LSCM

LOGISTICS SUMMIT 2019

物流高峰會

The Pivotal Role of Hong Kong in the Greater Bay Area

物流新科研創建大灣區。

Smart Cargo Locating Solution

Presented by

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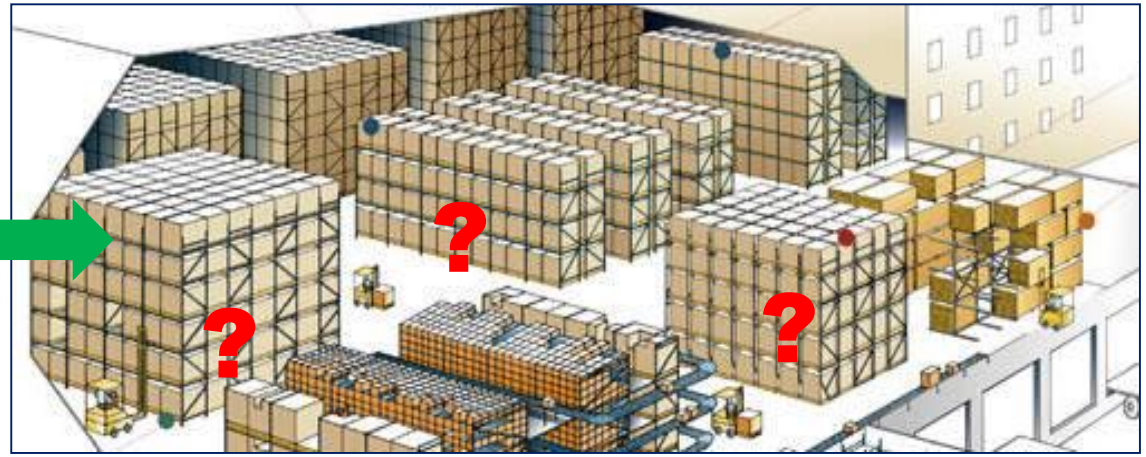
Background

- Hong Kong Air Cargo Terminals Ltd (Hactl) is the largest independent cargo handler in Hong Kong
- Hactl has recently introduced the Smart Cargo Locating Solution in 2018, which was researched and developed in collaboration with LSCM, in its SuperTerminal 1 facility

Hactl
Hong Kong Air Cargo Terminals Limited
香港空運貨站

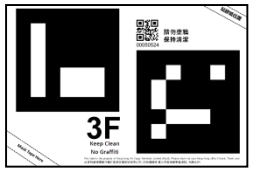
Challenges to Overcome

- Vast facility and huge volumes of daily cargo throughput; Oftentimes there are multiple items on a single AWB(air waybill)
- Unable to locate cargo quickly without proper and timely record of its location
- Manual updates to the cargo management system is required, which might lead to potential for errors



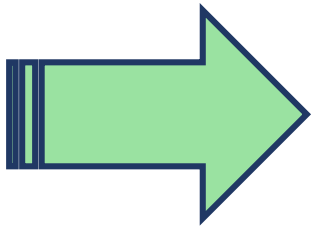
Project Objectives

- To implement a low-cost and effective real time cargo tracking management system in Hactl warehouse by using LSCM developed novel AR barcode vision recognition and indoor positioning technologies.



