



# Smart Library Solution

**SINGAPORE  
COMM**

# Traditional Library Pain Points

- Difficult to find a book due to unfamiliar with the location
- Books are misplaced in wrong shelf
- Stock take
- No recommendation to readers



# LIBRA meet library digitalization journey



- **Connect to Internet**
- **Turn Digital**

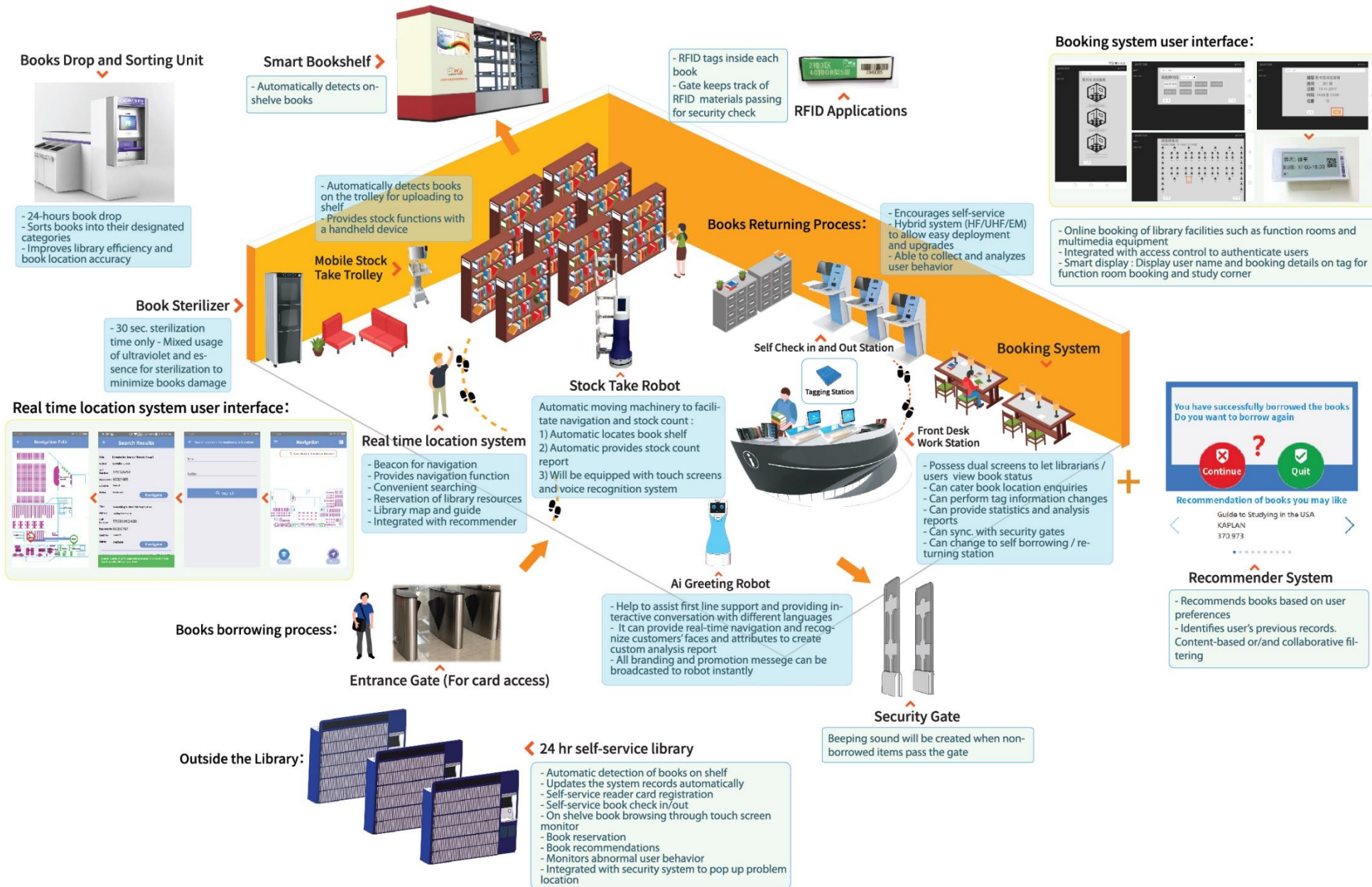
- **Social web**
- **Mobile Apps**
- **Customer & Agent Portal**
- **Integrated System**

- **Semantic web**
- **Big Data**
- **Predictive Analytics**

- **Intelligent**
- **Makerspace**
- **Context-Aware Technology**
- **Open Source**
- **Big Data**
- **Cloud Service**
- **Augmented Reality**
- **State-of-the-art Display**
- **Librarian 4.0**

**Entering a New Era of Smart Library 4.0**

# Smart People (Smart Education and Learning) Bronze Award





For users to borrow / return / renew / search catalogue and self service enquires

## **Self Check in and Out Station / Self Service Kiosk**



A sleek, white and black mobile robot stands in a futuristic, curved room with a brick-like wall and a polished floor. The robot has a tall, thin black sensor tower on its back and a small screen on its front. The room features orange accent lines and circular light fixtures in the ceiling.

