



*Logistics Robotics and Technologies
for Belt & Road Initiative*

一帶一路新機遇 · 科技物流展商機



Smart Logistics for e-Commerce through Hong Kong

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LSCM's Model:



- ❖ We treasure domain knowledge
- ❖ We are dedicated to public cause
- ❖ We serve industry, esp. SMEs
- ❖ We innovate!

Academia → Research Institutes → Government → Industry

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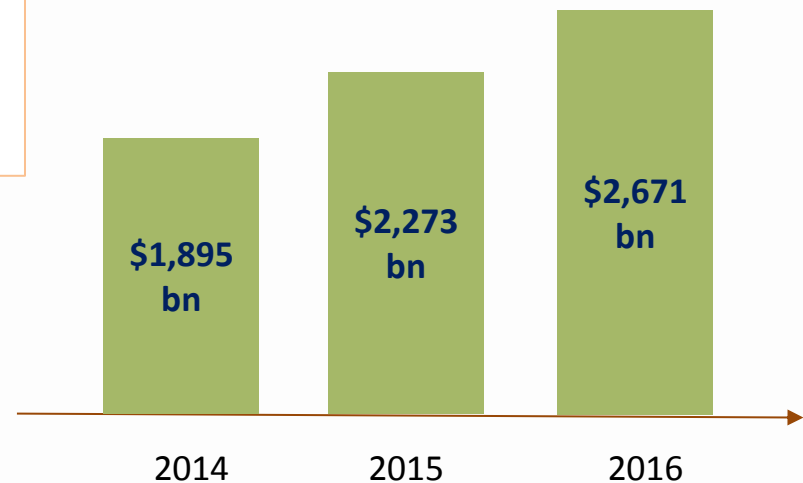


China in Global E-Commerce



Asia-Pacific	\$1,057 bn	+28%
North America	\$644 bn	+13%
Europe	\$644 bn	+13%
Latin America	\$33 bn	+28%
MENA	\$26 bn	+19%
Others	\$8 bn	+23%

Global E-commerce Turnover



- Asia-Pacific now is the strongest e-commerce region in the world
- China has surpassed USA, with the highest e-commerce turnover



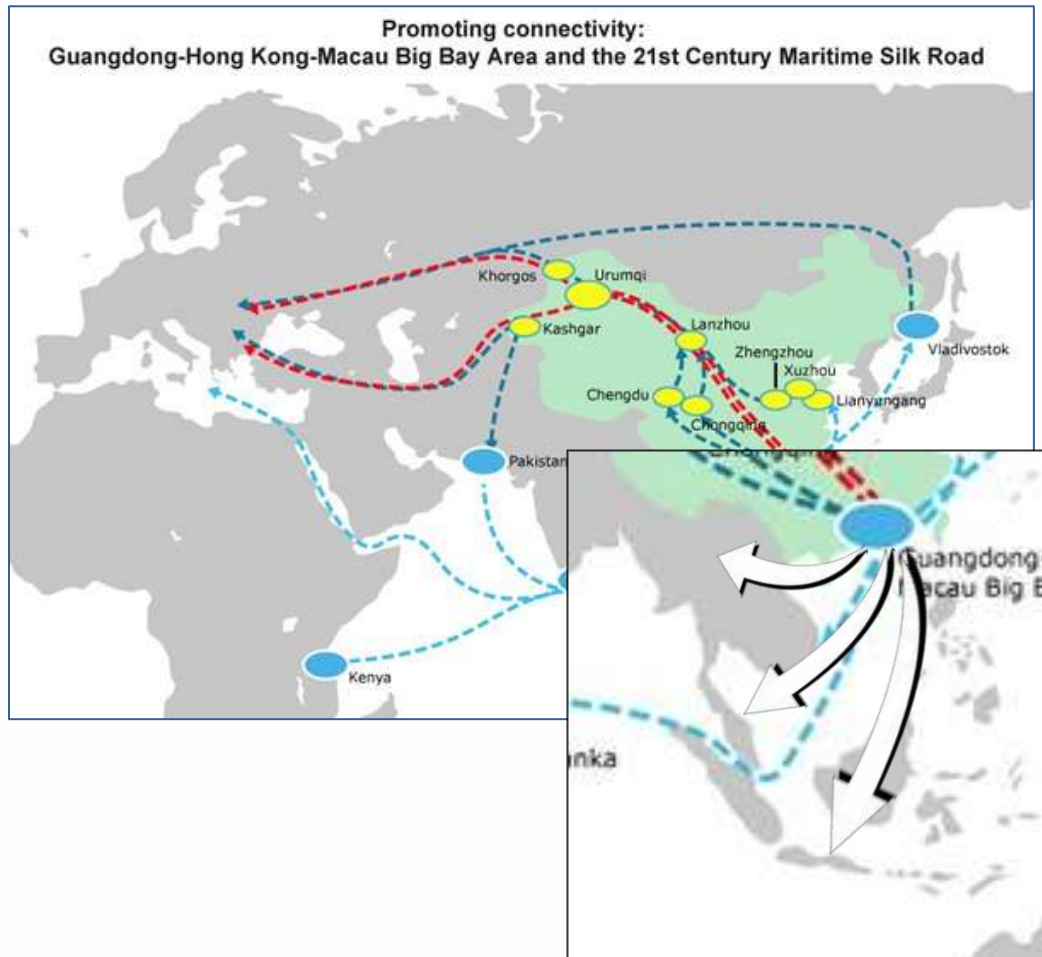
Provincial Level Cross-Border E-Commerce

