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# Design and Research in and around Value Interactions: Understanding the How and Why of Value Transactions

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## **Abstract**

This research reveals the importance of Design Anthropology under IoT platforms focused in public spaces. It defines a network of value transactions and the need to develop clear insights that can be used methodologically for prototyping. In a space and place where Distributed Autonomous Organisations (DAOs) and smart contracts may take precedent the paper argues a distinct and particular focus in practice to include non-human perspective taking.

## **Author Keywords**

Value Transactions; Design Anthropology; Ethnography; Empathy; IoT; Smart Transactions; Thing; HCI

## **ACM Classification Keywords**

Design; Algorithms; Human Factors

## **Introduction**

This contribution to research is about setting the tone for working under future IoT landscapes and the design challenges brought under ethnographic research. That includes extending empathy for varying perspectives across a plethora of interactions that will include non-human entities that may be entangled in a dynamic relation between Distributed Autonomous Organisations (DAOs), Smart Contracting and Algorithms.

An aim to integrate the use of empathy in the design process could be fundamental to any future development in human computer interaction. This landscape provides an opportunity to improve the 'spirit' of communities and in turn potentially increase the happiness and wellbeing of its members (Huck et al 2015).

I would liken this shift in human culture by the mark of 'Ubiquitous Computers'. I am sure in the distant future the archaeological record will reveal that Smart Cities developed around the world similarly to the agricultural revolution when farming independently exploded globally. Except with smart cities, we understand the collaboration across countries in research that was necessary to develop the various areas between sustainability to real time big data infrastructure. Human interactions are changing on a large scale. The growing networks between IoT, smart objects, and the consumer market challenge and expand user experience research.

There is an entanglement with any object or thing under an IoT platform. One's perspective creates a significant and resolute role in producing an understanding towards 'the things' and their engagements. There is drastic difference between the consumer and the company. A company is most likely motivated by increasing profits and leveraging gathered data, while the consumer primarily wants to decrease energy consumption, save money and maybe make the world better through their green efforts (Lindley 2017). By going beyond the design of an artefact and focusing on the values in interactions across stakeholders, an ecology of meaning and value can be abstracted from behaviours, actions and incentives in transactions (Speed 2015 : 6). From this will emerge a variance of actors that call for an empathic approach towards beyond-human perspectives, where dialogues are created between thing-centered and user-centric perspectives for new imagined communities.

## **PETRAS and STiPS**

This position paper presents methods, and insights developed in research conducted under the PETRAS research scheme. The PETRAS Internet of Things Research Hub is comprised of nine leading UK universities that work together to explore critical issues in privacy, ethics, trust, reliability, acceptability, and security.

The research referenced in this paper is being conducted at the University of Edinburgh with a focus on Smart Transactions in Public Spaces (STiPS). STiPS began as an examination of value transactions that currently take place in public spaces such as high streets, parks and event venues as a first step to supporting an increasing range of digitally mediated transactions. The current point of research is now developing a prototype to further explore what smart transactions in public space under growing IoT networks could be like, and similarly constructing a method for moving in and around the complexity of research on things that do not yet exist.

## **IoT and Design Anthropology**

Design anthropology in recent years has emerged out of the use of ethnography by designers into its own sub-discipline; as "it is not just the usefulness of ethnographic research and information for design that is at stake here; there appears to be a genuine affinity between design and the ethnography as a process of inquiry and discovery that includes the iterative ways process and product are interconnected and the reflexive involvement by researchers and designers" (Gunn et al 2013). A rather provocative method to explore beyond the user into its webbed relationships between artefact, data, and cultural infrastructure.

In STiPS research 'the cultural infrastructure' becomes synonymous with the IoT platform and the tool for vital cultural transmittal, 'modern ubiquitous micro computers' i.e. our smart phones. However, that is not

to say the smart phone should be viewed as a singular entity although it is a singular thing in and around which we can centre our focus of research, but not solely. To reveal an entanglement of entities that have moved beyond the human experience focus can be targeted towards the objects' projected personality, social relationships and life courses (Cila et al 2015: 4). The cell phone is only a gateway, but a gateway to what exactly? It is really hard to pinpoint and even more difficult to say for sure under growing IoT platforms. However, in Design Anthropology there is a keen focus on what many now refer to as Algorithmic Culture and for the purpose of this paper we should think of the cell phone as ongoing interactions with algorithms in various assemblages.

