

'Effing' the Ineffable: Opening up Understandings of the Blockchain

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ABSTRACT

Blockchain, an innovative public ledger of transactions that underpins digital currencies such as Bitcoin, has the potential to open up and offer radical alternatives to civic life, democracy and society. Yet there is currently only a small, technically savvy section of society who understand its principles. Therefore in order to work through and realize the potential of the blockchain and its transferability across society we need to find means to open up and reduce its 'ineffable' nature. This paper presents and reflects on an approach that made the complexity of the blockchain understandable or 'effable' using physical modeling. The design-based approach adopted a tangible system of Lego and colored stickers to allow participant-actors to physically enact transactions on a Blockchain Lego 'block'. This modeled simplification was not designed as a comprehensive or accurate explanation of Bitcoin and Blockchain but rather as a prompt for opening up rich dialogue and insightful lines of questioning.

Categories and Subject Descriptors

• Human-centered computing~Participatory design • Human-centered computing~HCI design and evaluation methods • Information systems~Electronic commerce

Keywords

Design, Blockchain, Making, Bitcoin, Creativity.

1. INTRODUCTION

Cryptocurrencies such as Bitcoin are challenging the way we perceive money. No longer are banks or governments the mediators of currencies with the power to divest or invest to dictate the flow of value within society. The invention of the blockchain, a globally stored and collaboratively written list of all transactions that have ever taken place within a given system, decentralizes money and offers a platform for its creative use, potentially opening up and offering radical alternatives to civic life, democracy and society. Already there are examples of blockchain technologies extending beyond the realm of currency, including the decentralization of domain name servers that are not subject to government takedown (e.g. Namecoin [5]), identity management and governance (e.g. BlockchainID [3] and Bitnation [1]), and digital assets such as car ownership and registration through Colored Coins [2].

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Yet currently there is only a small, technically savvy section of society who fully understand cryptocurrency principles. Therefore, to work through and realize the potential of blockchain and its transferability across society we need to find means to open up and reduce its 'ineffable' nature. Adopting a tangible, 'making' way to do this can provide a method towards developing nuanced participant reflections and insights [4].

2. DESIGNING A TANGIBLE BLOCKCHAIN

In order to present and consider the potential and ramifications of the blockchain, a tangible interactive workshop activity was developed and conducted during two iterative sessions in January (S1) and February (S2) 2015. Session 1 (S1) took place with approximately 20 Masters-level Design students whilst session 2 (S2) took place with 24 participants including designers, technology start up representatives and members of the local Bitcoin community.

Both workshop sessions followed a similar activity format. Participants were given a set of resource cards (slips of paper with symbols representing wheat, sheep, oil, wood etc.) and assigned 10 Bitcoins (pieces of Lego), which they were asked to mark as their own; in S2 this was through affixing an initialed sticker to each piece (see Figure 1). A central Lego baseplate was provided to log all transactions and, after explanation, the group was encouraged to conduct transactions between themselves to gather a more diverse group of resource cards (i.e. mix of sheep, woods, wheat etc.).



Figure 1: Marking the 'Bitcoins' with identifiable stickers

To complete a transaction a verbal agreement was reached and the resource card handed over (Figure 2) paid for with a Lego piece.



Figure 2: Beginning a transaction

The sold Lego piece had a new sticker added to it to document the new owner's initial and then was placed on the block (central Lego baseplate) as a record of the transaction (Figure 3). To ensure that the correct number of Lego pieces were still in circulation the new owner took a replacement piece for the Lego piece recorded on the 'block'.

Meanwhile, a subset of the group (5 people) were designated as 'miners' and challenged to solve mathematical puzzles. Once they had successfully completed a set number of these puzzles (up to 10 depending on how quickly they solved each puzzle) the rest of the group had to halt their transactions and the 'block' was sealed. For S2 the activity ran for three iterations to produce a three-layered 'block' (Figure 3).



Figure 3: The completed blockchain (3 'blocks' high).

3. DISCUSSION AND REFLECTIONS

The workshop sessions did not attempt to provide a comprehensive or accurate explanation of Bitcoin and blockchain but rather act as a way of opening up dialogue. It was notable that in S1 (where participants stood around the 'blockchain', knew each other beforehand and had similar low levels of knowledge about Bitcoin), discussion began as soon as transactions began to take place. Participants queried the research team, not only on

how to conduct transactions and the 'rules' of the activity but wider Bitcoin and blockchain queries. In S2, participants were more sedentary (due to the configuration of tables and chairs) and there was a wide range of existing knowledge about Bitcoin and cryptocurrencies (i.e. from novice to expert). S2 participants' interactions with each other were largely confined to their own table, moving to the Lego 'blockchain' table only to record transactions and then returning to their seat. The research team moved between tables and observed peer learning, i.e. the research team were (rightly) not necessarily viewed as the 'experts' in the room.

Following the activity, S1 were asked to consider in self-selected groups the applications of blockchain technologies and present back to the room; this ideation session produced diverse ideas including kidnapping (with geofenced money for ransom), medical services where bill payments for care are only released when patients get better, and means for tracking aid donations to ensure that they are not used in corruption. For S2, as the final section of the activity, they were asked to drop the resource cards (i.e. wheat, sheep) in favor of alternative resources that might be traded, these included: your soul, hugs, material objects such as cars, and the intellectual property (IP) to the blockchain.

These examples show how the tactile Lego-based activity did not close down or easily explain the technologies behind cryptocurrencies but opened up a safe space for conversations and actions, where all participants were cast in the initial role of novices in trying to understand the activity game.

It could be argued that not everyone needs to know how blockchain or mining works in order to use Bitcoin or similar currencies, and to an extent this is true (consider the analogy of driving a car versus the knowledge of a mechanic). However, for the design and HCI communities to be able to design platforms and services that harness the power of a peer-to-peer validated blockchain, understanding the underlying principles is essential in order to enable critical mass adoption levels.

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