# AI Stock Take Robot



# How AI Stock Take Robot Operates

## **AI Image processing algorithm**

Our robot contains cameras and antennas. When the robot is at a certain distance it is able to read the tags , image scanning and update its system on cloud.

## **Perform SLAM**

Our stock take robot include lidar and cameras, enabling them to perform SLAM - simultaneous localization (of their own location) and mapping of any area. This technology is able to avoid obstacles, including people and furniture.

## **The reader emits radio waves through different antennas**

The signals are bounced back by the tags and received by the same antennas. The approximate location of each tag with respect to the robot is then be calculated by the reader by measuring the distances estimated from each antenna reception time. The use of vision cameras enable image recognition of stock items.



# Design Structure





# Recent Project -

Hong Kong Public Libraries (Leisure and Culture Services Department)  
2021-2024



## ***Smart library robot features:***

1. Automatic located book shelf
2. Real time provide book stock count report
3. With touch screen and voice recognition function to provide the book recommendation
4. Automatic return to charging dock
5. 35,000 books read within 1 hours

## ***Benefits***

- Preset the complete automation of daily operation
- Reduce operation costs and decrease manual labor overhead
- Increase reader experience and their reading interest
- Save both library staff and reader accessible time

# Smart Dispenser / Reservation Locker







Self-Service Library Station  
自助圖書館





# 24hrs Self Service Dispenser / Locker

Both Smart Dispenser and reservation locker breaks the traditional book lending system as part of the continuous development trend of modern libraries. It does this by providing a 24-hour smart library service without borrowing time limit and provides a more convenient self-service book borrowing experience for citizens in any region.



# RFID Smart Locker

Smart storage for equipment or officers' gears

## DOOR OPEN ALERT

Alert if a locker door is left open after the transaction is complete.

## LOCKER STATUS

Reports the status of all lockers (Open, Closed, Full, Empty, Assigned, Unassigned).



## USAGE REPORTS

Interactions detail that have been made with smart locker system.

## ABANDONED REPORT

Reports if an item has been left in the locker beyond a specific time frame.

## Benefits of RFID Smart Locker

- Breaking the time limit, users can borrow or return their equipment at any time.
- Cabinets are available in various sizes, colors, and materials, allowing you to customize based on your need
- Centralized control and real-time monitoring of battery and lock status



48 Cases	98 Cases (Standard Size)	148 Cases (Expanded Size)	
1100mm(L) X 450mm(D) X2000mm(H)	1100mm(L) X 450mm(D) X2000mm(H) *2	1100mm(L) X 450mm(D) X2000mm(H) *3	

Installed with	
Size of Monitor	15.6 inches touch screen
Color & Size	Customizable
Weight	170-370KG
Payment Module	Octopus Payment
Data Output	Remote or use SD card to collect data, enable administrators to export sales data for management analysis
Power	220V
Hardware Modules	Printer, Barcode/ QR code Reader / HKID Reader/ UHF RFID Reader





## *Benefits*

- **Breaking the time limit**, can initiate borrowing and returning at any time.
- **Breaking the space constraints**, can initiate borrowing and returning from any location.
- **Breaking distance restrictions**, users can use mobile app to remotely borrow or reserve storage items.

# RFID Smart Display Shelf



**RFID Smart Display Shelf** is a high tech exhibit management system that integrates video advertising, Information interaction, and data collection. When the customer takes the product off the shelf, the system automatically detect detailed information of the product (product name, price, purchase channel, exquisite renderings etc.) on the display screen after automatic detection. It can reduce labor costs and improves the service image of the store.

# EXPRESS Smart Sorter – 72Bins

Library / Retail / Warehouse Automation Sortation System





# EXPRESS Branch Sorter (5/7/9/11 bins)

Library / Retail / Warehouse Automation Sortation System





### Features

- Express Smart Sorter can automatically sort the items according to the set rules
- The system can support up to 72 sorting bins
- Unrecognized items will be assigned to designated carts
- There is alarm and remote prompt function when the sorting bins are full
- UHF RFID Reader with integrated antenna
- Overall Sorting rate:  $\leq 3200$  items / hour



# Modules of Smart Sorter



Turning Machine



UHF RFID Reader /  
High Speed Barcode Reader



72 Sorting Bins



# Small Branch Sorters (Customizable Sizes)



- Each bin can hold more than 160 items
- Automatic weight lift feature for health protection

# Applications



Retail Distribution  
Centre



Food Distribution  
Warehouse



Book Store / Schools  
and Libraries



# Video Introduction of Smart Sorter



[https://www.youtube.com/watch?v=bO8m\\_GYBdSc](https://www.youtube.com/watch?v=bO8m_GYBdSc)