This is probably one of the most difficult frontiers of techno-culture to grasp due to its fast paced scaling. Therefore we borrow from the anthropology discussion and define algorithmic culture as, "the ways in which computers, running complex mathematical formulae, engage in what's often considered to be the traditional work of culture: the sorting, classifying, and hierarchizing of people, places, objects, and ideas (Striphas 2016)."

Illustrating the developing importance between HCI and Anthropology we should think of Jonathan Cohn's paper *My TiVo Thinks I'm Gay: Algorithmic Culture and Its Discontents*. This gave insight into how important certain algorithms can influence one's life. Tivo was one of the earliest and one of the best to popularize the digital recommender system, where algorithms proved to be very useful and yet revealing towards cultural anxieties between taste, consumption, and sexual identity (Cohn 2016: 2). In the 90s, TV series began to attract both hetero and homo sexual audience to what is popularly called queer TV programming. TV programs like *The Ellen Show* and *Will and Grace* and profitable recommendations generated by these systems led to the 'programming of the self' that became entwined

with changing norms around sexual identity and particular stigmas. This meant a merge between algorithmic personalization, sexuality, and recommender technologies like TiVo (Cohn 2016: 2). However, "algorithms are not static objects and they do not break the dynamic relationships that structure our everyday lives. Rather, as Christian Fuchs has argued in relation to Google, they are 'dialectical system[s] reflecting the contradictions of contemporary capitalism' (cited in Cohn 2016). These technologies may affect certain cultures, but they are also—simultaneously and irrevocably—transformed by such cultures as well" (Cohn 2016: 4).

### **The Use of Empathic Positionality**

Jonathan Cohn makes the point clear that we as human users are in a relationship with algorithms. Algorithms change what we think and in turn we also change what they 'think'. For this reason, it becomes highly valuable to collect multiple perspectives from all actors in such interactions. To have an inclusive view of culture in this manner of research, empathy must be extended to non-humans. With this pursuit in mind we define and use empathy as "...the experience of foreign consciousness in general, irrespective of the kind of the experiencing subject or of the subject whose consciousness is experienced" (Reiko 2012).

This use of empathy means that the non-human elements that shape modern trans-mediated ubiquitous computing culture can be framed as equally important in interactions with humans and allow research within the communities that exist in public spaces housed under an IoT platform. Understanding empathic use of positioning is good, but how did we actually come to find its usefulness? It did not start out as a linear explanation nor tangible knowledge, but was discovered as a process to ideate in future forward thinking that emerged in our early case studies. Currently, IoT platforms in public spaces are not really producing the kinds of interactions that exist at home with greater connectivity. Although that is changing, it is not clear

how that will change and why. In this research we first start out by understanding the now to imagine the future.

#### **4 Case Studies and its Insights**

This journey began at the Royal Highland Show in Edinburgh 2016 as we conducted ethnographic inquiry to get a grasp and feel for the transactions under STIPS research. This led to a lot of probing and four very similar yet unique case studies. In order to explore current practices around value transactions we have conducted a mixed methods design anthropology approach to explore the effectiveness of different methods in this context, adapt to the space and social background and mitigate against practical problems arising. Largely the studies are observational, and focus on the social, cultural and economic value transactions in public spaces.

The four sites included:

1. The Royal Highland Show. RHS is dedicated to showcasing the best of Scottish agriculture, allowing those in the trade to make new alliances and negotiate important business contracts.
2. The Edinburgh Fringe Festival, which began in 1947 as an unofficial adjunct to the Edinburgh International Festival. Now in its 70<sup>th</sup> year, it is the largest festival of its kind in the world. The Festival lasts for the whole of August each year, and has colonized every useable performance space in the city.
3. The Summerhall Christmas Market. Summer Hall is the former Royal (Dick) School of Veterinary studies in Edinburgh and is now a creative hub for the arts with studio and workshop spaces. Their Christmas Market was a special one-day ticketed event where one could buy gifts and cards for Christmas. This included the sale of artisanal luxury goods from local sellers, festive creative activities for kids, and lots of tasty things to eat and drink on a festive theme.
4. The Prince's Street Christmas Market. The month-long Christmas theme runs from December into early

January and is similar to other European Christmas Markets, but is juxtaposed on Edinburgh's Unesco World Heritage Architecture. Many things are sold like jewellery, trinkets, clothing, and artisanal food. It's a fairground with some carnival-style games on a Christmas theme, catering to families and adults.

