THE DIGITAL KOMODO DRAGON:

HOW INDONESIA CAN CAPTURE THE DIGITAL TRADE OPPORTUNITY AT HOME AND ABROAD

promoting sustainable global trade

hinrich foundation

Important Notice on Contents

This research employs a broad definition of "digital trade" which covers the production, distribution, marketing, sale or delivery of goods and services – domestically and abroad – supported by cross-border data flows. As international trade increasingly spills into the digital sphere with potentially huge economic benefits for economies, developing a knowledge base around the topic of digital trade becomes ever critical. This report serves to inform:

- **Governments and policy makers** to take into account the importance of digital trade for both the external and domestic economies when formulating trade and economic policy;
- **Businesses** in harnessing the opportunities afforded by digital trade in the form of increased exposure to overseas markets and uplifting productivity at home;
- **Industry groups** in recognising the nature and magnitude of economic benefits that digital trade could bring about to different sectors, and champion these in their outreach efforts.

This report was prepared by the Hinrich Foundation with analytical support from AlphaBeta. All information in this report is derived from AlphaBeta analysis using both proprietary research and publicly available data. Where information has been obtained from third-party sources, this is clearly referenced in the footnotes.

promoting sustainable global trade

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THE DIGITAL TRADE OPPORTUNITY FOR INDONESIA

VALUE OF DIGITAL TRADE FOR INDONESIA'S DOMESTIC ECONOMY[1]

Digital trade currently enables **UP TO IDR 125 TRILLION** of economic impact in Indonesia's domestic economy.

By 2030, digital trade will enable an estimated **IDR 2,305 TRILLION** of economic value for Indonesia's domestic economy.

Potential benefits are spread across all sectors of the Indonesian economy, but particularly relevant in **AGRICULTURE & FOOD, INFRASTRUCTURE, CONSUMER & RETAIL, AND RESOURCES.**

VALUE OF DIGITAL TRADE FOR INDONESIA'S EXPORTS[2]

Indonesia has **8 DIGITAL STARTUPS PER 1 MILLION PEOPLE,** a higher ratio than Japan (6 per 1 million people).

Digital goods and services accounted for only **1 PERCENT** of Indonesia's total export value in 2017.

By 2030, Indonesia's digital exports could **GROW BY 768%.**

THREE IMPERATIVES FOR CAPTURING THE OPPORTUNITY

1 ENSURING OPEN DATA FLOWS

2 PROMOTE INNOVATION-ORIENTED APPROACHES TO COPYRIGHT AND INTERMEDIARY LIABILITY REGULATIONS

3 MINIMISING BORDER FRICTIONS

1. This refers to economic value created by cross-border data flows for the domestic economy, and is estimated in terms of consumer surplus, productivity gains and cost savings.

2. This refers to the value of exports of digital goods and services, which consists of: revenue from overseas digital downloads of local apps, sales of products to overseas markets through cross-border e-commerce platforms, services provided using digital technologies and imported digital services that get used in the export of other products and services.

EXECUTIVE SUMMARY

Indonesia has developed an ambitious agenda to fully capture the benefits of digital technologies for individuals, businesses and start-ups. President Joko Widodo has stated that Indonesia aims to become Southeast Asia's largest digital economy by 2020.[1] Digital trade (see Box 1 for the definition) will be crucial for achieving this vision. The amount of cross-border bandwidth that is used has grown 45 times since 2005. This is projected to increase by an additional nine times over the next five years as flows of information, searches, communication, video, transactions and intra-company traffic continue to surge.[2] Digital trade is thus crucial not only as a way to increase and diversify Indonesia's export base, but also for helping Indonesian firms leverage digital technologies across every sector of the economy.

Yet, the importance of digital trade in helping Indonesia achieve this vision has received limited attention to date. Traditional economic metrics have failed to keep pace with the rapid growth of the digital economy and there is currently a lack of robust data measuring the importance of digital trade for exports or for the domestic economy. This report aims to address these gaps by providing new data on the importance of digital trade, both for Indonesia's domestic economy and exports, and recommendations for how Indonesia can fully exploit the benefits of digital trade as it seeks to become a leading digital nation.

Our key findings include (Exhibit 1):

- **Digital trade can create huge positive impact for Indonesia's domestic economy, with some of the biggest beneficiaries coming from outside the digital sector.** Digital trade enables Indonesian firms to achieve cost efficiencies (from storage of data), enter new markets and generate richer insights from data. It supports collaboration (particularly where Indonesia may have skill gaps), enables adoption of efficient business practices (such as allowing consumers real-time access to their bank accounts even when abroad), and supports management of global supply chains (e.g. tracking of export containers using Internet of Things technology). Today, the economic value of digital trade-enabled benefits to the Indonesian economy is estimated to be worth IDR 125 trillion (US$9 billion), which is equivalent to 0.9 percent of its GDP, paling in comparison with neighbouring countries such as Malaysia for which the equivalent figure is 2 percent. If digital trade is fully leveraged, it is estimated that the value to Indonesia's domestic sectors could grow by more than 18-fold to reach IDR 2,305 trillion (US$172 billion) by 2030.

- **Digital exports account for only 1 percent of Indonesia's total export value today, but this value could grow rapidly in the right conditions.** The export value of virtual goods and services enabled by the digital economy, such as e-commerce, account for IDR 28 trillion (US$2 billion) in exports today. Constituting only 1 percent of Indonesia's total export value, this value is relatively low even as compared against neighbouring economies. For example, though the size of Indonesia's GDP is three times as large as Malaysia's, the value of

1. Indonesia's information minister Rudiantara, reported by Reuters, March 7, 2016 - http://www.reuters.com/article/indonesia-retail-idUSJ9N14Y02J
2. McKinsey Global Institute (2016), Digital globalization: The new era of global flows.
Available at: https://www.mckinsey.com/business-functions/digital-mckinsey/our-insights/digital-globalization-the-new-era-of-global-flows

its digital exports is less than a third of Malaysia's. Nonetheless, in the absence of barriers to digital trade, it is estimated that Indonesia's digital exports could grow by 768 percent from today's levels to reach IDR 240 trillion (US$18 billion) in 2030.

- **To achieve the maximum returns to digital trade in future, it is imperative to consider reducing digital trade barriers today.** Policymakers in Indonesia and across the Asia Pacific are rushing to develop regulations for the digital economy. While Indonesia has made some promising reforms (such as the raising of the de minimis thresholds on inbound shipments), proposed data localisation requirements and the imposition of custom duties on digital imports could significantly impact data flows and undermine the country's ability to capture the digital opportunity. There is the opportunity for Indonesia to play a leading role, not only at home, but also abroad in pushing for facilitative digital trade rules in its various bilateral and multilateral trade negotiations.

The report is structured into three chapters. Chapter 1 examines the current and potential impact of digital trade at home and quantifies the economic value of technological gains enabled by digital trade. Chapter 2 assesses the current and future potential value of digital exports for the Indonesian economy. Chapter 3 highlights some of the concerns related to digital trade and how they can be addressed, and identifies the priorities for Indonesia to capture the digital trade opportunity.

EXHIBIT 1:

INDONESIA IS ALREADY REAPING SIGNIFICANT VALUE FROM DIGITAL TRADE, BUT THE FUTURE VALUE COULD BE SIGNIFICANTLY HIGHER

TOTAL ECONOMIC VALUE FROM DIGITAL TRADE

	Value of digital flows to the domestic economy	+	Value of digital exports
SOURCES OF VALUE			
DESCRIPTION	The value of digital flows for creating positive economic impact in the domestic economy through supporting adoption of digital technologies, including in traditional sectors (e.g. manufacturing, agriculture)		The value of export of virtual goods (e.g., apps, digital content) and of physical products enabled by digital (e.g., e-commerce)
VALUE TODAY (2017)	Digital trade enables up to **IDR 125 trillion** of economic value in the domestic economy		**11th** largest export sector in the Indonesian economy, worth **IDR 28 trillion**
FUTURE POTENTIAL (2030)	Potential for digital trade to enable up to **IDR 2,305 trillion** of economic value		Potential for digital exports to grow by **768 percent** by 2030, worth **IDR 240 trillion**

SOURCE: AlphaBeta analysis

BOX 1.
DEFINING DIGITAL TRADE AND ITS COMPONENTS

At present, there is no consensus about the meaning of digital trade. Part of what makes defining digital trade difficult is the rapidly changing nature of the digital economy. Different definitions have been used by various international organisations. The World Trade Organisation (WTO) has generally employed the term "electronic commerce" rather than "digital trade", defining it as "the production, distribution, marketing, sale or delivery of goods and services by electronic means".[3] The definition used by the United States International Trade Commission (USITC) is broader and includes the provision of e-commerce platforms and related services, but excludes the value of sales of physical goods ordered online, as well as physical goods that have a digital counterpart (such as books, movies, music, and software sold on CDs or DVDs).[4] The United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) recognises that while the narrowest definition of "digital trade" is "trade in digitised products" (i.e. trade in products with digital elements such as films and e-books, and in digital services such as IT and telecommunication services), a broader definition relates to "the use of digital technologies (ICTs) to conduct business".[5]

This research employs a broad definition of "digital trade" which covers the production, distribution, marketing, sale or delivery of goods and services – domestically and abroad – supported by cross-border data flows. This consists of (a) trade in digitally-enabled products and services, and (b) cross-border data flows that create economic value in the domestic economy. Both components of digital trade are analysed in this report:[6]

- **Trade in digitally-enabled products and services.** There are three components to this: a) Digitally-enabled products; b) digitally-enabled services; c) indirect digital services. For the purpose of this research, the value of exports in these components are estimated:

1. **Digitally-enabled products.** These refer to physical and digitised products that are traded electronically via the Internet, e.g. overseas digital downloads of local apps, or sales of physical products to overseas markets through cross-border e-commerce platforms.[7]

2. **Digitally-enabled services.** These refer to services that are provided using digital technologies. This is a large category because most industry sectors have adopted digital technologies and sell e-services to varying degrees. This includes online advertising (viewed from abroad), digital IT-BPO[8] services and the export of data processing and online software consultancy services. It also includes trade in other direct e-services such as online tourism booking and electronic banking; however, these categories are currently not able to be measured in a robust manner due to the lack of granularity in available data.

