

# **Building a smart city 4.0 ecosystem platform: a case study of Jakarta's Super App**

In this ongoing pandemic, a smart city has become a key driving factor for accelerating the digital transformation to cope with the Covid-19 crisis. Some emerging technologies are fast becoming a key instrument in a smart city, an increasingly important area in well-applied city services. This article introduces the concept of a smart city 4.0 ecosystem platform that provides new insights on how to translate a vision into reality using Jakarta's Super-App called JAKI ([jaki.jakarta.go.id](http://jaki.jakarta.go.id)) as a use case. The smart city 4.0 ecosystem platform offers a significant opportunity to advance the understanding of building a smart city with technologies, innovations and collaborations.

## **What is a Smart City 4.0?**

What makes a city smart? There is no clear consensus if one looks for a uniform answer. From a service provider's perspective, a smart city is an innovation related to emerging technologies, such as smart parking, smart home, and smart lighting. Government officials would say that a smart city relates to implementing digital government such as applying for permits or citizen identity cards and making public service less bureaucratic, more effective, efficient and transparent. The city residents would be more pragmatic, expecting a smart city to provide seamless transportation and better living conditions with more job opportunities.

These views do not compete; they are actually aligned because the concept of a smart city should serve added values and provide opportunities to address the city's problems and fulfil the citizen's needs. At its core, the smart city is about the ecosystem and people, people connecting to the people (digital citizens), people connecting to the business (digital economy), and people connecting to the government (digital government). It aims to improve citizens' quality of life, foster economic growth, and promote environmental sustainability by using technologies, innovations, and collaborations.

Our intended outcomes are twofold and interlinked: innovative city and happiness. We believe that the adoption of technology and innovation should lead to the paramount goal; the happiness of our citizens. With various emerging technologies and innovations, such as big data, artificial intelligence, Internet of things, cloud services, and blockchain, our work has considerably upgraded public services such as education, healthcare, transportation, public safety, etc. However, we want to go further. Our smart city concept needs to include fulfilling basic needs such as food, water, and electricity. Only by doing so, we can make sure of public happiness.

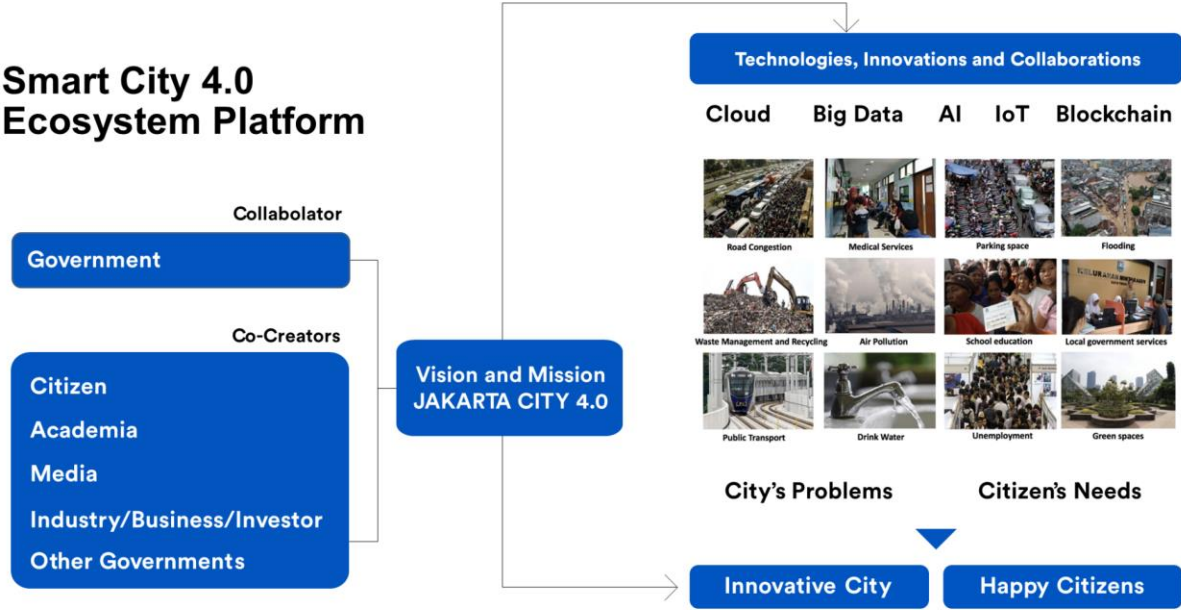


Figure 1: Smart City 4.0 Ecosystem Platform

The concept of smart city 4.0 aims to improve active participation and engagement of city co-creators, such as city stakeholders and residents, for building a better Jakarta. As a concept, it advocates for stronger collaboration (co-creation) and cooperation between citizens and communities in city development. The city government is no longer seen as the sole caretaker that has to supply all answers about the needs of the citizens. To do this, the city government has changed gears, turning Jakarta into a more collaborative ecosystem for the citizens, academics, communities, social organisations, start-ups, media, businesses, industries, and other governments, as seen in Figure 1.

