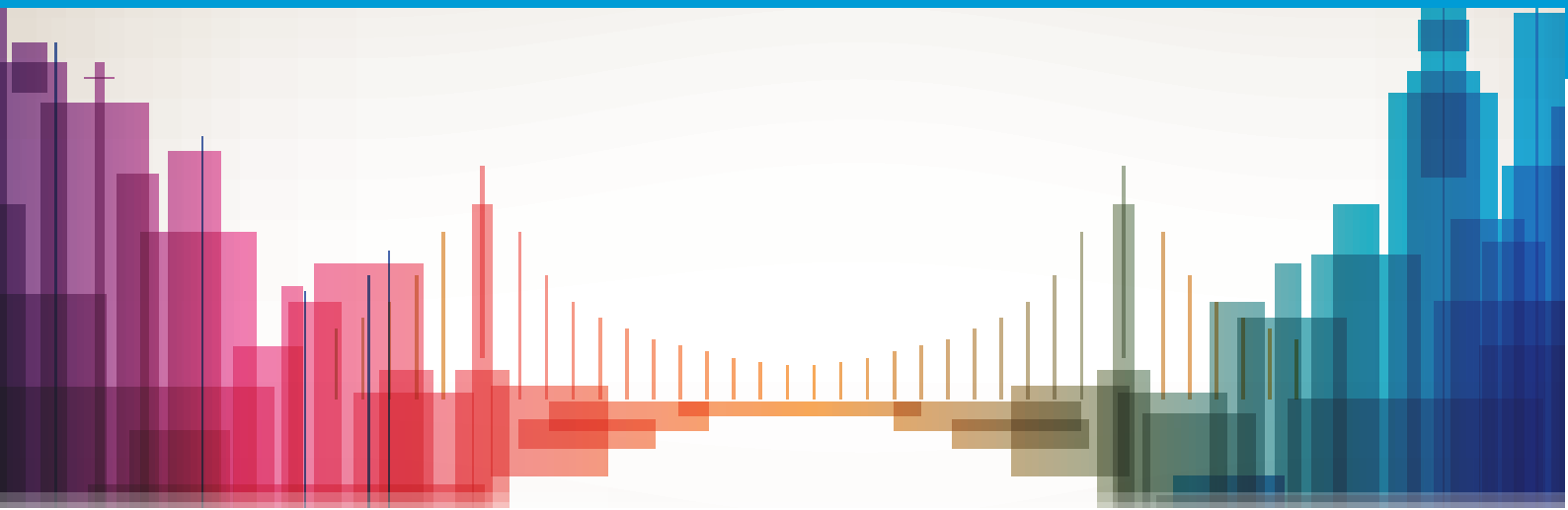


Dubai, United Arab Emirates

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



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Dubai, United Arab Emirates

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

Foreword

This publication was developed within the framework of the United for Smart Sustainable Cities (U4SSC) initiative.

Acknowledgments

The case study of Dubai, United Arab Emirates, was developed by Yiwei Song (Dubai Digital Authority).

The case study was reviewed by Okan Geray.

Okan Geray wishes to thank the U4SSC management team: Okan Geray (U4SSC Chair), Ramy Ahmed Fathy, Giampiero Bambagioni, Paolo Gemma, Wendy Goico Campagna, Tania Marcos and Emily Royall (U4SSC Vice-Chairs) for their assistance and contributions.

The author also extend their gratitude to the contributing organizations along with their representatives: Oliver Hillel from the Convention on Biological Diversity (CBD), Lucy Winchester and Vera Kiss from the Economic Commission for Latin America and the Caribbean (ECLAC), Simone Borelli from the Food and Agriculture Organization (FAO), Cristina Buetti from the International Telecommunication Union (ITU), Deniz Susar from United Nations Department of Economic and Social Affairs (UNDESA), Iryna Usava from the United Nations Development Programme (UNDP), James Murombedzi from the United Nations Economic Commission for Africa (UNECA), Guilherme Canela from the Regional Bureau for Sciences in Latin America and the Caribbean of the United Nations Educational, Scientific and Cultural Organization (UNESCO), Martina Otto and Sharon Gil from United Nations Environment Programme (UNEP), Matthew Ulterino from the United Nations Environment Programme Finance Initiative (UNEP-FI), Motsomi Maletjane from the United Nations Framework Convention for Climate Change (UNFCCC), Pontus Westerberg from the United Nations Human Settlements Programme (UN-Habitat), Gulnara Roll from the United Nations Economic Commission for Europe (UNECE), Katarina Barunica Spoljaric and Nicholas Dehod from the United Nations Industrial Development Organization (UNIDO), William Kennedy from the United Nations Office for Partnerships (UNOP), Naci Karkin from the United Nations University - Operating Unit on Policy-Driven Electronic Governance (UNU-EGOV), Sylvia Hordosch from the United Nations Entity for Gender Equality and the Empowerment of Women (UN-Women), Alexander Baklanov from the World Meteorological Organization (WMO) and Sandra Carvao from the World Tourism Organization (UNWTO).

