

Alternative Finance

// in Emerging Markets //

Smart Cities in Asia
May 2020

Foreword

Word from
the Editor

Around the world - and especially in emerging markets - **urbanization shows few signs of slowing down.**



There are network effects at work in cities, which create jobs, clustering capital and culture, and promote access to information. This draws in newcomers on a daily basis, resulting in strained infrastructure, congested roads, overcrowded classrooms, and waste disposal services struggling with a surge of trash. This is an issue around the world, and is perhaps most acute in the Asia-Pacific region, where a rapidly-growing middle class is developing lifestyle expectations that cities are struggling to accommodate.

A number of startups have emerged to help local governments deal with the drawbacks of urban growth. These firms are focusing on smart logistics to lighten the load on infrastructure - and they're turning a profit while doing it.

This has helped to drive alternative (non-bank) finance to the sector, with a number of accelerators, venture capital funds, and impact investors popping up to buttress the fledgling startups. These funders, and the companies they are investing in, are the focus of this report.

Our data shows that non-profits and public/semi-public funders lead the way for non-bank finance in the region, meaning there is lots of room to grow for private funders. That growth may be difficult to achieve in a region with a strained commitment to democracy. Privately, startups say government instability and corruption drives serious serious investors away, underscoring the importance of a stable, predictable macroeconomic environment in attracting the private sector.

The report contains interviews with industry leaders, unique data on investors, and For more insights into funding for innovative firms, please visit our Capital Finder. And if you'd like to commission your own report on alternative finance in emerging markets, please reach out to info@alliedcrowds.com.

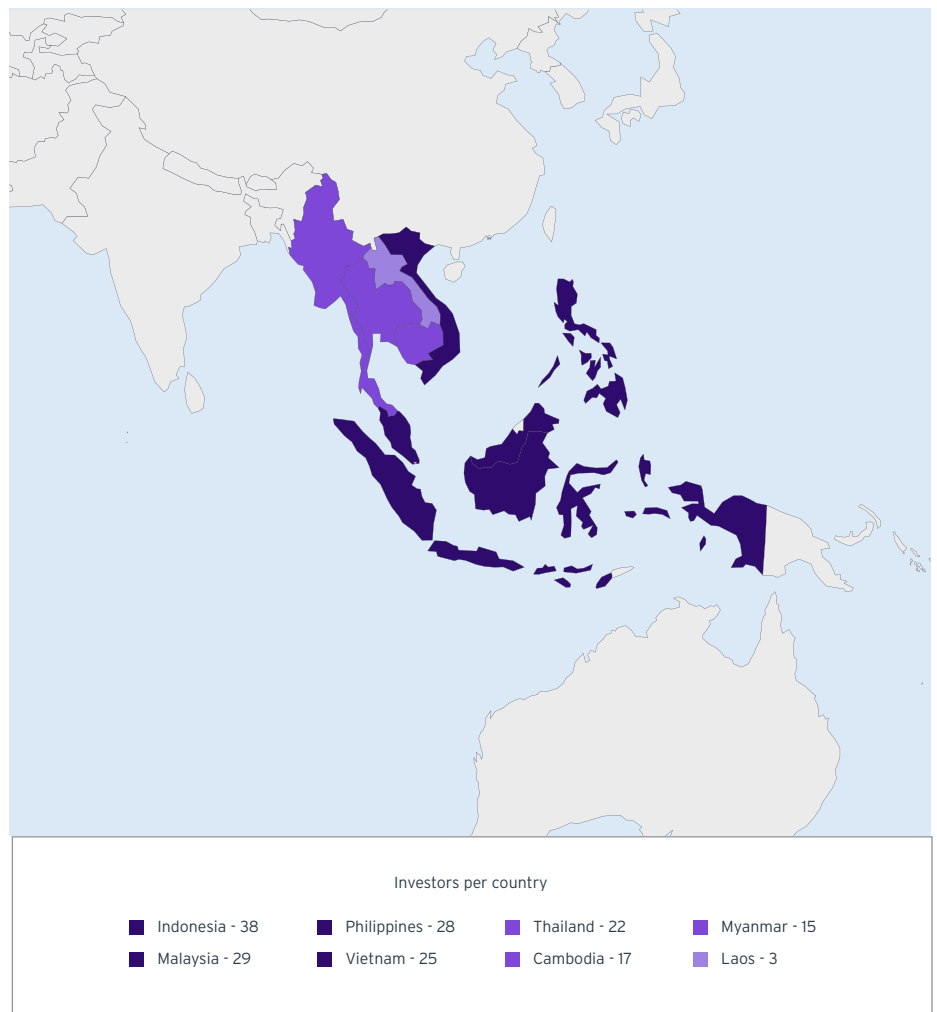
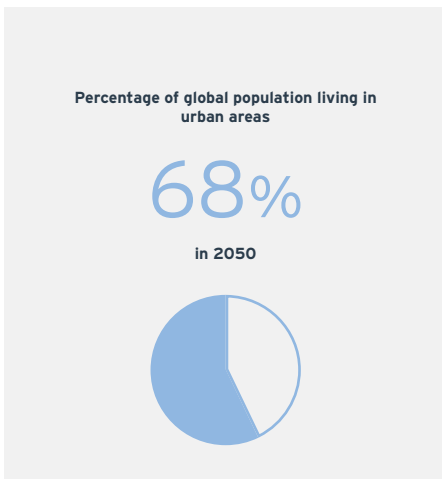
Introduction

