

Research Report on 5G Internet of Things (IoT) Applications

Jul 2022

ASTRI PROPRIETARY

- Background
- 5G Internet of Things (IoT)
- Relationships of Hong Kong Re-industrialization and 5G Development
- Cyber Security
- Evaluation and Preparation for 5G IoT

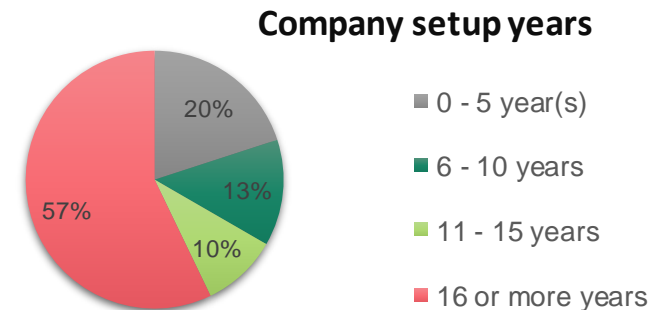
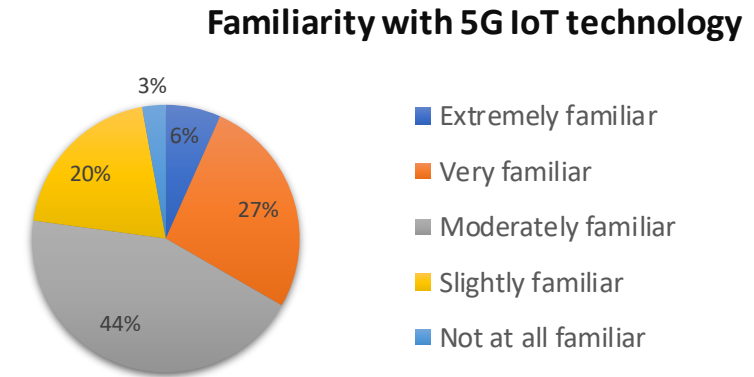
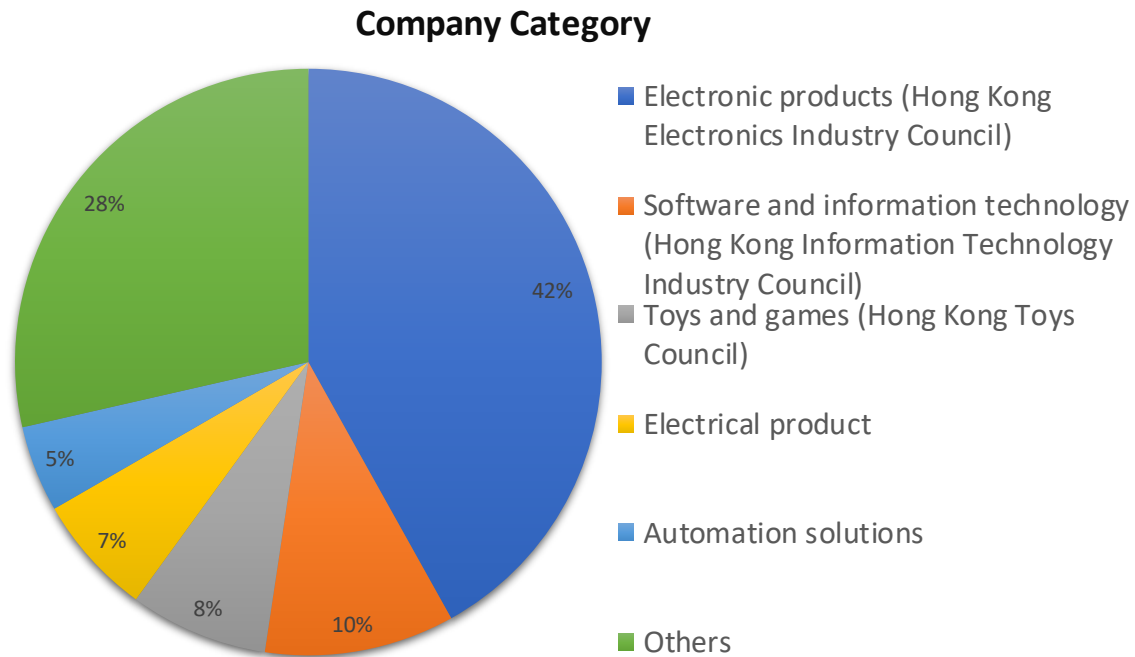
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Background



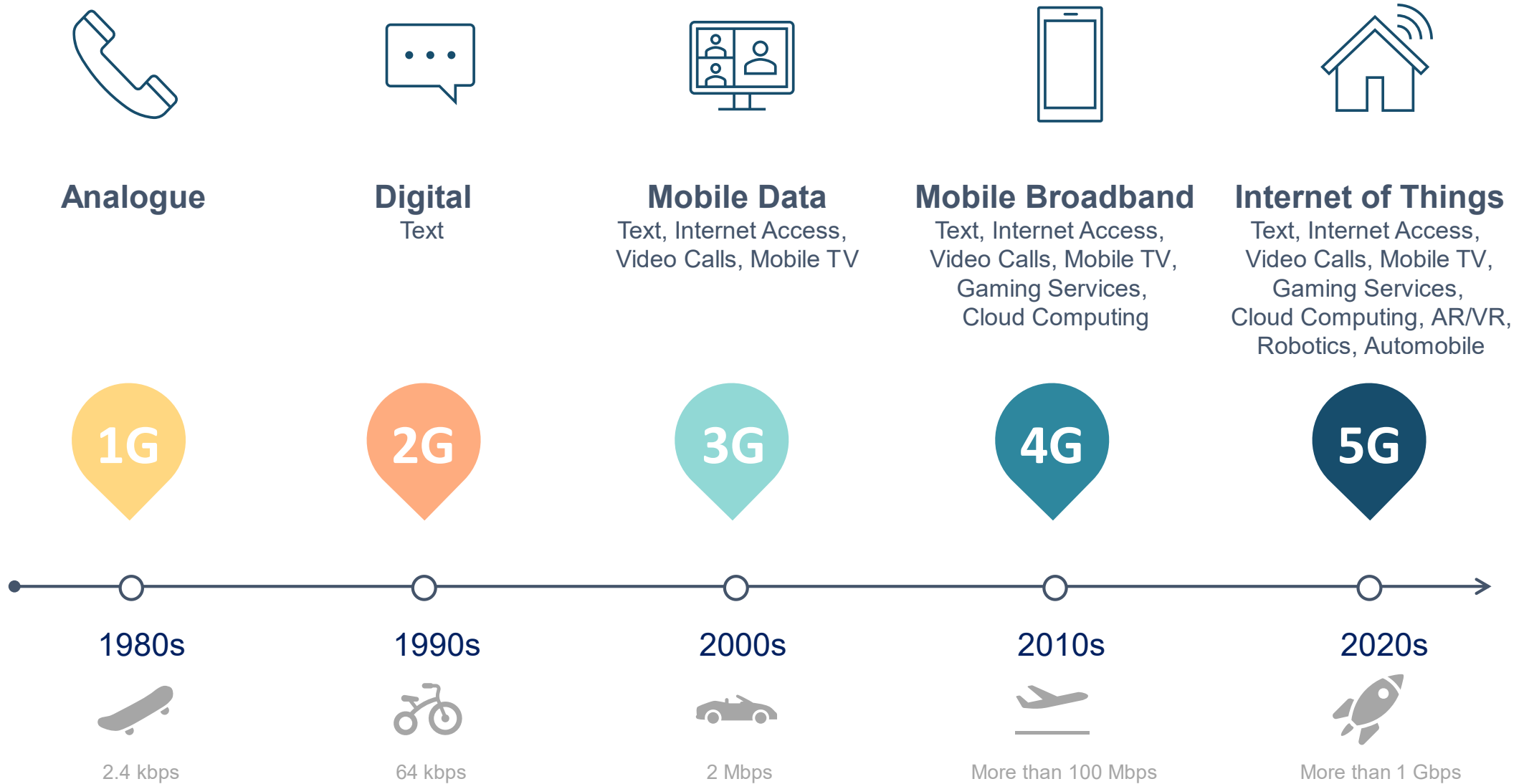
Background

- Conducted questionnaire survey at the beginning of 2022
- Distributed to all FHKI members and non-member companies from electronics, telecommunication, technology industries etc.
- A total of 105 valid questionnaires were received.

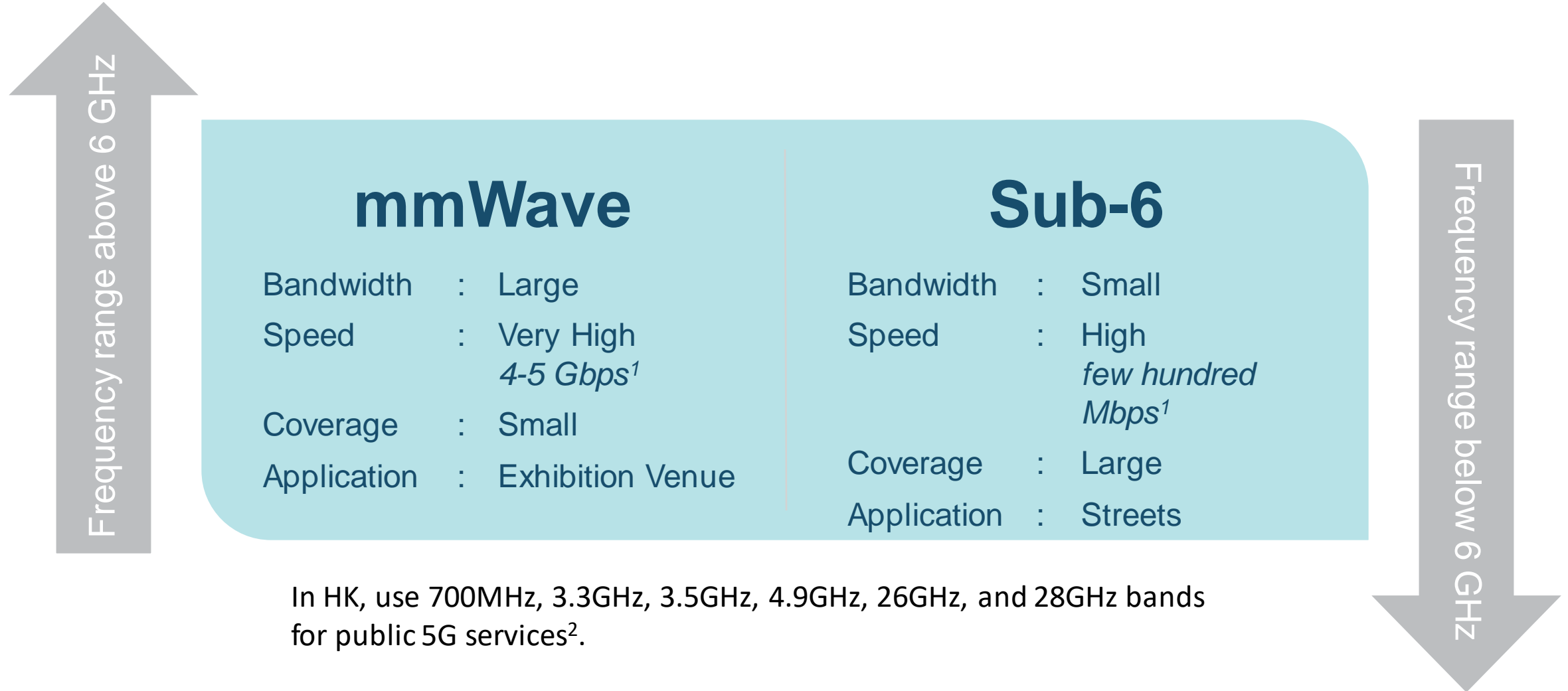


5G Internet of Things (IoT)

