5G and Digital Platforms for Smart Manufacturing

5G is the NEXT GENERATION NETWORK standardized by 3GPP
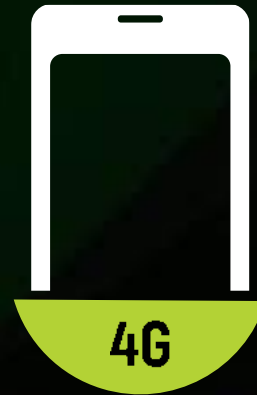
1G	2G	3G	4G	5G
1981	1991	1998	2008	2018
No data transfer	Up to **40** kbps	Up to **21.6** Mbps	Up to **1** Gbps	Up to **20** Gbps
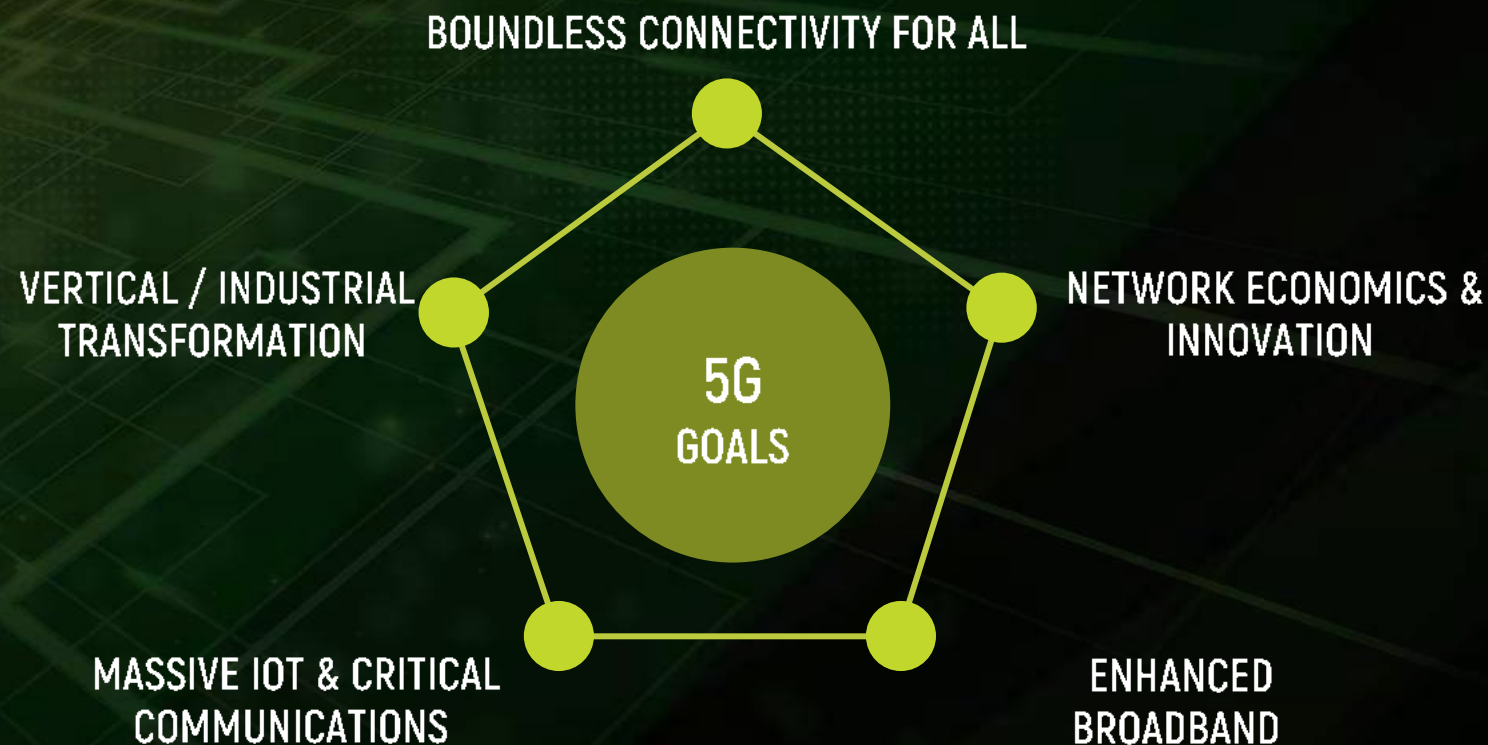
5G Involves Stakeholders from Other Industries

Industry Control

Mobile Robot

Wireless Sensors Network

5GAA
Automotive Association

5GACIA
5G Alliance for Connected Industries and Automation

5AIA

The standardization process is broader than for 4G: it includes standards for specific application interfaces.

