Adopting AI in the Public Sector to advance Digital Government Transformation

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Agenda

01. Artificial Intelligence
The history, applications, ethics and challenges of AI systems

02. Smart Cities
Applying AI tools to smart city concept to improve the public experience.

03. Public Administration's Role
The attitude needed to embrace the use of AI to implement smart city strategies.

Introduction to Artificial Intelligence

Artificial Intelligence

- AI refers to any algorithm or machine capable of observing its environment, learning, and making intelligent actions based on acquired knowledge and experience.

Goal of AI

- To create systems that can perform tasks requiring human intelligence, such as problem-solving, reasoning, and learning.

AI in Modern Society

- AI is omnipresent in everyday technologies and continues to drive advancements across multiple sectors.

History of AI

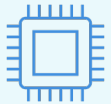
Handcrafted knowledge (1950s-1990s)

Statistical learning (1990s-2010s)

Contextual adaptation (2020s)

Source: Adapted from DARPA (n.d.).

Types of AI Systems

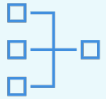


Weak/Narrow AI

AI systems designed for specific tasks without self-learning capabilities.

Real World Presence: prevalent today

Examples: Siri, Alexa, Chat GPT



Strong AI

AI with broad cognitive skills and self-learning capabilities. Capable of performing any intellectual task that a human can do

Real World Presence: theoretical but progressing

Superintelligent AI

AI that surpasses the best human minds in every field.

Real World Presence: Purely speculative at this point, with debates around its feasibility and implications.

Ethical Considerations

Bias and Fairness

AI systems can perpetuate or amplify existing biases in data.

Transparency and Accountability

Determining accountability for decisions made by AI systems.

Privacy Concerns

The large amounts of sensitive data AI systems handle can be used for privacy violations.

Ethical Use

Developing and adhering to standards for responsible AI use.

Social Inequality

Disparities in AI access can widen existing social inequalities.

Challenges in Development

Data Quality and Privacy

Ensuring the protection of sensitive and personal information used in large, high-quality datasets needed for AI.

Ethical Design

Integrating ethical principles into AI system development and addressing who is accountable for decisions.

Handling Unexpected Behavior

Ensuring AI systems perform reliably in diverse and unpredictable real-world scenarios, avoiding unintended behaviours.

Transparency

Developing methods to make AI decisions more transparent and interpretable, avoiding the “black-box” problem.

Global Policy and Strategy

EU AI Act (2024)

The first-ever legal framework on AI.

Addresses risks of AI and focuses on creating harmonized rules for AI developers and deployers.

UNESCO Recommendation on the Ethics of AI (2021)

First-ever global standard on AI ethics, focused on human rights and dignity.

UNESCO Caribbean AI Policy Roadmap (2021-)

Identifies priorities and supports the development of strategies for the Caribbean.

AI Strategies in the Caribbean

Dominican Republic

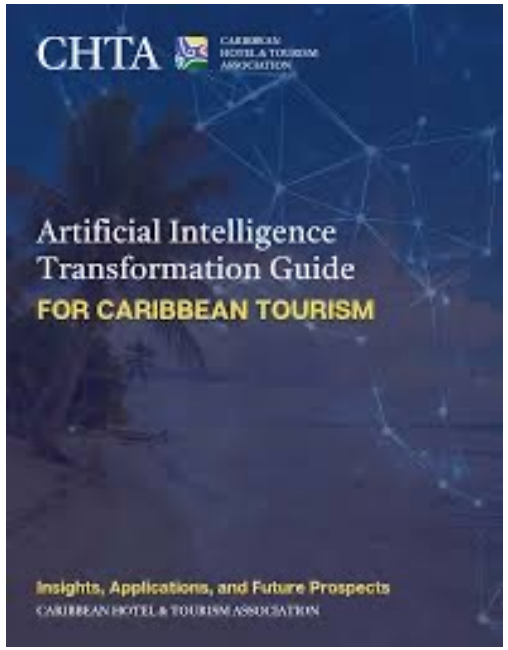
- The “Estrategia Nacional de Inteligencia Artificial” is the first national AI strategy in the Caribbean and part of the country's National Innovation Policy 2030.

In Development

- Cuba, Jamaica, and Trinidad and Tobago are in the process of developing national strategies.
- Digital Transformation is supported in many islands through national strategies and projects.

CARIBBEAN DIGITAL TRANSFORMATION PROJECT

Applications of AI in the Caribbean



Hospitality and Tourism

- CHTA authored Artificial Intelligence Transformation Guide for Caribbean Tourism to provide insights on AI applications in tourism industry.

Judicial System

- Caribbean Court of Justice announced use of Aida, a new AI-based technology developed by the Caribbean Agency for Justice Solutions, to streamline the legal research process.

