

「基於區塊鏈技術的組裝合成建築電子化質量檢測2.0： 從新冠時代的權宜之計到後疫情時代的通行做法」 新聞發佈會

Press Conference on “**Blockchain-Enabled e-Inspection 2.0 for MiC:
From a COVID-19 Expediency to a Post-Pandemic Common Practice**”

呂偉生教授 (Prof. Wilson Lu)
葉嘉安教授 (Prof. Anthony G.O. Yeh)
譚景良處長 (Mr. K. L. Tam)
薛帆博士 (Dr. Xue Fan)

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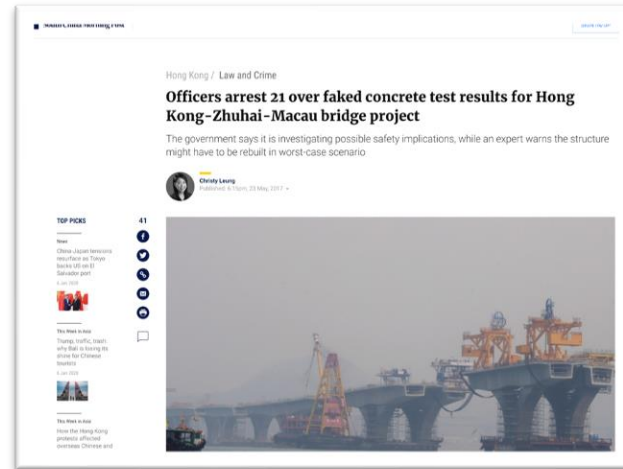
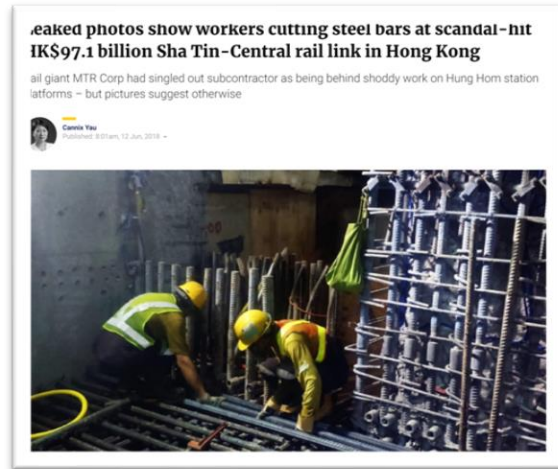
Outline

- Background – Inspection in Modular integrated Construction (MiC)
- The pilot project – HKU Wong Chuk Hang (WCH) student hostel project
- Digitalization of the MiC project
- Introduction of e-inStar
- Prospects and challenges

Part I: Inspection in Modular integrated Construction (MiC)

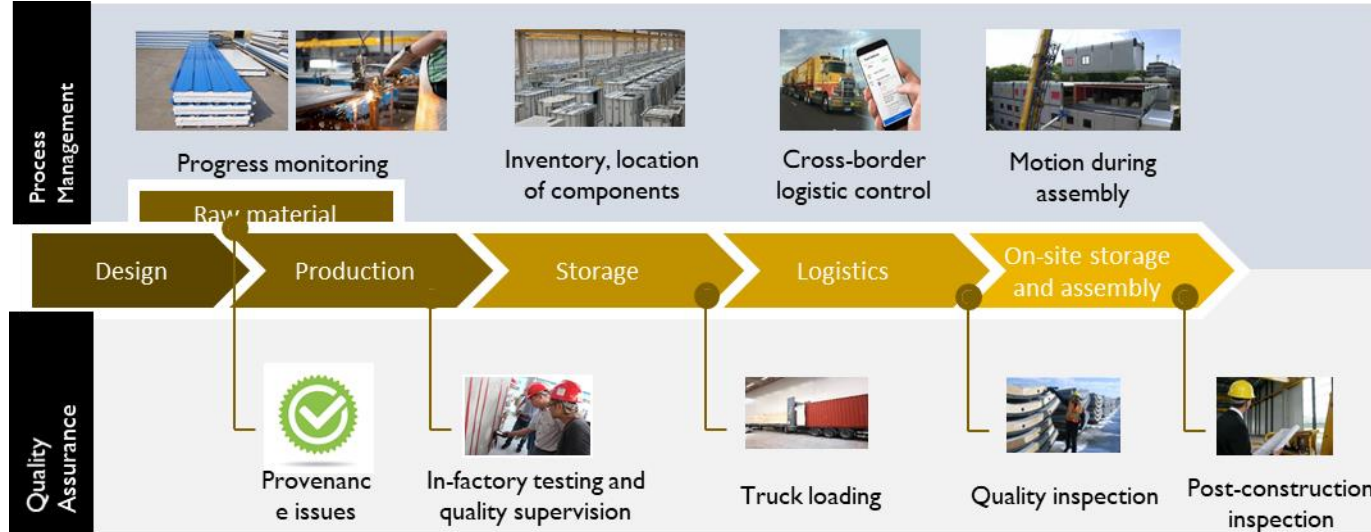
Quality Assurance in MiC Logistic and Supply Chain

- There are many quality scandals in cast in-situ construction. For offsite or even offshore construction, quality assurance is even more concerned by clients.



