



SMART CITIES

ROBERT OPP

Robert Opp is UNDP's Chief Digital Officer, leading an organisation-wide effort to harness the power of new technology to deliver more and better results in the countries and communities in which UNDP works.

Making Cities Liveable with Technology and Partnerships



Technology and innovation can help overcome the challenges that urbanisation faces.

Image: © Tampatra / Adobe Stock

Technology has the potential to improve the lives of millions living in cities, but it can also pose challenges. As more people move to live in urban areas in the next 30 years, the United Nations Development Programme is tapping both technology and partnerships to make cities adaptable, inclusive and sustainable.



Technology, driven by talent, ingenuity, partnerships, and engaged citizens, can help accelerate positive change from urbanisation.



Urbanisation is the great enabler and disruptor of the twenty-first century. It has driven major challenge and change, including increased inequality, accelerated climate change, and led to overcrowding in cities. With 2.5 billion more people projected to be living in cities by 2050, we need urgent action so that urbanisation, rather than creating more challenges, improves prosperity, enables better access to public services, and delivers the possibility of better and longer lives.

Technology, driven by talent, ingenuity, partnerships, and engaged and empowered citizens, can help accelerate this positive change. This is the premise of a “smart city” or a “future city” – an urban environment where technology and innovation, combined with sound policies and inclusive institutions, can improve lives and livelihoods. Developing countries, where urbanisation is happening fastest, need to take advantage of the opportunities offered by smart cities.

At the United Nations Development Programme (UNDP), we work with many partners to apply

technology for positive, sustainable change in urban environments. We use data to predict disasters, and draw on technology solutions to increase access to public services; reduce inequality and marginalisation; and make individuals, businesses, economies, and societies more prosperous.

This work is guided by our Digital Strategy, which focuses on using digital technologies to improve both our partnerships for solving development challenges, as well as the quality, efficiency, relevance and impact of UNDP’s work.

The UNDP Global Centre for Technology, Innovation, and Sustainable Development—our smart cities “hub” in Singapore—plays an important role in this effort. The Global Centre is leading smart city initiatives and collaborations around the world. It is building smart city knowledge and expertise across the UNDP system—all in partnership with the public and private sectors, the academia, and civil society. The goal is to use technology and innovation to develop adaptable, inclusive and sustainable cities.



Technology can help to develop citizen-centric solutions and catalyse innovation more broadly. But it can also present challenges.



Building Adaptable Cities Using Agile Governance

Adaptable cities proactively engage with the causes and effects of rapid urbanisation and other shocks, particularly climate change. City leaders have to make cities more resilient, build clean and healthy environments for citizens, and identify how all sectors can support this work. To achieve all these outcomes, smart city governance needs to be responsive, participatory and agile.

To be able to quickly identify challenges and opportunities, smart city governance requires data, a key tool. To get this data, platforms and spaces can be created for citizens and organisations to share their thoughts. This allows a city to adapt and respond to the needs and realities of its citizens.

UNDP is working with cities around the world to draw on data to achieve

this adaptability. For example, in the Armenian city of Kapan, the UNDP and partners have established a city resilience team to refine and strengthen disaster response, risk reduction and preparedness. We apply Geographic Information System, or GIS, technology to risk-assess locations across the city and use sensor data to trigger warning alerts.

In Vietnam, UNDP and the city of Da Nang are shaping a “CityLab” to embed innovation and experimentation into the delivery of public services. We have worked with the city authorities to improve public engagement by using chatbots and other experiments to identify citizen priorities. These tools generate more citizen interaction with government, providing policy experts and other decision-makers with greater



An earthquake simulation exercise was organised in kindergartens in Kapan, Armenia, to test and exercise the emergency response and preparedness of all personnel and children.

Image: UNDP Armenia



The rise of e-commerce has led to a proliferation of delivery services, while inadvertently contributing to road traffic.
Image: Lou Linwei / Alamy Stock Photo

insights into the lives of citizens, and allow them to build solutions that meet citizen needs.

Technology can help to develop citizen-centric solutions and catalyse innovation more broadly. But it can also present challenges. For example, the sharing economy and e-commerce, both driven by technology, can improve last-mile urban infrastructure and stimulate local innovation. They may also increase congestion and worsen inequality due to insecure employment. Smart city governance must be able to quickly identify and respond to such wide-ranging impacts.

Shaping Inclusive Cities with Technology

In cities, disparate groups live and work alongside each other: the rich and poor, rural migrants and urban dwellers, and people with all levels of education. This coexistence can sometimes lead to division, inequality and conflict.

