

A background image of a dark night sky with several bright, glowing sparklers or fireworks exploding, creating a festive and dynamic atmosphere.

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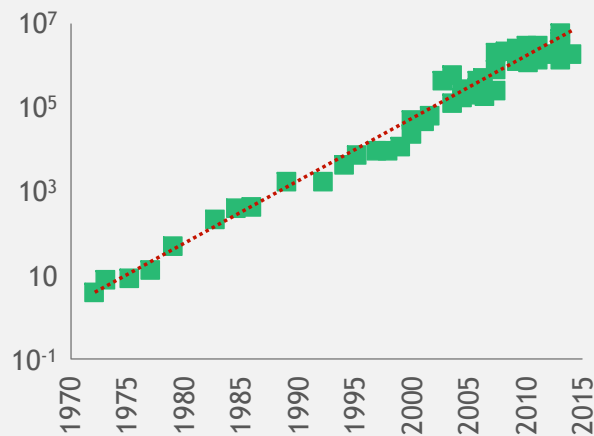
Digital infrastructure for the digital economy

JULY 2018

Foundational tech trends shaping the Digital Economy

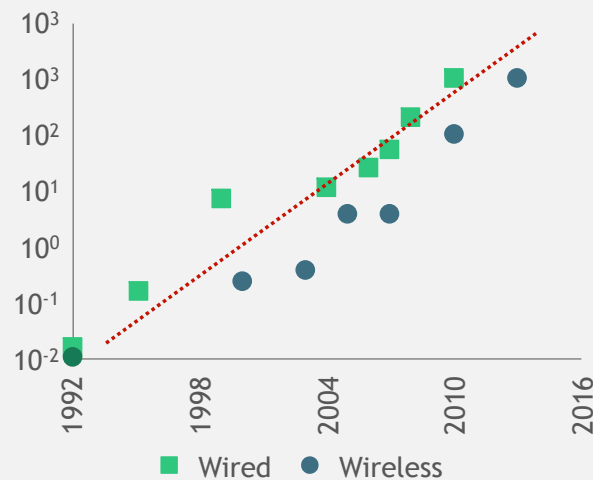
Moore's Law: Processing power doubles every 18 mths

Number of transistors per chip
'000 (Log scale)



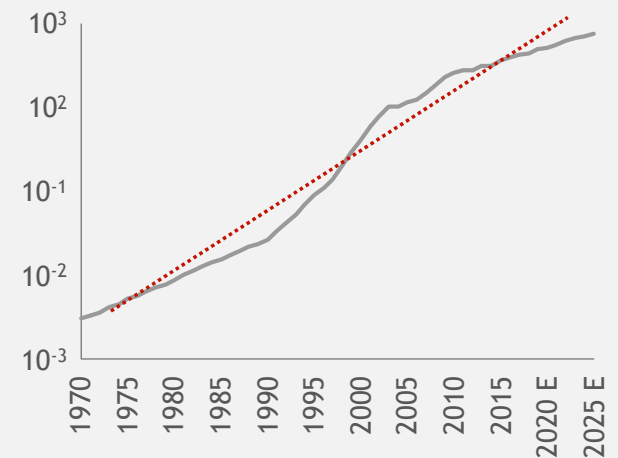
Nielsen's law: internet bandwidth grows by 50% p.a.

Downstream speed in
Mbps (Log scale)