3. **Indirect digital services (embedded in other exports).** These refer to imported digital services that get used in the export

3. UNESCAP (2016), Internal trade in a digital age. Available at: http://www.unescap.org/sites/default/files/aptir-2016-ch7.pdf
4. U.S. International Trade Commission (2017), Global Digital Trade 1: Market Opportunities and Key Foreign Trade Restrictions. Available at: https://www.usitc.gov/publications/332/pub4716.pdf.
5. UNESCAP (2016), Internal trade in a digital age. Available at: http://www.unescap.org/sites/default/files/aptir-2016-ch7.pdf
6. The detailed methodology is explained in an accompanying methodology document, which can be found on the Hinrich Foundation website (http://hinrichfoundation.com/trade-research/).
7. This research defines cross-border e-commerce platforms as Internet-enabled platforms that facilitate the selling and buying of products and services across national borders, where the seller and buyer are in different countries. This includes both B2B and B2C e-commerce. However, the analysis in this research focuses largely on B2C e-commerce due to the availability of existing data.
8. IT-BPO stands for Information Technology-Business Processing Outsourcing. This refers to the contracting of non-primary business activities and functions with digital components to a third-party provider. Examples of IT-BPO services include payroll administration, data management and customer/call centre relations.

of other products and services. Examples include telecommunication services such as email, video conferencing, digital file sharing, and Voice Over Internet Protocol (VOIP) services that are used by a mining firm exporting overseas.

- **Cross-border data flows.** This does not reflect 'international trade' in its conventional sense, i.e. transactions involving the exchange of goods and services for money, that are conducted between two parties located in different countries. Rather, cross-border data flows entail the exchange of data across national borders that create economic value, but which may not necessarily be associated with monetary transactions nor interaction between two parties (in many cases, it involves exchanges within the same company). Cross-border data flows take place for a variety of reasons including business processing (e.g. international supply chain data used to guide inventory stocking decisions at a company's retail stores worldwide) and operational efficiency improvements (e.g. data flows enabling Internet banking functions overseas so that consumers wishing to access bank accounts from abroad can do so). This research estimates the economic impacts cross-border data flows create for the domestic economy. These are not represented in terms of GDP or market size, but rather in terms of economic value, which relates to consumer surplus, productivity gains and cost savings. Six key channels (which are discussed further in Chapter 1) have been identified by which digital trade supported by cross-border data flows is important for boosting productivity, creating new revenue streams, or lowering costs in the domestic economy.

THE VALUE AT HOME FROM DIGITAL TRADE

Digital trade is supporting up to IDR 125 trillion (US$9.3 billion) of economic benefits in Indonesia today through enabling digital technologies that increase worker productivity, lower costs and create new sources of revenue. This is equivalent to just 0.9 percent of Indonesia's GDP, suggesting untapped potential considering other ASEAN economies such as Malaysia are experiencing economic benefits of about 2 percent of their GDP. The relatively low penetration rates of these digital technologies today suggests large potential for higher impact in the future. By 2030, this could grow by more than eighteen-fold, reaching IDR 2,305 trillion (US$172 billion).

UNDERSTANDING HOW DIGITAL TRADE IMPACTS DAY-TO-DAY OPERATIONS

This research adopts a broad definition of "digital trade" which relates to cross-border data flows, i.e. the exchange of data across national borders that create economic value (see Box 1 for the detailed definition). In this chapter, the economic impacts which cross-border data flows create for Indonesia's domestic economy have been estimated. To do this, six key channels have been identified through which digital trade is important for boosting productivity or lowering costs for Indonesian sectors (Exhibit 2).

- **Identifying and entering new markets.** New digital tools ranging from simple internet search engines to cloud computing, which are heavily reliant on cross-border data flows, can boost the export capabilities of firms, particularly micro, small and medium-sized enterprises (MSMEs). This allows these firms to operate with ease across geographies and tap into international supply chains, compete with larger exporters, and connect with consumers, suppliers, and investors across the globe. Analysis by the Asia Pacific MSME Trade Coalition (AMTC) estimates that digital tools could lower export costs of an average MSME by as much as 82 percent and reduce time involved in exporting for MSMEs by up to 29 percent.[9]

- **Reducing cost and increasing speed of data storage, processing and access.** High data generation is more likely to lead to cross-border flows, in part due to storage requirements. For example, data processing is 5 to 7 percent of the total input costs in sectors such as financial services.[10] Related to this, storing data in a number of geographic locations can enhance recovery management.

- **Supporting collaboration.** Some activities may be particularly complex, and the sharing of data across borders enables better collaboration between talents. This could include talent for the analysis of data or it could relate to the use of human-guided robotics. For example, remote robotic surgery allows complex operations to be completed even when those surgeons may not be in the same country. A further example is how cross-border data flows can enable researchers around the world to share insights, design experiments and analyse the results in a collaborative and real-time manner.[11]

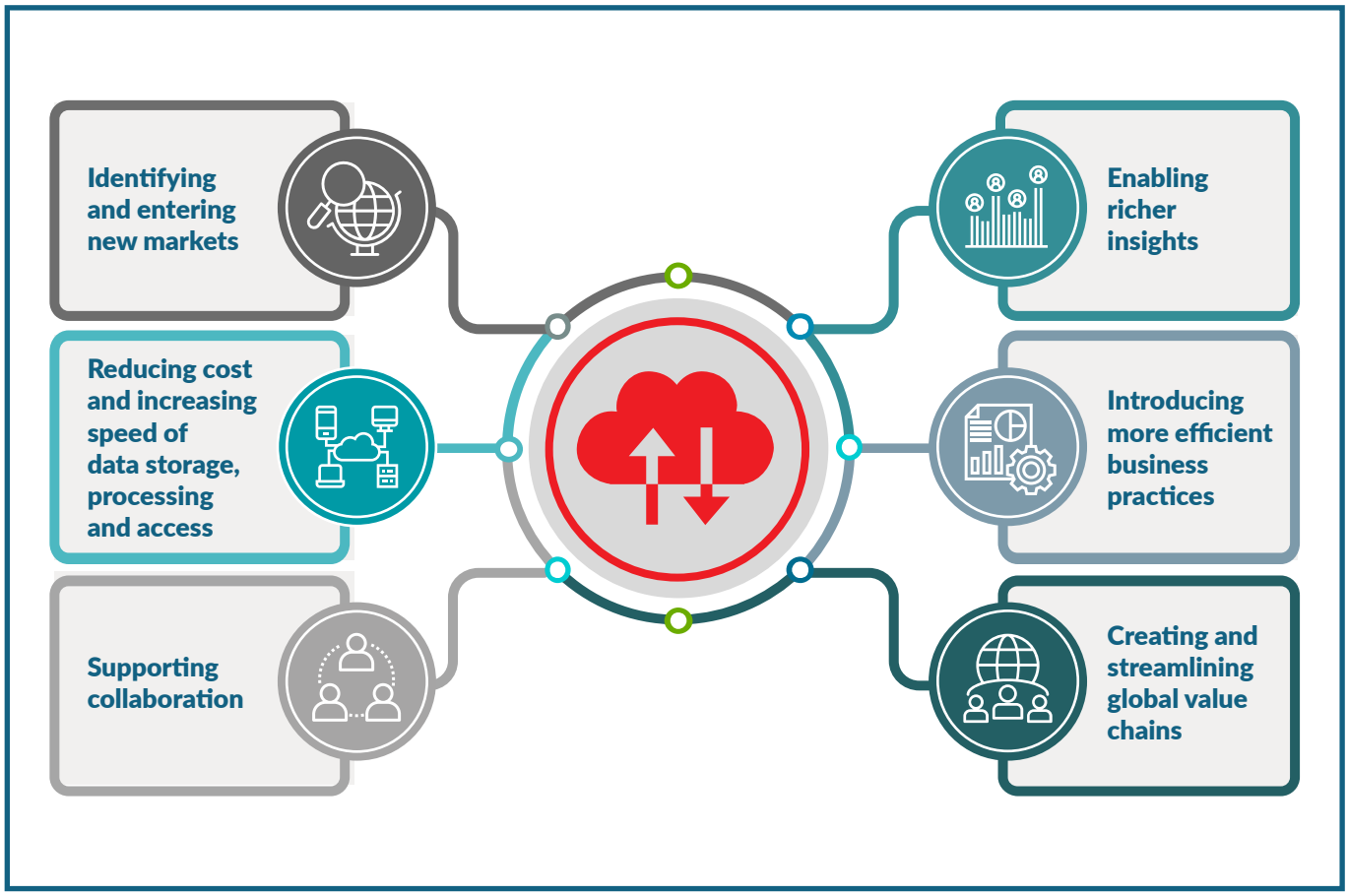
- **Enabling richer insights.** Used the right way, data can help companies improve products and make more informed business decisions. Analysis of the simplest datasets can lead to robust insights that inform important business decisions. For example, data on warehouse and point-of-sales inventory can allow retailers to optimise re-stocking through better forecasting of production and shipment needs, which could lead to increased sales.

- **Introducing more efficient business practices.** Digital trade can be a critical enabler of greater operational efficiency for businesses. This could include providing greater accessibility of data for clients across geographies (for example, Indonesian consumers wishing to access their bank accounts from overseas), enabling digital platforms to conduct routine operations such as collection and exchange of data, and outsourcing operations to locations with a comparative advantage in the provision of required services.

9. Asia Pacific MSME Trade Coalition (2018), Micro-Revolution: The new stakeholders of trade in APAC.
10. Matthias Bauer et al. (2014), The costs of data localization: Friendly fire on economic recovery, European Centre for International Political Economy (ECIPE). Available at: http://www.ecipe.org/app/uploads/2014/12/OCC32014__1.pdf
11. Joshua Paul Meltzer (2014), "The Internet, Cross-Border Data Flows and International Trade", Asia & the Pacific Policy Studies, vol. 2, no. 1. Available at: https://onlinelibrary.wiley.com/doi/epdf/10.1002/app5.60

EXHIBIT 2:

DIGITAL TRADE SUPPORTS PRODUCTIVITY, GROWTH AND COST EFFICIENCY THROUGH SIX MAIN CHANNELS



- **Creating and streamlining global value chains.** Digital data flows can help create efficiencies in real-time monitoring and decision-making to support global value chains. For example, businesses are able to receive customer orders in real time and adjust production processes accordingly. Likewise, Internet of Things (IoT) monitoring of the transit of goods across countries enables better control over supply chains, creating significant logistical benefits.

> "This research adopts a broad definition of 'digital trade' which relates to cross-border data flows, i.e. the exchange of data across national borders that create economic value."

