

6. Hub of All things



"... once we started working with the PRISMA community we found we're not alone, we realized there's a whole school of people who are doing similar approach as we do, we're also learning from the community on different ways and in best practices of implementing ethical research and innovation. "

Xiao Ma
HAT Data Exchange Ltd. Founder
and Warwick University Senior Fellow



The company and the technology

The product is the 'Hub of All Things' (HAT); this entails the HAT microserver, which is a new technology that confers intellectual property rights of personal data to individuals through their ownership of a database, wrapped with containerised microservices. The HAT can be described as:

- A legal artefact: a person is data controller/processor & subject;
- A technological artefact: a person can invoke private analytics and algorithms on their data to share;
- An economic artefact: a person can exchange data in bundle combinations & data is unencumbered;
- Market artefact - scaffolding into existing markets as a private data account, premium user account for applications/websites to pull data to/ from;

The HAT ecosystem is the first-ever personal data exchange ecosystem that enables individuals and organisations to exchange data directly between individuals and organisations without third party involvement. While there are many personal data lockers and repositories, the HAT is uniquely an artefact that is actually owned by the individual, and has a schema that 'flattens' and 'liberates' vertical structures of data so that new mashups and new ways of putting together data for new services could be created to serve individual lives. Individuals can acquire their own data from internet-connected objects or services, and this acquired data is then transformed by the HAT to enable individuals to contextualise their own data, making it meaningful and useful for decision-making. With that data, individuals can grant websites and applications rights to the data in their microserver that allow them to obtain more personalised services and recommendations. It seeks to solve the widely-perceived inadequacies of the online economy by implementing global operating standards for personal data exchange. The HAT is therefore a personal data platform for firms to offer individuals services for their data in a scalable way, yet allowing individuals to control the data rights given to firms. Importantly, the HAT and its transformed data is owned by the individual.

For firms, the HAT opens opportunities for exchanges and use of personal data in a way that is privacy preserving, real time and on demand. Firms can (1) build smart devices that individuals can control and acquire the data on the device onto their HAT; (2) build smart applications for individuals to make use of their data; or (3) help individuals exchange their data for better buying decisions, personalisation



and recommendation (4) not need to hoard data as firms can request for data in real time and on demand whenever needed and only while the user is using the service.

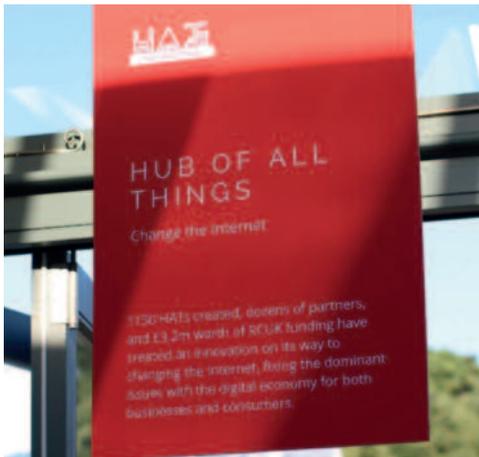
The enterprise grows out of a series of university-based research projects. The HAT project as a whole has received several grants from the RCUK/EPSRC/digital economy fund. Its researchers are actively seeking further funding. It has also crowdfunded £158,000. The team of researchers has involved 6 UK universities, 7 professors and 20 researchers. Alongside the UK Government funded research projects, there are two central private organisations:

1. The HAT Community Foundation (HCF) Ltd. A not for profit company registered in England. Governed by its membership on behalf of the whole HAT community.
2. HAT Data Exchange Ltd (Hatdex). A private limited company with share capital, with a mission as a social enterprise. (See <http://hubofallthings.com/downloads/hat-briefing-5-the-hat-foundation/> for details on the organisation of the HAT community. See also <http://hatcommunity.org/hatdex-economic-and-revenue-model/> for a brief account of this.)

The research project was initiated in 2013 and ended in 2015, but research continues with more than £10m funding using HATs for tourism, health, education and finance research, coordinated by HATLAB (<https://hat-lab.org>). The HAT Community Foundation and HATDeX were founded in 2015 and publicly launched in 2016. The company's product itself is at live testing stage with 1600 HAT owners (HATS available through iOS, web and Android).

