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# Accelerating the app economy in Indonesia:

Android and Google Play's  
impact in **Indonesia**



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<sup>1</sup> AlphaBeta was acquired by AA Access Partnership Pte Ltd in November 2021. The press release is at: <https://accesspartnership.com/access-partnership-acquires-alphabeta-to-expand-asian-and-global-policy-capabilities-2/>



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# EXECUTIVE SUMMARY



Indonesia has become one of the fastest-growing mobile economies in the world, with an increasingly mobile-engaged population of more than 200 million mobile Internet users in 2022.<sup>2</sup> Research shows that Indonesians spend over 5 hours per day on their phones, making them the most mobile-engaged country in the world (along with Brazil)<sup>3</sup>. The pace of digitalization was further intensified by the COVID-19 pandemic that propelled everyone to dive deeper into the digital realm.

As its mobile economy grows, Indonesia is witnessing the emergence of a flourishing app ecosystem. In fact, the latter has become instrumental to the country's digital transformation: giving rise to new developers and start-ups, a wide variety of apps, and robust e-commerce activity. Indonesia's dynamic app ecosystem has enabled businesses, especially micro-, small-, and medium enterprises (MSMEs), to thrive during the pandemic, and continues to drive the country's mobile economy forward. Notably, many of Indonesia's start-ups specialize in e-commerce,<sup>4</sup> some of which have evolved to become unicorns with a valuation of over USD 1 billion.

While many factors underpin the rise of Indonesia's mobile economy, this paper will focus on enablers of scale, namely: **operating systems** and **app distribution platforms**.

Operating systems are software that allow devices like smartphones to function by running apps and other programs. Smartphone manufacturers can easily choose an open operating system such as Android<sup>5</sup> to build devices with and focus on creating great hardware. This has facilitated a lowering of smartphone prices over the past decade and accelerated mobile innovation. Developers, too, leverage Android to build apps that are instantly compatible with many mobile devices, enabling them to reach a wide audience. Collectively, manufacturers and developers use Android to build helpful and innovative products and apps for people across Indonesia, improving digital inclusion as a result.

App distribution platforms are digital platforms where people go to find their favorite apps, games, movies, TV shows, books, and more - allowing them to easily access helpful and entertaining digital services and enjoy the benefits of the mobile economy. For instance, Google Play, which runs on Android, has helped Indonesian developers reach millions of users worldwide, and consumers have benefited greatly from this vibrant app ecosystem, with an average of **23 apps** on their devices that were proactively downloaded.<sup>6</sup> In addition, consumers have benefitted from the discovery of new apps on Google Play as well as increased security (Exhibit E1).

2. Statista (2023), "Number of mobile Internet users in Indonesia 2019-2028 (in millions)". Available at: <https://www.statista.com/statistics/558642/number-of-mobile-internet-user-in-indonesia/>

3. Data.ai (2022), "State of Mobile Market 2022: Spotlight on Indonesia Report". Available at: <https://www.data.ai/en/insights/market-data/indonesia-mobile-market-spotlight-2022/>

4. Media Indonesia (2021), "E-Commerce Lokal Jadi Raja di Persaingan Lokapasar Indonesia". Available at: <https://mediaindonesia.com/ekonomi/450169/e-commerce-lokal-jadi-raja-di-persaingan-lokapasar-indonesia>

5. Open operating systems refer to software with source codes that can be inspected, modified and enhanced by anyone. Android provides public documentation of its source code, allowing the public to provide feedback, report bugs and offer suggestions to improve source codes. More information available at: <https://source.android.com/>.

6. Access Partnership consumer survey 2023.

**EXHIBIT E1**

**Consumers believe that they have benefitted from using Google Play**



**88%**  
believe Google Play helps in discovering new apps aligned with their needs



**84%**  
believe Google Play features reduces online harm

Note: n=500. This survey sample was statistically significant at a 95 percent confidence level, and checked for representativeness based on region.  
SOURCE: Access Partnership consumer survey 2023.

Today, Indonesia has **over 10,000 app developers** that are active on Google Play,<sup>7</sup> who have altogether built **more than 42,000 Indonesian apps** on Android.<sup>8</sup> The app ecosystem enabled by Google Play and Android has generated new jobs in the app economy, and enabled the creation of jobs through the freelance economy (Exhibit E2).<sup>9</sup>



In 2022 alone, these app developers generated over **IDR 1.5 trillion (USD 103 million)** in revenues through Google Play, successfully tapping both domestic and international markets.

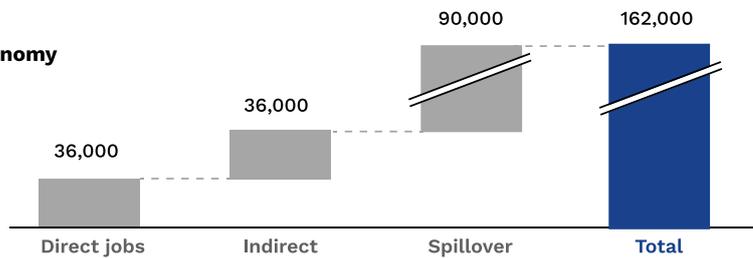
**EXHIBIT E2**

**Android supports jobs in the app economy and enables new jobs to be created through the freelance economy**



**Android job benefits in the app economy**

Google Play supports an estimated **162,000 jobs<sup>1</sup>** in the app economy in Indonesia



**Job benefits enabled by the freelance economy**

Thriving freelance economy due to app distribution platforms like Google Play also enables an estimated **8 million jobs<sup>2</sup>** across different app verticals, from game development to e-commerce and food delivery apps

1. App economy jobs are divided into three categories: direct, indirect, and spillover jobs. Direct app economy jobs include app developers; software engineers whose work requires knowledge of mobile applications; security engineers who help keep mobile apps safe from being hacked; and help-desk workers who support use of mobile apps. Indirect app economy jobs are non-IT jobs (such as sales, marketing, finance, human resources, or administrative staff) that supports core app economy jobs in the same enterprise. Spillover jobs are jobs in the local economy that is supported either by the goods and services purchased by the enterprise, or by the income flowing to core and indirect app economy workers.  
Notes: Figures are estimated based on latest available annual data for 2022.

2. This refers to 'own account workers' that utilize digital platforms to provide services and the benefits should not be attributed to Google Play alone.

SOURCE: Access Partnership analysis

But Indonesia's bright digital future continues to face challenges. A huge digital divide still exists in Indonesia: many seniors, lower-income households, and people living in rural areas are not digitally connected; many MSMEs have not adopted digital transformation; and there is a significant skills shortage in the local workforce. These are critical

issues that need to be addressed. To resolve them, private companies and government agencies must step up and work together. The final section of this paper provides recommendations on how Indonesia can fully harness the opportunities of its booming app ecosystem.