Kryder's Law: Disk density doubles every 13 months

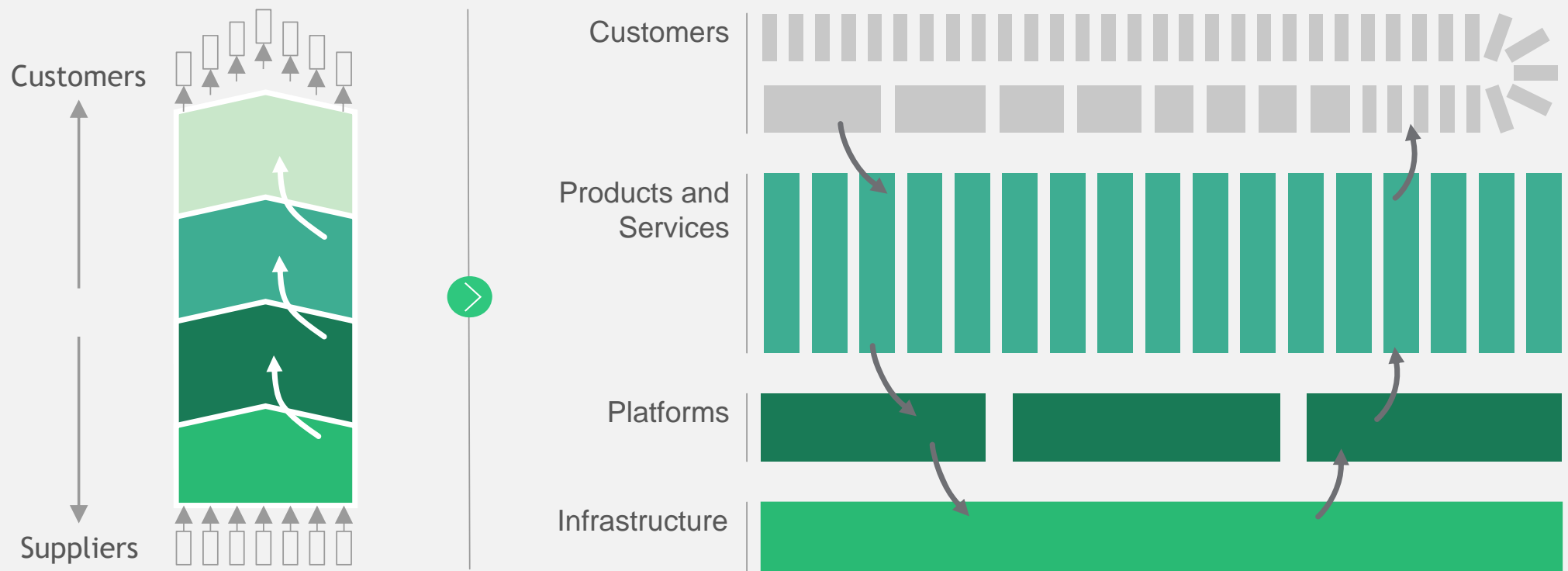
Gbit per square
inch (Log scale)



1. Maximum safe power consumption

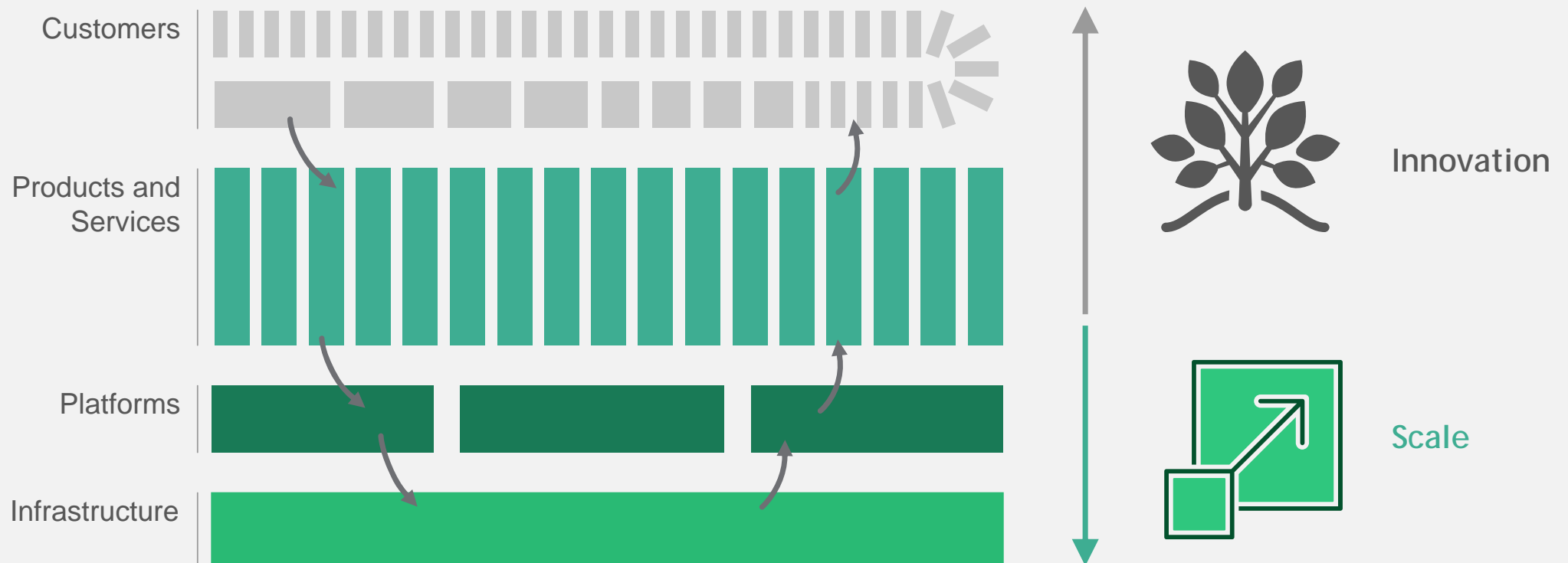
Source: Intel, press reports, Bob Colwell, Linley group, IB consulting, The Economist; Technology Futures Inc.; BCG analysis; Various industry sources and Deutsche bank estimates