China Provincial Level Administrative Regions Cross-Border E-commerce Index 2015

Rank	Province	Market Size Index	Growth Index	Cross-Border Index
1	Guangdong	100.00	13.31	77.77
2	Zhejiang	52.53	11.50	51.04
3	Fujian	22.78	19.97	37.87

- The 2015 Index shows that e-commerce hub provinces **Guangdong**, **Zhejiang** and **Fujian** are the top 3 performing players in cross-border e-commerce
- HK is at the neighborhood of Guangdong, Zhejiang and Fujian, en route on the e-commerce trades of Southern China with ASEAN and the Belt-and-Road markets

Contemporary Trade Route Development



New Development trends:

- Belt and Road Trade Routes
- Big Bay Area Economic Zone
- HK-Zhuhai-Macau Bridge

Trade will accelerate over the trade routes. HK is on the route.

- At the door of China
- Gateway of Big Bay Area
- Control point of the HZM Bridge to the biggest air cargo port

Question is, how is HK able to capture the opportunity?



Opportunities for HK Businesses

- Joining in the big trend of development of China's e-commerce development
 - Hong Kong's well-developed infrastructure, free flow of information, legal and arbitration, and the international business experience
 - Rich expertise in global supply chains, logistics hub, e-banking, fintech
 - These all contribute to an excellent environment for the development of new business models and concepts
- HK as a logistics hub for Chinese online orders
 - Hong Kong could serve as a logistics management hub between sellers and buyers among our Mainland and the worldwide markets, e.g. ASEAN, Australian, OBOR
 - Strong international logistics operators handle the e-commerce logistics integration, international forwarding and cross-border logistics for delivery in and out of the Mainland market



Technology as Key Factor for Advantage

1. Expedited Cross-Boundary Customs Clearance

2. Smart City helping Efficient Logistics Operations

3. Smart Warehouses with IOT and Automation



1. E-Lock to Expedite Customs Clearance

- Electronic lock for bonded transport operations
 - Electronic lock activated on the cargo container at the place of origin and deactivated at the destination. Lock status and travel location is under monitor. Cargo is safe during the course of transportation
- Cross-boundary customs clearance for fast transshipment logistics
 - In 2011, HKSAR Customs launched the ITFS scheme, to facilitate transshipment logistics through the SAR territory
 - In 2016, HKSAR Customs extended ITFS to join with GD Customs, to support expedited cross-boundary bonded lanes for fast transshipment logistics
 - State-of-the-art technology to enable use of a single e-lock, to support the independent and secured operations for each individual customs jurisdiction
- Currently, there are more than 400 point-to-point fast lanes between 34 GD Customs points and 12 HK ports in operation, saving each trucking trip for multiple inspections in the due course, 2 hours per se for each inspection

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Logistics Summit
物流高峰會 2017

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HK Customs Intermodal Transshipment Facilitation Scheme (ITFS)



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RFID Technology for Traffic Management at Air Cargo Terminals