Corporation between stakeholders with common interests should be led by industry associations

5G is not just FASTER, but a NEW PARADIGM

eMBB

Enhanced Mobile Broadband
Providing mobile network customers and industrial user with enhanced capabilities, benefiting B2C, entertainment and media, and other service sectors

uRLLC

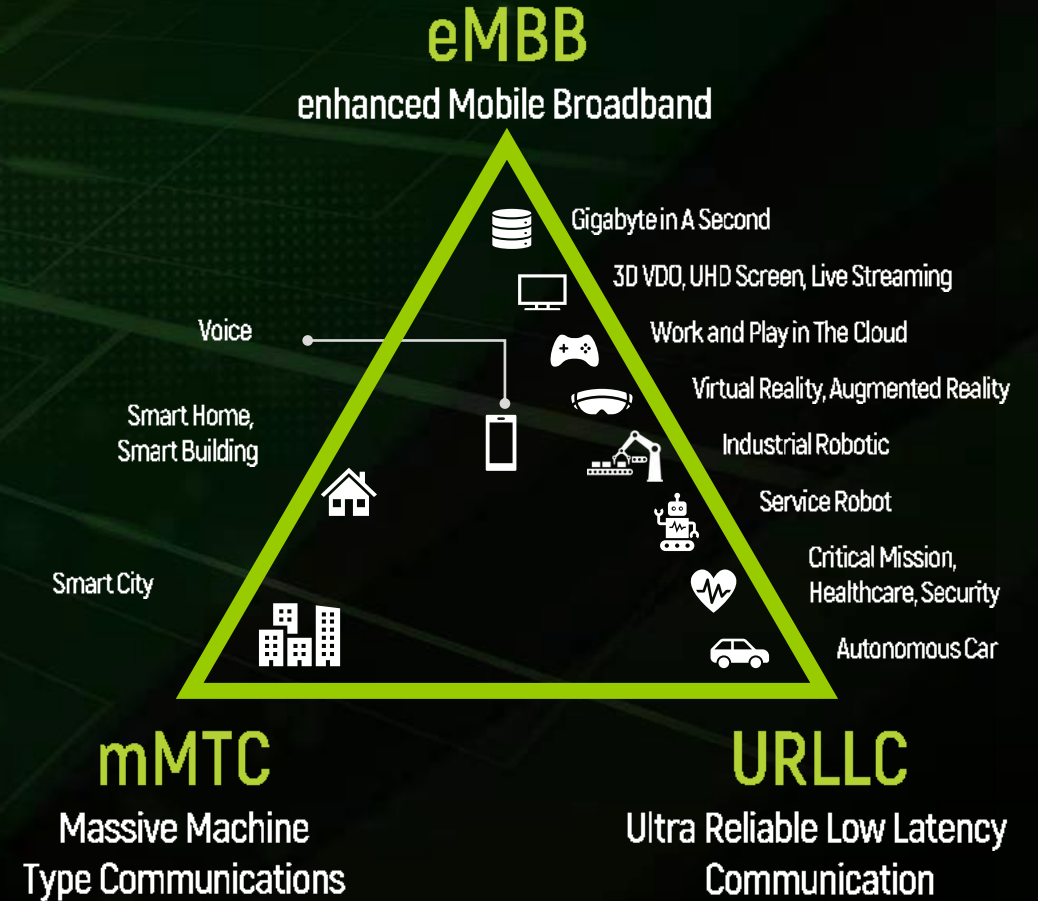### Ultra-reliable & Low-latency Communication
Supporting new use cases in mission critical applications (e.g. autonomous driving, remote surgical operation, industrial automation)
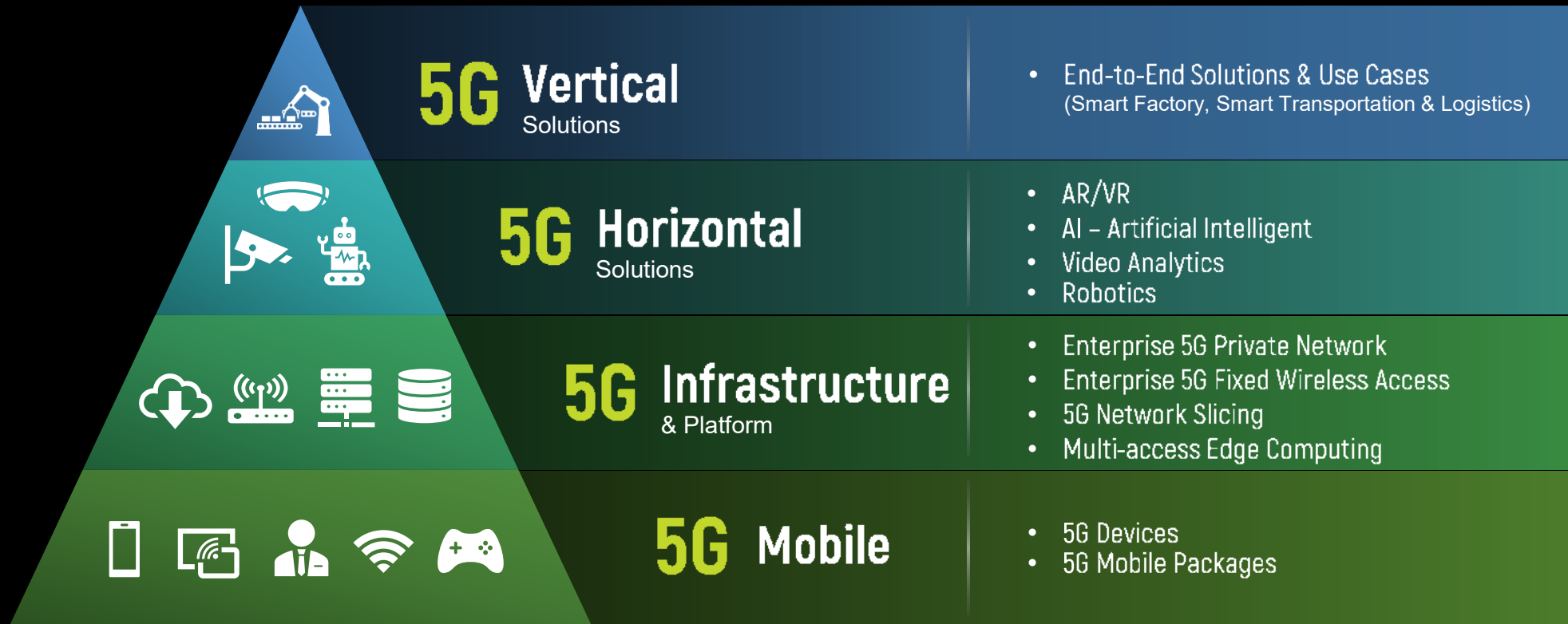
mMTC