Digital is shifting whole industries into a stack structure



Source: BCG analysis

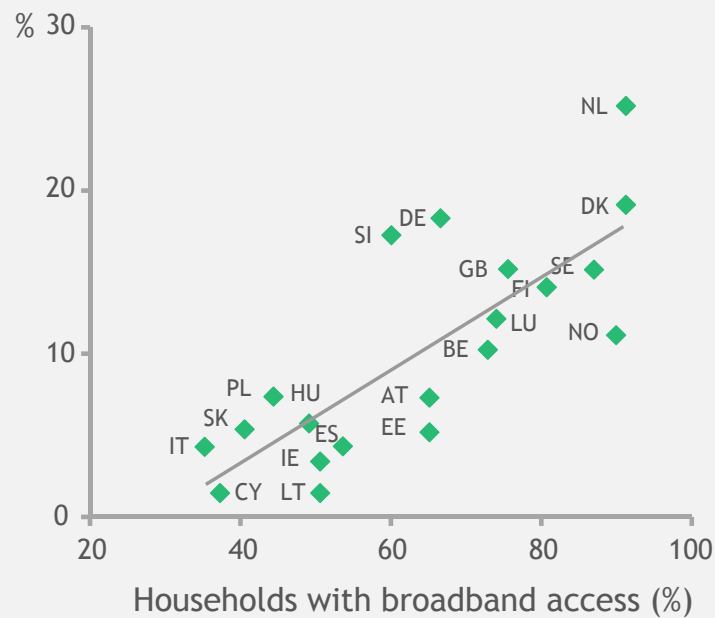
Different needs at different layers



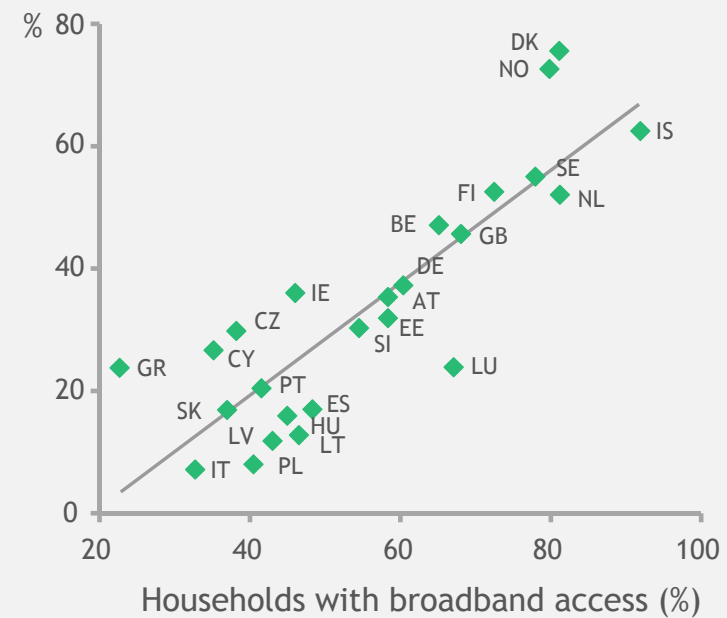
Source: BCG analysis

Connectivity infrastructure creates proven value...

Households using Internet to sell goods and services



Enterprises with employees who work at home



A 10% Δ in broadband penetration implies 1.2% Δ in growth of per capita GDP

Sources: "A review of broadband Internet transitions and policy from around the world" The Berkman center, Harvard university, October 2009; "Economic impacts of Broadband" C. Zhen-Wei Qiang, C. M. Rossotto, K. Kimura (World Bank)

