NATIONAL ICT ECOSYSTEM FRAMEWORK

BACKGROUND

The government's linchpin role in embracing innovation builds upon ICT as the currency of the digital economy. And for this objective, the National ICT Ecosystem Framework (NICTEF) is an authoritative reference source, as well as a living document that shall be updated periodically with the latest plans, programs and projects, including recent indicators, accomplishments, outcomes and results.

The NICTEF is a **blueprint** for the collection, management, and development of national ICT data of the Philippine plans, programs, and projects and shall serve as a: (1) **viewfinder** into the Philippine ICT environment and its relation to other ICT environments; (2) **strategic compass** directed in responding to ICT-related challenges through its priority thrusts in the identified focus areas; and (3) an **implementation and communication plan** for the stakeholder groups involved in supplementing ICT data to an evolving ICT environment.

The NICTEF also contextualizes strategies in light of connectivity masterplans and best practices to benchmark the pace of development within the region and identify trends and timelines to promote a holistic approach to the adoption of the ecosystem paradigm. The framework provides avenues to synchronize policy formulation, evolution of technology, and regulatory regimes to pave the ground for ICT inclusion in various government processes, and society in general. Centers of excellence and sectoral champions are identified to lead industry growth through compliance with global standards.
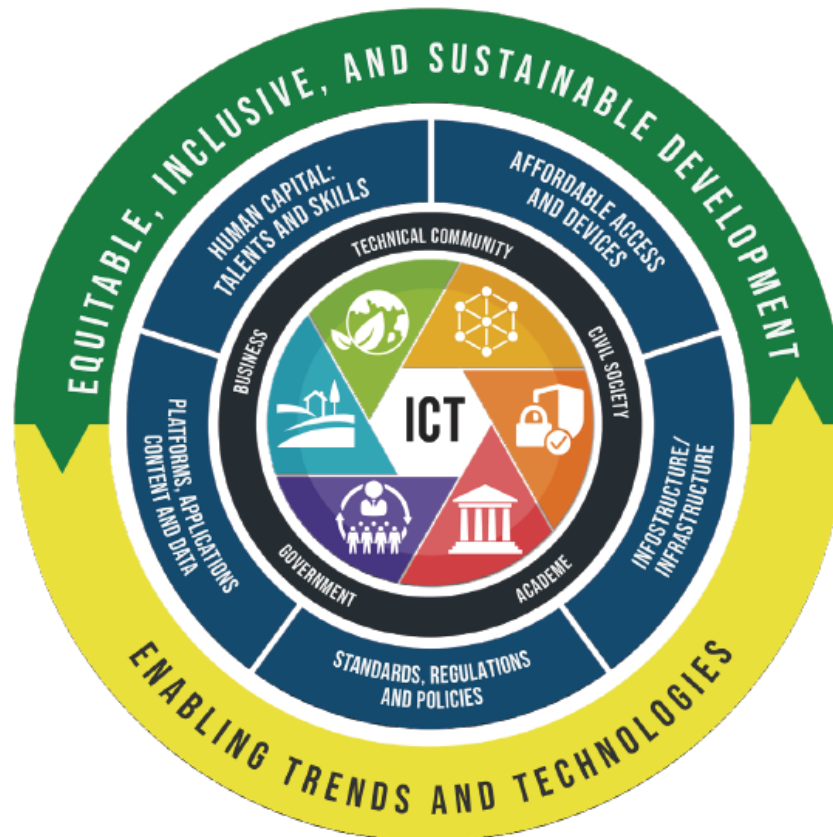
To synergize diverse industries and manage ICT for convergent platforms, it is high time that the Philippines adopt the NICTEF building upon its predecessor, the Philippine Digital Strategy (PDS) 2011-2016, as a complementary planning tool in fostering the development of a digital economy. It is with this sense of confidence that the administration advocates for trailblazing multi-disciplinary innovation, operationalizing emerging technologies, and updating the ICT diaspora nationwide.

VALUES, VISION, AND MISSION

(Values) We belong to an ICT ecosystem that values innovation, sustainability, inclusiveness, adaptiveness and happiness.

(Vision) Empowered and inspired by the strategic trends in our robust ICT ecosystem, we envision equitable, inclusive, and sustainable development in our society, and improved quality of life for our country's citizens and residents.

