

KEY POINTS

- City-level ecosystems are best positioned to foster tech startups, especially early-stage ventures. Ecosystems should play an active role in startup enablement, talent development, and urban place-making.
- Tech startups benefit from local support provided by startup incubators and accelerators, funding from personal and professional networks, research insights produced by universities, incentives from local government agencies, and business relationships with clients.
- Recruiting and retaining quality talent is key for startups because of the “money-follows-talent” principle. Tech startups require a diverse set of talent.
- While remote work has become mainstream, startups often recruit from within their personal networks and rely on face-to-face interaction to build trust and commitment.
- Startup talent is nurtured through a variety of channels: (i) the education system, notably universities; (ii) incubators and accelerators; (iii) within the startups themselves; and (iv) experience gained from working in other firms.

City-Level Tech Startup Ecosystems and Talent Development in Indonesia

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INTRODUCTION: EMBRACING TECHNOLOGY FOR FUTURE DEVELOPMENT

In early 2016, President Joko Widodo visited Silicon Valley where he expressed his goal of shifting Indonesia away from commodity dependence and creating a more technologically advanced and digitalized economy (Sipahutar 2016). This shift requires modernization of digital infrastructure, improved scientific research, and greater innovation among large companies, but also support for startup innovation and creativity. The government has implemented a range of policies and programs in line with the transformation agenda.

For technology-based startup enterprises—tech startups—to establish themselves and scale, they require an enabling environment that includes a broad set of actors.² This is the startup ecosystem, and, as this brief suggests, the best way to develop startups is through ecosystems at the city or subnational level that can support local expertise and competitive advantage. City governments and other local players can also leverage and tailor national-level action that creates a conducive regulatory environment, provides business incentives, and fosters global connectedness.

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In this publication, “\$” refers to United States dollars, “China” to People’s Republic of China, and “Rp” to Indonesian rupiah.

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² According to Startup Commons (n.d.), “A startup ecosystem is formed by people, startups in their various stages, and various types of organizations in a location (physical and/or virtual), interacting as a system to create new startup companies.”

At the local level, startups gain access to incubators and accelerators, seek funding from financial institutions, engage with universities and research institutions, are regulated, and gain access to government support programs. The world’s most vibrant ecosystems are not national or provincial. They are localities with a deep and dense mix of suppliers, financiers, and other players, underpinned by a network of supportive policies and programs. This focus on the local may seem odd given the expanded use of digital technologies that allow people and businesses to connect easily across geographic space, but local interaction is still important, especially for early-stage startups. This is particularly true in Indonesia, where physical (in-person) interaction is culturally valuable and cannot be fully replaced by videoconferencing and other forms of digital communications.

Early-stage tech startups stand or fall on their ability to develop ideas and solutions that provide customers with what they need or want, or address their pain points. They start with the idea of a new technology or the idea of modifying an existing technology and using it in a novel way or customizing it for a specific group of customers. Selling books online, for example, was a new model pioneered by Amazon which the company later iterated into a multinational online retailer. Typically, the creation of a commercially viable business model and a product–market fit is needed before the business can attract additional investment and scale its operations.

Ideas come not only from visionaries, but also entrepreneurial types, technology specialists (i.e., the geeks), designers, systems integrators, and those who understand customers, markets, and marketing. The leadership of tech startup teams typically requires a hipster (creative, design), a hacker (technology builder), and a hustler (marketing, networking) (Ellwood 2012). Collectively, they and other employees are called the “talent.” Attracting, nurturing, and retaining talent is critical for growing startups and the ecosystem.

A study by the SMERU Research Institute and the Asian Development Bank (ADB) suggests that building ecosystems at the city (or local) level and developing talent for startups are two critical areas to increase the number of successful startups in Indonesia.³ This brief, which draws on that study, highlights concern about the unequal geographic distribution of incubator and accelerator programs, financing institutions, and other components of the ecosystem. Startups outside of Java and Bali have reported difficulties accessing support programs organized by the central government and other ecosystem players. Startups would be better served by city and other local-based support mechanisms. In addition, the scarcity of talent is cited by startup owners, financiers, and others as a major constraint facing startups. Foreign investors, notably venture capitalists, are eager to enter the Indonesian market because of its large size and rapid growth, but they hesitate because of the limited availability of talent to execute startups’ ideas. What is said about how “money follows talent” holds true for startup funding.

“Good quality and professional incubators are located in Java. But there are distance and communication obstacles for us to reach them. We, in the east, sometimes find a lack of attention [to our region].”

