

Consumer-Centered Digital Communication for Power Management



Dr. Nyoman Adhiarna

Acting Director for Digital Economy, Ministry of Kominformatics and Informatics

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Power Management in Digital Era



LoRa Technology Creates Sustainable Metering Solutions

A composite image with a purple background on the left containing the text "LoRa Technology Creates Sustainable Metering Solutions" and the SEMTECH logo. On the right is a photograph of power towers at sunset with the LoRa logo in the top right and "www.semtech.com" in the bottom right.

SEMTECH

www.semtech.com

Outline

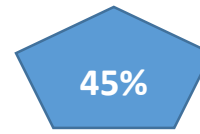
1. Background: National Initiatives
2. IoT: Current Conditions

A close-up photograph of a desk setup. In the foreground, a stack of books is visible, with several yellow sticky notes attached to the pages. A green and brown pen lies horizontally across the books. The background is a plain, light-colored wall. An orange rectangular overlay is positioned on the right side of the image, containing the text 'Background: National Initiatives' in a dark grey, sans-serif font.

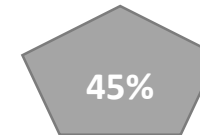
Background: National Initiatives

Internet Users and e-Commerce Activity in Indonesia

Aktifitas e-Commerce di Indonesia 30 Hari Terakhir



Mencari Produk Online



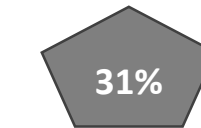
Mengunjungi Toko Online



Membeli Produk Online



Membeli melalui PC



Membeli melalui Mobile

Transaksi e-Commerce



28,07 juta orang
Pembeli produk online (+13% YoY)



\$7.056 Milyar
Total Pendapatan Penjualan Tahunan (+22% YoY)



\$251
Rata-rata Pendapatan Tahunan dari tiap Konsumen (+8% YoY)

Indonesia's Go Digital 2020

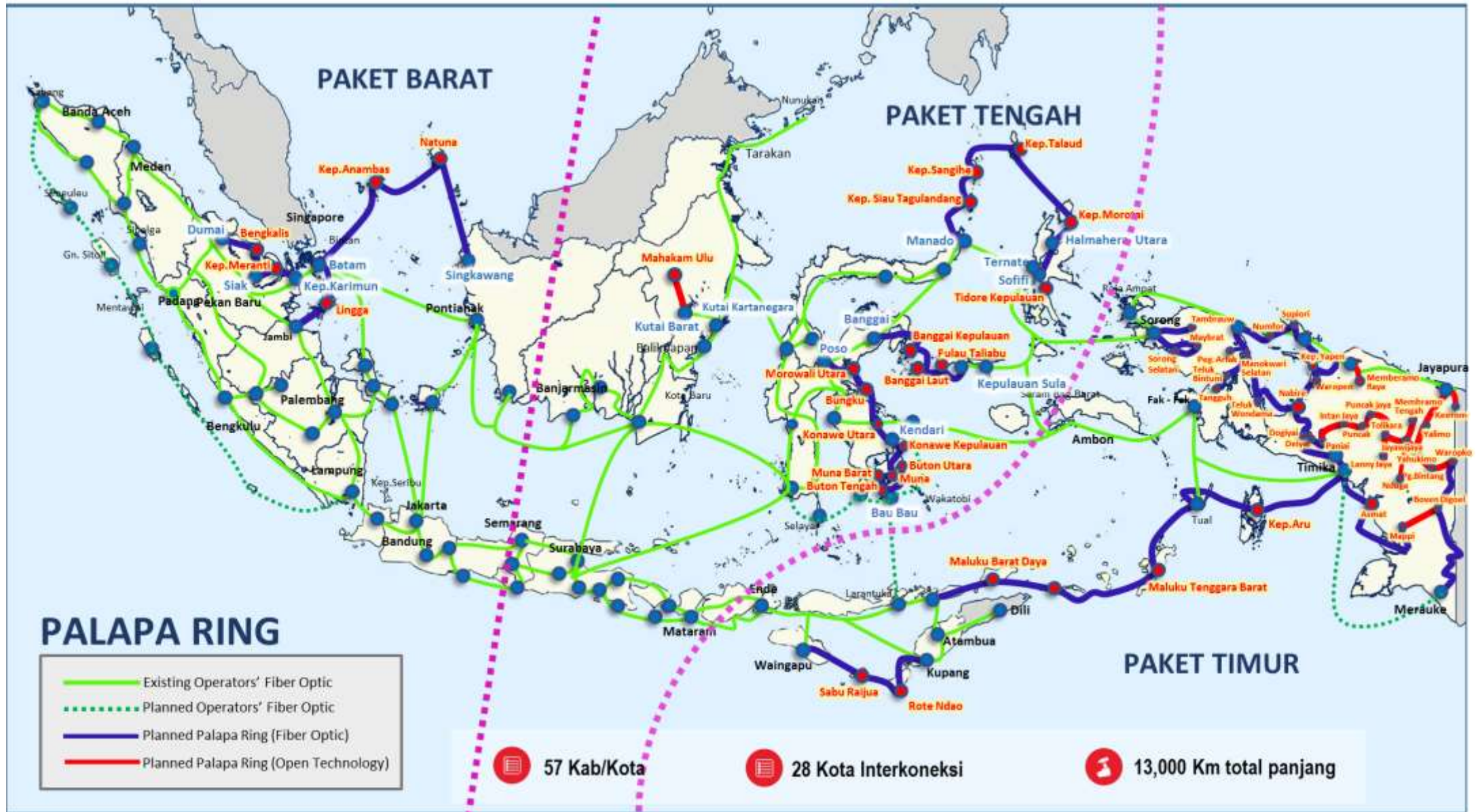
Indonesia has strong foundation to become digital players (not just market!)

