intentions in the blockchain-based healthcare mutual aid platform from a trust transfer theoretical lens. We plan to conduct a mixed-method study to address the research questions. The next two sections introduce the theoretical foundation and qualitative investigation. Then a theoretical model is developed. Conclusions and following-up research agenda are described in the final section.

## **Trust Theory**

Originated from social psychology, trust is conceptualized as the psychological state of a party to accept vulnerability based upon positive expectations of the intentions or behavior of another party (Rousseau et al., 1998). In the context of e-commerce and social commerce, trust is considered as a significant factor that facilitates an individual's transaction behaviors by reducing perceived uncertainty and risk (Pavlou and Gefen, 2004; Shao et al., 2019; Shao & Yin, 2019).

Previous literature has identified different trust targets in various contexts. One stream of studies focused on interpersonal trust, which refers to an individual's trust in other members within an online community (Simpson, 2007; Li and Chua, 2016). Another category of studies concentrated in institutional trust, representing an individual's trust belief based on structural assurance, guarantees and recommendations from third parties (Zucker, 1986; Pavlou and Gefen, 2004; Shao and Yin, 2019). While the third typology of studies paid attention to trust in IT artifact, which describes the willingness of an individual to behaviorally depend on an algorithm, a technology, and a piece of software to complete a task (Li et al., 2008). Given the ubiquity of information technologies, the traditional trust paradigm has shifted from interpersonal and institutional trust to trust in technology (Li et al., 2008; Dabholkar and Sheng, 2012). There is a call for more empirical studies to uncover the network and transfer relationships among various trust targets in the context of emerging technology usage (Ostern, 2018).

## **The Mixed-Method Design**

This study adopts a mixed-method to provide a better understanding of users' trust beliefs and formulation mechanisms in the emerging context of blockchain-based applications (Venkatesh et al., 2013). Following a sequential mixed-method design, we first conduct a semi-structured qualitative investigation to explore the trust targets and formulation mechanisms, and then employ a survey to quantitatively examine their path relationships (Venkatesh et al., 2016).

### ***Qualitative Investigation***

#### **Research Method and Sample**

We first conducted a qualitative investigation to better understand individuals' trust beliefs and salient antecedents in the context of 'Xianghubao', which is a health mutual aid platform under Alibaba's Ant Financial. We selected Xianghubao since it is recognized as one of the first online health platforms that implemented blockchain technology to ensure the transparency of information in China. The applicants with Sesame Credit above 650, which is calculated based on users' online transactions, are qualified to join in the platform. In particular, 58% actual applicants are young adults. We target our samples to potential individuals who have no previous usage experience on the platform. Totally 44 individuals (21 females;  $M_{age}=20.3$  years) were invited to register and try out using the "Xianghubao" platform for a period of time, and then completed several open-ended questions via an online survey.

#### **Nvivo Analysis**

Following a three-stage iterative coding procedure (i.e. open coding, axial coding, and selective coding), this study conducted a content analysis to analyze the participants' responses in the semi-structured qualitative investigation (Strauss and Corbin, 1990; Breward et al., 2017). In order to ensure the reliability and validity of content analysis, three doctoral students in the research team independently participated

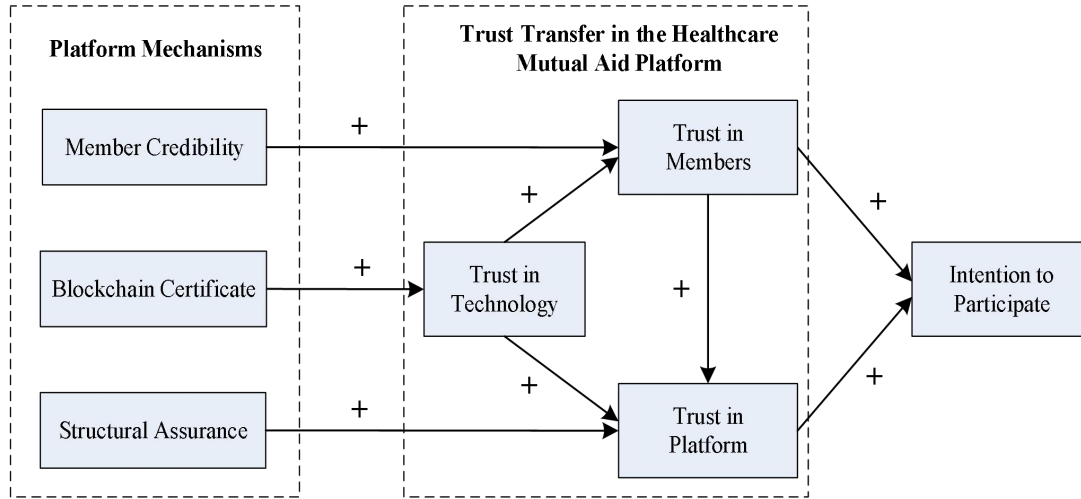
in the coding process (Breward et al., 2017). A group meeting was held in the final stage to discuss the inconsistencies of coding results and reach an agreement, as suggested in the previous literature (Strauss and Corbin, 1990; Breward et al., 2017). The detailed coding results are illustrated in Table 1.