Massive Machine-type Communications
Enabling industry players to connect massive numbers of devices with specific connectivity requirements, in sector such as manufacturing, utilities, and logistic.

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eMBB
enhanced Mobile Broadband

- Gigabyte in A Second
- 3D VDO, UHD Screen, Live Streaming
- Work and Play in The Cloud
- Virtual Reality, Augmented Reality
- Industrial Robotic
- Service Robot
- Critical Mission, Healthcare, Security
- Autonomous Car

- Voice
- Smart Home, Smart Building
- Smart City

mMTC
Massive Machine Type Communications

URLLC
Ultra Reliable Low Latency Communication

Source: ITU

AIS 5G Business
Your Trusted Smart Digital Partner

5G for Business

Pyramid Level	Details
5G Vertical Solutions	• End-to-End Solutions & Use Cases (Smart Factory, Smart Transportation & Logistics)
5G Horizontal Solutions	• AR/VR • AI – Artificial Intelligent • Video Analytics • Robotics
5G Infrastructure & Platform	• Enterprise 5G Private Network • Enterprise 5G Fixed Wireless Access • 5G Network Slicing • Multi-access Edge Computing
5G Mobile	• 5G Devices • 5G Mobile Packages

The **COMMERCIAL 5G**
Network Platforms for Business

- **SA/NSA** Dual Network

- **Network Slicing**

- **Multi-access EDGE Computing**

- **Private Network**

The New 5G Digital Ecosystems

AIS Business 5G

IoT ⬌ Edge ⬌ Connectivity ⬌ Cloud

- Cloud desktop
- Cloud storage
- Cloud gaming
- Cloud recognition
- Cloud VR
- Cloud AR

- Thin client
- STB
- Phone
- Guiding helmet
- Robot

Edge Computing

5G

Big data

AI GPU rendering

Drone management

Cloud computing Guide cloud

Language processing Safe city

Machine vision Medical cloud

100+ Mbps, up to 5ms
eMBB
uRLLC

Thin Clients:
Low cost, easy to deploy, easy to manage, mobility

One cloud for multi-use:
Not only serve Cloud Gaming, cloud PCs, Cloud Gaming, but also services car, health, drone, etc.

MEC Ecosystem for 5G

Customer Site

- Customers' On-Premise

Edge Data Center

- Multi-access Edge Computing
- Regional Data Center

Local Cloud & Core Data Center

- INTERNET
- PRIVATE LINK
- Azure Express Route
- Local Cloud
- Hybrid Cloud
- CSL Thai-IX