At Airport Cargo Terminals, Unloading and Inspection





E-Lock now Integrated across HK and Mainland in China

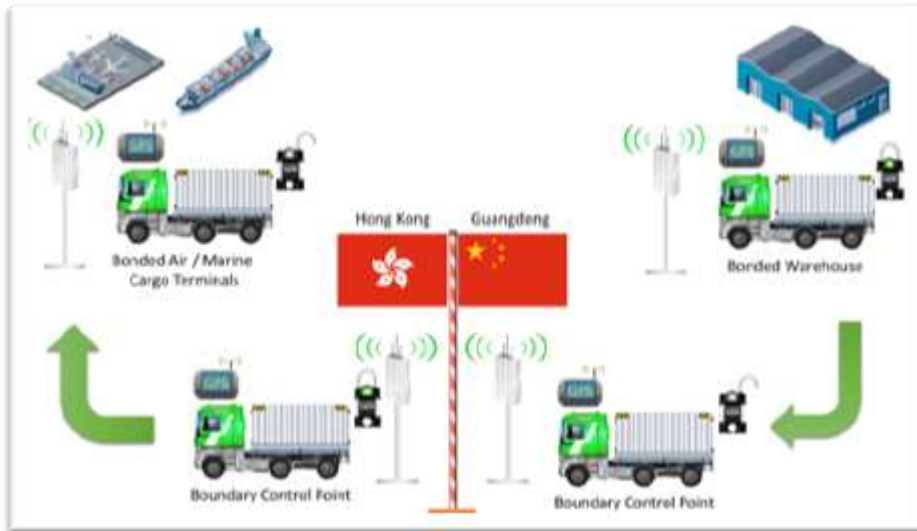
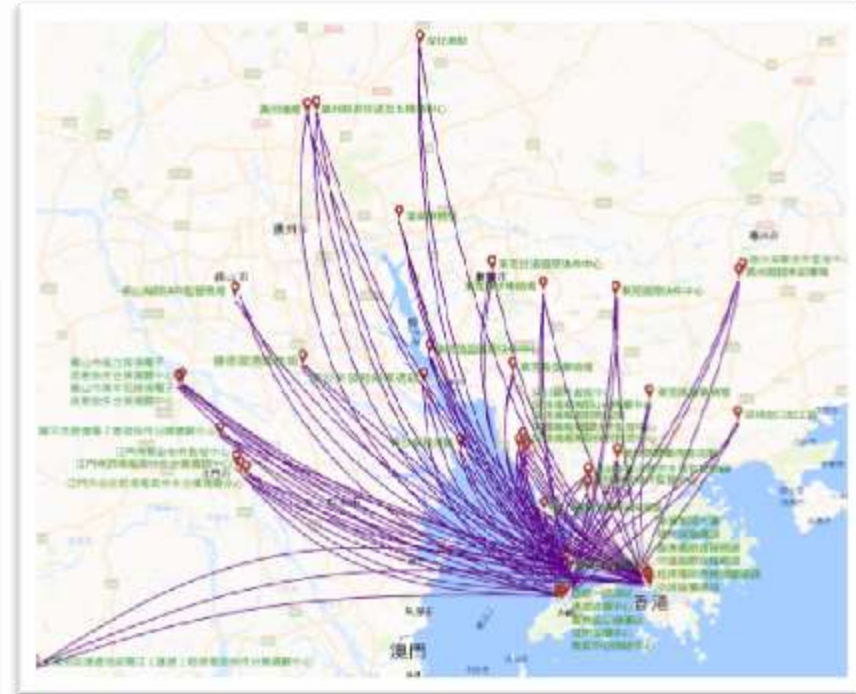
IoT Cross-Boundary Fast-Clearance Security System



E-Lock now Integrated across HK and Mainland in China

HK + Mainland China Check Points:

- ◆ 12 in HK
- ◆ 34 in Mainland
- ◆ Provides more than 400 expedited transshipment routes





2. Smart City Infrastructure helping Logistic Operations

- D-GNSS available to public for enhanced logistic tracking
- Advance truck arrival information infrastructure for better managed cargo terminal operations
- Mesh Wi-Fi networking for container terminals