Interview, agritech startup owner,
March 2021

PLAN, TARGETS, AND PROGRAM: GEARING UP FOR INNOVATION

Startups are seen as important players in Indonesia’s digital transformation. This is evident in the government’s target of encouraging the emergence of three new unicorns—startups with a valuation of more than \$1 billion each—as outlined in the Medium-Term National Development Plan (MTNDP) for 2020–2024. This goal has been surpassed. By 2022, nine new unicorns have emerged, in addition to the five that existed in 2019 (Rayda 2022). These unicorns belong to popular sectors, such as e-commerce, marketplaces, ride-hailing, logistics, and fintech. In general, the pandemic has stimulated the acceleration of mobile phone and internet use and therefore the growth of unicorns and other startups in these sectors in a country with a large market. The case is different for startups with a direct impact on human and sustainable development—e.g., agritech (agriculture), edtech (education), cleantech (environment), and healthtech. Only a very limited number of tech startups in these segments have been able to scale up and none have reached unicorn status.⁴ This is because product development in these market segments can take longer and require deeptech innovations, investors are less familiar with these segments and see them as risky, and customer demand is less developed. Nonetheless, these four market segments improve human life (education and health), assist the rural poor (agriculture), and aid climate change mitigation and adaptation.

Generally, government support for the development of the startup ecosystem is in line with the MTNDP. Table 1 provides selected targets from the plan to be achieved by 2024, along with recommendations from the authors of this brief on how best to achieve them through tech startup ecosystem and talent development at the city level.

³ ADB country studies on startup ecosystems can be found [here](#). The Indonesia report (forthcoming) discusses a range of startup issues, including but not limited to city-focused support and talent.

⁴ Several agritech firms have been able to scale although not yet to unicorn level.

Table 1: Achieving Selected Targets of Medium-Term National Development Plan, 2020–2024

Priority Program in MTNDP	Targets to Be Achieved by 2024 in the MTNDP	Recommendations to Achieve Targets ^a
Digital Transformation	Three new unicorns emerge and are facilitated	<ul style="list-style-type: none"> • Channel national support for startups through city governments and other local ecosystem players • Encourage city governments to take seriously their responsibility to develop the local startups ecosystem • Incentivize local governments to buy from startups—for pandemic recovery and beyond • Improve access to finance to support talent development
Increased Productivity and Competitiveness	80% of university graduates immediately find work 40% of innovation comes from national research priority 50% of the labor force has intermediate or advanced skills competency	<ul style="list-style-type: none"> • Develop talent through the education system • Apply a triple-helix approach (i.e., local government, universities, business) • Improve quality incubator and accelerator programs to develop talent • Deploy mentors with business experience
Improve digital Infrastructure	82% of the population uses the internet 95% of villages are covered by broadband internet	<ul style="list-style-type: none"> • Tackle local constraints to digital infrastructure access, affordability of data and devices, and improved power supply

MTNDP = Medium-Term National Development Plan 2020–2024.

^a Recommendations are provided by the authors.

Sources: Authors; Government of Indonesia (2020).

Meanwhile, a variety of programs have been rolled out to support startups (Appendix: Government Startup Support Programs). Although these programs are implemented nationwide, they provide support at the central rather than local level. Consequently, they tend to be modeled after the needs of the Jakarta region as the epicenter for startup development, and find the biggest uptake there. Concern about this unequal distribution of support was raised by startup founders and others interviewed for our study. Shenoy (2021) echoes the concern that there is disproportionate support provided to startups in Jakarta and a few large cities, whereas many other locations have weaker ecosystems offering less support, particularly for early-stage startups. This is one reason why Jakarta is the only city in the country that has gained global recognition in startup ecosystem rankings.

CITY-LEVEL APPROACH TO TECH STARTUP ECOSYSTEMS: IT TAKES A CITY TO RAISE A STARTUP

There are several reasons why ecosystems should be developed at the city or local level. These include (i) the ability of local authorities to provide targeted support to meet the specific needs of startups; (ii) the role of universities as nodes of research, ideas, and knowledge transfer; and (iii) the need for face-to-face

interaction that is not satisfied by digital communication. The disproportionate allocation of national program resources to one (or a few) cities leads to considerable disparity in the quality of ecosystems between cities in the same country.

The importance of the local level is reflected in the global ecosystem reports, which rank systems by city rather than country. The rankings reflect the idea that ecosystems are local environments and indeed show significant disparity in ecosystem quality, even among cities in the same country. For example, Startup Genome ranks the top 140 startup ecosystems globally and includes 49 cities or areas in the United States (US). There is considerable disparity between Silicon Valley, which tops the list, and San Antonio, Texas, which is among the bottom 10 cities globally. These disparities are evident in other countries as well and suggest that country-level rankings would mask the great variety in ecosystems at the city level.

Startup Genome’s list includes only one Indonesian city, Jakarta, which is ranked 52nd (or 12th in the list of emerging systems) in 2022. Startup Blink ranks the top 1,000 cities globally and includes five in Indonesia. Jakarta is a respectable 32nd, but the others rank much lower.⁵ Indonesia shows considerable disparity in its five main ecosystems, and even more relative to smaller cities. Bandung and Yogyakarta, which are among the five cities, have emerged recently as key startup centers as outlined in Box 1.