Evolution of Mobile Communication Technologies



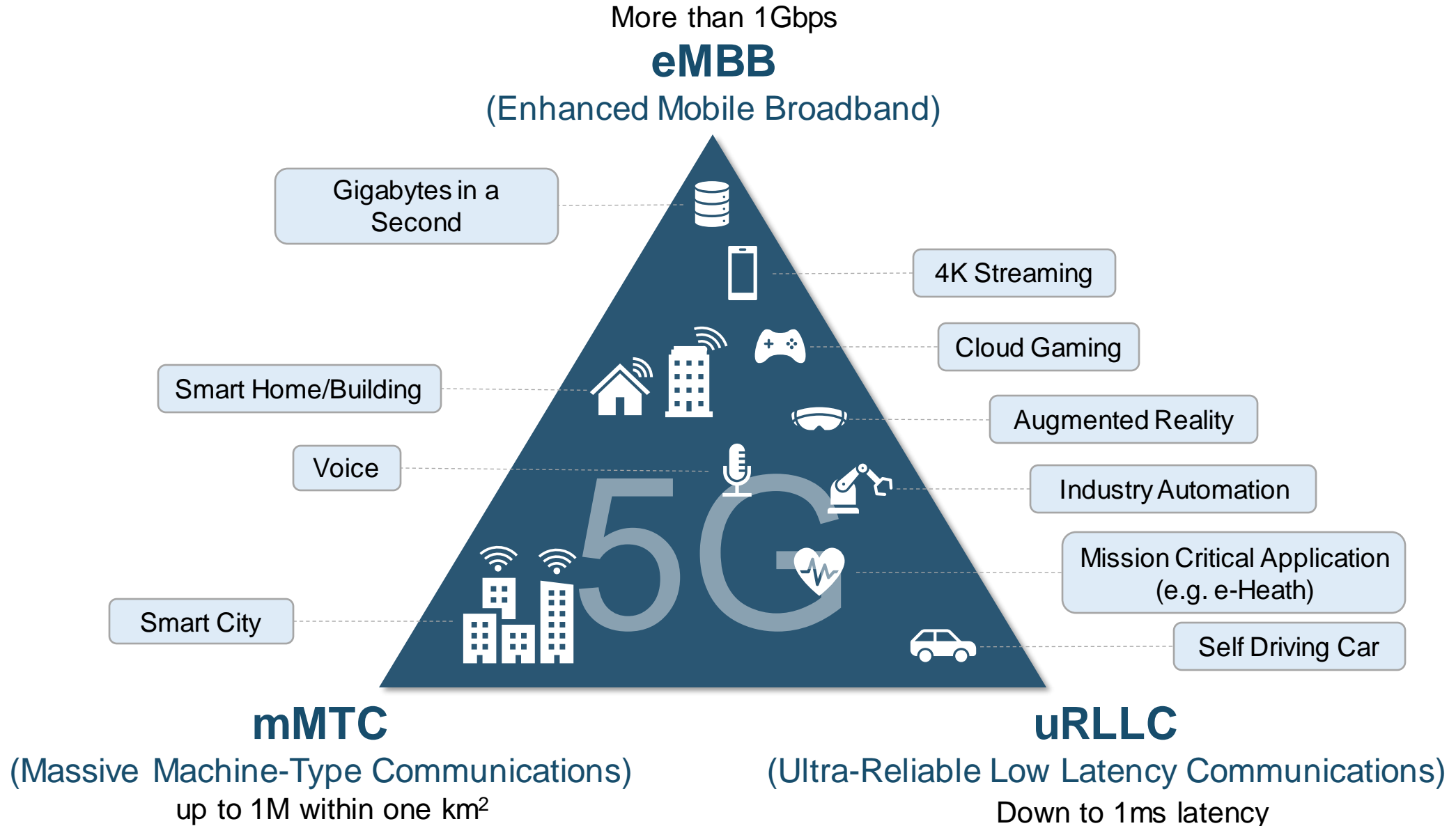
Frequency Ranges for 5G



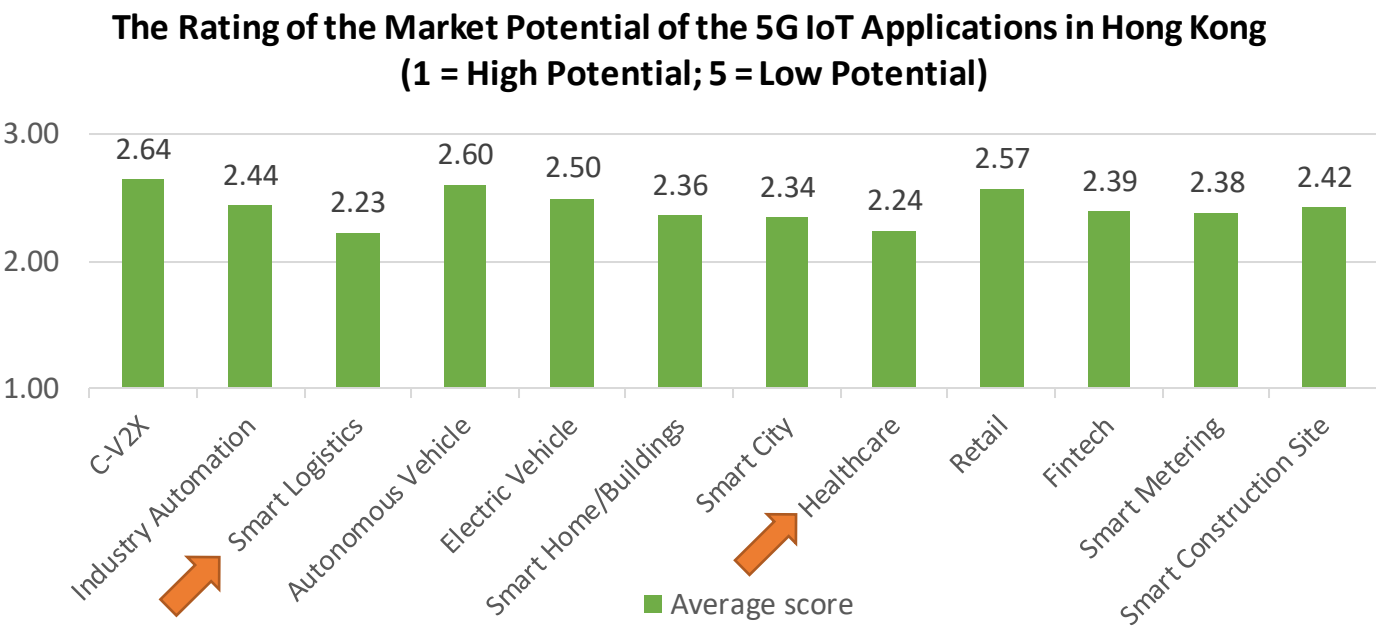
1. <https://www.androidauthority.com/sub-6ghz-vs-mmwave-5g-3051246/>

2. <https://www.5g.gov.hk/en/what-is-5g/introduction.html>

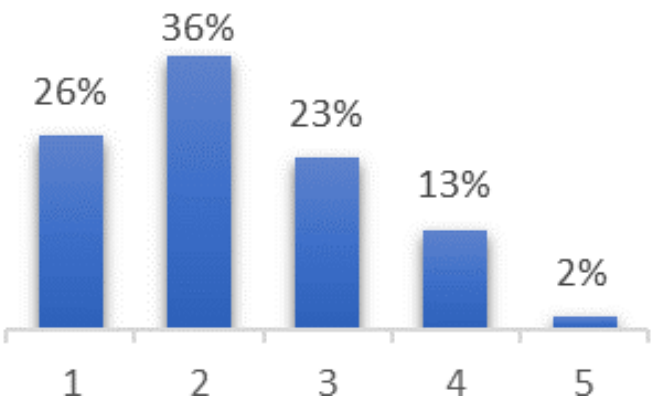
Why 5G IoT?



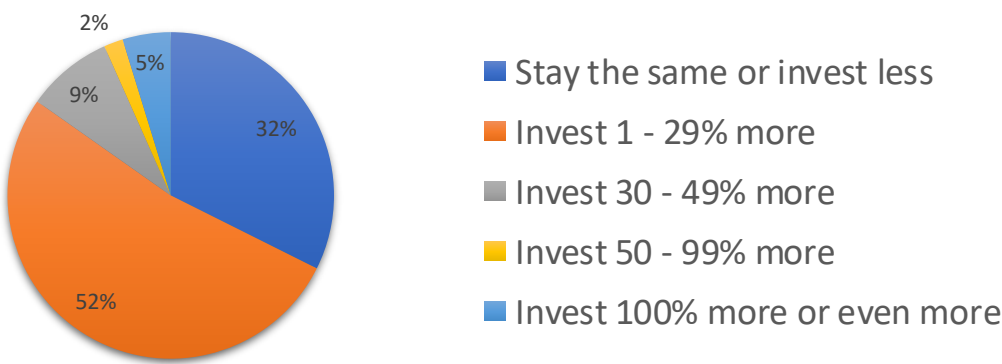
Market Potential of 5G IoT Applications in Hong Kong



The Rating of the Market Potential of 5G IoT Technology as a whole in HK
(1 = High Potential; 5 = Low Potential)

