



Unleashing the Potential of the Internet for ASEAN Economies

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Unleashing the Internet Potential in ASEAN Economies

- Second series of our study after the African Study in 2013 . Covering 20 countries in the African Continent, AXIS initiative.
- Objective of study: To take stock of ASEAN's of Internet Development progress in terms of interconnectivity within the region. Identify choke points and opportunities/strengths of the region in transforming into a Digital Society enabled by the Internet and ICT.
- Coverage: 10 economies (excluding Timor Leste)
- Outcome: Key policy recommendations and identification of policy leverages.



Leading to a digitally integrated economy and society



- Internet = stand-alone vertical
- Economies of *scale*



- Internet = universal platform
- Economies of *scope*

The role of the government is to facilitate advancement of an Internet economy with the vision to instill interoperability in order to usher in the digital economy

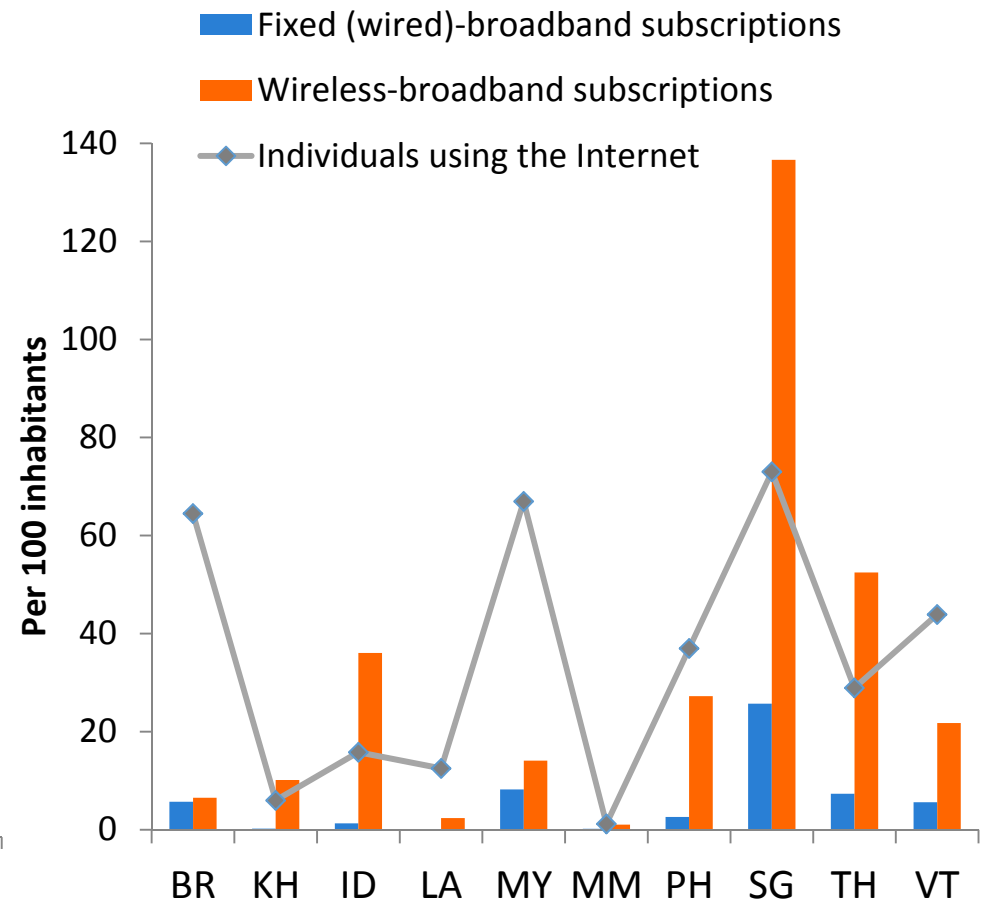
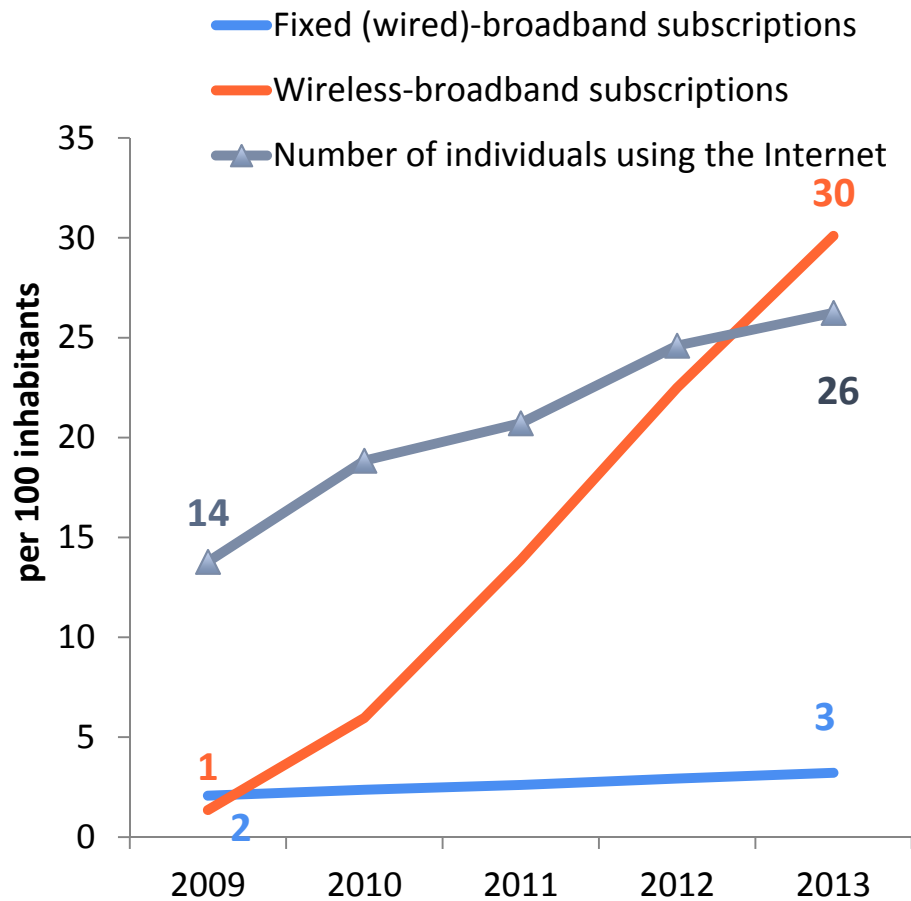
Technology Facts