(Photo source: SCMP)

Quality Assurance in MiC Logistic and Supply Chain



Quality Assurance in MiC Logistic and Supply Chain

Because of COVID-19, no one from HK can be dispatched to Mainland for inspection.



Quality inspections required at Mainland factories



Infeasible to dispatch now due to 14 + 14 days quarantines

(Photo source: Authors, SCMP)

Quality Assurance in MiC Logistic and Supply Chain

Process Management

News article snippet: "caked photos show workers cutting steel bars at scandal-hit K\$97.1 billion Sha Tin-Central rail link in Hong Kong". The article mentions that MTR Corp had singled out a subcontractor for shoddy work on Hung Hom station platforms.



Progress m...



tion of components



Cross-border logistic control



Motion during assembly

Quality Assurance

News article snippet: "Officers arrest 21 over faked concrete test results for Hong Kong-Zhuhai-Macau bridge project". The article mentions that the government is investigating possible safety implications.



actory testing
ality superv



Quality inspection



Post-construction inspection

Design

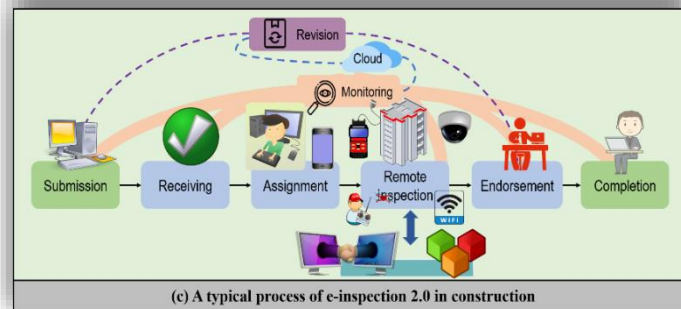
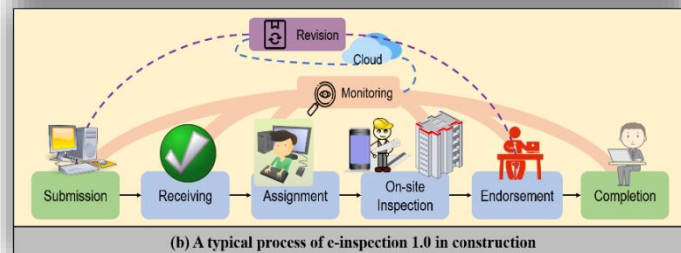
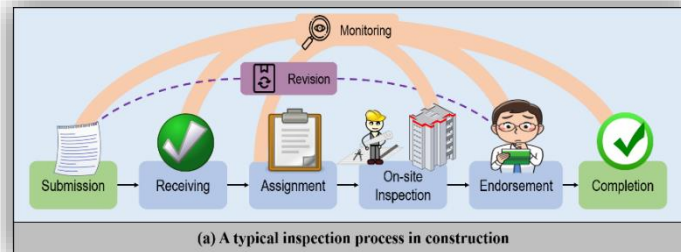
Production

Storage

Logistics

On-site storage and assembly

Different Generations of E-inspection Systems



Part II: The pilot project

Project Information



- A 3-storey non-residential podium with common space, canteen, support facilities and car-parking space
- Two 17-floor towers of student residences and staff accommodation
- 1,224 hostel places
- Site Area: 4306 m²
- NOFA: 14,277 m²
- CFA: 28,176 m²



Student Hostels (MiC)

Podium (RC Structure)

Project Information



Student Hostels (MiC)

Two 17 storeys towers
1,224 student places.
(952 Modules)

Podium (RC Structure)

Three storeys of podium space

Part II:

Digitalization of the MiC project

Digitalization of MiC



Mobile Platforms for MiC



Off-Site Production

- **Digitalized** workflow procedures
- Detailed record of **inspection records** carried out by AP/RSE/RC streams
- **Test reports** uploads
- **Production progress** status



