African ICT: Smart Infrastructure for Innovation

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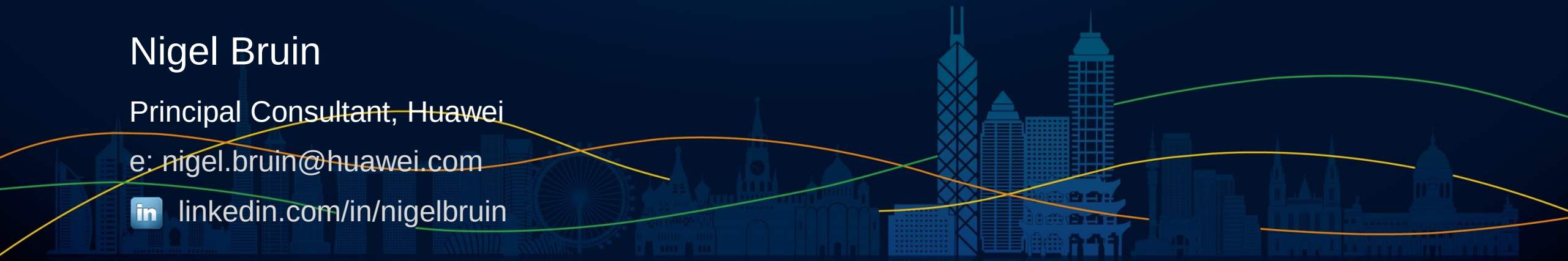

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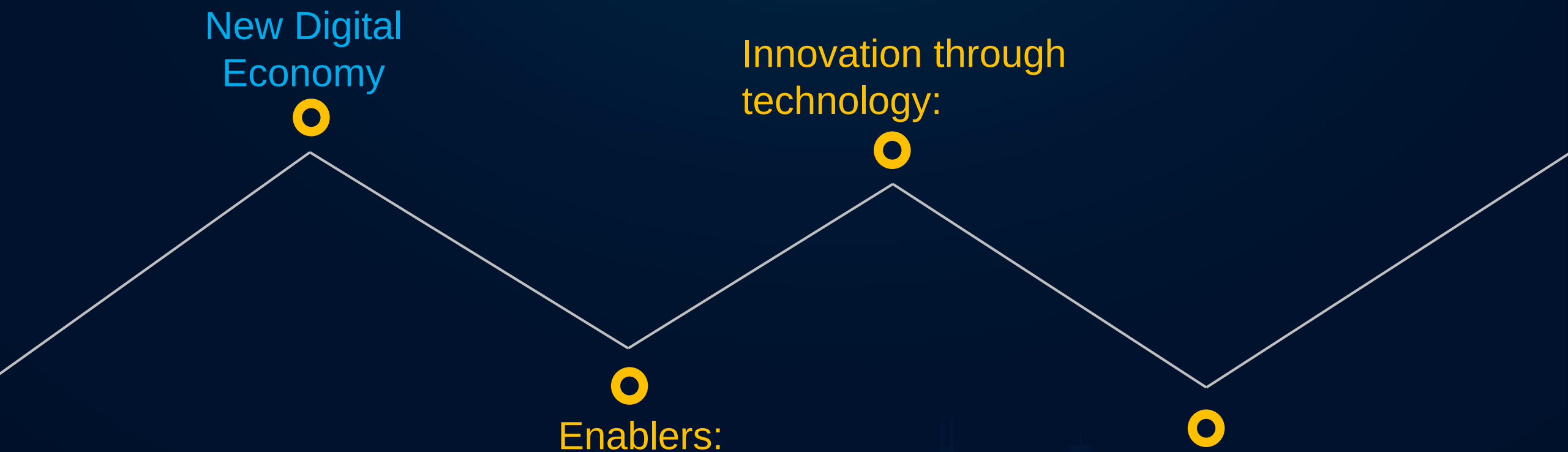
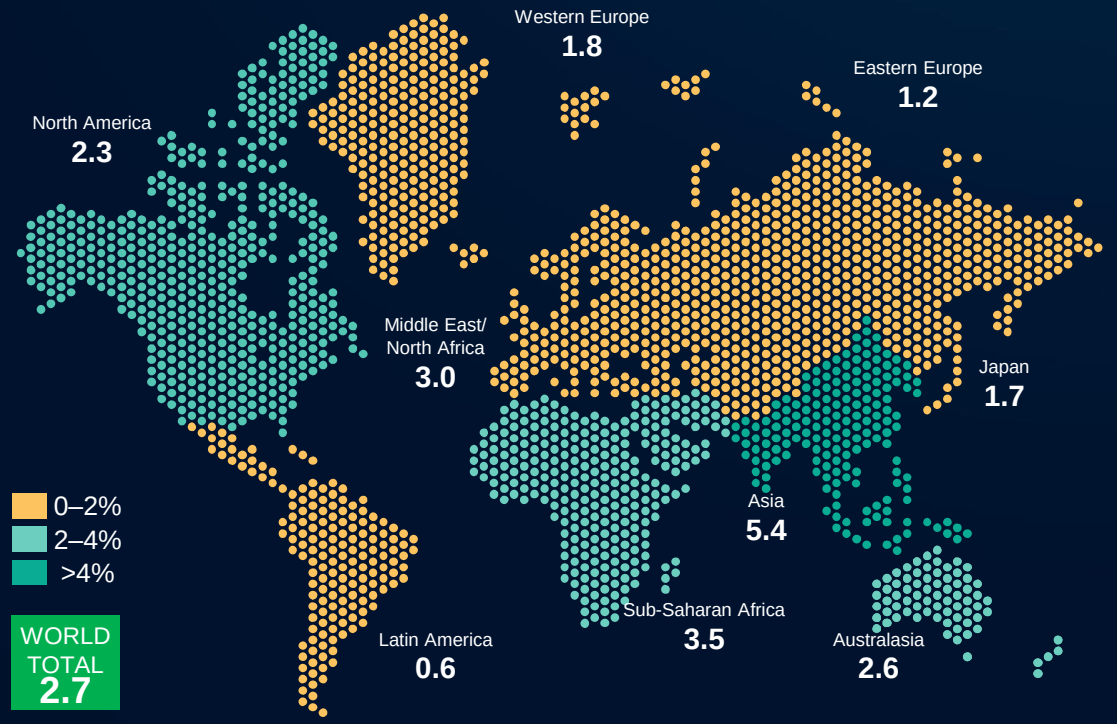
Innovation Journey