**e-Commerce Transaction Target:
USD 130 Billions (2020)**

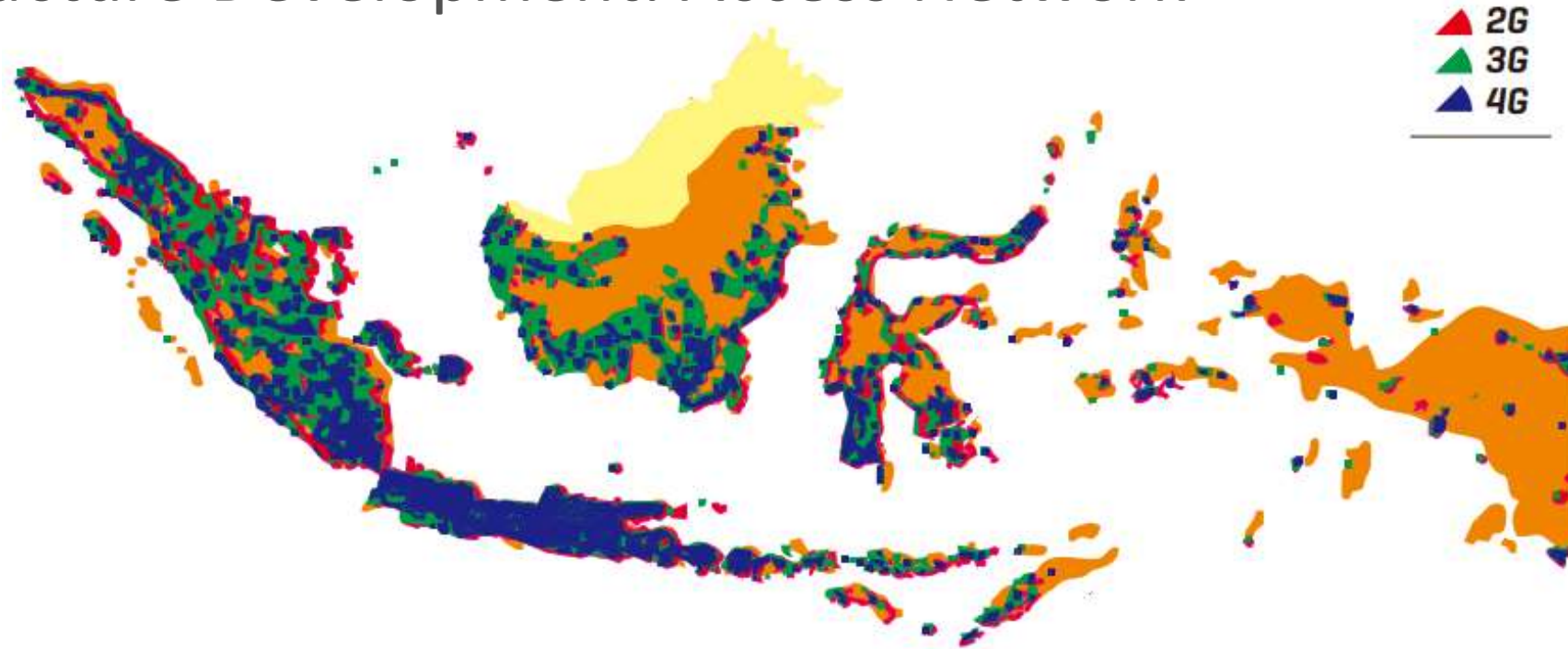


<p>2020 TARGET</p>	<p>1.000 + 10 Start-ups – Technopreneurs National Movement <i>(Total startup valuation: Rp.150 T)</i></p>	<p>1.000.000 Farmers & Fisherman Go Digital <i>(1) Agricultural sector contribution to the national GDP is Rp.961,1 T equal to 10,58% (BPS, 2013); (2) Increasing 11% of farmer's income (Rp.160 T/year) (Accenture, 2015)</i></p>	<p>8.000.000 SMEs Go Digital <i>(Contribution to the national GDP is Rp. 689 T (BPS, 2012))</i></p>	<p>5 Digital Unicorns NextiCorn <i>(Collaborative support program to Streamline Indonesia's most investable startups in their Series B fundraising stage to investors from foreign markets)</i></p>
<p>RELATED PARTNERS IN ACHIEVING 2020 TARGET</p>			<p>Bukalapak, Tokopedia, Shopee Grabfood, Blanja, Blibli</p>	

Infrastructure Development: Palapa Ring



Infrastructure Development: Access Network



	2G		3G		4G	
	Wilayah Administrasi	Presensi	Wilayah Administrasi	Presensi	Wilayah Administrasi	Presensi
Desa/Kelurahan (83.218)	75.493	90.72%	64.214	77.16%	61.051	73.36%
Kecamatan (7.175)	6.479	90.30%	5.691	79.32%	5.236	72.98%
Kabupaten/Kota (514)	490	95.33%	457	88.91%	412	80.16%
Jumlah site	133.865 BTS		175.796 Node B		62.291 eNode B	

1000 Digital Technopreneur toward “Next Indonesian Unicorn”



Digital Talents to Respond Industry 4.0

Non-degree educational programs and intensive training scholarship to prepare Human Resource in digital transformation towards Industry 4.0.

Program is held at national top-level universities with topics related to data science, Internet of Things (IoT), artificial intelligence etc.