- Technology changes is not additive but systemic (ecosystem). It is disruptive and dynamic nature.
- Technology advantages and disadvantages are not evenly distributed.
- The Internet's full potential has yet to be realised by mankind.

Key Takeaways - Overall

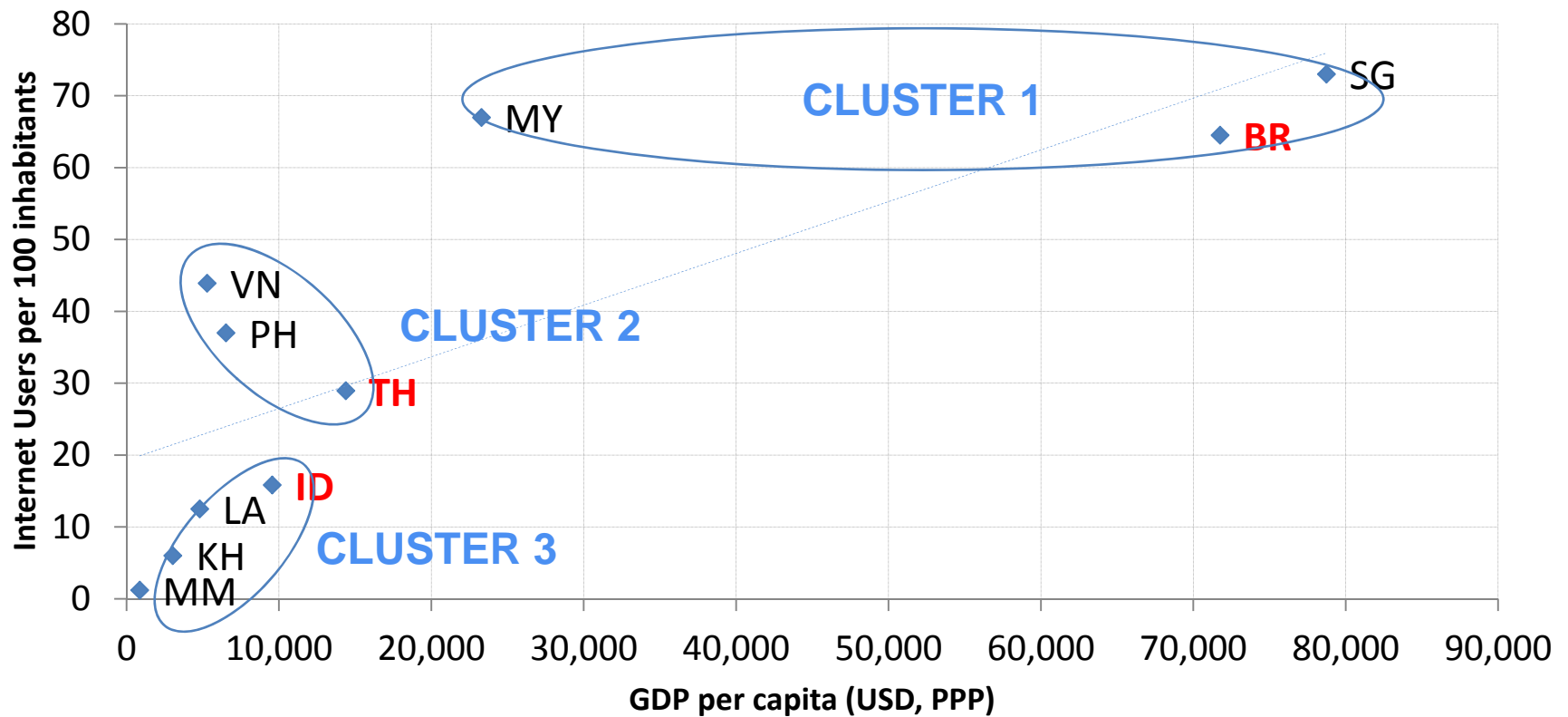
- 1 Generally, the ASEAN region Internet penetration doubled from 2009-2013. Mainly due to wireless broadband (30%) which is ten times more than fixed broadband (3%).
- 2 Mobile first access are the norm in low – middle income countries. And multiple device access are growing in middle-high income.
- 3 The interplay of bandwidth supply and affordability are the key constraints – not GDP/capita i.e. digital divide

ASEAN experienced healthy growth in penetration, especially in wireless, but regional averages mask huge diversity among countries



Source: ITU (2014), ITU World Telecommunication/ICT Indicators database, Population, Fixed (Wired)-Broadband Subscriptions, Wireless-Broadband Subscriptions, Percentage of Individuals Using the Internet.