Already, more than half of the global population lives in urban areas, and this share is expected to rise to **68% by 2050** - with 90% of this increase taking place in developing countries. Mass urbanisation has put pressure on emerging markets to respond to a growing number of challenges brought on by rising population density such as adequate housing, water and energy supply, and traffic management.

This compels municipal authorities to focus on smart urban solutions. In 2018, ASEAN leaders established the **ASEAN Smart Cities Network**, a collaborative platform where cities from ASEAN member states work towards the common goal of sustainable and smart urban development with technology as the enabler.

Globally, it is reported that **urban tech may be the largest sector for venture capital funding** (\$44 billion in 2017), attracting more investment than biotech and pharma (\$16 billion in 2017) or artificial intelligence (\$12 billion in 2017). In this report, we'll look at some of the technology and financing trends that are driving innovation in the urban tech sectors.

The Asia-Pacific (APAC) region boasts 6 of the world's 10 mega-cities, and also contains the largest slum population globally (**26.9% of the region's population** lives in informal urban settlements). The region faces the combined pressures of rapid urban growth with that of environmental degradation; **99 of the 100 most polluted cities** in the world are located in APAC.



Who is funding urban tech?

Traditionally, urban development projects in developing countries have been funded by government development banks and international financial institutions. These investments usually take the form of bonds, sovereign loans, direct loans, grants, equity funding, credit guarantees, or blended (public-private) financing. Multilateral organisations have stepped in to fill the gap as investment from commercial banks has declined; each year, these organisations provide **\$30 billion in lending directly to urban projects**.

Deloitte research suggests that **only 10% of the funding for smart city initiatives in ASEAN countries represents private investments**. While the tech sector more generally has attracted

many private investments, smart city projects need to go hand-in-hand with e-governance and open data strategies. Indeed, public sources of finance are considered the most effective financing mechanisms for city development, but this is because urban development is usually associated with infrastructural development.

It is important to recognize that there is a wide variety of opportunities in the 'smart' urban tech sector that have the potential to attract more private investors. While there is a growing trend of blended finance, **cities' ability to attract private funding** still depends on their level of financial maturity, as well as a transparent business environment.



IT'S NOT ALL ABOUT BIG DATA

Smart cities, as a sector, is an eclectic term: as the section below outlines, there are many potential ways startups can use tech to improve the infrastructure of cities. One overarching trend, however, is the importance of big data in smart city initiatives. Often, making cities smarter means measuring traffic pain points, identifying crime hot spots, and cutting down on wasted resources -- all of which, indeed, require data to analyze and improve on.