(Mission) We will achieve this by providing information and communication technologies that can be safely and securely used in digitally transforming the delivery of goods and services, researching and enabling ICT-driven innovations, fostering responsive and creative industries, and catalyzing participative communities of future-ready citizens and residents.

National ICT Ecosystem Framework Vision

FRAMEWORK ELEMENTS

The fundamental understanding of the critical roles of the following elements is necessary in addressing increased demand for socially established valuation metrics and updated industry policies. The National ICT Ecosystem is comprised of several interdependent framework elements:

- **Human Capital: Talents and Skills** – the individuals who access the applications, services, content and data that are provided by the players in the ICT ecosystem.
- **Affordable Access and Devices** – the interfaces through which humans access the applications, services, content and data – these may include wearable devices, cellphones, laptops, desktop computers, internet cafes, and other similar devices or venues.
- **Platforms** (Apps/Services and Content/Data) – these are the solutions (or portions of a solution) which are accessed by users in the ecosystem in order to achieve equitable, inclusive, and sustainable development in our society, and potentially to improve their quality of life.
- **Infostructure/Infrastructure** – these are the physical and logical components which collectively perform the function of providing secure connectivity between the users, their devices, and the platform which they are accessing.

- **Standards, Regulation, and Policies** – these provide the boundaries which will allow for the players and elements within the ecosystem to safely and productively inter-connect and inter-operate.

Framework Elements

STRATEGIC TRENDS

As the players of the ecosystem progress towards achieving the vision and mission of NICTEF, they will most probably find themselves impacted by several trends that they will need to consider.

In keeping track with the interest of the public, plans, programs and projects are made inclusive as they are transformed into industry supported strategies. While there were instances that technology has outrun policy, what makes for a viable ecosystem for innovation and sustainable development lies on a framework of assessing strategies for standards formulation, best practices adoption, and cooperative communication. Our primary objective then is to map relevant ICT trends of key ICT projects to assess its alignment with the national ICT development agenda.

- Fourth Industrial Revolution
- Artificial Intelligence
- Big Data
- Cloud Computing
- Internet of Things
- Blockchain

- 5G Networks
- Smart Cities
- Intelligent Transport
- Financial Technology
- Health Informatics
- Cyber Resilience
- Future Skills
- Capacity Building

STRATEGIC THRUST

Indeed, the growing relevance of ICT cannot anymore be underestimated, and for this reason, NICTEF identifies the following six (6) areas mirroring the digital transformation strategies of the government for sustainable development of the ICT ecosystem. NICTEF shall focus on promoting these thrusts in order to achieve its vision. Each thrust is supported by ongoing and proposed ICT-related projects of the DICT and its attached agencies which are expected to steer the country closer to the realization of the thrust's goals. This include:

- **Participatory e-Governance**
  This thrust on participatory e-governance seeks to deepen citizen participation in the governmental processes by examining the assumptions and practices of the traditional view that generally hinders the realization of a genuine participatory democracy. The thrust also addresses the inter-related questions of citizen competence, empowerment, and capacity building, and evaluates the impact of participatory governance on service delivery, social equity, and political representation.
- **Industry and Countryside Development**
  This thrust takes into consideration quantity, quality and scalability of talent, availability of infrastructure, competitive cost of doing business, government support and business environment in sustaining the benefits and addressing the challenges of the digital economy. By bringing ICT to the countryside, it will aid in achieving an inclusive economic growth in the country.
- **Resource-Sharing and Capacity Building Through ICT**
  This thrust brings in focus the essentials to the development and protection of integrated government ICT infrastructures and design architecture, taking into consideration the inventory of existing workforce, plans, programs, software, hardware, and installed systems, while advocating for continuing professional development by means of digital tools and enabling traditional ones with ICT and enhancing the ICT-related education curriculum.
- **Improved Public Links and Connectivity**
  Reflecting on a previous ITU study, which said: "The higher penetration of broadband, the more important is its contribution to economic growth," which also makes for "a positive contribution of broadband to job creation in developed and developing countries", this thrust covers discussion on leveraging connectivity to streamline business processes, reduce costs and improve operational efficiencies and enterprises drive innovation to move the focus from a consumer driven internet to an industrial one.