Artificial Intelligence in Smart Cities

Smart Cities

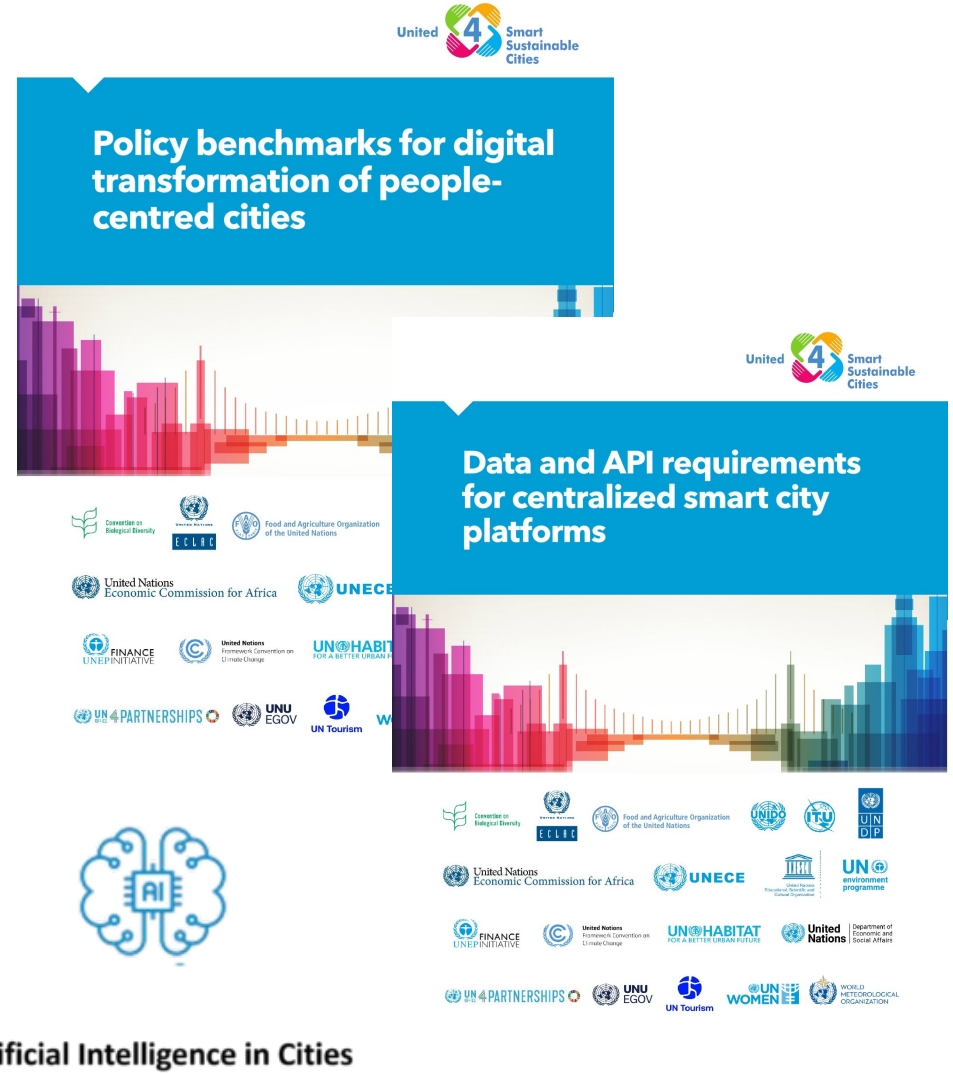
- “An urban settlement that applies technologies to enhance the benefits and reduce the problems of urbanization for its citizens.” (IMD, 2024)
- AI is employed to optimize various aspects of daily life, from transportation and energy management to public safety and healthcare.

Source: Bareilly Smart City (n.d.).

United for Smart Sustainable Cities (U4SSC)

- U4SSC initiative is a global UN collaboration, coordinated by ITU, UNEP and UNECE, and includes 9 Thematic Groups.

- **Thematic Group on AI in Cities:** develop frameworks to harness AI in conjunction with other frontier technologies to efficiently and effectively deliver urban services and operational processes.



Artificial Intelligence in Cities

Smart Cities in the Caribbean

The IDB Cities Lab identifies potential LAC cities and provides support for smart city development.

Montego Bay, Jamaica:

- Aiming to develop city's technology and infrastructure by 2030.

Nassau, Bahamas:

- Identified as a possible smart hub. Collaborating with ITU to incorporate technology into the provision of public services.

Arima, Trinidad and Tobago:

- Connected Arima project aims to enhance digital connectivity.