Economies are going digital fast

The Global GDP forecast 2016

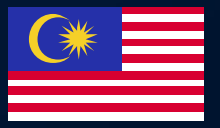


Source : Economist Intelligence Unit

Countries are setting policies to encourage ICT investment


Singapore Smart Nation


Digital Canada 150


Smart Digital Malaysia


Industry 4.0


Advanced Manufacturing 2.0


Internet Plus


Nigeria National
Broadband Strategy


Colombia Live Digital


Connected Argentina

148 countries have developed national broadband plan strategy or policy - ITU

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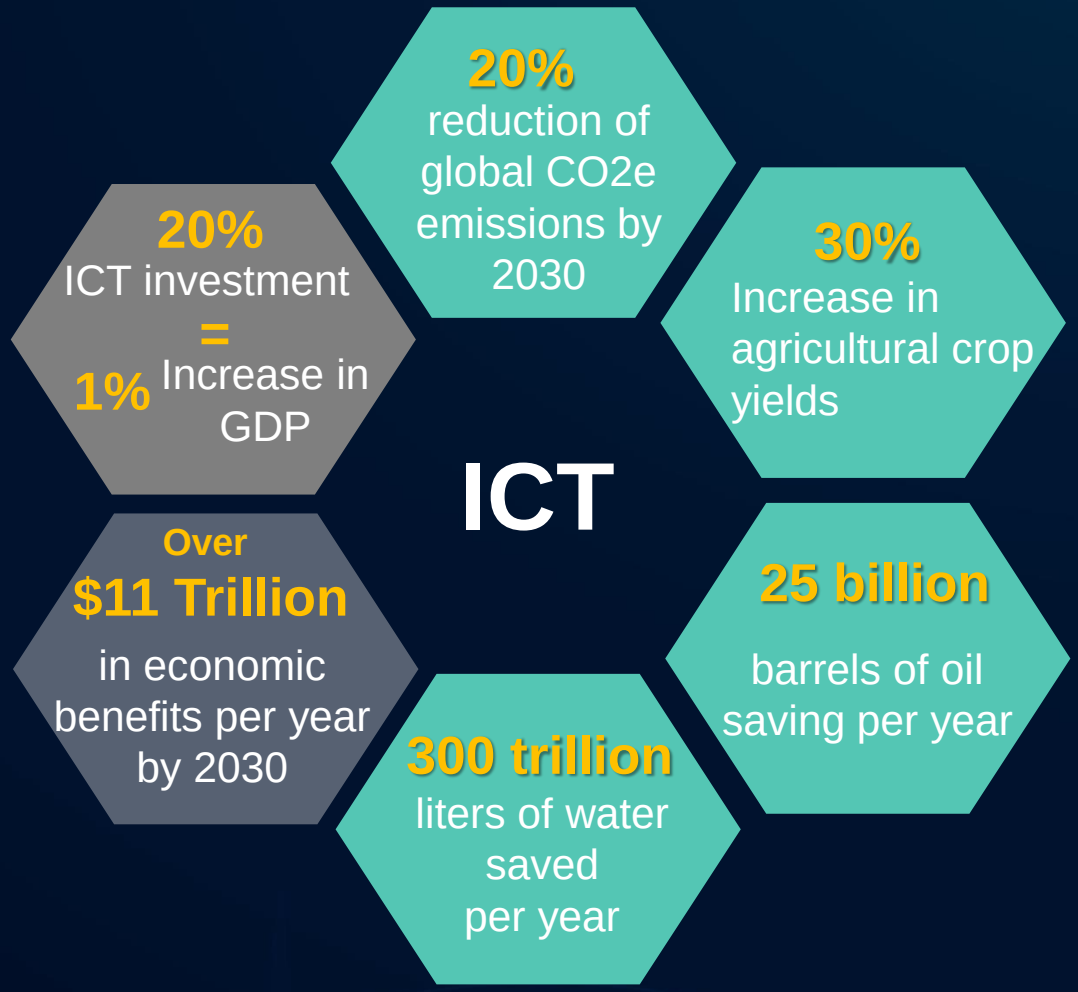
ICT drives digital transformation



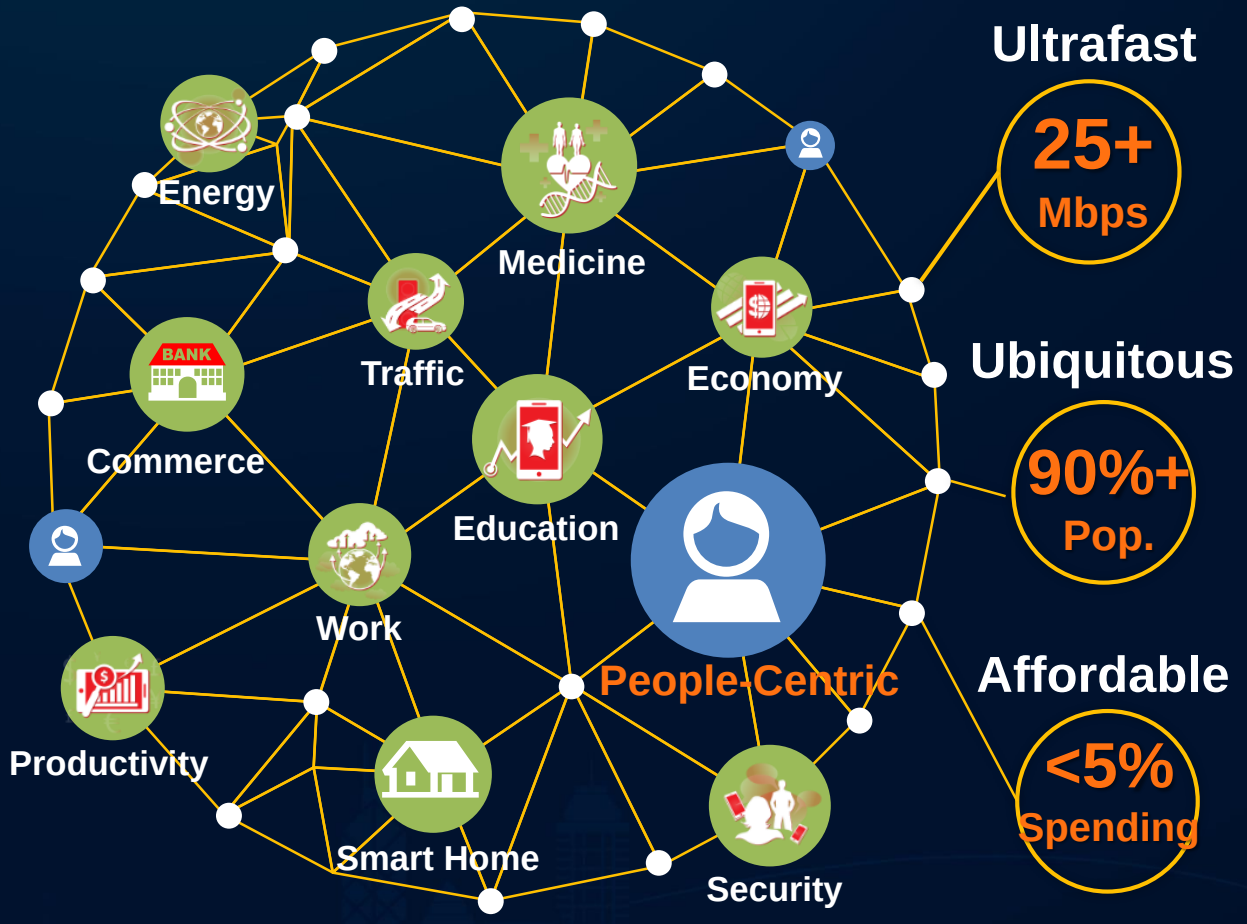
- **China**: Turnovers of e-commerce exceed CNY18 trillion, by-passing the credit card stage and directly entering the e-payment era, 12.7% of the total retail sales of consumer goods