7. Google Blog (2022), "Google Play & Android dibuat untuk membantu developer meraih kesuksesan". Available at: <https://indonesia.googleblog.com/2022/04/google-play-android-dibuat-untuk.html>  
8. 42matters (2023), "Indonesia App Market Statistics in 2023 for Android". Available at: <https://42matters.com/indonesia-app-market-statistics>  
9. Access Partnership (2023), Propelling Indonesia's digital economy: How Google Play helped Indonesian app developers generate over Rp 1.5 trillion in 2022. Available at: <https://accesspartnership.com/propelling-indonesias-digital-economy-google-play/>

# INTRODUCTION: DEVELOPING A STRONG APP ECOSYSTEM IN INDONESIA

Indonesia is one of the fastest-growing mobile economies in the world, with mobile Internet users estimated to reach almost 265 million users by 2028.<sup>10</sup> This has triggered the rise of the app economy<sup>11</sup> —a subsector of the country's mobile economy. The app economy refers to the ecosystem of apps, app developers, app distribution platforms, and the economic transactions and revenue generated through the use of mobile applications. This ecosystem, when developed, can be influential to a country's digital economy growth.

Indonesian consumers are also known to be some of the most mobile-engaged globally, spending over 5 hours per day on their mobile phones.<sup>12</sup> With the shift towards increased digitalization, many Indonesians have become increasingly reliant on mobile apps for day-to-day tasks, from communication and entertainment to e-commerce and online banking. The COVID-19 pandemic has led to increased mobile use with higher app

downloads<sup>13</sup> as more people utilized their mobile devices to help them work, study, communicate, and access entertainment during lockdowns.

Here is where Android comes in as an important part of the app ecosystem in Indonesia. Android's open-source nature allows original equipment manufacturers (OEMs) to build a wide range of unique devices that all work together without having to create new software from scratch. This leads to greater diversity and innovation in the industry, encouraging competition which drives down smartphone prices and increases device diversity, providing greater consumer choice and affordability. Better affordability and accessibility of Android-powered devices has led to **up to 97 million more Indonesians** being connected to the Internet through smartphones, potentially adding up to **IDR 653 trillion (USD 44 billion)** to Indonesia's Gross Domestic Product (GDP) over the last 5 years compared to if Android was not in the market.<sup>14</sup>



10. Statista (2023), "Number of mobile Internet users in Indonesia 2019-2028 (in millions)". Available at: <https://www.statista.com/statistics/558642/number-of-mobile-internet-user-in-indonesia/>

11. Technopedia (2017), "What does app economy mean?". Available at: <https://www.techopedia.com/definition/28141/app-economy>

12. Data.ai (2022), "State of Mobile Market 2022: Spotlight on Indonesia Report". Available at: <https://www.data.ai/en/insights/market-data/indonesia-mobile-market-spotlight-2022/>

13. Sensor Tower (2020), "Data Used by Mobile App Downloads Surged 52% During COVID-19." Available at: <https://sensortower.com/blog/app-download-data-usage-growth>

14. Access Partnership economic modeling and analysis.

Given the prevalence of mobile technology usage in Indonesia, developers have raced to provide consumers with the best apps and games. Over the years, consumers have come to expect this diversity of choice—for instance, each ride-hailing app has spawned a dozen more similar apps,<sup>15</sup> and so too with apps for shopping or video streaming.<sup>16</sup> Yet the app market is far from saturated, with the latest innovation just around the corner. Developers must keep pace to remain relevant or risk losing market share.

Developers then rely not only on their technological innovation, but also smart and effective distribution strategies. App distribution platforms, such as Google Play, can provide them with a unique opportunity to easily reach a larger group of potential customers worldwide. By leveraging the power of these app distribution platforms, developers can drive revenue as well as transform consumer behavior.

Among the many types of apps on the market, e-commerce has been one of the most competitive internationally, driving most of the digital economy growth and changing the way we behave as consumers. E-commerce has been integral in helping businesses, especially MSMEs, stay resilient. Indonesian businesses that went digital during the pandemic were found to be more likely to remain open, with sales rebounding more quickly.<sup>17</sup> The rise of e-commerce has connected businesses in

Indonesia to new markets across the world and driven three-quarters of the archipelago's digital economy gross merchandise value (GMV) in 2022. Furthermore, e-commerce is expected to grow by 17% annually on average between 2022 and 2025.<sup>18</sup> Aside from e-commerce, the app ecosystem has also encouraged the growth of apps in new areas, such as digital wallets like Gojek and DANA, some of which have reached a massive audience. Such platform apps, made possible through the app ecosystem, have allowed businesses to better engage new and existing customers digitally.

Aside from using e-commerce, local businesses have also come up with their own apps to better engage new and existing customers. These range from apps with digital wallets, such as Gojek and DANA, to smaller start-up companies like Poxel. The massive scale some of these apps have reached shows that the app ecosystem enables businesses to better connect with consumers and meet their needs.

As shown from the success above, the app ecosystem is crucial in helping Indonesia's digital landscape grow. With the help of accessible operating systems and app distribution platforms, local developers are able to create and distribute new apps and services more easily. Successful apps also help drive further adoption of smartphones, expanding the digital economy along with them.



15. Carisinyal, "15 Aplikasi Ojek Online Terbaik dan Terpopuler di Indonesia". Available at: <https://carisinyal.com/aplikasi-ojek-online/>

16. DailySocial (2020), "Pandemi mendorong konsumsi platform VOD yang lebih tinggi, konten original masih menjadi kunci". Available at: <https://dailysocial.id/post/lika-liku-platform-ott-video-lokal>

17. World Economic Forum (2021), "Why e-commerce is key to Indonesia's small businesses". Available at: <https://www.weforum.org/agenda/2021/11/why-e-commerce-key-to-indonesias-small-businesses/>

18. Bain (2022), "e-Conomy SEA 2022". Available at: [https://services.google.com/fh/files/misc/indonesia\\_e\\_economy\\_sea\\_2022\\_report.pdf](https://services.google.com/fh/files/misc/indonesia_e_economy_sea_2022_report.pdf)

# 01 GREATER CONVENIENCE AND CONSUMER CHOICE THROUGH A SECURE APP ECOSYSTEM

Android and Google Play provide consumers with open access to the world of mobile apps, giving them the freedom to choose from millions of options to find the ones that best suit their needs. With an average increase of **10%** annually between 2015 and 2022, the total number of apps available to users on Google Play has soared to **more than 2.6 million**.<sup>19</sup> This ever-expanding collection allows users to easily access a range of apps from productivity tools to social media platforms and mobile games.

## Android Ecosystem

The Android ecosystem is highly valued by users, with many mentioning app availability and customizability as the things they like most about Android, among other reasons (Exhibit 1).

