

IT as a Utility Network+ Workshop: Smart spaces and diversity

Southampton, 11 March 2013

Introduction

A group of experts from a variety of backgrounds, ranging from big data and the semantic web to cyber security and the built environment, but all with a shared interest in smart spaces and IT as a utility, met to discuss the topic's cutting edge in the context of diversity. The goal of the day was to identify a small number of issues and associated opportunities, recommendations and actions for the network.

In addition to the facilitated discussions, Professor Lizbeth Goodman, University College Dublin's chair of creative technology innovation, gave a keynote talk in which she outlined the history of SMARTLab and inspired participants with her emphasis on the importance of a driving vision that can be transformed into practical actions.

Throughout the day the discussion was wide-ranging, covering the nature of a utility, legal frameworks, political and economic challenges, scale and much more. However, the key issues for further consideration were distilled down to four main areas.

Key issues

Emerging from the discussion, the key issues of interest in the field were identified as:

1. Architecture analogies in building and computing

- Information architects now face the same kinds of design challenge that architects have always faced. Both create structures with the aim of enabling other activities to take place in that structure, and both understand that the design of the structure will influence the activity that happens within it. Traditionally, architects have attempted to understand everything that could take place in the building and build accordingly but they are now moving closer towards adaptability, allowing the space to be flexible and reused.
- Buildings used to be built with no expectation that they would change; they are now designed to evolve and change over time, from the nature of people coming into that space and what they can do, to the learning that goes on in the environment.

- While we can't know what the "unknown person on the other side of the mountain" is trying to do, we can leave a gap in our smart spaces, whether physical or virtual, where they can come in and make changes. Can we design our smart spaces for diversity from the beginning in that sense – can we put something in place that may be able to accommodate the unknown future person and their needs?

2. Discretised continuum between totalitarianism and anarcho-syndicalism

- On the web we can compare and contrast IT systems (authoritarian) and peer to peer networks (anarchic).
- Can we find smart cities along that same continuum?
- Do we say "this city is going to be a smart city and this is how it will be" or do we have a vision of what is going to happen and accept that we have no control over it? How do we build successful systems on a web that has no authority?

3. Compatibility, interoperability and negotiation

- If we're going to move towards smart cities, different systems will have to work together and so compatibility and interoperability is crucial. Therefore, compatibility will be a major issue for ITaaU.
- Compatibility does not have to mean that everything is homogenous but rather that two very different things are able to communicate – that there is room for negotiation between the systems.
- Negotiation is about requesting and declaring information. This may be in a physical space (what if you want to play cricket in the park but someone else wants a picnic? Do you turn the light on and the music down when you go in a room?) or a virtual space. It can be harder to reconfigure a physical space than a technical infrastructure (unless it's in a format you cannot get at or the systems do not talk to each other). Linked data has a role to play here.

4. Data, risk and trust

- If a power supplier sends you the wrong fuel and it blows up your house you can sue them. If you rely on an IT utility can you insure against financial loss / use an alternative if it is removed? How to defend against a risk?
- The open government licence is most important part of open data. It is a form of insurance that the data will not be removed, as has happened to apps built, for example, with transport data.
- In the digital economy a business risk is not just about money but can also relate to time, reputation and attribution.
- A focus on risk and insurance brings in the economic case.

Lizbeth Goodman's keynote

"Our structures, from healthcare to education, are broken and we cannot afford to fix them with bits of blutack. We need to invest strategically in a future vision."

Lizbeth Goodman, founder and director of [SMARTlab](#), impressed and inspired the meeting with her past achievements and future plans. Think big and think collaboratively were the watchwords of her session.

She opened with an overview of the history and current work of [SMARTlab](#). While its physical location has ranged from the University of Surrey, Central St Martins and the University of East London before reaching its current home in Dublin, its outlook has always been global. It works with both local and international communities, from the severely disabled children of the [Stephen Hawking school](#) to a Bengali-speaking women's group making purses and the yacht-building "Old Codgers" who use the lab's space for 3D design. It's all part of SMARTlab's mission to bring together teams of artists, scholars, technologists and policymakers to share a commitment to creative technology innovation for real social change.

Most pertinently, SMARTlab has recently been asked by Dublin city council to collaborate on the development of smart cities. The council has teams looking at the tools but it wants people who can explore why a smart city matters to the communities involved – who will use it and why? "The emotional glue," as Lizbeth describes it.

Lizbeth also highlighted the importance of language and of getting keywords into funding calls. She has been making sure that the word "creativity" is included in European frameworks. She recently attended the conference EU Science and lobbied for the following words to be added to policy documents:

- Hippocratic innovation.
- Creative technology innovation (CTI) to replace ICT – to put people, not the desktop machine at the centre. It's the same letters reordered!
- Empathy to be included alongside literacy and numeracy.

She also urged recognition of the following:

- Trust, between groups as well as secure systems.
- Inclusive design as a new field that should be funded as such. It is post-disciplinarian as it relies on the knowledge of the pillars of discipline to create something else. It includes IT as a utility and would create a natural home for some of the outputs of the network.

Lizbeth spoke powerfully about the need to think big and think collaboratively. She namechecked [The 100 Year Starship](#), an American project seeking to make the capability of human travel beyond our solar system a reality within the next 100 years – while using the breakthrough technology necessary to achieve that aim to enhance the quality of life for all on earth. Thinking about basic delivery systems, she drew together the digitisation of healthcare records and the technology needed for learners to own their own learning.