... but getting it right
can be costly, and
inefficient

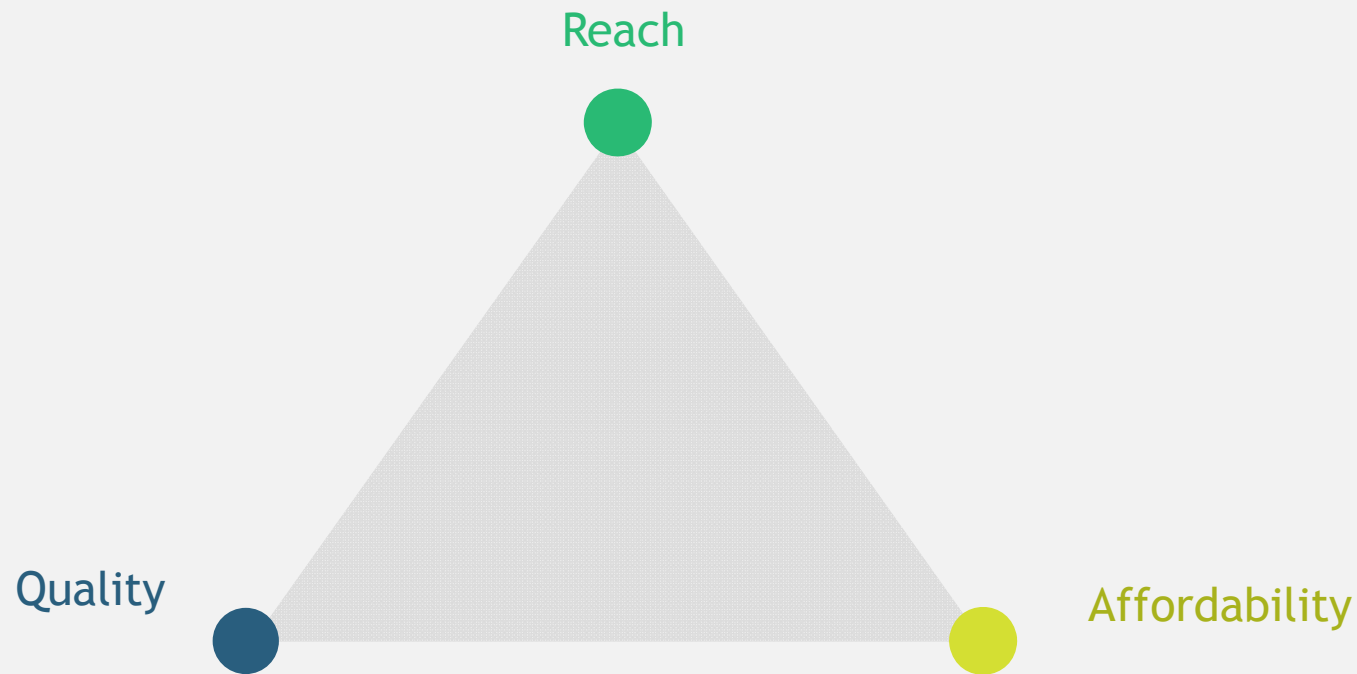
Australia pledged a massive investment for
FTTH 100 Mbps for all

Execution was delayed and 3x over-budget

Comprehensive multi-technology, supply-
demand-driven planning achieved the same
coverage with 45% less budget

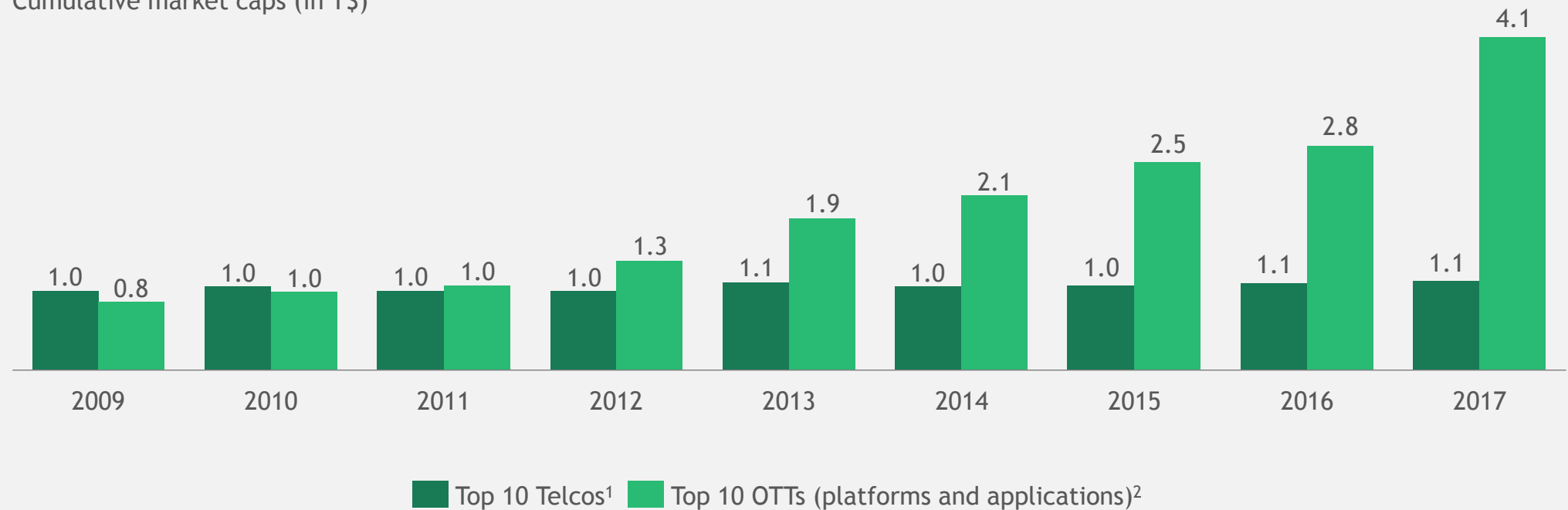


Complex considerations to balance reach, quality and affordability



The problem is getting harder with value migrating up

Cumulative market caps (in T\$)



