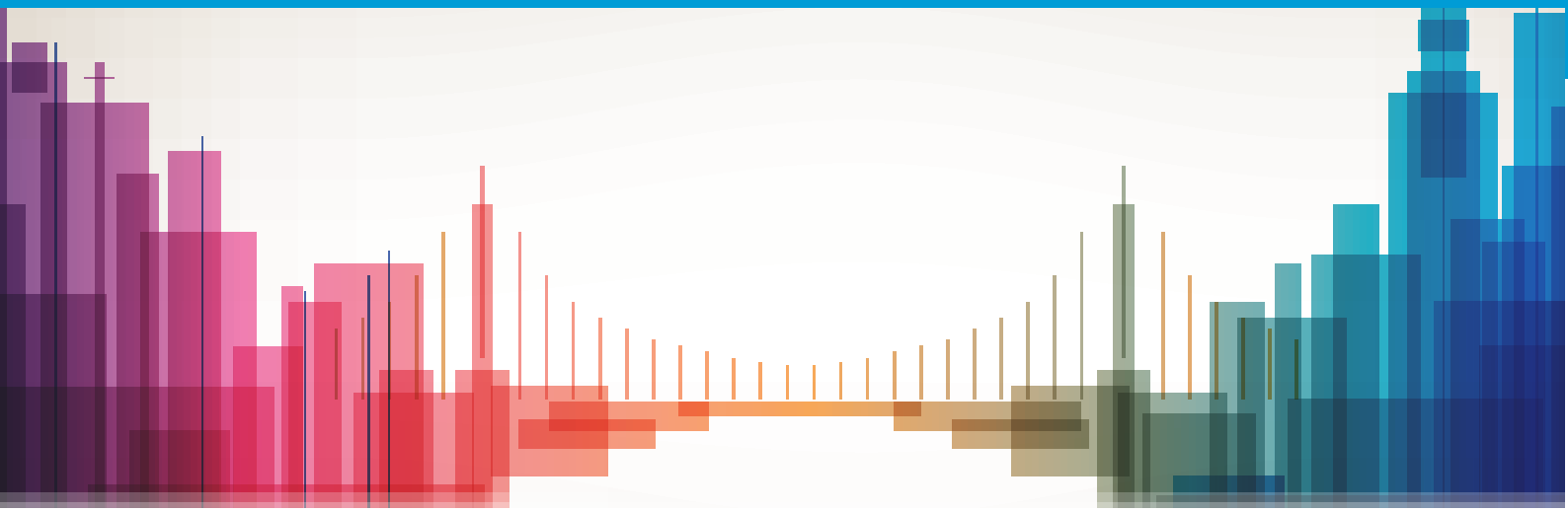
United 4 Smart Sustainable Cities

Copenhagen, Denmark

Case study of the U4SSC Guiding principles for artificial intelligence in cities



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Foreword

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Disclaimer

The opinions expressed in this publication are those of the authors and do not necessarily represent the views of their respective organizations or U4SSC members. In line with the U4SSC principles, this report does not promote the adoption and use of any smart city technology. It advocates for policies encouraging responsible use of ICTs that contribute to the economic, environmental, and social sustainability as well as the advancement of the 2030 Agenda for Sustainable Development. The study conducted in this report is based on extensive literature review and voluntary written contributions from stakeholders.

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1 Introduction

As the largest city and capital of Denmark, Copenhagen is home to nearly 1.5 million people. In line with the city's aim to provide a higher quality of life to its inhabitants, Copenhagen's smart city approach has been oriented to achieving carbon neutrality, so creating a more livable and sustainable city for its inhabitants.

2 Background & context

In 2019, the Government of Denmark launched the National Strategy for Artificial Intelligence, which charts out the AI development and adoption across cities in Denmark, while underscoring the current challenges priority areas and policy instruments.

The main objectives of this country-wide AI Strategy include:

- developing a common ethical and human-centred basis for AI;
- prioritising and support research in AI;
- encouraging the growth of Danish businesses by developing and using AI;
- ensuring that the public sector uses AI to offer world-class services for the benefits of inhabitants and society.

Denmark has also adopted the "Digital Growth Strategy 2025", which is a joint vision of the Danish Government, in collaboration with various industries and sectors, trade associations and social partners, thus contributing to the digital transformation processes on a national level.

In the city of Copenhagen, the ability of AI to predict heat and ventilation requirements in buildings to enable the monitoring of energy consumption and management of indoor climate. This project is expected to contribute to lowering energy consumption and ensuring carbon savings. Through this project, it would be feasible to pinpoint the peak hours of energy consumption, green transition and to economize on the heating bill.

3 AI principles in the city

3.1 AI principles (adopted by the city)

Denmark's six principles for the adoption of Artificial Intelligence are:

- Self-determination: People's autonomy and ability to make informed and independent decisions should be at the forefront. AI adoption should be above the requirements or decisions made by inhabitants of the city;
- Dignity: Human dignity should be respected in the development and use of AI and this technology should not cause injury to human and should be employed in a manner that it respects democracy and democratic processes. Additionally, it should not be used to infringe fundamental human rights;
- Responsibility: In decisions and decision-support based on AI, it should be possible to place responsibility on human beings;
- Explainability: This refers to the ability to describe, control and restore data, underlying logics and consequences of the use of AI. For example, being able to trace and explain decisions and decision support;
- Equality and justice: AI should be trained in such a manner that it does not reproduce prejudices that marginalize certain sections of the population based on background, ethnicity, gender, etc. and
- Development: Development Artificial intelligence can help forge great progress for society.

3.2 AI principles enablers (adopted by the city)

The main enablers in Copenhagen's AI adoption are governed by the country's National Strategy for AI. These include:

- *Strategy for Denmark's Digital Growth (2018):* This highlights the importance of standardisation of data and further provides insights on leveraging public data and promote the use of common public standards for data and interfaces better data sharing infrastructure and further facilitate interoperability of data:
  - Common Danish language resource;
  - Better access to public-sector data; and
  - More data in the cloud for artificial intelligence.
- *Cybersecurity:* AI systems are prone to threats and manipulated or influenced for malicious use. The Cybersecurity Strategy aims to enhance Denmark's technological preparedness to protect critical IT systems and data.

3.3 AI principles governance mechanism (adopted by the city)

As AI systems deployed are predicated on data, the Danish Data Protection Act, 2018 (DDPA) provides the guiding framework for data processing, the disclosure of personal data, the right of access, the designation of a data protection officer, limits on consent, prohibitions on data transfers, administrative penalties in line with General Data Protection Regulation (GDPR). Danish Data Protection Agency is tasked with the implementation and monitoring of this Act.

3.4 Policy instrument for AI principles (adopted by the city)

The National Strategy for AI focuses on human-centric adoption of AI, ensuring privacy, security, and transparency.

It lays down the guidelines for the establishment of a Data Ethics Council, which will monitor technological development and help to ensure that ethical issues are taken up so that the many advantages of using data can be supported in an ethically appropriate manner.

Based on the National Strategy for AI in Denmark, Copenhagen's AI strategy envisions the deployment of AI across all sectors, including health, transport, education and urban planning.

4 Conclusion

The AI adoption in the city of Copenhagen is largely governed by the National Strategy for AI. The activities of the Data Ethics Council are also anticipated to lay forth the guidelines for the ethical use of AI in the city across various sectors. Currently, the use of AI in Copenhagen is centered across energy efficiency and medical care, in alignment with Sustainable Development Goals 7 and 3 respectively. As the adoption of AI principles should be replicable, it is recommended that other instruments including the New Urban Agenda as examined as a means to promote sustainable urbanization in the city.

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