⁵ Startup Blink. Indonesia Startup Ecosystem Overview. <https://www.startupblink.com/accelerators/indonesia>.

Box 1: Bandung and Yogyakarta: The Rising City-Level Ecosystems Outside Jakarta

Jakarta is globally recognized as a major startup ecosystem in Southeast Asia. It is attractive due to its high internet penetration and strong market for startup products and services. It is also home to the largest number of investors in the country.

Bandung and Yogyakarta are becoming popular cities for startups. They have emerged near universities, where the ambience is one of collaboration rather than competition. Our study shows that some startup founders are often campus friends. These cities combine universities, a high-tech talent pool, and a pleasant lifestyle. The cities are ideal for hatching tech startups and have attracted well-known accelerators.

Bandung is a 2-hour drive away and is surrounded by a variety of industries that provide a market for startups' products. Meanwhile, Yogyakarta offers a low-cost living environment that is beneficial for early-stage startups with limited initial funding, as they can pay relatively low wages for their talent. Both cities also have or are close to many higher education institutions: around 164 institutions in Bandung and 136 in Yogyakarta.^a These higher education institutions supply abundant talent for startups.

^a The figures include polytechnics, universities, and others.

Source: Authors and sources cited.

This abundance of talent attracted the National University of Singapore (NUS) Enterprise and Salim Group to bring BLOCK71, a Singaporean startup ecosystem builder, to Bandung and Yogyakarta in 2018 (Kedaulatan Rakyat 2018). BLOCK71 has helped connect local ecosystem players—incubators, shared office space providers, talented individuals, and startups—with potential clients and investors through its community membership. Member startups are also helped to connect with the NUS international network, which includes universities and business partners domestically and in other countries, as BLOCK71 has offices in the People's Republic of China, Japan, the United States, and Viet Nam, as well as Singapore. However, BLOCK71 has not really been involved in longer-term collaborations with local governments.

The proximity between players in Bandung and Yogyakarta enables a penta-helix (i.e., five actors) collaboration between university, business, government, media, and the community. Ultimately, a startup can choose to be a big fish in a small pond (Bandung and Yogyakarta) or a small fish in a big pond (Jakarta) (Miller 2010).

Some startups are spin-offs from university research departments, while others rely on university researchers to develop, test, and prototype new technologies. Thus, one or two nearby universities often serve as the embryo of the local startup ecosystem.⁶ In the 1970s, many startups in the San Francisco Bay Area were set up near and had interactions with Stanford University. With the internet boom in the late 1990s, the Bay Area's Silicon Valley became a hub for startups and eventual corporate giants such as Google, Facebook, and Apple. In Boulder, Colorado, the university is a major player in fostering startups and supplying the talent sought by new enterprises (Miller 2010).

Startups engage in a range of interactions with other startups, other businesses, customers, and other players. Much of this activity often takes place locally, especially in the early stages of a startup's development. The benefits of local interaction have a long history in modern economics, starting with Marshall's (1890) notion of industrial districts and evolving in the postwar era to urban agglomeration effects, industrial clusters, and the new economic geography. Empirical work was conducted on successful small enterprise areas in northern Italy and branched into the analysis of clusters in developing countries (Humphrey and Schmidt 2002).

The insights from this work have been carried forward in the analysis of entrepreneurial ecosystems, which by definition are

“geographically bounded,” whether a “campus, city or region” (Mason and Brown 2014). Feld (2012) has proposed the “Boulder thesis” as a recipe for developing an effective ecosystem. The thesis incorporates the importance of collective engagement in regular events. Frequent and inclusive gatherings are more feasible at the city level than at the national level and are part of Boulder, Colorado's success as a startup hub.⁷

Furthermore, many policies and programs that are important to the business community are introduced at the city or otherwise subnational level. Mason and Brown (2014) argue that policy has evolved from a top-down or framework approach to one that combines top-down and bottom-up support. Top-level policies may include property rights protection, visas for foreign talent, and personal and corporate tax rates. Local-level support is provided by local government and local nongovernment associations as well as by businesses.

Finally, startups can benefit from the local presence of a variety of players that provide diverse types of support over time and depending on the development path of the individual startup. Our study found that startups need support in product development, finance, human resources, marketing, and other aspects. In addition, their needs differ at each stage of development, whether it is at startup formation, stability, or scaling. In addition,

⁶ A quality university is not necessarily a prerequisite for the emergence of a good ecosystem.

⁷ Boulder is considered a successful startup ecosystem because it has one of the highest densities of startups in the US. The combined ecosystem of Boulder and the adjacent city of Denver is ranked 24th in Startup Genome's global ranking.

Box 2: What Type of Support Do Startups Want from Local Governments?