- **Malaysia**: MyTeksi enables mobile taxi booking and goods delivery, mitigating traffic jams and enhancing efficiency

Source: WEF 2015, GCI 2016, GeSI

Digital economy needs infrastructure

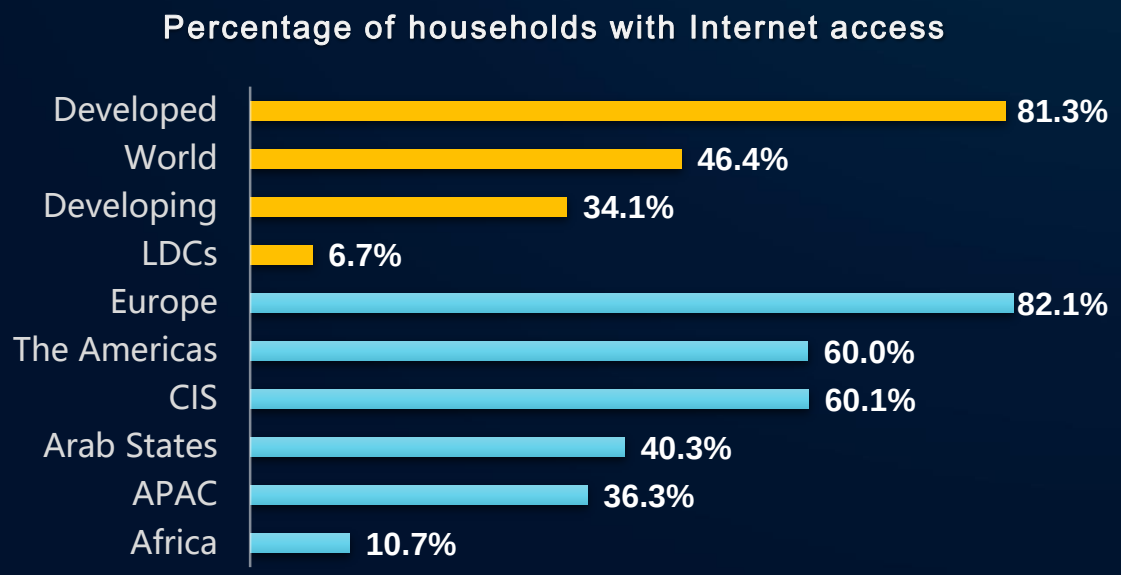
- Overwhelming evidence to support benefit of broadband investment in the creation of jobs and GDP growth
- Benefit : cost ratio of between 2.7 and 2.9 (Europe)[1]
- Household monthly income increases US$322 (OECD) and US$46 (BRICS), while bandwidth upgraded from 0.5Mbps to 4Mbps