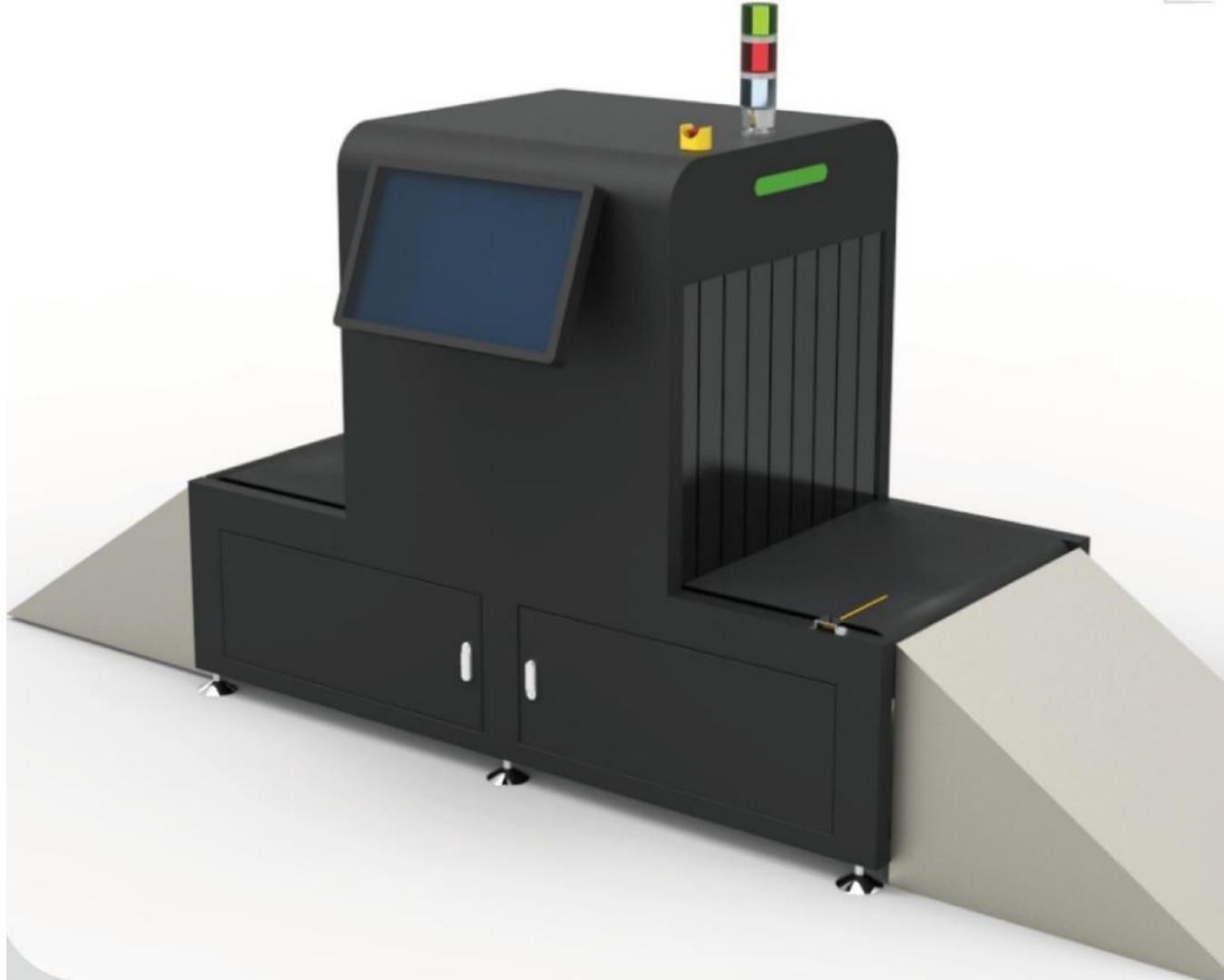
# 24hrs Books Return Unit

The 24hrs books return unit is a device installed in the outer wall of the library or in the library hall, which can identify the RFID tag of the books and the library cards. Through seamless connection with the library LMS system, the touch screen user interface simplifies the return procedure, readers can borrow or return their books anytime even when the library is closed. Books returned will be placed at bins and filed to book shelf accordingly.



# Book Checking Machine

Book checking machine supports multiple books scanning at one time, significantly reduce librarian workload by automatically detect and verify all books with stock list of the library. It can store , deliver , verify and provide statistic book count report.





# Pick and Go Security Gate

Our Pick and Go Security gate is a library security hardware device embedded with self check out feature target to digital transform traditional school libraries into total self service libraries.