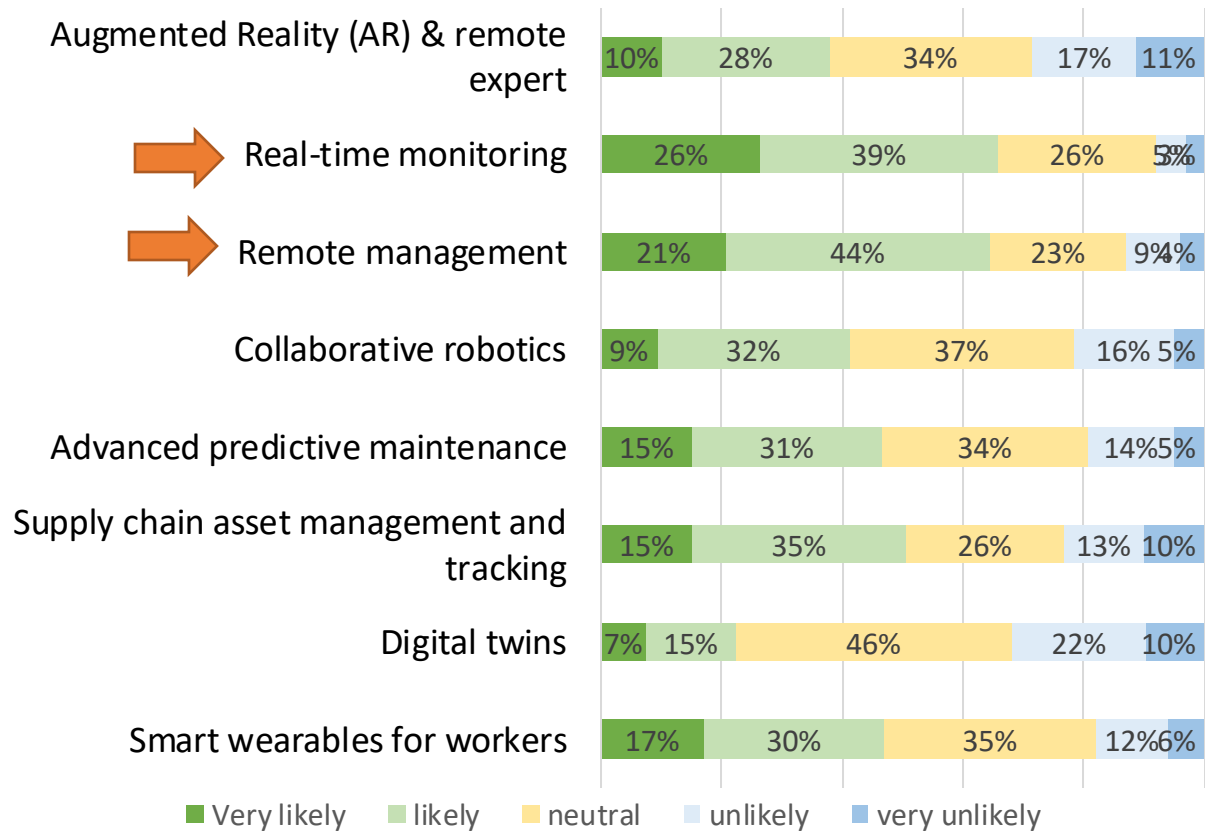


View in Changing Companies' 5G IoT Investment in the Coming 2-3 Years

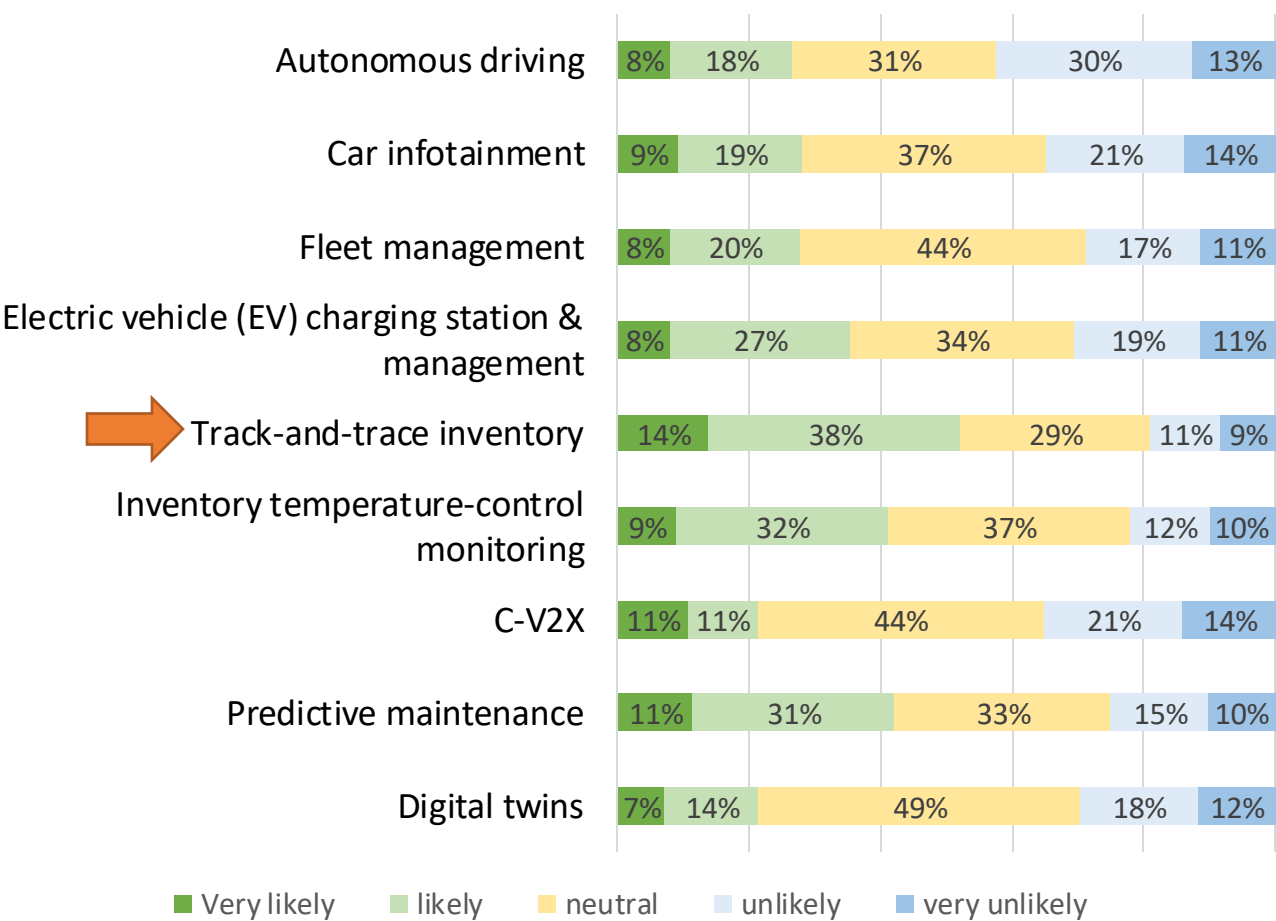


5G IoT Applications by Industry Verticals

Industrial Automation Applications

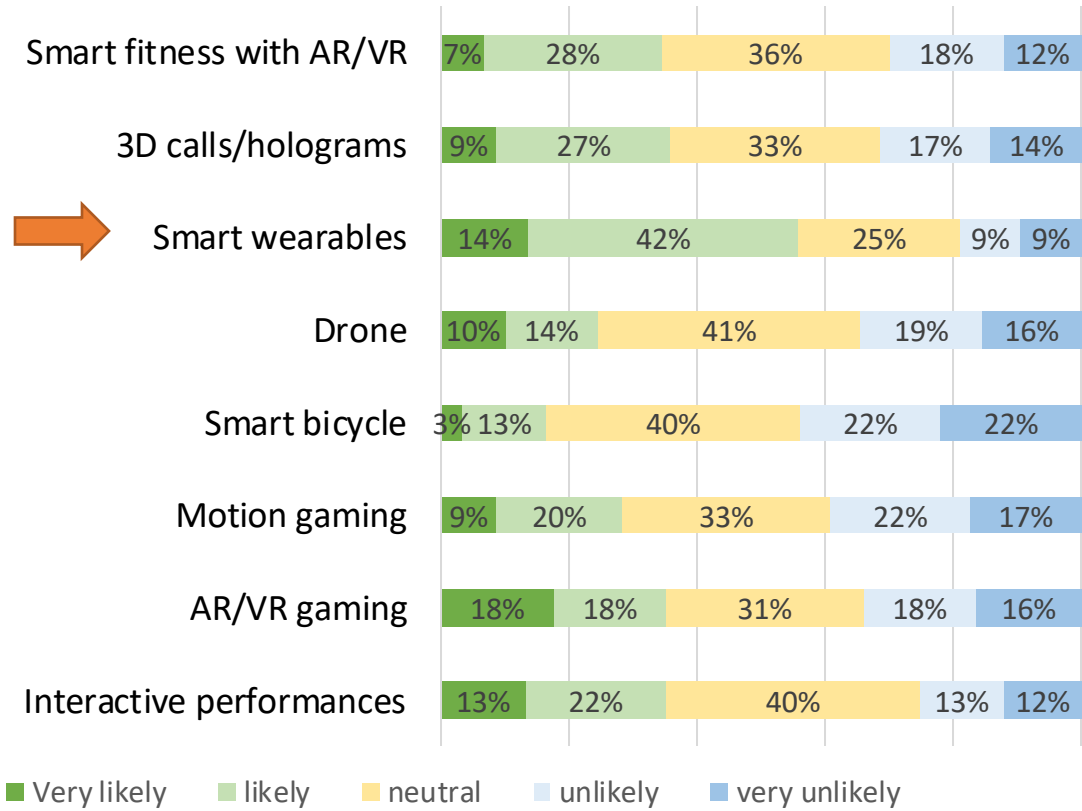


Automotive and Transportation Applications

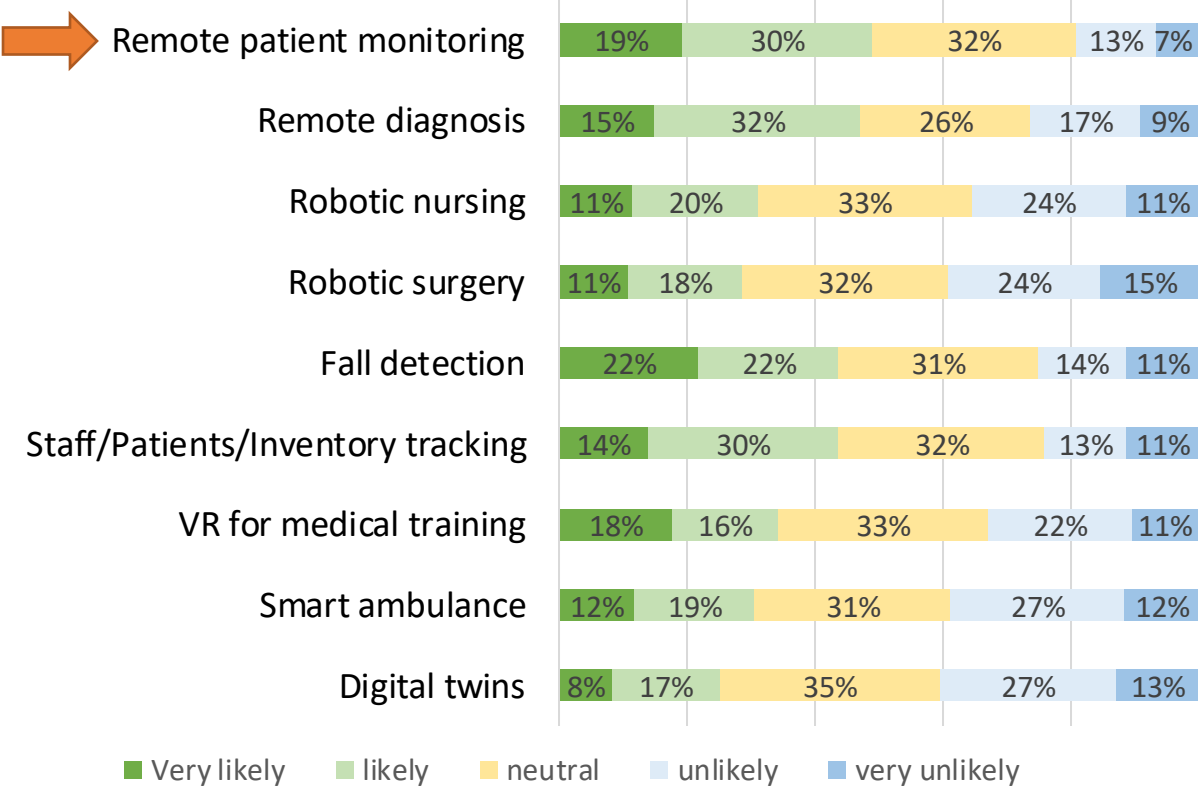


5G IoT Applications by Industry Verticals

Entertainment Applications

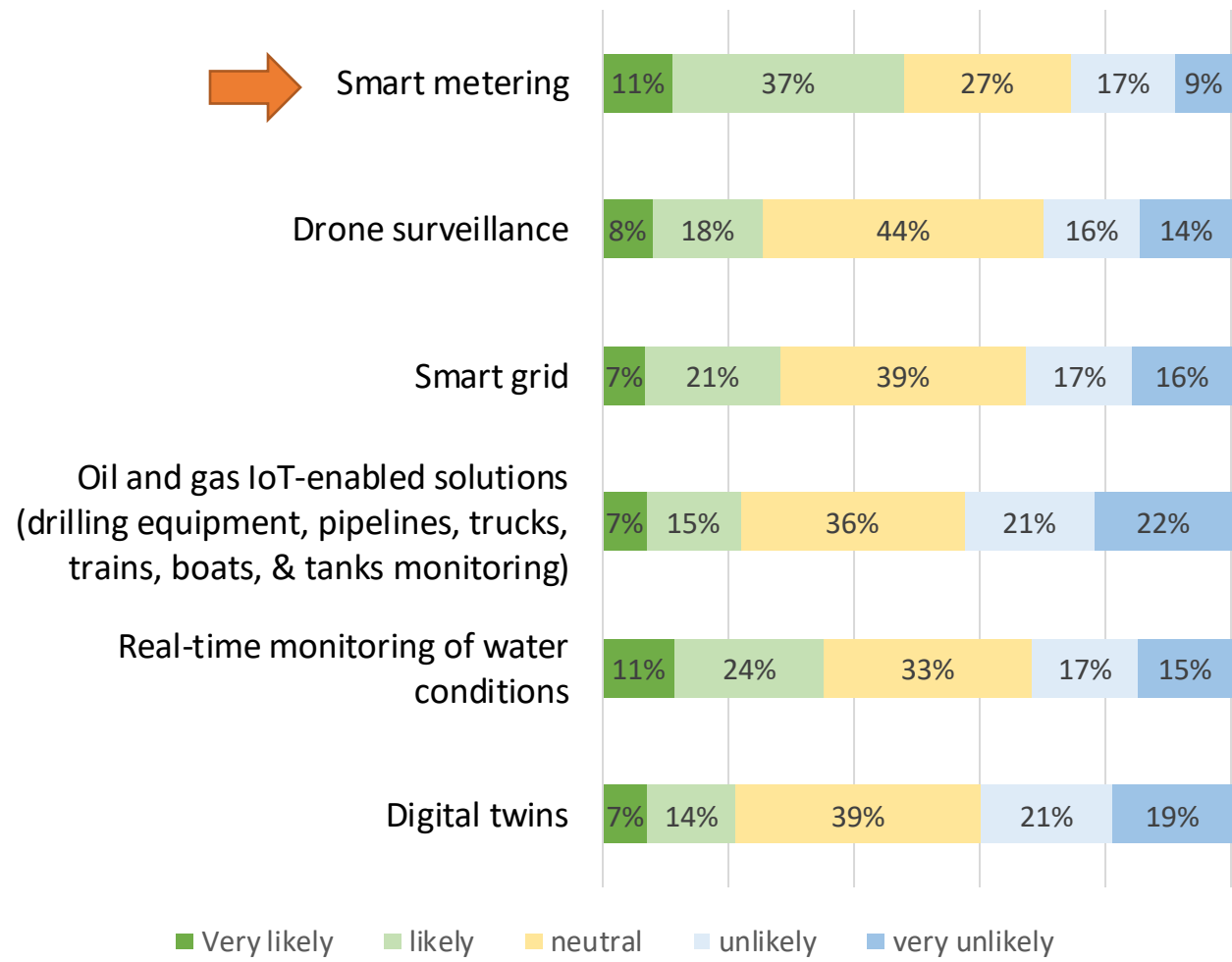


Healthcare Applications

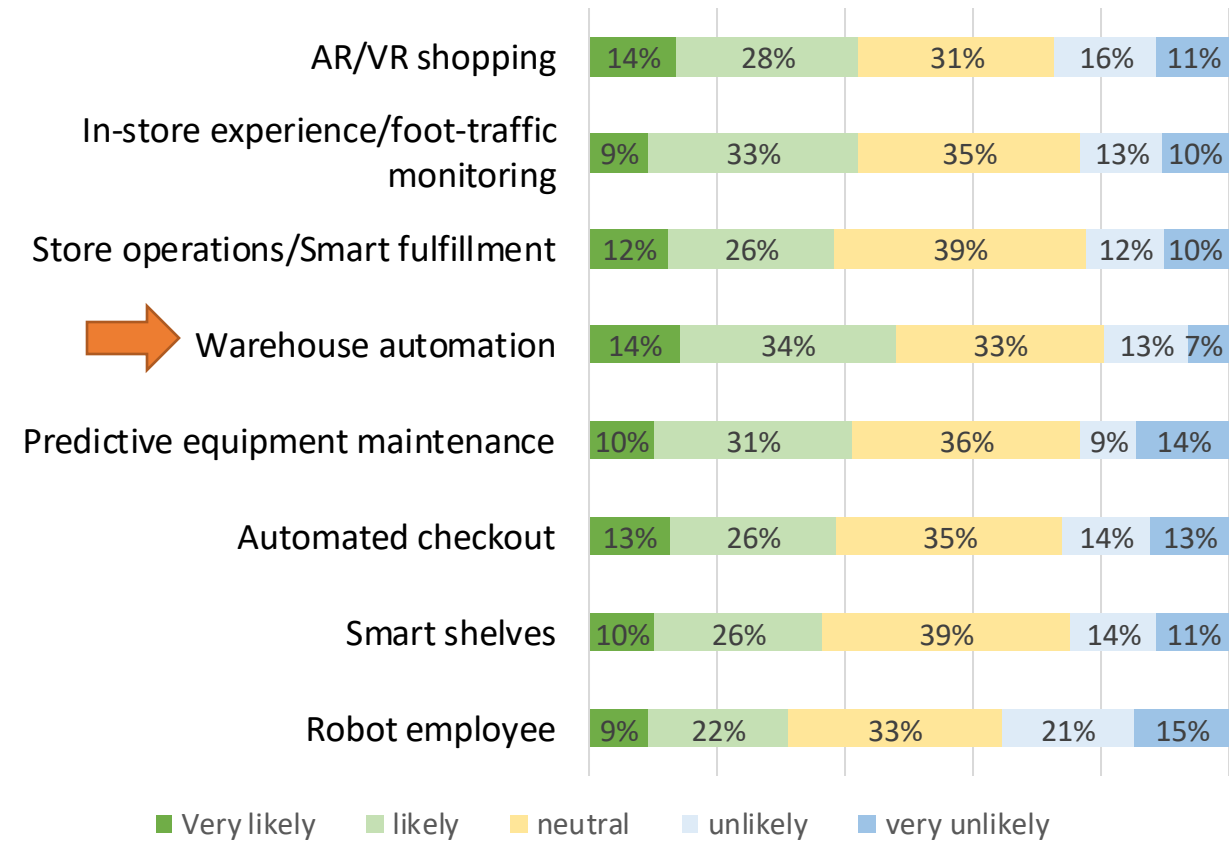