- **ICT User Protection and Information Security**
  This thrust considers several issues including end user computing security, information classification, file management, back-up, handling of sensitive or confidential data, responsible use of the internet including email, data protection legislation, disaster planning and system continuity. Further, this shall provide a strategic direction of making the Philippines cyber resilient and the ways to achieve such vision through knowledge management as a community of practice. After all, businesses, citizens and the government rely on the internet as the backbone of operations. This encompasses ensuring that the entities, systems, and processes involved can exchange ICT information in a safe and secure ICT environment.

- **Enabling and Sustainable ICT Environment**
  This thrust explores how the Internet and the ICT and related research communities can help tackle environmental challenges in the country through more environmentally sustainable models of economic development, and examines the status of current and emerging environmentally friendly technologies, equipment and applications in supporting programs aimed at addressing climate change and improving energy efficiency, including digital divide between gender groups and ensure that the benefits of ICT are evenly accessible to all.
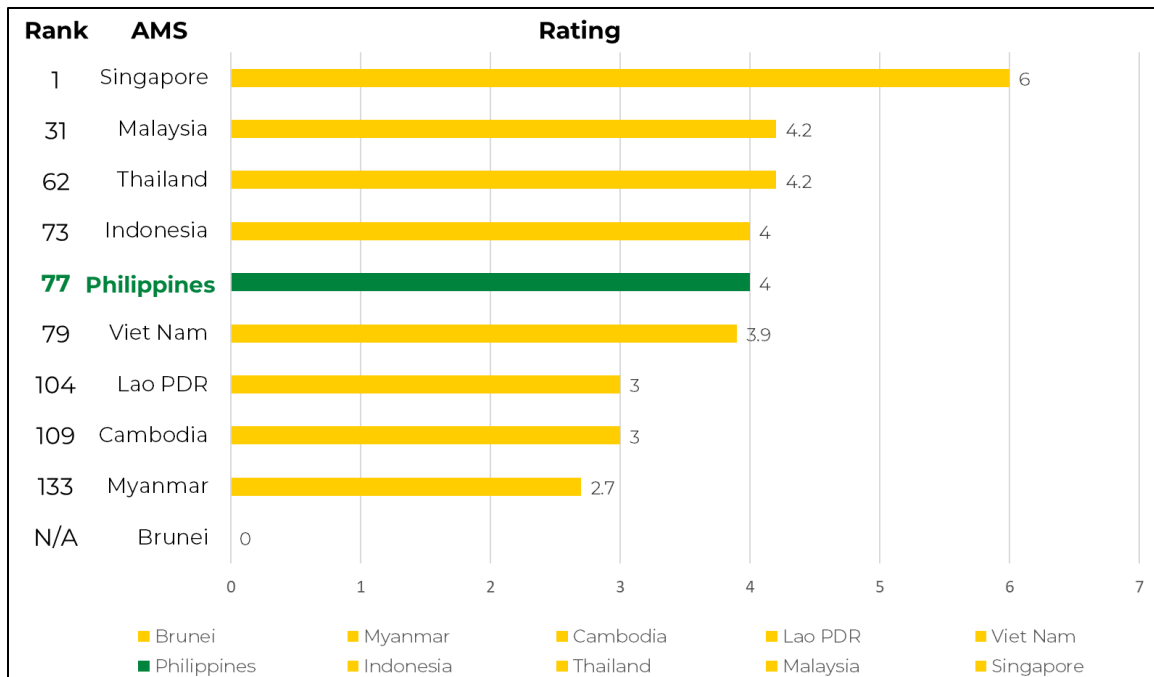
STRATEGIC INDICATORS

In order to measure the progress of the ecosystem, the following indicators were selected. Certainly, there are project-level and even sector-level indicators that would show progress on a more granular level. These measures are often included at the project level. For example, the National Broadband Program and the Free Wi-Fi Internet Access in Public Places each have their own success indicators which will be monitored and evaluated.

However, at the ecosystem level, there is a need to select indicators that would conflate multiple measures, since it takes an ecosystem working in concert, and not any individual project or program, to move the needle on these indicators.

