Study on the Discursive Strategies of *Wired* to Repair Trust in Blockchain

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Abstract: Digital trust involves not only human trust mediated by certain technology but trust in that technology. However, emerging technologies confront ever-growing skepticism. The blockchain debate is a typical example which may be led by its hypes from the mass media. If the place where blockchain is hyped is the place where the damaged trust in blockchain is repaired, *Wired* magazine, the voice of the industry, is an appropriate third-party repairer. Though previous studies have deeply investigated trust repair in interpersonal relationships, much remains unknown about how to measure trust in a specific technology and how to repair it if it is violated. This study aims to examine how *Wired* discursively repair trust in blockchain. To address the issue, 60 *Wired* stories on blockchain are collected as the corpus data. The corpus is annotated with the help of UAM CorpusTool. A discourse analysis is performed based on the annotation. Unlike the studies on interpersonal trust repair, the results show that the magazine puts more efforts on repairing the functionality and the helpfulness of blockchain partly due to the contextual variables. The discourse of the magazine, sitting on the rational side of trust, features open, objective, and straightforward. Together with the research standpoint of a third-party repairer, the repairing effect of trust-in-tech seems to be more predictable. The reparative strategies of EP & NN could be interpreted as a kind of justification to explain the violations of trust in blockchain, which the magazine mainly attributes to those externally unstable and uncontrollable factors. Above all, blockchain is a technological innovation with the aim to build a trustless world, but meanwhile, its development requires the escort from cyber-resilience which is built on the netizens' digital trust.

Keywords: Trust repair; Trust in a specific technology; Third-party evaluation; Blockchain; *Wired*

1. Introduction

Compared with the optimism of technique worship in the past, emerging technologies are confronted with ever-growing skepticism. The mass media tend to be techno phobic and sometimes exaggerates the potential risks, and the public often form opinions and attitudes without scientifically or authoritatively pertinent information. Furthermore, to dispel the mystification of the emerging technologies is usually beyond the reach of amateurs. The issue of trust is thus the weak link of the technology industry. Though previous research has discussed the effect of trust repair attempts in interpersonal relationships [1], much remains unknown about the outcomes of reparative strategies when it is administrated by cyber network system. The disputable trustless mechanism of blockchain technology is an example of digital trust issues to name. The advocates consider it as the driver of future digital economy [2], but its decentralized feature [3] makes it also possible for criminals to use it for illegal purposes. Concerns about cybersecurity [4] hereby rise. More importantly, some empirical research has proved that the nontechnical drivers are the real

obstacles for its current low adoption rate [5]. In the long run, the technology industry has to deal with their users' damaged trust in a specific technology. As mass media is the place where blockchain has been misrepresented, and it should be the place where the people's distrust in that technology is going to be repaired. *Wired*, the voice of the technology industry, is at the forefront of reporting blockchain, serving as an appropriate third-party [6] to tackle the problem. However, previous linguistic research on trust repair mainly focuses on interpersonal trust, but seldom steps into the field of trust between human and technology. Therefore, this study aims to examine how *Wired* discursively repair trust in blockchain.

2. Literature review

A clear divergence of what exactly trust is exists across disciplines because trust has long been an issue concerned by scholars of various fields. Trust is also a complicated phenomenon that has been classified into many types in different research backgrounds. Trust within social context often refers to interpersonal trust and existing literature mainly differentiates initial trust from experiential trust since a trust relationship evolves. From management point of view, trust is the lubricant of interpersonal relationship and the important foundation of cooperation [7]. However, violation of trust seems to be unavoidable, trust repair is of great necessity then through basically either verbal (e.g., make an apology) or behavioral (e.g., make a compensation) strategies.