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.

ISBN

978-92-61-3812-9



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1 Introduction

Dubai has emerged as a global hub for innovation and technology due to its extensive digital transformation efforts in the last two decades. Public and private sectors, as well as inhabitants and residents, have adopted digital services and solutions so propelling Dubai into becoming one of the most advanced digital economies and digital societies in the world. The city has recently entered its fourth generation of digital transformation through the efforts of Digital Dubai, formerly known as Smart Dubai, and has become a magnet for attracting international and local talent. In this context, AI has become a strategic emerging/frontier technology in various sectors such as health care, mobility and logistics, energy, education, financial services, retail, tourism, and public services, among others. Recognizing early on the potential adverse effects and ethical challenges associated with AI, Dubai has adopted a proactive and adaptive approach to addressing these concerns through the development and implementation of AI principles and ethics guidelines. It has also established a prudential governance approach for AI ethics at the city level.

2 Background & Context

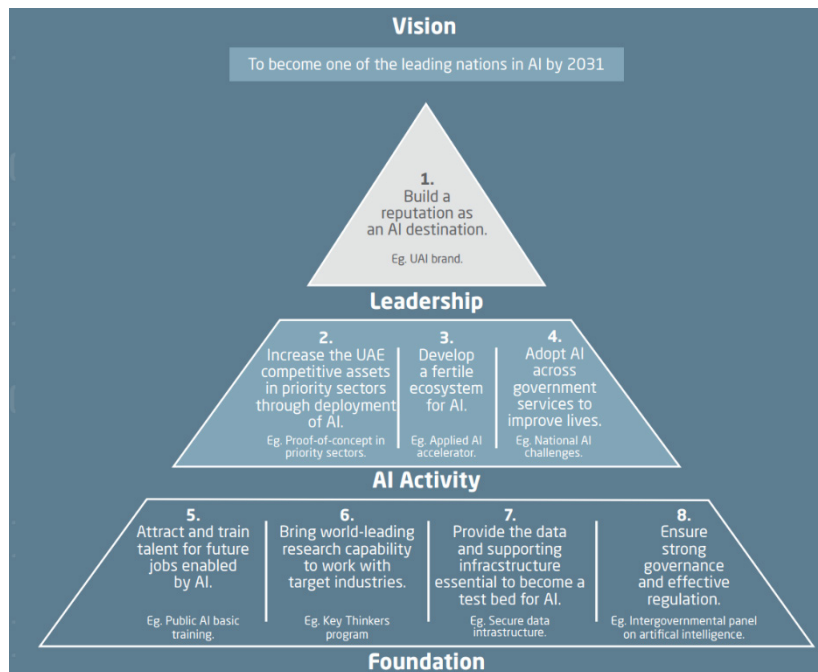
Dubai has actively pursued digital transformation as a strategic enabler, including e-government, smart government, smart city and, more recently, the digital city strategies. The city's efforts to evolve as a hub for emerging/frontier technologies are evident in its various initiatives such as the Dubai Future Accelerators programme, the Dubai Data Initiative, Dubai Blockchain Strategy, Dubai Metaverse Strategy, and the establishment of the Dubai Digital Authority (commonly known as Digital Dubai). These initiatives have, directly and indirectly, played a significant role in fostering AI adoption across various strategic sectors in Dubai.

AI was carefully selected as a major technology contributing to the city's success, and numerous AI use cases were piloted and implemented as part of Dubai's pioneering approach to technology innovation starting from 2015 onwards. As part of the effort to shape the global conversation around AI ethics, and to establish Dubai as a thought leader in AI adoption across the public and private sectors, Digital Dubai collaborated with IBM to launch its AI Lab to develop potential AI use cases¹ in 2017.

