Unlocking the Economic Benefits of Infrastructure Development/ Modernization through World Class Connectivity and IoT Adoption

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Malaysia’s Budget 2020 Focuses On Infrastructure Development/ Modernization

TOTAL EXPENDITURE
RM 297 BILLION

OPERATING EXPENDITURE
RM 241 BILLION

DEVELOPMENT EXPENDITURE
RM 56 BILLION

Development expenditure is up RM 1.3 billion as government plans to revitalize the economy by accelerating infrastructure projects.

Focus areas include transport, energy & public utilities, agriculture & rural development subsectors.
Today’s presentation focuses on World Class Connectivity and IoT Adoption.

How they can drive Infrastructure Development/Modernization and unlock Economic Benefits.
Unlocking **Economic Benefits** through World Class Connectivity

**Digital Core**
- Speed
- Always ON
- Bandwidth Intensive

**Digital Solutions**
- Augmented Intelligence
- Intelligent Cloud
- Big Data
- Real-Time Insights
- Un-interrupted Service

**Smart City Solutions**
- Smart Building
- Smart Parking
- Smart Security

**Monetize Services**
- Improved Customer Experience

**Competitive Advantage**
- Improved Operational Efficiency
- Improved Customer Experience
- Competitive Advantage

**DO IT RIGHT** by starting from the core

Ensure reliable & “always on” network with the right SLAs in place

Choose a Partner congruent with your vision and one that can help achieve that vision

**Unlocking Economic Benefits**

**Digital Solutions**

**Smart City Solutions**

**Monetize Services**

**Competitive Advantage**

**Unlocking Economic Benefits through World Class Connectivity**
Strengthening Digital Core with **Managed Connectivity**

**Managed DIA (Dedicated Internet Access)**
Dedicated Internet access from customer premise to the Internet

**Managed MPLS**
(Multi Protocol Label Switching)
Managed connectivity between HQ and multiple branches

**Managed SD-WAN**
(Software-Defined WAN)
An efficient and secure networking solution that connects branch offices with the HQ

- Firewall
- Traffic prioritization
- Intelligent path selection
- Auto VPN

**Managed Internet for Government (MIG)**
SD-WAN ready, Managed Internet connectivity with SLA and in-built Firewall

**Managed Digital Core**

**Fixed Connectivity**

**Converged Connectivity**

**Converged Solution**
Choosing the Right Managed Service for Your Network

Managed Service

Managed DIA (Dedicated Internet Access)

Managed MPLS (Multi Protocol Label Switching)

Dedicated Internet access from customer premise to the Internet

Managed connectivity between HQ and multiple branches
Start Your Digital Journey by Upgrading to Converged Solution

An efficient and secure networking solution that connects branch offices with the HQ

Converged Solution
Managed SD-WAN (Software-Defined Wide Area Network)

Managed Internet for Government (MIG)

Future Proof Solution
Secure & Reliable
Dedicated Support

SD-WAN Controller
Branch Office
MPLS network
Internet
Cloud Services

Transport Independence

Data Plane
Control Plane
HQ / DC / DR

Biz Fibre
DIA
MPLS
4G
Building an Infrastructure Without the Right Connectivity Can Deoptimize Expenditure Spend

Use Case: DIA & MPLS for Government Education i.e. University

**Challenges**

- Unmanaged network for 38K on-campus population
- Multi vendors environment
- Best effort technology
- Non-scalable network

**Solutions**

- Managed network of 13 branches nationwide for 38K on-campus population
- Single vendor for all connectivity equipment
- SLA with full redundancy
- Scalable network management based on department, location and user

**Outcome:**

300% increase of bandwidth for 38K campus population
World Class Infrastructure to Support JKR & Government Goals

**DIGITAL CORE**
- Speed
- Always ON
- Faster response time

**Smart City Solutions**
- Un-interrupted Service
- Real-time Insights

**Digital Solutions**
- Augmented Intelligence
- Smart Parking
- Intelligent Cloud

**Monetize Services**
- Improved Customer Experience
- Competitive Advantage

**Aligned To**

**JKR’s Goals**
- Strategic partner to customers in achieving policy success

**Government Goals**
- Leader in asset management, project management & engineering excellence for the country
- Development of country’s infrastructure through creative & innovative human capital & state-of-the-art technology
- Reduce Expenditure
- Increase Productivity & Efficiency
- Data-Driven Decision Making

**Smart Security**

**Smart Building**

**Smart Parking**

**Big Data**

**Intelligent Cloud**

**Augmented Intelligence**

**AI**

**Improved Operational Efficiency**

**World Class Infrastructure to Support JKR & Government Goals**
Smart Cities and IoT Adoption
With increase in urbanization and aging population, cities face multiple new challenges

Implementation of Smart Cities MUST have clear objectives

1. Support business digital transformation
2. More services to citizens
3. Optimise Public Spending
4. Increase efficiency
5. Maximise return on investment
What makes a City Smart?