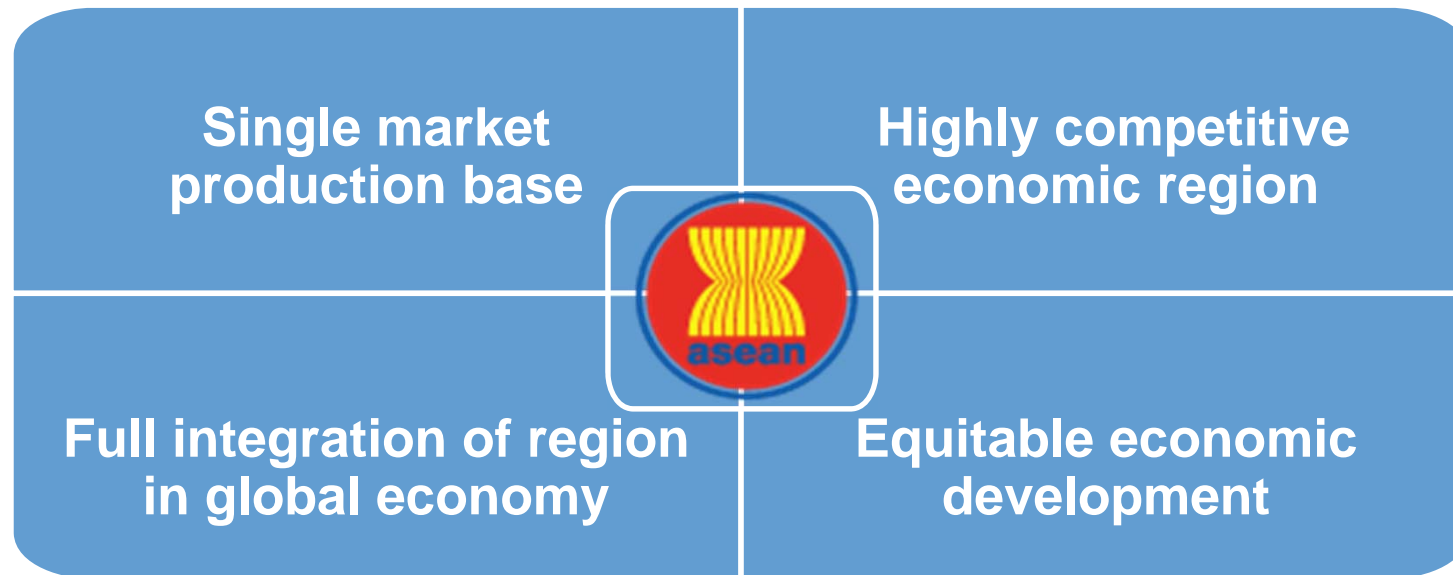
Level of economic development is only part of the answer.



ASEAN divides into 3 distinct clusters with large gaps in between.



ASEAN Economic Community (AEC)



Connectivity, encompassing physical, economic, human and digital arenas - is a critical requirement for ASEAN to remain competitive and for the AEC to succeed.

Key Takeaways

4

Interconnectivity and interoperability are, then, the key building blocks of a digital economy; multi-modal access the key enabler

5

Interconnectivity Choke Points: National backbone, backhaul capacity, ownership and other influences on IXPs/ISPs + service delivery and affordability are the key determinants to innovation and inclusiveness

International bandwidth supply affects wholesale prices and national coverage.

Country	International Capacity per capita (kbps)	Fixed BB coverage	Mobile Wireless BB
Singapore	258.3	★★★★★	★★★★★
Malaysia	15.6	★★★	★★★★
Thailand	6.62	★★★	★★★★
Philippines	5.45	★★	★★★
Vietnam	5.15	★★★	★★★
Indonesia	1.03	★★	★★★
Cambodia	0.76	★★	★★
Lao PDR	0.38	★	★★
Myanmar	0.29	★	★
Brunei	n/a	★★★★	★★★



Key Takeaways

- 6 Overall, the ASEAN region has adequate access to International Bandwidth through with many undersea submarine cable overlaying the region's corridors.
- 7 Seamless interconnectivity across national borders is key determinant for access and affordability for landlocked and newly emerging economies

The resulting affordability varies greatly

Country	Fixed-BB monthly subscription (USD/ Mbps)	As % of GDP per capita	Affordability
Singapore	\$1.7	0.04%	Affordable
Thailand	\$1.3	0.30%	Affordable
Brunei	\$52	1.60%	Moderate
Indonesia	\$6.3	2.20%	Moderate
Malaysia	\$28	3.20%	Moderate
Philippines	\$11.7	5.10%	Moderate
Laos PDF	\$35	25.50%	Expensive
Cambodia	\$35	41.70%	Expensive
Myanmar	\$100	138.20%	Unaffordable

Note: Broadband commission recommends the upper limit of 5% for communication expenditure as a % of GDP per capita (PPP)



Market conditions for IXPs and ISPs matter.