Application of AI in Smart Cities

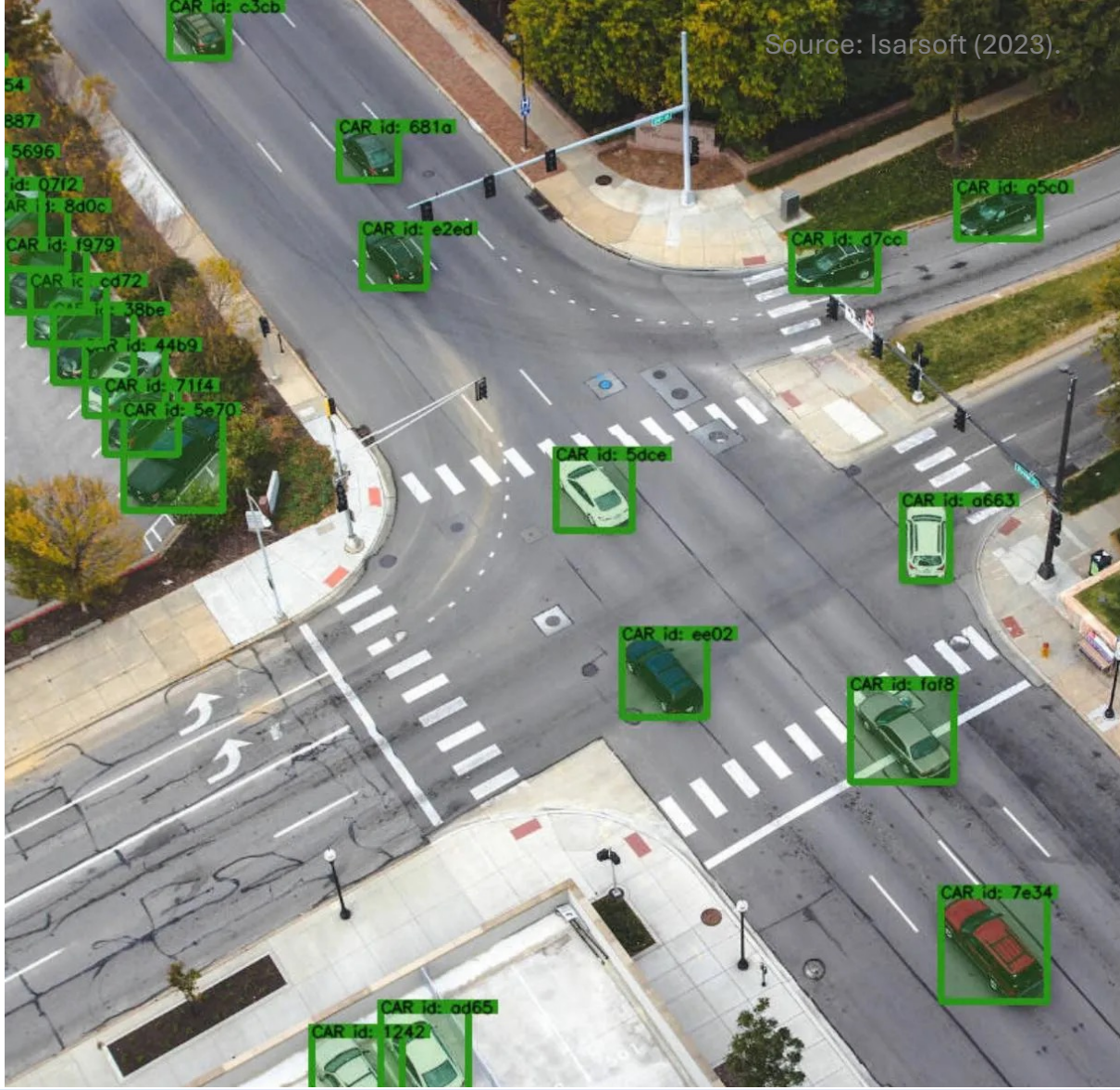
Safety	• Traffic management • Health-service delivery
Living	• Smart-home concept • Air quality monitoring
Mobility	• Autonomous vehicles • Electric vehicles
Energy	• Renewable energy • Building energy forecasting and optimization
Health	• Telemedicine and telecare • Disease control
Pollution	• Optimize waste collection • Predict traffic flow
Industry	• Predict potential issues • Enhance decision making

Source: Adapted from Szpilko, et al., (2023).

Safety

- Singapore's "Intelligent Transport Systems" uses sensors, traffic and control systems, and data analytics to monitor and manage traffic flow and share real-time traffic information with the public.

- Data analytics and IoT sensors can drive real-time health monitoring, early disease detection, and personalized treatment approaches.

