
Examining Online Peer-driven Transactions and their Contradictions in Blockchain Technologies

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Abstract

With the emergence of blockchain technologies, I argue that new forms of peer-driven transactions involving valued goods and services are being developed on the Internet. These online transactions are different from those previously examined in HCI. Blockchain-based transactions are often money-mediated, transnational, involve massive number of actors, and may transform large-scale collaborative work involving production and consumption of online media. While these online transactions seem beneficial to Internet users, the designs of these blockchain platforms are filled with contradictions with existing infrastructures as well as user practices. I provided examples of these contradictions including incompatibility with historic practices of finance, user transactions on the Internet, and questions of organizational forms of blockchain development. Finally, I propose examining novel online transactions while also paying attention to their contradictions as two important research agendas for blockchain researchers.

Author Keywords

Blockchain; online transactions; contradiction.

ACM Classification Keywords

H.5.3 Information Interfaces and Presentation: Group and Organization Interfaces—evaluation/methodology.

Introduction

Over the last ten years, more HCI researchers have focused their attention on online peer-driven interactions, for example, social learning in virtual worlds and political actions on social media [15,19]. With the emergence of blockchain technologies, I argue that new forms of peer-driven interactions involving transaction of valued goods and services are being developed on the Internet [8]. For example, new forms of cryptocurrency and blockchain are being developed to allow content creators to collect donations or payments online (e.g., [1,4]). While these online transactions seem beneficial to Internet users, the designs of these blockchain platforms are filled with contradictions with existing infrastructures as well as user practices [6,7]. I propose that these issues are important to development of certain blockchain technologies, and HCI researchers are well positioned to pursue these agendas.

Emerging forms of online transactions

Blockchain technologies are providing strangers with freer and more flexible ways of conducting transactions online. In my previous work, I described how a writer of an online forum (bitcointalk.org) had posted abstracts of articles he had intended to write [8]. If a user would like him to finish the article, he could donate as little as a few cents to the writer. Once donations in bitcoin had reached five dollars, the writer would proceed to complete that article [8]. In another case, users of an online community (reddit.com/r/dogecoin) crowdfunded thousands of

dollars in global donations using *dogecoin*, a cryptocurrency, to sponsor an electronic sports team to market *dogecoin* [8]. Ordinarily, these online transactions would have been difficult. One, users from different countries are likely to be using different kinds of electronic wallets which are incompatible with each other, for example, PayPal cannot be used to transfer money to a WeChat Wallet. Since anyone can download and install a cryptocurrency software tool, user access to a particular wallet is not a concern. Two, few electronic wallets allow a user to send a few cents in donation without incurring disproportionate transaction cost. With certain cryptocurrencies, transaction costs could be reduced to a fraction of a cent.

Thus, I argued that one implication of blockchain technologies is that of facilitating large-scale cost-effective transactions [8], and this may impact peer production economies. Taking an example from video gaming, some gamers (modders) scripted game modifications as data files and shared these for free on gaming websites [16]. These files could be downloaded as many as 20 million times, thus benefitting gamers and game companies immensely [11]. While previous work suggested that these content providers were altruistic and did not seek to be paid, a growing number of researchers are arguing that in reality there were few ways for them to receive donations or payments for their efforts [3,10]. One recent development in blockchain technology is to collect large number of small donations from Internet users, and redistribute the donations to content providers base on downloads, likes, or view counts (e.g., [1,4]).

In HCI, study of money-mediated¹ transactions has focused more on local practices such as earning time credit for performing handy work for a neighbor, or using smart cards on a bus [2,12,17,20]. New forms of transactions mediated by blockchain technologies are different in being online, transnational, involve a large number of actors, and may transform large scale collaborative work involving production and consumption of digital goods and services. Thus, a research implication for HCI is to investigate such new forms of online transactions.

Resolving systemic contradictions as an object of design

Contradiction, from activity theory, describes systemic discrepancies in social systems [5]. For example, a systematic discrepancy in the design of many cryptocurrencies is that the promise of fast transfer of money is being limited by financial compliance rules. Companies in most parts of the world need to comply with banking regulations which slow down the speed which cryptocurrencies can be converted into fiat currencies. This limits the extent online transactions conducted through cryptocurrencies can integrate with fiat driven economies. To resolve this and other contradictions, developers are altering original design of Bitcoin [14] by creating alternate blockchain designs. In this way, we can say that contradictions are “designing” blockchain technologies as much as designer intents [7].