GPS+Beidou Ground based Augmented Positioning Technologies

- Combine GPS and Beidou satellites to advance HK's GIS infrastructure
- Differential Global Navigation Satellite System (DGNSS)
- Accuracy improvement for mobile phones: from ~4.1m to ~0.4m



Mobile Phone GPS function

Accuracy	
Mean (m)	RMS (m)
4.1	4.5



RTK (Survey-grade Equipment)

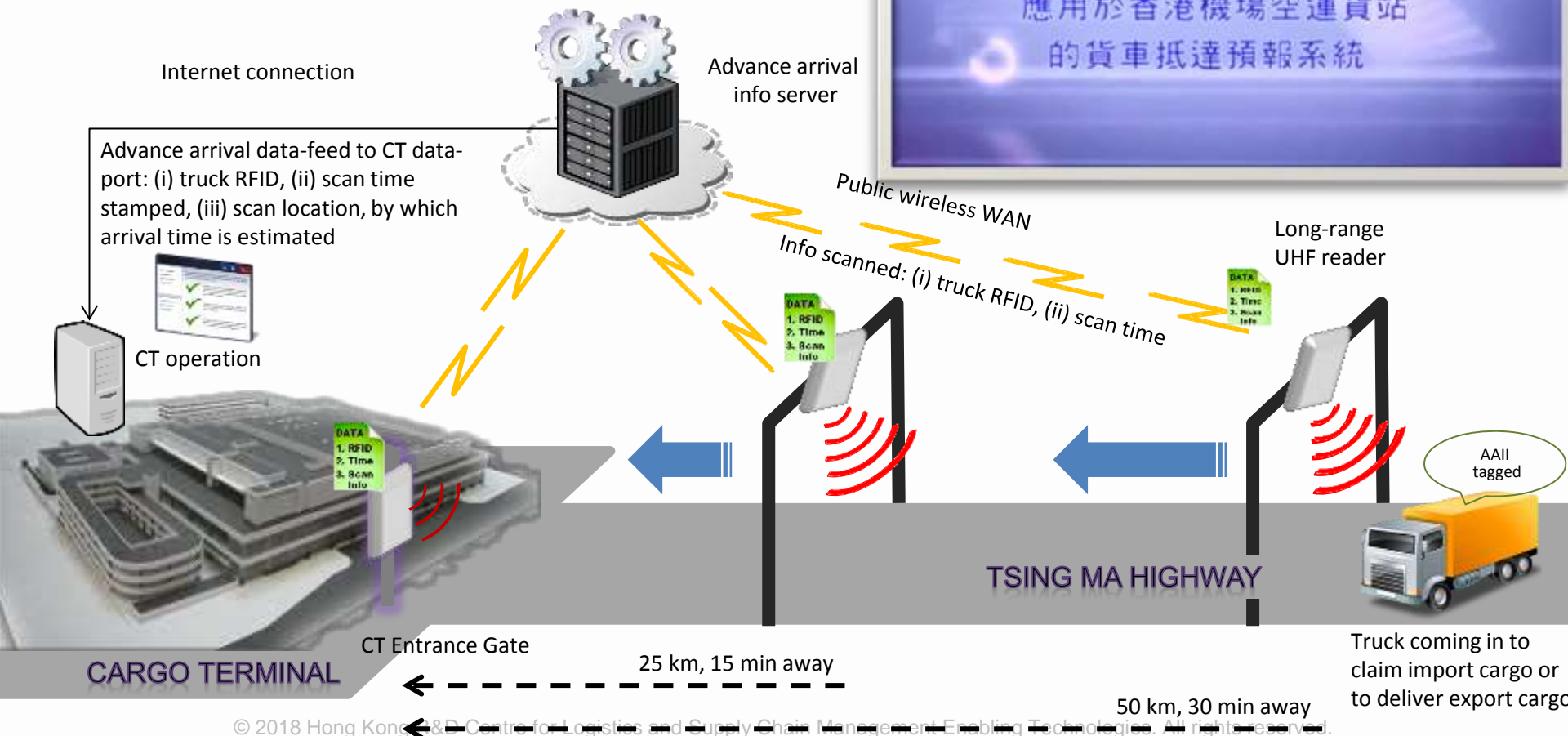
Accuracy
Centimeter level accuracy
Benchmark purpose