Computer vision recognition on AR barcode for goods identification

Indoor position tracking sensor



Warehouse operation efficiency and effectiveness enhancement

Overall System Operation

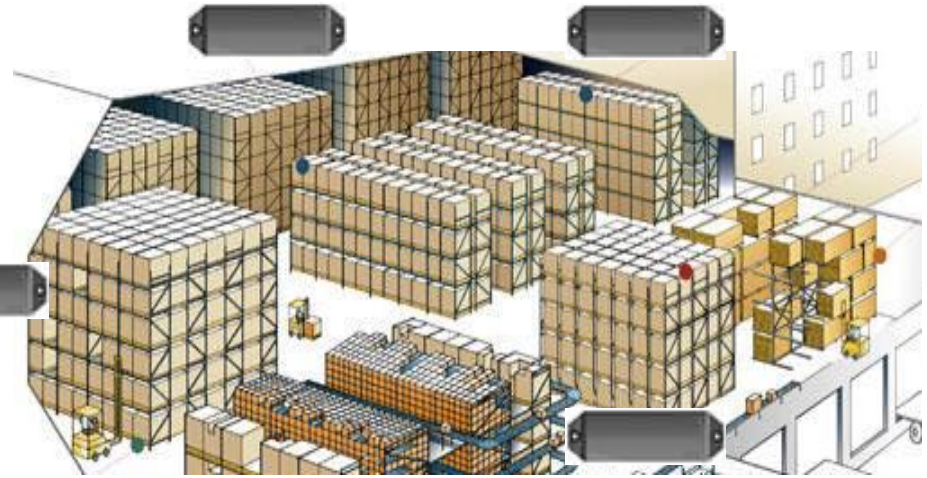
2. Recognize AR barcode by camera installed at platform scale and update system automatically

Forklift transfers cargo to allocated racking zone for storage temporally

Sensor #1 (Zone A)

Sensor #4 (Zone D)

Sensor #2 (Zone B)



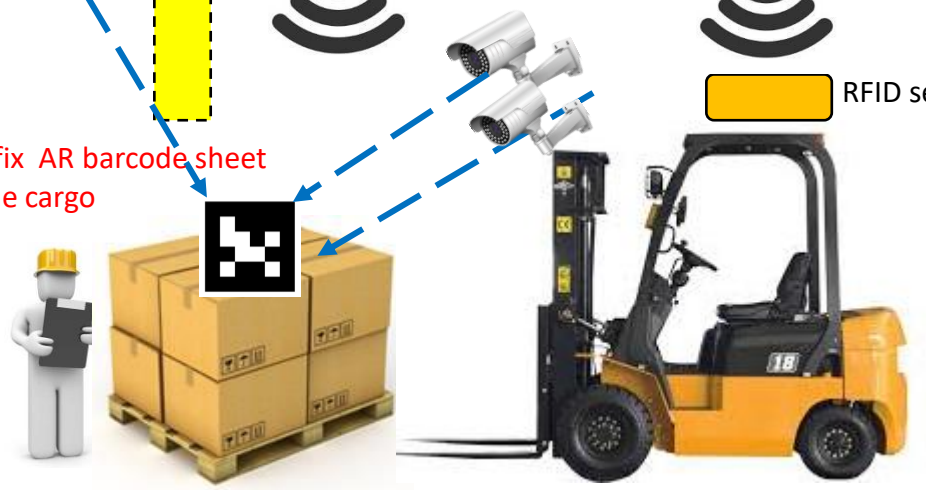
Sensor #3 (Zone C)

Sensor #2

Sensor #1

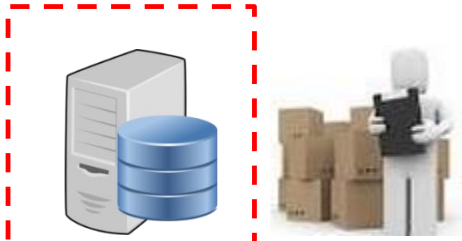
RFID sensing system

1. Affix AR barcode sheet on the cargo



3. Smart Forklift cameras recognize cargo AR barcode with indoor positon tracking sensor scanned location and update system via Wi-Fi network