Our interviews with Indonesian startups revealed that they need some unconventional types of support from city and local governments. Early-stage agritech startups for example wanted access to small plots of land to test the impact of their products and demonstrate them to farmers. These startups also wanted to collaborate with agricultural extension workers as key agents to promote their solutions to farmers. For cleantech, decentralized regulation presents a challenge. Cleantech companies looking to scale up into other regions must deal with different permits and requirements, as technical arrangement of waste management is the responsibility of local authorities. Cleantech startups wanted help understanding and navigating the different regulations. Edtech startups wanted local governments to introduce new educational technologies and train teachers to use them. Healthtech startups wanted city governments to promote greater openness to the use of new digital technologies in the sector. They would also like to see a more preventive approach to health care using healthtech solutions among health-care providers (e.g., doctors, hospitals, and clinics).

Source: Authors, based on interviews.

we found that despite some similarities, the needs of startups are also different for each sector, with specialized needs, for example, for segments promoting human and sustainable development, such as agritech, edtech, cleantech, and healthtech (Box 2). These needs can be better understood if ecosystem players, including incubators and accelerators, funding institutions, and policy makers, are in close proximity and can interact frequently with startups.

TALENT IS CRITICAL FOR STARTUP SUCCESS: THE WAR FOR TALENT

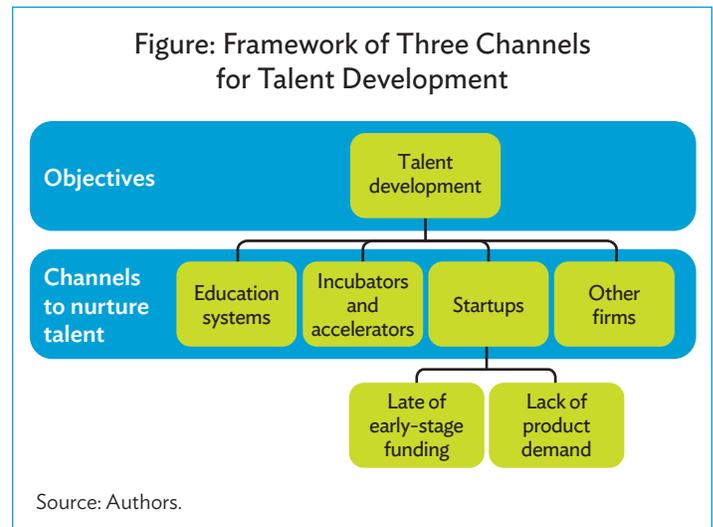
Anyone can steal your idea, but no one can steal your execution.

This line from Nadiem Makarim, Gojek’s former chief executive, has been quoted many times since CB Insights, a major source of market intelligence, cited Gojek as Indonesia’s first decacorn in 2019.⁸ The message resonates well with a common mantra in the startup sector, “A talented team makes all the difference.” A founder’s vision is important to a startup’s success, but it takes the right team to execute it. Startups are part of the knowledge economy and are powered by highly skilled talent. Team leadership requires quality individuals to fill the roles of hipster, hacker, and hustler. However, these needs of startups are often challenged in two ways in Indonesia: (i) the tendency to rely on traditional recruitment methods, and (ii) high staff turnover.

Indonesia ranks second in Asia in terms of the number of startups (2,390 in 2022), according to Startup Ranking (2022). However, as in other countries, most startups struggle to grow and scale up. Therefore, identifying challenges and providing targeted assistance will help them survive the “valley of death” and lead to more startups achieving scale. Our study found that one of the key factors in the development of a startup is talent—both with regard to the founder(s) and the wider team.

Talent scarcity was highlighted a few years ago by Tan and Tang (2016), who estimated that the Indonesian economy will face a deficit of 9 million digitally talented workers in 2015–2030. If the talent pool is not expanded, this will hinder the development of startups and the deepening of the digital economy. There are four channels for developing talent: through the education system, through incubators and accelerators, through the development of startups themselves, and through experience gained in other firms (see figure and the sections on channels below).

Most tech startup founders in Indonesia are highly educated, in part because the two main government startup programs (Calon Perusahaan Pemula Berbasis Teknologi [CPPBT] and Perusahaan Pemula Berbasis Teknologi [PPBT]) have a strong coverage at universities.⁹ Some founders already have work experience before launching their startups. However, this is sometimes entry-level experience or experience unrelated to work in other sectors. Running a startup while being unfamiliar with the sector or ecosystem can be problematic. The challenge also comes from the supply side: less than 1% of the workforce has advanced digital skills, such as artificial intelligence (SMERU, Oxford, and UNESCAP 2022).



⁸ A decacorn is a startup with a valuation of \$10 billion or more. “Deca” is 10 and “corn” is from “unicorn,” which is a startup with a valuation of \$1 billion.
⁹ After 4 years of program funding, it was found that the graduation rate from the pre-startup program (CPPBT) to the main startup program (PPBT) was only 11% (Kompas.com 2019). For this reason, the government changed the approach by introducing the CPPBT bootcamp to improve the graduation rate. CPPBT and PPBT were subsumed under Startup Inovasi Indonesia, which was later replaced by Program Pendanaan Perusahaan Pemula Berbasis Riset (PPBR) in 2021.