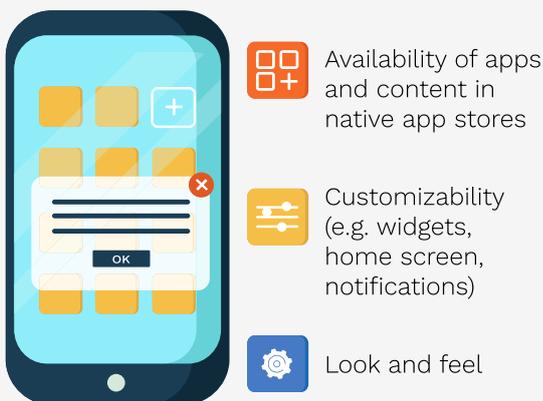
Android offers greater convenience for consumers, allowing consumers to easily access a variety of apps and tools through the native app store. For apps and tools that are commonly used such as email, search engines and online maps, Android device manufacturers are able to offer them as pre-installed apps on their mobile devices. This includes Google apps such as Google Search and Gmail, which consumers find useful to have pre-

installed. Even non-Android users whose devices do not have Google apps pre-installed use these apps frequently (Exhibit 2).

Nonetheless, if consumers do not use the pre-installed apps on their phone, they have the flexibility to easily disable or remove them on their devices, with more than half of consumers finding it easy to do so.<sup>20</sup> Similarly, while default app distribution platforms come with Android devices (e.g. Google Play Store; Samsung Galaxy Store), consumers are free to download third-party app distribution platforms from different providers on their Android devices.

### EXHIBIT 1

#### Best-liked features of Android as an operating system in Indonesia



SOURCE: Top three out of eight best-liked features of Android by consumers. This survey sample was statistically significant at a 95 percent confidence level, and checked for representativeness based on region. Access Partnership consumer survey 2023.

### EXHIBIT 2

#### Consumers find pre-installed apps useful, and users that do not have them pre-installed also use them frequently



#### Google apps used frequently by non-Android users

% share of Indonesian non-Android users



Note: n=500. This survey sample was statistically significant at a 95 percent confidence level, and checked for representativeness based on region. SOURCE: Access Partnership consumer survey 2023.

19. Statista (2023), "Number of available applications in the Google Play Store December 2009 to March 2023". Available at: <https://www.statista.com/statistics/266210/number-of-available-applications-in-the-google-play-store/>. Retrieved 14 April 2023.

20. Access Partnership consumer survey 2023.



Google Play continues to provide useful access to new apps and games. In fact, **97%** of Google Play users indicated that they would install it on their own if it did not come with their devices.<sup>21</sup>

By optimizing app recommendations and listings to users' preferences, Google Play is able to present new apps and games that are safe and interesting to an individual. Google Play brings about **better app discovery**, ranging from gaming apps which increases fun in their lives to learning and productivity apps (Exhibit 3).<sup>22</sup>

Indonesian consumers have downloaded an average of **23 apps** on their devices in addition to pre-installed apps, and believe that Google Play features enhanced online security (Exhibit 3).

### EXHIBIT 3

#### Significant proportion of consumers believe that they have benefitted from using Google Play



**88%**  
believe Google Play helps in discovering new apps aligned with their needs



**84%**  
believe Google Play features reduces online harm

Note: n=500. This survey sample was statistically significant at a 95 percent confidence level, and checked for representativeness based on region.  
SOURCE: Access Partnership consumer survey 2023.

In 2022, educational and mental health apps were recognized as top apps in Google Play's Best Of Play campaign<sup>24</sup> – reflecting the needs of the people as Indonesia transitioned to a new post-pandemic environment. These apps, which include KitaLulus and Bicarakan.id, were downloaded by more than a million users in total.<sup>25</sup> Developers of these apps attested to the value of Google Play, especially in providing support to smaller studios with limited budgets, like Algorocks. The studio's founder Adib Toriq said that not only has Google Play helped “popularize [their] game, it has also given [them] the tools and knowledge to succeed.”<sup>26</sup>

Google Play also offers numerous digital finance apps made by Indonesian developers, such as OVO and Kredivo, for Indonesian users. Digital finance apps became especially important at the start of the COVID-19 pandemic, when more consumers started to rely on digital financial services for everyday transactions.<sup>27</sup> Google Play enabled consumers to readily access digital finance applications, a service that has been particularly critical for Indonesian consumers based in areas where there are few banks or other financial institutions. With this access to digital finance services, the platform helps Indonesian consumers be better equipped in managing their expenses and income.

Part of why users trust these apps is because Google Play provides a safer and more secure ecosystem that protects consumers in Indonesia from online harm (Exhibit 4). For instance, Google Play Protect scans **125 billion apps** on Android devices per day to protect from malware and other harmful apps, even if they are not downloaded from Google Play. Using a combination of advanced machine-learning technology and human reviews, it also runs safety checks on apps from the Google Play Store before users download them, and warns them of apps that are potentially malicious.<sup>28</sup>

Google Play also provides a secure billing system that allows its users to safely purchase digital products and subscriptions. Through Google Play Billing,<sup>29</sup> developers can monetize their apps and games at scale in over **170 markets**, allowing buyers across the world to transact in their local currency and their preferred form of payment (such as GoPay in Indonesia or KakaoPay in South Korea) safely.

21/22/23. Access Partnership consumer survey 2023.

24. Google Blog (2022), “Aplikasi dan game terbaik di Google Play tahun 2022”. Available at: <https://indonesia.googleblog.com/2022/11/aplikasi-dan-game-terbaik-di-google.html>

25. Best apps and games on Google Play in 2022.

26. Google Blog (2022), “Aplikasi dan game terbaik di Google Play tahun 2022”. Available at: <https://indonesia.googleblog.com/2022/11/aplikasi-dan-game-terbaik-di-google.html>

27. Bank Indonesia (2022), “Pandemi Pendorong Digitalisasi”. Available at: <https://www.bi.go.id/id/publikasi/ruang-media/cerita-bi/Pages/Pandemi-Pendorong-Digitalisasi.aspx>

28. Google. “Use Google Play Protect to help keep your apps safe and your data private”. Available at: <https://support.google.com/googleplay/answer/2812853?hl=en>

29. Google Play, “Helping Developers Succeed”. Available at: <https://support.google.com/googleplay/android-developer/answer/9969970?hl=en#:~:text=Commerce%20Platform,most%20relevant%20local%20payment%20methods.>

## 02

# FACILITATING APP DEVELOPMENT IN INDONESIA WITH ANDROID AND GOOGLE PLAY

## 2.1 Vibrant app developer ecosystem in Indonesia leads to growing supply of app developers

Indonesia has over 2,000 start-up companies as of last year,<sup>30</sup> making the country one of the regional leaders. Indonesia ranks second in the number of unicorn<sup>31</sup> start-ups in Southeast Asia<sup>32</sup> with 13 unicorns<sup>33</sup> and two decacorns<sup>34</sup> to date, proving its vibrant start-up ecosystem. These unicorns are mostly tech-based start-ups from various industries, including the likes of payment gateway company Xendit, online investment platform Ajaib, and travel service provider Traveloka.