<i>Themes</i>	<i>Sub-themes</i>	<i>Exemplary Quotations</i>	<i>Percent</i>
Trust	Trust in technology	“Blockchain has a very high technical ability to ensure a high degree of credibility (P12)”	59.1%
	Trust in platform	“The Xianghubao platform ensures the safety and credibility of online healthcare mutual aid process for the users (P3)”	52.3%
	Trust in members	“People can be trusted and provide guarantees for each other on the Xianghubao platform (P1)”	36.4%
Antecedents of Trust	Blockchain Certificate	“Each cost can be traced, each surplus is publicized and each aid case is recorded by blockchain certificate (P3)”	36.4%
	Structural assurance	“The patient's medical records, treatment time and medication can be queried and can not be tampered with on the platform. The mechanism guarantees the authenticity of the treatment situation (P6)”	59.1%
	Member credibility	“Sesame Credit can reflect the user's credit level. Generally speaking, the higher the Sesame Credit is, the higher the user's credit level (P9)”	70.5%
Behavioral Intention	Intention to Participate	“I would like to participate in the Xianghubao platform for providing myself with additional health insurance and helping more people (P9)”	65.9%
<i>Trust Formulation Mechanisms</i>		<i>Exemplary Quotations</i>	<i>Percent</i>
Member Credibility → Trust in Members		“The sesame credit of members guarantees the fund can not be abused and better protect the interest of other users (P9)”	29.5%
Blockchain Certificate → Trust in Technology		“ The blockchain certificate guarantees the technical capability of Xianghubao, which enables that data can not be changed and is highly transparent (P1) ”	15.9%
Structural Assurance → Trust in Platform		“The effective rules and strict auditing procedures ensure the platform to be more convinced (P11)”	31.8%
Trust in Technology → Trust in Platform		“ The implementation of blockchain technology creates a mutual trust environment for the Xianghubao platform (P21)”	36.4%
Trust in Technology → Trust in Members		“ The application of blockchain technology promotes the reliability of platform audit and supervision, and largely guarantees the credit of members (P12)”	25.0%
Trust in Members → Trust in Platform		“ The Xianghubao platform selects trustworthy users by setting thresholds, which makes people more reliable in transactions. This is conducive to facilitate the credibility of the platform (P6)”	20.5%
Trust in Members → Intention to Participate		“I tend to participate in the platform, because the users trust each other based on the credit evaluation standards, and I also believe that other people are not cheating (P3)”	22.7%
Trust in Platform → Intention to Participate		“ I am willing to participate in the platform since the platform has established effective assurances to guarantee the transparency of the mutual aid process. I can see how many people I have helped in the past and whether their sickness is true (P8)”	27.3%

(Note: P represents participant, we code the 44 participants from P1 to P44; Percent represents the proportion of interviewees referring to each sub-theme in comparison to the total participants.)

**Table 1. Trust Targets and Formulation Mechanisms that Emerged from the Coding**

Based on the research findings from the qualitative analysis, this study identifies three targets of trust (i.e. trust in technology, trust in platform, and trust in members), three platform mechanisms (i.e. blockchain certificate, member credibility, and structural assurance), and an outcome variable (i.e. intention to participate). Drawing upon the quotes evidence and a theoretical lens of trust transfer, this study develops a conceptual model to investigate the relationships among the three trust targets, their antecedents and subsequent behavioral intention in the blockchain-based healthcare mutual aid platform, as illustrated in Figure 1.



Note: “+” represents the path relationship is supported by the quotes of coding

**Figure 1. A Preliminary Research Model**

## Conclusion and Following-up Research Agenda

This study explores the specific trust targets and their formation mechanisms in a blockchain-based healthcare mutual aid platform. Drawing upon a mixed-method design, we conduct a qualitative study and collect data from potential users of “Xianghubao” platform. Nvivo analysis was conducted and three different trust targets were identified from the case evidence: trust in technology, trust in platform, and trust in members. Furthermore, we find that three platform mechanisms, specifically blockchain certificate, structural assurance, and member credibility, are salient antecedents that formulate the three trust targets. A preliminary research model is proposed to uncover the antecedents, transfer mechanisms, and the outcome of the three trust targets. A following-up research will examine the proposed research model using a quantitative survey. Data will be collected from users of the same underlying population who have experienced the healthcare mutual aid platform (Venkatesh et al., 2016). Structural equation modeling technique will be used to examine the path relationships between the constructs.

Our study has potential contributions to the IS literature. Notably, we uncover the nomological network relationships among different targets of trust (i.e. trust in technology, trust in platform, and trust in member) in the emerging context of blockchain technology application. Despite trust having been largely examined in e-commerce and mobile-commerce, our understanding regarding the formulation of trust is still limited in the context of blockchain technology applications (Ostern, 2018). By conducting an empirical study in a blockchain-based online healthcare platform, our study pinpoints the significant role of trust in blockchain technology in affecting institutional trust and interpersonal trust. The expected research findings can enrich the extant literature of trust in the non-user-facing technology (i.e. blockchain), and uncover its influence mechanisms on individuals’ behavioral intentions.

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