1. Top 10 Telcos; China Mobile, AT&T, Telefónica, Vodafone, Verizon, FT, DT, NTT, NTT DoCoMo, America Movil 2. Top 10 OTT: Apple, Microsoft, Google, Amazon, Facebook, Ebay, Yahoo, Baidu, Tencent, Priceline

Source: Thomson; IQ Capital; annual reports

Policy makers must rethink scope, approach and level of engagement

	Historical perspective	Future perspective
Scope	<p>Telco-specific policies and regulations to ensure competition</p> <p>Technology-specific market definitions</p>	<p>Policies that recognize impact across entire ICT value chain</p> <p>Converged fixed/mobile/cable definitions</p>
Approach	<p>Rules-based regulations</p> <p>Ex-ante intervention to avoid harm</p> <p>Regulations established by government authorities</p>	<p>Principles-based regulations and other tools (e.g., transparency, self regulation)</p> <p>More ex-post to encourage experimentation (where competitive)</p> <p>Collaboration with industry and other organizations</p>
Level	<p>Policies and regulations established by national bodies and in select cases institutions (e.g., ITU)</p>	<p>Policies and regulations established at appropriate level (e.g., international where harmonization required, local where experimentation needed)</p>

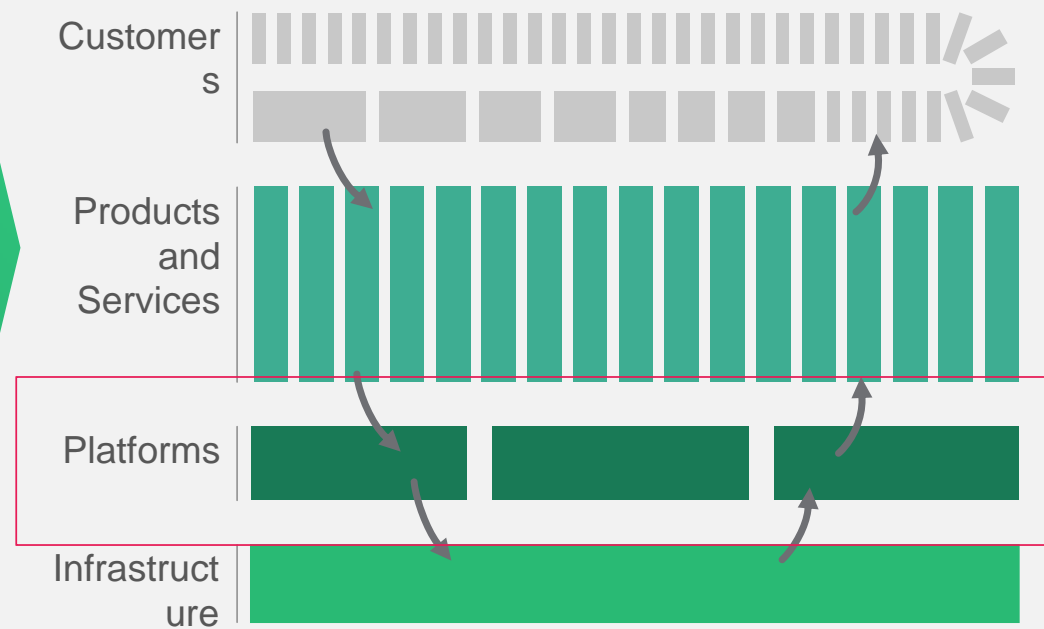
A new type of (soft) infrastructure is needed to capture this value

Enabling platform layer behaving like infrastructure

Old mindset: build a use case THEN look for the right data

... radically different from the ...