¹ I am using “money” to refer to any kind of store of value and medium of exchange, such as credit, token, and voucher to redeem future goods and services

Kow and Lustig [7] conceptualized the ways contradictions have influenced the design of blockchain technologies through the lens of *infrastructuring*, or designer appropriation of computing systems, social practices, and user bases to develop them into an infrastructure. Kow and Lustig [7] discussed that a common source of contradictions in blockchain development came not from end-users, but powerful actors, such as regulators, investors, and banking institutions, which impose historic standards and pre-existing rules on blockchain uses. Behind these contradictions are complex factors, which include economic agenda, political climate, and public opinion towards financial industry [13]. On top of this, other forms of contradiction involving users may also exist. For example, in the case of using blockchain technologies to enable large number of small donations to content providers [1,4], hypothetically, these designers may find that most Internet content consumers are unwilling to donate at all to content creators—a contradiction which they would need to resolve.

Contradiction may also arise from incompatibility between organizational forms of blockchain development and how they are (or not) accountable to their investors and users. Such organizational forms include components such as its collaborative structure (e.g., corporate or non-profit), recruitment or participatory practices (e.g., [9]), and methods of governing its operations. While Bitcoin started off between 2009 and 2010 as a typical open source development with only a handful of voluntary developers, recent projects are becoming better endowed. In the blockchain space, a new form of crowdfunding activity is known as “initial coin offering”

(ICO), and such activity has been known to raise tens of millions of seed funding for open source development. Despite its high financial stakes, regulations governing these ICOs are currently unclear, and many ICO projects did not keep proper accounting for their use of funds. In a recent case, the SEC filed charges against a group of companies, running the ICO of a cryptocurrency known as *PlexCoin*, which allegedly provided false information to investors regarding its technological expertise and development plan [18]. Thus, research work is sorely needed to investigate how such projects could be organized to sustain trust and work alongside existing financial and social systems. Researchers could use such case studies to identify best development practices for blockchain technologies.

In the past, HCI researchers had examined less contentious online transactions such as online discourses (e.g., WhatsApp) and familiar forms of local exchanges (e.g., Uber). Arguably, these activities also contain fewer financial and political risks to society², and thus contain fewer contradictions. Due to many blockchain technologies being designed to disrupt transactional processes within entrenched information ecologies contain powerful actors and publics, blockchain researchers may want to pay more attention to their systemic contradictions.

Blockchain technologies, online transactions, and HCI

Blockchain technologies could have major implication to new forms of online transaction, but many of these

² Even so, certain governmental regimes have suppressed online discourses.

projects require designers to resolve contradictions in their infrastructuring process. Thus, I propose these two important research agendas—both of which are well understood in HCI but may require special attention to their peculiarity in blockchain research.

One, studies examining new ways of interacting with computers are already well regarded by HCI reviewers. In blockchain research, new forms of transactional practices are thus straightforward extension from traditional HCI work. One thing to note is that many blockchain technologies are only being experimented by niche communities, for example, early versions of blockchain were appropriated almost exclusively by libertarians, followed by a small community of financial technologists [9]. Thus, to uncover novel and emerging practices, blockchain researchers may have to examine small scale deployments and isolated cases to predict future practices.

Two, out of the many proposed blockchain based online transactions, it should be accurate to assume that few will find sustainable use cases. By examining their contradictions and reasons of their impasse, we may better understand relationship between blockchain technologies and our society (e.g., to understand relationship between blockchain developers and their investors). These findings could then translate into best practices and advice for future designers.

Research agendas like identifying novel uses and contradictions are not new to HCI, but blockchain research may entail situations unique to its contexts. While I have discussed online peer-driven transactions more extensively in this paper, these research agendas should also extend to other blockchain technologies

which challenge social conventions and boundaries of contemporary societies.

Biography

Yong Ming's research focuses on cooperative practices of digital communities within the field of human-computer interaction. Specifically, he investigates ways which media technologies mediate interactions within peer-driven communities to develop new collaborative formations. He has examined peer collaboration in domains include blockchain, computer games, youth and learning, social movement, and others. His theoretical orientation is centered around activity theory, but he has also used compatible paradigms that emphasize concrete observations and cultural-histories. He employs a flexible use of research methods that are centered around participant observation. He is currently an Assistant Professor at the School of Creative Media at City University of Hong Kong.

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