The UAE provides a strong foundation for Dubai to thrive as an AI innovation hub, consisting of a cohesive and diversified multinational community capable of quickly adapting to emerging and frontier technologies. In 2018, the UAE AI Strategy was launched; this sets a clear vision for UAE to become the world leader in AI by 2031. As shown in Figure 1, eight strategic objectives are outlined in the AI Strategy:

¹ Dubai Digital Authority, 2021, [An Update on Our Next Steps Towards Safe and Fair AI For Dubai](#)

Figure 1: Eight strategic objectives



3 AI Principles in the City

3.1 AI Principles (adopted by the city)

Dubai has been working actively to become a global hub for AI innovation and development in alignment with the Vision of the UAE National Strategy for Artificial Intelligence 2031.² The Dubai Ethical AI Toolkit³ was created by the Dubai AI Lab in 2019, along with the formation of an AI Ethics Board drawing in local and global stakeholders to consult future strategies.

The purpose of Dubai's Ethical AI Toolkit is to provide not only philosophical guidelines, but also practical support across a city ecosystem. It supports industry, academia and individuals in understanding how AI systems can be used responsibly. With the long-term goal of reaching widespread agreement and the adoption of commonly agreed policies to inform the ethical use of AI not just in Dubai but around the world, the Dubai AI Principles aim to offer unified guidance that is continuously improved in collaboration with the stakeholder communities.

The Dubai AI Principles consists of four key principles.

² UAE Artificial Intelligence Office, 2018, [UAE National Strategy for Artificial Intelligence 2031](#)

³ Dubai Digital Authority, 2019, [Artificial intelligence principles & ethics](#)

Figure 2: Four key principles



Ethics

- Make AI systems fair;
- Make AI systems accountable;
- Make AI systems transparent; and
- Make AI systems as explainable as technically possible.

Security

- AI systems will be safe, secure, and controllable by humans; and
- AI systems should not be able to autonomously hurt, destroy or deceive humans.

Humanity

- AI systems should be given human values and made beneficial to society; and
- A plan should be in place for a future in which AI systems become increasingly intelligent.

Inclusiveness

- Governance of AI should be a global effort;
- The benefits of AI should be shared throughout society;
- AI systems should promote human values, freedom, and dignity; and
- AI systems should respect people's privacy.

3.2 AI Principles Enablers (adopted by the city)

The United Arab Emirates (UAE) has always been at the forefront of AI innovation and adoption, setting a precedent for the rest of the world to follow. In 2017, the UAE made history by appointing the first-ever minister for artificial intelligence, showcasing its visionary leadership and commitment to embracing cutting-edge technologies. Building on this momentous occasion, the UAE AI office was established with the sole objective of promoting and governing the widespread adoption of AI. The UAE AI office has developed various pioneering programmes with a focus on innovation, including the National Program for Artificial Intelligence and the National Program for Coders, aimed at unleashing the full potential of AI in the region.

Prior to the launch of Dubai AI Principles, Dubai has already seen hundreds of AI use cases across the private and public sectors in the past decade. The large number of AI use cases can enable the implementation of AI principles by providing practical examples of how AI can be used in different contexts, and by highlighting the potential benefits and risks associated with different approaches. As more organizations and industries adopt AI, there is a growing body of evidence and experience that can inform best practices for the deployment and improvement of the Dubai AI Principles.

The innovation in the Dubai Government's procurement management also plays a crucial role in enabling the implementation of Dubai AI Principles. In 2020, Dubai Electricity and Water Authority (DEWA) participated in launching the "AI Procurement in a Box" toolkit⁴ in collaboration with the World Economic Forum's Centre for the Fourth Industrial Revolution and The Centre for the Fourth Industrial Revolution UAE (C4IR UAE). The toolkit provides advanced mechanisms which enable a proactive approach to fostering innovation, efficiency and ethics in procuring AI technologies. By incorporating ethical and responsible AI principles into the procurement process, the city can ensure that the AI systems it acquires are designed and developed in accordance with ethical and responsible principles. The procurement process can also promote diversity and inclusion in AI systems, ensure accountability and transparency, and guarantee access for all members of the community.