- 2018: 10,000 participants
- 2019: 25,000 participants



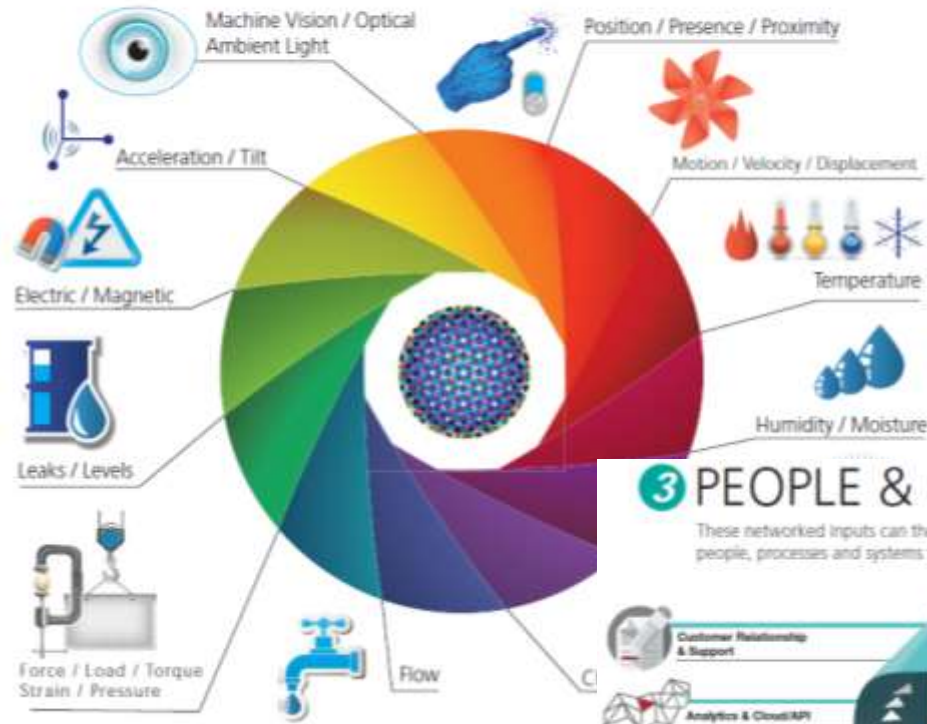


Internet of Things: Current Conditions

IoT Components: Sensor, Connectivity & People/ Processes

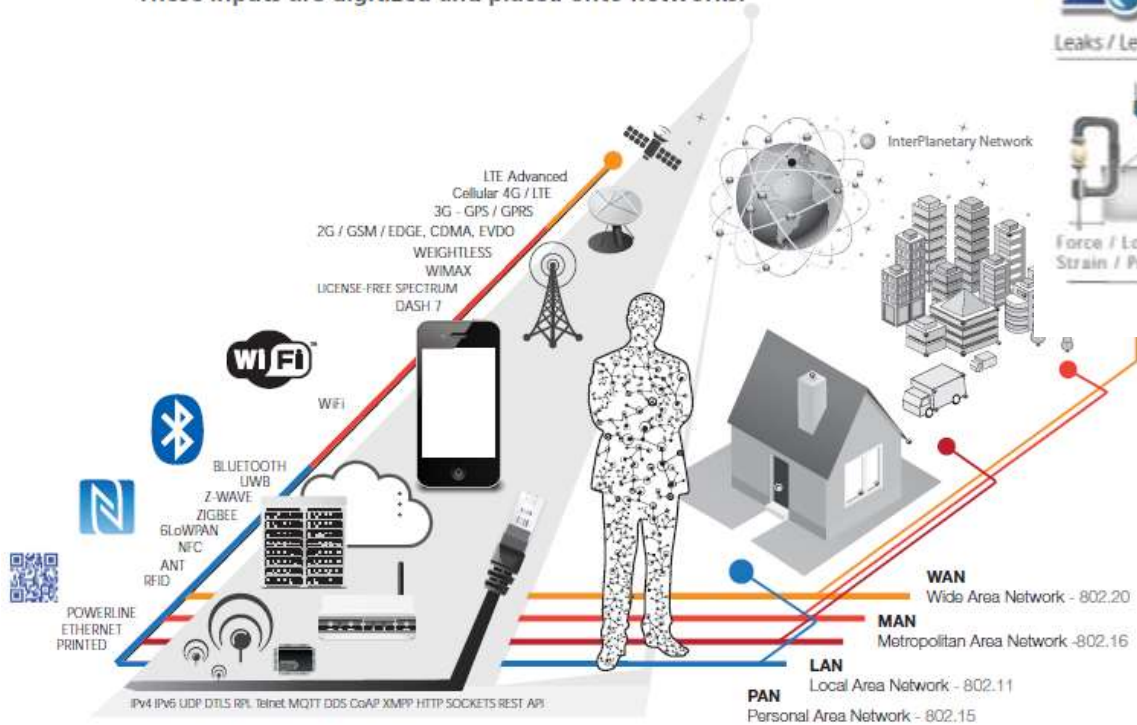
1 SENSORS & ACTUATORS