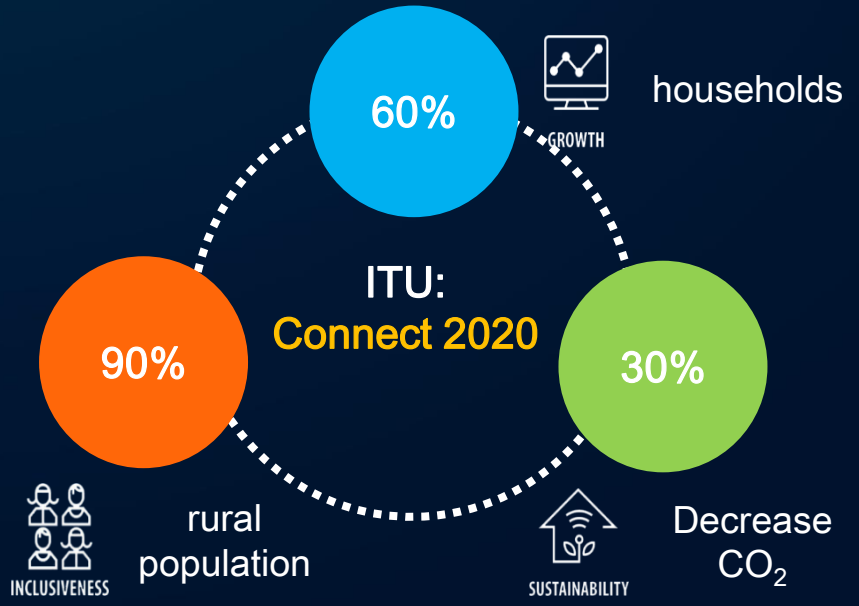
Source: Analysys Mason research

About 1B Households are Unconnected

Households: 779M connected, 992M unconnected



Connect 2020: Drive households BB fast-growing

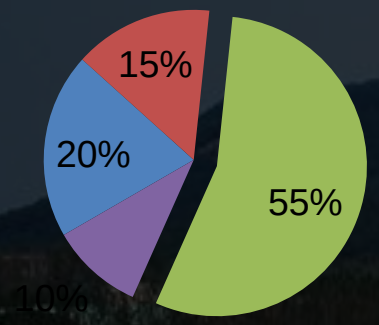


148 Countries with National Broadband Plans

More than 300M households will be connected by 2020

Gigabit on any media

FTTH Deployment Cost Breakdown



ODN + Engineering = **70%** total cost

Deploying Gigabits

gigabitmonitor.com

Networks Deployed

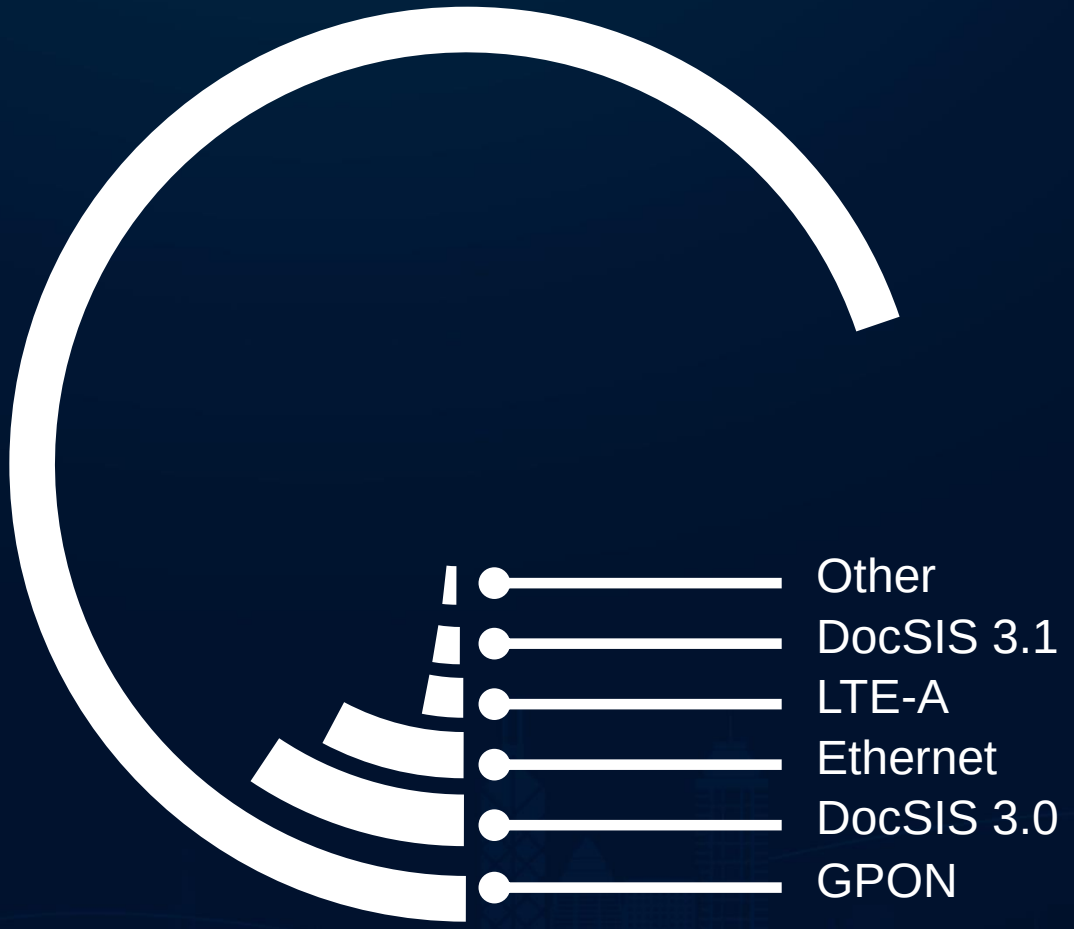
350

Under Construction

164

70% launched since 2015

Technology

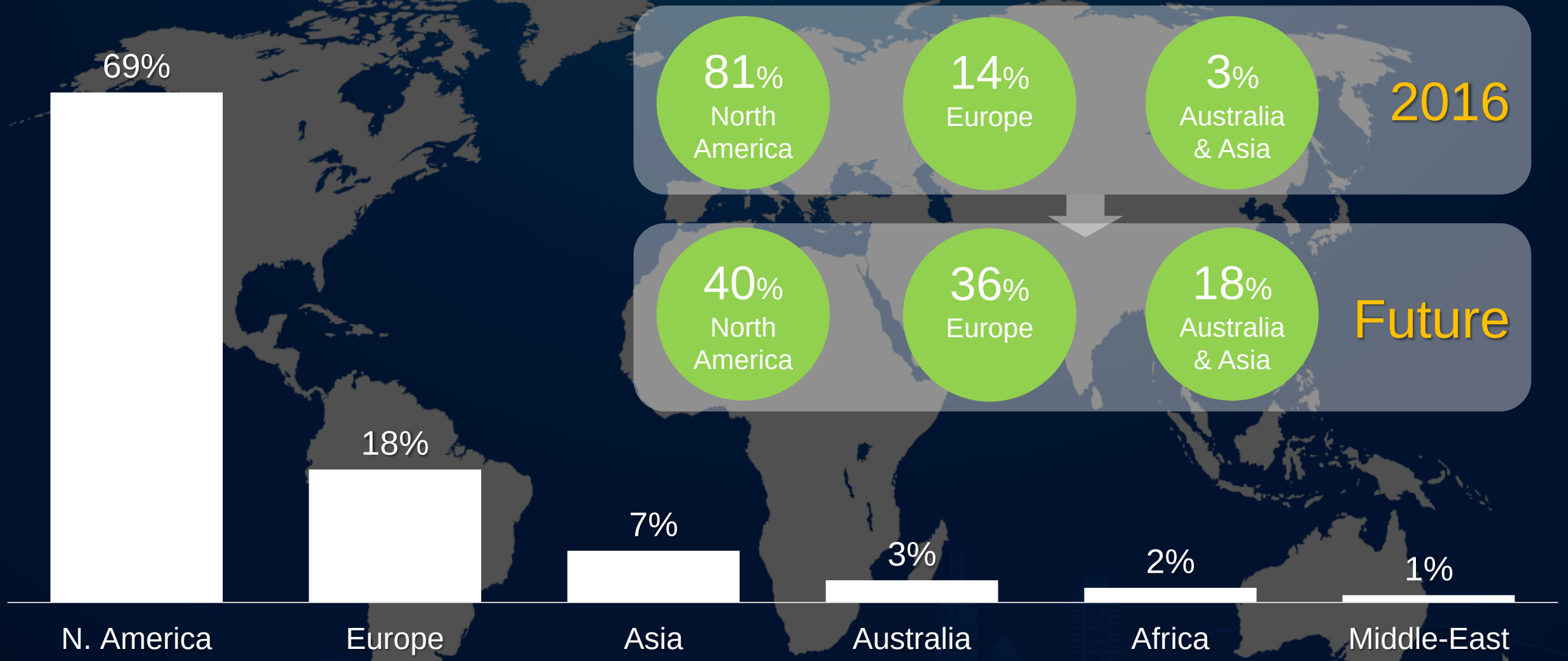


5G Plans:

37 telcos

Starting 2017

Who is deploying GPON



Huawei GCI

Benchmarking digital economy transformation

Traditional Economy

Digital Economy

The GCI provides a comprehensive and objective assessment of a country’s connectivity from both a national and business perspective.

5 technology enablers

Broadband

Communication foundation for collecting and sending data to users and machines.
Availability and affordability are demand drivers.
Security and responsiveness are experience drivers.

Data Centers

Computing and storage facilities for providing computing power and warehousing data.
Access and scalability are demand drivers.
Responsiveness and computing power are experience drivers.

Cloud

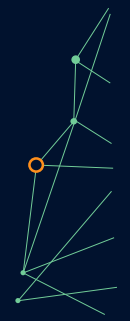
Distribution model for mass market access to computing and storage capabilities.
Access and affordability are demand drivers.
Security and responsiveness are experience drivers.

Big Data

Applications and analytics convert data into information and insights.
Data abundance and computing capabilities are demand drivers.
Data quality and real-time are experience drivers.

Internet of Things

Sensor and actuator networks for data collection and response.
Availability of network and application areas are demand drivers.
Quality analytics and applicability are experience drivers.



Communication and computing network forms the foundation of connectivity

Cloud Services enables the distribution, adoption and access to the communications and computing foundation

Big data analytics runs on top to convert data into information and information into solutions and innovation

IoT turns most things into autonomous computing systems that collect data, provide solutions, and drive innovation