- **Networked Readiness Index [World Economic Forum]**

In 2016, the Philippines recorded a score of 4.0 out 7.0 and by far has an increasing trend of score since 2012. The country has ranked 77th out of the 139 economies included in the survey. The Philippines has scored the highest in the 5th Pillar, Skills, which is under the Readiness sub-index. This implies that the country has a fairly higher enrollment rate in secondary education, better quality of education system, and higher adult literacy rate through an efficient use of ICT. Meanwhile, the Philippines has ranked high, 36th, in the 7th Pillar which is Business Usage. This means that it is one of the countries that utilize ICT in a wide extent of their business operation and has a huge capacity to come up with new innovations. Despite a score of 4.1 in the 4th Pillar, Affordability, the country has only ranked 107th among all the economies, indicating that the country has a relatively higher retail price of mobile telephony and broadband internet subscription due to limited competition in the market.

Rank	AMS	Rating
1	Singapore	6
31	Malaysia	4.2
62	Thailand	4.2
73	Indonesia	4
77	**Philippines**	4
79	Viet Nam	3.9
104	Lao PDR	3
109	Cambodia	3
133	Myanmar	2.7
N/A	Brunei	0

Networked Readiness Ranking of ASEAN Member States, 2016

- **ICT Development Index [International Telecommunications Union]**

The average IDI value for 2017 among the 176 countries included in the survey was 5.11 with the Iceland having the highest IDI of 8.98 and Eritrea with the lowest IDI of 0.96. Meanwhile, the Philippines scored 4.67 within the possible range of 0 to 10.
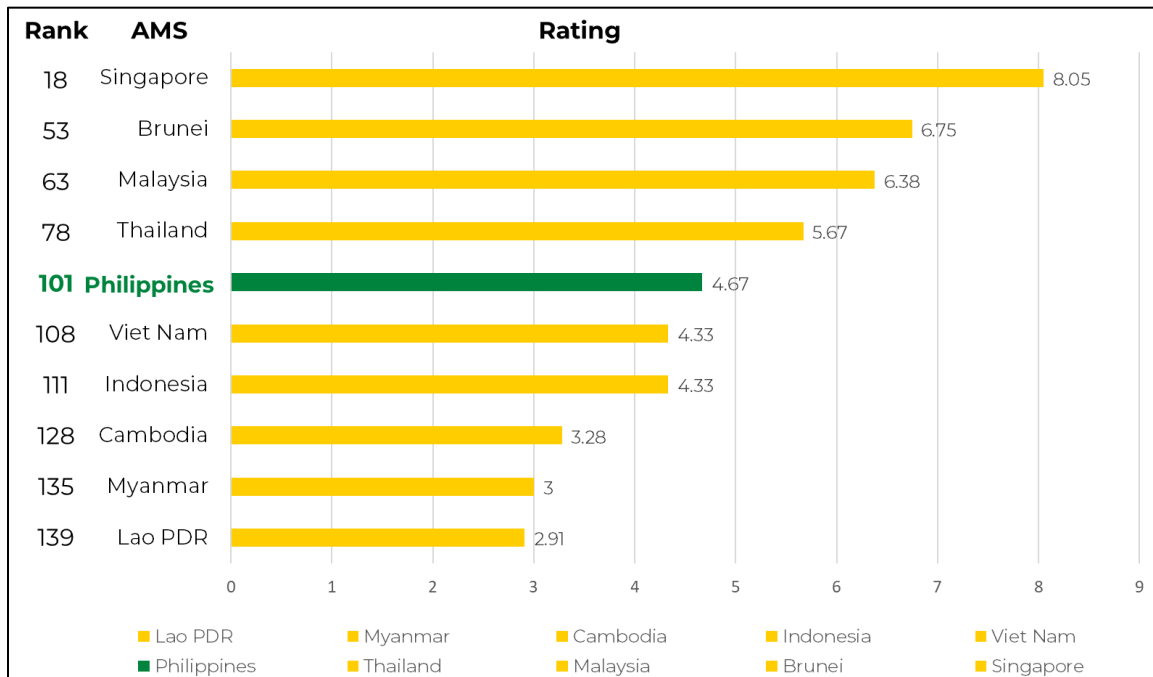
The world average IDI Access Sub-Index is 5.59 in which the Philippines scored 4.67. Among the indicators of this sub index, some of the indicators with significant differences are the fixed-telephone subscription per 100 inhabitants wherein the world average is 13.57 with the Philippines only having 3.71 indicating such a small number of Filipinos with fixed telephone subscriptions as they opt to use mobile phones, evident in the 109.17 score in the mobile-cellular telephone subscription per 100 inhabitants.

