ADB

Technical Assistance Report

Project Number: 51343-001
Knowledge and Support Technical Assistance (KSTA)
December 2017

Republic of Indonesia: Supporting Technological Transformation

Asian Development Bank

CURRENCY EQUIVALENTS
(as of 1 December 2017)

Currency unit	–	rupiah (Rp)
Rp1.00	=	$0.000073
$1.00	=	Rp13,528

ABBREVIATIONS

ADB	–	Asian Development Bank
ASEAN	–	Association of Southeast Asian Nations
BAPPENAS	–	Badan Perencanaan dan Pembangunan Nasional (National Development Planning Agency)
TA	–	technical assistance

NOTE

In this report, "$" refers to United States dollars.

Vice-President	Stephen P. Groff, Operations 2
Director General	Ramesh Subramaniam, Director General, Southeast Asia Department (SERD)
Director	Winfried F. Wicklein, Country Director, Indonesia Resident Mission, SERD
Team leader	Yurendra Basnett, Country Economist, SERD
Team members	Priasto Aji, Senior Economics Officer, SERD Emma Rose Allen, Country Economist, SERD Barlev Nicodemus Hutagalung, Programs Officer, SERD Cisca Olivia Roos, Senior Operations Assistant, SERD

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KNOWLEDGE AND SUPPORT TECHNICAL ASSISTANCE AT A GLANCE

1. Basic Data — **Project Number:** 51343-001

Project Name	Supporting Technological Transformation	**Department /Division**	SERD/IRM
Nature of Activity	Policy Advice, Research and Development	**Executing Agency**	Ministry of Finance
Modality	Regular		
Country	Indonesia		

2. Sector

	Sector	Subsector(s)	ADB Financing ($ million)
✓	Public sector management	Economic affairs management	0.75
		Total	**0.75**

3. Strategic Agenda

Strategic Agenda	Subcomponents	Climate Change Information	
Inclusive economic growth (IEG)	Pillar 1: Economic opportunities, including jobs, created and expanded	Climate Change impact on the Project	Low

4. Drivers of Change

Drivers of Change	Components	Gender Equity and Mainstreaming	
Governance and capacity development (GCD)	Institutional development	Some gender elements (SGE)	✓
Knowledge solutions (KNS)	Knowledge sharing activities		
Private sector development (PSD)	Conducive policy and institutional environment		

5. Poverty and SDG Targeting

Geographic Targeting	No
Household Targeting	No
SDG Targeting	Yes
SDG Goals	SDG8, SDG9

Location Impact

Nation-wide	High

6. Risk Categorization Low

7. Safeguard Categorization Safeguard Policy Statement does not apply

8. Financing

Modality and Sources	Amount ($ million)
ADB	**0.75**
Knowledge and Support technical assistance: Technical Assistance Special Fund	0.75
Cofinancing	**0.00**
None	0.00
Counterpart	**0.00**
None	0.00
Total	**0.75**

I. INTRODUCTION

1. The Government of Indonesia has requested knowledge and support technical assistance (TA) from the Asian Development Bank (ADB) on the implications of disruptive technologies on Indonesia. The TA will study the impact of disruptive technology, and how Indonesia can position itself to maximize the benefits and minimize the potential risks. It will address a critical knowledge gap and inform the government's National Medium-Term Development Plan (RPJMN, 2020–2024).

2. The TA supports the government's policy priorities under the National Medium Term Development Plan (RPJMN, 2015–2019).[1] While the TA is not included in ADB's country operations business plan for Indonesia, 2018–2020, it is fully aligned with ADB's country partnership strategy for Indonesia, 2016–2019 and Midterm Review of ADB's Strategy 2020.[2] The TA is consistent with the country knowledge plan and ADB's priorities on supporting new knowledge and high-level technologies to maximize development impact.[3]