There are, however, initiatives that showcase that big data does not need to be the central focus of smart city initiatives. Block by Block is a partnership among Microsoft, Mojang, and UN Habitat, which makes use of the popular game Minecraft to encourage popular participation in urban development.

The initiative aims to address two issues: identifying clever solutions for issues presented by increasing population density; and making the urban development process more democratic by opening up the conversation to groups not typically asked for their input (including young people and women). Young people, after all, will be the ones who inherit the city, said board member James Delaney, so shouldn't they also be asked for their input?

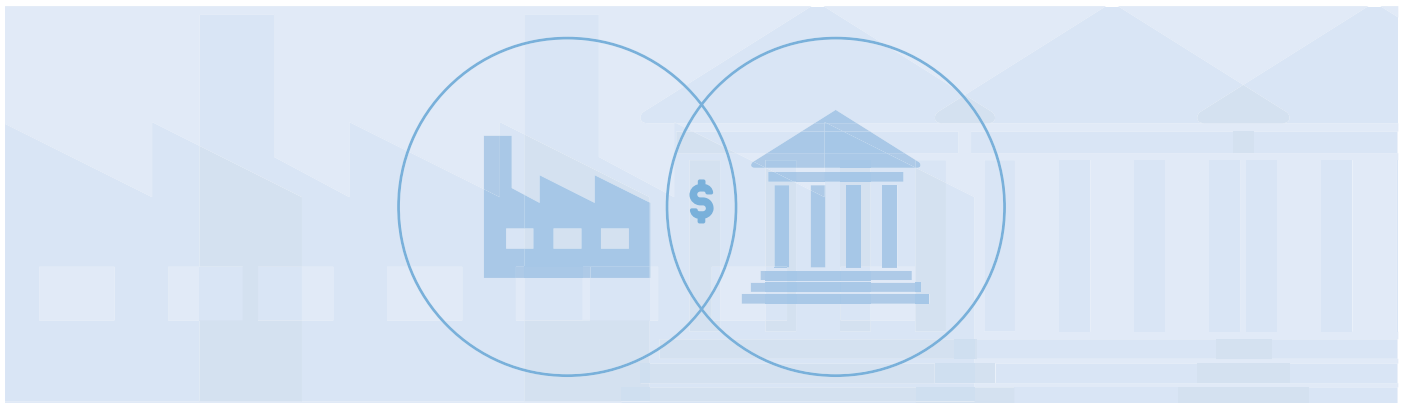
Block by Block invites people to come and design their solution for an urban redevelopment project, which is slated to take place in their neighborhood. The finalists pitch their solution to a panel of decision-makers, who select an idea to implement.

Government buy-in is important, Delaney said. Even though most of the funding for the development comes from Block by Block, the organization only invests in a project if the local government shows interest in it.

To date, the organization has completed over 100 projects around the world, many of them in the ASEAN region. While they may not make use of big data, Delaney thinks the projects can serve as a blueprint for other smart city initiatives that are "people-first, not tech-first."

Alternative finance for urban innovation

Combining public finance with private sector participation in projects offers local governments **more capacity to fill their infrastructure needs**, as traditional funding approaches will not be sufficient to accommodate a rapidly growing population.



In the Philippines, for example, the government set up the **Philippine Investment Alliance for Infrastructure**, a 10-year closed-end fund dedicated to equity investments in infrastructure and managed by Macquarie Group. As mentioned earlier, however, although construction represents an important aspect of smart city development, there is much potential in the wider urban tech space for private investors to contribute to the equitable growth of cities.

Our data shows that, out of the eight ASEAN countries analysed (Indonesia, Cambodia, Laos, Malaysia, Philippines, Thailand, Vietnam, Myanmar), Indonesia has an estimated 38 investors in the urban tech space, the largest of the group. The Philippines, Malaysia, and Vietnam boast 25 or more capital providers each in this sector, while alternative funders are more scarce in Thailand, Cambodia, and Myanmar have fewer than 25 each. Laos is last with only 3 investors willing to fund urban tech and smart city ventures.