DGPS

Accuracy	
Mean (m)	RMS (m)
0.4	1.8



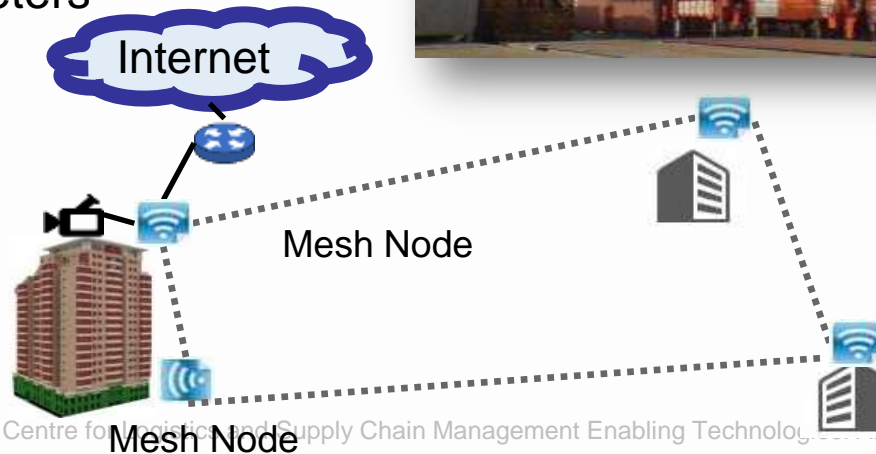
Advance Truck Arrival Notification



Mesh Wi-Fi Networking in Container Terminals

- Robust Wireless router readily deployable in outdoor environments
- Self-adaptive network with resilience and mesh algorithm
- Support network with mobility (over 50km/h) and data rate up to 300Mbps over 300 meters

Mesh router piloted at MTL



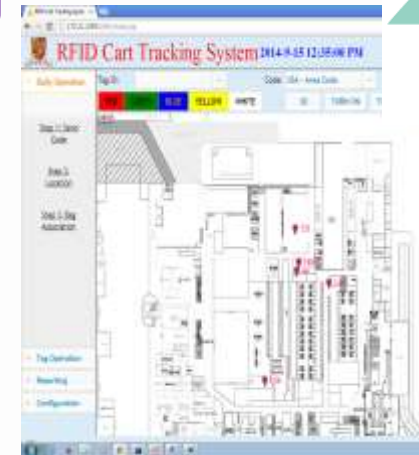


3. Smart Warehouse with IoT and Automation

- Robotic AGV automation
 - Automation of cargo lifting for shelving and picking, capacity and efficiency
 - Save human workers from heavy labor and injury-risky tasks
- IOT sensing, visibility on stock level and storage condition
 - Quick and low cost setup, flexible deployment extremely suitable for HK's e-commerce business growth
- Localization to manage cargo in air-cargo terminal
 - Real-time visibility of assigned cargo delivery carts awaiting flights
 - On-spot cart/item finding, enhance efficiency & speed for airfreight handling
- Demands for speedy logistics, agile warehousing, visibility and traceability, co-operated by both the large scale logistics centres and SME operators along the value chain from the Mainland and HKSAR extended to the oversea markets