Beeping sound will be created when non-borrowed items pass the gate (with whitelist and headcount feature)



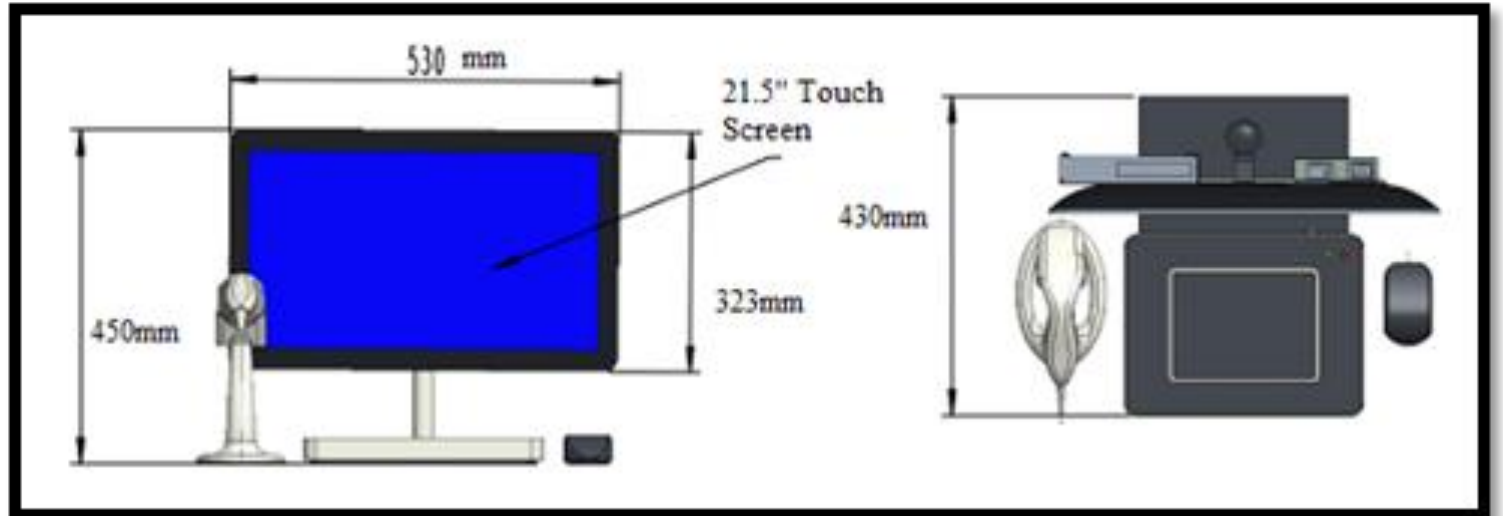


# Tagging Station

Amend tag information in easy manner



Tracking & Sorting Station



# Front Desk Work Station

Mainly designed for librarians to manage books borrowing /returning / renewal functions



# Mobile Stock Take Trolley

Automatically detects books on the trolley for uploading to shelf and provide stock taking with a handheld device





# Book Sterilizer

30 sec. sterilization time only - Mixed usage of ultraviolet and essence for sterilization to minimize books damage



# Software Applications

# AMS (Administration and Monitoring System)

A Centralized Management System to remotely monitor and receive all hardware equipment status and record all Equipment Activity Log, Payment Transaction Log, Visitor Count Log, Alarm and Audit Trail reports





# Features



- Web / Cloud based software
- Modular design, easy to expand
- User Interface support multiple themes and languages
- Receive all equipment status and trigger abnormal alert. Alert notifications will send to admin by email or mobile
- User Management and support multiple user roles & permissions
- Remote manage all equipment ON/OFF status and schedule working time
- Generate reports in centralized view such as check in and out report , alert and maintenance report



# Custom Made UI

**Central AMS** 11 / 1 / 2022 10:01  
User Name : Mary

**All Districts**



**Normal**  
**134**



**Abnormal**  
**3**



**Machine Full**  
**8**


**Warning: (00002) at Wo Che Plaza is malfunctioned, please check for maintenance**


**Warning: (00010) at Fu Tung Plaza is almost full (95-100% full) , please check for retrieval**

**Warning: (00021) at Victoria Park Swimming Pool is malfunctioned, please check for maintenance**

**Central AMS** 11 / 1 / 2022 10:01  
User Name : Mary

Address  Select District



**Hilton Plaza** 

Hardware Operation : **Normal**

Monitor : **OFF**

Network Connection : **Disconnected**

**Ma On Shan Plaza**

G/F, Bubble Lift Lobby at Ma On Shan Plaza, 608 Sai Sha Road, Ma On Shan, Sha Tin, N.T.