**NB-IoT**
- Low cost
- 10,000s’ devices
- Deep coverage
- 10+ battery life

**Broadband (4G, 5G, Fiber, WiFi)**
- High bandwidth
- 1,000s’ devices

_IoT and Smart Cities work together hand in hand_
5G pillars as defined by International Telecommunication Union

**FASTER SPEEDS (10X 4G)**
- Peak Data Rates:
  - DL: 20 Gbps
  - UL: 10 Gbps

**MASSIVE IoT**
- 1 mil connections per km2
- Battery life ~ 10 years

**CRITICAL COMMUNICATIONS**
- Average latency: 0.5 ms

Adapted from ITU M.2803-0
Proliferation of sensors, advanced analytics and high quality network available today

Network Infrastructure
• Providing infrastructure for IoT network

Sensors
• Technological advances have made sensors small, economical and portable

Analytics
• Cloud based data analytics generate meaningful insights for IoT sensors
5G promises enhanced business opportunities

- 5G Network
- 5G Contract
- Education
- High Speed Internet
- Manufacturing
- AR
- Smart City
- VR Gaming
**5G Use Case:** Autonomous vehicles will communicate to various external elements requiring a robust connectivity layer

Each vehicle is estimated to transmit and receive:

4,000 Gb of data per day

*Source: Unicom Engineering*
Narrow Band IoT (NB-IoT): Low Power Wide Area Network for low throughput & x-million M2M connections

**USE CASES**
- Utilities
- Logistics
- Industrial
- Smart Building & City
- Agriculture & Environment
- Consumer & Medical

**Features**

**Enhanced Coverage**
Wider & deeper indoor coverage compared to 2G/3G/4G

**Long Battery Life**
No battery replacement >5 years

**Low Cost**
Comparable to 2G

**High Volume of Devices**
~50K connections per cell
Maxis has had a presence in the IoT market for some years. Its partnership with Vodafone will provide it with a portfolio of enabling an end-to-end capabilities to manage its IoT connections, offer a worldwide service and target new sectors such as automotive.

Source: Analysys Mason IOT Scorecard 2017 Communications Service Providers, Emerging Asia–Pac
Maxis IoT Innovation lab to cultivate ecosystem engagement and technology growth

- **Fit for purpose test facilities** for solution providers or device manufacturers
- **Experiential showcase in a live environment** demonstrating various use cases
- **Expedited learning** by leveraging Maxis technical expertise and advisory
NB-IoT Challenge launched to encourage ecosystem development for NB-IoT

Prizes
- Total cash prizes of RM30,000 for top 3 winners
- Regional exposure via tech showcase
- Seed funding of up to RM100,000
- Access to Mentoring Programme from industry experts and future collaborations with Maxis

Themes
- IoT for Smart Cities
- IoT for Manufacturing
- IoT for Agriculture

Partners
- Microsoft: Azure IoT platform
- MDEC: Ecosystem development
- GSMA: Regional reach & Marketing
- Cytron: Starter kit expert
- MAGIC: Mentorship & coworking space

Roadshow
Total of 178 attended roadshows in: KL, Penang & Kuching held throughout May
NB-IoT Challenge concluded with 3 exciting winning solutions

1. **Momoku - Smart Agriculture**
   Monitor and optimize environment for optimal mushroom crop growth

2. **Vectolabs Technologies – Smart Cities**
   Smart road solution to detect cyclists and motorcyclists for safer roads - linked to smart streetlights

3. **DiTack - Smart Agriculture**
   Detect and repel growth of pest (weed) that is a threat for paddy farming

42 Customers Participated
6 Judges from various entities:

![MAXIS IoT CHALLENGE](image)
![Momoku - Smart Agriculture](image)
![Vectolabs Technologies – Smart Cities](image)
![DiTack - Smart Agriculture](image)
The 6 key domains of a smart city, typically addressed in silos

- **Smart Parking**: 30% of traffic congestion is caused by drivers circling to find a space
- **Waste Management**: 60% inefficiency in waste bin collection
- **Environment**: $1.7T economic impact due to air pollution
- **Safety & Security**: $3.2T annual cost of crime in the US, including both direct and indirect costs
- **Urban Mobility**: $300B annual cost of congestion for US drivers. $1400 per driver
- **Smart Lighting**: Up to 38% of overall municipal utility bill

Source: Cisco
Clear savings when implementing the smart lighting solution

- Up to 38% of overall municipal utility bill

- Smart Lighting

  - 30-40% reduction in costs when implementing LED lights

  - Further 30-45% reduction if rules are included, e.g. dimming, etc
Enable the Smart City ultimate goal with Maxis’ connectivity capability and smart solutions

- Citizen App
- Control Center / Smart City Dashboard
- Data Aggregation / Cross Sharing
- Device / Sensor Data

- Parking
- Waste Management
- Environment
- Safety & Security
- Urban Mobility
- Lighting
A Smart City ecosystem of partners required to deploy Smart City solutions
Smart City brings both government and citizens closer for better engagement

**Command and Control centre**
- Single platform to view overall city “condition”
- Able to track location of support forces and deploy in real time
- Alerts are received immediately with instantaneous response capabilities
- Emergencies sent to citizens via citizen app

** Citizen App**
- Increases citizen engagement
- Real time emergency updates
- Citizens able to provide feedback on faults, service experience, etc
Terima Kasih