The success of these tech unicorns has created

a ripple effect, spurring the growth of other start-ups and new fields of employment along the way. With this tech-centered growth, the number of app developers in Indonesia has reached **over 10,000** on Google Play,<sup>35</sup> and these developers have published **more than 42,000 local apps**.<sup>36</sup>

This surge in app development highlights the vast potential for innovation and creativity in the country. The apps created by Indonesian developers cater greatly to an extensive range of needs, be it social media, education, entertainment, or fintech (Box 1).

### Box 1. The app ecosystem inspires the creation of local apps that meets the needs of consumers

Alodokter is a digital health company and app founded in 2014 that first introduced chat telemedicine consultations in Indonesia. It is also one of the pioneers in chat-based AI assistance, integrating a healthcare platform with technology that 30 million Indonesians would sorely need years later as COVID-19 hit.<sup>37</sup>

Jenius is a digital bank whose range of financial services on its app have been used by over 3 million Indonesians,<sup>38</sup> making banking more accessible across the country.



30. Mexico Business News, "Indonesia Leading the Region's Digital Startup Ecosystem". Available at: <https://mexicobusiness.news/policyandeconomy/news/indonesia-leading-regions-digital-startup-ecosystem>

31. Unicorns refer to start-ups that are valued above USD 1 billion. Decacorns refer to start-ups valued above USD 10 billion.

32. Statista (2023), "Startups in Indonesia". Available at: <https://www.statista.com/topics/10216/startups-in-indonesia/#topicOverview>

33. CNBC Indonesia (2022), "Baru Diupdate, Ini Daftar 13 Unicorn Kelahiran Indonesia". Available at: <https://www.cnbcindonesia.com/tech/20220922152800-37-374219/baru-diupdate-ini-daftar-13-unicorn-kelahiran-indonesia>

34. Good Stats (2022), "Simak Daftar Startup Decacorn dan Unicorn di Indonesia 2022". Available at: <https://goodstats.id/article/simak-daftar-startup-decacorn-dan-unicorn-di-indonesia-2022-weled>

35. Google Blog (2022), "Google Play & Android dibuat untuk membantu developer meraih kesuksesan". Available at: <https://indonesia.googleblog.com/2022/04/google-play-android-dibuat-untuk.html>

36. 42matters (2023), "Indonesia App Market Statistics in 2023 for Android". Available at: <https://42matters.com/indonesia-app-market-statistics>

37. Katadata (2021), "Pademi Covid-19 Memicu Lonjakan Pengguna Platform Kesehatan Digital". Available at: <https://katadata.co.id/safrezifitra/indepth/611ff6afa0f43/pandemi-covid-19-memicu-lonjakan-pengguna-platform-kesehatan-digital>

38. The Jakarta Post (2021), "Jenius' ingenuity: From pension bank to Indonesia's leading digital bank". Available at: <https://www.thejakartapost.com/news/2021/06/07/jenius-ingenuity-from-pension-bank-to-indonesias-leading-digital-bank.html>

## 2.2 Android and Google Play provide an affordable, integrated platform and ecosystem for developers to create and publish apps

Android and Google Play have facilitated a safe and secure end-to-end platform and ecosystem for developers, producing an ideal environment for developers to create and publish apps for the world. This section describes the keys to that success.

### Android

Android simplifies the app development cycle for developers across new products and markets, with the compatibility of operating systems across OEMs leading to app development time savings, especially during the initial development phase.<sup>39</sup> At the same time, OEMs have the flexibility to adapt the operating system for uses beyond mobile phones to tablets, smart televisions and cars. This broad device compatibility ensures that app developers can target a vast user base and allows them to access a diverse set of apps across multiple devices, catering to their specific needs and preferences. It further provides opportunities for developers looking to expand their reach into new consumer groups.

### Google Play

Google Play does not charge a service fee by default, allowing most app developers to enjoy the benefits of Google Play without cost concerns. In cases where a fee structure is required for developers, different needs are considered. For instance, developers earning less than USD 1 million (~IDR 14 trillion) are required to pay a smaller fee.

Many reasons factor into why developers chose to publish their apps on Google Play, ranging from ease of consumer engagement to ease of developing apps on the platform (Exhibit 4).<sup>40</sup>

#### EXHIBIT 4

#### Top reasons why app developers publish on Google Play



Note: Top five out of 15 reasons why app developers publish on Google Play. n=300. This survey sample was statistically significant at a 95 percent confidence level, and checked for representativeness based on employee headcount and revenue.  
SOURCE: Access Partnership app publisher survey 2023.

39. Access Partnership (2017), Android impact: How the Android ecosystem supports economic impact in South Korea. Available at: [https://accesspartnership.com/wp-content/uploads/2023/03/South-Korea-Android-Economic-Impact\\_Aug2017.pdf](https://accesspartnership.com/wp-content/uploads/2023/03/South-Korea-Android-Economic-Impact_Aug2017.pdf)

40. Access Partnership economic modeling and analysis. This is out of a list of 15 options, where respondents were required to rank their top five.



## 2.3 Google Play supports app developers through increased revenue and global reach

Google Play has enabled app developers, especially small- and medium-sized ones, to increase their revenue and expand beyond Indonesian shores, with **84%** of Indonesian app publishers starting to do so.<sup>41</sup> While close to three quarters of app developer revenues still come from domestic sources,<sup>42</sup> app

developers consider having a global user base an important priority (Exhibit 5). In particular, **Southeast Asia and the Middle East** have high potential, given that they are the top markets which Indonesia's app developers are currently exporting to outside Indonesia.<sup>43</sup>

### EXHIBIT 5

#### Indonesian app developers are keen to reach out to global consumers outside the local market



**84%**  
of developers have expanded overseas

#### Respondents answering “Strongly agree” and “Somewhat agree”

% share of Indonesian app publisher respondents

**91%**



Having a global user base outside Indonesia for my company's apps is an important priority for my company.

Google Play and Android helps my company's apps reach international users.



**95%**

Note: n=300. This survey sample was statistically significant at a 95 percent confidence level, and checked for representativeness based on employee headcount and revenue.

SOURCE: Access Partnership app publisher survey 2023.

41. Access partnership app developer survey (2023). This is defined as app publishers that have at least 10% of users based outside Indonesia.