THE ECONOMIC VALUE OF DIGITAL TRADE FOR DOMESTIC SECTORS

To understand the economic value of digital trade for Indonesia's domestic sectors, a set of relevant technological applications for different sectors of the Indonesian economy were identified based on an extensive review of the academic literature (Exhibit 3).[12] The importance of digital trade was then assessed for each technological application, based on factors related to the six channels highlighted above, including (a) the volume of data generated (requiring more efficient storage requirements); (b) the scale requirements to draw insights (which cross-border data flows can facilitate by enabling pooling of data); (c) the complexity of the activity (and hence the potential need for cross-border collaboration); and (d) whether the activity to which the technology is being applied is itself cross-border in nature.

The value of these applications was sized both for 2017 and 2030. Economic value supported by digital trade across the major sectors in the Indonesian economy is estimated to be up to IDR 125 trillion in 2017. Though this number may seem substantial, it is equivalent to only 0.9 percent of Indonesia's GDP, paling in comparison with economies such as Malaysia where the economic value from digital trade is equivalent to about 2 percent of its GDP. Indonesia faces a critical opportunity to rein in more of this value by reducing the barriers to digital trade. In addition, low technology penetration rates today mean there is great untapped potential for Indonesia. If digital trade is fully leveraged, it is estimated that the economic value to Indonesia's domestic sectors could increase by more than eighteen-fold to as much as IDR 2,305 trillion by 2030 (Exhibit 4).

Some of the main opportunities and examples by sector include:[13]

- **Agriculture and Food.** Although this sector is Indonesia's largest employer (accounting for 41 percent of its workforce), Indonesian farms fall behind their Southeast Asian peers in terms of productivity and yield.[14] By enabling international

12. The detailed methodology is explained in an accompanying methodology document, which can be found on the Hinrich Foundation website (http://hinrichfoundation.com/trade-research/).
13. The descriptions below only include a subset of the total technologies analysed in this research. See the methodology document for a more extensive discussion of the analysis, which can be found on the Hinrich Foundation website (http://hinrichfoundation.com/trade-research/).
14. Far Eastern Agriculture (2015), "Bringing big data to farming in Indonesia."
Available at: http://www.fareasternagriculture.com/technology/machinery-a-equipment/bringing-big-data-to-farming-in-indonesia

collaboration between talents through the sharing of data across borders, digital trade is important for increasing value-adding information to local farmers and in turn help them increase yields, minimise waste, and boost revenue for Indonesian farmers. For example, local data analytics firm Dattabot partnered with Predix, an international cloud-based platform designed to store and process industrial-scale amounts of data, as well as with General Electric (GE) Digital which provided technical expertise to the app development process. Through this process, it developed HARA – a smart farming solution designed to help Indonesian farmers improve yields by providing data-driven insights into farm and field potential, input and supply management and the proactive mitigation of pests and disease.[15]

- **Consumer & Retail.** Indonesia is the largest e-commerce market in the ASEAN region and is projected to grow at a staggering 38 percent per annum. Local players are also leading the charge, including enterprises such as Tokopedia and Bukalapak.[16] Such enterprises leverage international digital platforms and services to enhance their customer offerings. For example, Tokopedia uses the services of Appier, a company which provides artificial intelligence platforms to enhance the efficiency of customer-facing platforms in 14 markets across Asia.[17] This service allowed Tokopedia to increase their monthly transaction volume by up to 202 percent, leading to month-on-month revenue increases of up to 179 percent.[18] Beyond increasing the company's sales, the benefits also extend to the 5 million local small-to-medium enterprises that Tokopedia facilitates selling for through its platform.[19] This service has enabled local merchants to send millions of products per month to customers across Indonesia, in turn also creating more jobs across the nation.[20] By enabling cross-border data exchanges, digital trade is crucial for enhancing the productivity of Indonesia's e-commerce players and unlocking more domestic economic activity and jobs.

- **Infrastructure.** Technologies such as predictive maintenance of utilities, smart ports and smart roads are key to driving efficiencies in this sector. PT Pembangkitan Jawa-Bali (PJB), the largest subsidiary of Indonesia's national power utility, is leveraging General Electric's digital asset performance analytics and operations optimisation system to enhance the efficiency of their assets.[21] Data will be sent from PJB to remote

15. General Electric (2017), "Databot and GE work together to secure the future of agriculture in Indonesia". Available at: https://www.ge.com/digital/sites/default/files/download_assets/Dattabot-GE-Predix-case-study.pdf
16. Frost and Sullivan (2016), Analysis of Southeast Asian e-commerce market. Available at: http://www.frost.com/sublib/display-report.do?id=P8F7-01-00-00-00&bdata=aHR0cHM6Ly93d3cuZ29vZ2xlLmNvbS5zZy9AfkBCYWNrQH5AMTUzMjY2NTAzNDMyNA%3D%3D
17. Appier Company Profile. Available at: https://www.appier.com/en/corporate.html
18. Appier, "Success story: A growing Asian brand". Available at: https://www.appier.com/en/caseDetailTokopedia.html
19. Shweta Modgil (2017), "How Tokopedia aims to better shape Indonesia by becoming Indonesia's Taobao." Inc42. Available at: https://inc42.com/indonesia/tokopedia-ecommerce-indonesia/
20. Demystify Asia (2016), "Tokopedia – Indonesia's largest online marketplace." Available at: http://www.demystifyasia.com/tokopedia/
21. General Electric (2017), "PJB spearheads digital energy for Indonesia with deployment of GE digital power plant software." Available at: https://www.ge.com/reports/digital-power-solutions-help-indonesia-save-us1-billion-annually-2/

EXHIBIT 3:
EXAMPLES OF RELEVANT TECHNOLOGIES BY SECTOR IN INDONESIA

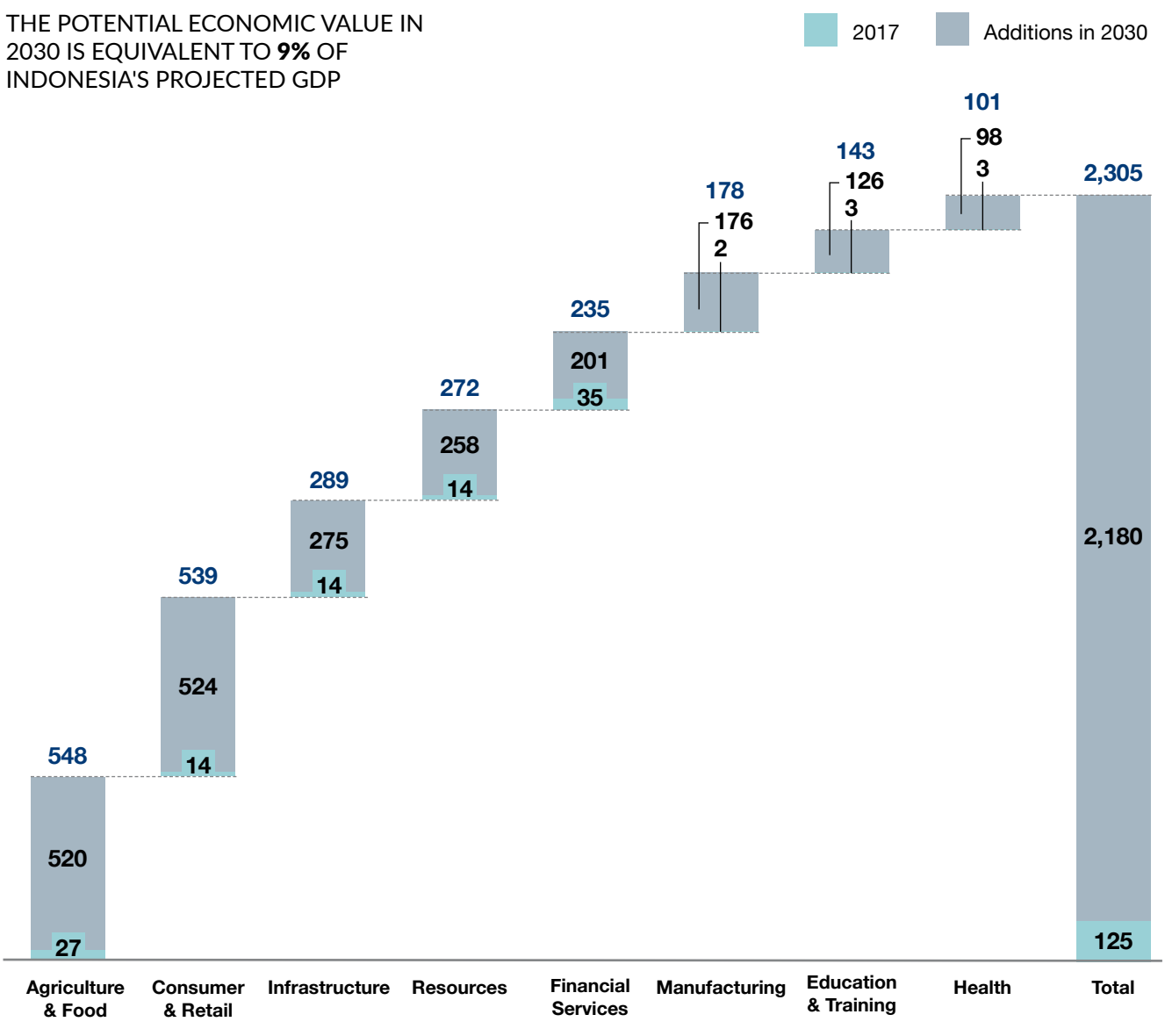
Resources	• Smart exploration • Autonomous mining equipment • Predictive safety • Performance monitoring
Financial Services	• Big data analytics • Digitising marketing, distribution and service • Reg tech • Financial inclusion through mobile payments
Agriculture & Food	• Precision farming • Supply chain management • Food safety • Real-time market information
Manufacturing	• Big data analytics • Additive manufacturing • IoT-enabled supply chain management
Health	• Remote patient monitoring • Telehealth • Data-based public health Interventions • Detection of counterfeit drugs • Smart medical devices • AI-enabled diagnostics
Infrastructure	• Smart grids • 5D BIM & project management technologies • Predictive maintenance • Smart buildings • Smart roads • Smart ports
Consumer & Retail	• Digitising channels • Inventory management • Analytics-driven products and services
Education & Training	• E-career centres and digital jobs platforms • Personalised learning • Online retraining programmes

EXHIBIT 4:

DIGITAL TRADE IS SUPPORTING UP TO IDR 125 TRILLION OF ECONOMIC BENEFITS IN INDONESIA, WHICH COULD GROW TO IDR 2,305 TRILLION BY 2030

POTENTIAL ANNUAL ECONOMIC VALUE[1,2]
IDR TRILLION, 2017 AND 2030 (HIGH-END SCENARIO)

THE POTENTIAL ECONOMIC VALUE IN 2030 IS EQUIVALENT TO **9%** OF INDONESIA'S PROJECTED GDP



1. These estimates do not represent GDP or market size (revenue), but rather economic value, including consumer surplus. The sizing includes the economic value that is both "somewhat enabled" and "highly enabled" by digital trade.
2. Due to rounding to the nearest billion, the numbers in this table may not add up precisely to the totals indicated.