New mindset: get the data THEN find the right monetization use case



PEOPLE *describe themselves*

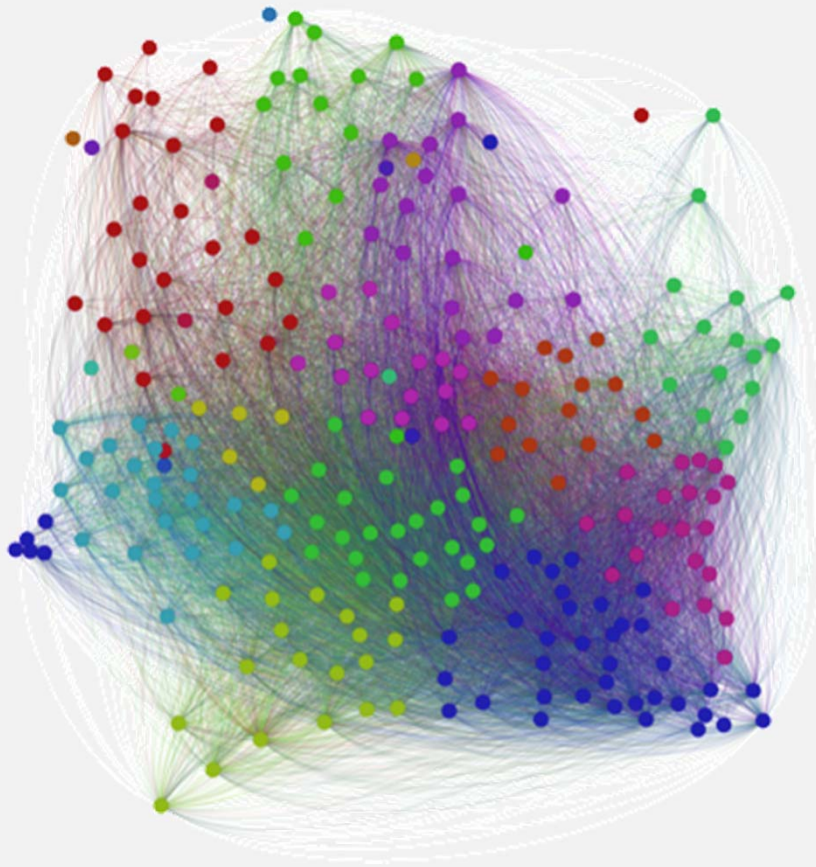
Côte
d'Ivoire



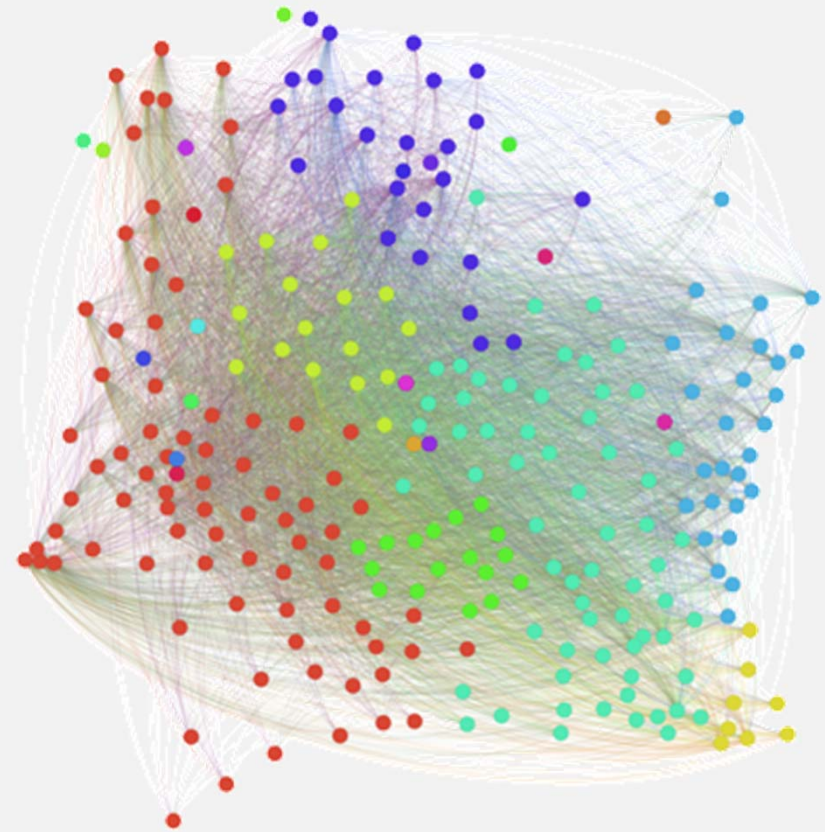
PEOPLE *describe themselves*

Orange in Côte d'Ivoire

MOBILITY NETWORK



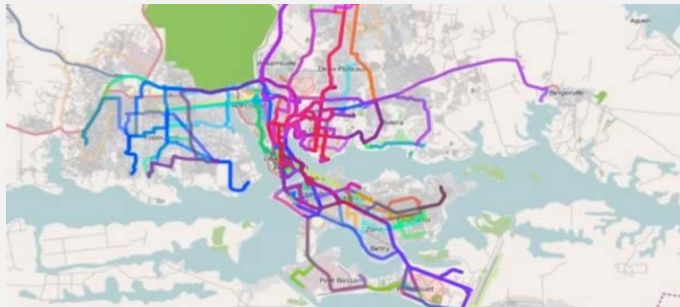
COMMUNICATION NETWORK



PEOPLE *describe themselves*

IBM Research: Optimizing the bus network in Abidjan, Côte d'Ivoire

CURRENT BUS NETWORK