42. Access Partnership (2023), Propelling Indonesia's digital economy: How Google Play helped Indonesian app developers generate over Rp 1.5 trillion in 2022. Available at: <https://accesspartnership.com/propelling-indonesias-digital-economy-google-play/>

43. Access Partnership analysis based on data available on data.ai.

## 03 HARNESSING OPPORTUNITIES WITH POLICY LEVERS

### 3.1 Challenges remain before Indonesia can fully harness the opportunities of the app ecosystem in Indonesia

Despite the great strides that Indonesia has made in building its digital ecosystem, there are still pockets of risks in various sectors that need to be addressed and turned into opportunities.



#### Digital divide:

Despite an increase in the share of digitally connected Indonesians, inequality still exists between regions and social groups. In fact, 80% of people residing in rural areas are unconnected or inadequately connected to the Internet.<sup>44</sup> This highlights the need to expand digital infrastructure and connectivity beyond urban areas. In addition, certain demographic groups, such as seniors, less-educated individuals, and low-income households, also face greater barriers to digital inclusion than others.<sup>45</sup>



#### Lack of investment in digital infrastructure:

This is especially the case in many rural and semi-urban areas where populations are widely dispersed. In such areas, the high spectrum requirements for establishing digital infrastructure are often not met due to insufficient demand,<sup>46</sup> and mobile operators are thus faced with high capital costs relative to the potential returns on investment.



#### Low digital adoption among MSMEs:

Despite more MSMEs embracing technology, Indonesia lags many other countries in Asia, with only 32% of MSMEs being part of the digital ecosystem and adopting digital technologies as of end-2022.<sup>47</sup> This presents a significant challenge to the country's app ecosystem, especially since MSMEs make up more than 97% of the workforce in Indonesia.<sup>48</sup> The problem further underscores how crucial it is to support MSMEs should Indonesia want to keep growing its app economy and continue its digital transformation.

44. World Bank Blogs (2022), "How to bridge the gap in Indonesia's inequality in internet access". Available at: <https://blogs.worldbank.org/eastasiapacific/how-bridge-gap-indonesias-inequality-internet-access>

45. Mulyaningsih (2020), "Poverty and Digital Divide: A Study in Urban Poor Neighborhoods." Available at: <https://jurnal.ugm.ac.id/jsp/article/view/52325/pdf>

46. Hadiyat (2014), Digital Divide in Indonesia (Case Study in Wakatobi-Regency). Available at: <https://media.neliti.com/media/publications/222391-kesenjangan-digital-di-indonesia-studi-k.pdf>

47. DataIndonesia.id (2022), "20,76 Juta UMKM di Indonesia Masuk Ekosistem Digital pada 2022". Available at: <https://dataindonesia.id/bursa-keuangan/detail/2076-juta-umkm-di-indonesia-masuk-ekosistem-digital-pada-2022>

48. World Economic Forum (2022), "How digitalization is accelerating the growth of MSMEs in Indonesia". Available at: <https://www.weforum.org/agenda/2022/05/digitalization-growth-indonesia-msmes/>

49. Institut Teknologi Bandung (2021), "Indonesia lacks digital talent". Available at: <https://www.sbm.itb.ac.id/2021/11/29/indonesia-lacks-digital-talent/>



### Skills shortage within the tech sector:

While demand for skilled talent remains high, it is estimated that there is still a significant digital skill gap of 600,000 tech workers per year,<sup>49</sup> posing a threat to the country's technological progress. This stems from a skills gap facing Indonesia's workforce in general, where in 2022, 33% of employees were underqualified and 16% of employees overqualified, meaning that their educational backgrounds did not match industry needs.<sup>50</sup> Analysts note that this discrepancy between demand and supply comes from universities' inability to answer the market's demands yet, with little link-and-match between universities and workplaces amid the rapid progress of Industry 4.0.<sup>51</sup> In particular, front-end developers and Android developers are expected to be among the most in-demand roles in the industry and are likely to face a shortage of skilled workers in the future.<sup>52</sup> These positions require a unique set of technical and creative skills, making them crucial to the success of any tech organization. If this problem remains, companies may find it hard to get qualified candidates to fill these roles.



### Relatively nascent app export market:

Many Indonesian app developers are still predominantly catering to the domestic market, with only ~28% of app developer revenues coming from overseas markets.<sup>53</sup> While it is understandable that local app developers would like to fully leverage opportunities in the domestic market first before expanding overseas, this also suggests that Indonesian app developers will have less experience in expanding overseas once they reach that stage. If the local industry wants to fully realize its digital transformation, there needs to be more focus on its exposure to the global market or on its app features that can cater to more users outside of Indonesia going forward.



50. Badan Pusat Statistik (2023), "The state of the Indonesian work force in 2022". Available at: <https://www.bps.go.id/publication/2022/06/07/c81631f750ee1ece2c3eb276/keadaan-angkatan-kerja-di-indonesia-februari-2022.html>

51. Kompas (2022), "Peneliti: Perguruan Tinggi Indonesia Belum Mampu Menjawab Tantangan Pasar Kerja". Available at: <https://www.kompas.com/edu/read/2022/08/26/175814371/peneliti-perguruan-tinggi-indonesia-belum-mampu-menjawab-tantangan-pasar?page=all>

52. International Labour Organization (2022), "The ILO research recommends steps to narrow digital skills gap in Indonesia". Available at: [https://www.ilo.org/jakarta/info/public/pr/WCMS\\_847255/lang--en/index.htm](https://www.ilo.org/jakarta/info/public/pr/WCMS_847255/lang--en/index.htm)

53. Access Partnership (2023), Propelling Indonesia's digital economy: How Google Play helped Indonesian app developers generate over Rp 1.5 trillion in 2022. Available at: <https://accesspartnership.com/propelling-indonesias-digital-economy-google-play/>

54. Antara News (2022), "Minister outlines priorities for Digital Indonesia Road Map". Available at: <https://en.antaranews.com/news/221329/minister-outlines-priorities-within-digital-indonesia-road-map>

## 3.2 The following policy levers will help Indonesia to fully harness opportunities present in the app economy

A review of global best practices has revealed important policy levers that need to be leveraged if Indonesia wants to remain a leader in Southeast Asia's tech landscape:

### Strengthen Internet access and digital infrastructure, especially in rural areas

To ensure the growth of digital infrastructure, the Internet should be accessible nationwide, with a focus on expanding Internet access and other digital services for businesses and individuals in rural areas. The Digital Indonesia Road Map 2021-2024 launched in 2016 partially addresses this, laying out several strategic directions, from investing in the development of inclusive, safe, and reliable digital infrastructure to the expansion of Internet network areas and 5G networks.<sup>54</sup>

However, more needs to be done to make an inclusive digital landscape in Indonesia, especially in rural areas. Over 62 million Indonesians still do not have access to the Internet, particularly in West Sulawesi, West Papua, and West Nusa Tenggara (NTB).<sup>55</sup> More work must be done to ensure that Internet access is provided evenly across the archipelago.