Future technologies riding on smart IoT drive augmented innovation

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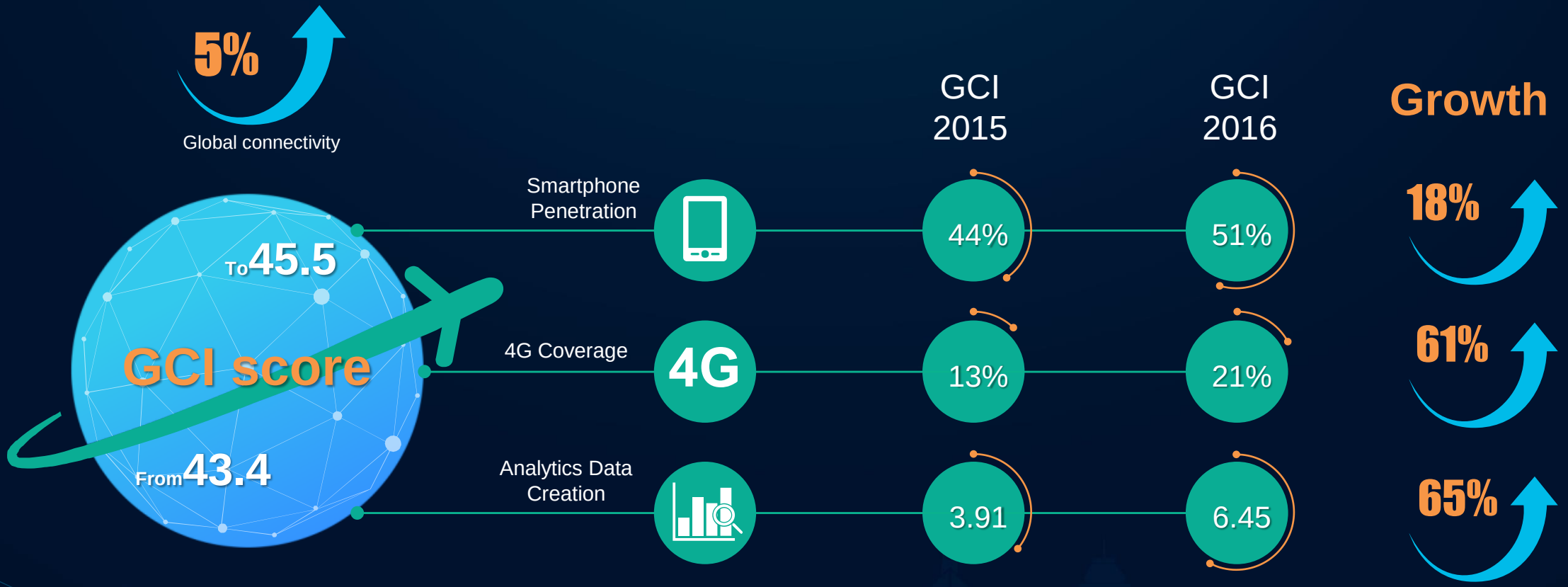
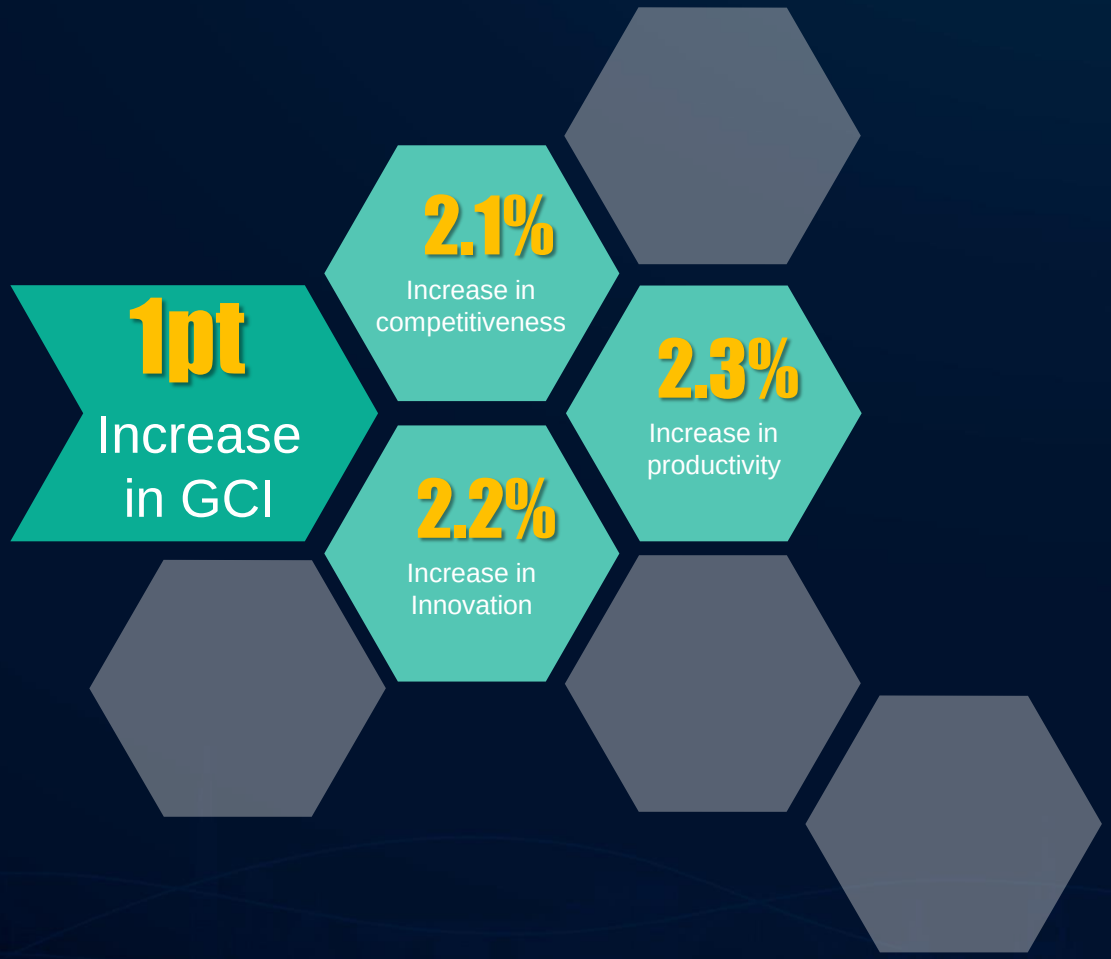
Transformation is accelerating



Digital infrastructure drives economic growth

A one-point increase in GCI does the following for your nation:



Inclusive development

Improving productivity as it brings rural and disadvantaged communities into the digital economy.

Innovation-driven development

Disrupting and reconstructing traditional industries, boosting efficiency and specialization

Sustainable development

Driving long term competitiveness in the face of emerging environmental concerns and regulations