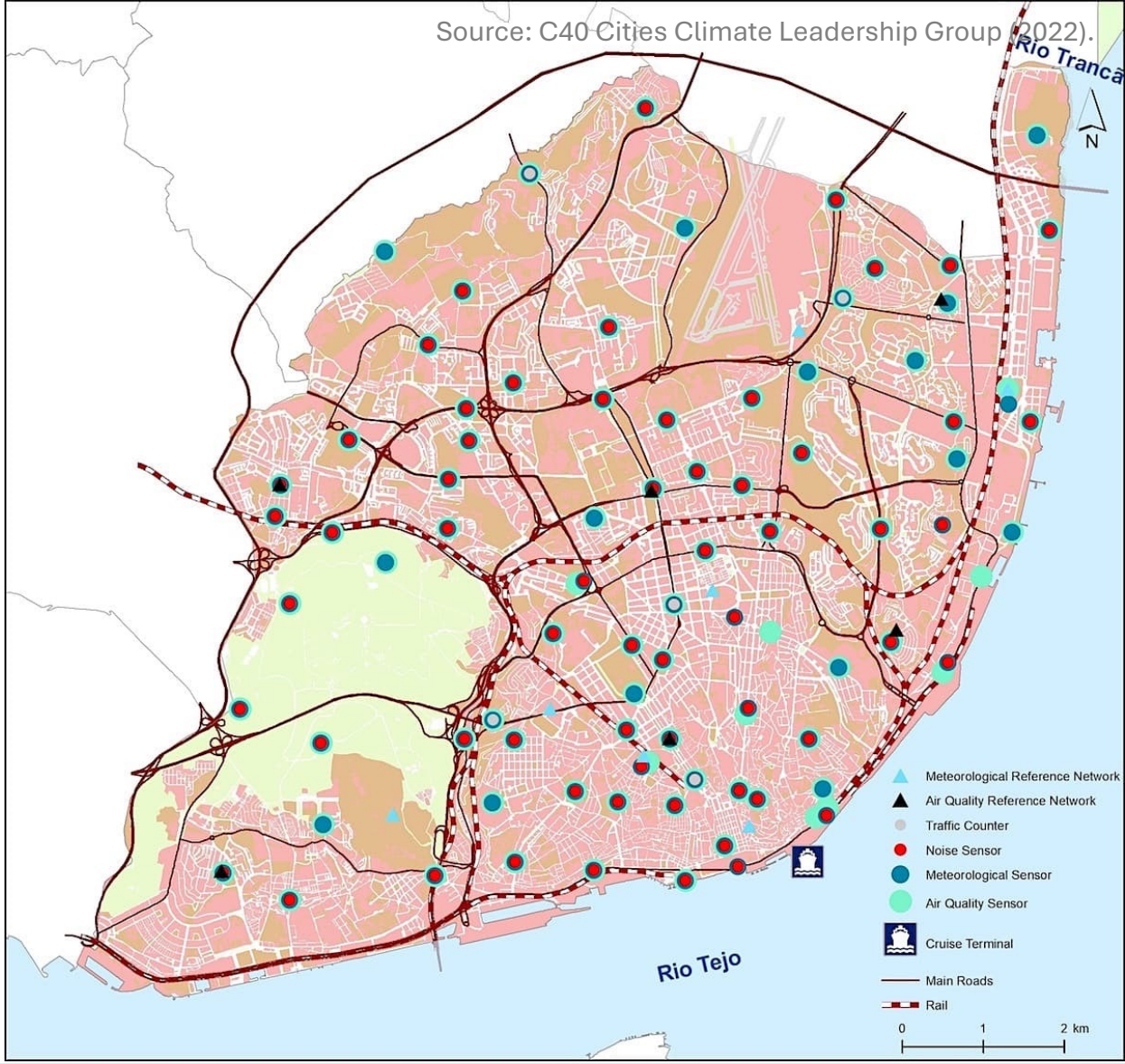


Source: Isarsoft (2023).

Living

- AI and IoT technologies generate data that provides valuable insights to enhance the quality of urban life.
- Data collected can assist in developing and implementing strategic planning for public sector.
- Lisbon, Portugal collects real-time information on air quality, noise, and urban climate to help implement the city's Air Quality Improvement Plan.

Source: C40 Cities Climate Leadership Group (2022).