Cross Border Logistics

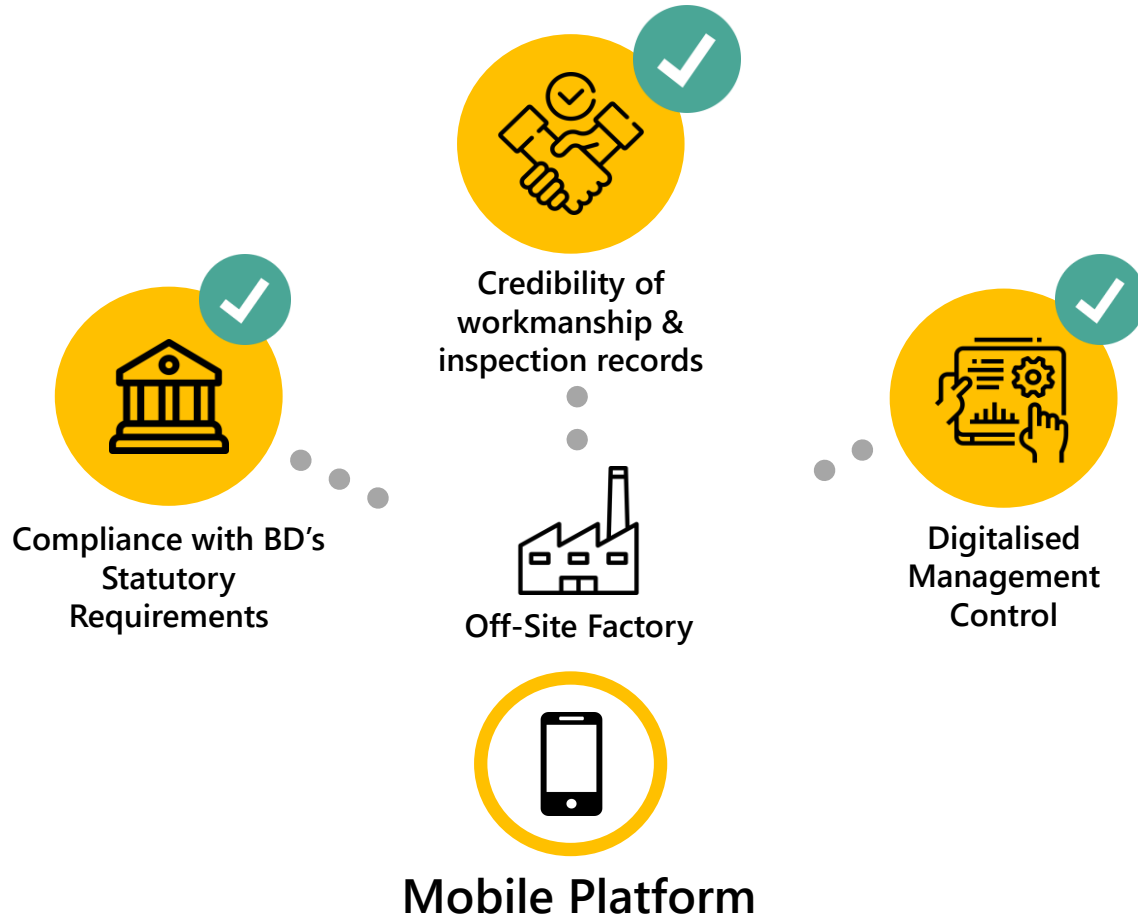
- **Real time tracking** of modules during transportation
- **Pin point** exact location of module
- Estimated **arrival time**