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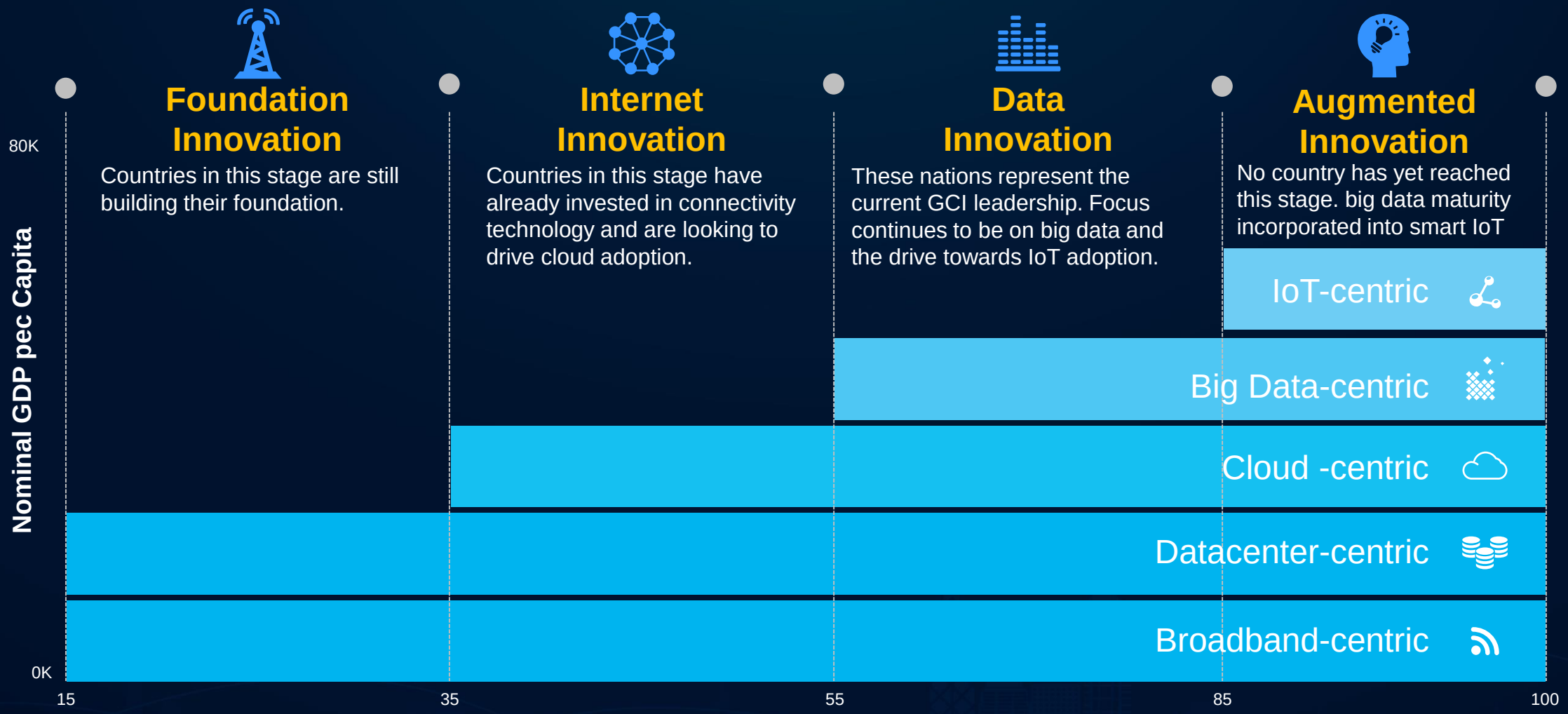
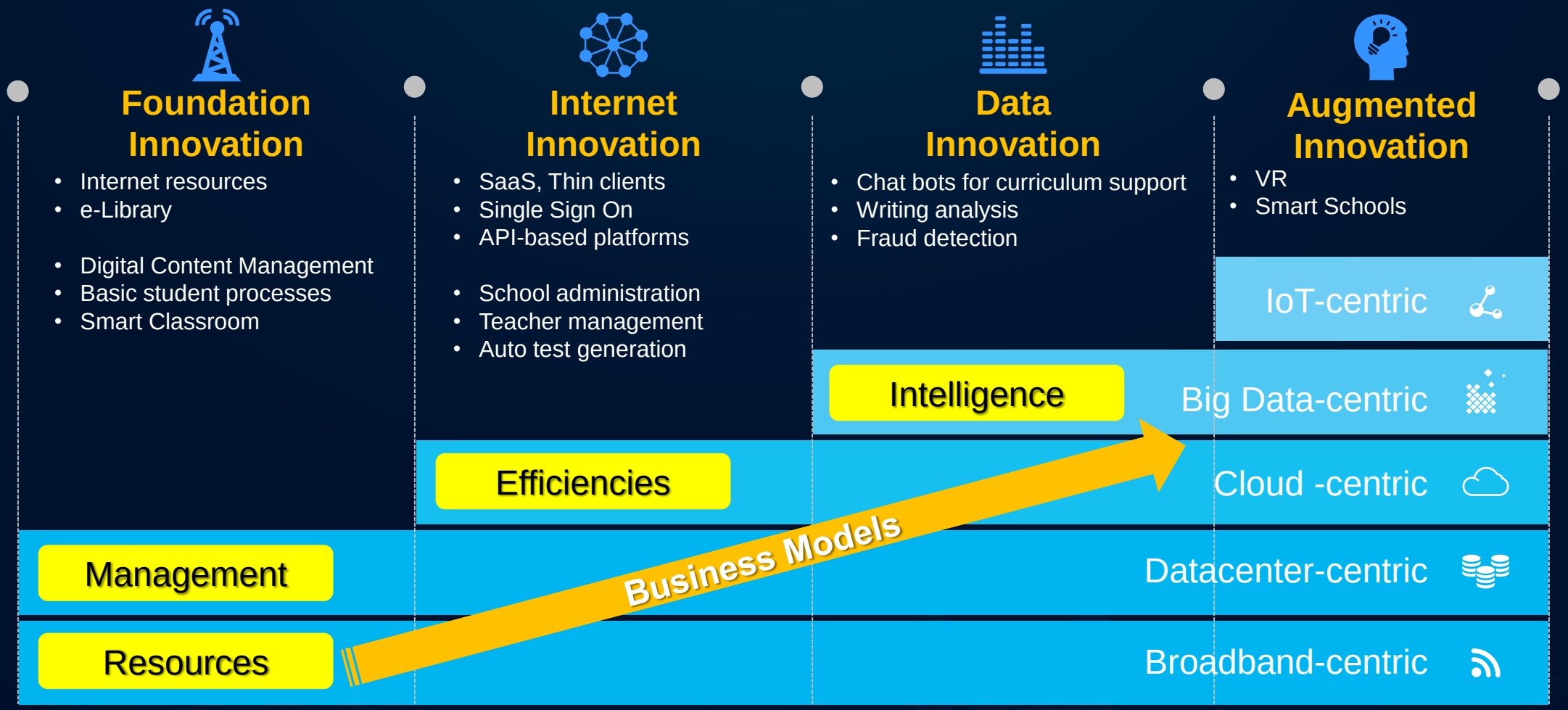
Innovation within Technology Progression



HEART Report

> When introducing edtech in schools, it is key to plan how it will integrate with pedagogy and the curriculum.
>
> Simply providing equipment is not enough to improve teaching