"There is money being spent on re-inventing blackboards and so on but most are not disability friendly and so lots of money is then spent retrofitting them rather than doing it from the start. If we all thought interoperably with healthcare, education etc then it would save money and improve outcomes for everyone. But it needs a big lobby and a different kind of thinking – the vision has to start from concrete things, universal design re-imagined so that we not designing for the margins."

Lizbeth argued that fragmented groups of people are not going to achieve anything, but a network with a vision could. "We need large programmes. Stop thinking about everyone winning £100,000 but about substantial billions for a big idea that if successful will make a social difference."

The day's discussions

Beyond the four key issues outlines above, the discussion ranged widely. The topics covered can broadly be grouped into five areas.

Defining a utility

The difference between a utility and a service was a thread that ran through much of the day's discussions. Participants agreed that standards are a factor – electricity is defined by 240v. Services are more complex and may come as a package, may need an app to use and so on.

But what about Google? It has the appearance of a utility but it's gaining more from the user's information than the user is - probably. Its business model depends on gaining that information whereas, while electricity supplier might monitor usage, its success does not depend on doing that. This raised questions of whether a utility is defined by scale – does it come down to how many users a service has? Agreement was not fully reached on whether search engines are a utility, although the term "pseudo-utility" had support.

"Is the internet itself the utility? If you were looking for a house to buy and discovered that it had no access to the internet, would you buy it? Has the internet become the equal of heat and light in that respect now?"

The legal arena

The legal aspects of the subjects under discussion raised a number of questions, including

- When is a utility a legal identity?
- Can you sue an anarchic utility?
- Who owns what data (eg the NHS does not own its own data and has to scrape it off a website and republish it)?
- Could it be challenged in law?

The group agreed that, while relevant, the usability and diversity argument within the legal arena was out of scope for the meeting and too big a field to try to resolve at that time. It should be acknowledged, parked and possibly tackled in a separate meeting where the bridging topic might be security.

Ubiquitous IT

A really interesting thread developed from the notion that right now we are living in a world of maximum provision of information, of near-ubiquitous IT coupled with older, "analogue" communication systems.

Taking the example of being lost on a city, there are currently multiple sources of help. The first port of call might be the map on your mobile phone but if the battery dies or the wifi fails then there are still other options: landlines, billboards, people to ask, maps at the railway station, signposts in the street. At the moment, because of resilience issues, we still have all those forms of help sitting there and they promote diversity. In the future, we may lose some of those options. How will that affect usability and diversity?

"Up until now IT was about this computer in the middle of the room. But now we have a model where we believe it's pervasive. If I want to know something I go to my phone to check. It's function-driven. But sometimes it's the case that, in the end, the most successful way of finding your way is to knock on someone's door..."

Diversity

What about diversity and people? The 80/20 rule was raised - it's cheap to provide for the majority and expensive to provide for the minority - but is the minority really the minority or is that an imposition of an outdated model? Has the digital economy changed the basis of that cost-benefit analysis? Might it make economic sense to look at what is perceived to be the 20 rather than the 80? What should the utility function(s) be? To what extent should the identification of a platform supporting diversity provide economic and societal benefits in a wider context?

"Most of the people currently designing for diversity will look at the device. But we need to look a few steps back. It needs to work not because it's a smartphone but because the data is designed for it. The platform model makes it just as easy to serve the 20%. With apps/taps what's the flow through, the information flow in a platform model and how might that affect diversity?"

Scaling

Time scales and physical scales were at the heart of the discussion around smart spaces, whether they be bridges or meeting places. In the Netherlands, motorways are built with sensors and wind turbines that relay information to another country from the one in which they were built – because sometimes you want data captured at different times. Then there is the issue of fragmentalisation – different parts of a building may now evolve at different rates. It is a much more complex situation than in the past when a bridge would be built and expected to last as it was for many years.

Other scaling issues relate to economics and monitoring. If a structure has an over-engineered lifespan or capacity, for example the Sydney Harbour Bridge, then there is less concern about monitoring. However, a just-in-time minimal cost approach needs monitoring and is it less about safety consciousness than money saving.

"The economic model now is the platform model – you build it and let someone else do the next layer. That's what we're talking about here – we do not need to build the Brooklyn Bridge."

Usability cropped up in the sense that "there is always still a human at the end of it - an engineer who wants to know how the bridge is doing". Buildings may be set up to monitor all the information which feeds into sustainability but if the person who was there when it was set up leaves and others do not know how to use it or how to make the best use of it... There is always the human element.

Conclusion

In addition to the four key issues that were captured during the day, a number of actions were identified. These included:

- **Potential further workshops**, including an architecture workshop hosted by the University of Brunel to further explore the first of the key issues. Participants also expressed interest in a workshop looking at the economics of the utility model.
- **Alternative funding**, including various European calls highlighted by Lizbeth Goodman. She urged anybody interested to contact her to find out more.
- The **ITaaU Network+ secondment scheme** which is now open for applications. More information can be found on the [ItaaU website](#)

In terms of the growth of the ITaaU network, by capturing this area the network has been able to identify what other networks and people need to be brought together to move this work forward.