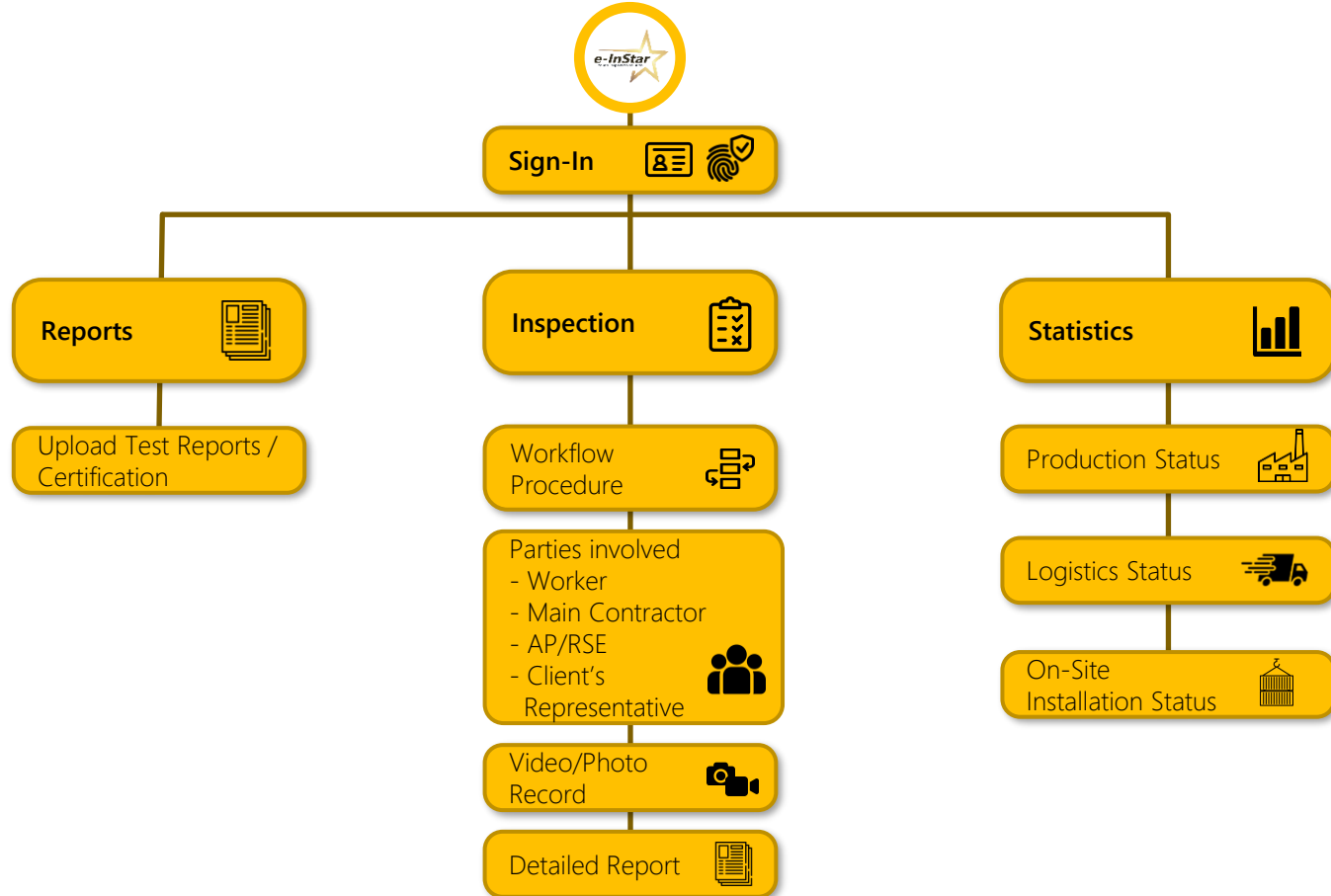
On-Site Installation

- **Real time** update of installation progress
- **Positioning checking** for installed modules
- Recording of **installation time**

Digitalization of MiC Off-Site Fabrication



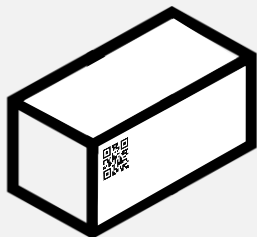
MiC Off-Site Production: E-inspection 2.0



Part IV:

Introduction of e-inStar

E-inspection 2.0: Module ID



- **Each Module** is given a **unique ID** using a naming convention system
- A **QR code** is generated from the ID
- The QR code is created as soon as the 3D module is formed and applied to the structure.