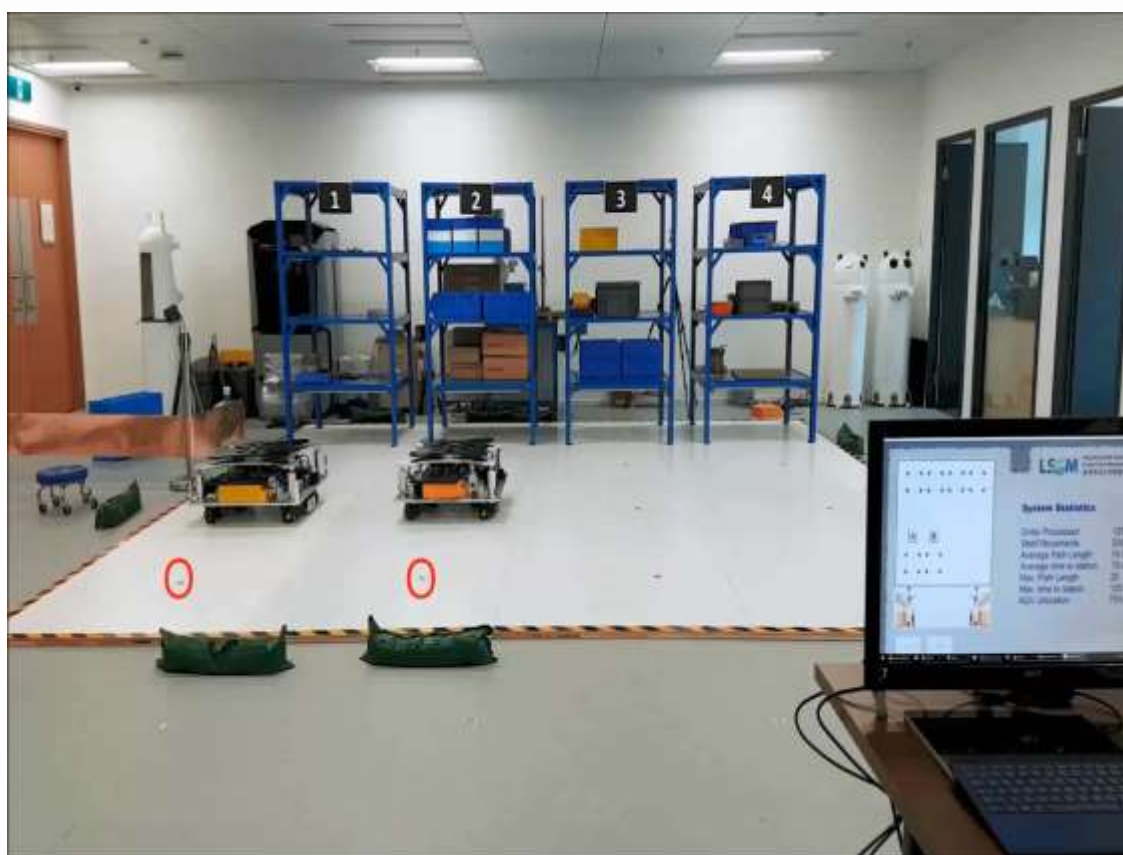
RFID-Enabled Sensing and Locationing Technologies for Real-time Environmental Monitoring