First Channel: Innovative Talent Cultivation through the Education System

The education system is an important source of talent. A good system can—and should—not only equip young people not only with knowledge and skills, but also cultivate the ability to think and act innovatively. The ability to innovate is necessary both for developing technologies for new products (tech talent) and for designing and implementing new business models (entrepreneurial talent). Furthermore, innovation is required both to address domestic challenges for the startup and to adapt to global market opportunities (Zhang 2015).

Innovative talent, both technical knowledge and entrepreneurial skills, can be developed through carefully designed learning activities and pedagogy at university. However, interviews conducted for our study found that higher education in Indonesia does not yet provide the required entrepreneurial aspect for talent cultivation. In Indonesia, undergraduate degree education can be theoretical and “academic” and is not infused with entrepreneurial thinking, while technical (non-degree) education is focused on producing technically skilled graduates.¹⁰ There is then a skills mismatch when tech startups hire undergraduate degree holders.

Many universities have created incubator programs and provided considerable support for them. However, a strong entrepreneurial perspective is often lacking in university-run incubators, according to our interviews with ecosystem stakeholders.¹¹

In general, universities’ research incubators (and by extension, their spin-offs) tend to focus on the research and technology aspect, without paying sufficient attention to the commercialization of the innovation and research discovery.¹²

However, the coronavirus disease (COVID-19) pandemic has shown how dynamic the skills and training landscape is, and has, for example, accelerated initiatives to cultivate innovative talent through curriculum reform. In 2020, the Kampus Merdeka program was created to give students access to nontraditional learning programs, such as certified internships at tech startups or participation in business incubation programs for one or two semesters. The program is designed to promote experiential learning to develop students’ ability to understand and gain experience in technology, business, and entrepreneurial activities.

Second Channel: Quality Incubators and Accelerators Can Cultivate Talent

Incubators and accelerators can provide significant support in developing the talent of founders and key principals in startups. Such programs offer various types of support, especially mentoring, which provides critical know-how for developing the necessary skills. Our study has shown that incubators and accelerators

“Incubators usually deploy their own university lecturers to coach the startups. Our ministry has given them guidance to include mentors from industry, so that startups know what the real needs facing the industry are. Collaborating with industry allows them to employ a triple-helix approach.”

Interview, government official,
January 2021

can cultivate talent both before a startup is formed (pre-startup creative programs) and during and after the startup’s formation.

In other countries, local governments have been known to provide or support startup incubators at the city level. For example, in Brazil, the People’s Republic of China, and the US, most local governments are involved in (i) channeling federal grants to local incubators, and (ii) providing incentives such as low-interest loans and tax credits to businesses that invest in incubators (Chandra and Fealey 2013). Some local governments in these three countries also facilitate the entry of nongovernment incubators into the local enterprise ecosystem. In good ecosystems, incubators provide startups with access to mentors with industry experience as part of a “demand-oriented incubation” strategy.

Compared with other countries, talent development and networking through incubators and accelerators in Indonesia are weaker and in need of reform. There are two specific weaknesses.

The first weakness is the lack of adequate staffing and use of mentors by incubators and accelerators. In 2020, there were about 120 programs in operation, most of which were managed by universities and local government in Indonesia’s big cities. However, the role of mentor is mostly performed by employees of the supporting institutions (universities or local governments). These staff members have other responsibilities in addition to being a mentor, and thus often cannot devote sufficient time to their mentoring role. They are also academics or civil servants who lack experience in managing or working in a startup (or indeed, in any type of business). The lack of business and tech professionals in these programs undermines the intent of mentoring startup talent based on prior experience.

¹⁰ The expected student learning outcome based on education level is regulated under Law No. 12/2012 on Higher Education.

¹¹ There is likely to be great variance in the entrepreneurial nature of university-based incubators, with some taking a stronger business approach. Indonesia has a large number and variety of higher education institutions (about 2,200), including about 390 universities.

¹² However, there are efforts to improve the business aspects of university incubators. For example, ADB’s PRIMESTEP project will support the commercialization of research and development and improve startup incubation in science and technology parks at Bandung Institute of Technology, Gadjah Mada University, IPB University, and the University of Indonesia.

Another weakness is the inadequate incubator support in developing talent through networking. Most Indonesian incubators or accelerators only provide links to investors through business pitch activities. Initiatives that provide access to other ecosystem stakeholders—such as a potential manufacturing partner—are usually not part of the incubator’s support or exit strategy. A study in Brazil shows a similar situation in which incubators and accelerators typically have limited interactions with non-funding players (Ponomariov and Toivanen 2014). Moreover, instead of networking, partnership, and linkage programs, most incubation programs offered by the Indonesian government focus on promotional events, which are necessary but not sufficient.