Create a
Naming Convention System Standard
for all future MiC Module projects

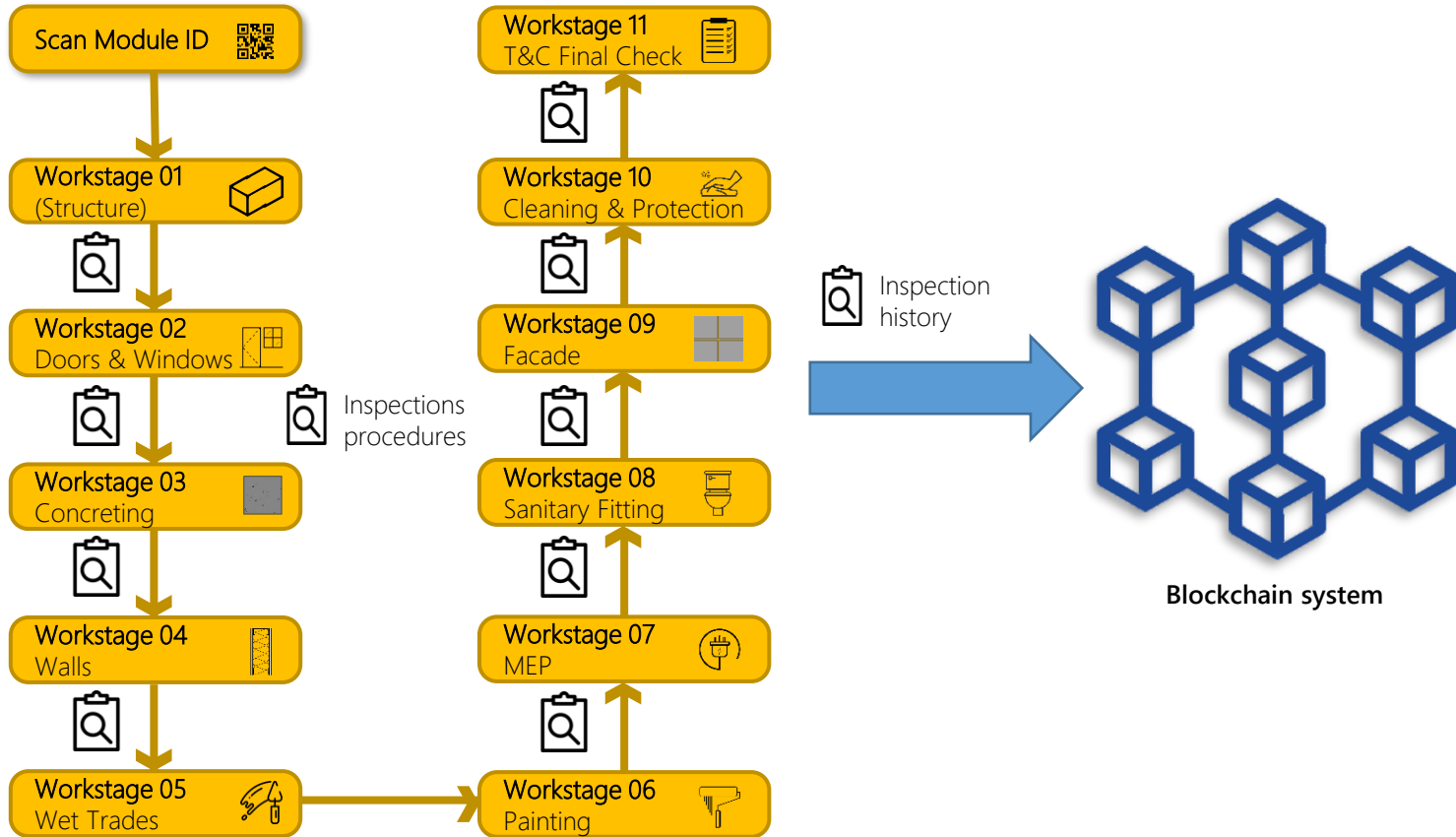


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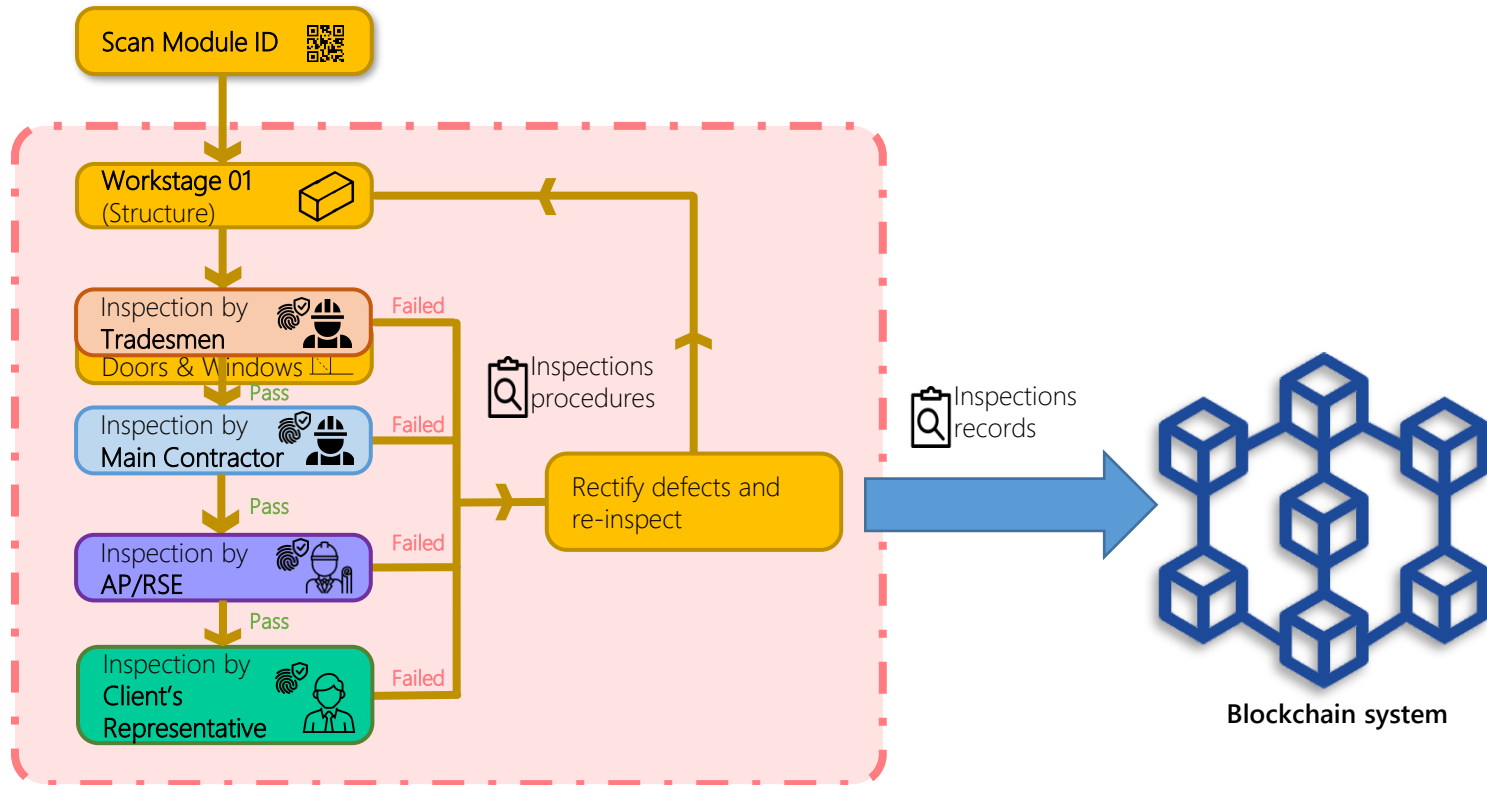
The **Naming Convention System** created for the modules allows us to identify the following information;