4. Operator retrieves cargo location easily



Hactl COSAC-Plus system

Smart Forklift

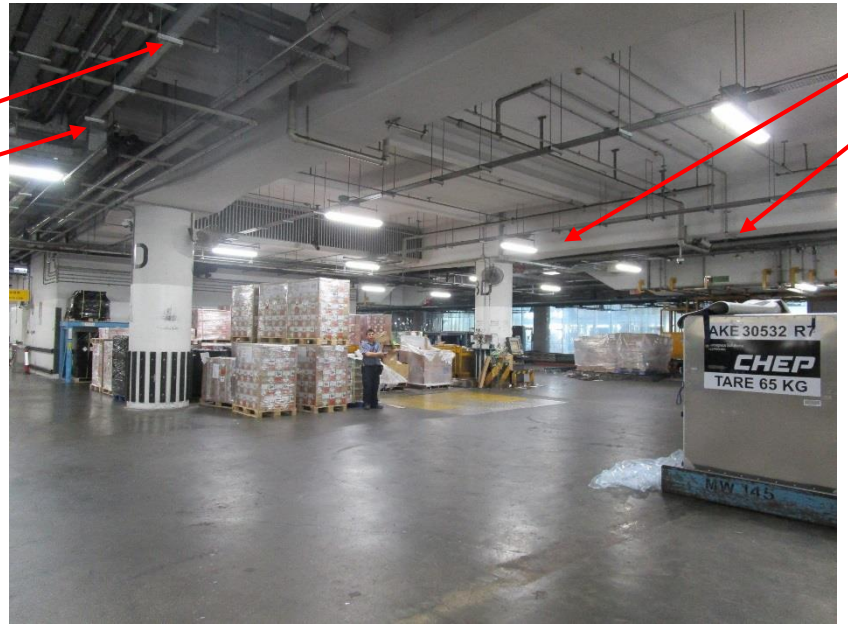
Cameras for AR barcode recognition

Indoor position sensing unit

AR barcode sheet affixed on cargo

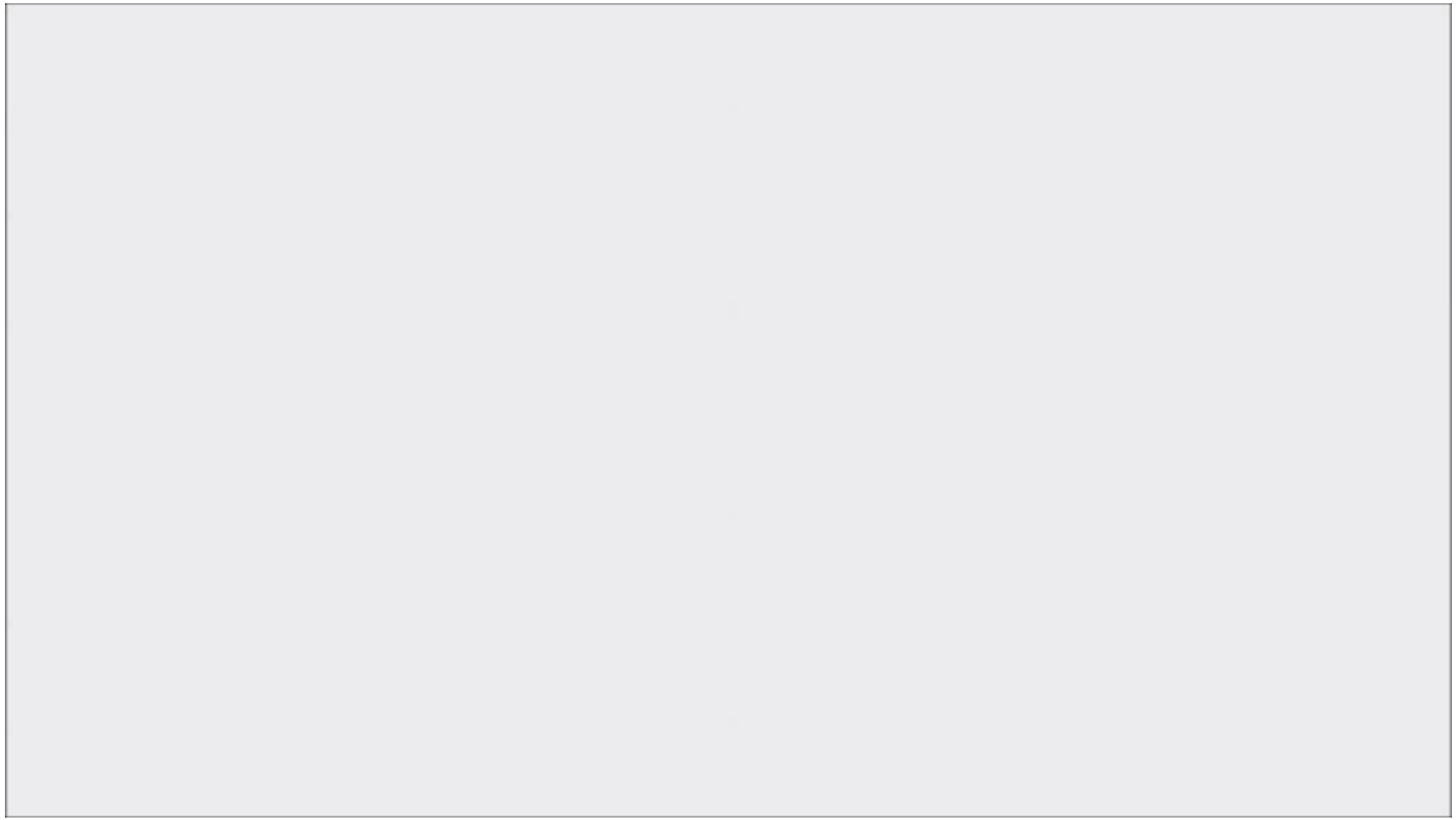
Indoor Positioning Network inside Warehouse