Research methods differed between all sites, but included different forms of ethnographic inquiry and qualitative methods. This included semi structured interviews from stall holders, event planners, and attendees. The sites were chosen to be inclusive of public spaces that were open to the public or public ticketed events. RHS and Summerhall were both ticketed, while The Fringe and Princess Street Christmas Market were open to all. Participant observation, auto-ethnographies, interviews were all centred around the notion of financial transactions, but did not strictly define transactions as purely monetary. RHS began as an exploratory study, that led to defining the simple scope and prospects of future public space enquiry. The Fringe included multi-party shadowing and both Christmas Markets built upon the two initial studies to investigate differences between ticketed and open event spaces.

Abstracted from these case studies were generalized insights:

- Cash is used most often, but not always preferred
- Network signals do fail
- Larger purchases require cards
- Making change is never easy
- Vendors sell stories and brand value
- Communication is important
- Place and space have value to both vendors and customers
- Making it easy to pay is most important (any payment is better than a failed sale)
- People are divided on perceptions of cash vs. card

- Security is important, but assumed to be safe
- People's experience can be understood through a journey of their transactions or a 'transaction journey'

All these insights serve as clear guidelines for developing financial or banking technology that can be used to prototype and ideate in UX communities. More importantly, this led to clear perspectives on values and the exchange of values between stakeholders, investors, sponsors, stall holders, and customers.

The first year and a half of STiPS research involved conducting ethnographies in public festival spaces to orient our thinking towards what a smart transaction in a public space could be. These insights and research effectively unpack the range of value transactions that are currently practiced with the technology that facilitates them, while also expanding the broader context of activities in public spaces and how this may influence the transactions, and the connections between them.

With this well mapped vision of value transactions across public spaces this research now attempts to disrupt the platform at which those values have been exchanged upon. The current prototype that is being developed places the concept of smart transactions in play at a festival space focused on capturing information about transaction journeys. This will inform our understanding of what these transaction journeys look like and how best to support them, and will be an initial step towards building more complex and fully functional iterations.

### **Design Anthropology Under IoT Platforms**

A smart transaction in a public space is a cultural shift that is hard to define; it may imply a change in value or a new perspective to participants. It is a cultural facet that embarks on the bigger question of how to describe current cultural practices in flux. Ethnographers have

struggled with how to describe cultures. "As interworked systems of construable signs (what, ignoring provincial usages, I would call symbols), culture is not a power, something with social events, behaviours, institutions, or process can be casually attributed: it is a context, something within which they can be intelligibly—that is, thickly—described" (Geertz 1973). The practice of thick description used in ethnography, made popular by Clifford Geertz, is a method of contextualization. In ethnography it goes quite far breaking down into emic and etic perspectives, or insider vs. outsider, as in subjective vs. deductive. This was coined by Kenneth Pike, an American linguist and anthropologist. "The etic view point studies behaviour from outside the particular system, and as an essential initial approach to an alien system. The emic viewpoint results from studying behaviour as from inside the system" (Duranti 1997:172). Yet both perspectives aim to create a sense of positionality for interpretation. This research takes the amalgam of varying perspectives into account to understand the different relationships and the values perceived in these perspectives.

Through practice-led research with narratives inclusive of beyond human users and beyond human problems; data flows can be grounded in the emergent landscapes of IoT and public space. This is a perspective that can directly provide thick cultural description of algorithms, social media streams, and very real human experiences entangled in its web. We must simply, yet very complexly, foster empathy towards 'a thing' and its relationship to humans and other things where a theory of practice can be built, allowing innovation for a plethora of value transactions across IoT platforms.

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