**High Internet Transit
Traffic Cost**
(USD per Mbps per month)

SG	< \$10
MY	\$25-30
VT	\$70
ID	> \$100 ~ \$60/70
PH	\$80
TH	\$80
KH	\$100
LA	\$100
MM	> \$100
BR	N/A

Lack of (perceived) demand + Limited supply
+ Non-competitive market conditions for IXPs

Lack of carrier-neutral IXPs

Unfavorable bi-lateral peering arrangement
for non-incumbents

Higher cost, latency in Internet speed,
quality of service issues



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Conceptual Framework: Connectivity to Interconnectivity Model



Digital Economy and Society

- Digitization of public service delivery, social interactions and commercial transactions
- Creation of inclusive and integrated society

Multi-modal Platforms

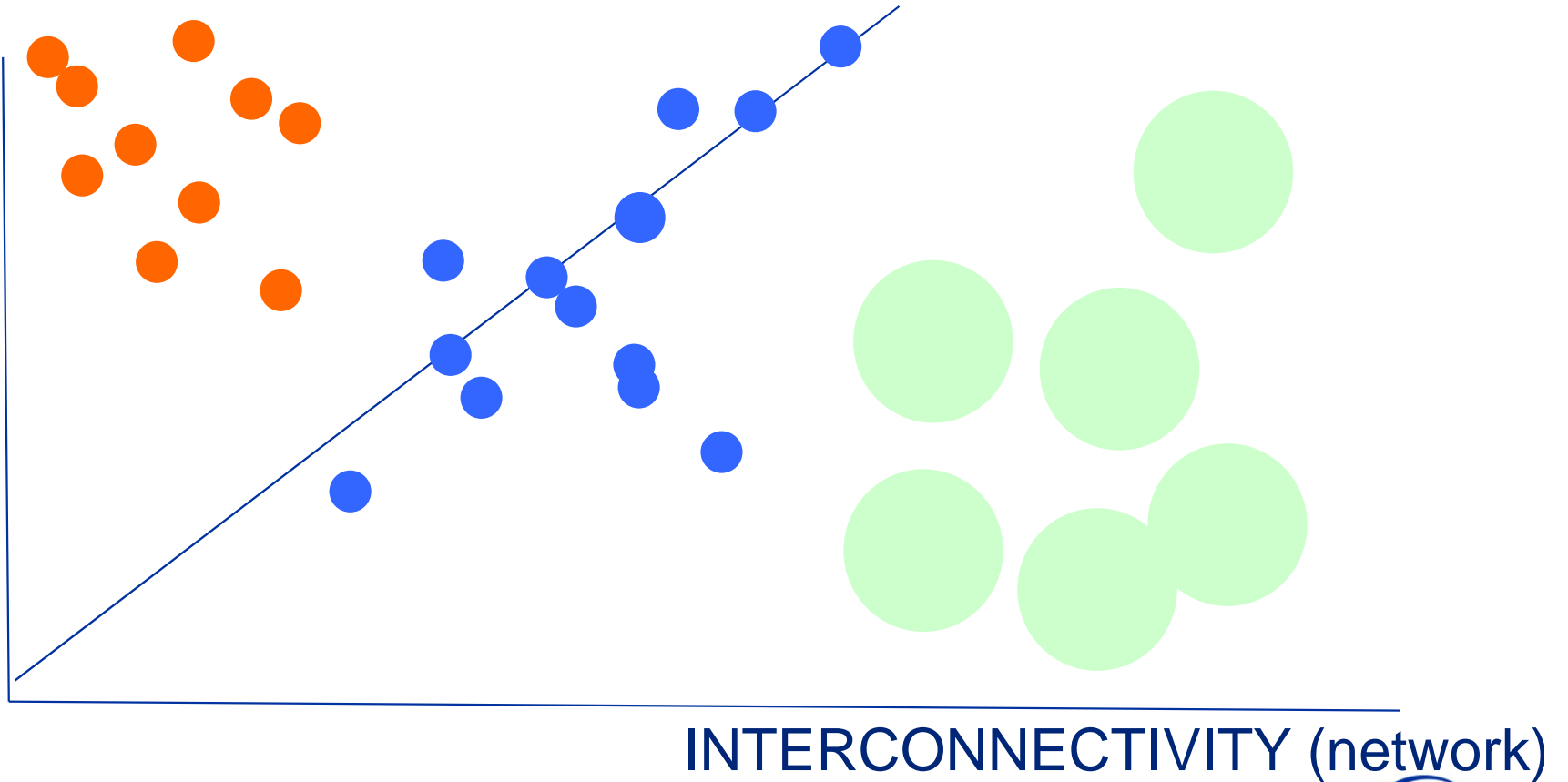
- More 'things' coming online
- Services, content and processes → platform agnostic