Public Cloud

- Public Cloud
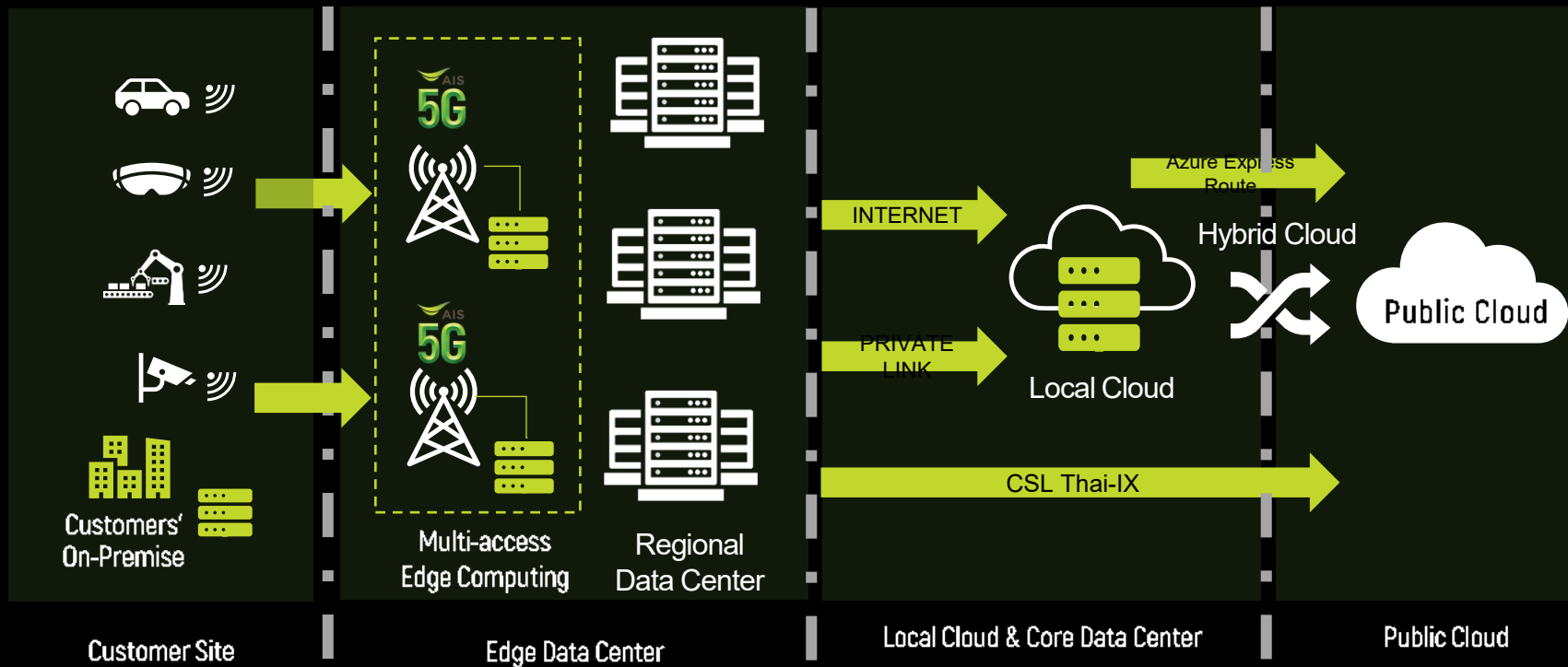
- Commercial 77 Province 5G Network Coverage
- The Most Multi-location Data Centers across Thailand
- Open Collaboration Ecosystems
- High-Capacity Interconnection Network
- Integrated Hybrid Cloud Infrastructure
- One-Stop ICT Services

AIS 5G Private Network for Smart Manufacturing

Privacy
Local network, private resources, interdependently managed

Security
Cellular grade security, sensitive data stays on-premise

Optimized
Tailored performance for enterprise specific applications, e.g., low latency, QoS, network slicing

Coverage, capacity, and mobility
Outdoor/indoor, high data speeds, seamless handovers, interference free

Reliability and seamless integration
Industrial grade reliability, latency and seamless integrate to existing IT network

Effective Data Processing
Massive data transferring and local processing with MEC