We are giving our world a digital nervous system. Location data using GPS sensors. Eyes and ears using cameras and microphones, along with sensory organs that can measure everything from temperature to pressure changes.



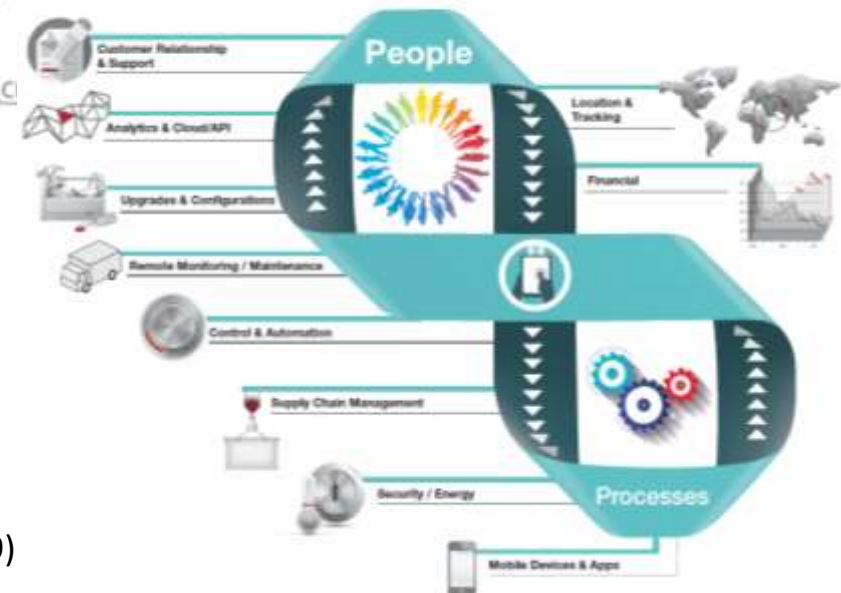
2 CONNECTIVITY

These inputs are digitized and placed onto networks.



