Smart cities

A smart city refers to an urban area that leverages digital technologies to enhance the quality of life, optimize resource use, and ensure sustainability. It utilizes cutting-edge digital technology tools to improve infrastructure, governance, and public services [1], [2], [3].

Smart cities aim to create sustainable urban ecosystems that balance technological innovation with social, environmental, and economic objectives [4], [5].

The backbone of smart cities lies in digital technologies, such as IoT, AI, cloud computing, and big data. These technologies enable real-time data collection and analysis, facilitating improved decision-making and city management [6], [7].

IoT devices monitor various city operations, from traffic management to energy consumption, while AI helps predict urban challenges like congestion and air pollution [8], [9]. Smart cities contribute significantly to the digital economy by fostering innovation and creating new business models. The integration of digital technologies enhances productivity, stimulates local businesses, and attracts investment [10]

Digital technologies offer numerous benefits to smart cities residents, such as automated healthcare, transportation, and education services [12], [13] ; energy-efficient buildings [5], [10]; and data-driven transparent governance [14], [15]. The implementation of digital technologies in smart cities enhances the overall quality of life and contributes to a more sustainable digital economy.

However, the deployment of digital technologies in smart cities presents various challenges, including privacy and security concerns, digital inequality, ethical and social issues, and environmental sustainability [2], [16], [17].

This paper examines these challenges through the broader aspects of inclusivity, human-centric development, and sustainability related to the use of digital technologies in smart cities.

It proposes viable solutions, presented as strategic recommendations, to address these challenges and promote a human-centric, all-inclusive, and sustainable digital economy.

We propose a set of strategic recommendations for stakeholders in the digital economy to foster more inclusive, human-centric, and sustainable urban environments in smart cities. For instance, to ensure inclusiveness, governments can implement robust data protection laws, while businesses and Public-Private Partnerships (PPPs) should focus on user-centric designs and public engagement.

Moreover, a human-centric approach prioritizes ethical AI use, inclusive public spaces, and participatory feedback mechanisms that reflect community needs.

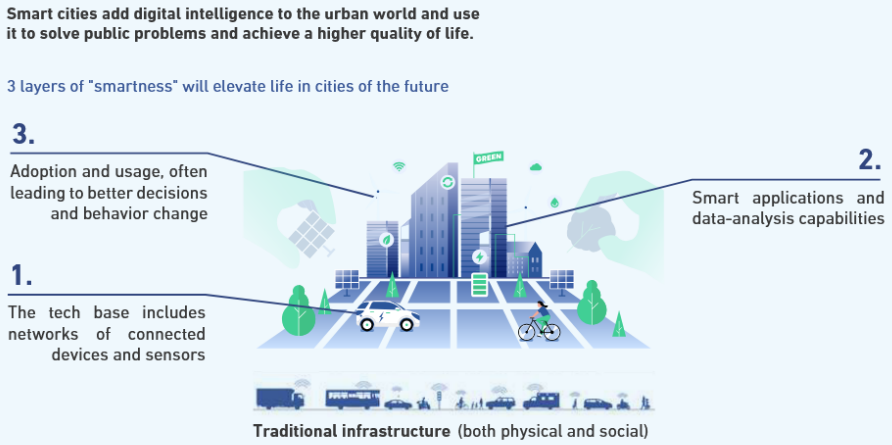

Figure 1:
Evolution of Traditional Infrastructure to Smart Cities [15]

Besides, sustainability goals can be achieved through interdisciplinary research, green infrastructure, circular economic initiatives, and transparency in environmental claims.

Collaborative efforts among smart city stakeholders, including governments, businesses, civil societies, and international organizations, are pivotal in integrating long-term planning, ethical governance, and community resilience into smart city projects, making them truly inclusive, human-centered, and sustainable.

In this article, we adopted a literature review methodology to search, analyze, and consolidate key challenges posed by digital technologies in smart cities. Our contribution lies in bridging research gaps by exploring the interplay between smart cities, the challenges of digital technologies and digital economy. Additionally, we propose strategic recommendations to address these challenges, emphasizing humanity, inclusivity, and sustainability to ensure equitable participation in the smart ecosystem. Therefore, we formulated the following.

Research Questions (RQs):

1. How do digital technologies in smart cities pose challenges in terms of inclusivity, humanity and sustainability?

2. What strategic recommendations can help stakeholders address smart city challenges while promoting inclusivity, humanity, and sustainability