SOURCE: AlphaBeta analysis

monitoring, diagnostics and optimisation centres for processing and analytics, before algorithm-based recommendations are sent to the individual power plants in real-time. This has the potential to reduce energy losses by up to 3 percent, generating annual savings of up to US$1 billion for Indonesia.[22] Digital trade is crucial for many of these infrastructure-related technologies due to the need for cross-border data flows (for remote data aggregation and analytics), the large volume of data generated (requiring cost-efficient and secure storage), and the need for collaboration and cross-border monitoring (for example, in the tracking of containers).

- **Resources.** Though Indonesia is endowed with vast energy and mineral reserves such as oil, gas, coal, tin and geothermal resources, a substantial proportion of this remains untapped.[23] Smart exploration approaches drawing on big data have the potential to uncover more opportunities in Indonesia's resource landscape, while technologies such as autonomous drills and predictive maintenance and safety applications will augment productivity in drawing from existing reserves. Digital trade is crucial for technologies in the resources sector due to the need for cost efficient data gathering and storage solutions, as well as the need to access global talent to analyse data.

- **Financial Services.** Indonesia has one of the lowest rates of financial inclusion today, with less than 50 percent of its adult population being banked.[24] Although brick-and-mortar banks continue to be the key driver of financial inclusion today, given Indonesia's geographical spread, high mobile ownership and active remittance market, there is great potential for digital financial services and mobile money that offer greater reliability of transfers and low transactional fees in the Indonesian market.[25] According to InterMedia's Financial Inclusion Insights survey, 21 percent of Indonesians who needed credit said they could not access it because they did not know of a proximate point of service.[26] For these digital financial and mobile money services to boost penetration rates, digital trade is critical for helping to lower the costs of storing high volumes of sensitive data in a secure fashion, and due to the cross-border flows of remittances and payments, with data needing to move seamlessly across countries.

- **Manufacturing.** The Indonesian government aims to encourage greater adoption of digital technologies to boost its manufacturing industry's competitiveness through its recent launch of its 'Making Indonesia 4.0' industry roadmap, which it hopes will help create 10 million new jobs by 2030.[27] Digital trade is essential to enabling this digital revolution by enabling seamless monitoring of cross-border supply chains and leveraging global collaboration to optimise production processes.

- **Education & Training.** Digital technologies hold the promise of enhancing the quality of instruction, improving the productivity of teaching and support staff, and enhancing the matching of labour demand and supply. Digital job platforms can potentially boost Indonesia's GDP by 2.2 percentage points and create over 3.8 million jobs by 2030 by reducing search costs and enhancing the efficiency of job matches.[28] At 6 million users as of July 2018,

22. General Electric (2017), "PJB spearheads digital energy for Indonesia with deployment of GE digital power plant software." Available at: https://www.ge.com/reports/digital-power-solutions-help-indonesia-save-us1-billion-annually-2/
23. McKinsey Global Institute (2012), The archipelago economy: Unleashing Indonesia's potential. Available at: https://www.mckinsey.com/featured-insights/asia-pacific/the-archipelago-economy
24. Data from The Global Findex Database 2017. Available at: https://globalfindex.worldbank.org/
25. InterMedia (2017), Financial inclusion in Indonesia: Lessons from the 2016 FII data. Available at: http://finclusion.org/blog/fii-updates/financial-inclusion-in-indonesia-lessons-from-the-2016-fii-data.html
26. InterMedia (2017), Financial inclusion in Indonesia: Lessons from the 2016 FII data. Available at: http://finclusion.org/blog/fii-updates/financial-inclusion-in-indonesia-lessons-from-the-2016-fii-data.html
27. Julien Hanoteau and Virginie Vial (2018), "'Making Indonesia 4.0' and supporting digital startups is good, but what about the small low-tech entrepreneurs?" The Conversation. Available at: https://theconversation.com/making-indonesia-4-0-and-supporting-digital-startups-is-good-but-what-about-the-small-low-tech-entrepreneurs-93863

Indonesia currently has the second highest number of users within Southeast Asia on the professional networking portal, LinkedIn, after the Philippines.[29] Digital trade is important for many of these opportunities given the scale benefits from pooling a large number of insights (both in terms of learning results, but also in cross-border job matching).

- **Health.** Overseas data management platforms enabled by digital trade can support digital solutions that help improve the quality of healthcare services in Indonesia. To improve the efficiency of the small, typically single doctor-run medical clinics which comprise a large proportion of healthcare services in Indonesia, local start-up Medigo developed a web and mobile-based application to automate and streamline workflows ranging from administrative doctor scheduling and patient registration processes to drug and patient record management.[30] The start-up currently serves over a hundred clinics, and is planning to expand this to over a thousand.[31] To achieve this scale, Medigo leverages overseas cloud management tool 'Amazon Web Services' for affordable and reliable data storage and management, as well as overseas-based data repository and management tool 'Bitbucket' to coordinate the codes being developed by the team across different parts of Indonesia.[32] As co-founder and CEO of Medigo, Mr Harya Bimo, states, "A lot of the collaboration in the development of codes are done in an online repository outside of Indonesia. Although our developers are based in Indonesia, they are working in different regions – Malang, Yogyakarta and Jakarta. Having this online repository that manages simultaneous coding processes greatly increases our productivity."[33]

28. McKinsey Global Institute (2015), A labor market that works: Connecting talent with opportunity in the digital age. Available at: https://www.mckinsey.com/~/media/McKinsey/Business%20Functions/McKinsey%20Digital/Our%20Insights/Digital%20globalization%20The%20new%20era%20of%20global%20flows/MGI-Digital-globalization-Full-report.ashx
29. Data from Statista. Available at: https://www.statista.com/statistics/272783/linkedins-membership-worldwide-by-country/
30. Medigo (2018). Available at: https://medigo.id/qlinik
31. Interview with Mr Harya Bimo, Co-Founder and CEO of Medigo.
32. Interview with Mr Harya Bimo, Co-Founder and CEO of Medigo.
33. Interview with Mr Harya Bimo, Co-Founder and CEO of Medigo.

THE VALUE OF DIGITAL EXPORTS FOR INDONESIA

Indonesia's digital exports in 2017 are estimated to be worth over IDR 28 trillion (US$2 billion). This makes it the country's 11th largest export sector, accounting only for 1.2 percent of its total export value. This value is relatively low in comparison with other ASEAN economies – for example, though the size of Indonesia's GDP is three times as large as Malaysia's, the value of its digital exports is less than a third of Malaysia's. However, if digital trade is fully enabled, Indonesia's digital exports could potentially grow more than 8.5x in value from today's levels to reach IDR 240 trillion (US$18 billion).

THE VALUE OF INDONESIA'S DIGITAL EXPORTS

There is vast potential for improvement to the value of Indonesia's digital exports today. Estimated to be currently worth IDR 28 trillion, these exports are equivalent to only 1 percent of the country's total export value. This is significantly low when compared against other ASEAN economies such as Malaysia's, whose digital exports account for 3 percent of its total export value. Further, although the size of Indonesia's economy is three times as large as Malaysia's, the value of its digital exports is less than a third of Malaysia's. However, it is estimated that the value of Indonesia's digital exports could grow by 768 percent in 2030, if digital trade is fully leveraged (Exhibit 5).

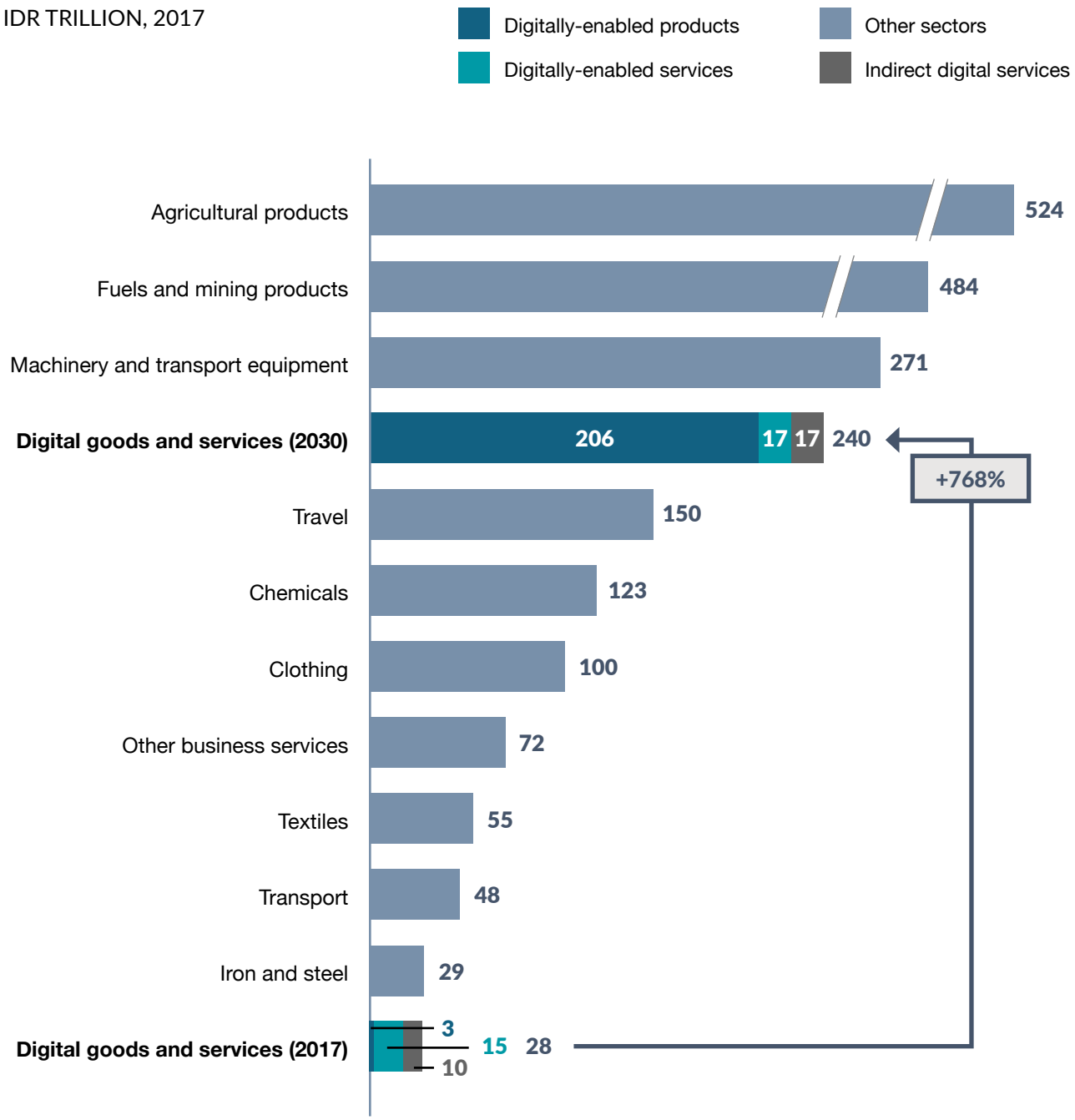
It should be noted that this report's estimate of the value of digital exports is conservative, due to data constraints. For digitally-enabled products, the value of products exported via cross-border e-commerce platforms only focuses on Fast Moving Consumer Goods (FMCG) and not other categories of goods where e-commerce could be important, due to the availability of data. Since a large proportion of FMCG goods are B2C in nature, the estimate of e-commerce exports would likely approximate the value of B2C e-commerce. Similarly, the value of digitally-enabled services only focuses on a subset of services where robust data is available.