5G IoT Applications by Industry Verticals

Energy and Utilities Applications

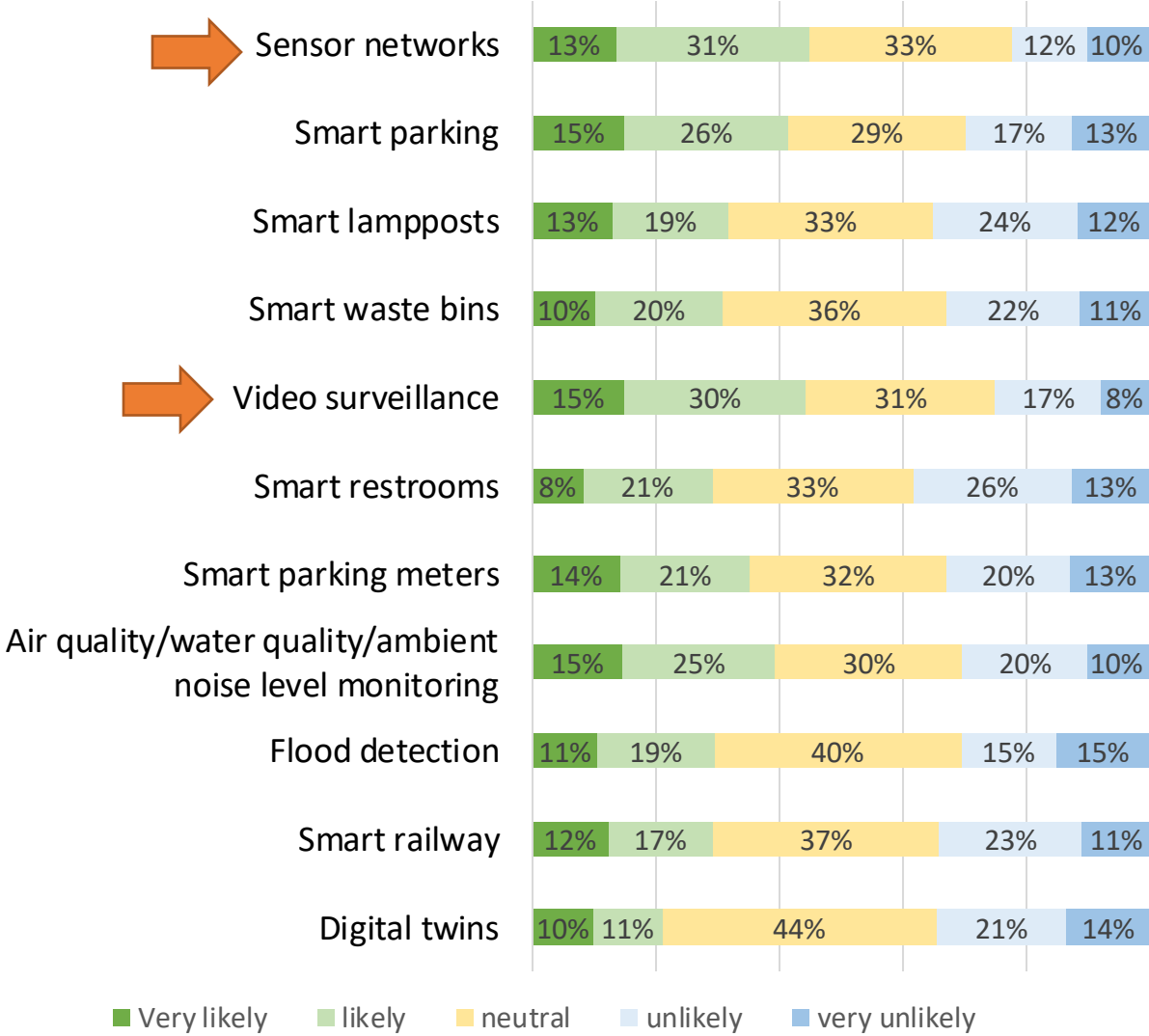


Retail and Consumer Electronics Applications

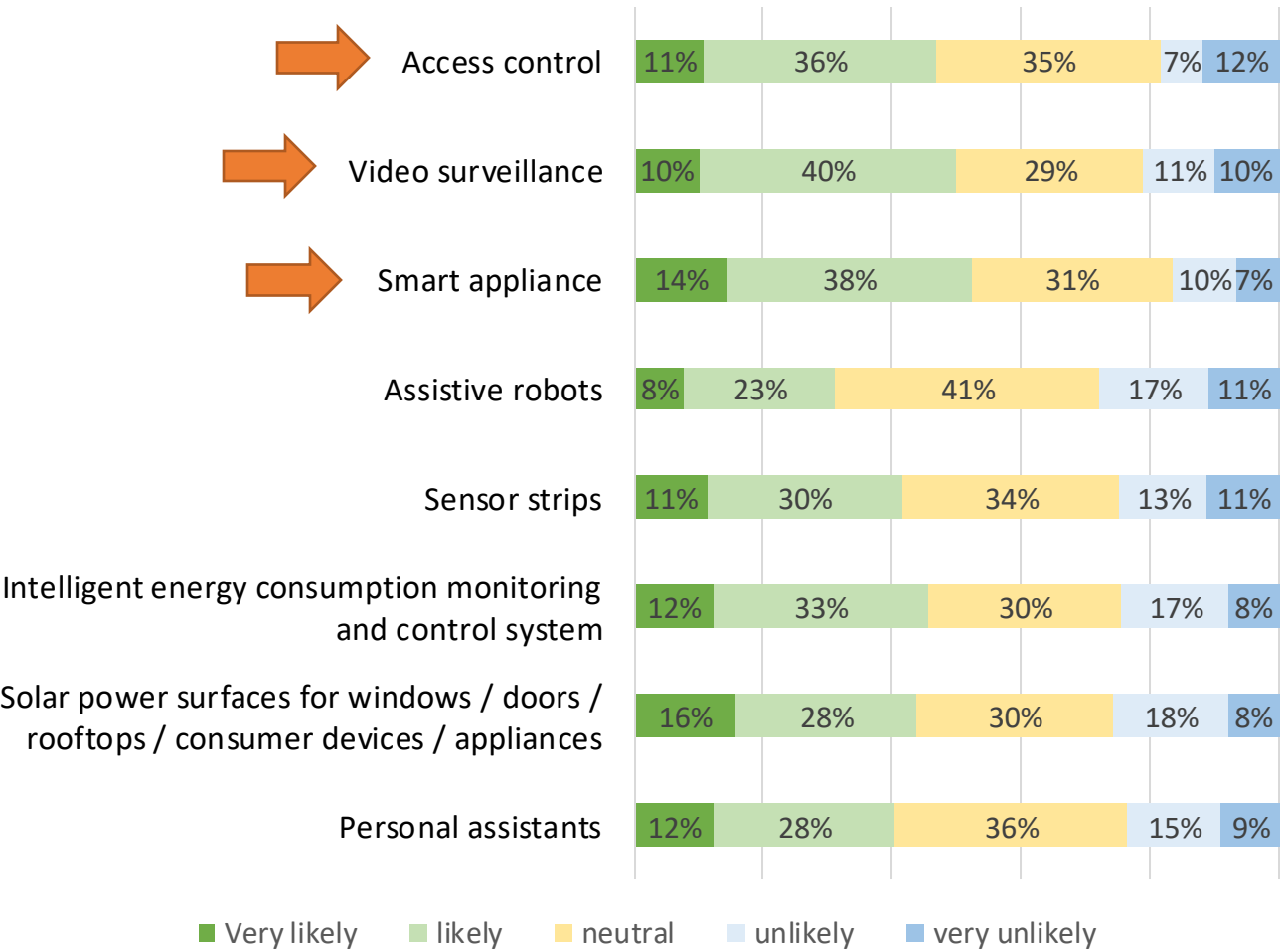


5G IoT Applications by Industry Verticals

Public Sector Applications

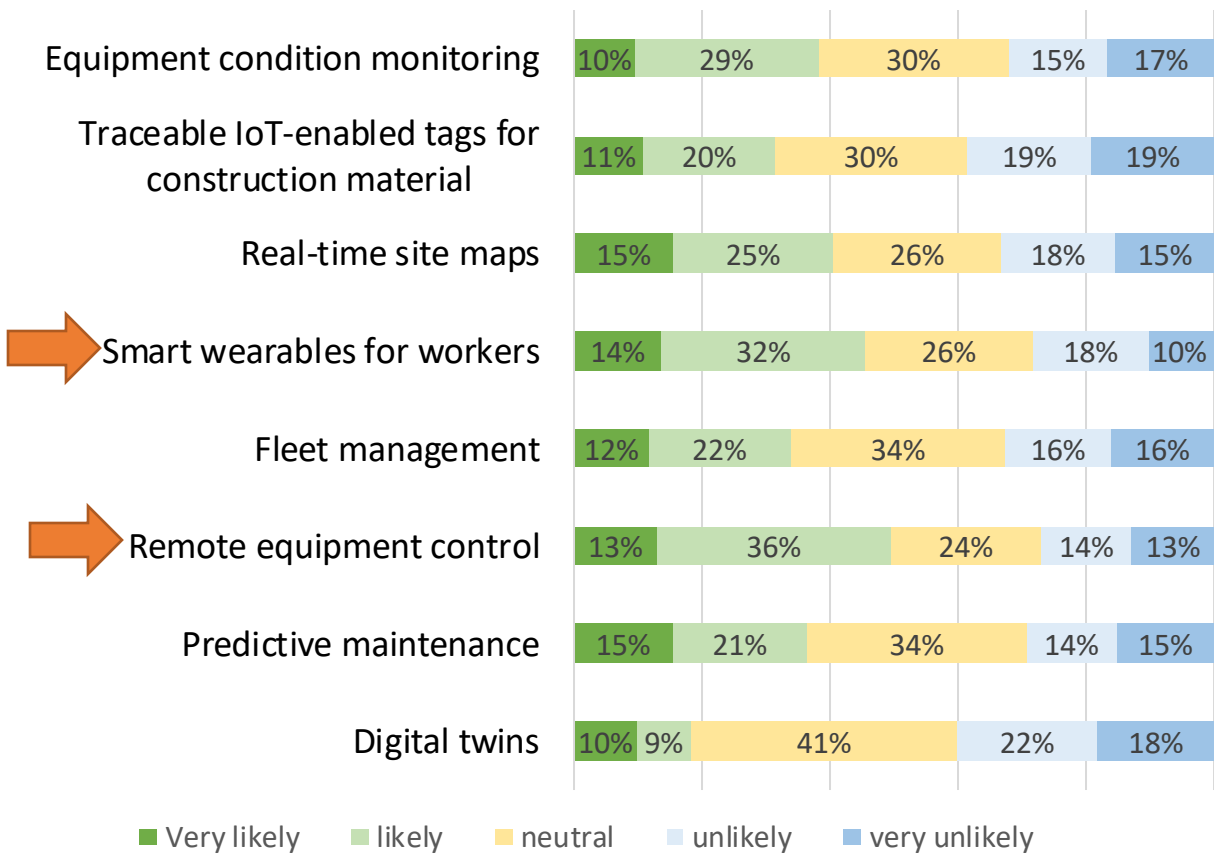


Home Automation Applications

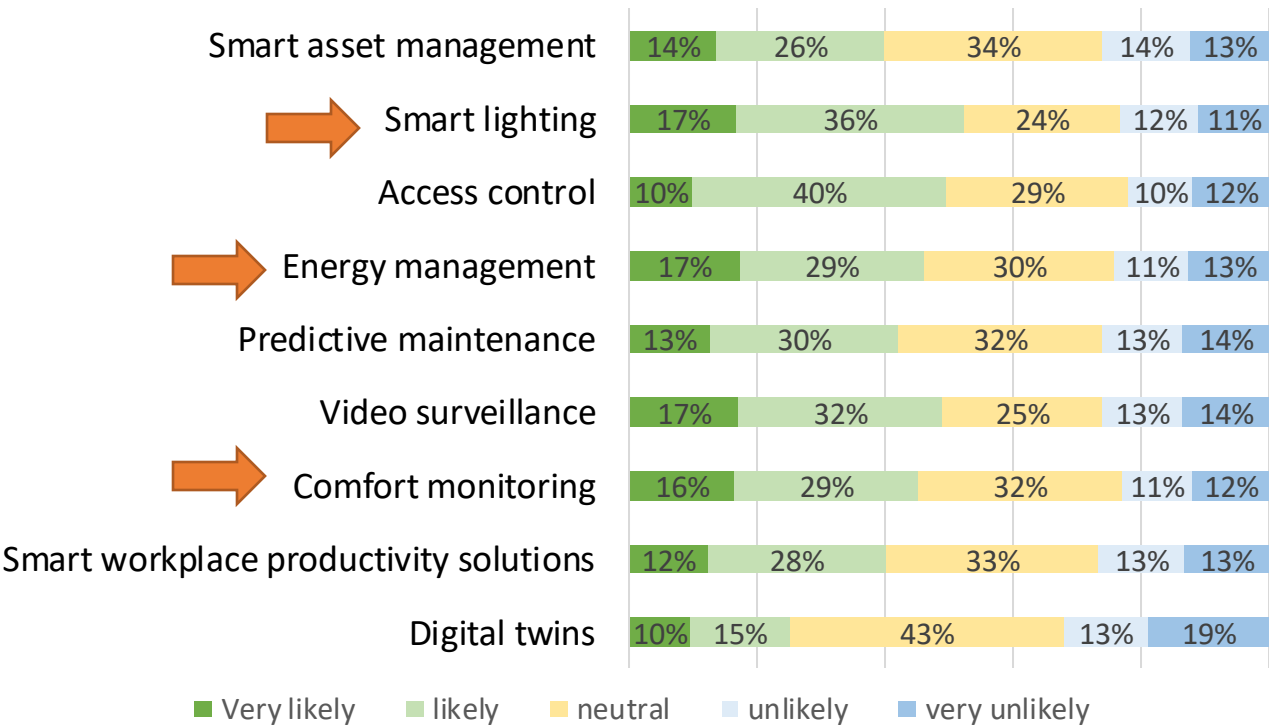


5G IoT Applications by Industry Verticals

Construction Technology Applications

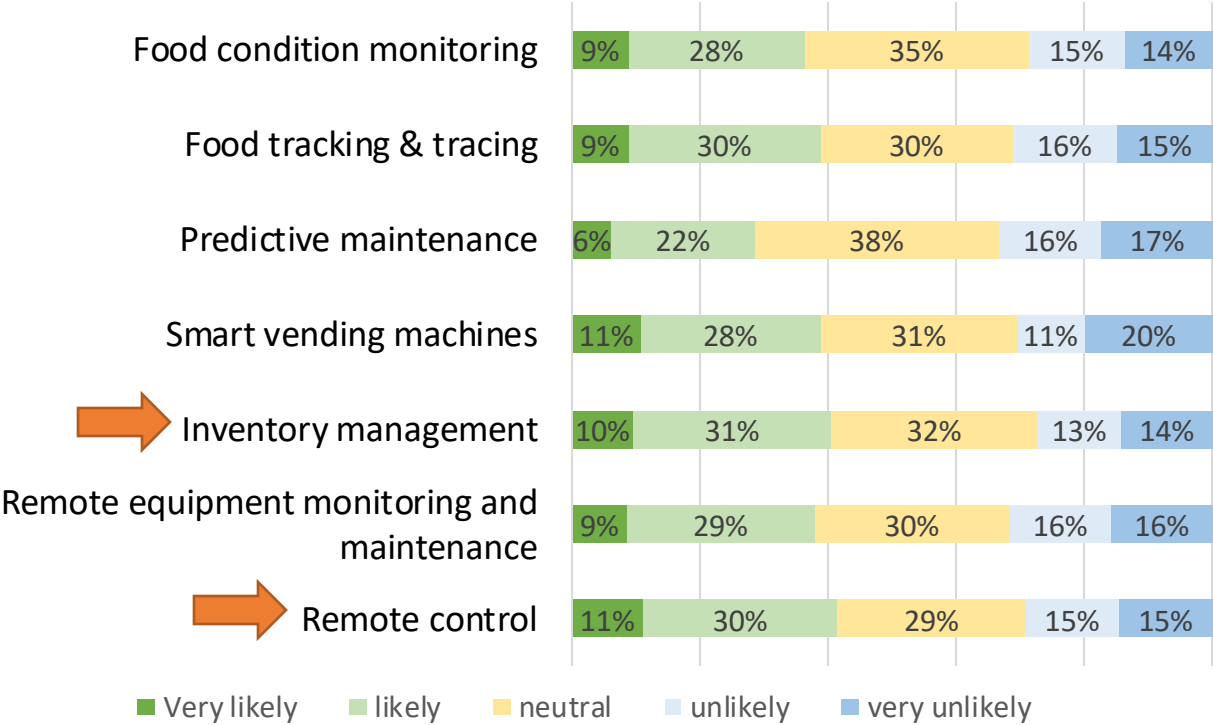