可以讓我們於物配中心實時追蹤



Warehouse Robots by LSCM



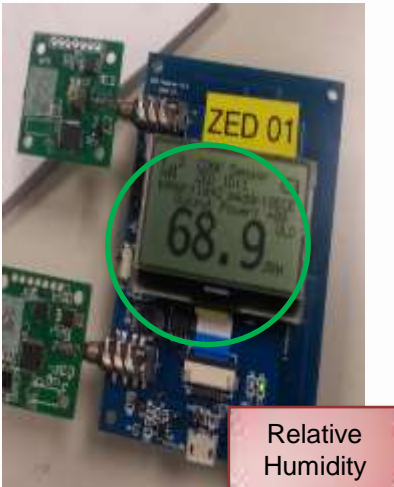
Kiva-like Automation



AGV Planning System in Warehouse



Sensor-based Asset Management and Environment Monitoring



Relative Humidity



香港科學館
HONG KONG SCIENCE MUSEUM



香港歷史博物館
Hong Kong Museum of History

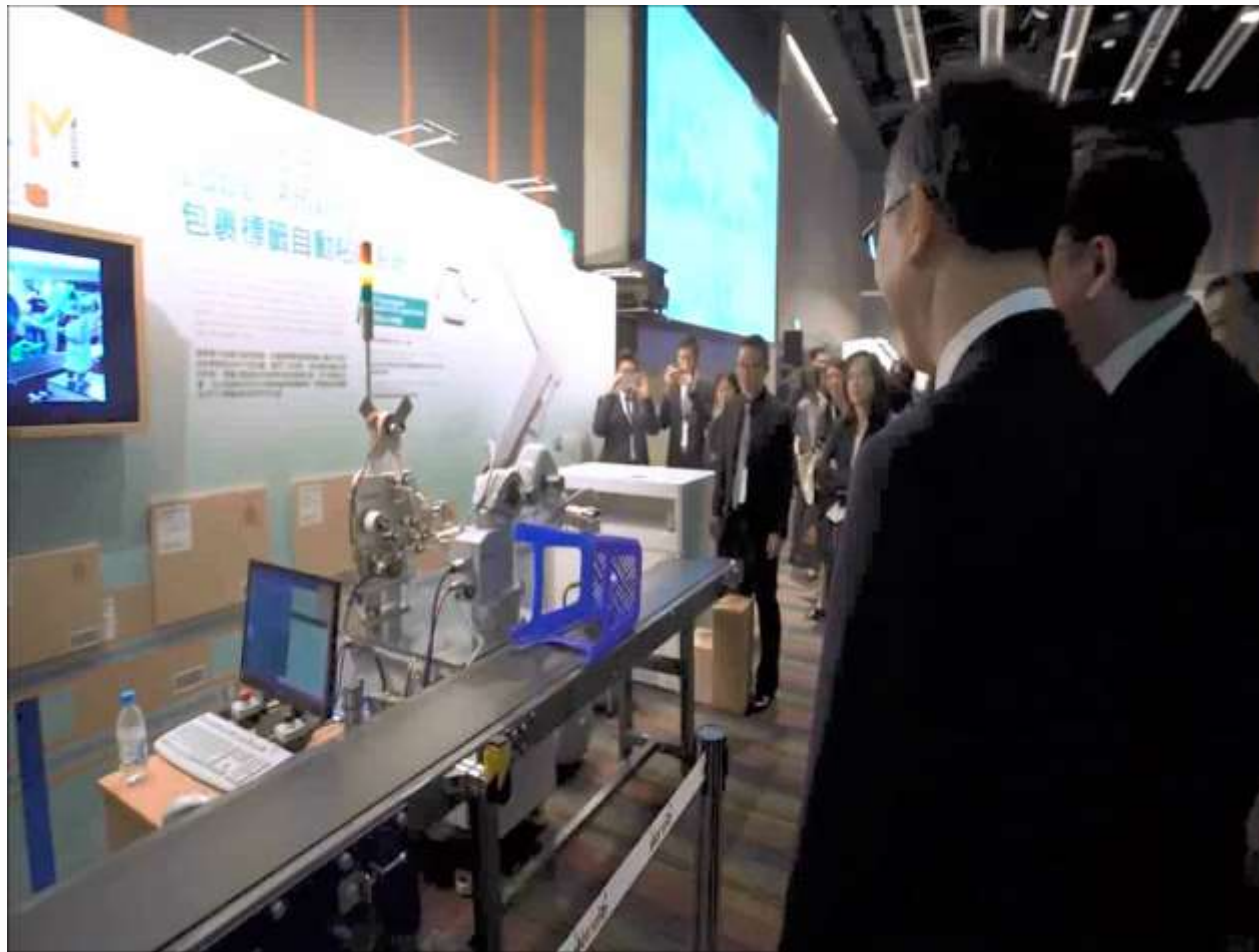


香港電影資料館
Hong Kong Film Archive





Label Affixing System, exhibited at HKIA Technovation 2017





Testbed with HK and PRD Greater Bay Area for the Integrated E-Commerce Business Community Extended over the ASEAN and OBOR Trade Routes



Testbed at GD-HK-Macao Bay Area

- 9 cities in GD + HK + Macao
 - Great economic potential by the US\$1.36 trillion of GDP and a population of 100 million
 - Connecting HK with the cities in Guangdong and Macao benefits development of all sides
 - Connected with top performing e-commerce markets in the Southern China – Zhejiang, Fujian
- Testbed with HK and the Greater Bay Area as model for cooperative development
 - Cross-boundary logistics aggregator, e-commerce export from the Mainland market can be consolidated in HK, leveraging the efficient warehousing and forwarding facilities and the internationally renowned credibility in supply chain integrity
 - No. 1 world leading airport and cargo handling infrastructure, frictionless land customs boundaries. The greatest advantage of HK as an international hub
 - Good support of 3PL, 4PL and global supply chain service platforms can be operated in HK, to orchestrate the supply chains and logistics activities around the GD-HK-Macao Greater Bay Area



Collaborative Operation Model of LSCM:



- ❖ We treasure domain knowledge
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Academia → Research Institutes → Government → Industry
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Thank You Very Much