Security and Compliance
Data localization, mobile grade security

Thailand Enterprise 5G Market Size and Adoption Journey

Million Baht

Source: IDC, AIS
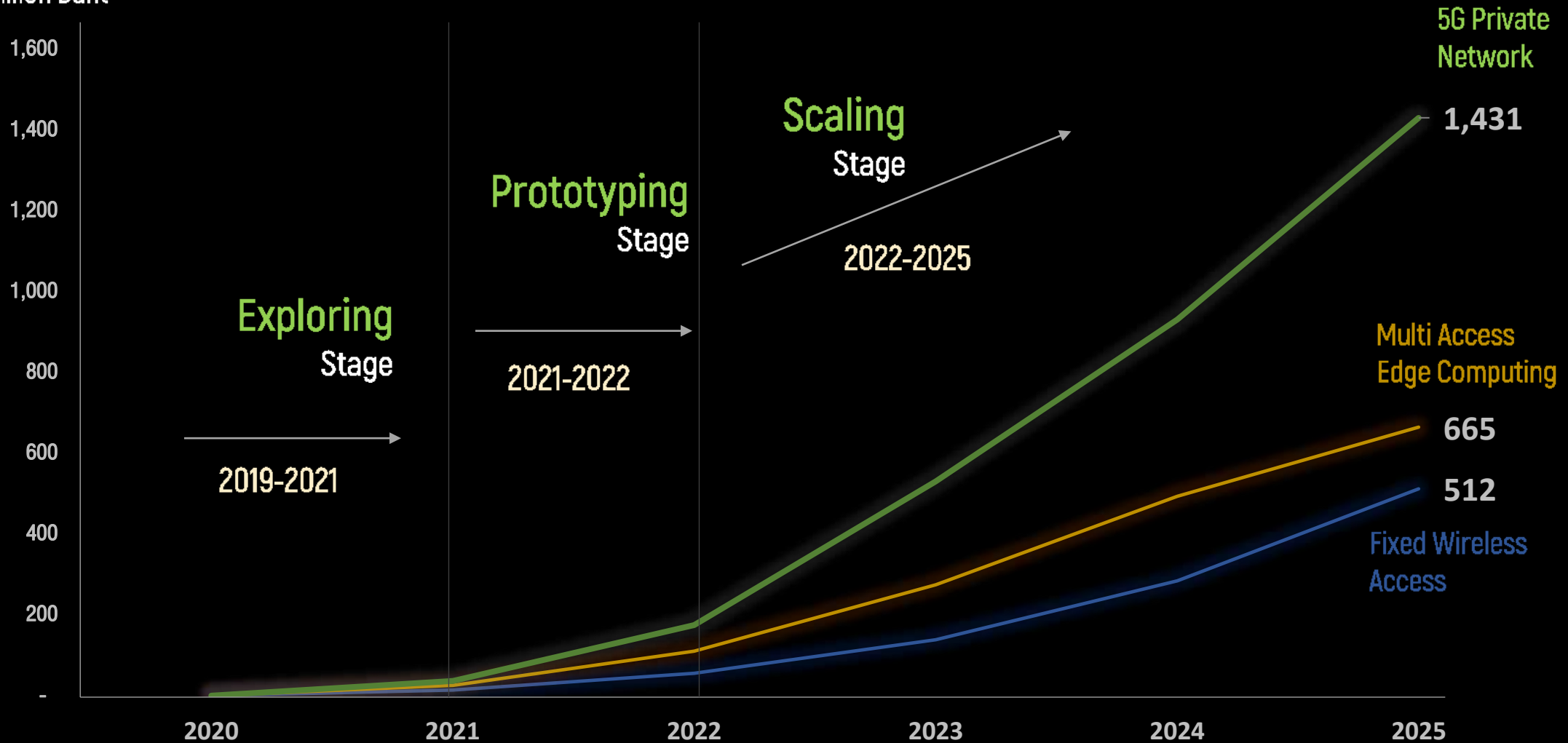
Thailand 5G B2B Use Cases

Impacts on Vertical Industry in 2025

49% Manufacturing

20% Retail

10% Transportation & Logistics

8% Agriculture

5% Mining, Energy & Utilities

4% Healthcare

3% Financial Services

Source: Arthur D.Little Analysis

5G
for Manufacturing
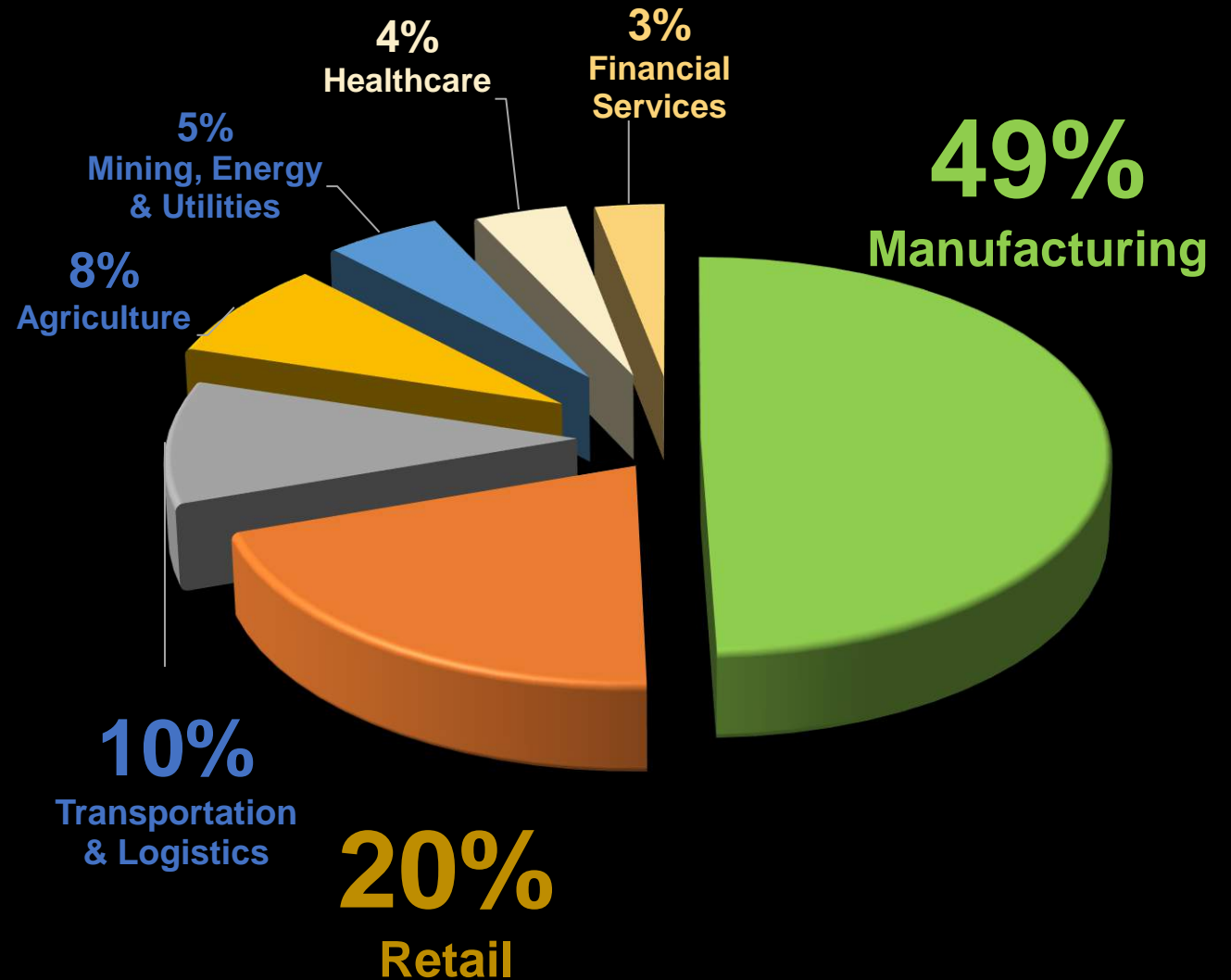
Enhance Productivity with High Quality