Cities must be shaped to be inclusive spaces, where no one is left behind. This includes prioritising the rights of citizens, particularly when collecting, aggregating and sharing data. In China's city of Guiyang, our work with the local government resulted in a set of indicators for inclusiveness, such as housing affordability and availability, public safety, and environmental measures, which are now being tracked for the provision of public services.

||
Smart city governance needs to be responsive, participatory and agile, able to identify and respond to wide-ranging impacts of technology.

||



The Municipal Government of Chongqing offers free training courses for rural migrant workers to equip them with the skills needed to make a decent living.
Image: Li Wenyong / World Bank / Flickr

Technology itself is not always inclusive. 3.6 billion people in the world still do not have Internet access.

In El Salvador, UNDP works with national authorities to design, implement and monitor evidence-based citizen security policies founded on a comprehensive and prevention-oriented approach. These are focused on reducing different forms of violence and crime across the country.

Technology can play an important role in building inclusive cities, such as by making public service delivery more effective. In Bangladesh, wholesale digital transformation by local government agencies with the UNDP has revolutionised public service delivery. The poorest and most marginalised communities usually travel days to access public services. Through a new nationwide network of more than 5,000 digital access centres, all citizens can get easier access to both public

and private services. Now, public services and government support are only a short journey away. With reduced bureaucracy and travel time, this has saved two billion days of time and an estimated US\$8 billion (S\$11.1 billion) in costs.

Yet, we need to be aware that technology itself is not always inclusive. 3.6 billion people in the world still do not have Internet access. Digital literacy remains a global challenge, and women and girls have lower access to and ownership of technology. Similarly, data-driven approaches may exclude “hidden” populations, which are often not included in data collection efforts. Cities need to identify and tackle these issues, to avoid exacerbating the digital divide.

Ensuring Sustainable Cities Through Partnerships

Sustainability should be treated as a fundamental component in building the cities of the future. Cities have been dominated by the linear economy: take, make, use and dispose. We need to shift from a linear economy to a circular economy, with more efficient production and all waste channelled back into use.

With technology, scarce natural resources can be smartly distributed and managed so that cities become zero-waste and have sustainable environments. In Kenya, the national government and UNDP are exploring how a circular economy approach can improve urban waste management. This includes identifying new technologies for recycling and composting. This work is also focused on building and supporting small-scale businesses

that add value by leveraging new technologies. These technologies, in turn, have reduced the barriers to entry to this sector, allowing these small businesses to succeed.

Contributing to the urban fabric are the private sector, academic institutions, civil society and other organisations—and we need to engage with all of them to build sustainable cities. For example, the city of Seoul has partnered with a private IT firm to develop the Clean Construction System (CCS), which digitalises and standardises the administration of public constructions. The CCS discloses the information of the construction projects to citizens, including the management of resources and payment to sub-contractors. Such public infrastructure management, coupled with transparent and

||
With technology, scarce natural resources can be smartly distributed and managed so that cities become zero-waste and have sustainable environments.
 ||



In Mombassa town, many children can be found at the dumpsite collecting metals and plastic.
 Image: Stars Foundation / Flickr



Seoul shares 'Clean Construction System' practices with the Ministry of Infrastructure of Ukraine, which was applied in a road reconstruction site in Kyiv.
 Image: Andrey Krepkikh / UNDP in Ukraine



Solar panels on the roof of factories in Singapore. By 2030, Singapore will ramp up its solar capacity by more than seven times from current levels.
 Image: Aerial / Alamy Stock Photo



Technology can be transformational, allowing us to build genuinely smart cities that are adaptable, inclusive and sustainable urban environments.



accountable public information, is the backbone of sustainable cities where citizens are empowered and the government is trusted. Since 2016, the UNDP Global Policy Centre in Seoul has been sharing the CCS and other innovative policy tools with partner cities like Da Nang in Vietnam, Kampala in Uganda, as well as in five other countries for adoption in local contexts.

In understanding how technology enables sustainable cities, we must also consider any negative consequences. For example, the use of technology and ancillary services such as data centres may lead to increased electricity consumption. Developing machine-learning tools and algorithms that power smart cities can also drive up greenhouse gas emissions. We need to be alert to these issues and take a holistic approach to the use of technology. Cost-benefit analyses, rigorous evaluations, and a commitment to learning what works are some approaches to ensuring that the impact of technology use is positive. And this work is strengthened by collaboration and partnerships.

Concluding Thoughts

Urbanisation is a powerful force for reducing inequalities, eliminating poverty and addressing climate change and other global challenges. In this context, technology can be transformational, allowing us to build genuinely smart cities that are adaptable, inclusive and sustainable urban environments. Smart cities have a unique opportunity to save the lives of millions of people, improve the lives of billions and shape urbanisation to be a force for good.

As part of our Digital Strategy, the UNDP and its Global Centre in Singapore are accelerating the use of digital technologies to solve development challenges, including those posed by rapid urbanisation. We want cities to work for all citizens and the 2.5 billion more people who will call them home over the next 30 years. 