Intelligent Building Automation Applications

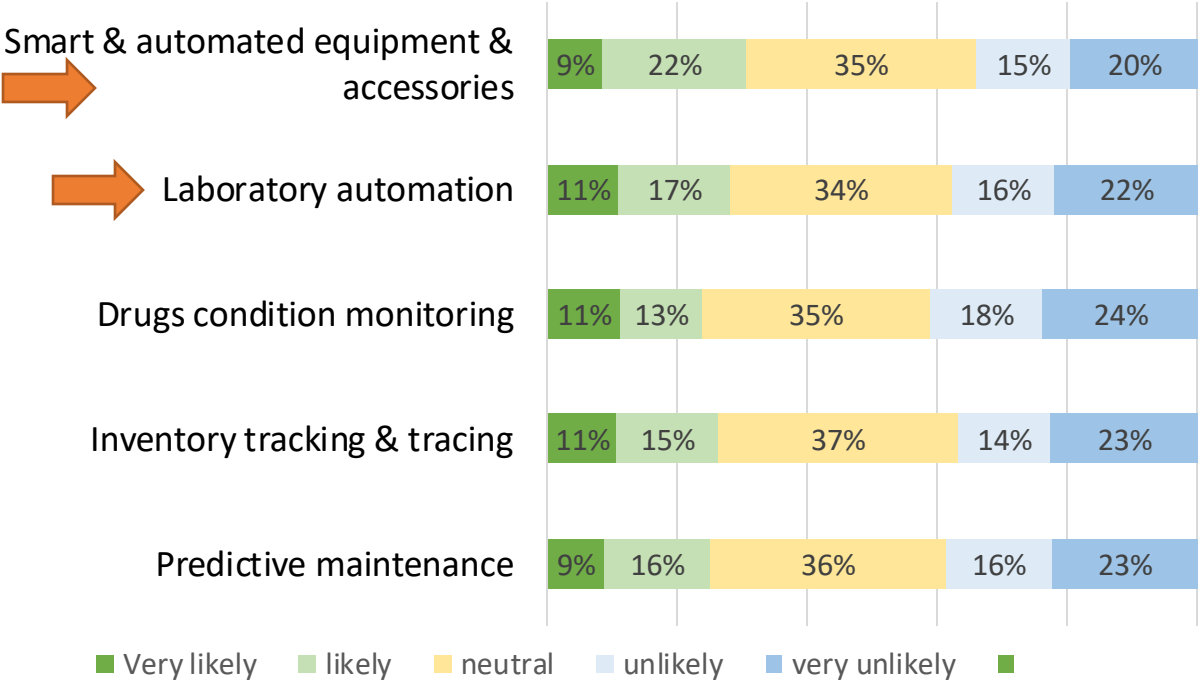


5G IoT Applications by Industry Verticals

Foodtech Applications

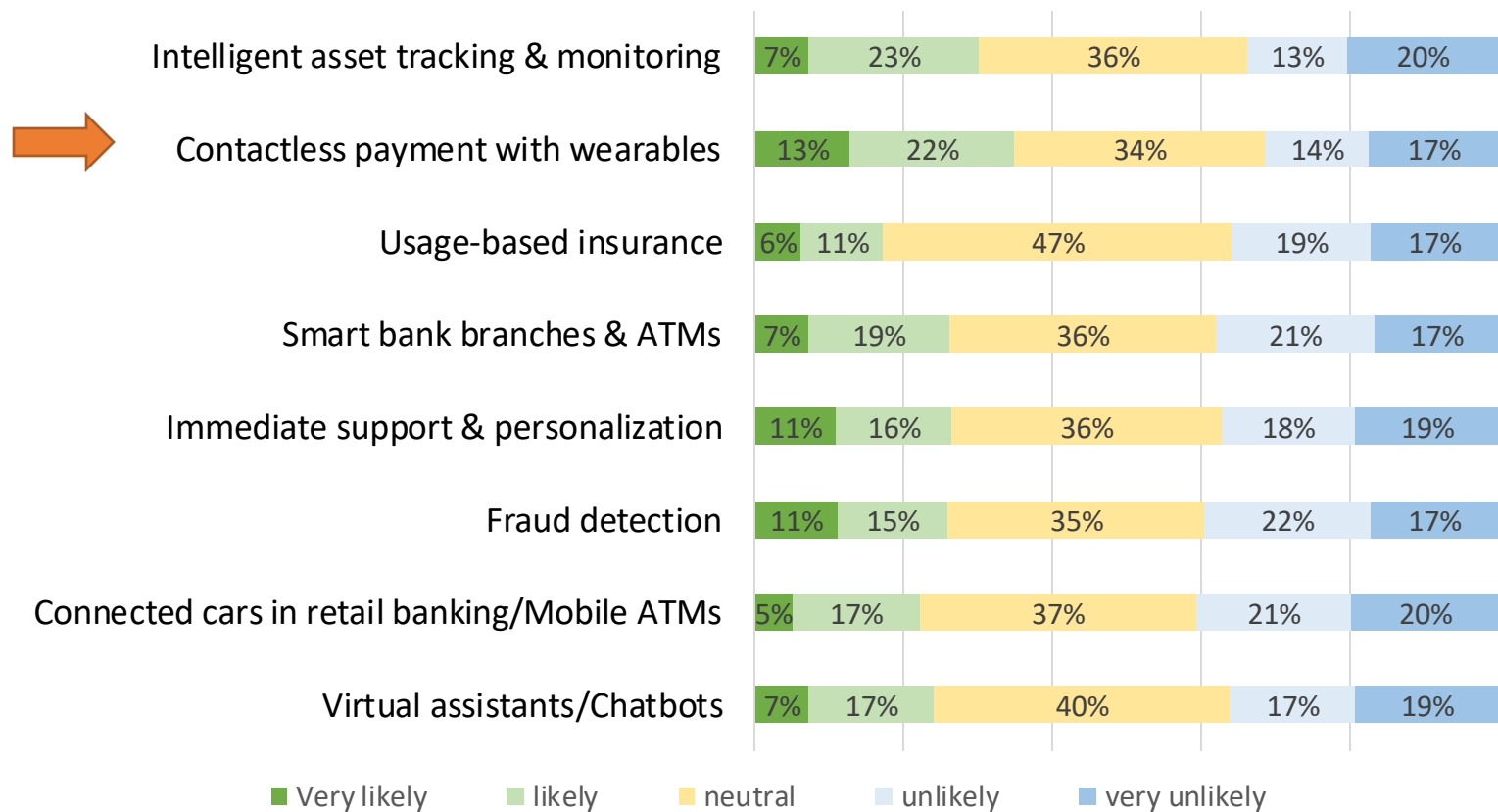


Biotechnology Applications



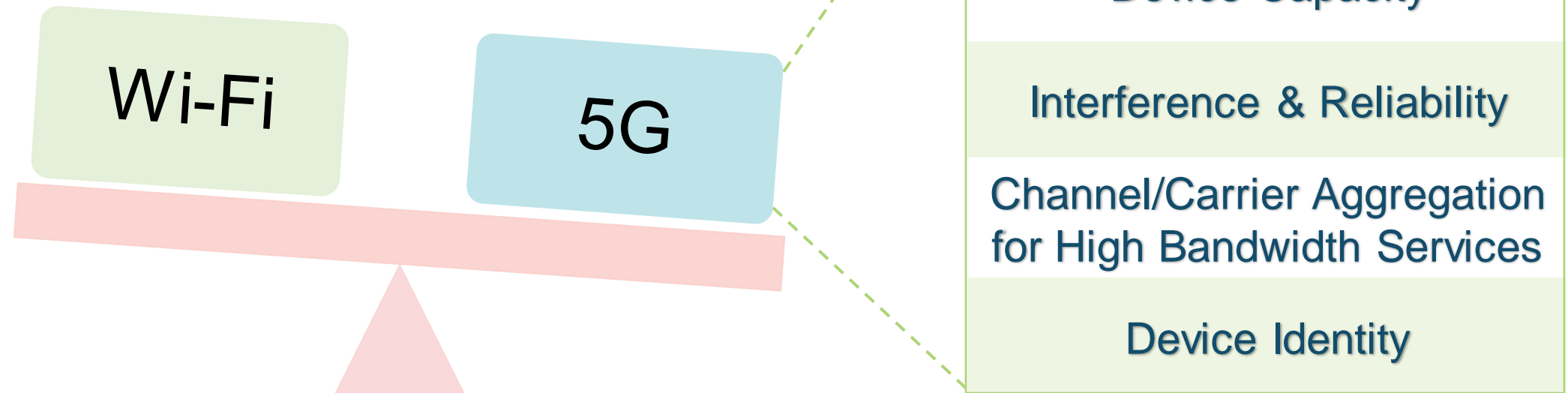
5G IoT Applications by Industry Verticals

Financial Institution Applications

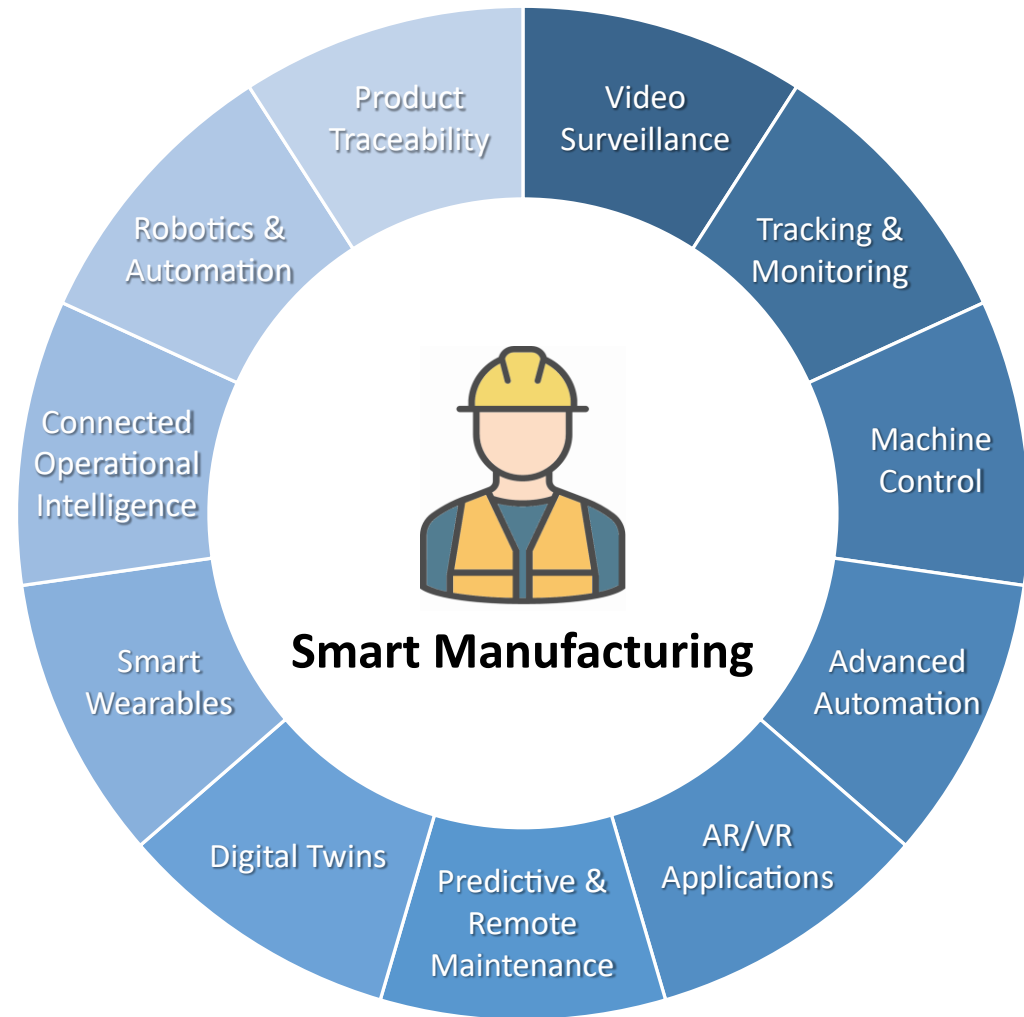


Relationships of Hong Kong Re-industrialization and 5G Development

Wi-Fi vs. 5G for Industry 4.0



Use of 5G IoT Applications in Manufacturing Industry