Optimize Resource and Cost Control

Customer, Partner, Supply Chain Management

Secure and Safe Workplace

Energy and Emission Management

5G HORIZONTAL APPLICATIONS
For Business

AR

VR

Drone

Robotics

Machine Vision

Digital Signage

Remote Supervision

Camara 360
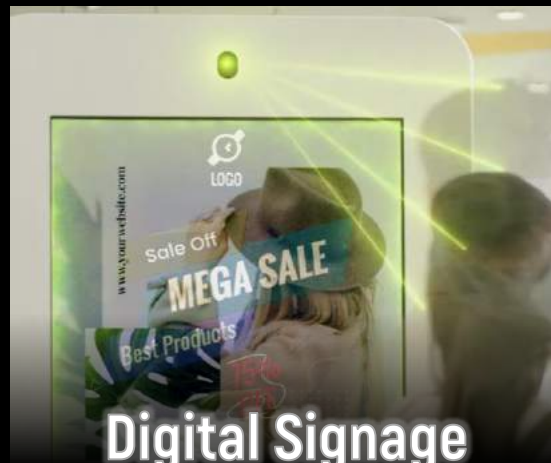
AIS 5G Use Cases in Business
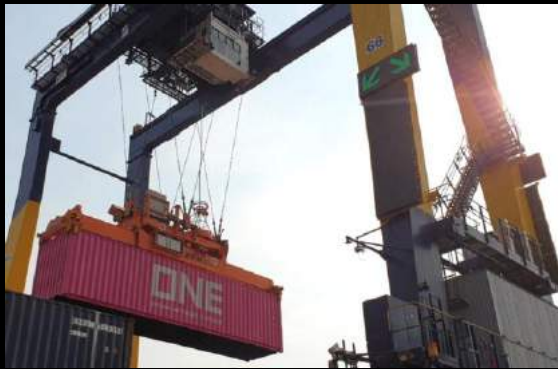
Are You Ready for Industry 4.0?

Understand Where You Are

- Where you are today
  → Understanding your legacy infrastructure

- Where you are going
  → strategy

Evaluate Readiness

- Product lines

- Partners

- Which system can be integrated into digital plan

- Which to hang on

- Which to rip out and replace

Embrace Proof of Scale

- Most of projects tend to die in proof-of-concept stage

- Need commitment to move on to the next target (proof of scale)