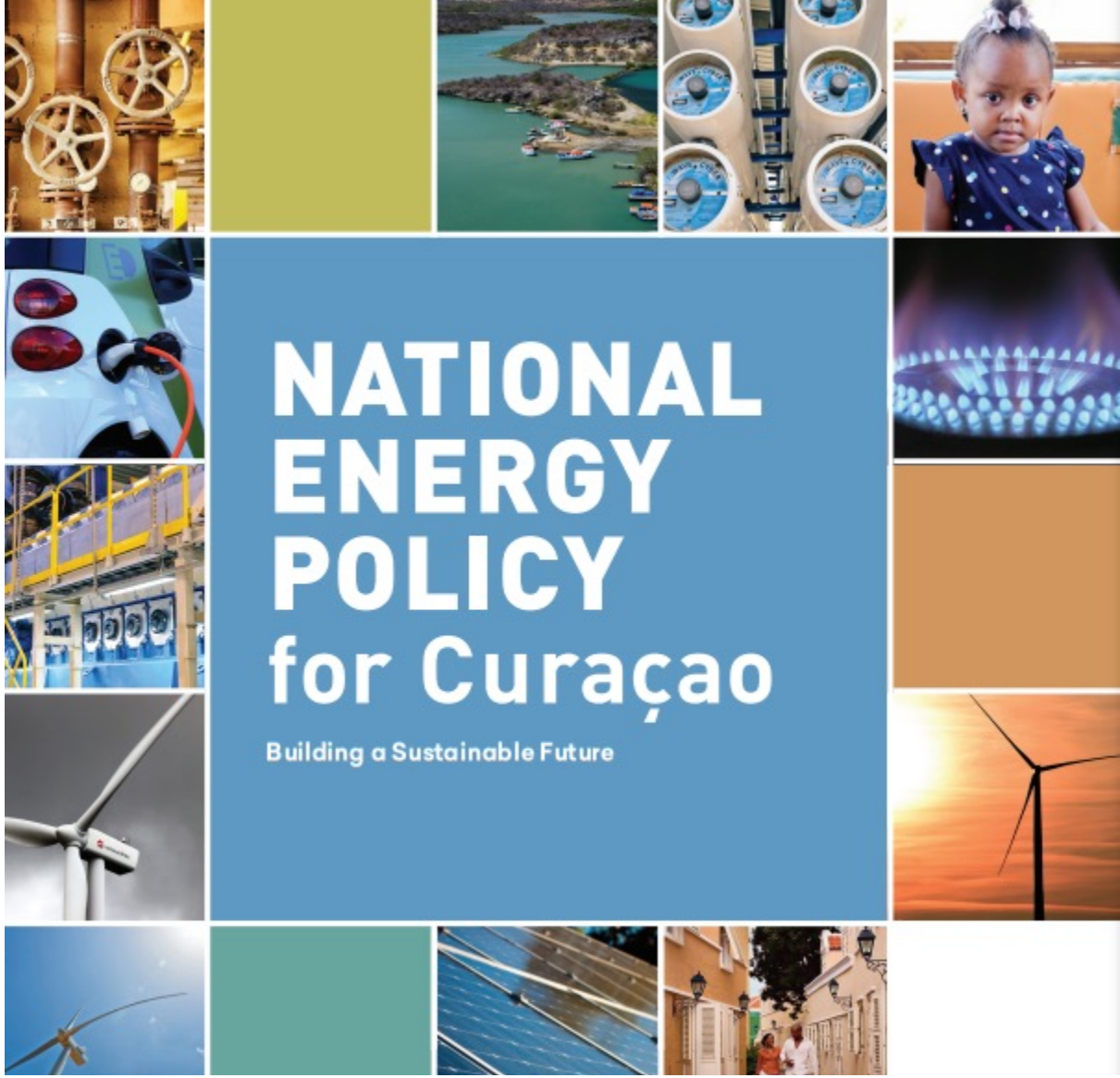
Mobility

- Various projects electrifying public transportation are being implemented worldwide.
- Metbus Electric Buses in Santiago de Chile has a fleet of 411 EBs and has reduced operational costs by 76%.
- The UK Zero Emission Bus Regional Areas (ZEBRA) programme funds local transport authorities to support the introduction of zero emission buses and infrastructure.

Energy

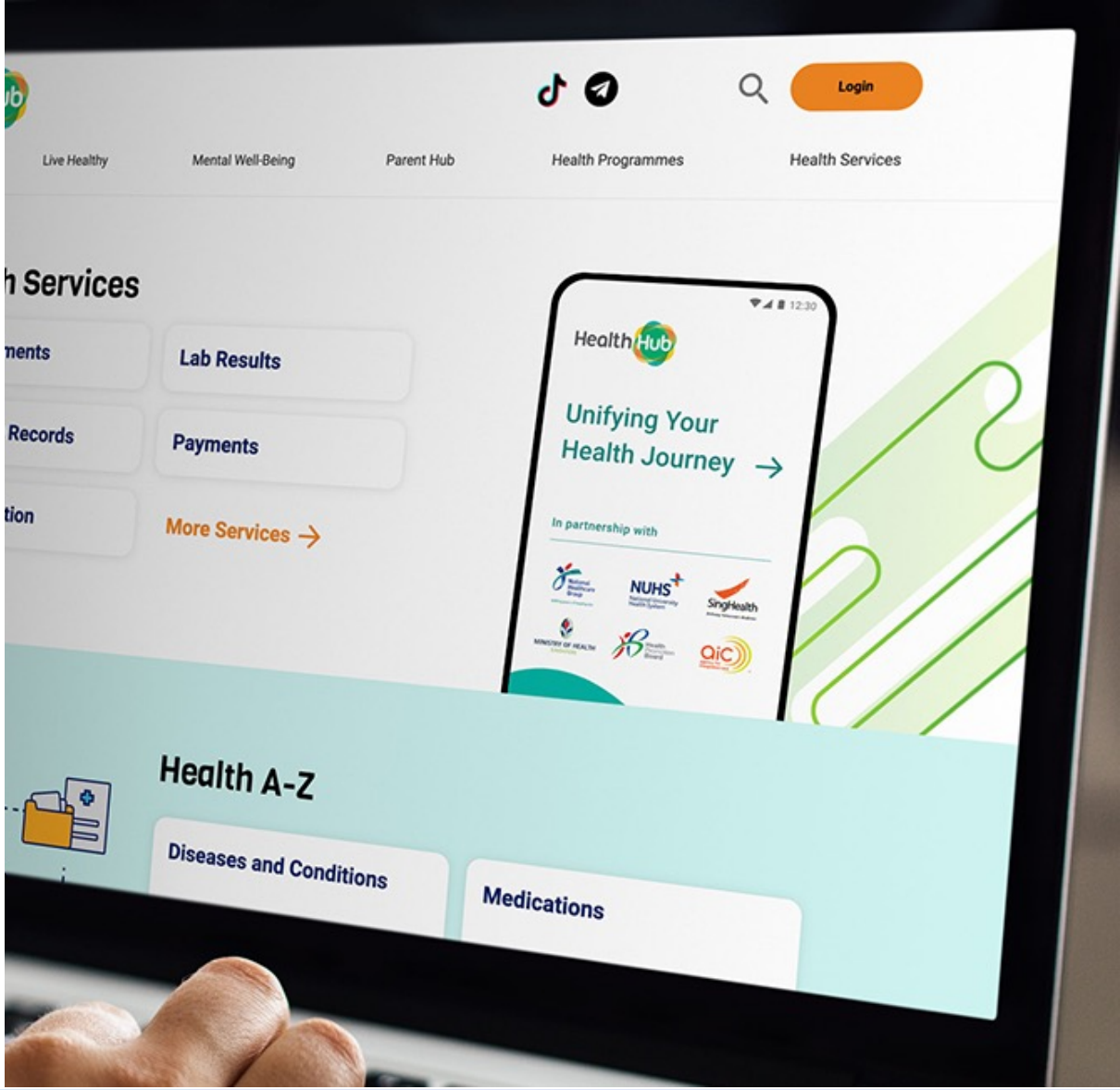
- AI assists in smart metering, non-intrusive appliance load monitoring, and energy consumption prediction.