II. ISSUES

3. **Transformative impact of disruptive technologies.**[4] The digital economy is disrupting and transforming production, consumption, governance, and societal interactions. It is driven by two interlinked technological forces: increasing internet connectivity and advancement in machine learning. The combination of these technologies is enabling humans to decipher with speed the patterns of large structured and unstructured data generated by the connectivity. Disruptive technologies (internet of things, robots, 3D printing, artificial intelligence, blockchain) will influence how (as well as where) goods are produced and services delivered, and people's lifestyle choices, including the future of work. For example, mobile phones and the internet took only a few years to spread, but the technology has disrupted and transformed a wide range of economic activities. The speed of "creative destruction" heralded by disruptive technologies is expected to be exponential. The current suite of disruptive technologies is referred to as "Industry 4.0" because of the scope, scale, and speed of the impact.[5]

4. **Potential for digital transformation.**[6] Indonesia is among the fastest-growing internet markets in the world, and Southeast Asia is the fastest-growing region. From 2014 to 2015, mobile internet usage in Indonesia increased from 55 million to 67 million; revenues from cloud services increased from $269 million to $364 million; the total number of connected devices (internet of things) increased from 32 million to 39 million; and internet traffic (big data and advanced analytics) increased from 277 petabytes to 448 petabytes. Among the active internet user population, 78%

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[1] Government of Indonesia. 2015. *National Medium-Term Development Plan: RPJMN, 2015–2019*. Jakarta.

[2] ADB. 2016. *Country Partnership Strategy: Indonesia, 2016–2020—Towards a Higher, More Inclusive and Sustainable Growth Path*. Manila; and ADB. 2014. *Midterm Review of Strategy 2020: Meeting the Challenges of a Transforming Asia and Pacific*. Manila.

[3] The TA first appeared in the business opportunities section of ADB's website on 28 November 2017.

[4] K. Schwab. 2016. *The Fourth Industrial Revolution: what it means, how to respond*. Davos: World Economic Forum; R. Thomas, A. Kass, and L. Daarzani. 2013. Fast and Furious – How digital technologies are changing the way we work. *Accenture Outlook.* No. 3; ADB. 2017. *ASEAN 4.0: What does the fourth industrial revolution mean for regional economic integration*. Manila; and M. Wolf. 2017. Taming the masters of the tech universe: Examining the macroeconomic impact of the world's most valuable companies. *The Financial Times*. https://www.ft.com/content/45092c5c-c872-11e7-aa33-c63fdc9b8c6c.

[5] The other three industrial revolutions are Industry 1.0 = steam to mechanize production; Industry 2.0 = electricity leading to mass production; and Industry 3.0 = electronics and information technology to automate production.

[6] R. Anandan, R. Sipahimalani, A. Bharadwaj, J. Jhangiani, D. Kim, S. Ramesh. 2016. *e-conomy SEA: Unlocking the $200B Digital Opportunity*. Singapore: Google and Temasek; and J. Chang, G. Rynhart, and P. Huynh. 2016. *ASEAN in transformation: How technology is changing jobs and enterprises.* Geneva: International Labour Organization.

in Indonesia were engaged in online purchases compared with 75% in the United States. Based on this trend, the e-commerce market in Indonesia is projected to increase from about $2 billion in 2017 to $46 billion in 2025.

5. **Benefits and risks.**[7] The potential benefits of digitization for Indonesia's economy is projected to be about $150 billion by 2025, and the multiplier effect will likely be substantially larger. The benefits of disruptive technology accrue from the increased participation of the nonproductive and partially active workforce as well as improvements in labor productivity. For instance, online ride hailing applications in Indonesia, such as Grab and Go-Jek, have not only increased jobs, but service providers have better wages and access to insurance. Likewise, the rapid growth of FinTech players has the potential to provide borrowers, especially the unbanked population, with alternative means to access financial services. Further, disruptive technologies could lead to improved efficiency in the economic sectors (e.g., manufacturing, transport, agriculture, and public utilities). A surge in foreign investments in e-commerce platforms in Indonesia signals the potential of the digital economy for the country.

6. Disruptive technologies also pose important risks for Indonesia in the form of jobs losses in certain sectors and a potential increase in inequality. For instance, about 60% of salaried workers in the manufacturing sector in Indonesia are potentially at risk from automation. In the absence of effective policies, the economics of the internet tend to favor natural monopolies and lead to the concentration of markets and polarization of benefits. Analog complements (institutions, skills, and regulations) will be important in ensuring the impact of such technologies is more inclusive.