Third Channel: Startups Nurture Talent

Startups can employ the talent developed through the first two channels. However, startups themselves also develop talent. This happens through learning-by-doing when employees are working for the enterprise. In addition, startups provide (or can provide) reskilling and upskilling training to their workers.

Fourth Channel: Experience in Other Firms

Talent can also emerge from other businesses, be they small and medium-sized enterprises, large corporations, or in some cases, nongovernment organizations. Staff and managers may initially develop their innovations as intrapreneurs, providing solutions to improve business practices or address internal pain points. They may also be product designers, engineers, or marketing personnel. Such talent occasionally takes the plunge and leaves their organization to become a founder or join an existing startup. They bring with them their business experience, market insights, technical expertise, and professional network which can be great assets to their business venture. The benefits of first working in an established business were recognized in interviews with startups.

FUNDING NEEDED FOR TALENT RECRUITMENT AND DEVELOPMENT WITHIN STARTUPS

Early-stage tech startups often struggle to retain talent because of cash flow and funding constraints. Our study found that a talented employee’s decision to leave a startup is partly due to a lack of satisfaction with the salary and other aspects of the reward package. Large established companies in Indonesia pay much higher salaries than startups, as Table 2 suggests. In addition, startups compete for talent from other ecosystems. The average salary in Singapore can be four times the salary offered for the same position in Indonesia (Table 3).¹³

In addition, talent development in startups is necessary but costly. There is a cost to train new employees through internal learning, training, and career planning programs; a cost (including time) to build relationships between new employees and clients; and an initial loss of productivity as new employees need time to

“The most accessible mentorship in Indonesia is to work in a corporation, unicorn, or enterprise. We can see founders of many successful startups who are those with experience working for these entities, rather than fresh graduates from the university.”

Interview, edtech startup, February 2021

understand the business. Furthermore, talent development is not a one-time effort but a continuous process, as different skills are needed at each stage of the startup’s development to meet more complex and changing market demands (Erickson, Moulton, and Cleary 2018).

Given the cost of building and retaining good talent, it is necessary for startups to have adequate funding. At the same time, access to funding requires the startup to already demonstrate good talent—particularly the founders and key team members. Our study found that the investors’ decision to provide funding to early-stage startups is based mainly on the quality of

Table 2: Tech Talent, Average Month Salary

	Startup ^a (\$)	Consumer and Retail Corporate ^b (\$)
Hipster (Digital designers)	Senior UI/UX Designer 1,300	Head of Digital Marketing 5,800
	Junior UI/UX Designer 600	Junior Designer 1,600
Hacker (Engineers)	Senior Software Engineer 2,100	Engineering Manager 2,600
	Junior Software Engineer 650	Engineer 1,100
Hustler (Product and marketing)	Senior Product Manager 2,300	Head of Marketing 7,200
	Junior Product Manager 850	Marketing Manager 4,200

UI = user interface, UX = user experience.

^a Source: Glints and Monk’s Hill Ventures (2021).

^b Source: Michael Page (2022).

¹³ Living costs are, however, higher in Singapore.

Table 3: Tech Talent in Indonesia and Singapore, Average Monthly Salary, 2020

		Indonesia (\$)	Singapore (\$)
Hipster	Senior UI/UX Designer	1,000–1,700	3,000–7,000
	Junior UI/UX Designer	300–900	2,200–5,900
Hacker	Senior Software Engineer	1,400–2,800	4,000–11,000
	Junior Software Engineer	300–1,000	2,200–6,800
Hustler	Senior Product Manager	1,700–3,000	3,300–6,900
	Junior Product Manager	500–1,200	1,500–3,500

UI = user interface, UX = user experience.

Source: Glints and Monk’s Hill Ventures (2021).

the founders and the execution team. Investors invest in people (“money follows talent”) as much as in the product or service they are developing. In a sense, the talent funding problem is a “chicken-and-egg” problem.

LACK OF DEMAND INHIBITS TALENT DEVELOPMENT WITHIN STARTUPS

Funds for recruiting and training good talent can also come from the startups’ sales revenue. Again, this is a circular relationship: high-quality talent helps the startup generate revenue, while positive revenue funds talent retention and training development. However, revenue is not only based on talent, but also on the overall success of having a superior product, marketing it well, and meeting a demand.

Our study shows that many early-stage startups do not understand or develop their markets adequately, be it other companies (B2B) or individual customers (B2C). Trust in new brands is generally low in Indonesia, so it can be difficult for new enterprises to break into new market (Greenhouse Team 2018). Demand is also affected by shocks: most startups were negatively affected by a drop in demand or disruption to their supply chains due to the COVID-19 pandemic. Some startups suspended operations or canceled expansion plans; others had to pivot their offering or change their business model.