On the other hand, the official platforms of Dubai such as Dubai Now⁵ and Dubai Pulse⁶ are digital portals that allow users to access a wide range of public services and information. These platforms, along with numerous Internet of Things (IoT) projects, generate large amounts of data about the city's infrastructure, economy, population and resource usage, which can be greatly leveraged to enable, validate and improve the implementation of Dubai's AI Principles.

Alongside the launch of Dubai AI Principles, Dubai AI Lab conducted multiple capacity-building programmes with its partner entities to ensure mutual understanding and efficient implementation of the principles in AI-related projects across the city. At the same time, the Dubai Ethical AI Toolkit⁷

⁴ Dubai Electricity and Water Authority, 2020, [DEWA participates in launch of 'AI Procurement in a Box' toolkit](#)

⁵ [Dubai Now](#)

⁶ [Dubai Pulse](#)

⁷ Dubai Digital Authority, 2019, [Artificial Intelligence Ethics Guidelines](#)

was published, with a focus on providing tangible suggestions to help stakeholders adhere to the Ethics principle. The Toolkit contains detailed explanations and implementation examples around four sub-principles: Fairness, Accountability, Transparency and Explainability.



3.3 AI Principles Governance Mechanism (adopted by the city)

Following the launch of the Dubai AI Principles & AI Ethics Guidelines (part of the Dubai Ethical AI Toolkit), Digital Dubai invited stakeholders from the private and public sectors to form the AI Ethics Advisory Board⁸ with the mandate to steer the development and deployment of human-centred ethical AI, and to encourage fairness, transparency and accountability in AI systems in Dubai. The AI Ethics Board was designed to create a multi-stakeholder collaborative platform and foster an ongoing dialogue in Dubai, where the execution and compliance of the Dubai AI Principles are designed to be decentralized.

The AI System Ethics Self-Assessment Tool⁹ was developed following the launch of the Dubai AI Principles and the AI Ethics Guidelines, in order to enable AI developer organizations or AI operator organizations to evaluate the ethics level of an AI system decentrally. The tool provides organizations with a set of questions to assess their AI readiness across various dimensions, including data readiness, technical readiness and organizational readiness. Based on the responses, the tool generates a score and provides recommendations for how organizations can improve their AI readiness.

3.4 Policy Instrument for AI Principles (adopted by the city)

Below is a non-exhaustive list of policy instruments that support and complement the Dubai AI Principles, on the national level and the city level:

National Level:



UAE AI Strategy (2018):

The UAE sets a clear vision through its AI Strategy, of becoming the world leader in AI by 2031. Implementing this vision on the ground requires rigorous dedication and clear steps that outline the path to success.

⁸ Dubai Digital Authority, 2019, [Smart Dubai's AI Ethics Advisory Board inaugural meeting](#)

⁹ Dubai Digital Authority, 2019, [AI Systems Ethics Self-Assessment Tool](#)



UAE AI Guide (2018):

This guide provides an overview of different types of AI as part of the National Program for Artificial Intelligence, and summarizes relevant applications already deployed across various industries in the UAE.



UAE Deepfake Guide (2021):

This guide aims to define the problem of deepfakes as this technology is hard to detect and identify. It also presents protective measures and how to report identified deepfakes to the appropriate authority.



UAE AI Ethics Guide (2023):

In collaboration with Dubai AI Lab and with reference to Dubai AI Ethics Guidelines, the UAE AI Ethics Guide was launched by the UAE AI Office as a fulfillment of the goals and aspirations set in the UAE National AI Strategy and the international Sustainable Development Goals (SDGs).



UAE AI Adoption Guideline in Government Services (2023):

This guideline provides a comprehensive overview of the current global posture of AI, especially among public sectors. It also enlists the UAE AI Adoption Framework and Methodology in Government Services, in order to evolve the AI maturity across UAE Government services.



UAE Generative Artificial Intelligence Guide (2023):

The “Generative AI” guide serves as a valuable resource for government entities, enabling them to leverage the benefits of AI technologies and enhance its implementation across various fields.

City Level:

Dubai AI Ethics Guidelines (2019):

This guide provides a universal, practical and applicable framework informing ethical requirements for AI design and use. Such guidelines are intended to refine, expand and evolve as a collaborative process in which all stakeholders are invited to be part of the dialogue.