2.1. Interpersonal trust repair discourse

The action of trust repair could not be taken only by the trustee [8], but the trustor or both of them, suggesting three research standpoints. Among them, the standpoint of the violator is criticized for the lack of innovation on reparative strategies and the ignorance of realistic factors. Notably, the standpoint of third-party evaluation starts to prevail in the field. The theoretical mechanism of trust repair tends to be grounded on the attribution theory [9], the perceived equity theory or the theory of social risk, schematically presented in trust-related models. Reparative strategies like apology, denial, and explanation [10] draw attention if compared to those models, but the effect of trust repair is universally controversial since it is affected by various measurable and non-measurable factors [11] namely, emotion, time span, interpersonal relation, attribution of violation, and so on. There are also no approbatory criteria within a discipline or relatively mature approaches to consult partly because of different research methods.

Linguistic studies on the topic are still underdeveloped, but some of them believe that language plays a role in building and maintaining and sometimes undermining a trustworthy relationship [12]. It is feasible to construct trust as discourse [13] when ideational concepts of trust are concerned. The model of trust repair discourse [14], developed from the casual attribution model of trust repair, demonstrates how the damaged interpersonal trust is repaired through the discursively reparative strategies of "emphasize the positive and neutralize the negative" (EP & NN) from the dimensions of literature-grounded trusting beliefs of "ability, integrity and benevolence" (AIB) [15]. However, the adaptability of the model is questioned for it is developed from a particular text. Firstly, trust violation does not equate to or necessarily lead to trust crisis, but relevant studies seem to prefer the background of a palpable crisis. Therefore, similar research seldom probes trust repair in the background of a potential crisis. Secondly, the model lacks consideration of discourse purpose: it is inappropriate to construct AIB as discourse effects as they are not decided only by the speaker [16]. Thirdly, EP & NN are too general when applied in specific contexts, and they fail to manage emotion that is an important base for interpersonal trust repair [17]. Although various modifications to the model are made in order to make up for the one-sidedness of previous research, trust between individuals or groups, especially its emotional side, is still the focal point in the complex social intercourse.

In fact, the rational side of trust plays a role in such reparative behaviors and the trust relationships do not confine to the human-human pattern. People do place their trust on non-human entities in daily life.

With the overwhelming popularity of technological usage in society, a critical examination of the human-technology trust relationship is ever more worthwhile. Considering the human factors inherited in trust, a shift to trust in a specific technology does not surpass the research paradigm of interpersonal trust, but expands its application, and might weakens the flaws of the model by changing the trustee.

2.2. Trust in blockchain

"Trust in a specific technology" (trust-in-tech) [18] means "treat technology as trustee" [19] in a digital world. It is neither unreasonable nor uncommon because people talk about trust in non-human entities in everyday discourse. Previous studies on interpersonal trust repair can serve as the starting place for exploring trust-in-tech, and relevant research questions like what constitutes and how to measure trust-in-tech are helpful to draw up a general picture of the dynamic circulation of the human-technology trust relationship. The answer to those questions lays a foundation for research on both the violation and the repair of trust-in-tech. Specifically, the system-like trusting beliefs of "functionality, reliability, and helpfulness" (FRH) [20], corresponded to human-like trusting beliefs of AIB, are proposed to account for some of the complexities of building and maintaining such a new relationship in the digital world. FRH mainly involve and assess the social presence or affordance of a specific technology. The measurements of trust-in-tech resemble those of interpersonal trust. Studies on the topic are welcomed because such studies not only help to elucidate how human actually experience, feel about, and respond to the digital environment [21], but more importantly, to address a big-time issue: in today's technologically manipulated society, trust-in-tech confronts ever-growing skepticism and the debate on blockchain is a typical example.

Blockchain originally appeared in those bitcoin papers [22] and became a buzzword in the cryptocurrency mania in 2017 because it provides financial services for customers without access to banking via smart contracts [23]. As the most popular Distributed Ledger Technology (DLT) [24] deployed in practice, it is believed to be the top area of exploration in supply chain and trade flow. Besides, it solves a fatal defect of past online systems: once the center was hacked, the whole system collapsed. The center of the system can be seen as the authorities in reality where people place trust. Quite a few research focus on the role of blockchain in strengthening cybersecurity and protecting privacy. Perhaps it is bringing human into a brand-new trust paradigm. However, it is not unbreakable [25]. Although DLT is encrypted, its decentralized structure dooms that start-ups cannot have a full control over clients' personal data. There were industrial efforts to handle data vulnerability in the past, and internet engineers keep working on technical loopholes and introducing new methods to resist cyberattacks [26]. Opinions vary on if this trustless technology eliminates our needs for trust. The truth lies somewhere in the middle as corresponding challenges accompany with its wide applications [27].