We foster this dynamic ecosystem by building Jakarta’s Super-App called JAKI. This Super-App has become our government platform to sustain continuous innovation and collaboration to make our version of the smart city a reality.

### What We Do in Jakarta Smart City

By carrying out the concept of the Smart City 4.0 Framework as a form of translation and implementation of the governor’s vision of “Innovative City, Happy Citizens”, Our work has been guided by certain principles to reach our intended outcomes, namely Mobile First, System-and-Data Driven, Digital Experience, and Smart Collaboration, as seen in Figure 2.

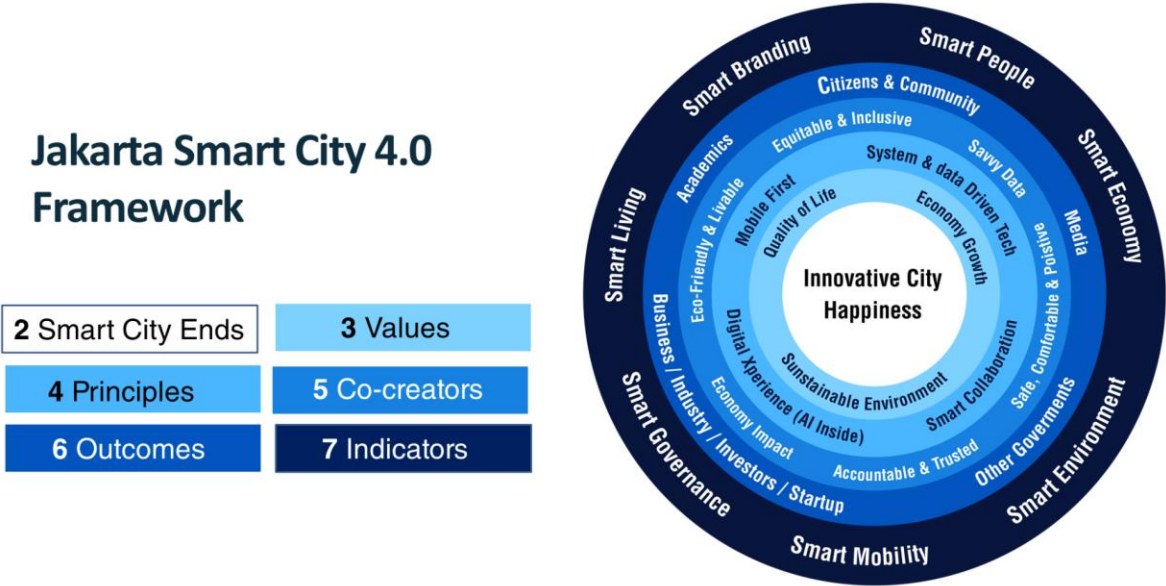


Figure 2: Jakarta Smart City 4.0 Framework

### Mobile First: We’re Doing It for Our citizens

Mobile devices have changed the way people consume information and meet their daily needs. The APJII 2018 survey shows that 93.9% of Indonesians are connected to the Internet daily via smartphones. With JAKI, we want to bring better services to our citizens in the palm of their hands with convenience, effectiveness and efficiency.

As the Jakarta Super-App platform, JAKI has integrated more than 15 features and 28 applications developed by agencies and the public. It provides a single sign-in, which allows a citizen to access all digital services, make payments, and update personal information.

During the pandemic, JAKI serves as a platform for Jakarta's Covid-19 Response via [www.corona.jakarta.go.id](http://www.corona.jakarta.go.id). It is mobile-friendly, the content is available in two languages (Indonesian and English), and it is also accessible through the website. In almost sixteen months since its initial launch on March 6 2020, the total access to the website has reached more than 42 million hits (data per July 18 2021).

### **System and Data-Driven: Data-Driven Innovations to Support Smart City**

Jakarta has better responses to the COVID-19 pandemic due to smart infrastructure, data analytics, and predictive modelling. Building government as a platform transforms government into a public API where city co-creators can build, connect and interact. JAKI continuously improves the Omni-channel experience of its users to get better and more personalised services. JAKI aims to deliver personalised services and integrate all digital services from birth to death, not only provided by the government but also by our city co-creators. Personalised public services can be developed and adapted to individual circumstances using a Digital ID for Jakarta residents. Hence, various services and data for Jakarta residents can be integrated and customised.

The Vaccination Registration– one of JAKI's most popular features– is the prime example of data utilisation which helps citizens independently register and book their schedule for the Covid-19 vaccination. As of July 18 2021, more than 18 million people have accessed the platform, and about 220,116 people have been registered and vaccinated.