7. **Constraints.**[8] In 2012, Indonesia scored 3.11 (0 = lowest, 10 = highest) in the population weighted Knowledge Economy Index,[9] down from 3.68 in 1995. Indonesia's global ranking on the knowledge economy has slipped from 88th position (out of 100; 1 = the best) in 1995 to 97th in 2012. Indonesia lags on information and communication technology infrastructure compared with its peers, digital usage is uneven across regions, and internet penetration remains low. This is largely due to low public and private investment in technology infrastructure, skills mismatch, and lack of an appropriate policy and regulatory framework.

8. **Government initiatives to leverage benefits.** The government has developed the 2020 Go Digital Vision, which entails Indonesia emerging as the largest digital economy in the Association of Southeast Asian Nations (ASEAN) by 2020. The government's 14th economic reform package included a road map for promoting e-commerce.[10] The road map included actions around funding, taxation, cybersecurity, consumer protection, education and human resources, communication infrastructure, and logistics. The government has started targeted measures to

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[7] McKinsey&Company. 2016. *Indonesia in the digital age – an anthology of digital perspective*. Jakarta; M. Hallward-Driemeier and G. Nayyar. 2017. *Trouble in the Making? The Future of Manufacturing-Led Development*. Washington, DC: World Bank; S. Santoso. 2017. *How can ASEAN nations unlock the benefits of the Fourth Industrial Revolution?* Davos: World Economic Forum; and World Bank. 2016. *Digital Dividends.* World Development Report. Washington DC: World Bank.

[8] B. Chakravoti, A. Bhalla, and R. Chaturvedi. 2017. 60 Countries' Digital Competitiveness, Indexed. *Harvard Business Review*. 12 July. https://hbr.org/2017/07/60-countries-digital-competitiveness-indexed; and ADB. 2014. *Innovative Asia: Advancing Knowledge Based-Economy*. Manila.

[9] This is an aggregate index representing a country's or a region's overall preparedness to compete in the Knowledge Economy. https://knoema.com/WBKEI2013/knowledge-economy-index-world-bank-2012. Accessed in November, 2017.

[10] Republic of Indonesia. 2017. *Presidential Regulation of the Republic of Indonesia Number 74 of 2017 on 2017 – 2019 National E-commerce Roadmap*. Jakarta.

leverage the potential of the digital economy for achieving inclusive growth.[11] For example, 1 million local farmers and fishers are to be supported to promote and sell their produce online. Similarly, the government plans to help 8 million small and medium-sized enterprises use digital technologies.

9. **Knowledge gap.** A critical knowledge gap exists regarding the impact of disruptive technologies on Indonesia. This limits the development of enabling policies as well as a clear business case for public investments. The following issues remain understudied: (i) the aggregate impact on the economy; (ii) implications on productivity, efficiency, and employment at the sector level; (iii) an effective policy framework designed to help materialize the benefits and reduce the risks for Indonesia; and (iv) the implications for development partners, including ADB. The TA will help address this knowledge gap.

10. **ADB's value addition.** With Indonesia aiming toward higher income levels in the context of a complex global and regional economic environment, ADB's operations in Indonesia have an increasingly strong focus on knowledge solutions, and seek to leverage knowledge and financing in the core sectors. In addition to the expected impact on the national economy and the job market, the digital transformation will have direct implications on ADB's core sectors of operations in Indonesia. The TA will be part of a series of knowledge products that ADB will contribute in informing the country's medium-term development plan.