Mon-Sun & Public Holiday: 5:30 am to 1:30 am

**Almost Full (95% - 100% Full)**

**Yiu On Shopping Centre**

G/F, Yiu On Shopping Centre, 2 Hang Hong Street, Ma On Shan, N.T. (Near Shop G116)

Mon-Sun & Public Holiday: 6am to 11pm

**Almost Full (95% - 100% Full)**

**Central AMS** 11 / 1 / 2022 10:01  
User Name : Mary

**Add new Normal Schedule**

Schedule Name :  Start Date:  End Date:

District







Sunday	<input checked="" type="checkbox"/>	Open			
Monday	<input checked="" type="checkbox"/>	Open	Shutdown time:	<input type="text" value="/"/>	<input type="text" value=""/>
Tuesday	<input checked="" type="checkbox"/>	Open	Shutdown time:	<input type="text" value="/"/>	<input type="text" value=""/>
Wednesday	<input checked="" type="checkbox"/>	Open	Shutdown time:	<input type="text" value="/"/>	<input type="text" value=""/>
Thursday	<input checked="" type="checkbox"/>	Open	Shutdown time:	<input type="text" value="/"/>	<input type="text" value=""/>
Friday	<input checked="" type="checkbox"/>	Open	Shutdown time:	<input type="text" value="/"/>	<input type="text" value=""/>
Saturday	<input checked="" type="checkbox"/>	Open	Shutdown time:	<input type="text" value="/"/>	<input type="text" value=""/>

**Central AMS** 11 / 1 / 2022 10:01  
User Name : Mary

Search RVM

Address  Select District  Eup.ID

**Result**

Eup. ID	Serial No.	District	Software Version	Status	Alert Date / Time	Log Report
00010	16558497	Central and Western	V.1.0	Normal	/	
00011	16558496	Central and Western	V.1.0	Normal	/	
00010	16558497	Central and Western	V.1.0	Normal	/	
00011	16558498	Central and Western	V.1.0	Normal	/	
00020	16558499	Central and Western	V.1.0	Normal	/	
00021	16558500	Central and Western	V.1.0	Normal	/	

Next Page        ...195

# BENEFITS

1. Increase efficiency and productivity
2. Instantly receive all equipment status and abnormal alert
3. Remotely schedule equipment working time
4. Organized and accurate management





# LOG System Application

The logistics tracking system (LOG) relies on location technologies, such as barcodes, RFID, and smart tags, to provide visibility of books and assets as they move through library branches.

3 / 5 / 2022 10:01

User Name : Mary

Box Transit In / Out

Reception Mode

TSS Sorting

Print Box Label

Search Current Record

Search Historical Record

Discrepancy Record

Statistic Report

3 / 5 / 2022 10:01

User Name : Mary

### Box Transit In / Out

Box Transit In
Box Transit Out

Search

Scan barcode or enter barcode

All

✓

Box No : K63-Transit-01  
Workstation ID : TSS\_00010  
Origin Location : XXXX  
Received at (time)

○

✓

Box No : K63-Transit-02  
Workstation ID : TSS\_00010  
Origin Location : XXXX  
Received at (time)

○

□

Box No : K63-Transit-03  
Workstation ID : TSS\_00010  
Origin Location : XXXX

○

Close
Receive All (2)

3 / 5 / 2022 10:01

User Name : Mary

### Reception Mode

Branch Mode
MTR Book Drop Back Date

No.	Status	Title	Call No.	Barcode No.	Time	Remove
1	Normal	Player One	074.8 2037	38888214830101	01/05/2022 17:30:03	
2	Transport	Secret Ring	074.8 2021	38888214830212	01/05/2022 17:30:03	
3	Reserved	Give yourself a chance	074.8 2033	38888214830456	01/05/2022 17:30:03	
4	Problem Item	Sherlock Holmes	074.8 2056	38888214830435	01/05/2022 17:30:03	
5	Transport	One Two Three	074.8 2037	38888214834521	01/05/2022 17:30:03	
6	Normal	Brave New World	074.8 2033	38888214839572	01/05/2022 17:30:03	
7	Problem Item	Fahrenheit 451	074.8 2052	38888214830004	01/05/2022 17:30:03	
8	Normal	My Lanni 2	074.8 2012	38888214831563	01/05/2022 17:30:03	
9	Transport	The Lord of the Rings	074.8 2042	38888214838255	01/05/2022 17:30:03	

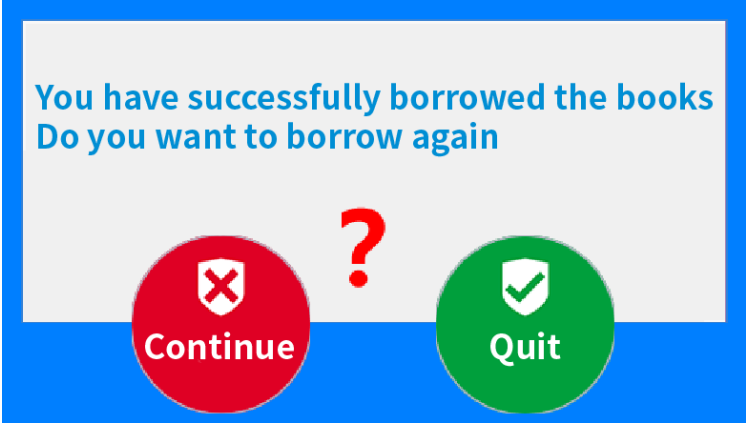
Normal
12
Transport
7
Reserved
2
Problem Item
3