- Curaçao's National Energy Policy includes 9 strategies for sustainable energy such as energy efficient buildings and efficient system planning.



Health

- Integration of telemedicine, telecare, and AI within smart home systems improves quality and efficiency of care.
- Acknowledging the future burdens of an aging population, Singapore developed Smart Health Initiatives to proactively meet these needs.
- HealthHub is a one-stop health portal that lets citizens easily access their medical records.



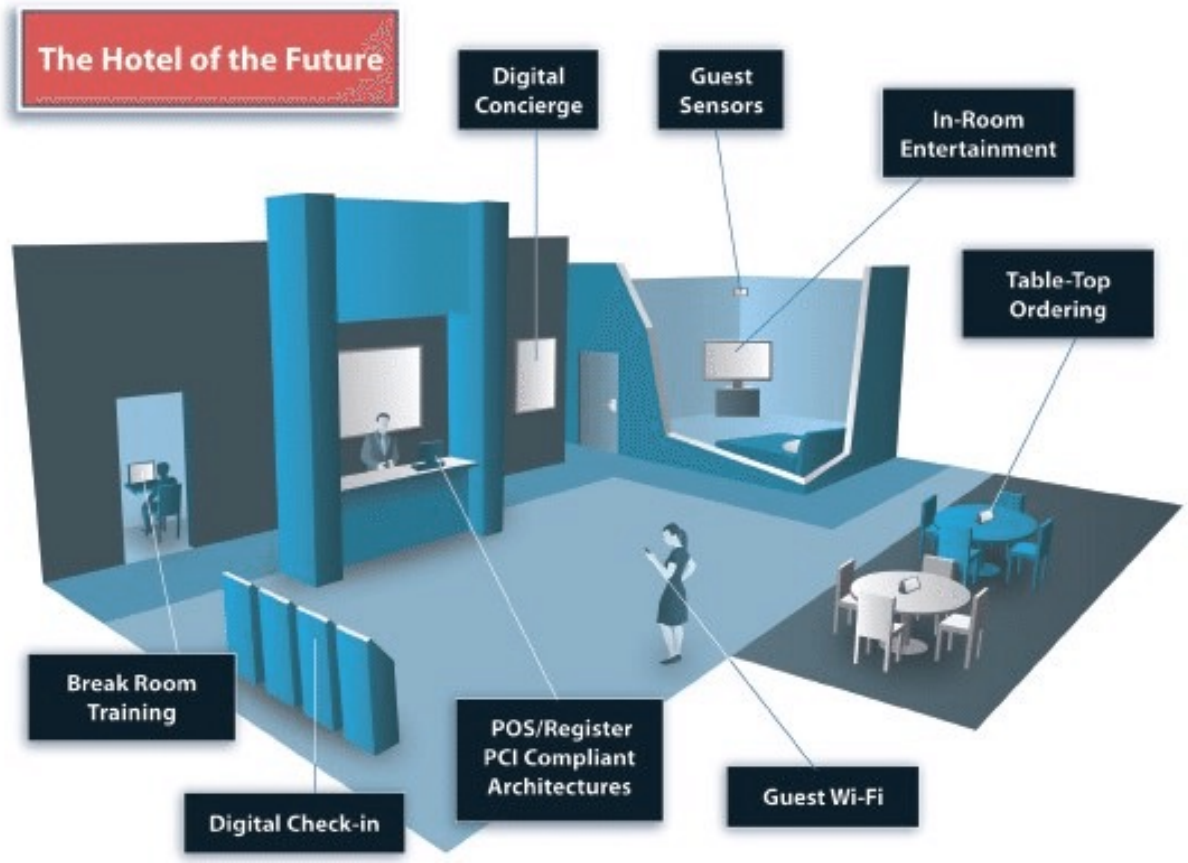
Source: Sohag and Podder (2020).