III. THE TECHNICAL ASSISTANCE

A. Impact and Outcome

11. The TA is aligned with the following impact: benefits of technology leveraged for sustainable and inclusive economic growth (TA defined). The study findings will inform the National Medium-Term Development Plan (RPJMN, 2020–2024). The TA will have the following outcome: better informed public policies and investment plans.[12]

B. Output, Methods, and Activities

12. **Output: Flagship study on the implications of disruptive technologies for Indonesia prepared.** The TA will support analysis of the implications of disruptive technologies on Indonesia. The study will cover both economy-wide impacts, as well as the impacts on selected sectors and subsectors (such as manufacturing, finance, energy, e-commerce, and urban). The analysis will seek to model the effects on the Indonesian economy, which are likely to be transmitted and amplified through global value chains; and examine the broader implications for industrialization, employment prospects, and inequality.

13. **Analytical approach**. The analysis will seek to answer the following questions: (i) What are the implications for economic productivity, jobs, and inequality? and (ii) What needs to be done to leverage the benefits and mitigate the risks? Question (ii) will identify the policies and investment required for increasing Indonesia's competitiveness, capability, and connectedness. Social concerns (e.g., impact on poverty and gender) will be integrated as crosscutting themes. The current body of literature on the topic will be used to map technology and its relevance to the (sub)sector. The topics covered by the TA will include: disruptive technologies, macroeconomic

[11] M. Basu. 2017. Indonesia reveals digital economy targets: Goals set to get SMEs and farmers to sell online. *GovInsider.* 21 April. https://govinsider.asia/innovation/indonesia-reveals-digital-economy-targets.

[12] The design and monitoring framework is in Appendix 1.

management and public services; financial technologies (e.g., blockchain) and banking; robotics, 3D printing, and manufacturing; internet of things and smart cities (urban); artificial intelligence, e-commerce, and private choices (retail); and energy storage (battery) and utilities (energy).

14. **Research methodology**. The analysis will employ quantitative methods grounded in relevant economic theory. As relevant, enterprise surveys will be conducted. Qualitative case studies will be used to increase the granularity of the analysis. Sex disaggregated data, where available, will be prioritized to inform the likely gender impacts. Data availability and limitations will be taken into consideration when refining the methodology.

C. Cost and Financing

15. The TA is estimated to cost $850,000, of which $750,000 will be financed on a grant basis by ADB's Technical Assistance Special Fund (TASF-other sources). The government will provide counterpart support in the form of counterpart staff, office space, secretarial assistance, domestic transportation, and other in-kind contributions. The key expenditure items are listed in Appendix 2.

D. Implementation Arrangements

16. ADB will administer the TA. ADB's Indonesia Resident Mission, Southeast Asia Department will select, administer, and supervise the consultants' outputs for the TA, and will evaluate consultants. The Ministry of Finance will be the executing agency. The National Development Planning Agency (BAPPENAS) and the Ministry of Finance will be the implementing agencies. The TA will be coordinated with relevant ministries, such as the Coordinating Ministry of Economic Affairs, the Ministry of Industry, and the Ministry of Communications and Informatics. Pursuing the "One ADB" approach, the resident mission will closely coordinate the implementation of the TA with ADB's Economic Research and Regional Cooperation Department as well as other relevant departments and offices.

17. The TA will be implemented from January 2018 to March 2020. TA resources will be disbursed following ADB's *Technical Assistance Disbursement Handbook* (2010, as amended from time to time). ADB will engage consulting firms and individual consultants, and all TA-financed goods will be procured in accordance with ADB's Procurement Policy (2017, as amended from time to time).

18. The implementation arrangements are summarized in the table.

Implementation Arrangements

Aspects	**Arrangements**		
Indicative implementation period	January 2018–March 2020		
Executing agency	Ministry of Finance		
Implementing agencies	National Development Planning Agency (BAPPENAS) and Ministry of Finance		
Consultants	ADB will engage the consulting firm and individual consultants in accordance with ADB's Procurement Policy (2017, as amended from time to time).		
	Five individual international consultants	13 person-months	$286,000
	Firm (CQS)	21 person-months	$161,700

Aspects	Arrangements
Procurement	All TA-financed goods shall be procured in accordance with ADB's Procurement Policy (2017, as amended from time to time).
Disbursement	The TA resources will be disbursed following ADB's *Technical Assistance Disbursement Handbook* (2010, as amended from time to time).