- **Block**
- **Floor**
- **Module Sequence**
- **High / Middle / Low Zone**
- **Module Type**

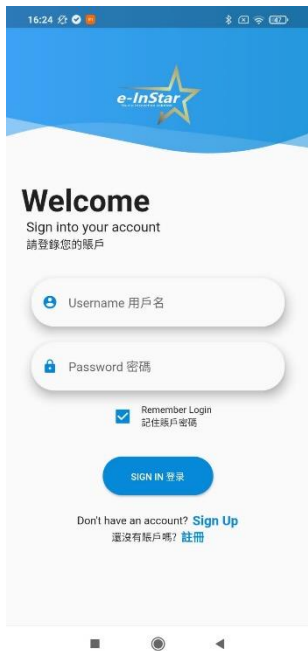
E-inspection 2.0: Inspection Record



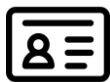
E-inspection 2.0: Inspection Record



E-inspection 2.0: Inspection Record



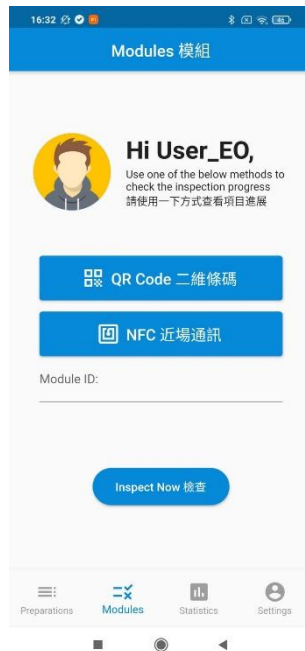
Two Factor Authentication



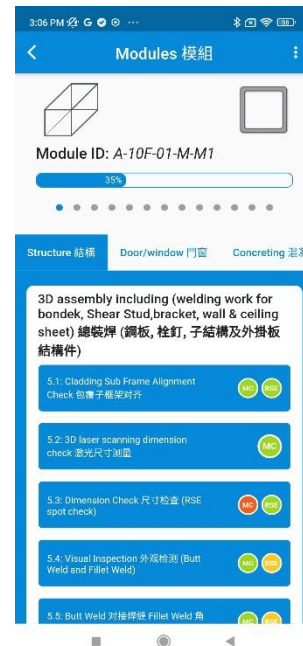
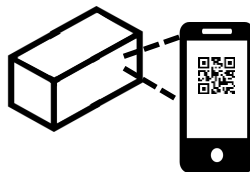
User ID