**Total Scan Books : 24**

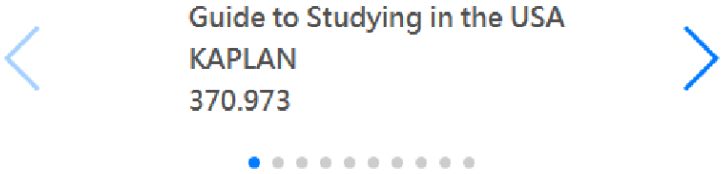
Save & Quit

# Books recommendation system

Users can receive book recommendation upon borrowing



### Recommendation of books you may like



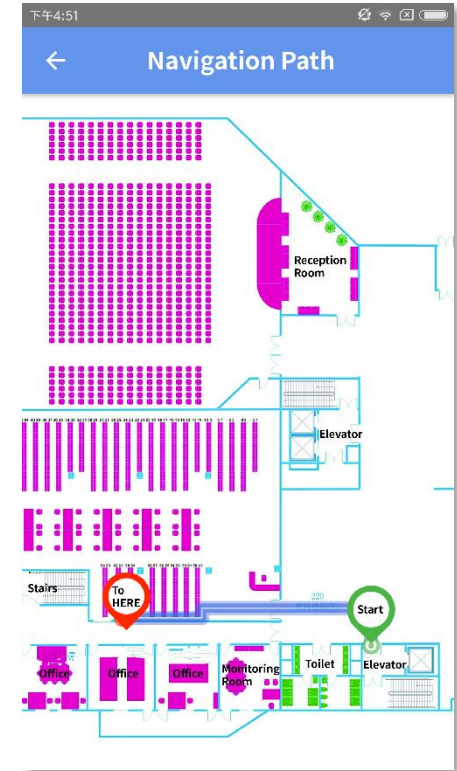
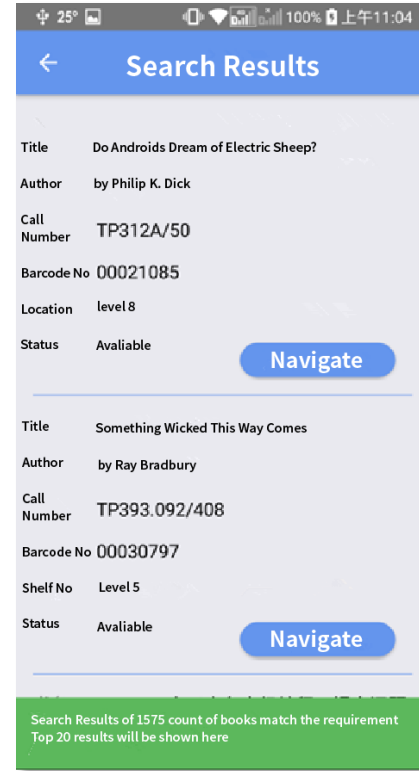
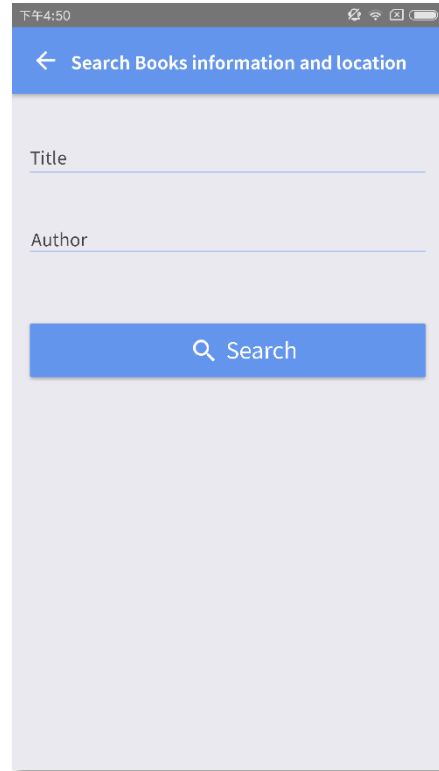
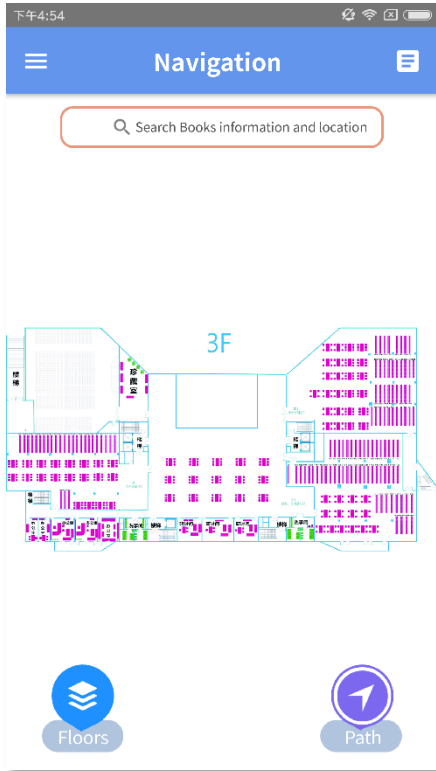
- Recommends books based on user preferences
- Identifies user's previous records. Content-based or/and collaborative filtering