Do What Works and Get Rid Of What Does Not

- Result-driven

- Be Flexible

- Be Innovative

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AIS 5G2B
Joint-Development & Partnership
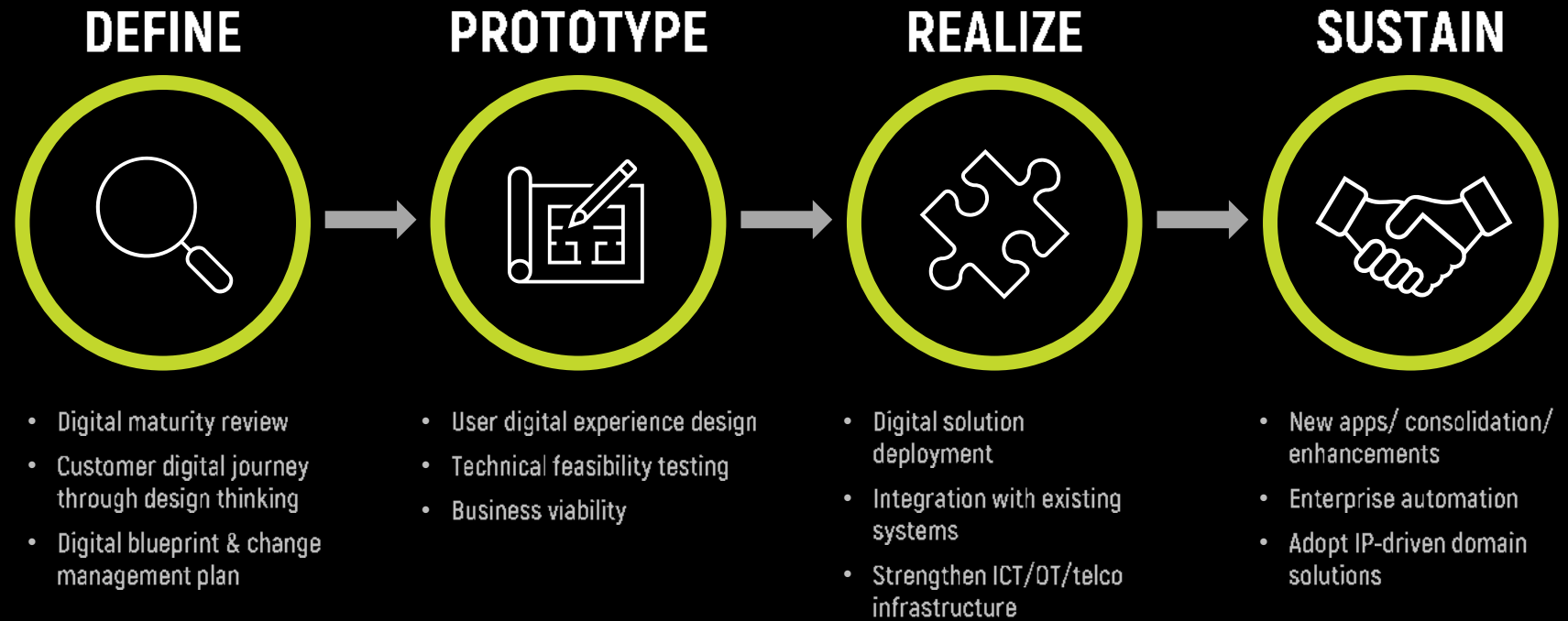
DEFINE
- Digital maturity review
- Customer digital journey through design thinking
- Digital blueprint & change management plan

PROTOTYPE
- User digital experience design
- Technical feasibility testing
- Business viability

REALIZE
- Digital solution deployment
- Integration with existing systems
- Strengthen ICT/OT/telco infrastructure
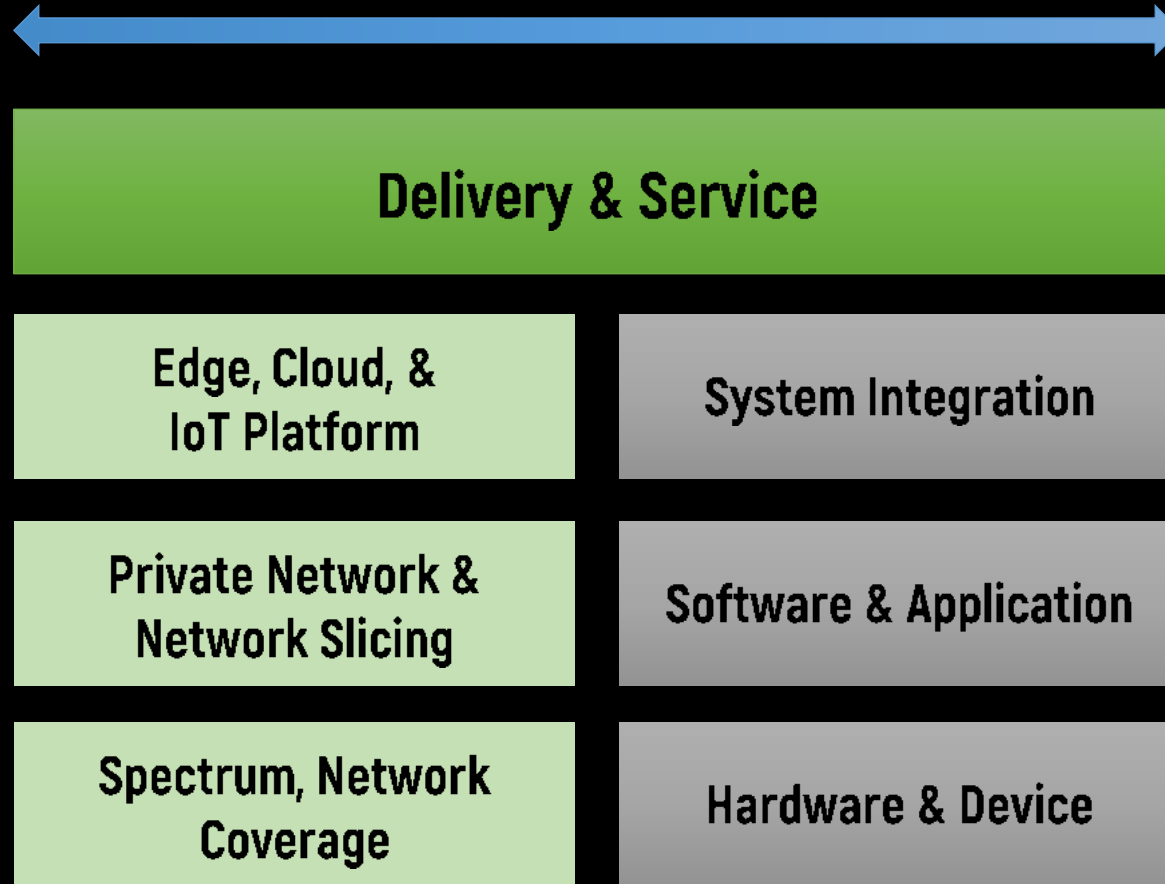
SUSTAIN
- New apps/ consolidation/ enhancements
- Enterprise automation
- Adopt IP-driven domain solutions
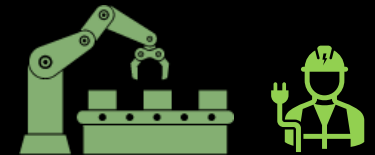
5G ECOSYSTEM & PARTNERSHIP