EXHIBIT 5:

IF DIGITAL WERE A SECTOR, IT WOULD REPRESENT INDONESIA'S 11TH LARGEST EXPORT SECTOR, AND COULD INCREASE BY 768 PERCENT BY 2030

VALUE OF EXPORTS FOR INDONESIA[1]

IDR TRILLION, 2017



1. Due to rounding to the nearest billion, the numbers in this table may not add up precisely to the totals indicated.

SOURCE: WTO (data on 19 other sectors); AlphaBeta analysis

DIGITALLY-ENABLED PRODUCTS

The value of these exports is currently IDR 2.6 trillion (US$194 million) and could grow by eighty times the current value by 2030, reaching IDR 206 trillion (US$15 billion). This huge growth is expected to be driven by rapidly expanding e-commerce exports due to the projected growth of e-commerce markets in the region.

- **E-commerce.** E-commerce platforms can be crucial gateways to connect firms to export markets and provide a new source of future growth for traditional sectors such as manufacturing. Approximately 12 percent of the global goods trade is now conducted via international e-commerce, with much of it driven by platforms such as Alibaba, Amazon, eBay, Flipkart, and Rakuten.[34]

  The e-commerce export opportunity is substantial. Data from eBay shows that Indonesian businesses on their platform are much more likely to be involved in exporting than those not using the platform; in fact, 100 percent of Indonesian SMEs on the eBay platform do so.[35]

  Based on average export revenue data and eBay data on the proportion of sellers on their platform who export, it is estimated that e-commerce generated over IDR 2.6 trillion (US$194 million) of export revenues for Indonesia in 2017, which could grow to over IDR 206 trillion (US$15 billion) by 2030 based on the forecasted growth of e-commerce markets in nearby countries.[36] One example of an Indonesian company taking advantage of the e-commerce export opportunity is Indonesia-Product.com, the online business

34. McKinsey Global Institute (2016), Digital globalization: The new era of global flows. Available at: https://www.mckinsey.com/~/media/McKinsey/Business%20Functions/McKinsey%20Digital/Our%20Insights/Digital%20globalization%20The%20new%20era%20of%20global%20flows/MGI-Digital-globalization-Full-report.ashx
35. eBay (2016), Small Online Business Growth Report. Available at: https://www.ebaymainstreet.com/sites/default/files/ebay_global-report_2016-4_0.pdf
36. Based on AlphaBeta analysis.

BOX 2. INDONESIA-PRODUCT.COM

Phoro source: http://indonesia-product.com/listing/smesco-indonesia.html

Indonesia-Product.com is an online platform for Indonesian merchants to promote their websites globally to facilitate sales in foreign markets. Today, Indonesia-Product.com has over a thousand members consisting largely of small businesses whose product offerings range from furniture, garment, paper, handicraft, food, and other local Indonesian products.

directory which is bridging the gap between traditional businesses and digital adopters (See Box 2).

However, most Indonesian businesses have yet to tap the export opportunity, with less than 7 percent of them being engaged in exporting in 2015 (versus 11 percent in Malaysia).[37] Within Indonesia, only 2 percent of the country's total domestic retail sales are currently done via the internet.[38] Small and Medium Enterprises (SMEs), in particular, still face substantial challenges in bridging the gap to global markets. This is in part due to Indonesia's challenging geography, relatively slow internet connection speeds and ICT infrastructure, and low adoption of cashless payment systems.[39]

To address these issues and maximise the opportunities from e-commerce, the Indonesian government issued the 'E-Commerce Road Map for the Year of 2017-2019' to support growth in the national e-commerce sector. This sets out guidelines for consumer protection, logistics, ICT infrastructure and funding for e-commerce start-ups.[40]

- **Digital apps.** Indonesian app developers have largely yet to seize the export opportunity. However, several success stories do show that innovative Indonesian companies can successfully compete abroad and create strong export markets for their apps. For example, Inovidea Magna Global is an Indonesian mobile app development firm that has been able to penetrate foreign markets. Inovidea's photo editing app PicMix has been downloaded globally by more than 5 million users. Interestingly, the biggest group of PicMix users, after Indonesia, resided in South Africa.[41]

37. *The Balance – Small Business (2018) Export Potential in Indonesia. Available at: https://www.thebalancesmb.com/export-potential-in-indonesia-1953479; and World Bank Enterprise Surveys. Available at: http://www.enterprisesurveys.org/Custom-Query*
38. *AusTrade-Australia Unlimited (2018), E-commerce in Indonesia.*
39. *Vasundhara Rastogi (2018), "Indonesia's e-commerce sector – market potential and challenges". Available at: https://www.aseanbriefing.com/news/2018/09/06/indonesias-e-commerce-sector-market-potential-challenges.html*
40. *International Law Financial Review (2016), "Indonesia: e-commerce policy". Available at: http://www.iflr.com/Article/3647745/Indonesia-E-commerce-policy.html*
41. *Novia D. Rulistia (2015), "The rise of local app developers." The Jakarta Post. Available at: http://www.thejakartapost.com/news/2015/12/15/the-rise-local-app-developers.html*

DIGITALLY-ENABLED SERVICES

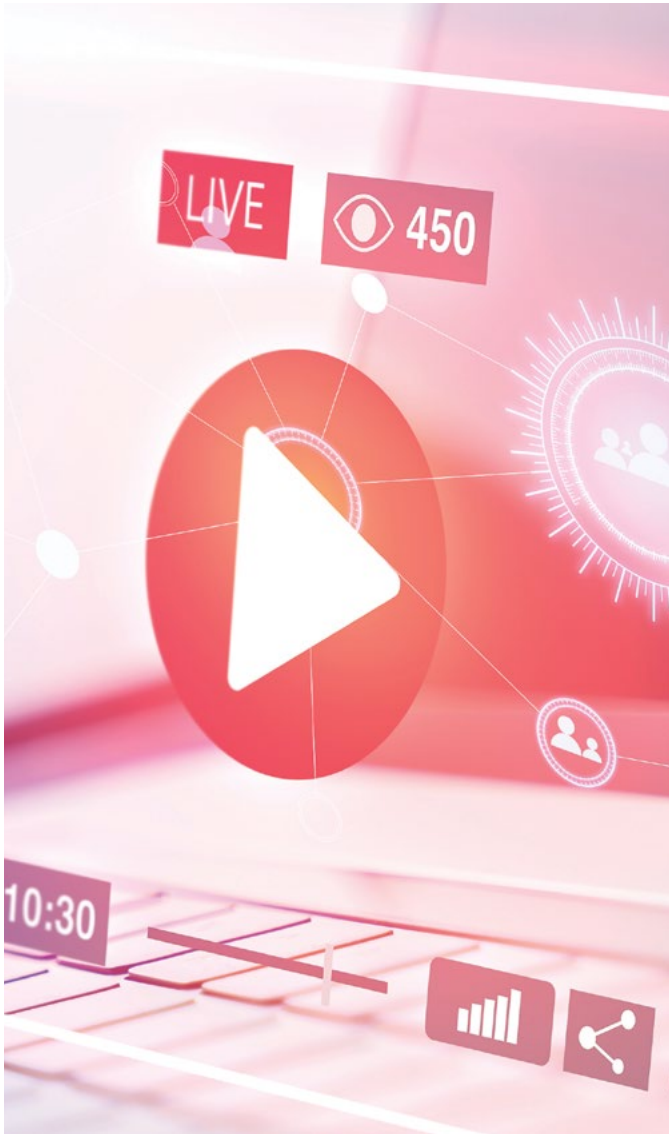
The value of these exports is currently IDR 15 trillion (US$1.1 billion) and could grow by 13 percent by 2030, reaching IDR 17 trillion (US$1.3 billion). This growth is expected to be largely driven by Indonesia's digital infrastructure services exports.

- **Digital infrastructure services.** This includes telecommunication services such as the export of email, video conferencing, digital file sharing, and Voice Over Internet Protocol (VOIP) services as well as data processing. Indonesia's digital exports of infrastructure services in 2017 are estimated to be IDR 15 trillion (US$1 billion).[42]

- **Online video advertising.** With the advent of online video sharing platforms such as YouTube, Vimeo and Facebook, Indonesian stories and voices are finding new global audiences.

  The demand for Indonesian content and the economic opportunities associated with them is growing. In 2014, 44 percent of the views of YouTube content uploaded by users in Indonesia came from outside the country.[43] For example, Raditya Dika, a stand-up comic with a YouTube channel, is one of the top Indonesian YouTubers with over 4.3 million subscribers and 550 million views on his channel.

  Online video platforms are estimated to have supported over IDR 46 billion (US$3 million) in advertising revenues from foreign markets for business in Indonesia in 2017. These revenues reflect the incomes earned by Indonesians from advertisements displayed on their content. This could potentially grow to over IDR 497 billion (US$37 million) in 2030 based on the forecasted growth of the digital advertising market.[44] This is in addition to the large, but difficult to size, value of direct digital services exports in industries such as tourism (including online ticket booking), financial services, accounting, law, education and even medicine.



42. Based on AlphaBeta analysis.
43. OECD (2016), Economic and social benefits of Internet openness.
Available at: https://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=DSTI/ICCP(2015)17/FINAL&docLanguage=En
44. Based on AlphaBeta analysis.