Innovation in edTech

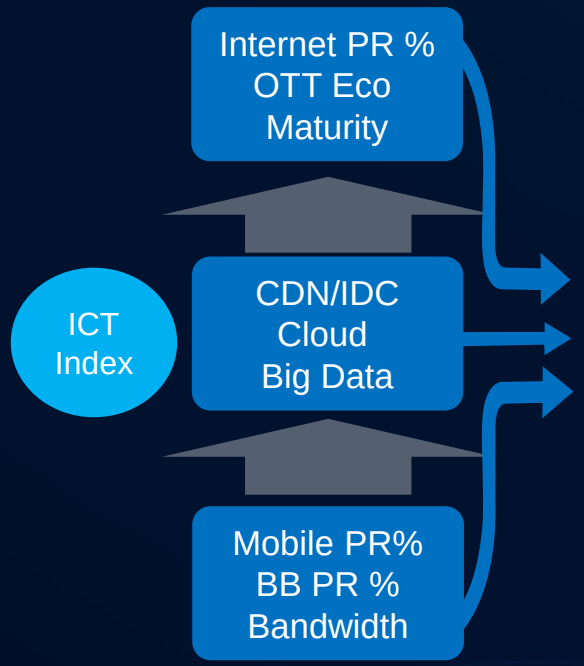


Integration Boosts Economy

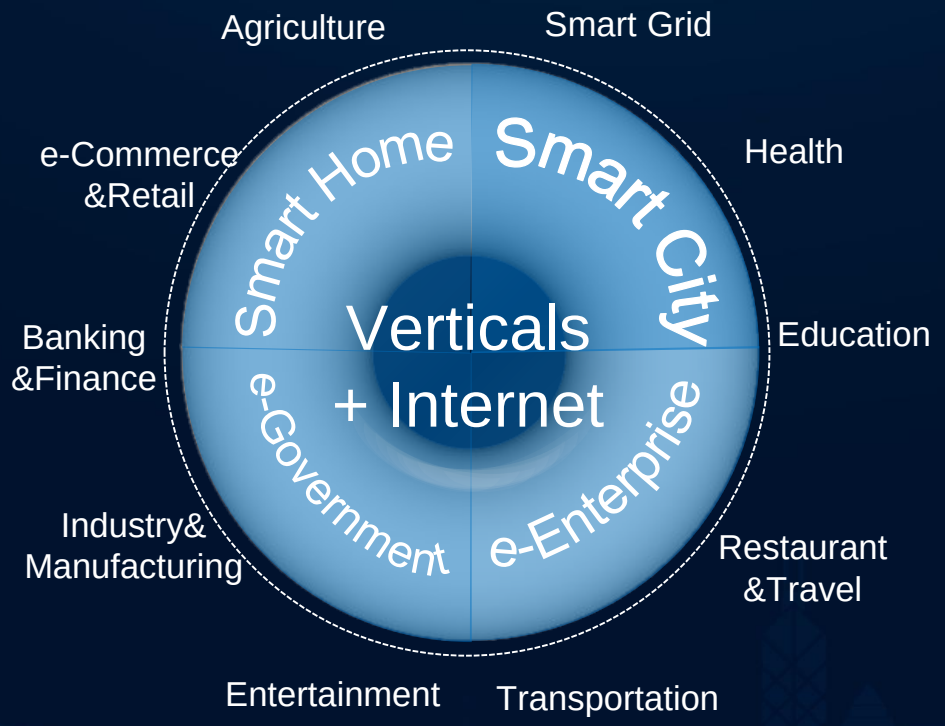
Technology supports internetization, internetization creates new measurable growth

Platform: Digitization

Result of integration of digitized tech is Internetization

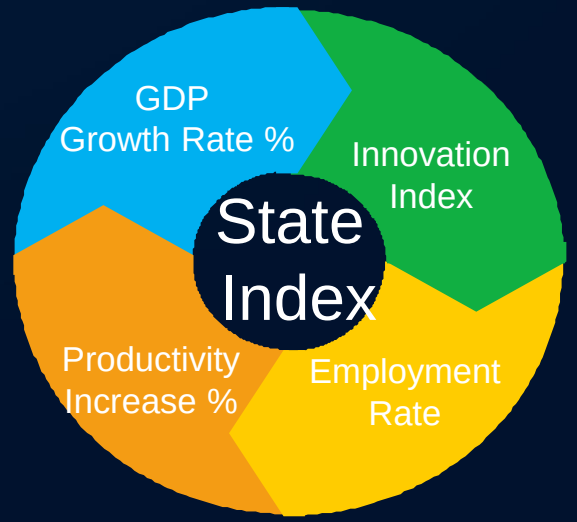


Internetization



New Growth Paradigm

Bolstered by tech, but triggered by [Internet + Verticals]



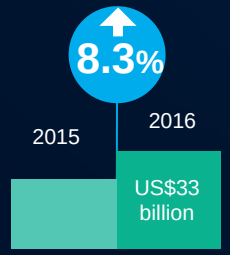
Source: Huawei Consulting Analysis

Indonesia

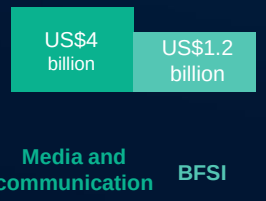
Increasing ICT supply to give more people access to the digital world, 90% of investment is on ICT hardware

Big gains with big ICT investment

Country level



Industry level



US$33 billion in ICT investment in 2016
8.3 percent growth compared with 2015

Policy is making its difference

Data center networks: an international approach

The government is starting many partnerships with foreign tech vendors such as Japan's NTT on the processes and core infrastructure for upgrading DC services.

Indonesia Broadband Plan (IBP)

On a national scale, the IBP aims to provide fixed connectivity through fiber alongside mobile voice and data services, and through its usage to formulate a 5G service plan by 2020.

Getting the nation healthy with Indonesia Sehat (Healthy Indonesia)

ICT was introduced into the healthcare system in 2014, a central feature of which was a smart health card for each citizen, which has in large part driven the Indonesian Broadband Plan (IBP) alongside the faster rollout plan for rural Indonesia by 2019.

Indonesia FTTH Association (IFA)

Supports national broadband development to boost digital economy

by 2019

IBP

$21 billion

Indonesia Broadband Plan

- 100% building at 1 Gbps
- 71% household at 20 Mbps
- 49% suburban household at 10 Mbps

IFA

17 members, from various to promote the development of broadband infrastructure with support from the Indonesian government.

MoU

Signed by Indonesia's Ministers of ICT, Public Works and Public Housing, and Home Affairs to accelerate optical fiber infrastructure build-out

China

Increasing ICT demand for industry digitization and high-quality economic growth

Going digital by increasing ICT demand

E-commerce

Media Market

Launched Broadband China strategy. By 2020:

- High-speed broadband to reach 98% of rural villages
- Urban broadband access to hit 50 Mbps while rural access to reach 12 Mbps
- FTTH to deliver 1 Gbps speeds in its most modern cities

Next step: a global manufacturing center based on low carbon economy

Launched the “Made in China 2025” strategy

- Incentive policies and investments focusing on cloud services, Big Data analytics and IoT
- Encourage independent innovation of SMEs

China ICT spend
US$**415b**
2015

Malaysia

Using digital technologies to drive economic transformation

The outlook for data centers is promising

Growth jumping by over 40% in the past three years – over double Asia Pacific's average of 16%.

Government has rolled out multiple initiatives to spur cloud adoption

-A key 2014 scheme for SMEs granted up to 750 Ringgit for cloud subscriptions to 1,800 SMEs.