Working with Hub of All Things

The vision for this pilot project was continued involvement in the role of embedded ethicists. This was divided in to two phases. The first was an extended scoping exercise, consisting of a series of meetings on topics that have arisen in earlier discussions, with the goal both of iteratively narrowing down the specific points at which the PRISMA researchers in the Interdisciplinary Ethics Research Group at Warwick (IERG) could make productive interventions and also bring out unrecognised issues. The second phase focused on delivery of specific Responsible Research & Innovation advice, which we set out overleaf.



Activity has included authoring a work plan, a regular series of meetings in person and by telephone with members of the company including Xiao Ma, Jonathan Holtby, and Irene Ng; involvement of the company at the PRISMA workshop in Brussels in April 2017; involvement of the company at a forthcoming event organised by us for the UK intelligence services; a workshop in February 2017 on data ownership with HAT and Warwick Interdisciplinary Ethics Research Group; the attendance of the embedded ethicist at the HAT research seminar in Cambridge; and acquisition of a beta version of the product for testing by IERG.

In carrying out this activity IERG are continuing to work with the members of the HAT Community Foundation on privacy issues in particular and are working in particular on (i) the value of privacy that HAT supports, and (ii) the contexts in which trades of data for services are non-exploitative. Two particular ongoing issues in this regard are:

- The extent to which facilitation of people's rights to their personal data is dependent on the manner of regulation of the data trading platform as much as it is dependent on the technical capability to trade data itself.
- How HAT is beneficial to both individuals and companies, and the extent to which there may be trade-offs in this regard built in to the architecture of the technology, for example where the exploitative aspect of trades of data in exchange for services might be replicated in a HAT-governed market.

Advice

The efforts of the HAT community to take the lead at the public and intellectual level in the areas of the theory of data ownership and data privacy are laudable. This is manifested in several places including in the publication of papers and online articles on the topic by HAT developers, the MadHatters newsletter, and the organisation of the Wolfson-HAT seminar series. The work in this direction is a model for other technology developers in bringing normative issues in at an early stage of technology development. Our general advice is that HAT continue and deepen such work, and in doing so offer a yet richer body of answers to the questions that the idea of a personal data exchange raises. More specifically we propose:

1. Further investigation of the ways in which HAT activity falls in to RRI categories.

The RRI brand has some cache with funding bodies, and the translation of HAT's activities into RRI terms might have the advantage of making its work more attractive to funding bodies who formally recognise RRI and from whom HAT seeks funding. Furthermore, RRI has some functional value that may supplement the existing efforts of the HAT as a social enterprise. For instance, HAT might seek certification as a B Corp.

2. Exploration of possible tensions between HAT's role as improving data security and HAT's role as improving data privacy or control.

The personal data exchange is sometimes advocated on the grounds that it is personal, and sometimes advocated on the grounds that it provides for exchange. The extent to which these two goals overlap or conflict is central to understanding the HAT's social appeal. On one hand, the HAT provides for a complicated architecture in which each individual's information is kept in a separate database. This seeks to provide not only practical security of data, but also legal ownership and control, since there is legal precedent for the ownership of databases if not data itself. On the other hand, HAT allows people to extract the value from their own data, thereby escaping the apparently exploitative nature of the online economy. However, it may be the case that the easier it is for data to be exchanged, the less it will be ensiloed within the HAT's secure architecture, being instead held and mediated by third parties. We propose further understanding of this possible trade-off and the desirability of different points upon it.



3. **Emphasis on the democratisation of the marketplace.**

It appears that a great deal of the effective power of the HAT in providing people with control of their data occurs in the specifics of the governance of the marketplace in personal data that it proposes. It is in principle possible for HATs to be ubiquitous but for data only to be tradable in marketplaces that freely allow third party trades and thereby seem exploitative in just the same way that the current online economy seems exploitative. Indeed the current HAT cannot provide 'first point of access' personal data silos; it provides auxiliary silos for combining existing data sets that are stored and controlled elsewhere, such as on Google or Facebook servers. This suggests that a central part of the HAT's offering in giving people control of their data is in writing and enforcement of the codes of practice that govern the bodies who can connect to HATs, rather than in the existence of HATs themselves. The organisation already has gone to some lengths to consult stakeholders and democratise this process; our advice is that since the distinctive offering of HAT depends upon this process, efforts at democratisation of the marketplace should remain central.