Blockchain, perhaps more than any other technology, is in need of trust–in-tech to change its low adoption rate at current stage and to escort its future development. The decentralized feature of blockchain leads to its coupling relation [28] with our trust-in-tech, but people's distrust in emerging technologies customarily root and sprout. This study aims to apply specific discursive strategies to repair system-like trusting beliefs of blockchain. In addition, *Wired* magazine is at the forefront of reporting the technology industry [29-30] where blockchain has been hyped and misunderstood. Therefore, a possible research question could be: How does *Wired* apply EP & NN to repair trust in blockchain from the dimensions of FRH? Such study does not set in any trust crisis event and the state of trust-in-tech involves only a subtly unidirectional flow of cognition and emotion.

2.3. A model of trust-in-tech repair discourse

Based on the theoretical foundation reviewed above, a model of trust in blockchain repair discourse is initiated for research needs and presented in **Figure 1.** The model is adapted from the model of trust repair

discourse and the causal attribution model of trust repair. It is a gradable model circled in the dotted box that contains three linearly developed levels of discourse-as-context, reparative strategies and system-like trusting beliefs. At the micro level, engagement, and attitude systems of systemic functional linguistics [31] are introduced to identify those linguistic resources of dialogic engagement, evaluation (explicit or invoked) and affect respectively for fulfilling EP & NN. At the meso level, EP & NN are set to repair trust in blockchain from three key dimensions of RFH at the macro level. The research standpoint of the third-party evaluation goes through the whole process. The impact of contextual variables (i.e., *Wired* & blockchain) and the casual attributions to violations of trust in blockchain will be discussed based on the coming results, especially the discourse analysis.
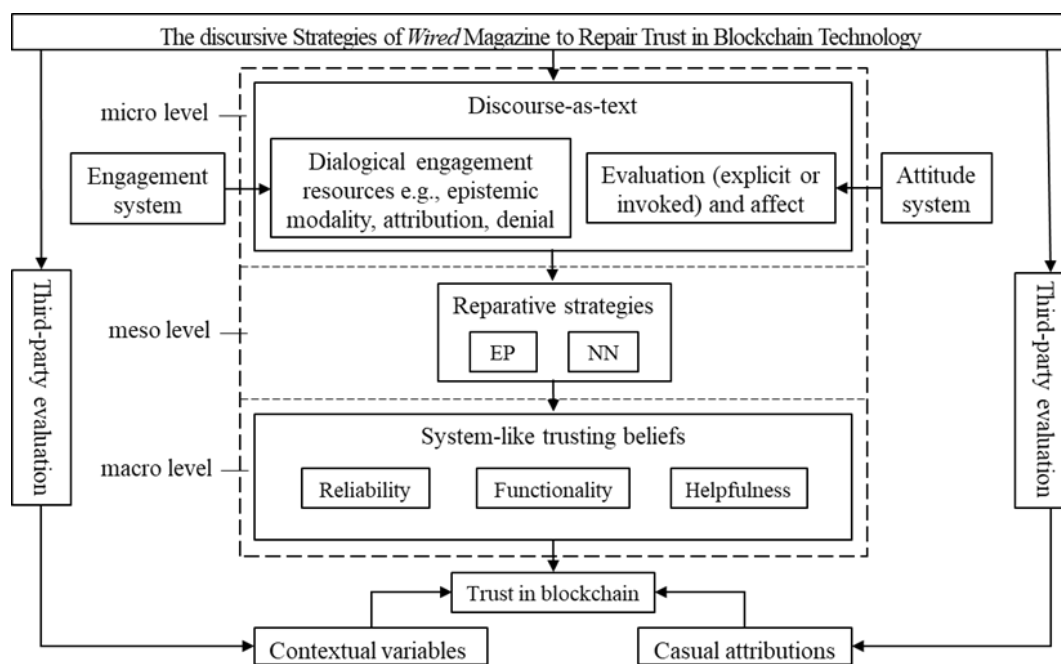
**Figure 1.** An adapted model of trust in blockchain repair discourse