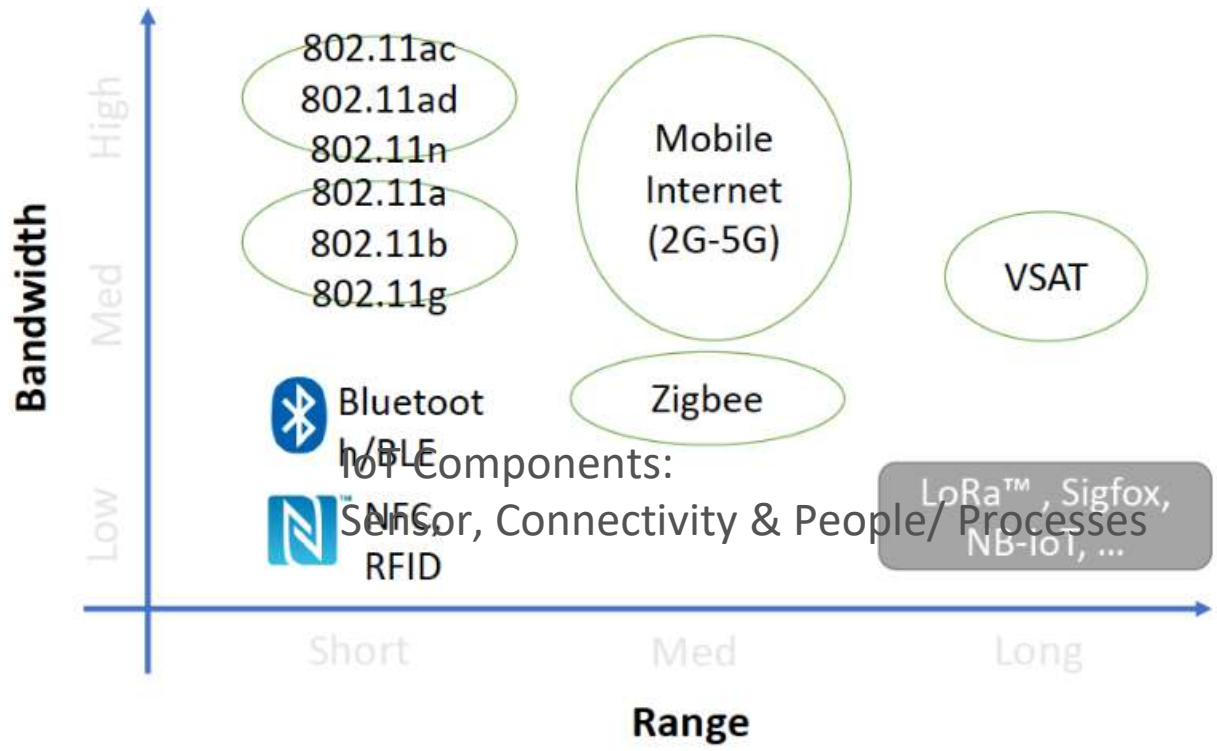
3 PEOPLE & PROCESSES

These networked inputs can then be combined into bi-directional systems that integrate data, people, processes and systems for better decision making.



Source: Postscapes (2019)

Technologies and Standards



IoT Components:
Sensor, Connectivity & People/ Processes

Non-3GPP dan Non- Satelit

SRD

- zigbee
- Bluetooth®
- WiFi™

LPWA

- LoRa™
- sigfox

Standar 3GPP

- 2G
- 3G
- 4G LTE
- 5G
- NB-IoT
- LTE-M

Satelit

- THURAYA
- iridium
- ORBCOMM™
- inmarsat
- dll.

Radio Spectrums



Standar 3GPP

Band 1 (2100 MHz) LTE-M & NB-IoT
Band 3 (1800 MHz) LTE-M & NB-IoT
Band 5 (800 MHz) LTE-M & NB-IoT
Band 8 (900 MHz) LTE-M & NB-IoT
Band 31 (450 MHz) LTE-M & NB-IoT
Band 40 (2300 MHz) LTE-M

Pita Frekuensi Lain yang Akan Dialokasikan
untuk Jaringan Bergerak Seluler yang
Memungkinkan untuk LTE-M dan NB-IoT

