Smart governance perspective	UDTs opportunities	UDTs challenges
Governance of smart city	• data-driven urban solutions and creative problem-solving • simulation for discovery and improved scenario analysis • enhanced forecasts for effective policy implementation • multidimensional understanding of community needs • swift disaster response, localization, and citizen support • improved smart community management and resource availability • detailed disaster information for increased policy effectiveness	• socio-technical system challenges, including data integration • gaining a holistic perspective on urban dynamics • overlooking human-related aspects in UDT and shift toward social perspective • modifying behavioural patterns and addressing inequalities • managing co-benefit, adverse effects, collective and individual models • proactive stakeholder involvement • accuracy of reflection and addressing communication system limitations • metaverse for simulation and integration of social media sensing • limited human resources and internal support • insufficient UDT education and knowledge management
Smart decision-making	• increased role of democracy and human agency • integration of temporal perspective and diverse data collection • enhancing real-time understanding of ongoing events and conditions • forecasting potential problems and insights into long-term impact • holistic data integration, historical analysis, visual representation, and continuous learning • supporting SDG achievement through data access and exploration • improved decision-making and enhanced urban policies • a consolidated view across sectors	• limitation to long-term forecasting • effectiveness in reflecting urban complexities • interoperability, uniform data standards, and compatibility of data and technology • addressing misconception of benefits and handling social dynamics • clear problem statement, and transparency • integration of physical and cyber world • managing heterogeneity, quality, overload and governance of data • government's role in data governance • centralisation of processing and addressing complexity of data sources • managing costs of computational resources and overcoming resource limitation
Smart government administration	• process optimization (planning and management), efficiency measurement, improved monitoring • real-time insight in process performance • visualisation for decision-makers • improvement in urban planning, disaster management, energy management, carbon assessment, and wellbeing monitoring • more unified local governance systems and proactive policy	• higher implementation costs • integration of local context • shift from centralised to community-driven urban planning and governance • coordinating capabilities and effective process management (risk, change, conflict) • overcoming silo organisational structure for improved inter-departmental cooperation and data exchange
Smart urban collaboration	• enhanced citizen engagement and understanding stakeholder behaviour and preferences • prioritizing sustainability, inclusivity, and healthcare • building transparency and trust • fostering collaboration through effective CIM • inclusive planning for informed and proactive society • breakdown of siloed data provision • deeper societal understanding • building evolutionary scenarios	• recognizing and enhancing citizen contributions • addresing limited citizen involvement • providing a citizen interaction framework or consolidated agenda • providing effective communication and interface usability • alleviating citizen anxiety toward large-scale solutions • ensuring a unified and consistent concept of CIM • modifying citizen behavioral patterns