3. Research methods

To answer the research question, 60 articles from the official website of *Wired* are collected and incorporate onto UAM CorpusTool [32]. The corpus data contains 70,000 words or so. For corpus annotation, three systems are built on the tool. Among them, amendments are made to the engagement and attitude systems in branch and depth to identify those linguistic resources in an alternant way. The trust-in-tech system is responsible to identify EP & NN and FRH respectively via text analyses. Finally, a discourse analysis is conducted to describe the reparative process. The data processing synchronizes with the corpus annotation, and each feature of the systems is enclosed with a detailed gloss to assist the annotation.

4. Results

4,310 pieces of featured linguistic resources are identified in terms of engagement and attitude, which fulfill 500 pieces of EP & NN from the corpus data. The results are displayed in **Figure 2** and each feature is followed by its number of frequency and global percentage. Specifically, the engagement is slightly less than the attitude in the number of frequencies, but the contract distinctly outweighs the expand. Furthermore, the disclaim is about four times more than the proclaim. Subsystems of the disclaim vary slightly while those of the proclaim vary considerably.

As for the type of the attitude, the judgement ranks first, followed by the appreciation and the affect. About four-fifths of the attitude is inscribed between lines and more than half of it is positive. The results

above are generally consistent with similar studies of interpersonal trust repair [33]. Most of the judgment is subdivided into the capacity, and about half of the appreciation is subdivided into the reaction. The in/security is the most prominent affect, but most of the affect is non-authorial. For EP & NN, EP is fulfilled over four times more than NN. For