An Internet of Cars: Connecting the Flow of Things to People, Artefacts, Environments and Businesses

Chris Speed
Edinburgh College of Art
Lauriston Place, University of Edinburgh
Edinburgh
0131 651 5747
c.speed@ed.ac.uk

Duncan Shingleton
Edinburgh College of Art
Lauriston Place, University of Edinburgh
Edinburgh
0131 651 5748
duncan@shingleton.org

ABSTRACT
In this paper, the authors introduce a creative approach to conceiving cars as data packets through the use of their license registration plate and offering a playful platform that allows users to engage with them as though they were part of social media. The paper introduces the concept of the Internet of Things and suggests that a barrier exists that is preventing the general public from conceiving cars as being part of a similar network. The authors identify similarities between existing tagging technologies that support objects to be tracked through the internet but highlight the apparent oversight of cars to offer the same capabilities. The authors present a vision for a platform that leverages the unique identifying properties of car registration plates and introduces a cultural project in which people will be able to 'play' with cars as they might data through games, messaging services, and visualisations.

Categories and Subject Descriptors
J.5 [ARTS AND HUMANITIES]: Fine Arts

General Terms
Design, Experimentation.

Keywords
Internet of Things, barcodes, cars.

1. CONTEXT
The vision of an Internet of Cars is located within the emerging technical and cultural phenomenon known as 'The Internet of Things'. The term is attributed to the Auto-ID research group at MIT in 1999 (coined by Kevin Ashton at the Auto-ID research group at MIT in 1999 [1]). The term, 'internet of things', refers to the technical and cultural shift that is anticipated as society moves to a ubiquitous form of computing in which every device is 'on', and every device is connected in some way to the internet. The specific reference to 'things' refers to the concept that every new object manufactured will also be able to part of this extended Internet, because they will have been tagged and indexed by the manufacturer during production. It is also envisaged that consumers will have the ability to 'read' the tags through the use of mobile 'readers' and use the information connected to the object, to inform their purchase, use and disposal of an object.

The implications for the Internet of Things upon production and consumption are tremendous, and will transform the way in which people shop, store and share products. The analogue bar code that has for so long been a dumb encrypted reference to a shops inventory system, will be superseded by an open platform in which every object manufactured will be able to be tracked from cradle to grave, through manufacturer to distributor, to potentially every single person who comes in to contact with it following its purchase. Further still, every object that comes close to another object, and is within range of a reader, could also be logged on a database and used to find correlations between owners, environmental conditions and applications.

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1.2 The Problem
However the authors suggest that a technically determinist vision of tags and codes appears to be obscuring an opportunity to fold existing 'things' into an internet for traffic. Cars are the single most visual form of actual moving data that we know and yet they are wholly overlooked as packets of data that interface with humans, businesses and the environment. The vision within this paper introduces the principle that car registration plates can be used as unique identifiers in the same way as barcodes and offer a platform for people will begin to store data on to them, use them as interfaces to social networks, pass messages between people, and connect to environmental data.

The authors speculate that the primary barrier is one of habit. The public do not identify the registration plate on a car as a portal to the internet in the same way that QR codes (quick response barcodes) or RFID are beginning to offer.

Our objective: Identifying cars as things within an Internet of Things that have the potential to link people, services, artefacts and places.

Our barrier: The public identification of cars as packets of data.

In Sixth Sense transport [2] we are looking to provide travellers with many forms of interface to enable them to 'see' the flow of traffic and begin to anticipate new travel opportunities. Part of this work involves developing visualisations of future transport options as well as mobile applications that support sharing. Considering cars as data packets is one way that we are exploring how to alter how people perceive automobiles and offer them new models akin to the fluidity of email, social media and file sharing.

1.3 Our Vision
Dynamic, fluid and representing individual packets of information within a UK wide network, cars could be critical components within the emerging phenomenon known as the Internet of Things. Each one tagged with a unique identifier that is scannable with smart phones, as well as the highly sophisticated roadside cameras, car with their number plates have been the equivalent of barcodes on supermarkets products for many years. However they

remain woefully overlooked. This vision explores a commercial and social platform for turning cars into networked artefacts that will provide the missing link in connecting the flow of things to people, artefacts environments and businesses.

Visible in the street, cars that are linked through a common web platform offer a fluid interface to the Internet of Things that will make visible the flow of products and services that could change the way we inhabit cities in the 21st Century. Able to 'see' where things have come from and where they are going, cars have the potential to become the next web browser.

Cars offer a local and dynamic interpretation of social activity: where people go, what their habits are. Lift sharing, moving things such as shopping, postal items and messages suddenly transforms the opportunities for an Internet that we can 'see'. In contrast is the static life of things such as barcoded products bought from supermarkets which only appear 'on the grid' when they are scanned at the point of manufacture, in the warehouse, and finally at the point of sale. We know that as individuals or as families we move 'things' around in bags and cars but these things are hidden and therefore are offline during transit preventing them from connecting to other people and services. We wouldn't dream of scanning a tin of baked beans in someone else's supermarket plastic bag. But cars are in the public domain and they offer an open platform upon which things in flow can suddenly be made accessible.

Figure 1. Vehicle registration plates and Quick Response barcodes both operate as individual identifiers.

1.4 Southampton: The First City For An Internet Of Cars

The primary convergence scenario for an Internet of Cars are the thousands of cars that travel across, through and about the city of Southampton every day of the week. This busy city is no different to any other in its reliance upon the car as a conduit for moving people and things to support personal, social and commercial needs. At present though, there are no connections between people and the things (cars). Through correlating the data accrued by 25 roadside traffic cameras with social data that is mined at each location, and data that is associated with specific cars, a platform will emerge that will reveal the car as a point of network inquiry about the conditions and practices that make up Southampton.

Cars offer a local and dynamic interpretation of social activity: where people go, what their habits are. Lift sharing, moving things such as shopping, postal items and messages suddenly transforms the opportunities for an Internet that we can 'see'. Through close collaboration with SCAN[1], the intention is to develop a public platform that enables car registration data gathered from the 25 traffic cameras to be complemented by crowd sourced data. The promotion of free smart phone apps that allows residents and visitors to Southampton to scan cars will provide a further data that will contribute to an image of the cities social, economic and environmental flows.

Data visualisations, serious games and messaging systems will support the articulation of the City for an Internet of Cars and more importantly introduce car registration number plates as a form of tag and barcode that may play an equal role in constituting an internet of things. The principle of the games is simply to raise public and business awareness of a form of internet that is currently hidden in plain view. Workshops and exposure within the month project will launch a thousand commercial ideas that will then capitalise on this Internet of Cars.

Opening up and coupling databases that link to number plates through which people and businesses are able to write and read to, will spring forth a host of social and industrial opportunities.

2. NOTES

1. SCAN is an agency developing digital and interdisciplinary arts in the South of England. It works in partnership with a broad range of individuals, groups and institutions nationally and internationally to commission innovative projects that cross and merge disciplines drawn from arts, media, humanities, science and technology. SCAN us supported by the Arts Council of England and Bournemouth University.

3. ACKNOWLEGMENTS

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4. REFERENCES

[1] Kevin Ashton. 2009. That 'Internet of Things' Thing. *RFID Journal*, 22. Juli 2009. Abgerufen am 8.

[2] Nigel Davies, Manfred Lau, Chris Speed, Tom Cherrett, Janet Dickinson, and Sarah Norgate. 2012. Sixth sense transport: challenges in supporting flexible time travel. In *Proceedings of the Twelfth Workshop on Mobile Computing Systems & Applications* (HotMobile '12). ACM, New York,