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Tangible Tools for Understanding Distributed Systems

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1. Workshop Organizers

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2. Context of Workshop

Data specialists are at the forefront of exploring new ways of exchanging value using blockchain, cryptocurrencies and smart contracts as direct exchanges between things, systems and people. These novel technologies are challenging concepts of value and value exchange in a variety of ways. Far from being neutral, they are entangled with political, economic, social and material arrangements, co-producing new relationships of power and distributed authority, which raises questions of ethics, privacy and trust. This is exemplified by a variety of fast-moving commercial services and new research agendas that explore such technologies in areas as varied as supply chain provenance, healthcare records, aid distribution, forms of digital identity, licensing and copyright agreements. We consider that designers have a unique opportunity to question these novel assemblages which may have a profound impact on our future lives. The emerging nature and increasing use of this underlying technological infrastructure encourages us to rethink current practices of ownership, trust and ethical relationships and to reconsider "value constellations"[1] not as independent entities but entangled networks of people, services and things.

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[1] Speed, C. and Maxwell, D. 2015. Designing through Value Constellations. interactions 22, 5 (August 2015), 38-43.

This workshop builds on our established research exploring material[2] and experiential[3] tools to explore the role of distributed technology and its socio-material implications, as well as our previous experience working with designers on Blockchain projects across the EU[4]. We will explore the implications of the vastly evolving distributed ledgers and autonomous systems which introduce the principle that products and services may soon be owned and managed collectively and not governed by one person or authority, thus allowing us to rethink traditional concepts of trust, ownership and power. Following on from a previous workshop[5], this particular half-day design workshop will support participants' critical understanding of these new forms of distributed power and trust while exploring what tangible tools may offer design researchers in understanding complex technological systems.

3. Planned Activities and Expected Outcomes

We propose a highly participatory workshop with a short introduction and several group work activities. The introduction will provide a background to the topic of distributed ledgers and followed by a joint discussion in which we identify and articulate the concept of distributed systems, their challenges, and potential design opportunities (1 hour). The main part of the workshop will be a series of rapid explorative design exercises using a range of tangible materials (magnets, pins, strings, wire etc.) to create relational maps of distributed systems. The groups of participants will be provided with materials to develop understanding and concepts of trust in distributed systems, that will be presented back to the group (2.5 hours). This will be followed by a summary of the insights from the day, a dialogue on how tangible tools can help understand complex technologies such as trust in distributed systems, and a discussion on how to communicate this to the wider design community (0.5 hour).

4. Intended Audience

We welcome designers, researchers and practitioners (ideally 20 participants) from all backgrounds to participate in our workshop who have an interest in understanding trust in distributed systems and learning through material tools. No previous knowledge is required and we welcome academics, creatives, industry experts and non-specialists alike.

5. Length of Workshop

We propose the workshop to last for half a day. From previous experiences, half a day is sufficient for building an understanding of the technology through the planned tangible interactions while allowing opportunity to discuss and consider the wider implications for

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[2] Bettina Nissen, Kate Symons, Ella Tallyn, Chris Speed, Deborah Maxwell, and John Vines. 2017. New Value Transactions: Understanding and Designing for Distributed Autonomous Organisations. In Proc. DIS '17 Companion. ACM, New York, NY, USA, 352–355.

[3] Bettina Nissen, Larissa Pscetz, Dave Murray-Rust, Hadi Mehrpouya, Shaune Oosthuizen, Chris Speed. 2018. GeoCoin: Supporting Ideation and Collaborative Design with Location-Based Smart Contracts. In Proc. CHI'2018. ACM, New York, NY, USA, forthcoming.

[4] Alexandre Polvora, Susanna Nascimento. Blockchain4EU workshop European Comission https://blogs.ec.europa.eu/eupolicylab/

[5] DIS workshop documentation: http://aftermoney.design/designing-daos/

the design community.

6. Space and Equipment Required

The workshop requires no special facilities beyond a standard room with a projector and large tables for group works. All workshop materials will be provided by the organisers.

7. Potential Outputs

We will document the design explorations developed from the workshop on a special page on the Design Informatics website alongside the ESRC-funded After Money project website summarising the workshop and its insights. We will reflect on both the insights around distributed systems for the design community as well as the use of tangible tools for understanding complex technologies.

About the Organizers:

Bettina Nissen is a design researcher with a PhD from Newcastle University and is currently a Research Associate on the ESRC funded After Money project in Design Informatics at the University of Edinburgh exploring blockchain technology for novice audiences.

Larissa Pschetz is an interaction designer, researcher and lecturer at the University of Edinburgh. Her research is focused on socio-technological narratives and inclusive IoT, having worked in a variety of project involving distributed ledgers and cryptocurrencies.

Ella Tallyn is a UX designer and research associate on the EPSRC funded PETRAS IoT Hub. She has worked as a UX designer on both commercial and academic projects and is currently exploring data transactions and smart contracts and how these might inform the development of location-based IoT technologies.

Alexandre Pólvora is a Policy Analyst and Researcher at DG JRC / Joint Research Centre and the European Commission. He has been developing collaborative and transdisciplinary frameworks for evidence-based policy advice at the EU Policy Lab, leading the Blockchain4EU project.

Chris Speed is Chair of Design Informatics at the University of Edinburgh. Chris is an expert in design for the Network Society, Digital Art and Technology, and The Internet of Things. Chris is the Principal Investigator on the Oxchain project.