Across Southeast Asia, the most widely available source of non-bank funding for entrepreneurs in the urban tech space is non-profit funders (33 in the region), with public/semi-public organisations (26) and venture capital firms (20) coming in second and third. Angel investor networks and startup competitions remain relatively scarce overall, signalling the need to diversify the scope of players in the

entrepreneurial ecosystem, specifically when it comes to developing smart city technology.

Interestingly, crowdfunding platforms are actively financing urban tech projects in each of the analysed countries -- with a total of 8 active in the region. Crowdfunding platforms in North America and Europe have funded some infrastructure projects in their regions, and it's encouraging to see crowdfunding also be used across the APAC region in a similar manner.

Despite non-profits coming in as the most prominent investor type across the region, the most prevalent funding types are lending and equity (92 of each type in the region), while grant funders total 56.

There are deep-rooted issues in the alternative funding sector. In some countries, startups we spoke with complained of government instability, red tape, and corruption making it difficult to operate. These issues can cause unpredictable currency fluctuations, seriously hampering the outlook for a company's projected revenues and costs. Additionally, there is varying degree of appetite for new technologies across the countries in the region, and the quality of IT education varies from country to country, too. This means only a few startups are able to hire the talent they need to succeed, resulting in a dearth of

high-quality firms. Mix in the fact that the region is made up of different languages, making it more difficult to scale than in other parts of the world, and the result is a challenging environment for private investors to navigate; it's no wonder we're seeing only a few funders step in to fill the gap.

Indeed, many smart city projects are won and undertaken by large, established firms (IBM, Dell, Accenture, etc.), leaving few ways for startups to enter the market, said David Henderson of DRVR, a Bangkok-based startup. His firm works with companies to improve transport logistics and reduce costs; it also identifies best times to service vehicles, using existing on-board computers. Large sources of funding like the Asian Development Bank, he said, are funding only big-ticket investments (in \$8-10m range minimum), making it difficult for smaller firms to receive the funding they need.

Beyond investments in urban tech startups, there has been a recent increase in creative financing mechanisms associated that have the potential to make cities more liveable. Blockchain-backed land registries, for example, increase urban dwellers' confidence in the ownership system. **Vietnam** has been experimenting with tokenization of land rights to track both assets and payments in order to bring accountability into land investments.

Data Breakdown

Smart City Funders in Select Asian Countries

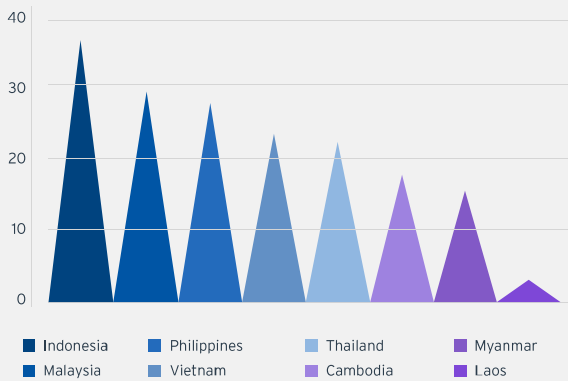


Chart 1: Number of smart city funders per country.

Total Number of Funders vs. Smart City Funders

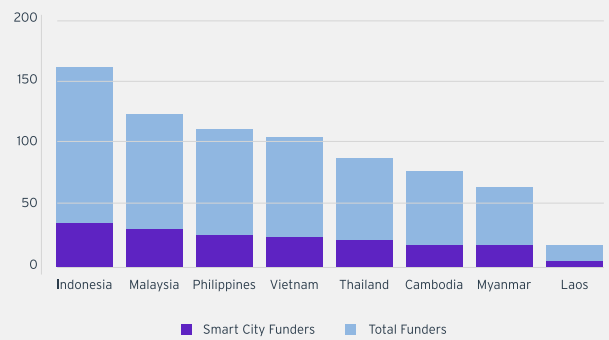


Chart 2: Share of smart city funders as a percentage of total funders.