### Support businesses, especially MSMEs, in digital transformation

MSMEs are an essential contributor to Indonesia's economy, accounting for around 60% of Indonesia's GDP.<sup>56</sup> However, only an estimated 32% of MSMEs in Indonesia are part of the digital ecosystem.<sup>57</sup>

Establishing new frameworks for toolkit development for MSMEs is a possible approach to help MSMEs transition to the digital economy. For instance, Singapore's Infocomm Media Development Authority (IMDA) has established the "SMEs Go Digital Program", which helps SMEs adopt digital technologies through providing them with resources and training covering general topics such as e-commerce and cybersecurity.

Furthermore, a lack of resources and time constraints remain important reasons why MSMEs are slow to adopt digital technologies.<sup>58</sup> Lowering barriers to digital adoption through grants, investments and training programs can incentivise MSMEs to start exploring the use of digital technologies. For instance, the Digital New Deal in Korea included a KRW 10.1 trillion (USD 7.7 billion) investment to establish digital infrastructure and facilitate innovation in the private sector. Over 170,000 businesses have since 2020 benefited from the program, of which 95% are MSMEs.<sup>59</sup> Similarly, Malaysia's SME Ecosystem Program supports new microenterprises with gaining access to digital tools through providing training, technical guidance and grants. Over 20,000 microenterprises have registered for the program and started selling on digital platforms as of 2022.<sup>60</sup>

55. CNN Indonesia (2022), "62,66 Juta Orang Tak Tersentuh Internet, Sulbar Paling Minim Online". Available at: <https://www.cnnindonesia.com/teknologi/20220610142436-192-807371/6266-juta-orang-tak-tersentuh-internet-sulbar-paling-minim-online>

56. Cabinet Secretariat of the Republic of Indonesia (2022), "Gov't to Maintain MSMEs' Role as Economic Backbone". Available at: <https://setkab.go.id/en/govt-to-maintain-msmes-role-as-economic-backbone/>

57. DataIndonesia.id (2022), "20,76 Juta UMKM di Indonesia Masuk Ekosistem Digital pada 2022". Available at: <https://dataindonesia.id/bursa-keuangan/detail/2076-juta-umkm-di-indonesia-masuk-ekosistem-digital-pada-2022>

58. OECD (2021), The Digital Transformation of SMEs. Available at: <https://www.oecd.org/publications/the-digital-transformation-of-smes-bdb9256a-en.htm>

59. Ministry of Science and ICT (2021), "Digital New Deal Harness the Winds of Change, Bringing Innovation". Available at: <https://www.msit.go.kr/eng/bbs/view.do?sCode=eng&mId=4&mPid=2&pageIndex=&bbsSeqNo=42&nttSeqNo=527&searchOpt=ALL&searchTxt=>

60. GovInsider (2022), "How Malaysia is helping SMEs thrive post-COVID with digital transformation". Available at: <https://govinsider.asia/intl-en/article/how-malaysia-is-helping-smes-thrive-post-covid-with-digital-transformation-sme-corp-rizal-bin-nainy>

61. World Bank (2021), Indonesia COVID-19 Observatory – Digital Merchant Infographic. Available at: <https://thedocs.worldbank.org/en/doc/e975e535c0a25907216079e138c56307-0070012021/related/Indonesia-Digital-Merchant-Infographic.pdf>

### Provide skills upgrading opportunities for aspiring and current app developers

To remain competitive in the tech industry, app developers in Indonesia must continuously upgrade their skills and knowledge. 23% of around 15,000 merchants surveyed said digital skills training was a crucial area that needed working on if the country wants to succeed in the long run.<sup>61</sup> Among other initiatives, academic programs through public-private partnerships that support skills upgrading in the workforce can help to bridge this gap. For instance, the Australian government invested AUD 2 million (USD 1.3 million)<sup>62</sup> to build one of the world's largest game developers' hubs in Adelaide, South Australia, in 2017.<sup>63</sup> Similarly, the GO-Academy program from Gojek provides a 12-week internship program for students with tech backgrounds from various universities, complete with campus engagements and boot camps that give them a chance to upscale their engineering knowledge, especially in mobile app development.

Other public-private partnerships include the co-development of university curriculums by the government and the industry. Indonesia has started its foray with Bangkit<sup>64</sup>, a program led by Google, which is offered as part of Kampus Merdeka program from the Education, Culture, Research and Technology Ministry to equip students with in-demand skills and tech certifications, helping to bridge the gap between higher education and the tech industries. Other similar programs by Google have also helped app developers to upgrade their skills (Box 2).

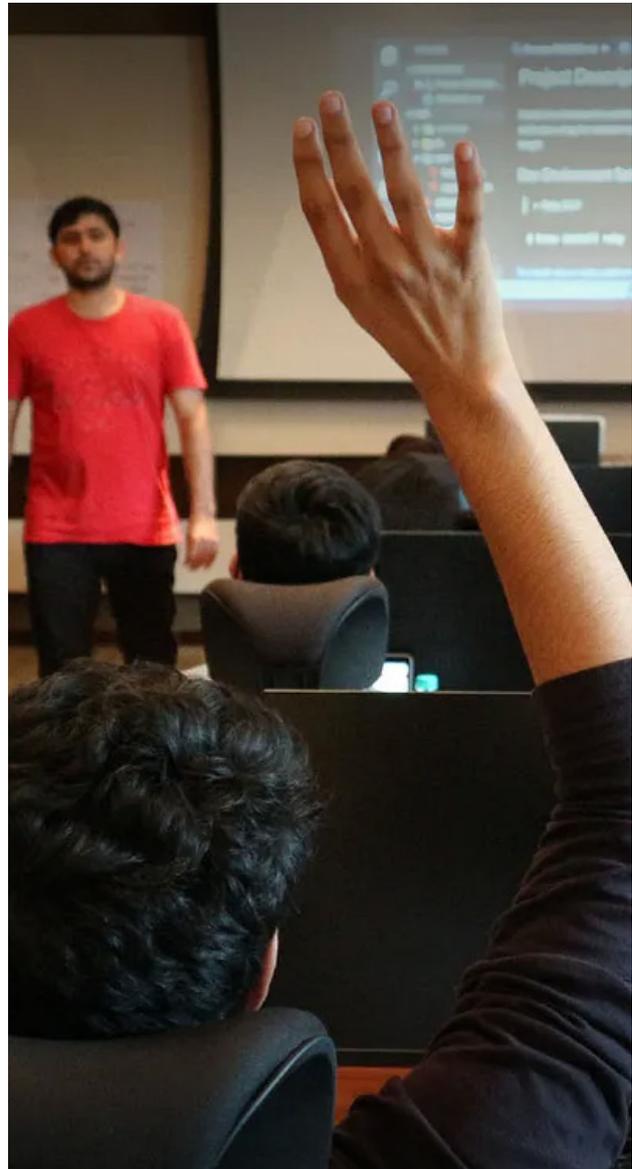


Image Credit: <https://medium.com/life-at-go-jek/how-go-jek-learns-from-football-academy-to-produce-world-class-talents-29ae35b668ad>

62. Currency conversion was done based on the average AUD/USD exchange rate in 2017, available at: <https://www.exchangerates.org.uk/AUD-USD-spot-exchange-rates-history-2017.html#:~:text=This%20is%20the%20Australian%20Dollar,USD%20on%2002%20Jan%202017>.