JAKI also allows citizens to report public problems they find across Jakarta, including violations of the Large-Scale Social Restriction. With a picture taken with a smartphone, citizens can submit their complaints through JAKI and will be automatically registered in the Cepat Respon Masyarakat (CRM) Platform. The CRM platform provides transparency by allowing citizens to keep track of their complaints online. As of July 14 2021, there have been 14.163 reports by 7.911 citizens related to Large-Scale Social Restriction. About 13.523 complaints (95,5%) have been solved.

## Digital Experience: Organizational Digital Transformation

During the new normal, Jakarta Smart City collaborates with academia and startups to develop a system that will enhance the safety of the citizens using design thinking, system thinking and computational thinking. Understanding citizen needs, solving the problems, seizing the opportunities, and putting the values on livelihood are our digital transformation in building JAKI as a government platform.

We're building a new feature that will promote Digital Health Identity and be integrated into our Super-App JAKI. For example, we provide features in JAKI to support online activities during the new normal such as work from home and learning from home. These features include JakLapor (online complaint system), JakPangan (online food information), JakCLM (online Rapid Test) and our latest innovation, the Vaccination Registration feature to accelerate the vaccination program in Jakarta. JAKI encourages increased digital experience, creating features that work effectively during the pandemic:

- **JakLapor** and **JakRespons** allow citizens to submit their complaints in minutes. Citizens can also monitor their reports in real-time without having to inquire to the government office.
- With machine learning, **JakCLM** allows citizens to check their risk of getting COVID-19 independently.
- **Jejak**, a digital guestbook, provides QR Code-based supervision of buildings and public premises' capacities in Jakarta. With this feature, the government monitors health protocols and seeks to prevent new clusters of COVID-19.
- **The Vaccination Registration** feature aims to open broader access to COVID-19 vaccines for all citizens. We're also collaborating with the Jakarta Department of Health, The National Armed Forces and private sectors to establish Vaccination Centers around the city.

## Smart Collaboration: Collaborating with Co-creators for More Solutions

The pandemic has physically kept us apart from families, friends and colleagues. However, it has also strengthened our bonds. Collaboration has become indispensable to weather this crisis together. At Jakarta Smart City, we are bolstering collaborative projects with government officials, startups, social organisations, and, above all, Jakarta citizens through different collaborative schemes such as the playground, co-develop, and consumer schemes.

For instance, we've been working with the Department of Health of Jakarta in providing the most updated, accurate and trusted data on COVID-19 cases in the capital city. With the Department of Spatial Planning and Land Management of Jakarta, we are developing an integrated map of COVID-19 spread, a map of the controlled zone in Jakarta and an interactive map to support the Large-Scale Social Collaboration (KSBB) program helping those who are in dire need.

We have also worked with the Indonesian Ministry of Communications and Informatics and the Ministry of Health through PeduliLindungi to support vaccination registration in Jakarta. By using public API, it helps citizens independently register and book their schedule for the Covid-19 vaccination.

Jakarta Smart City also collaborates with Harvard CLM Team and Klakklik.ID in developing Kalkulator Covid-19, a self-assessment app powered by Corona Likelihood Metric (CLM) machine learning. With full support from the Jakarta Department of Health, the CLM can also be used as the first screening test to assess the risk of COVID-19 infection of the users.

With Cartenz Lab, we developed a contact-tracing app to support new public behaviour on health, safety and productivity. We also integrated Jakarta Aman and Sekolah.mu into JAKI to keep working and learning from home. All these efforts show that JAKI isn't merely a government-designed app but also a community-designed service that helps people during the pandemic.

As a collaborative ecosystem, at a national level, JAKI won a gold medal at the 2020 Indonesia Entrepreneur TIK (IdentTIK 2020) for the public sector category. We will be representing Indonesia at ASEAN ICT Awards 2021. At an international level, we are delighted for JAKI to be recognised as the WSIS Prizes 2021 Champion for the first time participating in the e-Government category. We will not stop here, considering security by default/design for future improvement; we will continue to develop this super app as a government platform to be implemented globally.

Finally, the year 2020 has become a momentum for Jakarta Smart City, gaining new status as the Regional Public Service Agency (BLUD). This condition will increase our agility, capacity and professionalism in improving public services and providing solutions to city problems. Jakarta stands proud and is transforming into a more innovative and liveable city. We will continue our hard work and ensure the happiness of the citizens of Jakarta.

## **About the author**

Yudhistira Nugraha is a senior member of the Indonesian Government, currently assigned as Director of Jakarta Smart City – Department of Communications, Informatics, and Statistics, the Provincial Government of Jakarta. He has been a civil servant since 2006 and had been working for more than 13 years at the Ministry of Communications and Informatics. His last assignment at the Ministry was as the Deputy Director for E-Government Services in Economic Affairs.

He received a D.Phil. in Cyber Security from the University of Oxford. He also holds a Data Protection Officer Professional University Certificate (ECPC-B DPO) from the European Centre of Privacy and Cybersecurity (ECPC) of Maastricht University, the Netherlands. He also undertakes research and teaching in the area of cybersecurity, privacy, and smart city at Telkom University.