Funding Types per Country

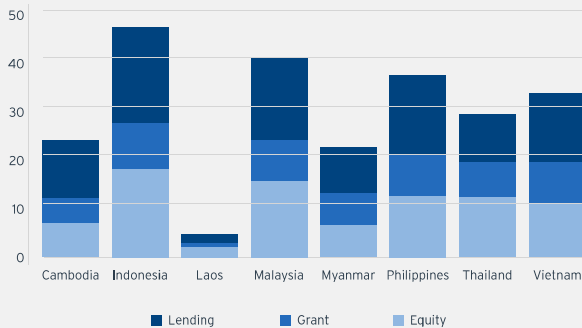


Chart 3: Breakdown of smart city funders by capital type (some funders have more than one funding type).

Smart City Funders by Investor Type

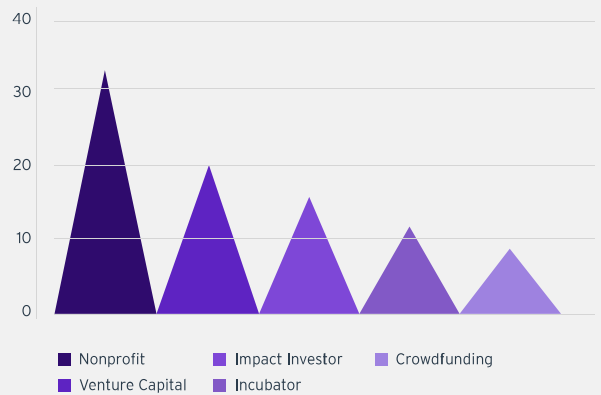


Chart 4: Top five investor types among smart city funders.

Trends in Urban Tech

In recent years, **Southeast Asia** has emerged as one of the world's leading regions for startups.

With its digital economy predicted to reach **\$240 billion by 2025** and continuous improvements in Internet of Things (IoT) systems, businesses have to face increasing expectations of smart and connected experiences.

Transportation and food delivery services, two core components of the urban tech sector, account for a significant share of the region's internet economy. **96.4%** of urban Indonesian millennials use transportation apps, while food delivery apps are the second most frequently used mobile app at 87.8%. Here we look at some of the trends driving the growth of the urban tech sector in Southeast Asia:

Co-living and co-working

Facilities are changing the way people live and work in cities. Indonesian market leader **CoHive** has raised a total of \$37 million since starting up as a co-working space in 2015, and recently opened its first co-living property to respond to the housing shortage in Jakarta -- where heavy traffic and congestion have impelled younger workers to value convenience. An increasing number of co-working space operators in the region are adding the **option of co-living to their services**; Livit Spaces (Bali, Indonesia), KoHub (Koh Lanta, Thailand), and 47 East (Manila, Philippines) are among some of these facilities leveraging their scenic locations to attract entrepreneurs, small businesses, and digital nomads alike. In terms of broader real-estate service innovations, **Vietnam-based Ohana** helps young college students and professionals locate affordable accommodation by matching their requirements with potential landlords.

Mobility tech

Globally, venture capital funding for **mobility tech** has increased from **\$5.9 billion in 2014 to more than \$50 billion in 2018**. The **market for electric passenger vehicles** is expected to reach \$356.5 billion by 2023, with \$205.9 billion in sales coming from the APAC region alone. Starting as a call centre for booking motorcycle drivers, the eclectic ride-hailing, mobile payments, food delivery, and logistics startup GoJek is Indonesia's first and highest-valued unicorn at **\$9.5 billion**. It is second in the region only to Grab -- also a ride-hailing, food delivery, and e-payment app.

Logistics

With **logistics** costs eating up **27%** of manufacturing firms' sales in the Philippines, and representing between **25-30%** of Indonesian GDP, there is much potential for innovation in robotic systems, autonomous vehicles, and drone delivery to disrupt warehouse design and end-user requirements. Indonesian startup Kargo, the 'Uber for trucks', has raised **\$7.6 million** in seed funding and applies sharing economy principles to disrupt the urban logistics sector.