EXHIBIT 6:

COMEDY

- **Who:** Raditya Dika
- **Channel:** Raditya Dika
- **Detail:** Stand-up comedy sessions, skits, vlogs, casual interviews with celebrities and reaction videos
- **Subscribers:** >4.3 million
- **Views:** >550 million

VLOGGER

- **Who:** Ria Ricis
- **Channel:** Ricis Official
- **Detail:** Vlogs and challenges
- **Subscribers:** >4.6 million
- **Views:** >584 million

CELEBRITY

- **Who:** Family of 13
- **Channel:** GEN HALILINTAR
- **Detail:** Lifestyle, music, and challenges
- **Subscribers:** >3.4 million
- **Views:** >715 million

GAMES

- **Who:** Reza Oktavian
- **Channel:** rezaoktavian
- **Detail:** Games, music
- **Subscribers:** >2.2 million
- **Views:** >382 million

INDIRECT DIGITAL SERVICES

Imported digital services are crucial for enabling the growth of the exports of non-digital sectors. In traditional sectors such as manufacturing, imported digital services, such as email, video conferencing, Voice Over Internet Protocol (VOIP), digital file sharing and data processing help Indonesian firms in reaching new markets. For instance, Toyota Indonesia's workers faced significant productivity hurdles due to Jakarta's notorious traffic jams. Toyota decided to leverage Microsoft's cloud technologies (such as SharePoint and Skype) to provide more flexible collaboration opportunities through digital technology.[45] In 2017, the impact of imported digital services on exports in all other sectors in Indonesia is estimated at just under IDR 9 trillion (US$672 million), which could grow to IDR 17 trillion (US$1.3 billion) in 2030.[46]

45. Microsoft (2017), "Toyota Indonesia boosts employee productivity and collaboration."
Available at: https://customers.microsoft.com/en-us/story/toyota-indonesia-manufacturing-microsoft-services
46. Based on AlphaBeta analysis.

CAPTURING THE DIGITAL TRADE OPPORTUNITY

In order to realise the full potential of digital trade, policy makers will need to address four areas of potential concern surrounding digital trade. The good news is that all of them are addressable without needing to unduly restrict digital trade flows. Indonesia has an opportunity to ensure a strong domestic ecosystem for digital trade and to also play a role in advocating strongly for digital trade to remain open in the Asia Pacific to safeguard the potential benefits for Indonesian firms.

PERCEIVED CONCERNS RELATED TO DIGITAL TRADE

Governments have increased their constraints on digital trade in recent years, ranging from data localisation requirements through to local registration mandates. Four reasons are often made to justify such interventions:

1. PRIVACY
Protecting the privacy of citizens

2. SECURITY
Enabling rapid access to data for law enforcement and safeguarding national security as well as the security of users

3. ECONOMIC
Supporting the growth of domestic digital firms and local jobs

4. FISCAL
Protecting the local tax base

Many of these justifications require critical examination. Some overlook the fact that the same end objective could be achieved more efficiently through technological measures or modernised regulations without jeopardising the benefits of digital trade.

CONCERN 1:

PROTECTING THE PRIVACY OF CITIZENS AND SAFEGUARDING THEM FROM INAPPROPRIATE CONTENT

Digitised information requires appropriate privacy safeguards in order to protect citizens and safeguard against nefarious use or interference. There are different ways of addressing legitimate data privacy concerns and many can achieve the same objective of safeguarding privacy, without unduly impeding data flows.

For example, the Asia-Pacific Economic Cooperation (APEC) forum established the Cross-Border Privacy Rules (CBPR) and Privacy Recognition for Processors (PRP) systems which require participating businesses to implement data privacy policies consistent with the APEC Privacy Framework.[47] These forms of privacy protections are solutions that allow cross-border data flows while safeguarding privacy through interoperable enforcement mechanisms, providing an ideal international framework that APAC policymakers could seek. On the other hand, data localisation requirements could actually increase privacy risks by requiring data to be stored in single centralised locations that are more vulnerable to intrusion.

CONCERN 2:

ENABLING RAPID ACCESS TO DATA FOR LAW ENFORCEMENT AND SAFEGUARDING NATIONAL SECURITY AS WELL AS THE SECURITY OF USERS

Cybersecurity concerns may be exacerbated by constraints on cross-border digital trade that limit the scale of cloud providers (thus potentially impacting their ability to ensure appropriate investment in data safeguards) and by concentrating data in few locations (as opposed to maintaining redundant datasets at multiple data centres spread across countries).

Modern data storage systems take advantage of 'sharding', a type of database partitioning that separates very large databases the into smaller, faster, more easily managed parts called data shards. Sharding assists the intelligent transmission and storage of data, enabling the movement and replication of data between data centres and across borders in the interests of integrity, efficiency and security.

Cloud providers balance factors ranging from internet bandwidth and the likelihood of power outages over available networks to network throughput in order to optimise systems.[48] As one set of researchers found, "Requirements to localise data do nothing on their own to make data safer; in fact, they will only make it impossible for cloud service providers to take advantage of the Internet's distributed infrastructure and use sharding."[49]

Moreover, research has shown that local storage providers in fact apply less rigour to data security than global providers as a result of fewer financial resources, less technological expertise, lower competitive need to draw customers and technological restrictions (e.g. on sharding and the distributed storage of backup

47. For further information, see: http://www.cbprs.org/
48. Urs Holzle (2018), "Freedom of data movement in the cloud era" (Google Blogs). Available at: https://www.blog.google/products/google-cloud/freedom-data-movement-cloud-era/
49. Patrick Ryan, Sarah Falvey, and Ronak Merchant (2013), "When the cloud goes local: The global problem with data localization". IEEE Computer Society, Issue 12, Vol. 46. Available at: https://www.computer.org/csdl/mags/co/2013/12/mco2013120054-abs.html

> For example, the Asia-Pacific Economic Cooperation (APEC) forum established the Cross-Border Privacy Rules (CBPR) and Privacy Recognition for Processors (PRP) systems which require participating businesses to implement data privacy policies consistent with the APEC Privacy Framework. These forms of privacy protections are solutions that allow cross-border data flows while safeguarding privacy through interoperable enforcement mechanisms, providing an ideal international framework that APAC policymakers could seek.

copies).[50] There are also numerous examples of data localisation creating issues for the resilience and security of data by making it susceptible to a single point of failure. For example, in 2012, a small explosion in a data centre in Calgary, Canada, led 30,000 people to lose landline phone services (including to emergency services) and interruptions to the functioning of radio stations, fire authorities, taxi services, and even some local government functions for several days.[51] National-level events such as flooding, earthquakes, tornadoes, and wildfires could create resiliency issues even for data stored at multiple points within a country.

There are valid issues when it comes to law enforcement officials requiring timely access to data in other countries; however, these issues are best addressed by tackling the specific requirements of law enforcement agencies through inter-governmental data sharing agreements, rather than constricting data flows.[52] For example, Indonesia could explore discussions with the United States under the CLOUD Act, which authorises providers to disclose communications content pursuant to a lawful order from a foreign government that has entered into an executive agreement with the United States.

50. James Arlen and Brendan O'Connor (2015), "Xenophobia is hard on data: Forced localization, data storage, and business realities", Sector. Available at: http://www.sector.ca/Program/Sessions/Session-Details/xenophobia-is-hard-on-data-forced-localization-data-storage-and-business-realities/

51. Leviathan Security Group, "Comparison of Availability Between Local and Cloud Storage". Available at: https://static1.squarespace.com/static/556340ece4b0869396f21099/t/559dad9ae4b069728afca34a/1436396954508/Value+of+Cloud+Security+-+Availability.pdf

52. Joshua P. Meltzer and Peter Lovelock (2018), Regulating for a digital economy: Understanding the importance of cross-border data flows in Asia. Available at: https://www.brookings.edu/wp-content/uploads/2018/03/digital-economy_meltzer_lovelock_working-paper.pdf

CONCERN 3:

SUPPORTING THE GROWTH OF DOMESTIC DIGITAL FIRMS AND LOCAL JOBS

It has been argued that free digital trade will result in a select number of large multinationals (with the necessary scale) capturing the economic benefits, while local firms receive limited benefits and local economies miss out on employment opportunities. The economic literature has debunked the notion that trade protectionism spurs the creation of highly-productive domestic champions,[53] and the same is even more true for the digital sector for several reasons.

First, digital multinationals make important contributions to the local digital ecosystem. A survey of start-ups across Asia (including in Indonesia) found that 88 percent considered it crucial to attract foreign technology investment to the country, with some of the most important channels including start-up financing, investments in the digital ecosystem, and knowledge transfer.[54] In Indonesia, such examples of the importance of digital multinationals to the local digital industry are plentiful:

- **Investment in research.** Apple will be building three R&D centres in Indonesia where such app development and marketing tools will be housed and shared with app developers.[55]

- **Support for innovation.** IBM's 'Smarter Cities Challenge' is a competitive grant programme in which IBM partners cities who have put forth the most compelling proposals by leveraging IBM's technical expertise in cloud computing, analytics and artificial intelligence to achieve their visions

53. For a literature review, see Arvind Panagariya, "A Re-examination of the Infant Industry Argument for Protection", Journal of Applied Research, February 18, 2011. Available at: http://journals.sagepub.com/doi/abs/10.1177/097380101000500102
54. AlphaBeta (2017), Digital Nation: Policy levers for investment and growth. Available at: http://www.alphabeta.com/digital-nation-policy-levers-investment-growth/
55. Apple Insider (2018), "Apple's first Indonesian R&D center to open in second quarter, iPhone 7 sales to start on Friday". Available at: https://appleinsider.com/articles/17/03/30/apples-first-indonesian-rd-center-to-open-in-second-quarter-iphone-7-sales-to-start-on-friday

– fully funded by IBM.[56] The city of Jakarta has received such support, particularly in the area of digitising its transport services.[57]

- **Support for local enterprises.** Through a strategic partnership with Google allowing them to fully leverage Google Maps technology and data, local digital enterprise Terralogiq has become a key player in Indonesia's mapping technology industry. The company has since developed many maps-based applications across a variety of sectors such as infrastructure, retail and agriculture.[58]

- **Support for the education system.** Oracle launched the Oracle Academy, a free educational computer science programme, which 20 Indonesians universities have joined and incorporated as part of their curriculum.[59] It also collaborates with the Ministry of Education and Culture and the Association of Informatics and Computer Science Higher Education (APTIKOM) to provide training to over 3,000 local teachers from 900 secondary vocational schools.[60]