Pollution

- Improved waste management process using drones to detect river debris and pollution.
- Using technology-based evaluation systems to determine optimal location of smart waste bins.
- Barcelona, Spain uses sensors to monitor the fill levels of bins to create optimized routes for waste collection.

Industry

- AI has the ability to reshape sectors in smart cities, including the manufacturing sector and hotel industry.
- Emphasizing collaboration between humans and machines to enhance customer satisfaction.



Avoiding Inequalities in Smart Cities

Disproportionate Access

- High-tech infrastructures can increase divide between those in smart cities and those outside.

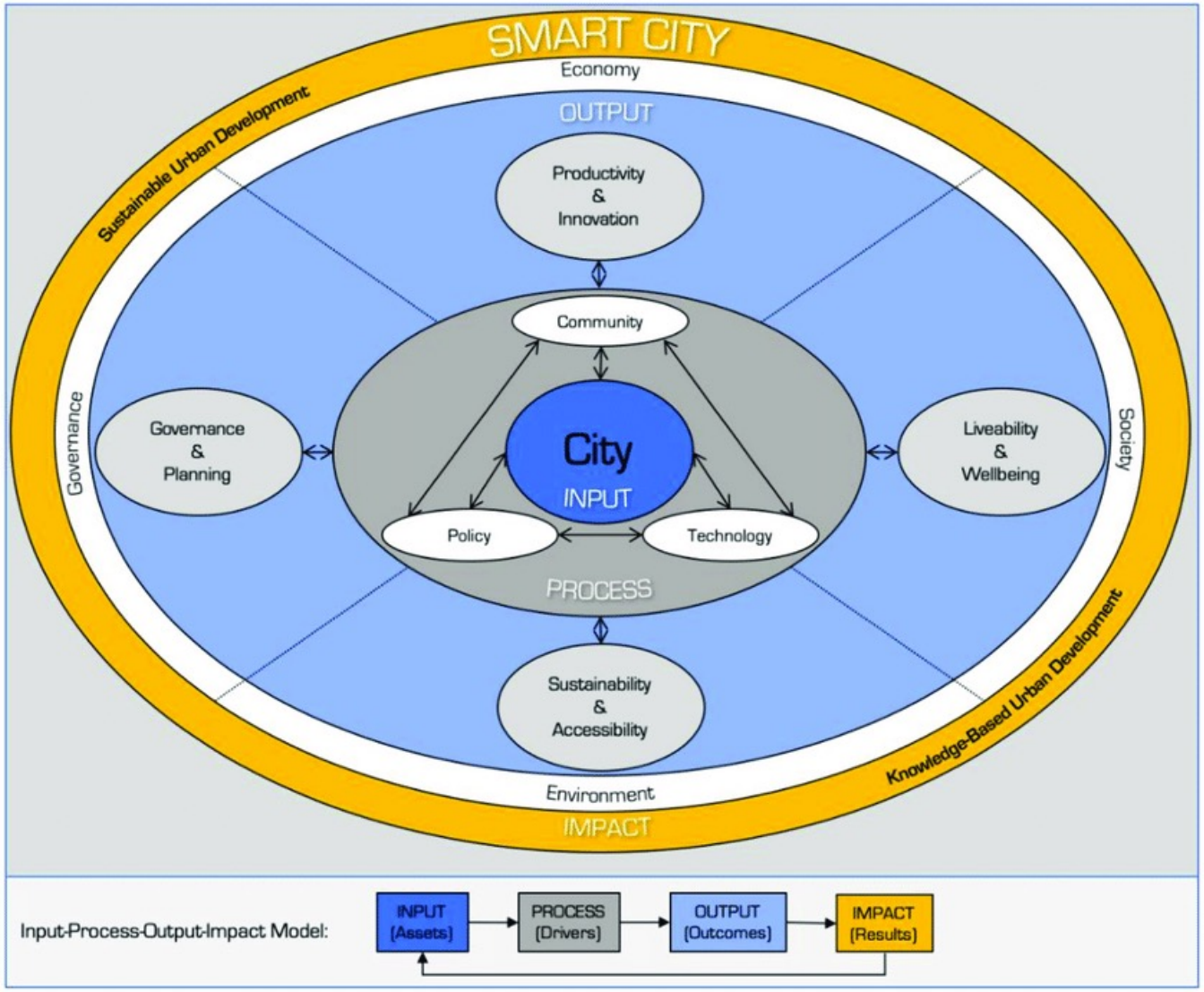
- **Songdo, South Korea:** low-income community at the periphery lacked infrastructure leading to illegal littering and exaggerated previously invisible inequalities.