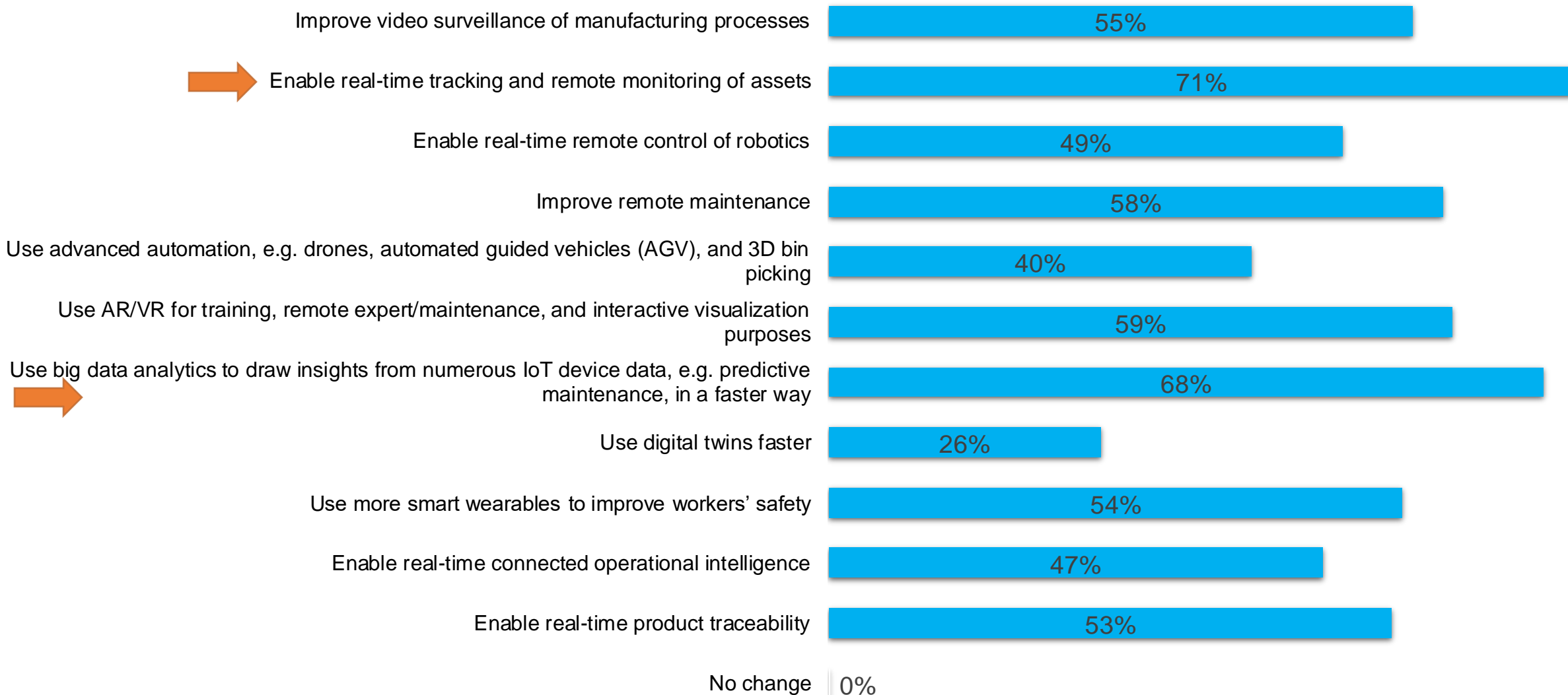
- Improve Video Surveillance of Manufacturing Processes
- Real-time Tracking and Remote Monitoring of Assets
- Remote and Real-time Control
- Advanced Automation
- AR/VR Applications (Training, Remote Expert/Maintenance, Interactive Visualization)

- Predictive Maintenance and Remote Maintenance
- Digital Twins
- More Smart Wearables to Improve Workers' Safety
- Real-time Connected Operational Intelligence
- Smart Automation with Robots and Real-time Remote Control of Robotics
- Real-time Product Traceability