Self Check in and Out Station



# Navigation

Assist users to locate books via mobile apps

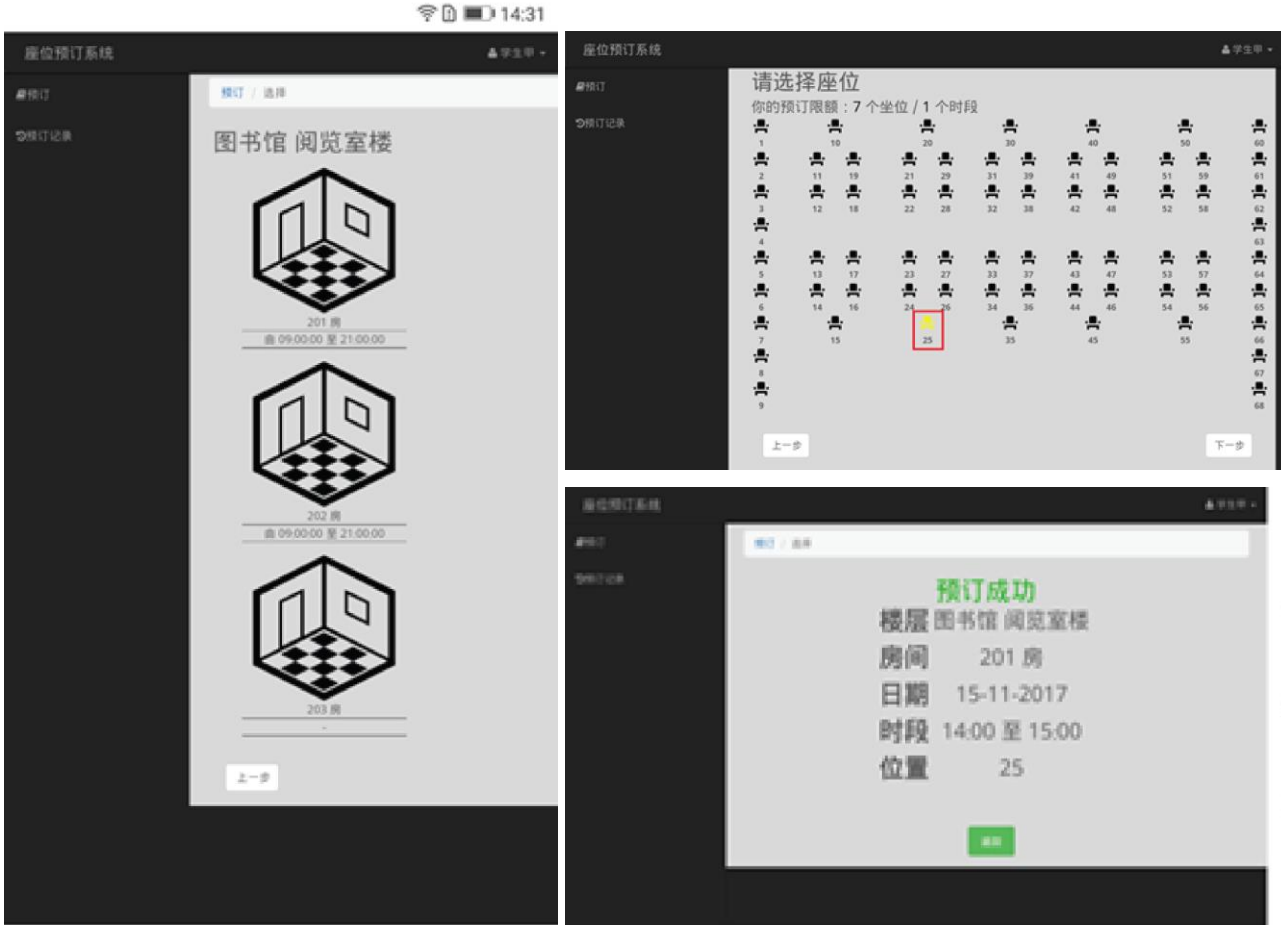


- Supports real time location indication
- Supports multiple floor indication
- Convenient searching
- Library map and guide
- Integrated with recommender