FRH, the data is inclined to discuss the functionality and the helpfulness of blockchain. **Table 1** summarizes the main discursive motives of EP & NN made by *Wired* to repair FRH of blockchain. EP tends to start from the technology end while NN tends to start from the human end in the trust-in-tech relationship. The functionality seems to show what blockchain is, the reliability deals with what users care about, and helpfulness anticipates what its potentialities are.
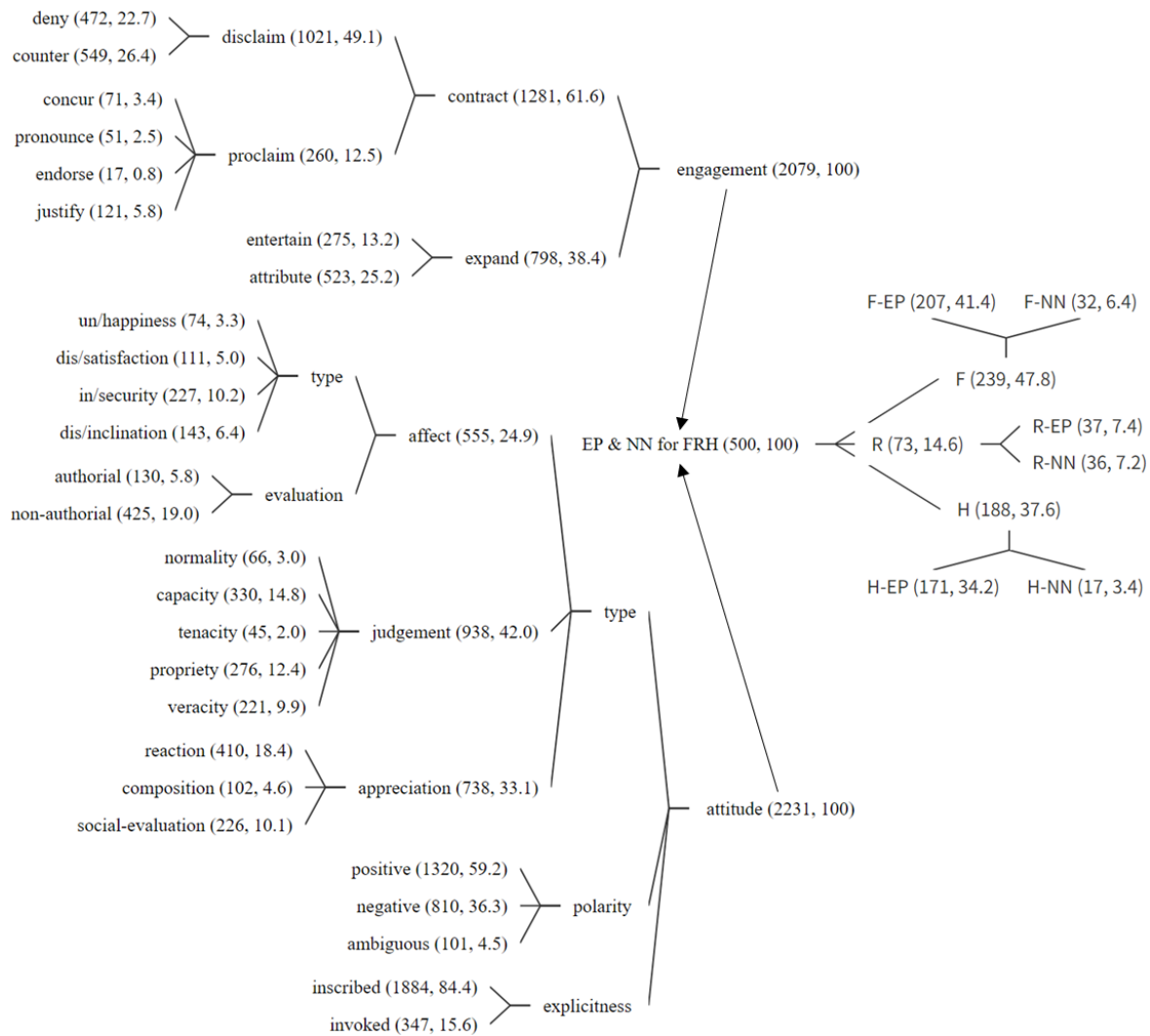
Figure 2. The statistical results of the annotation from UAMCT

Table 1. A summary of trust in blockchain repair discourse analysis

F-EP	Blockchain is openly secure, highly self-managing, hard to be tempered with.
	Blockchain is the solution to problems on record-keeping and provenance-providing.
	Blockchain fires middlemen and has potential to create a trustless cyberspace.
F-NN	The proof-of-stake algorithm will make blockchain less energy-consuming.
	Blockchain does not show the added information but only computational results.
	Tech megatrends boost blockchain hype that do not tell the full story.

R-EP	Blockchain is immutable, so records are permanently stored.
	The interdependence of blockchain ensures integrity of records.
R-NN	As a distributed ledger technology, it is impossible to take blockchain down easily.
	Blockchain cannot refuse online attacks and online attacks make blockchain robust.
	Quantum computers could break blockchain but rescue it, too.
	What blockchain needs now is not regulation but understanding.
H-EP	Blockchain optimizes complex supply chains for big corporations.
	Blockchain helps photographers assert control over their work.
	Blockchain provides permanent provenance to counteract different kinds of fraud.
H-NN	Some use blockchain for illegal purposes, but others use it for good.
	Blockchain disrupts music market but develops music business.

