Smart cities better defined by new research

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Credit: William Cho

Researchers at the University of Birmingham have identified a handful of key elements that define 'smart cities'– cities like Singapore and Copenhagen, which are both at the top of their game in using technology to enable their citizens to enjoy a better quality of life, but in different ways.

Singapore's vision focuses on developing the 'smartness' of its people in using technology, such as wireless communications and energy-efficient appliances or vehicles. This helps people to reduce the need to move or, if necessary, do so more cleanly.

In contrast, Copenhagen's strategy centres on engaging people, companies and government to create a 'green' economy, as well as ensuring that urban planning allows the city to grow in a way that creates an improving quality of life.

Both cities were used as case studies in the research, which investigates whether smart cities are realising their potential for lower carbon dioxide emissions and is being carried out by a team from the University's Department of Civil Engineering.

They demonstrate that a smart city can be defined by a vision that includes five key factors: digital technology; environmental sustainability; civic initiatives; mobility; and business. The team discovered that over 70 per cent of activity contributing to a smart city occurred in the first three of these areas.

Professor Chris Rogers said: "Singapore and Copenhagen demonstrate that each smart city adopts solutions that fit its own circumstances. It's vital to learn from these global examples and understand how they became smart – understanding these key factors will help smart cities to fulfil their potential.

"Smartness is a complex and ever-changing concept, but can be expressed as 'talent-green-technology'. It's important to have talented people and a citizenry that is receptive to working towards all of the goals of a smart, sustainable and resilient city.

"This will involve innovative use of new technology, but it must equally

support the delivery of smart low carbon dioxide initiatives that both improve the quality of life of citizens and enhance the natural environment."

Initiatives to reduce carbon dioxide emissions are a core part of work promoting environmental sustainability. However, the University team's research suggests that they still need to be incorporated fully into the smart cities' agenda if 'smart' is to become 'truly smart', and not simply make what we currently do more efficient.

The research shows that there is a lack of official 'smartness' indicators at both international and national levels. On the whole, cities are responding to the challenge of reducing carbon dioxide emissions, with different degrees of urgency, but this is not always linked to a vision for developing a smart city.

Whilst the European Union has the biggest concentration of smart cities, the USA comes out on top as the smartest country, with Brazil lying in seventh place, followed by China in eighth. The UK occupies fourth place in the league table.

More information: Marianna Cavada et al. Do smart cities realise their potential for lower carbon dioxide emissions?, *Proceedings of the Institution of Civil Engineers - Engineering Sustainability* (2015). DOI: 10.1680/jensu.15.00032

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