Smart city

As one of ASEAN's key focuses in the region, **smart city** developments have the potential to create more liveable cities, and to accommodate the **90 million people** in the region expected to urbanise by 2030. **UBS estimates** that the wider APAC region will account for 40% of the global addressable market growth for smart city projects, or \$800 billion by 2025. Smart city technologies have been gaining traction, as an increasing number of startups in the region are leveraging urban analytics to make cities more inclusive. In Jakarta, **Qlue** works with the provincial government to allow citizens to identify and report issues in their neighborhoods through the mobile app (see more on Qlue below). Meanwhile, **UN Habitat is collaborating with Microsoft and Mojang** in several Asian cities to encourage communities to participate in upgrading public spaces (more on this in the box above). In Hanoi, Vietnam, **Minecraft** is being used to identify safety issues to make streets and public transport safer for women. Below is an overview of three smart-city initiatives in Southeast Asia, with a focus on startups.

Smart City Spotlight

Jakarta Indonesia

Bumi Serpong Damai, an Indonesian property developer, is building a **smart-city innovation hub** 35km from Jakarta city center, and will provide all smart-saving public utilities and energy-efficient infrastructure, household broadband internet, as well as an e-payment app encompassing ride-hailing, facility hire, healthcare, and entertainment services. The new digital city is meant to attract and accommodate tech startups.

Jakarta's local government has also **partnered with several tech startups** to accelerate the development of smart-city projects through SME training and digital collaborations for smart mobility, tax-collection monitoring, and improved garbage collection. Botika, a startup taking part in this collaboration, has developed a virtual chatbot that will enable citizens to convey suggestions and complaints about daily problems in the city. In terms of funding, Indonesia has the largest number of investors willing to finance smart city and urban tech initiatives, and has one of the most mature ecosystems in the region. While the number of venture capitalists and impact investors **has increased** over the last few years, our data indicates that nonprofit organisations and public/semi-public investors still dominate the urban tech funding landscape in terms of number of investors available.

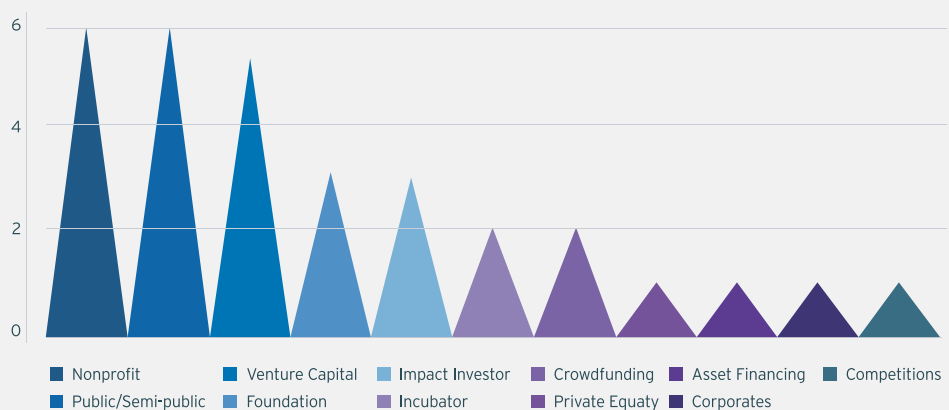
Phuket Thailand

Phuket has been designated by the Thai government as one of six smart-city pilot projects. As one of the country's largest tourism hubs attracting more than **8 million international visitors** each year, the project is largely focused on using data analytics and IoT technology to improve safety and boost confidence among tourists. The city's Digital Economy Promotion Agency has attracted proposals from 55 startups through a startup challenge with a focus on smart tourism, safety, healthcare, education, and governance. **Five companies** have been shortlisted to date; all with creative solutions to improve the experience of both living in and visiting Phuket. The smart city plans include a Smart City Innovation Park to promote investments and support SMEs, a 'Smart Surveillance' system to be designed and implemented by **Huawei**, including CCTV with facial recognition technology incorporated with thousands of feeds from private businesses to make the network more comprehensive. Some, however, have expressed concern that despite the increased security, such initiatives will allow the government vast powers to monitor their citizens.