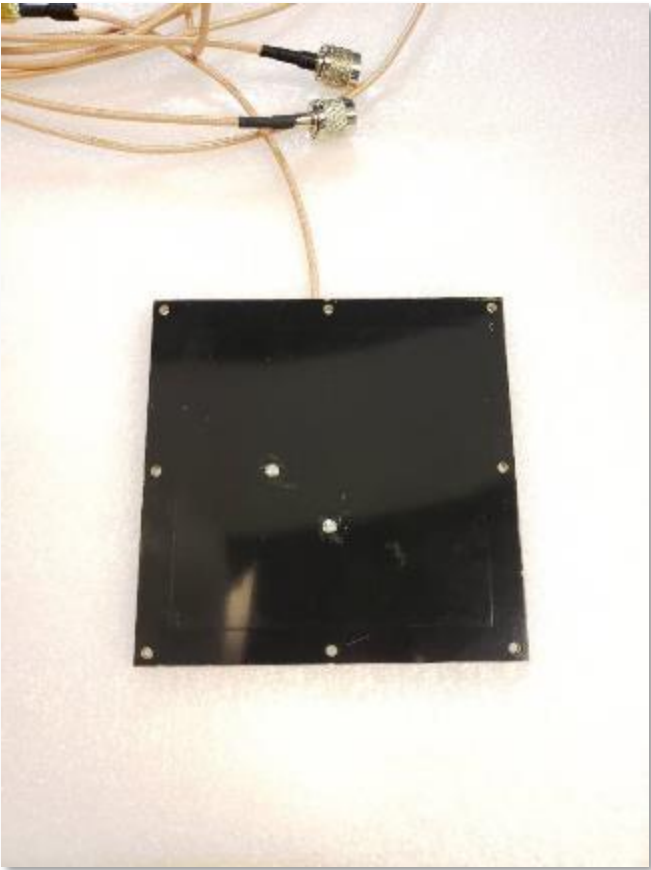
# Booking System

- Online booking of library facilities such as function rooms and multimedia equipment
- Integrated with access control to authenticate users
- Smart display : Display user name and booking details on tag for function room booking and study corner



# RFID localisation

Antennae to be put under the table for counting and locate books



# Key Project Experience

Country: **Singapore**

Customer Name: **National Library Board**

Type of System/Solution: **RFID Library Solution**

**Project Description: Development, supply & installation of RFID Library Systems for Public Libraries. Provide demo, discuss with related parties on the required specifications, roll-out in stages where initial stages are confirmed through live usage before full roll-out**

**Major Deliverables: To develop & supply BBSs, BDSs, BSSs, EAS Gates and RFID readers to all NLB's Regional, Community and Children Libraries with software application including Annual Maintenance**



**National Library Board**  
Singapore





# Reference for Libra (Hong Kong)



Hong Kong Public Libraries  
of the Leisure and Culture  
Services Department



香港恒生大學  
THE HANG SENG UNIVERSITY  
OF HONG KONG



## Customers in China

Central China Normal University  
Tianjin University  
Anhui Normal University  
Shandong University  
Henan Normal University  
Anqing Normal University  
Dalian University  
Jiangsu Duke Kunshan University  
West Anhui University  
Wangnan medical college  
Bozhou University  
Bengbu Medical College  
Anhui University of Finance and Economics  
Chuzhou University  
Tongling University  
Henan University of Urban Construction  
Xuchang University  
Nanyang Institute of Technology  
Xinxiang Medical University  
Henan University of Animal Husbandry and Economy  
Anhui Medical College  
Datong Health School  
Hefei Preschool Education College  
Anhui Water Conservancy Technical College  
Hefei Technology College  
Anhui Physical Education College  
Anhui Vocational and Technical College  
Hefei economic and trade tourism school  
Huangshan Vocational Technical College  
Chuzhou City Technical College  
Henan Technical College Of Construction  
Henan Institute of Economics and Trade  
Tianjin College of Commerce  
Tianjin Transportation Technical College  
Hefei NO.10 Senior High School  
Yingshang No.1 Middle School  
Wuhan Evergreen No.1 Middle School  
Senior High School of Lishui Jiangsu  
The No.2 Senior High School of Mengcheng  
Xuchang Experiment Primary School  
Hefei Shi Fan Fu Xiao San Xiao  
Hefei Wanghu Primary School  
Hefei Tunxi Road Primary School  
Xuzhou Air Force Service Institute  
The Second Military Medical University



## Overseas Customers

Hang Seng Management College  
Hong Kong Institute of Vocational Education (Tsing Yi)  
National library of Singapore  
Singapore Polytechnic  
Singapore Management University  
Institute of Technical Education-College West  
Singapore Dunman High School  
INSEAD  
Tanglin Trust School  
Nanyang Technological University

# Overseas Reference

**SINGAPORE  
COMM**

# Customer Logos





# Thank You

We appreciate your consideration of our entry



Address: 8 Jalan Kilang Timor #03-09 Kewalram House Singapore 159305

Tel: +65 6880 0800(General), +65 6880 0811(Customer Service)

Fax: +65 6880 0899

Email: [sales@singcomm.com.sg](mailto:sales@singcomm.com.sg)

Website : <http://www.singcomm.com.sg>

**SINGAPORE  
COMM**