Pita Frekuensi Lain yang Akan Dialokasikan
untuk 5G IoT



Satelit

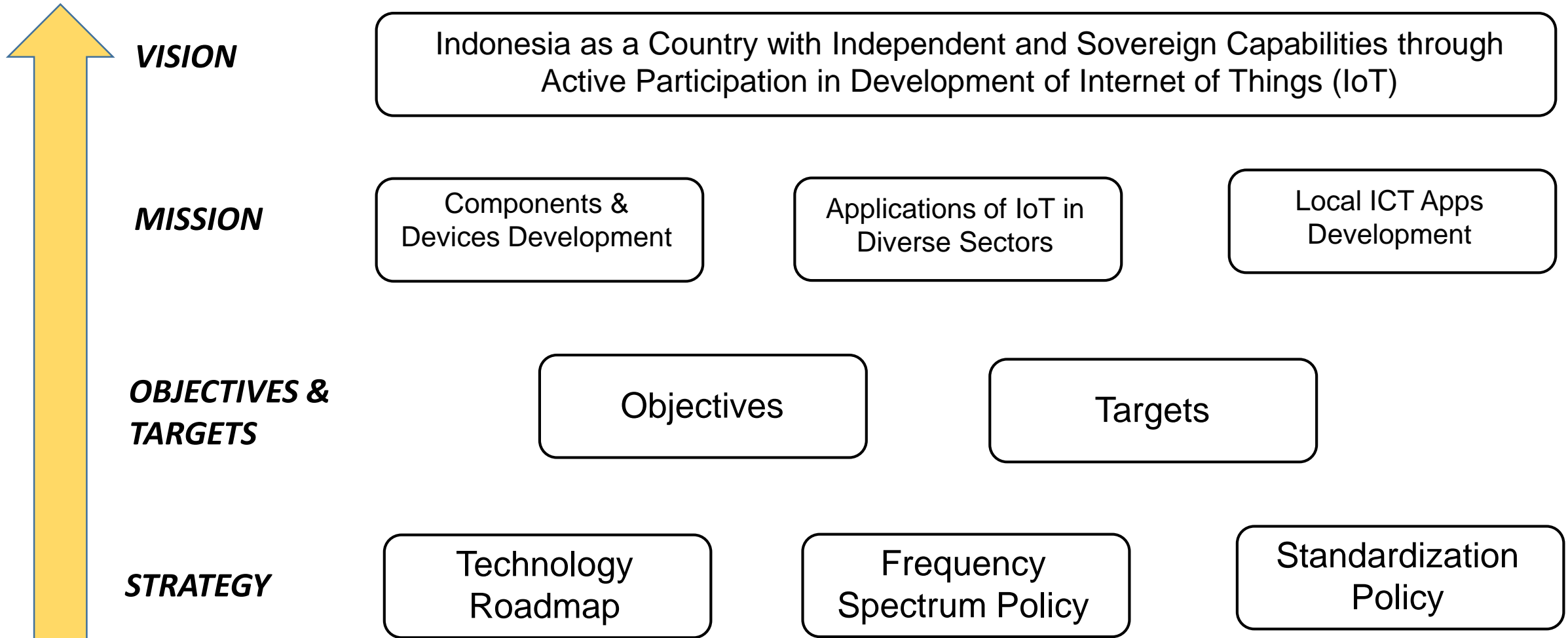
L-Band (1.52 – 1.66 GHz)
S-Band (2.52-2.67 GHz)
C and ext. C Band (3.4-4.2 GHz, 5.92 GHz – 7.07 GHz)
Ku-Band (10.95- 11.7 GHz, 13.75-14.5 GHz)
Ka-Band (17.3-21.2 GHz, 27-30 GHz)
Q-Band (37.5-42.5 GHz)
V-Band (42.5-43.5 GHz, 47.2-50.2 GHz)

Non-3GPP dan Non- Satelit

2,4 GHz
5,8 GHz
919-925 MHz (draft)
5,x GHz (draft)

Akan dilakukan
evaluasi terhadap
frekuensi 919-925 MHz

Internet of Things (IoT): Policy Direction



Current Conditions in Indonesia

1. There are many developers ranging from startups to academics. Most popular applications: CCTV networks, weather / flood sensors, vehicles tracking system and other smart city applications.
2. Application developers need government supports and also collaboration with industry in different sectors. Its dynamic usages can be a trigger for the sustainability of other industry such as devices and components.
3. Some are still constrained by the process of developing expensive prototyping and importing security modules.
4. The success in developing this application layer will ensure a step to maximize the development of national IoT
5. IoT industry in Indonesia still does not make security as a priority and most industries tend to make services and features as the most critical points in the development.



Thank You

Email: i.nyoman.adhiarna@kominfo.go.id