Indoor Position Tracking Sensors



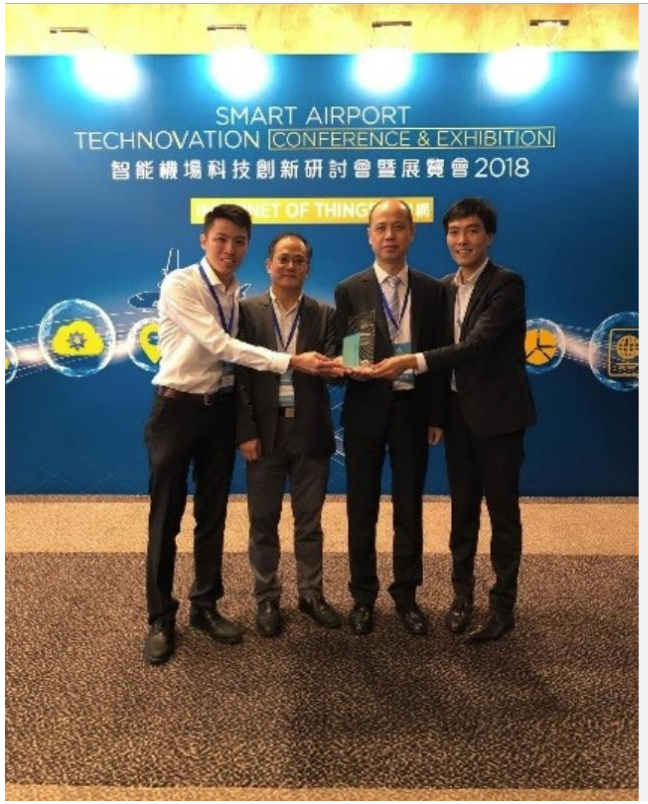
Indoor Position Tracking Sensors

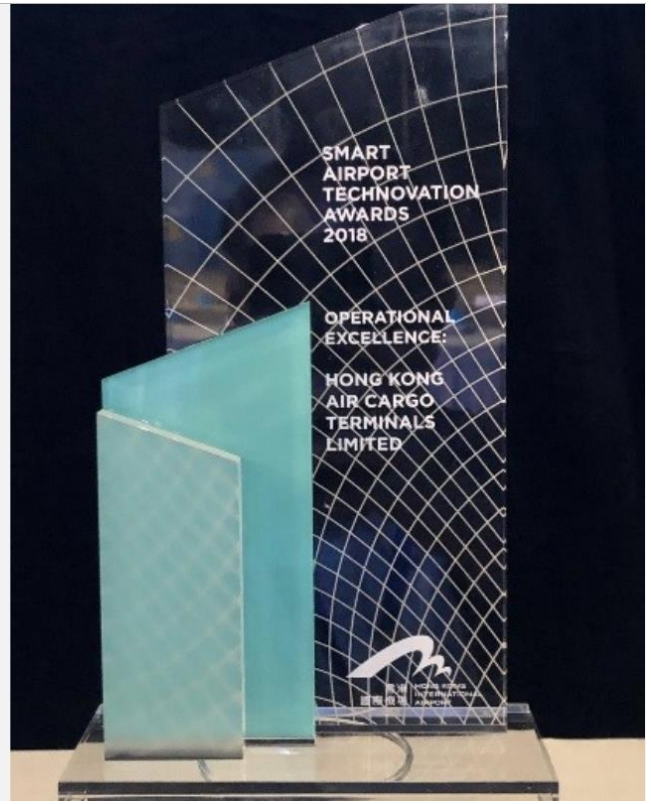
Smart Cargo Locating Video



Award

Smart Airport Technovation Award 2018– Operational Excellence
(Organizer: Hong Kong International Airport)