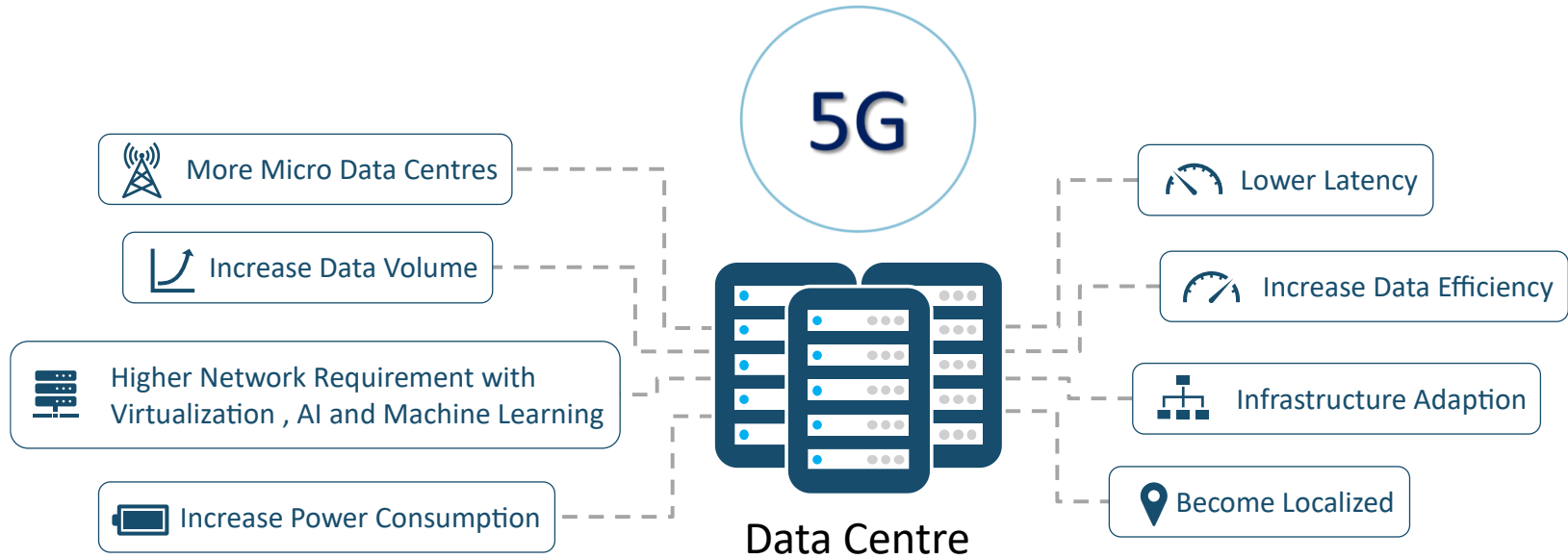
	Use cases	Usage	5G + Advanced Automation Advantages
Advanced Automation	Drones	<ul style="list-style-type: none"> - Asset inspection and maintenance - Transportation of materials and parts within the company - Inventory taking 	<ul style="list-style-type: none"> - Avoid lengthy, dangerous, and expensive manual inspections - Detect defects more accurately - Save inspectors' insurance costs - Enable preventive maintenance - Enable better management
	Automated Guided Vehicles (AGVs)	<ul style="list-style-type: none"> - Transport parts/shipments in and across warehouses 	<ul style="list-style-type: none"> - Strengthen the coordination of AGVs - Improve safety in human-machine interactions - Enable real-time remote control - Enable Real-time data collection and analysis
	3D Bin Picking	<ul style="list-style-type: none"> - Find parts anywhere in the field 	<ul style="list-style-type: none"> - Able to operate anywhere with advanced vision systems, but not fixed/known locations only - Require minimal internal processing power with cloud & edge computing

Use of 5G IoT Applications in Manufacturing Industry

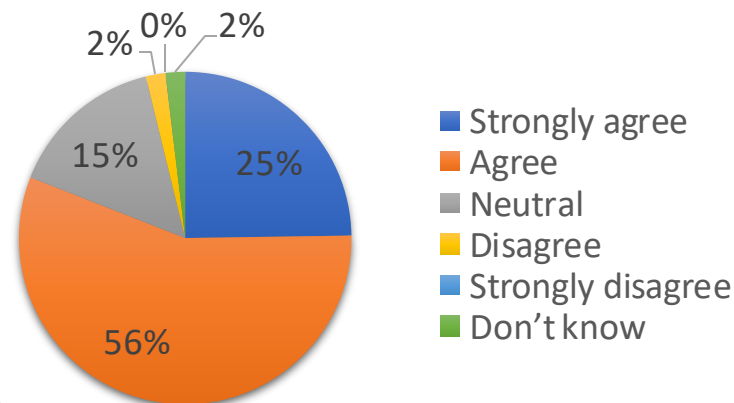
Effects of the Rise of 5G Will Bring to Hong Kong Manufacturing Industry



How 5G Adoption will Impact Data Centres

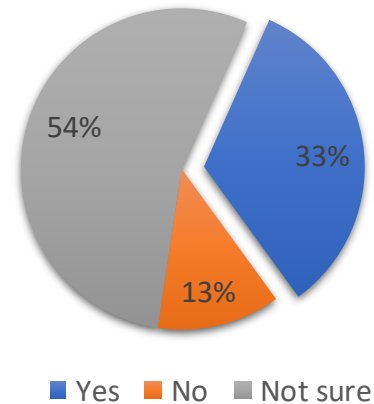


"Since 5G IoT applications involve a lot of cloud computing/data centres investment, the rise of 5G IoT applications will contribute to the development of data centres"

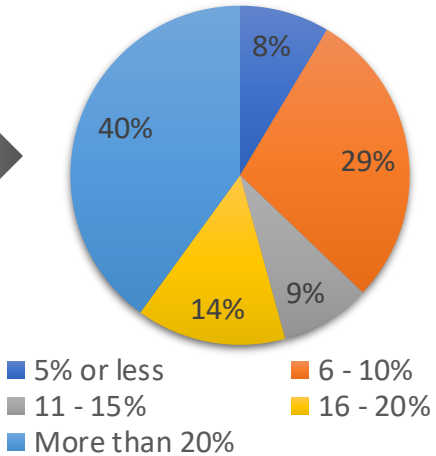


Increase in Cloud Resources in Data Centre(s) Regarding 5G IoT

Will increase the cloud resources in data centre(s) regarding 5G IoT



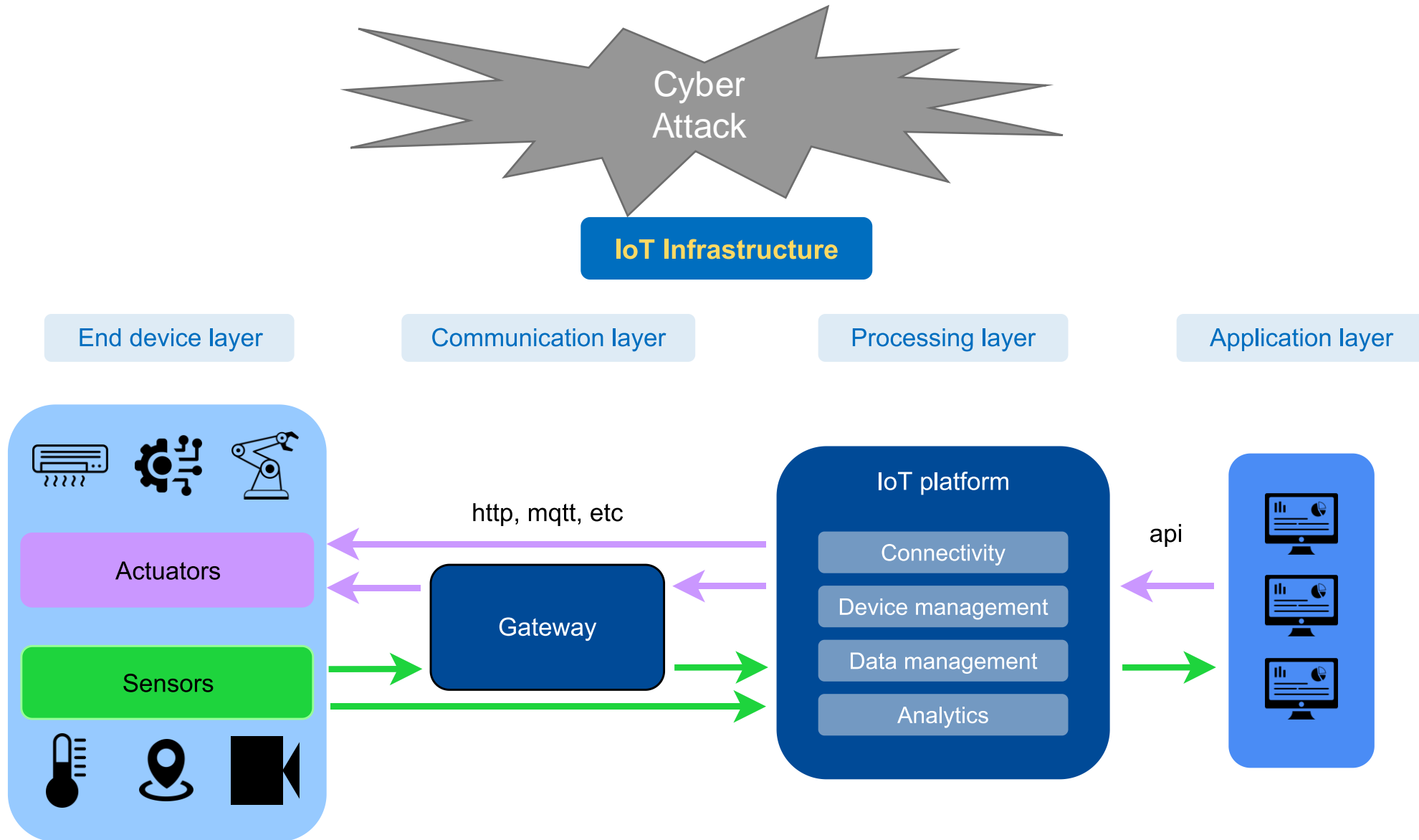
Expected percentage increase in cloud resources



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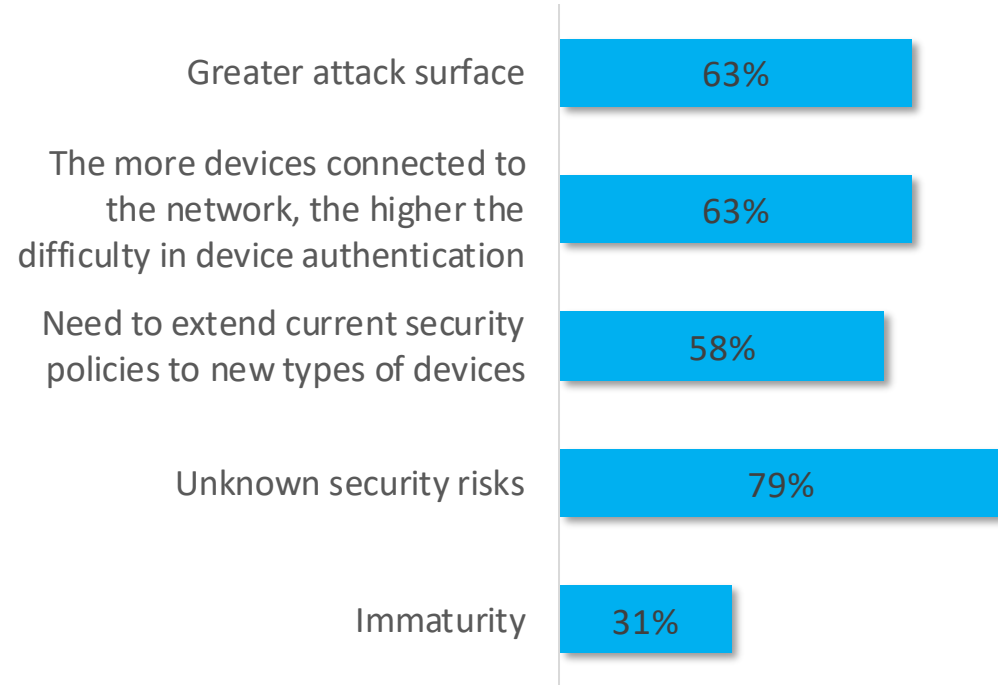
Cyber Security



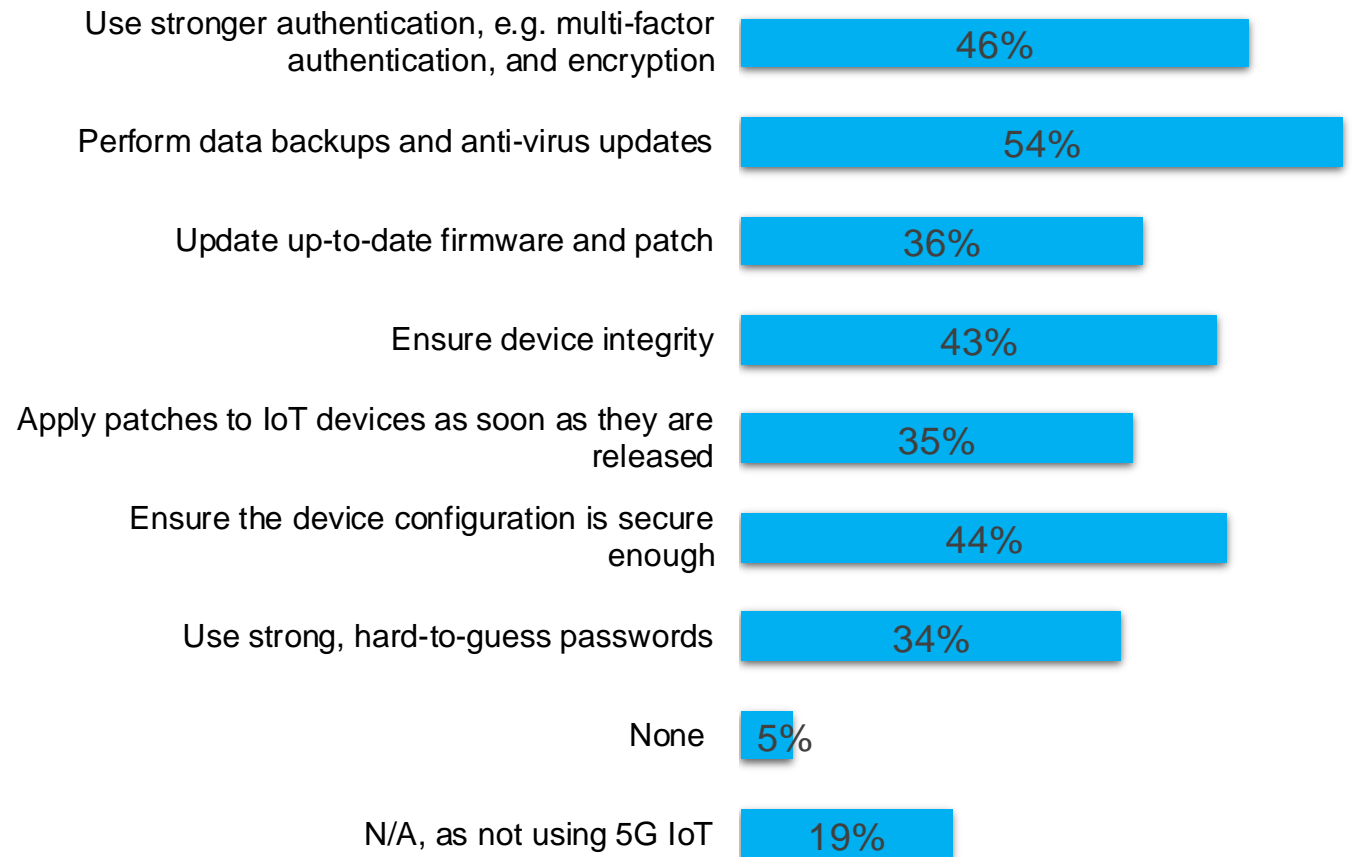


Cyber Security Issues in 5G IoT & Existing Methods to Tackle the Cyber Security Issue in 5G IoT