Second, digital constraints impacts not only negatively affect the digital sector itself, but also the broader economy. In fact, the larger impact is on non-digital sectors. The macroeconomic costs of forced data localisation range between 0.7 percent and 1.1 percent of GDP.[61] In addition, data localisation has been associated with investment decreases of up to 4 percent.[62]

Third, digital trade constraints bring about significant additional operational costs which often fall hardest on SMEs. While a major company may have sufficient revenues and scale to justify building data centres in multiple locations, smaller firms can be shut out of the domestic and international internet economy completely if they cannot access affordable computing and data services. Past research has found that local companies would be required to pay 30-60 percent more for their computing needs from strictly enforced data localisation policies.[63] Indeed, it has been observed that not only does the fragmentation of global online networks by data localisation laws result in delays, inefficiencies and higher costs from building or renting physical infrastructure in each jurisdiction, it also imposes the need to operate in a "complex array of different jurisdictions imposing conflicting mandates and conferring conflicting rights".[64]

Fourth, protectionism could encourage retaliatory behaviour in other jurisdictions with the potential to shut out local firms from these foreign markets. McKinsey Global Institute estimates that data flows accounted for US$2.8 trillion of economic value in 2014 and any impediment to these flows could create significant economic headwinds.[65]

Finally, the perceived benefit of data localisation requirements for domestic employment is typically much smaller than expected. Data centres, for example, are 'capital heavy' but 'job light' investments that are likely to create few local jobs.[66]

56. IBM (2017), "Smarter Cities Challenge aims to make lasting urban improvements".
Available at: https://www.ibm.com/blogs/cloud-computing/2017/02/17/smarter-cities-challenge-improvements/
57. IBM Smarter Cities Challenge (2018). Available at: https://www.smartercitieschallenge.org/cities
58. Based on interview with CTO of Terralogiq, Mr Farry Abimael Argoebie.
59. Oracle (2009), "20 universities in Indonesia join the Oracle Academy". Available at: http://www.oracle.com/us/corporate/press/017922_EN
60. Enterprise Innovation (2016), "Oracle Academy to help advance computer science education in Indonesia."
Available at: https://www.enterpriseinnovation.net/article/oracle-academy-help-advance-computer-science-education-indonesia-62262970
61. Matthias Bauer et al. (2014), The costs of data localisation: Friendly fire on economic recovery, European Centre for International Political Economy (ECIPE).
Available at: http://www.ecipe.org/app/uploads/2014/12/OCC32014__1.pdf
62. Matthias Bauer et al. (2014), The costs of data localisation: Friendly fire on economic recovery, European Centre for International Political Economy (ECIPE).
Available at: http://www.ecipe.org/app/uploads/2014/12/OCC32014__1.pdf
63. Leviathan Security Group (June, 2014), Quantifying the costs of forced localization. Available at: https://static1.squarespace.com/static/556340ece4b0869396f21099/t/559dad76e4b0899d97726a8b/1436396918881/Quantifying+the+Cost+of+Forced+Localization.pdf
64. Sascha Meinrath (2013), "We can't let the Internet become balkanized", Slate.
Available at: http://www.slate.com/articles/technology/future_tense/2013/10/internet_balkanization_may_be_a_side_effect_of_the_snowden_surveillance.html
65. McKinsey Global Institute (2016), Digital globalization: The new era of global flows.
Available at: https://www.mckinsey.com/business-functions/digital-mckinsey/our-insights/digital-globalization-the-new-era-of-global-flows
66. TechRepublic (2016), "Why data centers fail to bring new jobs to small towns".
Available at: https://www.techrepublic.com/article/why-data-centers-fail-to-bring-new-jobs-to-small-towns/

CONCERN 4:
PROTECTING THE LOCAL TAX BASE

A fear of many policymakers is that digital trade makes it easier for companies to shift profits to low tax jurisdictions and hence avoid paying taxes. This perception, however, is not necessarily backed by the data. Research by the European Centre for International Political Economy (ECIPE) shows that the taxes paid by the world's largest Internet firms are on average commensurate with leading businesses across the Asia-Pacific region.[67] As government officials have increasingly acknowledged, the international approach to tackling Base Erosion and Profit Shifting (BEPS) and US tax reform have together been largely successful at addressing the issue of double-non-taxation and indefinite deferred taxation respectively.

The conversation has now moved on to how that tax should be allocated among countries, particularly countries with large consumer markets. At present, digital multinationals (like non-digital multinationals) pay the majority of their tax where their product development takes place. Some countries have expressed their desire for the presence of large consumer markets to play a stronger role in how profit (and therefore taxing rights) is allocated, but it is no longer accurate to suggest that there is a broad problem of digital multinationals not enough paying tax at a global level.

Surveys of digital multinational enterprises conducted by AlphaBeta in past research found that investors

are more concerned about the unpredictability of the tax environment, as opposed to the rate itself.[68] For example, over half of respondents in Deloitte's latest "Asia Pacific Tax Complexity Survey" considered the tax compliance and fiscal requirements in Indonesia to be "complicated".[69] The early lessons from BEPS reforms in the region highlight the importance of a strong consultation process with industry and of enforceable mechanisms that do not discriminate against the digital sector.[70]

67. T Martina F. Ferracane and Hosuk Lee-Makiyamahe (2018), Geopolitics of Online Taxation in Asia-Pacific - Digitalisation, Corporate Tax Base and The Role of Governments. Available at: http://ecipe.org/publications/the-geopolitics-of-online-taxation-in-asia-pacific/
68. AlphaBeta (2017), Digital Nation: Policy levers for investment and growth. Available at: http://www.alphabeta.com/digital-nation-policy-levers-investment-growth/
69. Deloitte (2017), Shifting sands: risk and reform in uncertain times. 2017 Asia Pacific Tax Complexity Survey.
70. AlphaBeta (2017), The Screen Evolution: How video-on-demand boosts Asia's economies and generates value for viewers, business and society. Available at: http://www.alphabeta.com/the-screen-evolution/

PRIORITIES FOR ACTION

CATEGORY 1: ACTION AT HOME

Indonesia has a number of opportunities to enhance its current domestic regulatory approach to data:

- **Ensuring open data flows and interoperability.** Pursuant to Government Regulation 82 of 2012 (GR 82), electronic system providers offering public services must place data centres and disaster recovery centres within Indonesia, ostensibly for the purposes of law enforcement and customer protection.[71] It is unclear what constitutes "public services" in this regulation and as highlighted earlier in this chapter, law enforcement and customer protection concerns can be addressed without requiring data localisation, which can impose significant costs on the economy.

Indeed, academic research has shown that recently proposed or enacted legislation on data localisation could potentially reduce GDP by around 0.5 percent in Indonesia, and this could grow to up to 0.7 percent of GDP if economy-wide restrictions are introduced.[72] A draft revision of this regulation has proposed to divide data into three categories: strategic, high risk, and low risk. Only strategic data would be subject to data localisation requirements, however the current definition of strategic data is overly broad, including Indonesian citizens' data.[73] An example of how the data localisation requirements could impact one MSME is provided in Box 3.

71. Baker McKenzie (2018), "Indonesia - changes to data localisation provisions for electronic system operators". Available at: https://www.lexology.com/library/detail.aspx?g=a3b371a0-1b95-4ebc-86a1-2cbcda491eda
72. Matthias Bauer et al. (2014), The costs of data localisation: Friendly fire on economic recovery, European Centre for International Political Economy (ECIPE). Available at: http://www.ecipe.org/app/uploads/2014/12/OCC32014__1.pdf
73. Baker McKenzie (2018), "Indonesia - changes to data localisation provisions for electronic system operators". Available at: https://www.lexology.com/library/detail.aspx?g=a3b371a0-1b95-4ebc-86a1-2cbcda491eda

Clarity is required around the type of data that can be shared, the boundaries of sharing, and the type of consumer consent that is required. A useful first step would be for Indonesia to adopt the APEC Privacy Framework and join the APEC Cross Border Data Privacy Rules System as well as adopt ISO Standards such as ISO27018 that specifies controls to protect personal data.

A related opportunity is to encourage interoperability between digital frameworks, particularly on payment gateways, to avoid the costs of companies having to customise their approaches to every single market. One opportunity for Indonesia is to support the implementation of the data management initiative under the Master Plan on ASEAN Connectivity 2025 (MPAC 2025), which aims to improve transparency and accountability on data regulation requirements in ASEAN and identify areas to enhance performance and coordination.[74]

- **Promote innovation-oriented approaches to copyright and intermediary liability regulations.** A strong environment for digital trade is one in which the development of innovative digital content is facilitated in a manner that does not undermine the interests of rights holders. While addressing copyright concerns and removing undesirable content (such as hate speech) are clearly important priorities for stimulating innovation and protecting consumers, the challenge is to balance such objectives with a system that is sufficiently flexible that it does not impose undue burden on firms, particularly MSMEs.