Da Nang Vietnam

Vietnam has announced the plan to transform the central city of Da Nang into a smart city. Da Nang is already considered as the country's hub for technology services, with **93%** of over 3,800 businesses active in the IT and software sector. Indeed, while Da Nang is only the country's fifth largest city, it has led Vietnam's **Provincial Competitiveness Index for the last three years**. This is very attractive to potential investors as Da Nang emerges as a popular business destination; in the first half of 2019, the city pulled in more than **\$542 million** from foreign investors. Located in a low-lying coastline susceptible to flooding and typhoons, the city is devising data solutions to assess and predict climate risks. In 2016 the \$1.3 million business incubator **Danang Entrepreneurship Support Company was established**, supporting the growth of the city as one of Southeast Asia's next startup hubs. While there is still a long way to go, Vietnam comes in fourth in the region only behind Indonesia, Malaysia, and the Philippines when looking at the number of investors active in the smart city and urban tech sector.

Spotlight on Indonesia



Expert Perspective

Improving Government Intervention Through an App Interview with Rama Raditya, Founder & CEO Qlue

Qlue started out as a citizen reporting app in Jakarta, and has since grown to become a smart city platform that combines big data, AI, and workforce management to tackle problems across the country (and beyond). It is one of the leading smart city startups in the region. We got in touch with the CEO and founder of the company to ask a few questions about the company's journey and the fundraising scene in the region.

What problems did you set out to solve?

Established in 2016, Qlue was established to solve various social and environmental problems in Jakarta through citizen reporting app (QlueApp). QlueApp has acted as a platform that connects citizens with its government. Through the app, citizens can report problems on their surroundings which will be solved by government officials.

Currently, Qlue has transformed from a citizen reporting app to a comprehensive smart city provider company in Indonesia. We have built a platform that consists of cutting-edge technology products leveraging artificial intelligence (AI), internet of things (IoT), and workforce management.

Qlue has developed comprehensive solutions to bring impact and accelerate positive changes in realizing smart city technology implementations in both government and private sectors in Indonesia. By implementing smart city solutions, we aim to bring cost efficiency and effectiveness to their business operations.

What are common use cases for the app?

Through QlueApp, governments can get real-time insight into the problems in their cities. All the data is integrated and visualized through a single dashboard, which will help them in designing data-driven policy.

Since the establishment with Jakarta through Jakarta Smart City (JSC), Qlue has contributed significant improvement to the capital city such as reducing 8,000 flood-spots to 450, 72% extortion and increasing citizens' trust to the government by 49%.

Jakarta Smart City command center also utilizes the dashboard from Qlue (QlueDashboard) to monitor problems and job dispatching to increase efficiency and effectiveness in handling problems. Other than that, the field officers are also



equipped with mobile apps developed by Qlue (QlueWork) to respond to the citizens' reports.

As for the private sector, Qlue helps several largest property developers in Indonesia, in providing digital services to their residents through features such as billing payments, house repairing services, customer care services, and panic button for emergency issues.

“Through QlueApp, governments can get real-time insight into the problems in their cities.”

We also collaborate with Indonesia's National Disaster Agency (BNPB) to help them in disaster evacuation and recovery. Working with the volunteers, NGOs, and communities, we leverage public participation to report broken infrastructures, missing citizens, garbage piles, and other problems or damage. For example, during the Bima flood in 2017, our collaboration with BNPB has helped the disaster recovery faster, from 2 months into only 3 weeks.

Our technologies also help the private

companies to reduce operational costs up to 30% by providing Qlue AI-based analytics, QlueVision. Qlue helps private companies reduce the potential threat of unauthorized personnel in entering their premise. Our Facial Recognition and License Plate Recognition technology allows company with high-security level to:

- Receive early alert if such unidentified personnel and vehicles entering a restricted zone, by comparing the detected object's facials with the enrolled faces database or with the registered personnel database

- Receive early alert if such vehicles entering the premises

- Identify the numbers of trucks entering and exiting the estate area

- Alert the traffic control team of any vehicles which might park illegally in the designated area

Qlue also working together with several shopping malls in Jakarta to grow them as the AI-based shopping mall in Jakarta by:

- Identifying numbers of people entering and exiting the mall area
- Gaining insight on consumer behavior to improve the customer experience

- Analyzing the heat map of the floor to help them define the tenant rental fee for



“Our collaboration with the governments has brought many positive impacts to the community and city on a larger scale.”

have also made us easier in raising money from investors or other sources like a grant. For example last year, we successfully secured funding from the GSM Association. For accelerators or impact investors, social impact is considered to be an added value.