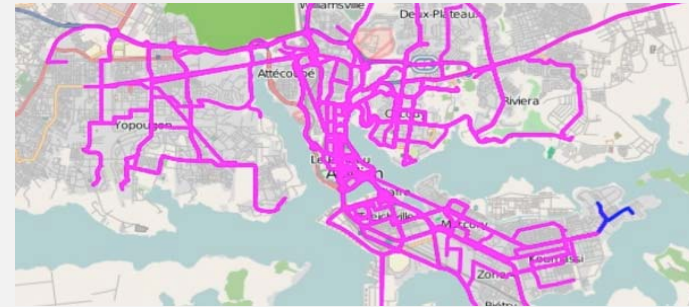
OFF-NETWORK TRAVEL



TRAVEL VOLUME TO ONE DESTINATION



OPTIMIZED NETWORK

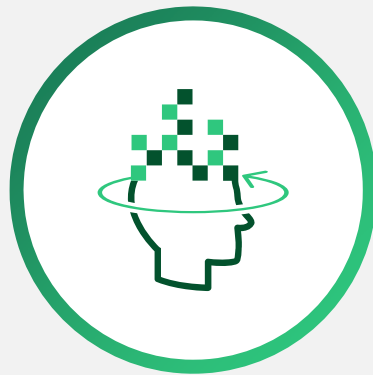


10% reduction in city-wide travel times

Which (soft) infrastructures to build?



Data
infrastructure
(Singapore)



Identity
infrastructure
(India)



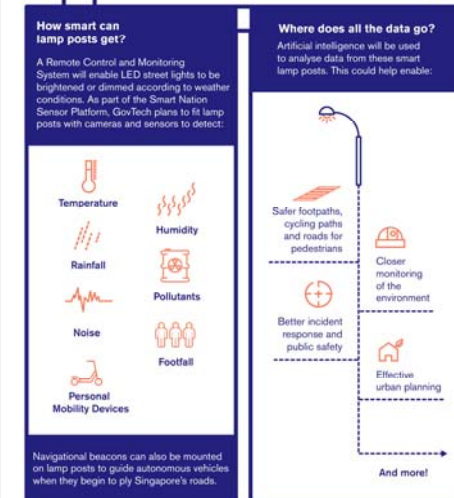
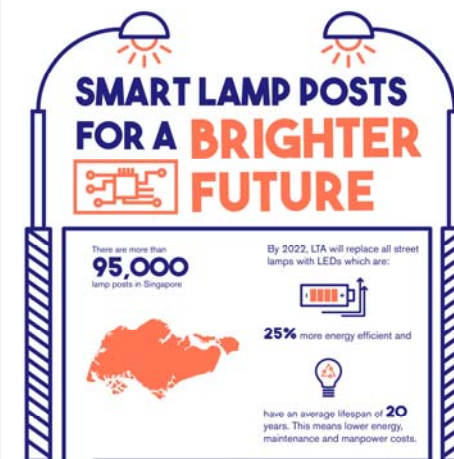
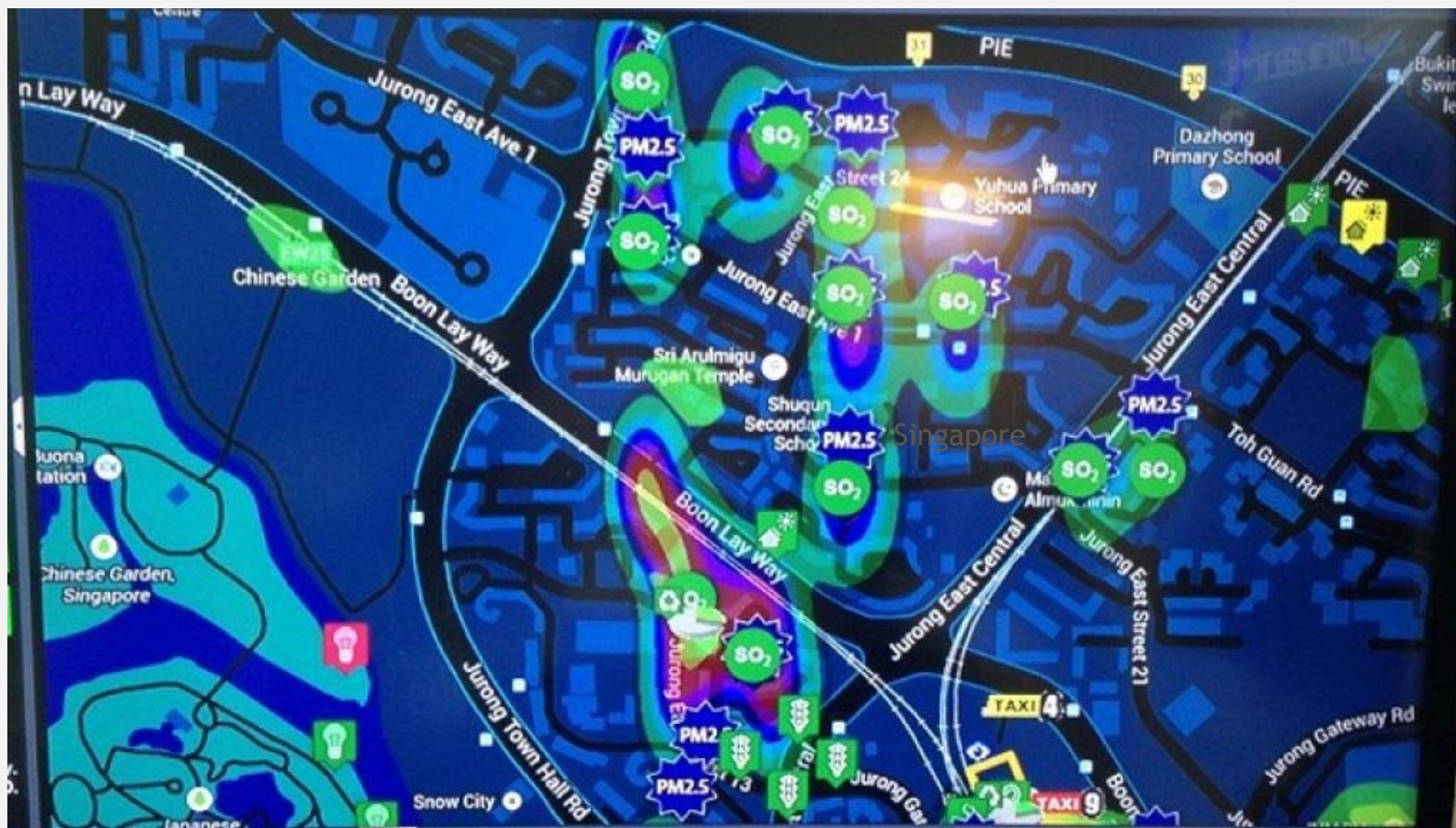
Payment
infrastructure
(China)