Security Concerns for 5G IoT Technology



Precautions to Alleviate the Security Concerns Associated with 5G IoT



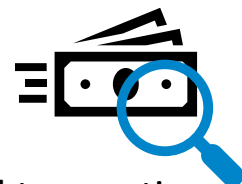
Key Benefits of IoT with Blockchain

Building Trust to The IoT Data



- Secure
- Immutable
- Decentralized

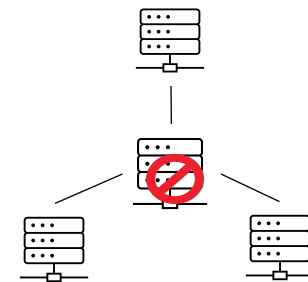
Enhanced Security



All transactions can be tracked

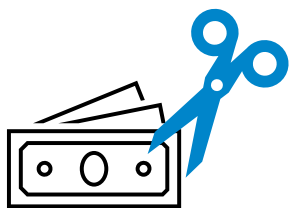


Secure transaction



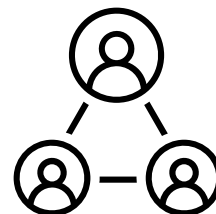
Avoid single point of failure

Reduced Costs



- Can automatize transaction validation and processes
- No need to pay for middlemen and intermediaries

Speed of Transactions

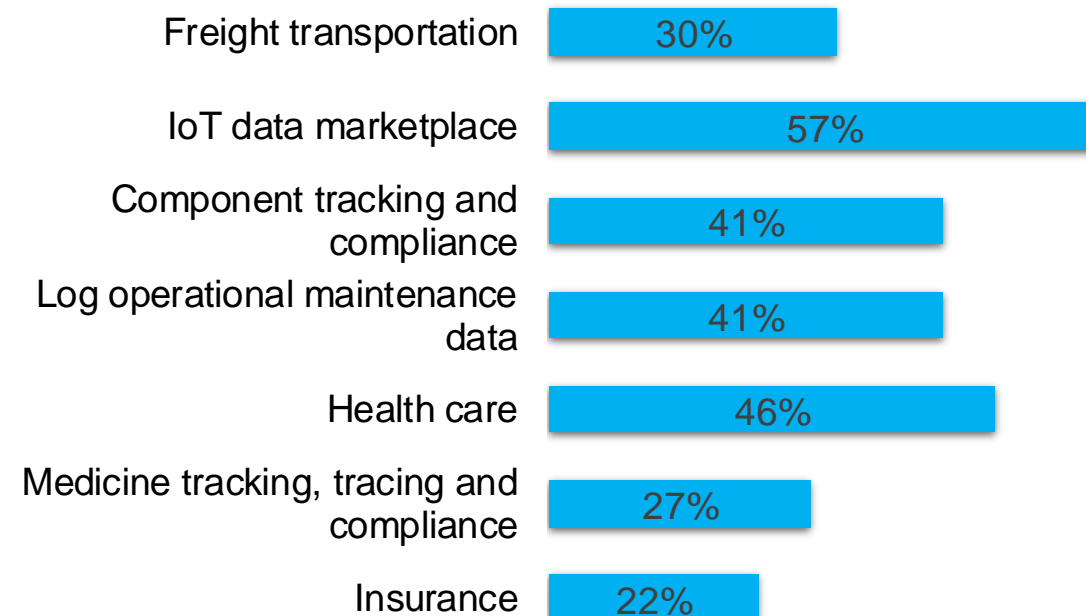


- Different parties without a basis for a relationship of trust can exchange data directly with one another
- Eliminating manual processes and increasing transaction speed.

Blockchain + IoT Use Cases



Interest in IoT Blockchain Applications

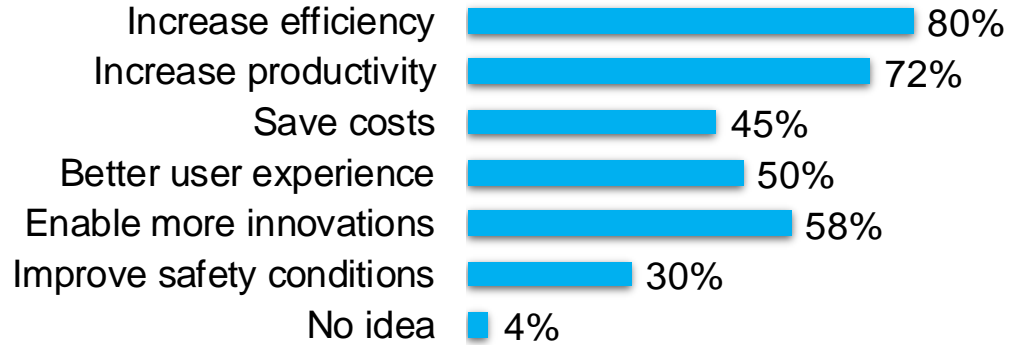


Evaluation and Preparation for 5G IoT

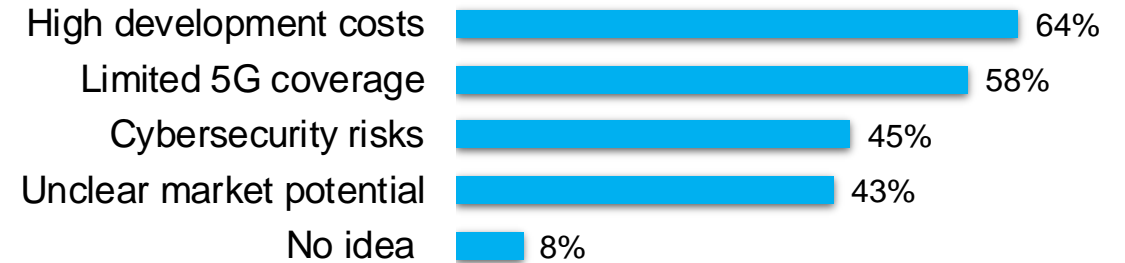


Pros and Cons of 5G IoT

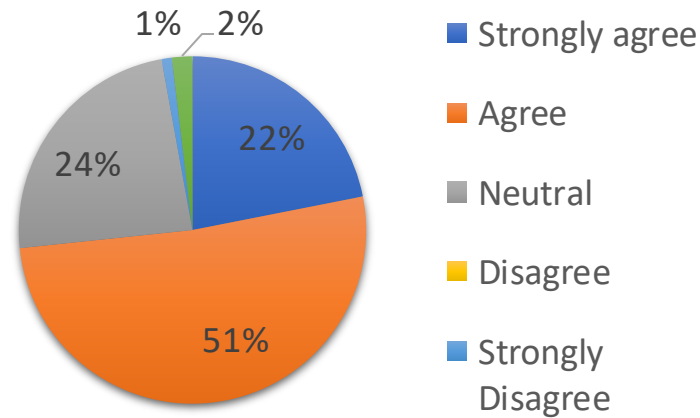
The Pros of 5G IoT Applications



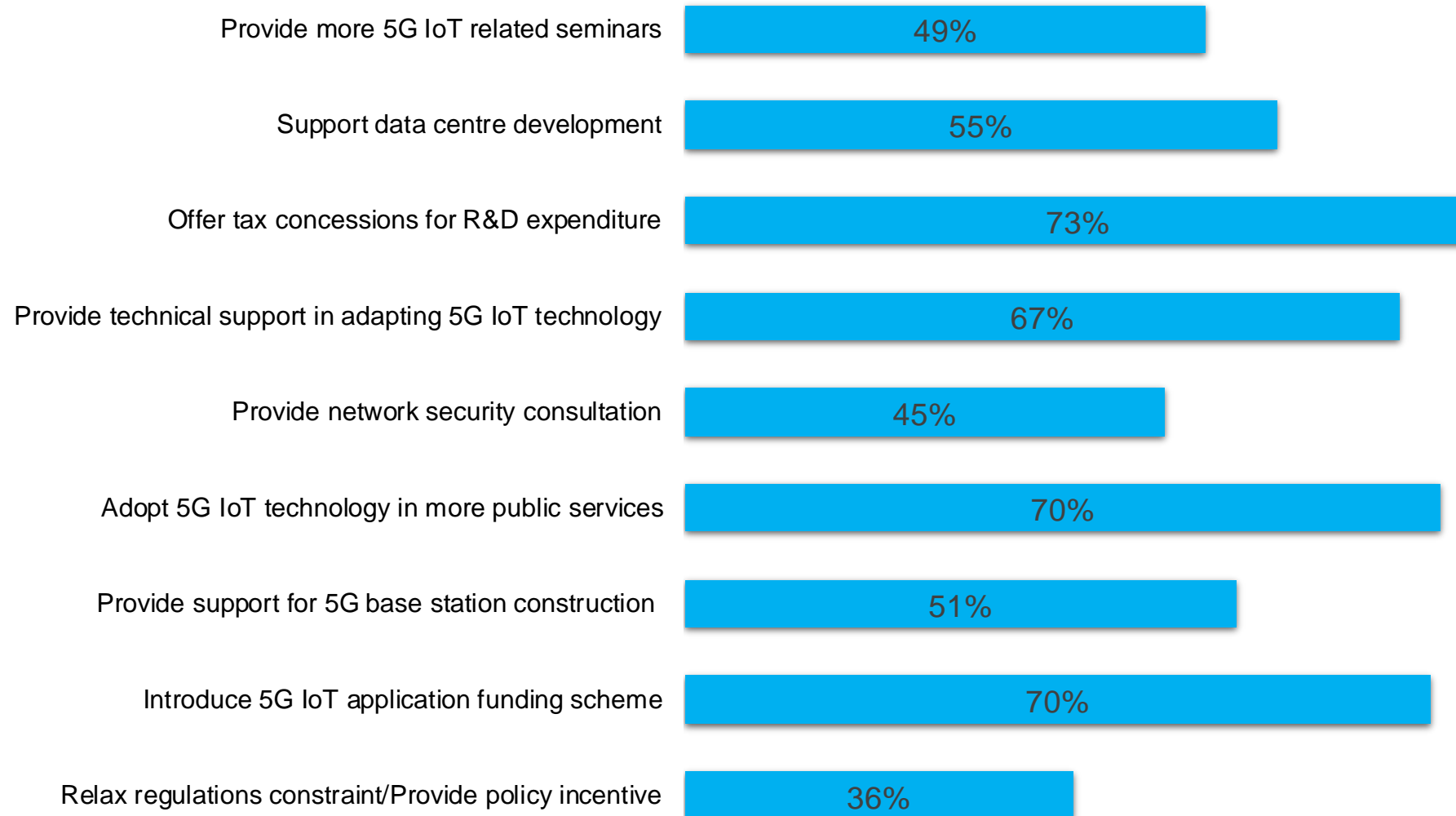
The Cons of 5G IoT Applications



"5G IoT brings more benefits than drawbacks"



Measures that Hong Kong Government can Take to Help the Industries in Adopting 5G IoT Technology



Thank You



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Date: 7/2022

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