Social impact and media publication made from the B2G sector attracted new clients from B2B. They contact us and ask if the smart city solutions are able to be implemented in the private sector. Currently, our client 55% are government institutions and 45% are private institutions. In 2020, Qlue will focus on expanding to the private sector, targeting 60% of its client base from the private sector and 40% from government institutions.

- Gaining insight on consumer behavior to improve the customer experience

- Analyzing the heat map of the floor to help them define the tenant rental fee for specific areas

On the IoT side, we develop IoT technology that empowers traffic light controllers with sensors to automate traffic signals by making it dynamic based on vehicle density on the intersection. This can also help to decrease traffic congestion rate and illegal parking, while also creating a safer neighborhood for the residents.

What’s the role of alt finance (VCs, impact investors, angel networks, etc.) in funding smart city firms in Indonesia?

We are looking for VCs that have the same vision as us, a strategic partner that does not only invest in us, but also to grow our business as we want to accelerate positive changes. We are looking for VCs that offer to expand and strengthen strategic synergies with strategic enterprise clients across industry. The fund from the alternative sources will be used to expand business in Indonesia and internationally.

What was your experience like raising money from Prasetia?

Prasetia is a Qlue angel investor, and they are very supportive in growing and expanding our business. The fund and network from the VCs help us to hire professional employees and expand to new cities and countries. They also support Qlue in giving professional advice on how to grow the company.

They also support us to initiate product

development in the early stage. Early stage is very critical for us because we need their experience and expertise to develop a product-market fit.

Did the relationship with gov’t make it easier to raise money (for example, was it perceived to be a stable source of income)?

When we started in the business to government (B2G) sector, there is a perception that the B2G sector is not scalable, not sustainable, and unpredictable. There is also a perception that B2G startup is not interesting for venture capital in Indonesia.

“We are looking for VCs that have the same vision as us, a strategic partner that does not only invest in us, but also to grow our business as we want to accelerate positive changes.”

But our collaboration with the governments has brought many positive impacts to the community and city on a larger scale. These positive impacts have led us to several recognitions, like accelerator programs and awards.

On the business side, our positive impacts

Do you have expansion plans for abroad? If so, what factors do you look for when considering new countries or cities (e.g., gov’t support, internet penetration, social media usage, something else?)

Since last year, we’ve decided to enter the Asian market due to its huge potential in the smart city market. In addition, we already have a local partner in Kuala Lumpur, Malaysia, Dubai, United Arab Emirates, and Tokyo, Japan, as we aim to expand our business further to Asian and European markets this year.

When penetrating a new country, the treatment is similar in Indonesia, where we consider internet infrastructure and technology adoption in the area/regions.

Conclusion

As governments and citizens across **Southeast Asia** grapple with **urbanisation**, startups are **increasingly coming up** with solutions to face its accompanying challenges - population density, resource efficiency, provision of social services, evolving living and working habits, and logistical pressures.

Looking forward

As this report has demonstrated, the momentum for urban tech innovations in the region has been growing, and alternative finance providers are having to fill the gap created by institutional investors, who have traditionally focused on infrastructure investment and development.

Indeed, the realisation that the process of turning cities 'smart' inevitably involves cooperation with the private sector has meant that municipal governments are increasing their calls for public-private partnerships through startup competitions, improved regulatory frameworks, and business-oriented infrastructure projects. A key factor in improving urban citizens' quality of life is the concept of open-source data, enabling both businesses and government to leverage publicly available data to better analyse trends, plan, and distribute their goods and services. As Southeast Asian authorities and businesses ramp up their readiness to the future of urban living, it is increasingly apparent that the scale and scope of investors in this sector needs to be streamlined as well.



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