Dubai AI Ethics Self-Assessment Tool (2019):

This self-assessment tool is built to enable AI developer organisations or AI operator organisations to evaluate the ethics level of an AI system, using Dubai’s AI Ethics Guidelines.

Dubai Synthetic Data Framework (2022):

This framework is designed to help organizations adopt Artificial Intelligence (AI) technology so they can develop solutions and services that use these data in analysis and machine learning processes, instead of real data that may involve a violation of privacy.

4 Implementation of AI principles in the city

Within one year of its launch in January 2019, the Dubai AI Principles and the Self-Assessment Tool have registered a total of 17 178 visits across all Ethical AI Guidelines' pages on the Dubai Digital Authority's official website.¹⁰ The Dubai AI Principles have been adopted efficiently and effectively across various sectors, facilitated by the city's dynamic AI ecosystem and numerous pre-existing AI initiatives.

The Roads and Transport Authority (RTA) was the inaugural government body to implement the Ethical AI Toolkit, making it compulsory for all its AI-driven systems. The Authority utilized the self-assessment instrument on 15 AI-centric projects and initiatives, which allowed for the identification of ethical shortcomings that had previously been overlooked. The RTA personnel noted that the toolkit had enhanced their understanding of AI system transparency and accountability, thereby simplifying the complex subject of AI ethics.

The AI Lab of Digital Dubai employs the Ethical AI Self-Assessment Tool for all projects in development. The toolkit evaluates numerous initiatives in terms of ethical aspects such as AI-enabled systems created by the DHA to identify and measure the decline in patients' conditions in emergency departments; a cognitive school locator service developed by the KHDA; and a risk engine for declarations by Dubai Customs.

The AI Self-Assessment Tool brings attention to a wide range of concerns associated with the ethical implementation of AI. These include the necessity to comprehend the quality and accuracy of the data feeding the algorithms utilized in artificial intelligence; the importance of transparency and articulating highly intricate AI forms to those affected by the decisions they produce; and the integration of ethics into the professional growth of AI developers to ensure the creation of secure, equitable and responsible AI systems.

¹⁰ Dubai Digital Authority, 2020, [AI self-assessment tool has been used on 18 AI use cases](#)

5 Conclusion

This case study on the Dubai AI Principles demonstrates the city's proactive approach to addressing the ethical challenges and potential risks associated with AI implementation. Several key lessons can be drawn from Dubai's experience in formulating and implementing AI principles:

1. Collaboration and stakeholder engagement are vital for creating a comprehensive and effective set of AI principles. By involving local and global stakeholders, Dubai has successfully developed AI principles that are relevant, practical, and adaptable across various sectors.
2. Integrating AI principles into existing AI initiatives and use cases has facilitated their efficient adoption and implementation. The strong foundation laid by previous AI projects in the city has allowed for seamless integration and accelerated the impact of the AI principles.
3. A robust governance mechanism such as the AI Ethics Advisory Board plays a critical role in overseeing the deployment of ethical AI and promoting fairness, transparency, and accountability in AI systems.
4. Engaging and learning from a broad range of stakeholders in the private and public sectors globally has been instrumental in incorporating diverse perspectives and insights at an early phase. Such an approach enables the creation of a more comprehensive and effective set of AI principles that can cater to various needs and concerns while being in alignment with global standards and best practices.

The impact of Dubai's AI principles has been significant, evidenced by the widespread adoption and positive outcomes across various sectors. This has been supported by the city's robust AI governance mechanisms and proactive pilot initiatives such as DEWA's procurement innovation. AI principles have improved transparency, accountability and ethical decision-making, leading to more responsible and beneficial AI systems. Despite the significant progress, challenges remain in ensuring that AI principles stay up-to-date and relevant in the face of rapidly evolving technology. Continuous refinement and collaboration will be essential for addressing these challenges and maintaining the effectiveness of AI principles.

The critical success factors for Dubai's AI principles include a clear vision and commitment from the government, strong collaboration between public and private sectors, and a supportive AI ecosystem that fosters innovation and accelerates AI adoption.