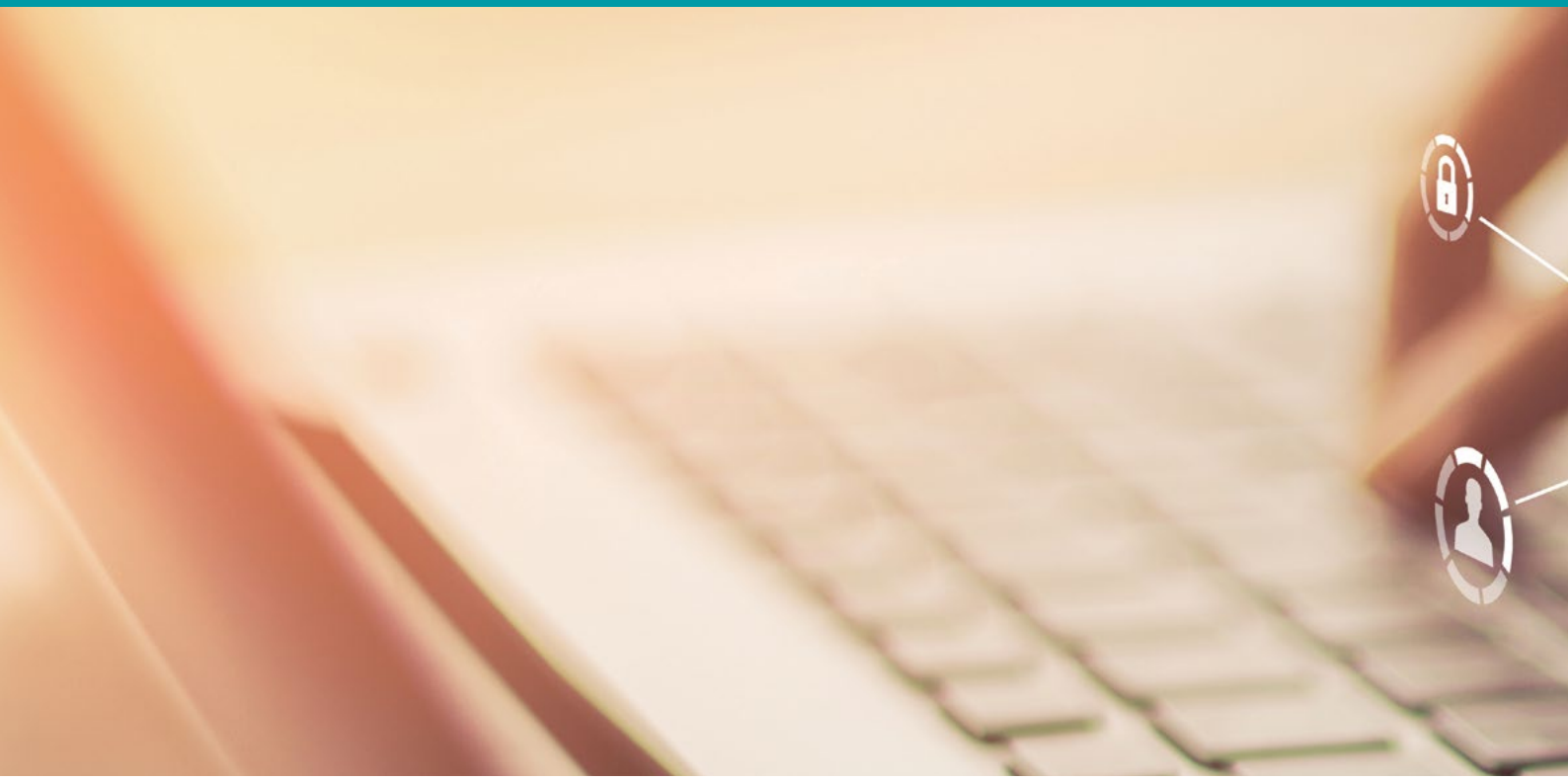
  As Indonesia further develops its copyright regulations, ensuring clarity on issues such as the 'fair use doctrine', which aims to balance the interests of content creators on the one hand, and society's competing interest in the free flow of ideas, information, and commerce on the other hand, will be important as part of this.

  Similarly, well-balanced internet Intermediary Liability (ILL) regulations can help to ensure the effective removal of illegal content without constraining the free flow of information. In this regard, in early 2018, the Ministry of Communications and Information Technology, Kominfo, proposed potential changes to existing legislation to include a 'safe harbour' policy to address platform liability over content distributed over the platform and potentially broadening the definition of illegal content. It is imperative that regulations define clear and cost-efficient requirements for intermediaries to comply with legislation and provide clarity on any potential liability.

- **Minimising border frictions.** Cross-border trade would be greatly enhanced by reducing the need for local registration, removing disclosure requirements of key intellectual property, and minimising unnecessary procedures and duties. Local establishment requirements can be cost prohibitive especially for MSMEs, and pose as a disincentive to businesses by effectively serving as an additional tax on operations. While there are currently no explicit local registration requirements in Indonesia at present, Government Regulation 82 of 2012 (GR 82) will require commercial internet platforms to register their platforms locally at Kominfo, or at least appoint a local representative to serve as a point of contact.

  On 15 February 2018, the Indonesian government issued a regulation under the Indonesian customs code to make "software and other digital products transmitted electronically" subject to import duty.[75] This includes operating system software, application software, audio visual media services

74. ASEAN Secretariat (2016), Master Plan on ASEAN Connectivity 2025.
Available at: http://asean.org/storage/2016/09/Master-Plan-on-ASEAN-Connectivity-20251.pdf
75. This refers to Regulation 17 and Chapter 99 of the Indonesian Customs Code. See: Ministry of Finance, Republic of Indonesia (2018).
Available at: https://jdih.kemenkeu.go.id/fullText/2018/17~PMK.010~2018Per.pdf



(AVMS) as well as other software and digital products. Effective as of 1 March 2018, this regulation currently imposes a rate of 0 percent, which creates the legal mechanism to impose duties and customs compliance obligations on such goods in the future.

Running counter to the WTO moratorium on customs duties on electronic transmissions which has been in place since 1998,[76] it has been argued that this regulation would improve Indonesia's trade balance, shrink its fiscal deficit and ensure the competitiveness of domestic businesses.[77] Unfortunately, the arguments do not consider the potential negative impacts on the domestic economy nor on Indonesia's digital exports.

As elaborated in Chapter 1, digital trade supports sizable economic benefits that digital imports bring to domestic businesses. Many of these benefits would be negatively impacted through the rising costs of digital imports. This possible adverse cost impact on Indonesian consumers and businesses is likely to hurt Indonesia's international competitiveness rather than improve it, which is particularly true for Indonesian SMEs.[78] For example, in 2015, AlphaBeta estimated that over 550,000 Indonesian businesses connected with consumers through online search and more than 250,000 businesses generated sales through the Internet, many of which utilised imported online marketing tools.[79] More than 6,000 Indonesian businesses, mostly SMEs, were also estimated to have adopted business productivity tools (e.g. Office 365, G Suite) in 2015.[80]

In addition, imposing custom duties as a stop-gap measure to improve the country's trade

76. United Nations Economic and Social Commission for Asia and the Pacific (2016), International trade in a digital age. Available at: https://www.unescap.org/sites/default/files/aptir-2016-ch7.pdf
77. Yuafanda Kholfi Hartono (2018), "Welcoming import duties on intangible goods". Available at: http://www.thejakartapost.com/academia/2018/01/10/welcoming-import-duties-on-intangible-goods.html
78. Asia Pacific Economic Cooperation (2016), 2016 CTI report to ministers. Available at: http://publications.apec.org/-/media/APEC/Publications/2016/11/2016-CTI-Report-to-Ministers/TOC/Appendix-26-Pathfinder-on-Permanent-Customs-Duty-Moratorium-on-Electronic-Transmissions-Including-Co.pdf
79. Estimates based on data from Ministry of Communication and Information Technology, Indonesia. (2013). The usage of ICT by business sector in Indonesia. Ministry of Communication and Information Technology, as well as data from Global StatCounter.
80. Number of firms is estimated based on Google Admin installs and Android smartphone penetration in 2015.

balance could trigger retaliatory tariffs from other governments, particularly in the region. This could potentially place Indonesia at risk of digital export revenues suffering losses in its future, undermining the potential export growth elaborated on in Chapter 2, and being shut out of the gains to global digital trade.

While governments should seek to create a level playing field for both resident and non-resident providers of digital services, this objective could be achieved through less distortive measures. For instance, imposing a Value-Added Tax (VAT) or Goods and Service Tax (GST) on non-resident providers of digital services is an approach that has been adopted by an increasing number of countries across the world, including all member states of the European Union, South Korea, India, Australia, New Zealand and Taiwan.[81] Not only is this in line with the principle that tax revenues should accrue to the jurisdiction in which the digital services are actually consumed, a non-resident VAT would also maintain a consistent tax treatment between digital and non-digital services without conflicting with international rules, standard practices and the non-discrimination principle.[82]

An area where Indonesia has adopted encouraging recent reforms is around custom duties on digital products. A de minimis threshold of US$200 could generate over US$30 billion in economic benefits for all 21 APEC members.[83] Indonesia is leading from the front in this area by increasing its de minimis threshold from US$50 to US$1,001 in 2017.[84]

81. Avalara VATlive (2018), "Global VAT & GST on digital services". Available at: https://www.vatlive.com/global-vat-gst-on-e-services/
82. Alexander Bellheim et al (2014), Your pocket guide to VAT on digital e-commerce, Bird & Bird.
Available at: https://www.twobirds.com/~/media/pdfs/books/bird--bird--pocket-guide-to-vat-on-digital-ecommerce.pdf?la=en
83. Stephen Holloway and Jeffrey Rae (March 2012), "De minimis thresholds in APEC", World Customs Journal, Vol.6 # 1.
84. UPS (2017), "Indonesia increases the De Minimis threshold on inbound shipments". Available at: https://www.ups.com/vn/en/about/news/apac-de-minimis.page

BOX 3.
PEGAXIS – HOW UNCERTAINTY SURROUNDING REGULATION AFFECTS DIGITAL MSMES FOREIGN EXPANSION PLANS[85]

MSME start-up Pegaxis is a one-stop e-procurement property management services platform for real estate. The platform connects property managers with vendors for an exhaustive list of services such as gardening and landscaping or lift repair and maintenance services. Building operators can list tenders on the platform and vendors can bid for contracts. Data localisation regulation is a key area of concern for the business.

Phoro source: Pegaxis

Ted Poh Chen Wei, Chief Executive Officer and founder of Pegaxis stated that, "Like most MSMEs, we do not have expensive physical servers but rely on existing cloud solutions. To comply with regulation, we will have to find a local data centre provider. Unfortunately, the data centre market in Indonesia is nascent, meaning providers are likely going to be more expensive, of uncertain quality and less reliable. Also, switching data centre provider is not a simple copy paste as the architecture might be very different. That means we will face cost searching for providers, cost of setting up a new infrastructure and exposure to uncertainty."

CATEGORY 2:
ACTION ABROAD

The Indonesian Government is currently engaged in a number of bilateral and multilateral trade deals. These include the Regional Comprehensive Economic Partnership (RCEP), a proposed free trade agreement (FTA) between the ten member states of the Association of Southeast Asian Nations (ASEAN) and the six states with which ASEAN has existing free trade agreements (Australia, China, India, Japan, South Korea and New Zealand). Advocating on the three issues highlighted above and in particular, support for the WTO e-commerce negotiations, can help increase the export opportunities for Indonesian firms.

Moreover, Indonesia's participation in the ASEAN 'Work Programme on E-Commerce 2017-2025' has been a promising step. This programme has identified a series of initiatives to promote region-wide accessibility of broadband infrastructure, create a conducive environment to foster the growth of a regional e-commerce marketplace, improve ASEAN logistics services and create a level playing field for e-commerce players within the region.[86]

85. AMTC (2018), Micro-Revolution: The New Stakeholders of Trade in APAC. A vailable at: http://tradecoalition.org/resource/micro-revolution-the-new-stakeholders-of-trade-in-apac/
86. ASEAN (2018), "ASEAN work programme on electronic commerce 2017-2025". Available at: https://asean.org/asean-economic-community/sectoral-bodies-under-the-purview-of-aem/e-commerce/

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