63. ABC News (2017), "SA government announces \$2 million digital gaming development fund". Available at: <https://www.abc.net.au/news/2017-11-20/sa-government-push-become-national-leader-gaming-industry/9171662>

64. Google (2023), Kickstart your tech career with Bangkit. Available at: [https://grow.google/intl/id\\_id/bangkit/?tab=machine-learning](https://grow.google/intl/id_id/bangkit/?tab=machine-learning)

65. Google Blog (2022), Belajar pemrograman Android membawa Brian semakin dekat menggapai mimpi. Available at: <https://indonesia.googleblog.com/2022/06/Brian-Catraguna-JuaraAndroid.html>

## Box 2. Uplifting developer skills in Indonesia through Google programs

### #JuaraAndroid allows app developers to expand their suite of technical skills and hone creativity

#JuaraAndroid is a community-led online self-study program for app developers who would like to take their skills one step further. App developer Brian Catraguna benefited from the program as it spurred him to be more creative in creating user interfaces that would cater to users of his app.<sup>65</sup> Similarly, aspiring app developer Patricia Fiona had the opportunity to learn more about using Kotlin, a new Android programming language, and navigating various Android tools through the program.<sup>66</sup>



### Google Play x Unity partnership provides training to aspiring game developers<sup>67</sup>

The Google Play x Unity partnership provides aspiring and current developers with opportunities to learn the ropes and kick-start their projects. Under this program, game developers and university students in Indonesia receive free training from Unity under one of the three learning paths of developer, artist and programmer, and receive a certification upon completion of the program. Other than strengthening technical knowledge of game developers, the program also allows participants to expand connections with other developers, fostering opportunities for discussion and collaboration. One such beneficiary is Muhammad Ramadhan Rizki Daulay, who felt that the program is suitable for both new and current developers, and allows them to meet communities with the same interests and enable more collaborations.<sup>68</sup>



### Indie Games Accelerator links high potential indie game studios to industry experts and a global community<sup>69</sup>

The Indie Games Accelerator is a fully digital accelerator program that allows top game studios to learn from live masterclasses, mentoring sessions and networking opportunities. The program covers topics ranging from initial ideation and conceptualisation of games to strategies to grow and monetise the final product, allowing developers to increase their revenue sustainably. For instance, Indonesian-based Gambir Studio managed to grow its revenue by 20% after participating in the Indie Games Accelerator, which allowed them to gain insights on how to leverage on data to improve the appeal of their games to consumers.<sup>70</sup>



66. Google Blog (2022), Gali potensi untuk mendapat karir cemerlang dengan mempelajari Android. Available at: <https://indonesia.googleblog.com/2022/06/Patricia-Fiona-JuaraAndroid.html>

67. Google (2023), Google x Unity Game Developer Training. Available at: [https://grow.google/intl/id\\_id/gamedevelopertraining/?tab=game-developer](https://grow.google/intl/id_id/gamedevelopertraining/?tab=game-developer)

68. Google Blog (2023), Three Indonesian game developers received one of the most sought-after global certifications in the gaming world. Available at: <https://indonesia.googleblog.com/2023/07/Google-Play-Unity-Game-Developer-Training-2023.html>

69. Google Play (2023), Indie Games Accelerator. Available at: <https://developersonair.withgoogle.com/events/indie-games-accelerator>

70. Android Developers (2023), Android Developer Story: Gambir increased revenue by 20% after Indie Games Accelerator. Available at: [https://www.youtube.com/watch?v=\\_smjK7xpxEE](https://www.youtube.com/watch?v=_smjK7xpxEE)

71. CNBC Indonesia (2022), "Baru Diupdate, Ini Daftar 13 Unicorn Kelahiran Indonesia". Available at: <https://www.cnbcindonesia.com/tech/20220922152800-37-374219/baru-diupdate-ini-daftar-13-unicorn-kelahiran-indonesia>

## Build up Indonesia's capabilities as a regional hub for tech, with collaboration and knowledge sharing among app developers in the region

Indonesia is already one of the leaders of unicorn start-ups in Southeast Asia, and its 13 unicorns, mostly tech-based, form a good launchpad to make the country a tech regional hub.<sup>71</sup> The country has already implemented several initiatives from the government, such as the Merah Putih Fund<sup>72</sup> targeted at unicorn hopefuls, the HUB.ID platform that helps start-ups upscale regionally, and the "1000 Digital Start-ups Movement" that provides an array of classes and bootcamps in 20 cities across the archipelago to encourage more entrepreneurs to start up and create a strong, collaborative digital ecosystem.

However, more is needed beyond these projects to provide greater regional and international exposure to Indonesian firms. This includes continuous collaboration between the government and tech start-ups, as well as constant research and knowledge-sharing in the digital realm by mentors and advisers with new app developers across the country. A strong industry association that works closely with the government and local and international developers can be valuable as well, like the Indonesian Game Association (AGI), which has started to unite other game developers.

Indonesia can also bloom into a regional tech hub with more developed smart cities. Bandung, one of the biggest cities in Indonesia, is potentially a good model for other Indonesian cities. The city focused on urban transformation by improving Internet connectivity, deploying fiber optic networks, and expanding wireless coverage.<sup>73</sup> By prioritizing digital infrastructure development, Bandung laid the foundation for a seamless digital infrastructure. Bandung also has strong data platforms which integrated various data sources, and takes a data-driven approach through apps like the government-citizen complaints unit Lapor,<sup>74</sup> promoting collaboration, entrepreneurship, and inclusive decision-making across various stakeholders. It sets an example for other cities to adopt its strategies.

