

Artificial intelligence and the mediation of social needs in smart-city initiatives: a critical analysis

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What is Smart City?

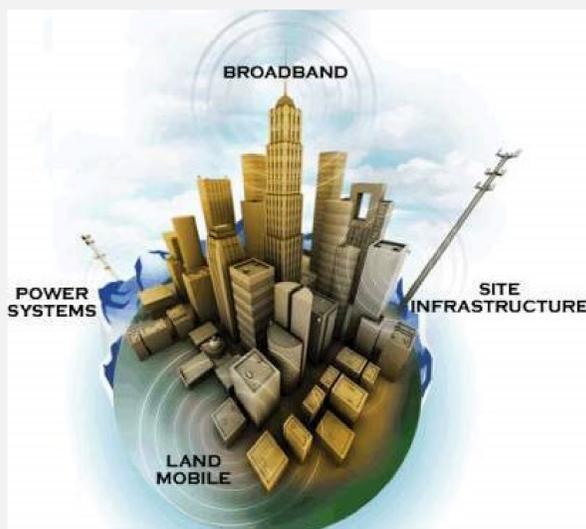
There is no universally agreed definition of what constitutes a smart city and many definitions of smart cities exist (Coletta et al., 2019).

On the one hand, the use of information and communication technologies (ICTs) to stimulate economic development and, on the other, the extensive embedding of software enabled technologies into the fabric of cities to augment urban management (Kitchin, 2014).

A smart city is one whose economy and governance are being driven by innovation, creativity and entrepreneurship, enacted by smart people. (Coletta et al., 2019).

Smart cities can be identified along six main axes or dimensions

- Smart Economy
- Smart Mobility
- Smart Environment
- Smart People
- Smart Living
- Smart Government



AI and Smart City

In recent years, researchers have reported the incorporation of artificial intelligence in smart city research and practice, noticing how AI is becoming an increasingly important feature of smart urbanism. Despite the fact that artificial intelligence has very broad application prospects, there is still a lack of research on the use of artificial intelligence specifically in smart city initiatives (Dwivedi et al., 2019, Yigitcanlar et al., 2020, Cugurullo, 2020, Macrorie et al., 2019). According to Yigitcanlar (2020), the future technological infrastructure of a smart city is essentially based on AI-enabled innovations. However, no scholarly work has provided a comprehensive review of the topic yet. Besides, Macroire et al. (2019) point out that there is a lack of systematic reviews of the relationship between the smart city and artificial intelligence. As Cugurullo (2020) puts it “there is little or no knowledge of the many ways through which artificial intelligence is impacting on the development of smart-city initiatives.” Moreover, with the rise of the concept of a citizen-centric smart city in recent years, how artificial intelligence and smart city technologies can address social needs has become a pressing issue which requires academic research.

Smart City and AI in China

China has the largest number of smart cities in the world (Institute, 2019), combining embedded sensors, metering devices, cameras, and other monitoring technologies with big data processing and artificial intelligence (AI) analysis to manage its cities and public spaces (Caprotti and Liu, 2020b, Dameri et al., 2019). China's leadership has signalled the importance of smart-city development, elevating it to a national strategy, and has poured government resources into its growth (唐睿卿, 2019). China reportedly has nearly 800 smart cities pilot programs underway or in planning, which would be more than half of all smart cities around the world (Shen et al., 2018). Since 2015, AI has seen rapid development in China, and the Chinese government has introduced a series of policies to support the development of AI, thereby pushing Chinese AI to enter a new phase (Zhao et al., 2019). AI has been continually mentioned in government reports for three years in a row, and it has risen rapidly from a national level to a strategic height (2020a, 2019a, 2018b). This explains why China's AI industry has already gone past the germination stage, and it is now entering the development phase, with greater attention to bringing applications to fruition (Allen, 2019). The Chinese government has also gradually clarified the domestic AI industry's upstream, midstream and downstream patterns: the upstream provides basic capabilities, the midstream converts basic capabilities into AI technology, and the downstream applies AI technology to specific industries (Zhao et al., 2019).

Research Abstract

Using Guangzhou, the largest city in the south of China, as a case study, this research will examine how artificial intelligence technologies are applied in Guangzhou's smart city initiatives to meet the health needs of citizens. Firstly, 30 interviews will be conducted with key stakeholders to investigate how artificial intelligence is transforming Guangdong's healthcare sectors. Secondly, 3000 surveys will be conducted across Guangzhou. Research participants will include citizens in the Guangzhou metropolitan area (i.e., Guangzhou city; Foshan; Zhaoqing; Qingyuan; Yunfu; Shaoguan).

The main aim of this PhD project is to critically assess the use of artificial intelligence in Guangzhou's smart-city initiatives, with a focus on healthcare as an example of a social need mediated by artificial intelligence. The overarching research objective is approached via five interrelated specific questions:

1. What contextual factors are influencing the integration of AI technologies into Guangzhou's smart-city initiatives?
2. Through what policies and strategies is Guangzhou's government integrating AI technologies into the local smart-city agenda?
3. To what extent are the above policies and strategies targeting specifically the social needs of Guangzhou's citizens?
4. What AI-enabled smart-city initiatives are being implemented in Guangzhou to tackle health issues?
5. How are Guangzhou's citizens responding to those AI-enabled smart-city initiatives meant to address health issues?