Others to
come



Singapore: Smart Nation Sensor Platform



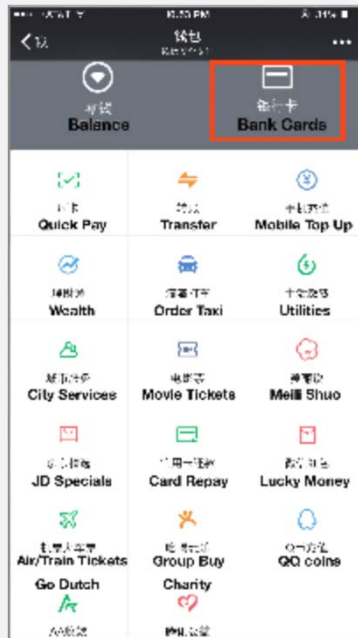


China: Going cashless for everything ... even street food





Digital players such as WeChat have become an integral part of daily life...



“There are two types of people in the world: people who use WeChat, and people who don’t use WeChat”



... and powering the next generation of China SMEs



Providing SMEs with team collaboration tools and services



Simple set up of mini-programs and mini-stores



Microloans provided by WeChat Bank

Digital infrastructure for the digital economy

Key messages

Creating environments where data can flow and digital services can thrive is fundamental to advancing the digital economy

- Ecosystems need infrastructure and investment-friendly environments

Delivering the infrastructure to support the digital economy is the collective responsibility of many stakeholders

Complex considerations to achieve rich, quality and affordability in digital infrastructure

Policy makers and industry participants alike must adopt a bias towards experimentation and innovation

- Simply investing more is not the answer
- Technological and business model experimentation and innovation is important for both infrastructure and digital services
- Catalyze innovation through investment in new data and enabling platforms – data is the new infrastructure

Forward-looking, light-touch approach to policy and regulation is required to encourage innovation and investment across the digital economy stack

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A close-up photograph of a lit sparkler against a dark background. The sparkler is positioned on the right side of the frame, with numerous bright, golden-yellow sparks radiating outwards in all directions. The sparks vary in length and intensity, creating a dynamic and celebratory visual effect. The background is dark and slightly out of focus, emphasizing the bright light of the sparkler.

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