5. Discussion

It is truly inappropriate to construct AIB for interpersonal trust repair as discourse effects which are not decided only by the speaker. At the macro level, matters of emotionality are naturally harder to control than those of rationality; at the micro level, the particularity of trust-in-tech requires a third-party to play the role of repairer, and the evaluation from reputable *Wired* would lower the uncertainty of discourse effect. Besides, trust repair dynamics in the human-technology interaction is different from those in human-human relationship. FRH of a technology are theoretically easier to be measured than AIB of a person. Moreover, FRH have a positive bias for technology but against human [34], inclining the discourse effect to be prominent.

According to the attribution theory, *Wired* mainly attributes the violations of trust in blockchain to those external factors such as tech megatrends, the blockchain hype [35], internet system, cyberattacks, illegal or unethical applications and so on. Owing to the locality of the factors, subscribers of *Wired* perceive a weak correlation between the violations and the violator, resulting in positive credential assessments on FRH of blockchain. The credibility of the violator stays because those factors are uncontrollable. The instability of the factors is also in favor of repairing trust-in-tech. As for EP & NN, they could be categorized into explanation, justification more precisely, to repair trust in blockchain; both of them also function well. On the one hand, the unrequited emotion between the trustor and the trustee is not so urgent to be managed if compare with those negative even hostile emotions in trust crises; on the other hand, the effect of a third-party on trust repair implies almost unnecessary emotion management between it and the other two parties. Furthermore, the trust-in-tech repair discourse focuses more on the technology and what users do with it than on human.

The influence of contextual variables on some of results on **Figure 2** is discussed mainly from two aspects. Firstly, the affect fails to outnumber either judgement or appreciation in frequency. One possible explanation goes to the context of *Wired*. The magazine has devoted itself to all aspects of technology and innovation for three decades. Stylists see it as a men's lifestyle magazine that allows for a negotiation of masculinity premised on work and leisure and production and consumption. The way of conceptualizing technology as culture accumulatively exerts subtle influence on the language of *Wired*, which is open, objective, and straightforward. Secondly, the security is the most frequently observed effect though the effect is the least kind of the attitude. This could be attributed to the seemingly predetermined relation between the technology and data security [36]. Thirdly, the data talks more about the functionality and the helpfulness than the reliability of blockchain. This can be justified if consider the corpus annotation. What FRH refer to is semantically links with the subsystems of the judgement and the appreciation, but the

context of blockchain is the reason behind it. The blockchain hype is actually an exaggeration of its key features or functionality under the technique megatrends [37]. The wide applications of blockchain argue for its usefulness, and the technology is still in nascence with limited feedbacks or assessments, which explains the inferior positions of the reliability and NN in frequency counting.

The security concern is a trigger to blockchain debate, and the trust-in-tech repair discourse analysis finds that *Wired* appears to respond to the debate [38]. The response is not a black or white affair. There are problems to think about, such as the general classification of the technology and the level of trust in need. Public or permissionless blockchain like bitcoin and Ethereum is trustless, but both of them require a low level of trust among anonymous users in order to take in charge of the network. Private or permissioned blockchain like Hyperledger is not trustless due to the dominant role of one or more organizations in maintaining those ledgers [39]. Therefore, blockchain indeed has challenged the traditional mode of trust and been trying to bring us to the paradigm of digital trust [40], but we still need interpersonal trust to reach a real trustless world.

6. Conclusion

The consideration of both trust repair and digital trust is of necessity to deal with the growing skepticism towards emerging technologies in the digital age. This study starts from the theoretical foundation of interpersonal trust repair to our damaged trust-in-tech and situates at *Wired* magazine to frame blockchain debate. The trust-in-tech repair discourse analysis demonstrates how *Wired* apply EP & NN to repair FRH of blockchain. Compared with studies on interpersonal trust repair, this study reiterates the rational side of trust which would result in more predictable discourse effects. The major findings could give certain references for technical enterprises to tackle trust-related problems of products or services powered by emerging technologies. Of course, there are limitations. The corpus data comes from only one magazine that may not show the whole picture of blockchain, and the manual annotation is often questioned for subjectivity. Future research would expand the corpus data and collect feedbacks from the subscribers of *Wired* on the topic by questionnaire if possible.

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