Editorial

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How disruptive is the smart cities movement?

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I recently attended a seminar on smart cities in a country house retreat that was organised by the UK Government's Tech City Hub (http://www.techcityuk.com/) and a cloud computing company called Improbable (http://improbable.io/) who see their potential market being the developing of platforms for agent-based simulations of all kinds including city applications. The seminar was focussed on exploring the disruptive effects of new technologies which could potentially make cities smart through changes in our behaviour due to information being available to us almost instantly, in near real-time. The emergence of such data from populating cities and public places with many varieties of sensor will certainly change our patterns of location and social networks and all this is likely to change the city from its mid-20th century form as a rather ordered, perhaps even simple kind of place to something much more diverse, heterogeneous, and complex. Classic disruption, as Christensen (1997) argues, comes from bottom-up, non-established, small initiatives that somehow innovate first under the radar and suddenly pose a threat to established ways of doing things. Invariably, these utilise new technologies that require new business practices in their use, generating much lower costs and/or much more convenience, hence proving irresistible to consumers. The archetypal example at present is the personalised taxi service Uber which breaks the long standing monopolies of organised taxi firms that have dominated the market and in so doing, have increasingly disadvantaged the consumer. It has taken the all-pervasive nature of the internet, and in particular the emergence of smart phones to reach the point where communications between customer and suppliers in cities have become possible without the kind of elaborate organisation that has been developed over many years for such services. Uber is probably in the vanguard of many other such services that will be disrupted in similar ways.

The extent however to which such technologies are deeply disruptive to the form and function of the city is debatable. If you are an established taxi driver, then the existence of Uber can force you out of business and it may well be that many traditional services will be entirely displaced by such developments. But in terms of changes in behaviour that impact the way we travel, then it is an open question as to whether services like Uber will really change these patterns and their structural importance in configuring the city. Big changes in behaviour are more likely to come from our growing preference for walkable locations and our concern for the deleterious impact of sedentary travel on our health, and these may change our preferences for different locations much more significantly than the accessibility afforded us by new travel services.

This raises the prospect of how disruptive smart city technologies are likely to be for the way we structure our cities. There are several elements to this. The means by which we communicate is already having a major effect on the form and function of our cities. Physical travel is being both substituted for and complemented by ethereal travel, if I might use the phrase, i.e. communications that take place electronically. The market place

is being revolutionised by such trades and what is coming to take the place of physical transactions are a complex bundle of activities that blend the material with the ethereal. Online shopping is simply one manifestation of this. Ordering and viewing is done via the net while physical delivery is no longer the province of our going to collect something but it is brought to us directly. Our social relationships too are being enhanced and substituted for in complex ways by new social media while education and health are being enriched by the same blend of physical and non-physical transactions. The entire basis of communications in cities is being dramatically transformed and for the first time, there is a sense, but only a sense, in which the form of the city is being divorced from its functions.

The central question is whether or not all these new technologies combined with the fact that these are opening up more and more opportunities for interaction at different scales and time horizons add up to the kind of disruption that occurred when the industrial revolution began with mechanical technologies, then electrical and latterly digital. To an extent, these great waves of change have introduced very different communications technologies that have led to dramatic transformations in the structure of cities. Prior to the introduction of mechanical technologies embodied in the internal combustion engine, cities could not grow beyond about 1 million persons and only when the electrical technologies emerged during the second industrial revolution in the late 19th and early 20th centuries could cities become global in extent with their spheres of influence becoming truly universal. Digital technologies have consolidated this with the reach of anyone, anywhere being truly global.

All this marks a major transition from the industrial to post-industrial age. It is marked by a period of intense creation in which old industries based on old style, organisational forms are being destroyed only to be replaced by new bottom-up, renegade forms of organisation. Uber is the most obvious contemporary example. This process of creative destruction as it was called by Schumpeter (1939) runs in parallel to the kind of technological disruption articulated by Christensen (1997). It represents the latest of the long waves articulated by Schumpeter following Kondratieff who articulated them so clearly in the 1920s, the 'Sixth Kondratieff' being the era of the smart city (Batty, 2016). Adding all these changes together may well lead to a regime in terms of the way cities are evolving that is considerably greater than the sum of its parts and may well lead to a distinct change in the way we perceive cities physically. In short, the form and functions of the smart city may well be something very different from the industrial city. If we add Uber type services, automated ticketing, online buying and selling, searching and deciding using Google technologies, social networking through Twitter and Facebook, MOOCs that enable us to learn about anything, anywhere, anytime, and a host of similar new technologies in health, then all of these may well change the form of the city in ways that are unimaginable.

Add to this the layers of cybersecurity that are being put in place, and the tensions over privacy, confidentiality and intellectual property, then it is entirely possible that we will generate a level of complexity in cities that cannot easily be unravelled. All these developments are taking place in uncoordinated, bottom-up fashion and the ways they interact are largely unknown. This could make our understanding of cities ever more problematic and in this sense, these technologies would be completely disruptive of our abilities to make sense of how best they might be regulated, managed, and optimised to the benefit of the citizenry at large. This could lead to disruption on a scale that is well beyond the kind of local disruptions associated with the new sharing economy made possible by total connectivity. The machine could well 'stop' as Forster (1909) so presciently described such a possible world over 100 years ago. This I believe is the real challenge for

the smart cities movement: to figure out how all this change at so many different levels adds up to a new picture of the city and how it is evolving.

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