Fingerprint verification



Scan Module ID



Inspection status of module



E-inspection 2.0: Inspection Record



Comment box



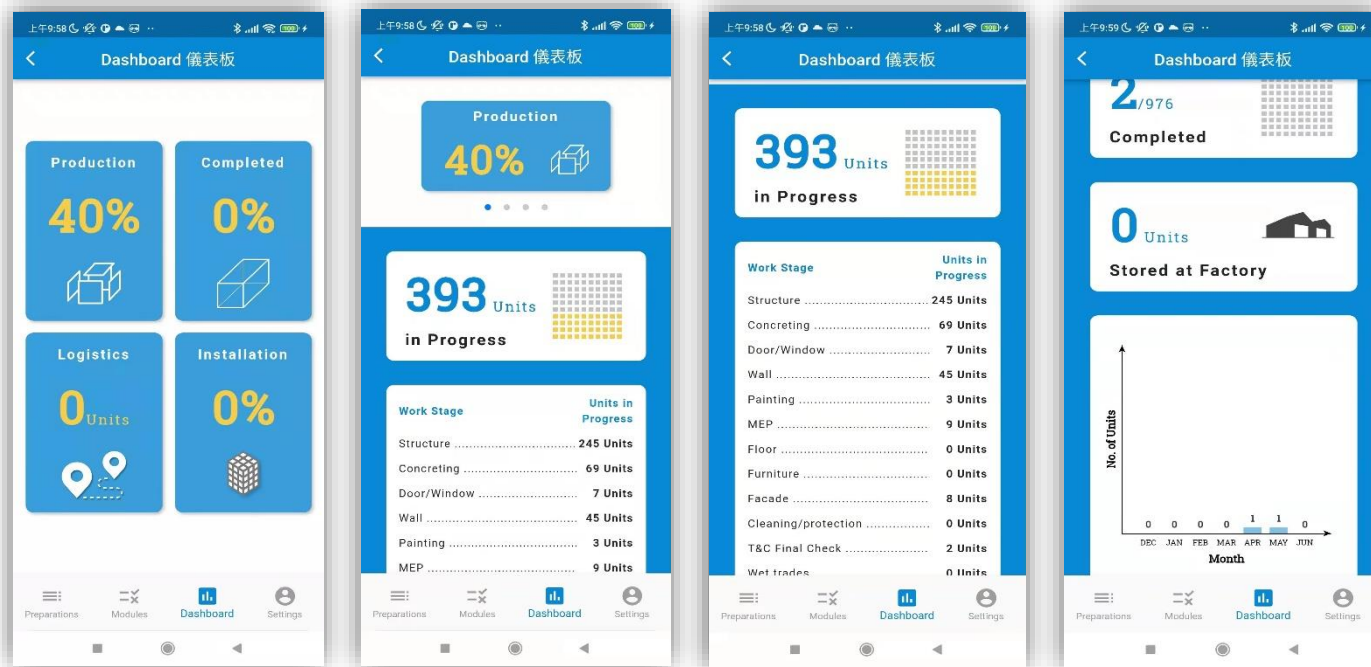
Help button



Photo upload function

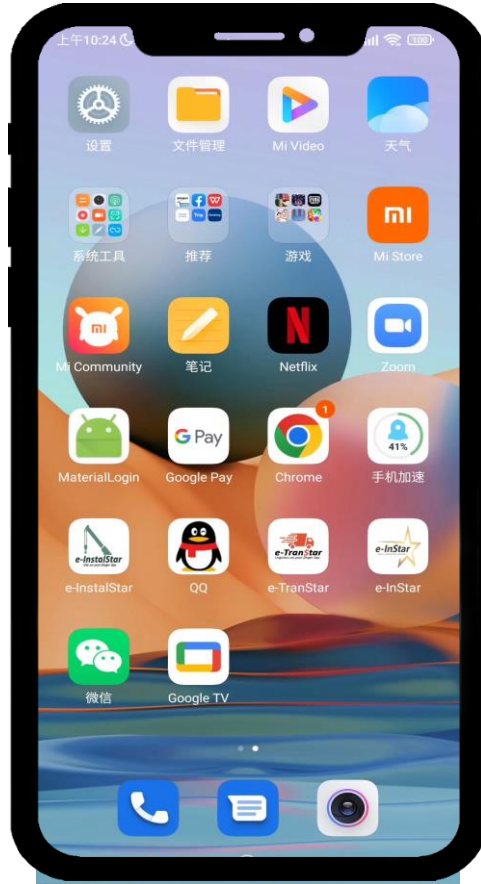


E-inspection 2.0: Dashboard



Statistics for decision-making

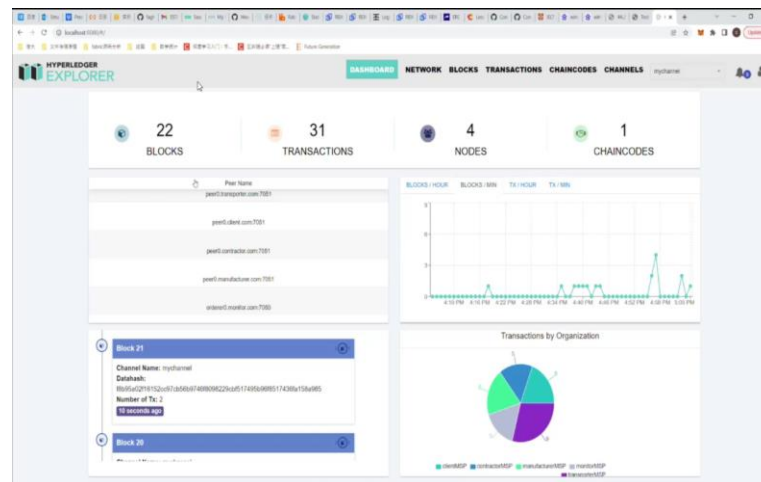
E-inspection 2.0: Inspection APP - *eInStar*



E-inspection 2.0: The Blockchain System



Transaction
(Inspection record)