Supply Chain Innovation of the Year (Smart Logistics)
(Organizer: Supply Chain Asia Forum 2019)

Automated Guided Vehicle Implementation for Towngas

Background

- The Hong Kong and China Gas Company Limited (Towngas) is Hong Kong's first public utility company, and also one of the largest energy suppliers in Hong Kong.
- Also focus in development of quality appliances under TGC, SIMPA and Mia Cucina brands.
- Recently Towngas also opened up the sales of household products via physical showroom and online store.

Towngas SHOP

Stock Picking Before AGV Usage

- Currently there are 22 showrooms in Hong Kong. Stock replenishment for showrooms is one of the critical business workflow.
- Stock picking for items distribution in the past was manually done with trolley in the stocking area.

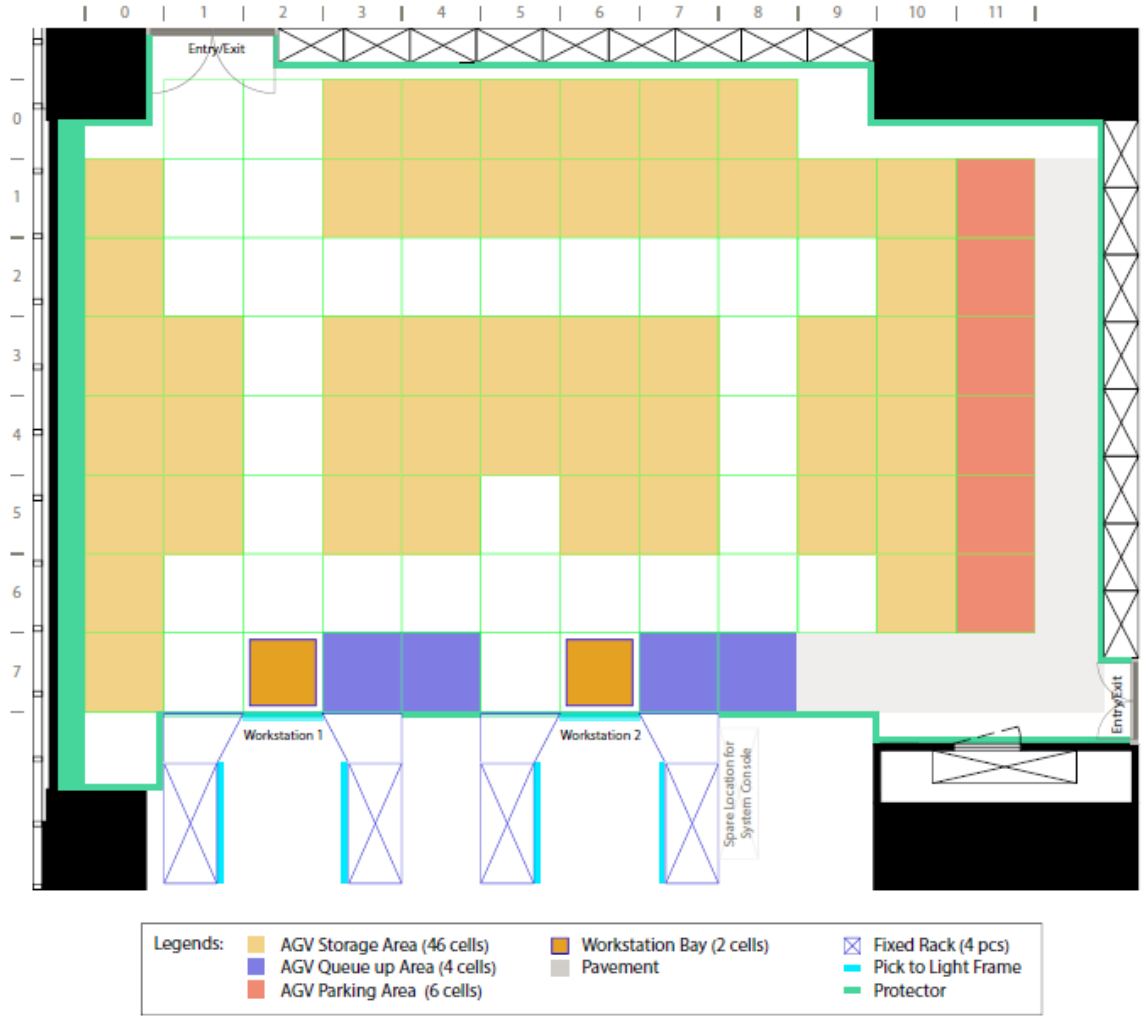
Stock Picking With AGV

- To implement a fully automatic stock picking system with the AGV (Automated Guided Vehicle) technologies
- Aim to reduce both manpower and time required for stock picking task

AGV in Action

Stock Picking Bay

Pilot Run at Towngas



Settings:

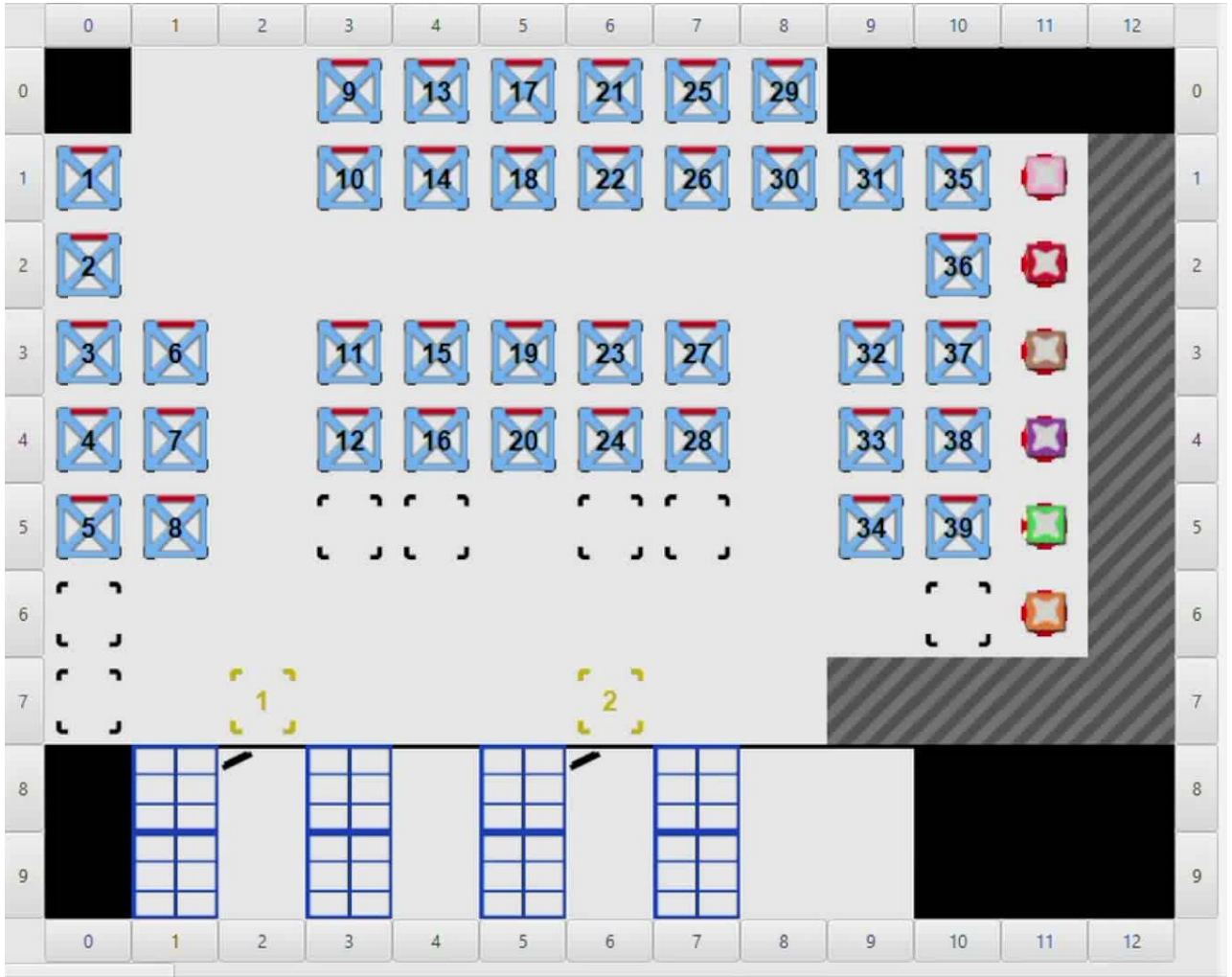
Area: ~2000 sqft

Total no. of cells (grid): 89

No. of storage shelves: 40

No. of AGVs: 6

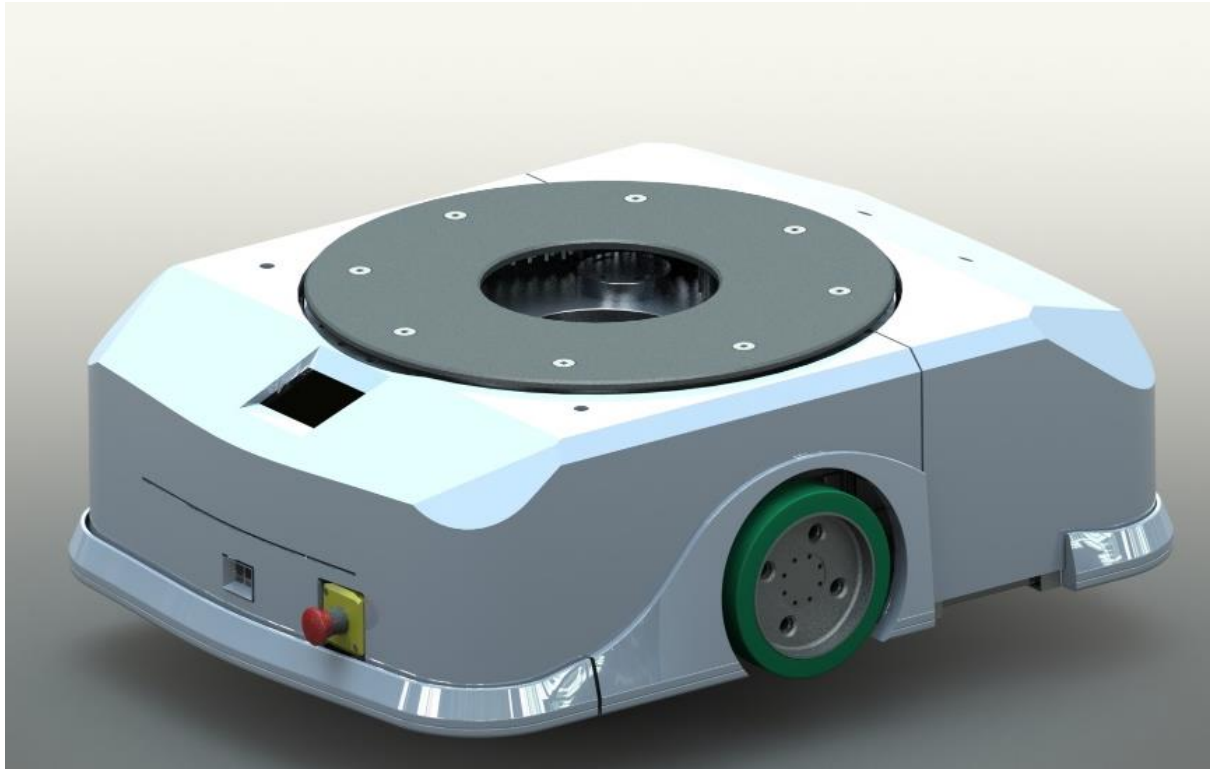
AGV Operation Overview