Furthermore, Indonesia can also maximize its capabilities as a regional hub by establishing a tax offset for its growing developers in tech-related industries. Australia, for example, has introduced legislation in 2022 to establish a Digital Games Tax Offset and provide game developers eligible under the government's criteria with a 30% refundable tax offset. This helps reduce their cost in completing, ongoing development, or porting of the games they created, and Indonesia can see this as a blueprint that it can follow.<sup>75</sup>



72. Antara News (2022), "Merah Putih Fund diperlukan untuk bantu startup". Available at: <https://www.antaranews.com/berita/3267401/merah-putih-fund-diperlukan-untuk-bantu-startup>

73. ZonaBandung (2022), "Gelar Infrastruktur Fiber Optik dan Dukung Bandung Smart City, Bali Towerindo Berikan Free Wifi di Area Publik". Available at: <https://www.zonabandung.com/bandung-raya/pr-1203687035/gelar-infrastruktur-fiber-optik-dan-dukung-bandung-smart-city-bali-towerindo-berikan-free-wifi-di-area-publik>

74. UNDP (2020), "5 lessons for smart cities in ASEAN: the example of Bandung, Indonesia". Available at: <https://www.undp.org/policy-centre/singapore/blog/5-lessons-smart-cities-asean-example-bandung-indonesia>

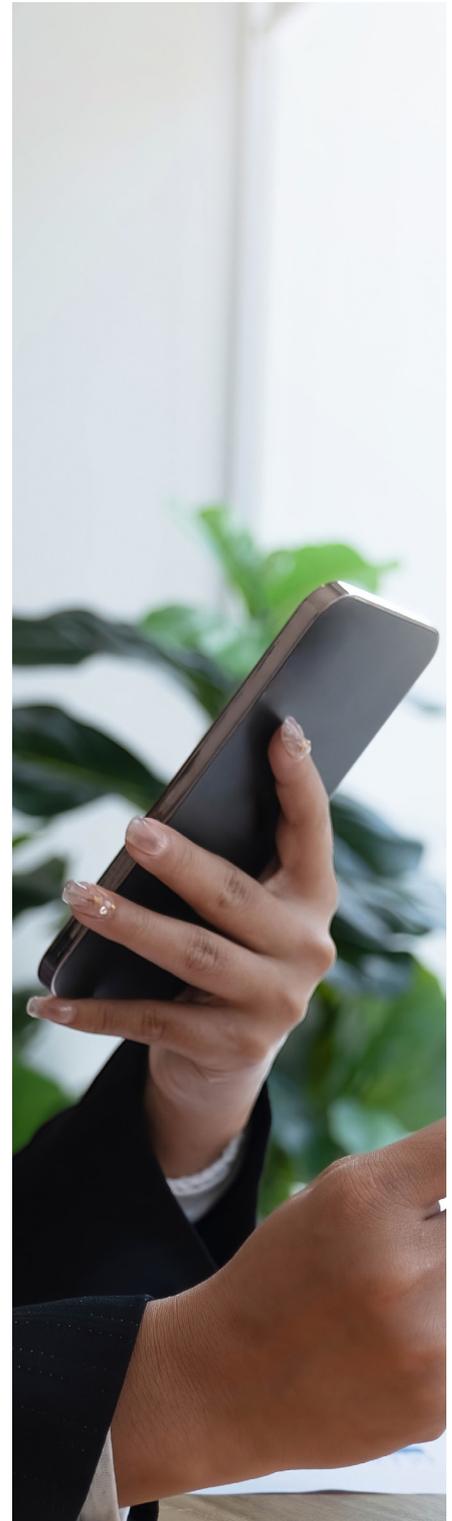
75. Australian Taxation Office (2023), Digital Games Tax Offset. Available at: <https://www.ato.gov.au/General/New-legislation/In-detail/Direct-taxes/Income-tax-for-businesses/Digital-Games-Tax-Offset/#:~:text=The%20legislation%20forms%20part%20of,expenditure>

# CONCLUSION

Indonesia's digital landscape has thrived due to the growth of local app developers and the overall technological innovations brought on by the country's digital transformation. New fields of employment are starting to open up thanks to the success of app-based start-ups in Indonesia, accelerating the country's app economy.

This rise of Indonesia's app economy comes from the country's app developers' unique and innovative products, like a one-size-fits-all online investment platform, or ride-hailing-and-e-wallet super-app. But many aspects influence their success, one of the most important being scaling factors such as open operating systems and app stores. As elaborated upon above, open operating systems drive scale through lowering costs and time spent on producing new mobile devices, thus getting them into the hands of more consumers. Meanwhile, app stores help to curate, organize and surface the plethora of available apps and games to consumers, thus helping the right apps reach the right users. Together, these factors give developers the exposure that their products need. Additionally, their flexibility and trusted safety systems, like those offered by Android and Google Play, provide an additional protection and ease of access to people around the country, making app creation affordable and inclusive for current developers and aspiring developers wanting to take on the digital world.

Such a digital environment is exciting for prospective workers and has been instrumental in driving the country's economy forward. But at the same time, many conventional jobs in various industries are also shifting toward app-based needs, creating the need for specific sets of skills unprecedented a decade ago. This calls for further action from both the government and the private sector in the country, particularly in cultivating new talents and providing programs needed to upgrade their skills in the digital industry. The government has come up with a Digital Roadmap, while institutions and companies have united for various incubation programs. More sustainable initiatives that provide accessibility and exposure to the global market are necessary for the country's long-term app economy's success, with Android and Google Play continuing to play vital roles in fueling Indonesia's digital growth.



# APPENDIX

## A1. Methodological note for consumer and app publisher surveys

501 consumers in Indonesia were surveyed online by Access Partnership in 2023 to understand the core reasons behind how consumers interacted with their smart devices, in particular their behavior with respect to handset purchases, usage of app distribution platforms (e.g., online stores where mobile applications can be downloaded or purchased, such as Google Play), key prioritized features, top activities on their smart devices, and attitudes towards pre-installed apps. This survey sample was statistically significant at a 95 percent confidence level and checked for representativeness based on demographic variables including age, income level, and geographical location.

300 app publishing companies in Indonesia were also surveyed online in 2023 on their use of app distribution platforms (such as Google Play), their perceptions towards such tools, and how these tools have facilitated their efforts to expand their customer outreach overseas (i.e., outside of Indonesia). This survey sample was statistically significant at a 95 percent confidence level and checked for representativeness based on employee headcount and revenue.

## A2. Methodological note for the societal benefit of Android

The societal benefit of Android was analyzed through a two-step methodology. First, Android's contribution to growth in new smartphone subscribers from 2017-2022 was isolated. We use a range to account for the uncertainty arising from the fact that some new Android subscribers may derive from users switching between smartphone operating systems and therefore are not contributing to additional smartphone penetration. Second, estimates from the academic literature on the 3G/4G impact on economic growth were applied to the incremental mobile subscriber growth from Android. As smartphones require 3G/4G subscriptions to have full functionality, additional smartphone subscriptions are equivalent to 3G/4G subscriptions.