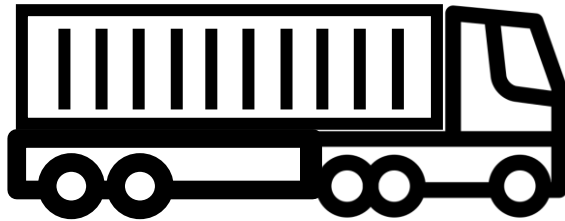
Part V:

Prospects and challenges

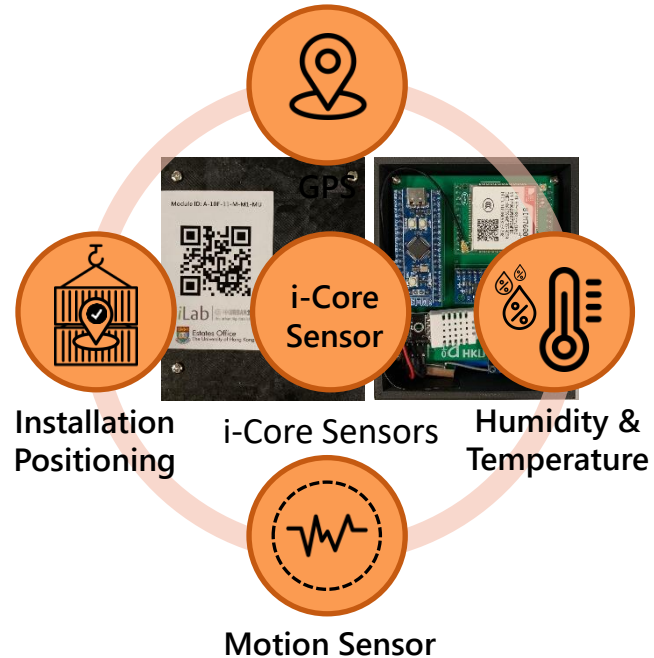
What's Next: Logistics



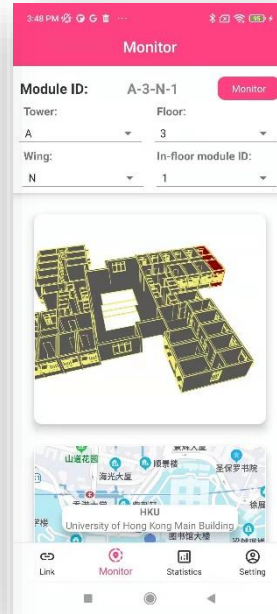
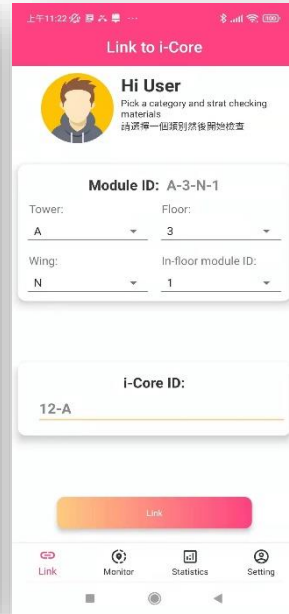
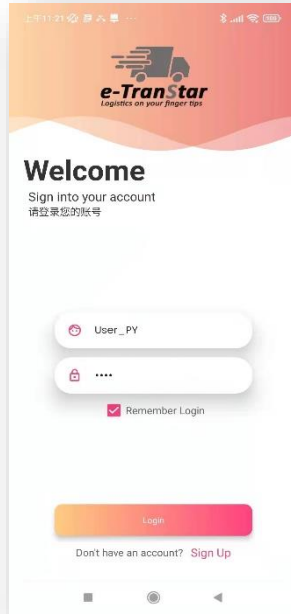
The **i-Core sensors and smart address systems** are one of the development tools with multi-functions to monitor both the logistics and installation of MiC modules



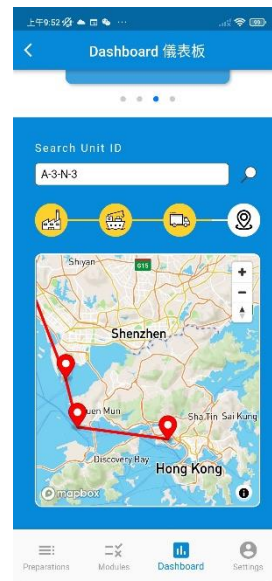
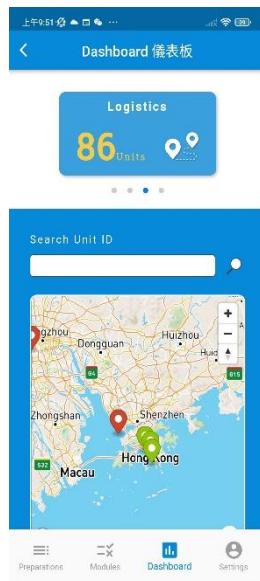
i-Core sensors and smart address plates are installed in the MiC modules



What's Next: Logistics



What's Next: Logistics



Thank You