Productivity Gain with AGV

Manpower Saving	Time Saving
50%	50%

AGV Hardware Overview



Features

*Payload: 500KG

*Speed: 1.00m/s

*Positioning Accuracy: <30mm

*Self balancing on uneven floor

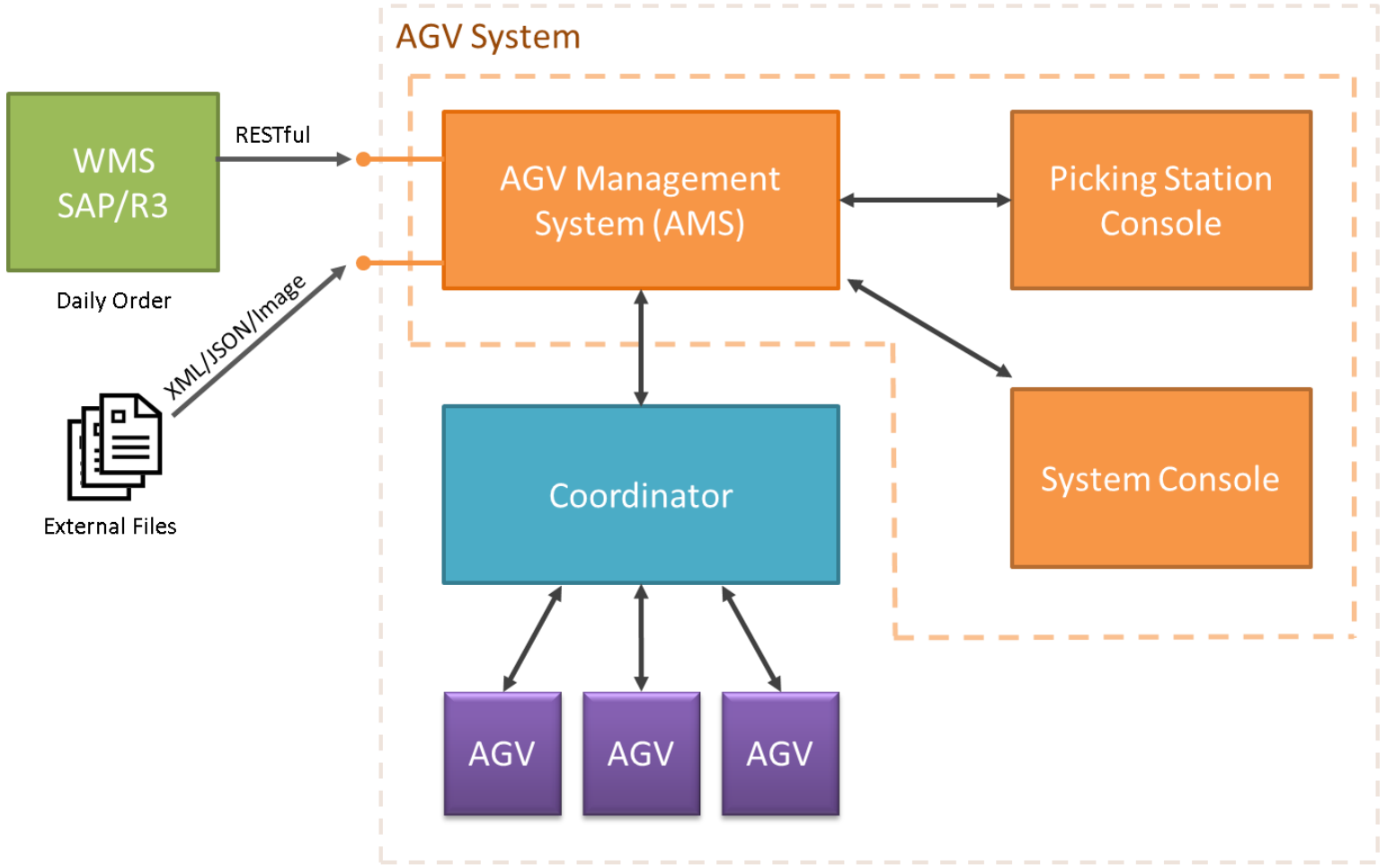
*Independent rotation platform

*Shelf CG detection and weighting

*Fast battery swapping

*Accept various type of battery (Lithium/Lead acid)

Software System Architecture



~ Thank you ~