Digital Technology

ABB · Akamai · aruba (a Hewlett Packard Enterprise company) · aws · AXIS COMMUNICATIONS

BLENDATA · Check Point SOFTWARE TECHNOLOGIES LTD. · cisco · CLOUDIAN

CLOUDFLARE · CORTEX BY PALO ALTO NETWORKS · dahua TECHNOLOGY · datafarm · DELL Technologies

DoubleMe · ERICSSON · f5 · FORTINET · Hewlett Packard Enterprise

HIKVISION · hp · HUAWEI · IBM · iLog

K2 · Lenovo · Microsoft · Mi · milestone

MITSUBISHI ELECTRIC · Mobicrat MOBILE NETWORK CONSULTING · mobileiron · ncs making IT happen

NOKIA · NUTANIX · OMRON · OPPO

Opsta We build scale · paloalto NETWORKS · Pico · Qualcomm

R · Ruckus WIRELESS · SAMSUNG · SANGFOR · SAP · Schneider Electric

tcs TATA CONSULTANCY SERVICES · TKK CORPORATION · TREND MICRO · Trustwave · UiPath

V2X · veeam · VERSA NETWORKS · vivo · vizrt · VOXTRON · vmware · ZTE

Government & Regulator

NBTC · depa · NSTDA

EEC · THAILAND BOARD OF INVESTMENT · PEA

PAT · TARA · Thai IoT

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Industry Expert

AMATA POSSIBILITIES HAPPEN · BTP · HI-TECH INDUSTRIAL ESTATE · ROJANA INDUSTRIAL PARK · TBTZ · WHA GROUP

U-TAPAO RAYONG PATTAYA INTERNATIONAL AIRPORT · BTS · BEM BANGKOK EXPRESSWAY AND METRO · SAMITIVEJ

CPN · centralworld · CENTRAL RETAIL · THE MALL · EMPORIUM · EMQUARTIER · SIAM PARAGON

IMPACT MUANG THONG THANI · PMCU · SAMYAN MITRTOWN · BITEC · BHIRAJ BURI · E·G·V CINEMAX MAJOR GROUP

Kubota · SCG · APC · TOYOTA · NISSAN · HONDA · SF

SC ASSET · PROPERTY PERFECT · PRUKSA · SANSIRI · MAJOR · SNC · BOSCH Invented for life

FOOD PASSION · MBK GROUP · SHERA · L'ORÉAL THAILAND · FORTH

PTT · ONELINK · K · THAIVIVAT · MSIG · TQM

Education - Research & Development

Chula Chulalongkorn University · PSU PRINCE OF SONGKLA UNIVERSITY · มหาวิทยาลัยธรรมศาสตร์ THAMMASAT UNIVERSITY · KU KASETSART UNIVERSITY · KMUTNB

CHULA ENGINEERING · Mahidol University Wisdom of the Land · มหาวิทยาลัยเชียงใหม่ CHIANG MAI UNIVERSITY · RMUTTO

TCDC · TGGS · AIS AIAP IoT Alliance Program · AIS The StartUP · InVent Power up your Business · PLAYGROUND

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AIS 5G | AIS Business Network | AIS Business Cloud | AIS Cyber Secure | AIS IoT | CSL One Stop ICT Service

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