Another indicator in which the Philippines scored much lower compared to the world average is that of the international internet bandwidth per Internet user, as the country had a record of 43439.79 bits per second and a world average of 74464 bits per second. The percentage of households with computer in the Philippines is only 39.10%, relatively smaller than the world average of 46.61%.

In terms of the IDI Use Sub-Index, the Philippines scored 3.70 while the world average has reached 4.26. The percentage of individuals using the internet in the country is 55.50% which is almost 10% higher than that of the world average. Meanwhile, in the other remaining indicators, fixed (wired)-broadband subscription and active mobile-subscription per 100 inhabitants, the Philippines has scored 5.46 and 46.38, respectively. These are noticeably lower than the world average.

With the IDI Skills Sub-Index, the Philippines scored a 6.20, higher than the world average of 5.85. In its indicators, mean years of schooling and secondary gross enrolment ratio, the Philippines scored 6.20 and 9.30 which are higher than the world average. Meanwhile, it scored 35.75 in the tertiary gross enrolment ratio, more than 3 points lower than the world average.

Rank	AMS	Rating
18	Singapore	8.05
53	Brunei	6.75
63	Malaysia	6.38
78	Thailand	5.67
101	Philippines	4.67
108	Viet Nam	4.33
111	Indonesia	4.33
128	Cambodia	3.28
135	Myanmar	3
139	Lao PDR	2.91

ICT Development Ranking of ASEAN Member States, 2017

- **Digital Adoption Index [World Bank]**

The overall DAI varies on a 0–1 scale because its source indicators are normalized to that scale. As with the sub-indices, 0 is the lowest possible score on the DAI, representing no adoption of digital technologies, and 1 is the highest possible score, representing full adoption of digital technologies. Theoretically, a country can score a perfect 1 if it has the best score on all the indicators comprising the DAI or a perfect 0 if it has the worst score on all the indicators. But in practice, DAI scores ranged 0.14–0.87 in 2014 and 0.15–0.87 in 2016.

In 2016, the Philippines earned a score of 0.43 in the DAI which is relatively lower than the average score of its neighboring countries within East Asia and Pacific which is 0.50. The country scored 0.35 in the Business sub-indicator, lowest among the three sub-indices. In the said indicator, it was found that the Philippines had 92% 3G coverage, download speed of 3349 kbps, and 11 million secure servers. In terms of People sub-index, the country scored 0.52 which is lower than the average score of 0.63 of countries in East Asia and Pacific. The study shows that only 18% of the Filipinos have internet access at home while 88% have mobile access at home. In the Government sub-index, the Philippines earned a score of 0.43 which is equal to the average score of its neighboring countries. The country scored 0.48 in online public services, 0.03 in digital identification, and 0.77 in core administrative systems.
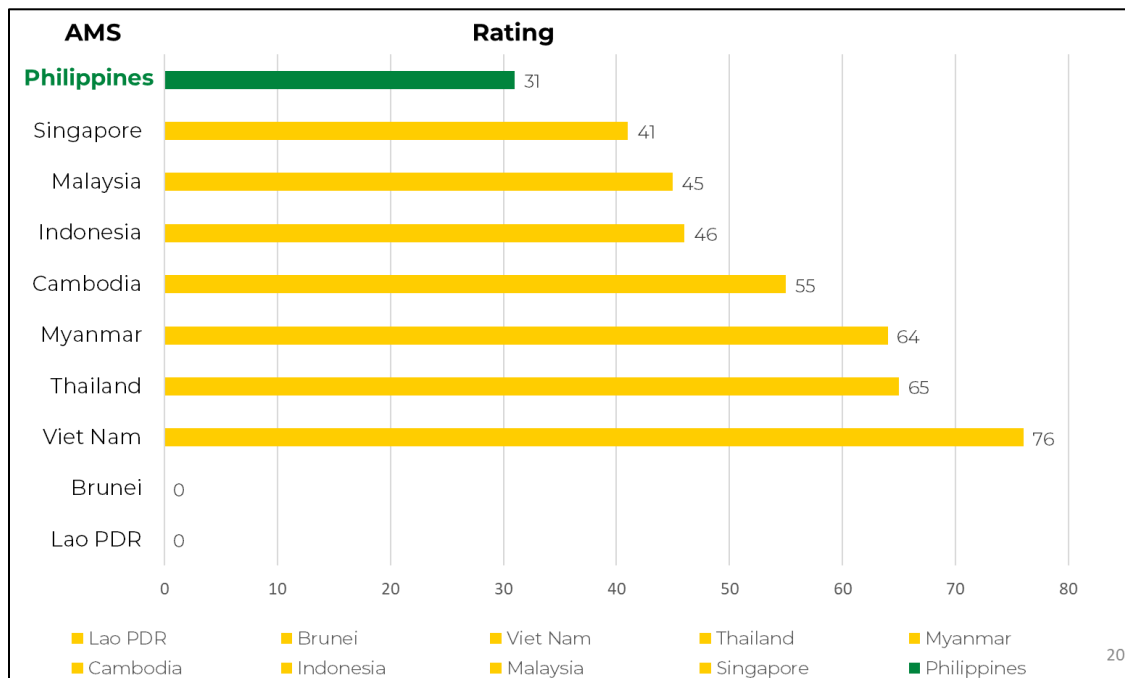
AMS	2014	2016		AMS	2014	2016
Singapore	0.87	0.87		**Philippines**	**0.44**	**0.49**
Malaysia	0.65	0.69		Indonesia	0.39	0.46
Brunei	0.57	0.63		Cambodia	0.36	0.40
Thailand	0.57	0.62		Lao PDR	0.20	0.26
Viet Nam	0.47	0.54		Myanmar	0.17	0.26