Interconnectivity and Interoperability

- Proprietary networks becoming IP-based
- Platforms talk to each other and are able to work with one another

DIGITAL SOCIETY

INTEROPERABILITY



Economics of connectivity, latency and speed

• A year-long performance redesign resulted in a 5 second speed up (from ~7 seconds to ~2 seconds). This resulted in a 25% increase in page views, a 7-12% increase in revenue, and a 50% reduction in hardware. This last point shows the win-win of performance improvements, increasing revenue while driving down operating costs. (video, slides)

- Shopzilla

- **0.5s latency caused 20% drop in traffic on Google network!**



Key Takeaways

- 8 Interoperability refers to how easily different devices, applications or/and platforms work together (compatible) in a seamless fashion without any special effort.
- 9 Open standard solutions are the key enabler to interoperability and interconnectivity.
- 10 Interoperability of the connected world hinges upon investing in open system, updated technology and technology neutral policy. Also enables resource sharing, extend inclusion and futur proof innovation for the next big thing!

Interoperability & Interconnectivity Dependent System and Platform

E-retailing/digital trade	→	Authentication, semantic web, digital signature, payment/remittance system,
Smart Grid	→	Internet of Things, RFID
E-Healthcare	→	Digital Identity
Telemedicine	→	Biometric, Bio-Sensor
Disaster Management System	→	Meteorology Intelligence Network, Space Technology



Disaster Risk Management

- ICT and the Internet play a crucial role in different phases of disaster risk management
- Multi-platform communications systems enhances efficiency and efficacy of disaster information flow
- Cloud-based systems allow immediate access to analytics and risk-assessment
- SNS opened door to 'crowd sourced' early warning
- Within ASEAN, connectivity and information dissemination still remain a challenge

Health & Education

- E-health enables (among others):
 - better informed decision making
 - real-time and remote consultations and treatment
 - universal records to enhance quality of treatment
- However, interoperability and interconnectivity within and across e-health systems remains an issue
- ASEAN ICT Masterplan 2015: All ASEAN countries committed to promote ICT for education, including curricula development
- Massive Open Online Courses (MOOCs) emerging as one particular promising platform and collaborative learning tool; there are others
- Challenges include basic connectivity, cost of connection, bandwidth availability, cost of maintenance and capacity



Recommendations

- 1. Wireless access** *Proactively promote extension of wireless networks*
- 2. Network access
Affordability** *Networks need to be not only accessible but affordable*
- 3. Device affordability** *Getting onto the networks is crucial, smartphones offer countries the change to leapfrog iterative development*
- 4. Infrastructure sharing** *Move focus from CAPEX to OPEX by sharing access to towers, spectrum, etc.*
- 5. IPv6 transition** *Clarify and promote IPv6 transition timetable*
- 6. Insist upon
interconnectivity** *Economies of scale and scope maximize social and economic benefit*
- 7. Build interoperability
into services delivery** *Require that devices, services and app work together in delivering services*
- 8. Inclusion through ICT** *Especially to communities at BOP*
- 9. Make policy-making
mobile-first** *Adapt national digital economy plans accordingly*
- 10. Empowerment +
Capacity Building** *Enable access and participation to all sections of community*



Thank You

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