Potential for Bias

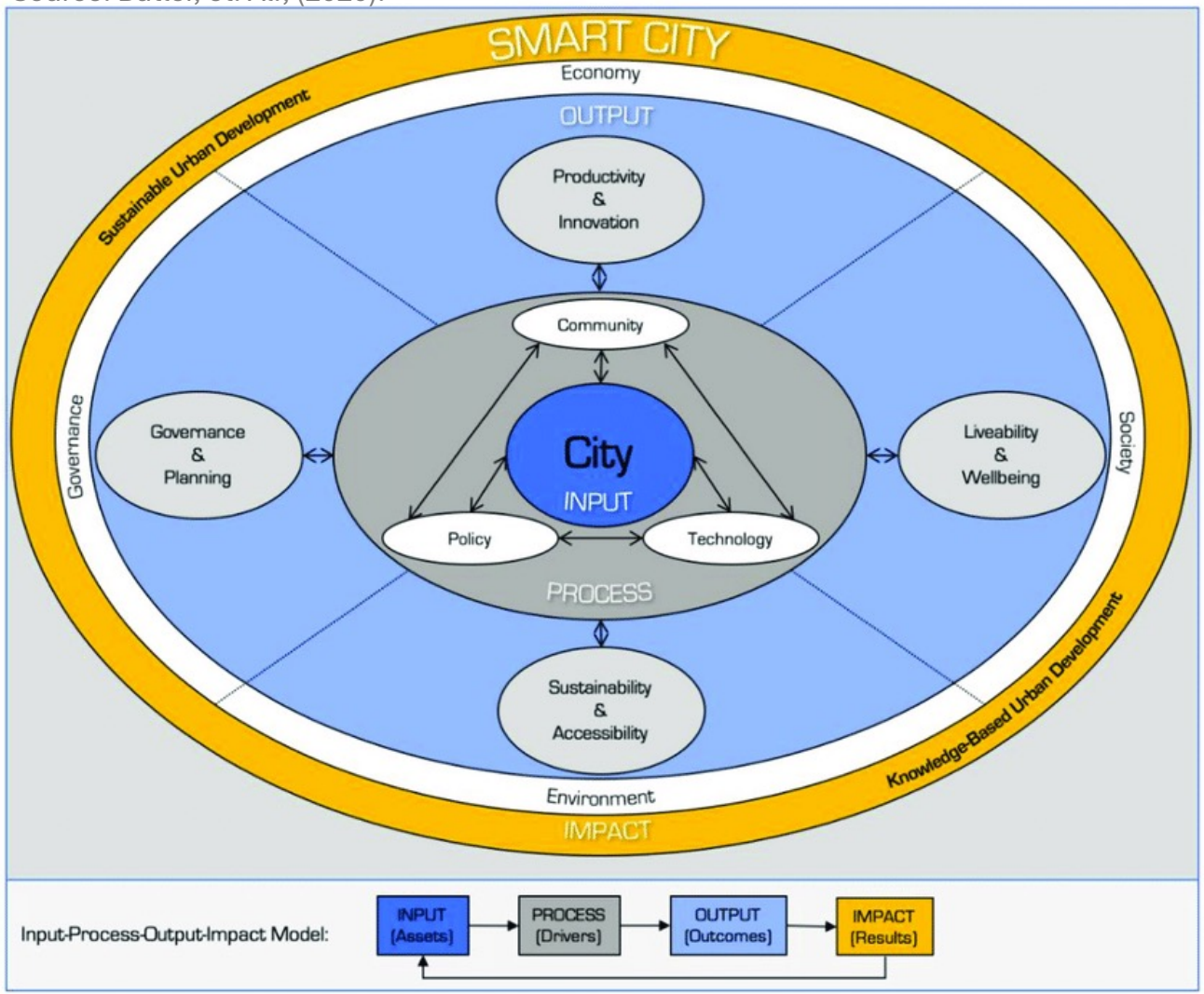
- Algorithmic decision-making in smart cities reliant on data which can be influenced by bias and affect the fairness of outcomes.

Smart City Conceptual Framework

Source: Butler, et al., (2020).



Source: Butler, et. Al., (2020).



The Role of Public Administration

- Public administration plays a critical role in developing and implementing strategies.
- Incorporation of smart city strategies to enhance quality of life through digital solutions.
- Using existing assets to develop citizen-centered projects.

Barriers Facing Public Administration

Study looking at the barriers public administration representatives in the Czech Republic face when implementing Smart City strategies.

- **Limited funding:** options to receive funding are limited and sometimes dependent on meeting set objectives and requirements.
- **Legal requirements:** lengthy legal tenders for smart solutions.
- **Lack of formal supervision of implementation:** no political committee to formally supervise implementation of projects.
- **Reluctancy to undertake long-run projects:** stronger tendency to pursue short-term projects in-line with political terms.
- **Limited authority:** Limited authority to influence and implement certain projects.
- **Lack of smart strategy:** requires a working group that would focus on smart projects.

Digital Transformation Leaders

Internal Source of Transformation

- Public administration managers can serve as internal sources for digital transformation, advocating for and implementing digital tools and digital government transformation.

- Public managers play a leading role in implementation of different tools, technologies, and practices.

Culture of Innovation

- Supportive leadership is critical to establish a culture of innovation necessary for digital transformation and implementation of strategic plans.

Changing Mindsets

Steps to changing mindsets:

STEP 1: Identify

STEP 2: Realize

STEP 3: Understand

STEP 4: Adopt strategies

STEP 5: Change beliefs

STEP 6: Transforming behaviors

Source: Cristina Rodriguez-Acosta, UN DESA, DPIDG, PMCDU

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