The transferability of Dubai's AI principles to other cities depends on several factors such as the local context, government support, and the existing AI ecosystem. However, the collaborative and adaptable nature of the principles, along with the lessons learned from Dubai's experience, can serve as a valuable reference for other cities aiming to develop and implement their own AI principles. By customizing the principles to suit the local context and leveraging existing AI initiatives, cities worldwide can benefit from Dubai's experience and create a more responsible and ethical AI landscape.

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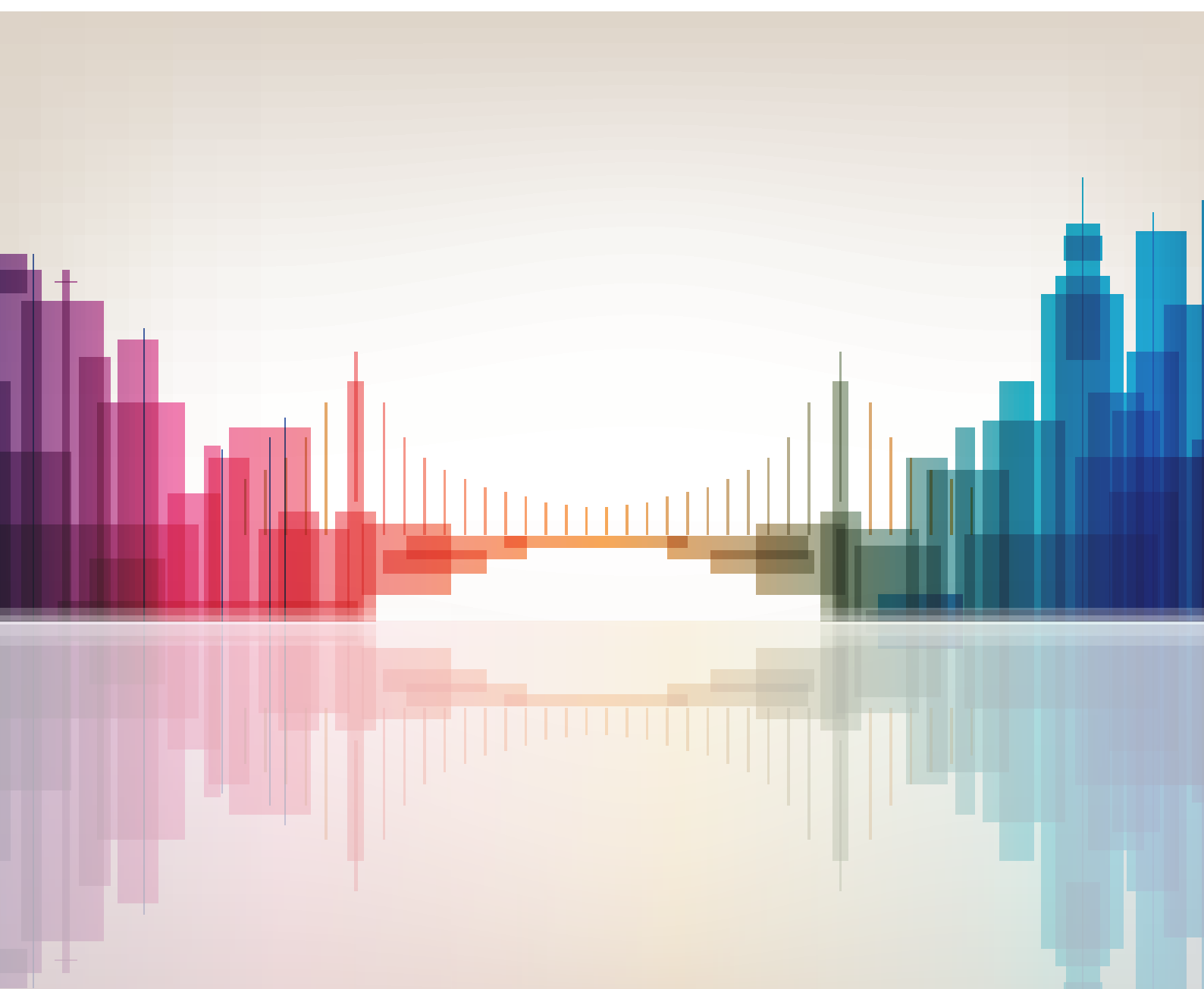
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ISBN: 978-92-61-38121-9



Published in Switzerland
Geneva, 2024

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