Digital Adoption Index Score of ASEAN Member States for 2014 and 2016

- **Freedom on the Net Index [Freedom House]**

The Philippines earned a score of 31 making it a "partly free" country. The report has also noted that the Philippines has slipped from a Free to Partly Free country and is one of the countries that had biggest declines in the score. Philippines previously had a score of 28 in 2017. This decline is due to content manipulation and cyber attacks that threatened to distort online information which calls for a stronger cybersecurity for the country.

Freedom on the Net Score of ASEAN Member States for 2018

- **World Digital Competitiveness Ranking [IMD World Competitiveness Center]**

The Philippines earned an overall rank of 56, part of the bottom 10 countries, which is 10 steps lower than its previous rank in 2017. It has also been consistently falling in the ranking since 2014. Knowledge factor has improved but was still outweighed by the declines in technology and future readiness factors. Capital sub-factor under technology has had a major drop from 29th to 43rd due to decline in perceptions about the effectiveness of banking and financial services and

availability of venture capital. Adaptive attitudes and business agility, under readiness factor, has dropped from 50th to 60th.
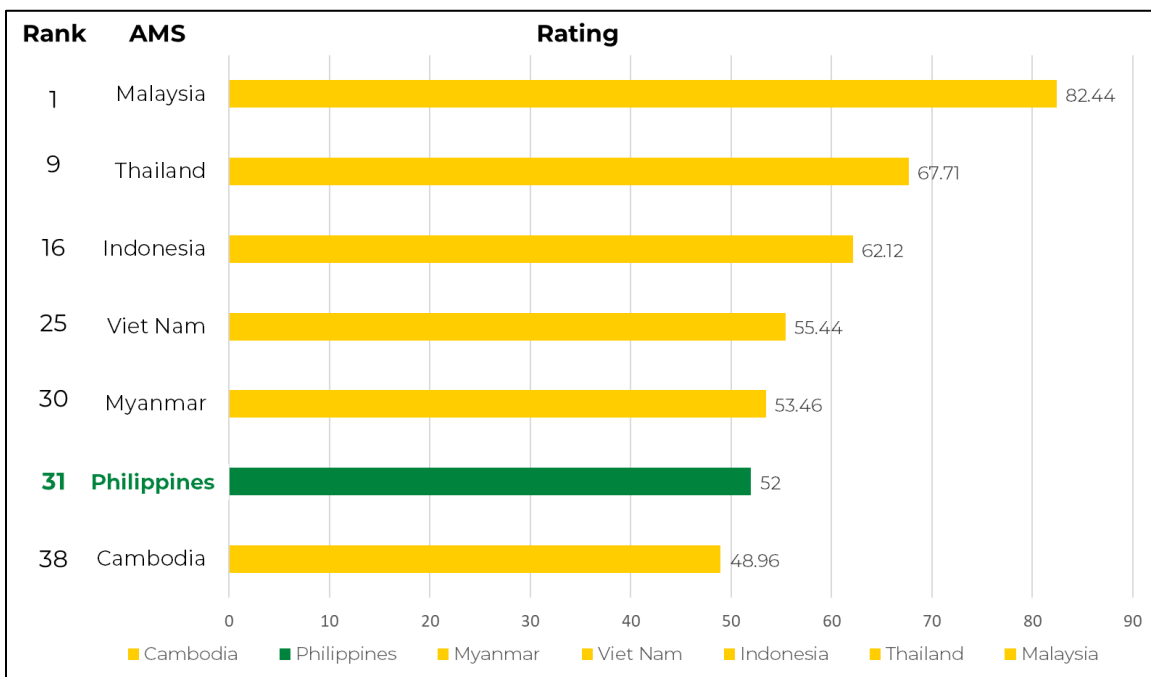
AMS	OVERALL	KNOWLEDGE	TECHNOLOGY	FUTURE READINESS
Singapore	2	1	1	15
Malaysia	27	17	22	29
Thailand	39	44	28	49
Philippines	**56**	**50**	**58**	**52**
Indonesia	62	61	59	62

ASEAN Member States' World Digital Competitiveness Ranking for 2018

- **Affordability Drivers Index [Alliance for Affordable Internet]**

The Philippines ranked 31st out of 61 countries in 2018. One of the key findings of the report is that island archipelagos such as the Philippines face a particular challenge in providing affordable internet. Industry cost incurred in providing broadband access for an island archipelago nation is five times higher than the cost for coastal nations.

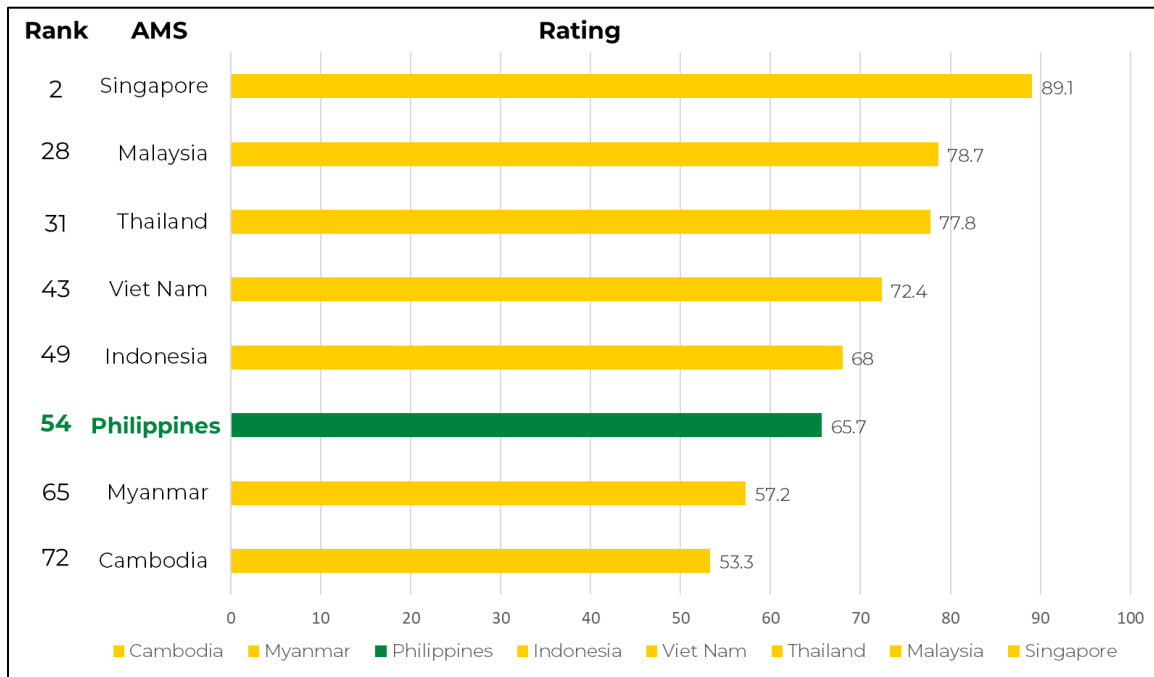| Rank	AMS	Rating
1	Malaysia	82.44
9	Thailand	67.71
16	Indonesia	62.12
25	Viet Nam	55.44
30	Myanmar	53.46
31	**Philippines**	52
38	Cambodia	48.96