In the longer term, government policies (or their lax enforcement) can inhibit demand in some sectors. Policies that set standards for sustainable agriculture, clean energy, and climate change create demand for agritech and cleantech

“Incubators outside Java are still limited. It is expected [hoped] that government programs also increase the number and quality of incubators outside Java as startups are a rising number there.”

Interview, agritech startup owner, February 2021

solutions. Currently, there are many regulations to protect the environment, but few are enforced or implemented due to a lack of implementation guidelines and enforcement mechanisms. In addition, local governments are buyers of products and services that can create demand for startups. For example, during the pandemic, governments worked with healthtech startups to rapidly develop and deploy solutions. Similarly, the Kartu Prakerja program funded online training programs for young and unemployed people during the pandemic, generating increased demand for edtech.

WEAK INTERNET CONNECTIVITY AND AFFORDABILITY INHIBITS ECOSYSTEM BUILDING

Indonesia’s territory is as large as Europe, and providing internet connectivity across the archipelago is a major challenge. In late 2019, the government launched the Palapa Ring as a backbone for high-speed internet connectivity. Nevertheless, a deep digital divide prevails. Only 36% of villages have access to a base transceiver station (BTS) and only 64% of villages have a strong 4G internet connection (SMERU, Oxford, and UNESCAP 2022). Disparity in infrastructure leads to disparity in local startup ecosystems in smaller cities and rural towns. In this context, agritech development suffers considerably from the lack of internet connectivity. Schools outside Java and Bali are also affected. Without internet connectivity, schools are unable to adopt innovative learning solutions offered by edtech.

The lack of internet connectivity hinders the development of the startup ecosystem and talent pool at the local level. On the one hand, the startup talents’ skills are difficult to develop without better internet connectivity. During the pandemic, for example, incubators and accelerators were forced to use online meetings to mentor and nurture their startup participants. Unfortunately, substituting online mentoring for in-person mentoring is only possible for startups with sufficient internet connectivity. On the other hand, startups from outside Java and Bali also mentioned that the internet plays a significant role in recruiting talent, both in their local area and from other cities and provinces.

POLICY RECOMMENDATIONS

To foster more high-growth tech startups—including unicorns—efforts can be made to develop ecosystems at the city level throughout Indonesia and expand the talent pool needed by startups. New tech startup hubs—with local interaction among ecosystem players, an ample supply of local talent, and high-quality local internet—could be adopted by other cities, following the examples of Bandung and Yogyakarta.

The following recommendations are proposed.

First, channel national support for startups through city governments and other local ecosystem players. The national government has fiscal resources and a self-defined mandate to support startups and create a knowledge-driven society. These resources can be channeled to competent local support institutions, including local government, to enable effective implementation and assistance to startups and robust development of local startup ecosystems.

Second, encourage city governments to take seriously their responsibility to develop the local startup ecosystem. Cities must take a leadership role and include startup development in the city's economic development strategy. They must be knowledgeable of the elements needed for a supportive ecosystem, understand the current state of the system, and be able to identify what needs to be improved. They can use their convening power to bring stakeholders together and foster collaboration. They can entice other players (incubators and accelerators, finance and investment institutions, and startup representative and networking bodies) to remain in their city, relocate, or provide their startup ecosystem support offerings in their city.

Third, incentivize local governments to buy from startups—for pandemic recovery and beyond. Government is a major buyer of goods and services from all businesses. In public-oriented sectors such as health (hospitals) and education (schools and colleges), it can be the single most important buyer. Startups should court government as a customer, but government should also be open to opting for tech solutions to improve the effectiveness and efficiency of public services. The pandemic has pushed governments to look for digital and tech solutions. Healthtech and edtech are good examples.

Fourth, improve access to finance to support talent development—and vice versa. Better access to finance provides startups with the funds to recruit, train, and retain quality human resources. In turn, better talent improves access to funds, because investors focus on the quality of the team when making funding decisions. Local pitching competitions, networking opportunities, and consultations between investors and startups can be facilitated—through local government, sector associations, incubators and accelerators, and others—to improve the flow of finance to startups.

Fifth, develop talent through the education system. A robust education system is needed to produce qualified graduates in science and technology, management and marketing, and entrepreneurship. Efforts should be made to foster innovative thinking in classrooms and laboratories, in extracurricular activities, and in university-based incubator and accelerator programs. Creativity developed in education can spill over to generate ideas for products, services, and business models.

Sixth, apply a triple-helix approach involving local government, higher education, and the private sector. The approach should ensure effective collaboration among these three players and ensure that they do not operate alone in silos. Each level needs to know what the others are doing and how their activities can be integrated to avoid both gaps and duplication.

Seventh, improve the quality of incubator and accelerator programs. Talent can be developed by program managers and contracted trainers. Program managers should be skilled and experienced in developing startup founders. Guidance should be tailored to the startup's specific sector, stage of development, and team composition. In areas where program managers lack expertise, the program can bring in outside business and tech experts to coach and develop the startup team's skills.

