Ethics and integrity, particuly around AI in FM Urban FM and placemaking solutions

Artificial intelligence and digital technologies are becoming increasingly important in urban facility management, as cities look for ways to be more efficient, sustainable, and socially inclusive.

This report looks at how ethical and regulatory frameworks for AI support responsible use of these technologies in urban facility management. The report discusses the role of digital tools in promoting social sustainability and compares how different countries approach AI and urban facility management. Overall, the report shows that successful use of AI in cities depends not only on technology, but also on good governance and a people-centered approach.

1. Ethics Policies

Current ethical and regulatory frameworks for artificial intelligence aim to make sure that AI systems are used safely, transparently, and responsibly. The EU AI Act is the first major legal framework in Europe that regulates AI. It groups AI systems into different risk levels and requires strict rules for high-risk systems, such as good data quality, clear documentation, transparency, and human oversight (European Artificial Intelligence Act, 2024). The Act alsohighlights the importance of protecting fundamental rights, avoiding discrimination, and making AI decisions easy to understand. These rules apply not only to organisations insidethe EU but also to those outside the EU if they offer AI systems on the European market (European Artificial Intelligence Act, 2024).

While the EU AI Act is a binding law, the ISO standards focus on helping organisations understand and manage AI. The ISO/IEC 22989 standard explains important terms, definitions, and basic ideas for trustworthy AI, such as transparency, fairness, safety, robustness, and accountability (International Organization for Standardization, 2022). This shared terminology helps organisations and supports the development of other AI standards.

The ISO/IEC 42001 translates these ethical principles into concrete requirements for an AI management system within organizations. The standard outlines how risks should beidentified and reduced, how responsibilities are assigned, how data is used responsibly and which measures are needed to monitor and continuously improve AI systems (Standard Norge, 2024). A key focus is placed on transparency, documentation and clear humanoversight to detect and prevent potential harm at an early stage (Standard Norge, 2024).

To conclude, the three frameworks work well together. ISO/IEC 22989 gives the basic definitions, ISO/IEC 42001 explains how organisations should manage AI responsibly, and the

EU AI Act sets the legal rules. Together, they create a clear and consistent structure for using AI in a safe and responsible way.

1. Urban Facility Management Technologies and Social Sustainability

Urban facility management increasingly relies on digital technologies to address challenges related to rapid urbanization, environmental degradation, and social equity. Technologies such as Artificial Intelligence (AI), Digital Twins, Building Information Modeling (BIM), Geographic Information Systems (GIS), and Internet-of-Things (IoT) platforms enable data-driven planning, efficient resource management, and resilient urban infrastructure (Batty, 2018; Bibri & Krogstie, 2017).

Urban Digital Twins integrate real-time sensory data with BIM and GIS to create dynamic representations of urban environments. These systems support land-use optimization, infrastructure monitoring, disaster preparedness, and energy-efficient facility management (Dembski et al., 2020; Lu et al., 2020). BIM provides detailed building-level information, while GIS enables spatial analysis at city scale, together informing sustainable planning and infrastructure resilience (Noardo et al., 2020).

Beyond operational efficiency, urban technologies play a significant role in promoting social sustainability. Socially sustainable cities prioritize accessibility, equity, safety, and citizen participation (Dempsey et al., 2011). AI-supported urban placemaking—including citizen feedback analysis, social mapping, and behavioral insights—helps identify underserved communities and improve comfort, mobility, and public safety (Kandt & Batty, 2021). Emerging concepts such as Civic Digital Twins expand technical models by incorporating participatory processes, enabling residents to engage in decision-making and co-design urban spaces (Dembski et al., 2020).

However, technology-driven urban management raises governance and ethical challenges. Issues related to data privacy, surveillance, unequal access, and algorithmic bias may undermine social equity if not adequately addressed (Kitchin, 2014). Effective governance frameworks, transparency, and inclusive participation are therefore essential to ensure that digital innovations contribute to urban well-being rather than reinforcing existing inequalities.

To summurise, digital technologies offer powerful tools for improving urban facility management and sustainability. Their successful application depends on integrating technological efficiency with social sustainability principles, ensuring that urban spaces are not only smart and resilient but also inclusive and people-centered.

2. Comparison of Austria, Switzerland, and the Netherlands

Applying the Urban FM Placemaking Framework at the national level highlights distinct strengths among Austria, Switzerland, and the Netherlands. Switzerland performs strongest overall, particularly in infrastructure quality, service reliability, safety, digital competitiveness, and environmental performance, supported by a low-carbon electricity mix and high institutional trust

(European Commission, 2023; Institute for Management Development [IMD], 2025; International Energy Agency [IEA], 2023).

The Netherlands excels in placemaking, accessibility, mobility, and urban management, notably in cycling infrastructure, digital public services, and data-driven urban operations. However, it continues to face higher carbon intensity relative to Austria and Switzerland (European Commission, 2023; IMD, 2025; IEA, 2024).

Austria presents a balanced profile, combining high urban livability, strong public services, and a high share of renewable electricity. While Austria currently lags behind Switzerland and the Netherlands in advanced AI deployment and FM digitalisation, its governance quality and sustainability performance provide a solid foundation for future integration (European Environment Agency [EEA], 2024).

The comparison shows that Switzerland leads overall due to its strong infrastructure, digital performance, institutional trust, and environmental outcomes. The Netherlands stands out for placemaking, mobility, and advanced digital urban management, though it faces higher carbon intensity. Austria offers a balanced and sustainable model with high livability and strong governance, providing a solid basis for future digital and AI integration. The examples showcase different need of approach to succeed in socially sustainable urban spaces.

3. EU, United States, and Malaysia: A Comparative Perspective

The European approach to AI contrasts notably with the market-driven model of the United States and the capacity-building pathway observed in Malaysia. The United States leads in AI adoption due to strong corporate investment, productivity-driven implementation, and a light-touch, sector-specific regulatory environment that enables rapid experimentation and scaling of enterprise AI solutions, including in facility management (McKinsey & Company, 2025).

Malaysia follows a more cautious and sequential approach. Practitioner perspectives indicate that AI implementation is constrained by limited baseline data, traditional work practices, and evolving governance frameworks. Emphasis is placed on establishing robust digital foundations, such as BIM, sensors, and digital twins, before advancing toward mature AI use, while ensuring transparency, cultural alignment, and ethical responsibility (Pavithran, interview summary).

Overall, the comparison reveals three distinct trajectories: the EU prioritizes regulation and ethical governance, the United States emphasizes speed and innovation, and Malaysia focuses on foundational readiness and social sustainability in AI-enabled FM.

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