ASEAN Countries' Affordability Drivers Index for 2018

- **Inclusive Internet Index [Economist Intelligence Unit]**

The Philippines had an overall rating of 65.7 placing to the 54th rank in 2018. The study has also concluded that the country had an average gender gap of 14.3% in favor of women and is on top of the index in the said matrix. Other top performers are mostly high-income countries such as France, UK, and South Korea.

Rank	AMS	Rating
2	Singapore	89.1
28	Malaysia	78.7
31	Thailand	77.8
43	Viet Nam	72.4
49	Indonesia	68
54	**Philippines**	65.7
65	Myanmar	57.2
72	Cambodia	53.3

ASEAN Countries' Inclusive Internet Index Overall Rankings for 2018

- **E-Government Development Index [United Nations]**

The E-Government Development Index (EGDI) assesses e-government development at the national level. Its primary objective is to measure the readiness and capacity of national institutions to use ICTs to deliver public services. The Philippines has slipped from 71st rank in 2016 to 75th in 2018. Despite this, the country is few lower middle-income countries which earned a score higher than the global EGDI average of 0.55.

Rank	AMS	Rating
7	Singapore	0.8812
48	Brunei	0.7174
59	Malaysia	0.6923
73	Thailand	0.6543
75	**Philippines**	0.6512
88	Viet Nam	0.5931
107	Indonesia	0.5258
145	Cambodia	0.3753
157	Myanmar	0.3328
162	Lao PDR	0.3056

Legend: Lao PDR, Myanmar, Cambodia, Indonesia, Viet Nam, Philippines, Thailand, Malaysia, Brunei, Singapore

E-Government Development Index Rankings of ASEAN Countries for 2018

PROJECT SUBMISSION

The National ICT Planning, Policy and Standards Bureau (NIPPSB) of the DICT, responsible for the formulation of government-wide policies, plans, programs, and standards on ICT matters, will accept submission of project profiles from government agencies, private sector companies, and civil society organizations. Inclusion in the NICTEF will provide greater visibility for the project proponents, which may assist in promoting the project to a wider audience of potential partners, funders, customers and beneficiaries.

Inclusion in the NICTEF will also enable the DICT to provide recognition of diverse efforts within the ecosystem, and to harmonize such efforts in order to avoid unnecessary overlaps. Finally, the NICTEF project profiles will help the DICT to analyze if all strategic thrusts and framework elements are covered, or if not, to identify where gaps exist so that resources may be properly allocated. This allows the DICT to ensure that the NICTEF continues to be responsive to the trends, and relevant to the needs, of the ecosystem, and that the projects in the NICTEF are aligned with the aforementioned values, vision, and mission statements.

WAY FORWARD

In order to ensure that the NICTEF retains its relevance and remains attuned to both evolving developmental requirements as well as dynamic innovation in ICTs, the DICT with its stakeholder partners shall maintain and engage in processes that allow for ongoing inputs to and periodic reviews of and revisions to the framework.

Thus, to further foster multistakeholder participation and operationalize the NICTEF as a living document, the DICT will:

- Setup and maintain a website to serve as a focal point for continuing review, assessment, tracking, revision and augmentation of NICTEF policies, plans and projects;

- Conduct periodic regional engagement activities to validate and adopt sector-specific result matrices that each sector or representative agency has identified in the projects on-boarded to NICTEF; and

- Validate and adopt measures being undertaken to leverage or improve utilization of ICTs by the sector organizations or relevant government agencies.