Eighth, deploy mentors with business experience. Mentors with business and technology experience can provide practical, real business advice on how startups can break into or even create new markets. Civil servants usually do not have the expertise and experience that would enable them to fill this role effectively.

Ninth, tackle local constraints to digital access. High-quality, low-cost digital infrastructure will improve local internet connectivity. Many startup innovations are internet-based or rely on digital platforms for marketing. Demand for startups' products and services can only increase if potential customers have fast and affordable access to the internet. Local governments can help by creating a clear legal status for land that can be used to build 4G base stations. The lack of such legal status has constrained the spread of mobile internet services across the archipelago. Along with telecommunications infrastructure, improvements in the power supply will also benefit the growth of startups.

Appendix: Government Startup Support Programs

Program	Ministry	Start Year	Target	Type of Support Provided
Perusahaan Pemula Berbasis Teknologi (PPBT)	Ministry of Education, Culture, Research and Technology ^a	2013	Startups scaled up to Advanced Tech-Based Startup Grant Program (Perusahaan Lanjut Berbasis Teknologi [PLBT])	Funding of Rp100 million–Rp500 million provided through incubation program for a maximum of 2 years to commercialize the products
Hub.ID	Ministry of Communication and Information Technology	2014	Startups to be matched with investors and connected with corporate and government partners	Acceleration program to intensify growth; 2-day summit to link with global venture capitalists and business partners; and ecosystem to collaborate and search for new opportunities
Calon Perusahaan Pemula Berbasis Teknologi (CPPBT)	Ministry of Education, Culture, Research and Technology ^a	2016	Pre-startups scaled up to enter the PPBT program	Incubation consisting of team development and product development, 1 year
1,000 Startups Digital Program	Ministry of Communication and Information Technology	2016	Early-stage startups in agriculture, health, education, tourism, logistics, maritime	Incubation for 3–6 months consisting of (i) discussion with stakeholders, (ii) bootcamp to develop minimum viable product, and (iii) one-on-one mentoring
Baparekraf for Startup (BEKUP) Academy	Ministry of Tourism and Creative Economy/Tourism and Creative Economy Agency	2016	Early-stage startups that already have a minimum viable product	Incubation program consisting of (i) 2-day bootcamp in each large city focused on designing products that could help solve creative and/or social challenges at the local level; (ii) one-on-one mentoring; and (iii) facilitating startups' pitching sessions to VCs, corporate partners, and relevant government stakeholders In general, BEKUP has been held in around 17 big cities across Indonesia. During 2020, BEKUP was held in Jakarta, Surabaya, Bali, Medan, and Makassar.
E-Commerce Roadmap (Presidential Regulation 74/2017)	Ministry of Trade	2017	Ecommerce, SMEs, startups, and logistics	A steering committee of various relevant ministries and technical assistance formulating government regulations and ministerial regulations for e-commerce
Startup4Industry Program	Ministry of Industry	2018	Startups that already have a minimum viable product	(i) Problem-solving competition to curate startup participants; (ii) Techlink matching activity between startups and larger businesses; and (iii) Solution discussion by matching tech startups and problem owners and involving other stakeholders
Next Indonesian Unicorn	Ministry of Communication and Information Technology	2018	Later-stage startups in logistics, e-commerce, fintech, media and advertising, healthtech, edtech, SaaS ^b	Facilitate contacts between startups and Series B investors, both locally and internationally, through one-on-one meetings and networking dinners
Startup Studio Indonesia	Ministry of Communication and Information Technology	2020	Startups in agriculture, health, education, tourism, logistics, and maritime sectors that have reached product-market fit stage	Intensive acceleration program for around 1.5 months, consisting of (i) business skills development and branding; and (ii) facilitating access to seed/pre-series A/series A investors

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Appendix continued

Program	Ministry	Start Year	Target	Type of Support Provided
Kedaireka	Ministry of Education, Culture, Research and Technology	2020	Lecturers and students in higher education, collaborate with businesses registered on the Kedaireka platform	Matching funds for collaborative projects with the business and upon approval of the submitted proposal by the Kedaireka board
BEKUP Mentor Training Program	Ministry of Tourism and Creative Economy/Tourism and Creative Economy Agency	2021	Startup enthusiasts, founders, and tech and business experts with minimum 2 years of experience in a managerial position	Upskilling individuals to act as mentors for startups through various activities such as workshops, consultations, and case simulations

SMEs, small- and medium-sized enterprises, VCs = venture capitals.

^a Now provided through the National Research and Innovation Agency. The program was subsumed under Startup Inovasi Indonesia in 2020, which was later replaced by Program Pendanaan Perusahaan Pemula Berbasis Riset (PPBR) at the end of 2021.

^b SaaS = software as a service.

Source: Authors.

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