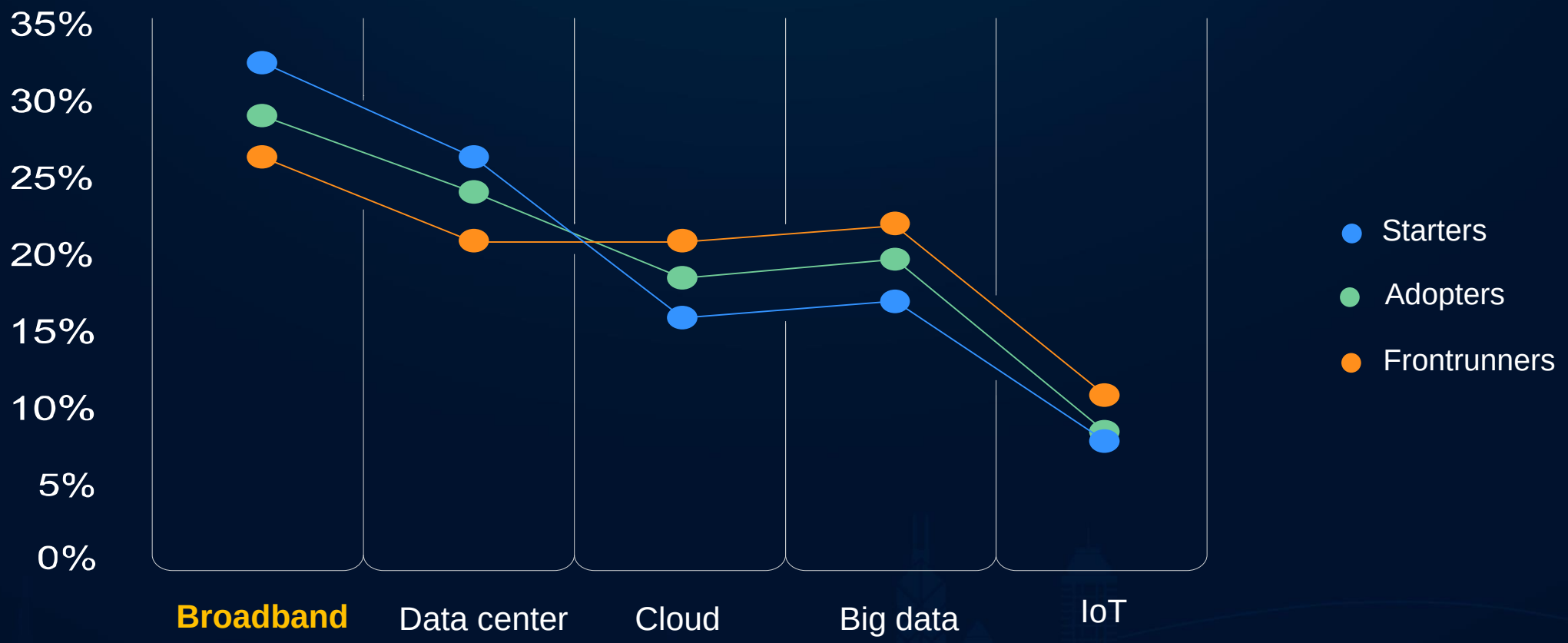
-A strong cloud ecosystem has been created for Malaysian ISVs and data center providers.

Launched LTE networks with peak download speeds of 75 Mbps

Regulator allocated the 2.6 GHz frequency band to four of the nation's mobile service providers

Broadband is #1 technology enabler

Priorities for investing in technologies in 2016



Recommendations for Starters

Policy Markers

- Increase ICT investment as a percentage of GDP to expand mobile broadband nationwide
- Reduce tariffs and subsidize smartphone adoption to get smart devices into homes
- Promote investment in DCs by third parties to meet national computing needs
- Open telecoms market to widen coverage and make broadband affordable through competition
- Plan high-speed broadband through 4G and FTTH rollout

Industry Leaders

- Act now to plan digital transformation initiatives, even if it's only high-speed broadband for e-commerce. The majority of enterprises in the Foundation Innovation stage are in Phase 1 of digital transformation – now is the time to get ahead.
- Lobby the government to define a national standard for high-speed broadband bandwidth, coverage, and speed over the next one to two years to support industry digitization.
- Step up cloud services to support digital transformation.

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Manage as you Measure

Benchmarking national ICT policy: Overall – Supply-side – Demand-side.

Macro Policy	GDP +2%	People • +10k ICT jobs • training	ICT Skills • Schools • SMEs
Broadband Infrastructure	Broadband >60% adoption	Coverage: • ultra FBB • 4G and better	Terminals: • Smartphones • 4K devices
Services Innovation	eGov • 50% svcs • Open Data	#Startups • #VCs • #M&As	Ecosystem • #partners • #API appls.
Measure & Publish	FBB • b/w, latency • U-vMOS)	MBB • b/w, latency • availability	International bandwidth • bps per user

National Indices

GCI
Global Connectivity Index

HDI
Human Development Index

IDI
ICT Development Index

NRI
Network Readiness Index

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Considerations

Policies institutions and incentives :

Policies set the direction of digital transformation, and form the legal basis for a nation to act.

Incentives set the speed and depth of change and institutions drive change, provide governance, and monitor progress.

Manpower and skills :

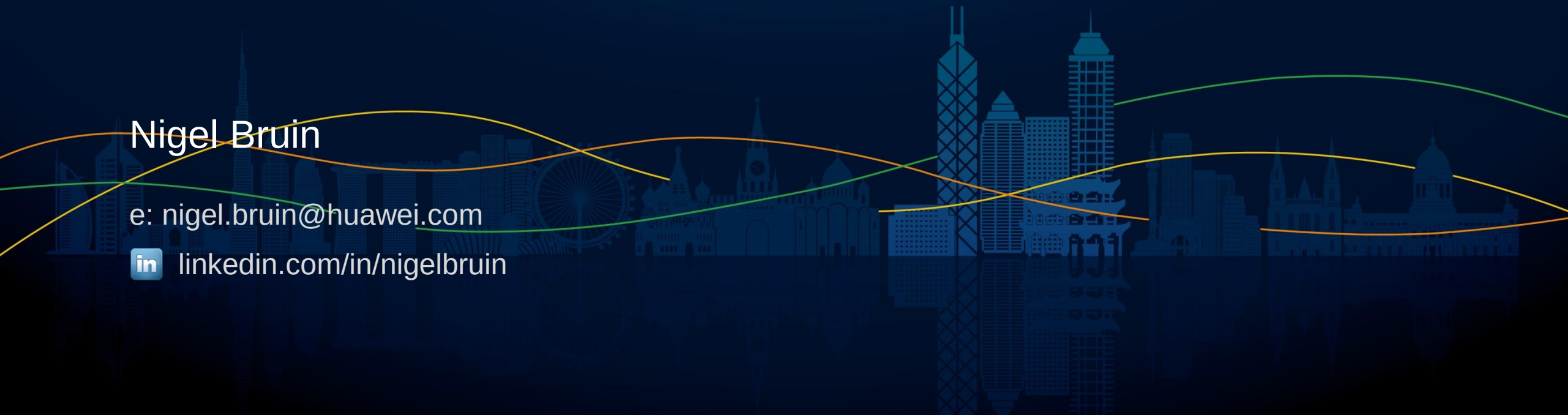
Skilled manpower is at the heart of digital transformation. Technical, management, policy, and planning skills are all needed.

IT literacy is crucial as it affects how digital content is consumed and adopted by people at large.

Digital ecosystem:

Governments need to take the lead in digitally transforming themselves, driving cross-industry collaboration, and building long-term partnerships with the private sector and the financial world to create a robust ICT ecosystem.

THANK YOU



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e-Management System