ADB = Asian Development Bank, CQS = consultants' qualification selection, TA = technical assistance.
Source: Asian Development Bank.

19. **Consulting services.** The TA will recruit 13 person-months of international (a lead economist and international experts) and 21 person-months of national experts (through a national firm and/or research institute).[13] A national firm and/or research institute will conduct the survey as well as macroeconomic, sector, and labor market analysis. All international consultants will be recruited using individual consultant selection. The national firm and/or research institute will be recruited using consultants' qualification selection. The composition of expertise will be based on sectors selected and prioritized and will be responsive to the knowledge demand.

IV. THE PRESIDENT'S DECISION

20. The President, acting under the authority delegated by the Board, has approved the provision of technical assistance not exceeding the equivalent of $750,000 on a grant basis to the Government of Indonesia for Supporting Technological Transformation, and hereby reports this action to the board.

[13] Terms of Reference for Consultants (accessible from the list of linked documents in Appendix 3).

DESIGN AND MONITORING FRAMEWORK

Impact the Technical Assistance is Aligned with
Benefits of technology leveraged for sustainable and inclusive economic growth (TA defined)

Results Chain	Performance Indicators with Targets and Baselines	Data Sources and Reporting Mechanisms	Risks
Outcome Better informed public policies and investment plans	By 2021 Background papers for the National Medium-Term National Development Plan (RPJMN, 2020–2024) (Baseline: 0)	Government publication	Lack of coordination among relevant agencies
Output Flagship study on the implications of disruptive technologies for Indonesia prepared	By 2020 1a. Impact assessment at the macroeconomic and sector levels completed (2017 baseline: 0) 1b. Policy recommendations developed (2017 baseline: 0)	Technical assistance report and knowledge product	Data limitation Low-quality analytical product

Key Activities with Milestones

1. Flagship study on the implications of disruptive technologies for Indonesia prepared

1.1 Recruit consultants by Q2 2018.

1.2 Review initial data collection and literature by Q3 2018.

1.3 Conduct stakeholder consultations and workshops intermittently from Q2 2018 through Q4 2019.

1.4 Model the impact of disruptive technologies on Indonesia's economy; examine what it means for industrialization and employment prospects; and identify public policy priorities by Q1 2019.

1.5 Assess the effect of disruptive technologies on productivity and efficiency at the sector level in Indonesia, and identify sector-specific risks by Q1 2019.

1.6 Present findings at the final workshop (Q1 2019).

1.7 Draft report for review by Q3 2019.

1.8 Disseminate final report by Q1 2020.

Inputs

Asian Development Bank: $750,000 Technical Assistance Special Fund (TASF-Other sources).

Note: The government will provide counterpart support in the form of counterpart staff, office space, secretarial assistance, domestic transportation, and other in-kind contributions.

Assumptions for Partner Financing

Not applicable

Q = quarter
Source: Asian Development Bank.

COST ESTIMATES AND FINANCING PLAN
($'000)

Item	Amount
Asian Development Bank[a]	
1. Consultants	
a. Remuneration and per diem	
i. International consultants	286.0
ii. National consultants	161.7
b. Out-of-pocket expenditures	
i. International and local travel	50.0
2. Survey[b]	100.0
3. Travel cost of Asian Development Bank staff acting as resource person	15.0
4. Workshops	20.4
5. Report and publications	41.9
6. Contingencies	75.0
Total	**750.0**

Note: The technical assistance (TA) is estimated to cost $850,000, of which contributions from the Asian Development Bank are presented in the table above. The government will provide counterpart support in the form of counterpart staff, office accommodation, office supplies, secretarial assistance, domestic transportation, and other in-kind contributions. The value of the government contribution is estimated to account for 11% of the total technical assistance cost, but no financial contribution is required.

[a] Financed by the Asian Development Bank's Technical Assistance Special Fund (TASF-other sources).

[b] Consulting firm and/or research institute will undertake the survey.

Source: Asian Development Bank estimates.

LIST OF LINKED DOCUMENTS

http://www.adb.org/Documents/LinkedDocs/?id=51343-001-TAReport

1. Terms of Reference for Consultants