

# Service Innovations :

the National Library Board (NLB) of Singapore's journey

Ngian Lek Choh

Consultant, NLB

Chair, Cybrarian Ventures Pte Ltd

IFLA Governing Board Member, 2013-2017



NLB

National Library Board  
Singapore

# Quick facts about Singapore and NLB

## Libraries & Archives

- 1 National Library
- 1 National Archives
- 26 Public Libraries

Population 5.2 mil

Area : 750 sq km

Languages :

English, Chinese,  
Malay, Tamil



# Some other quick facts about NLB

## Membership

**Over 2.1m** members

## Visits

**Over 23.7 m** visits

## Loans

**Over 33.2m** loans

## Collection

**Over 1.3m** titles  
**Over 8m** items

## Online Usage

Digital User Visits: **> 13.5m**  
e-Retrievals: **> 52.8m**

FY2014 figures

# A typical day in Singapore libraries...



**79,000 people  
visit libraries**



**100,000 loans  
are made**



**300 new  
members join  
the library**



**27,000 people  
attend library  
programs and  
exhibitions**



# Book Borrowing : innovations

- ❖ Early days – manual borrowing process, with long queues
- ❖ Self-service borrowing – using 3M machines
- ❖ Self- service borrowing and returning of books – using radio frequency identification tags (RFID)
- ❖ Mobile phone loan service – borrowing books using users' mobile phones



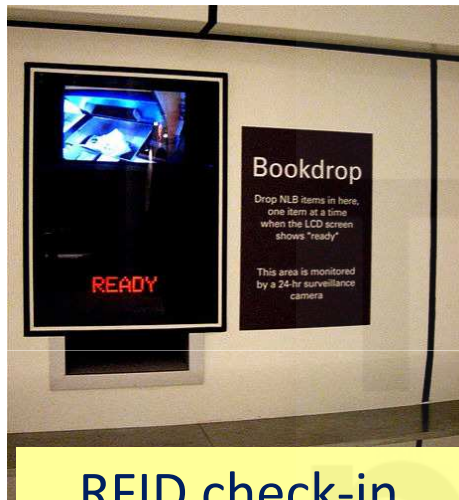
Early days, users need to visit libraries to obtain books and information.. Queues were long!



# Past 15 years..

Library services manned by staff  
became self-help services

Today, Web and mobile  
services are now the  
norm



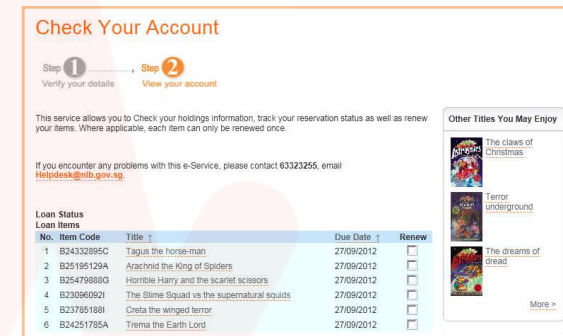
RFID check-in



RFID gates



RFID check-out



# NLB Mobile: a new mobile phone service

- ❖ Check out physical library items using mobile phone
- ❖ Search the catalogue
- ❖ Place reservations
- ❖ Renew items
- ❖ Locate nearest library
- ❖ Search and book library events
- ❖ Passcode for added security



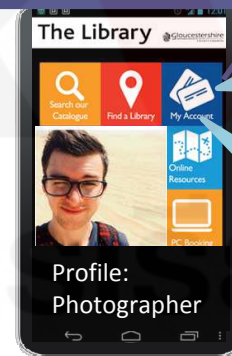
# NLB mobile app allows users to obtain information and to receive personalised content anytime, anywhere

- Mobile location-based recommendations
- Mobile reservations : reserve books on-the-go
- Mobile borrowing
- Mobile payment
- Mobile event registration

Mobile &  
Interactive Services

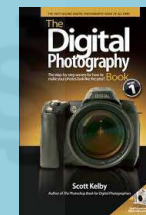


Push of Personalised  
Content



Let's  
talk  
Photography

Talk & exhibition on  
Photography



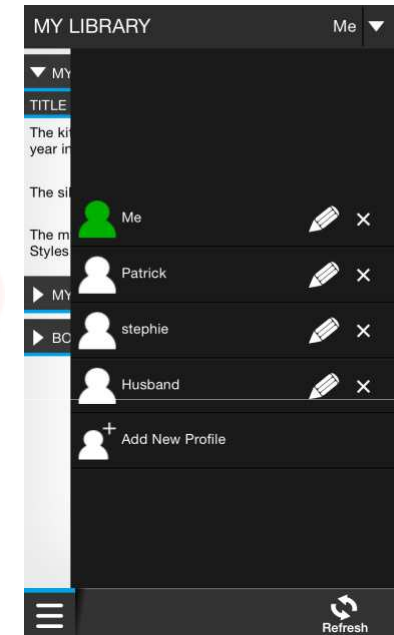
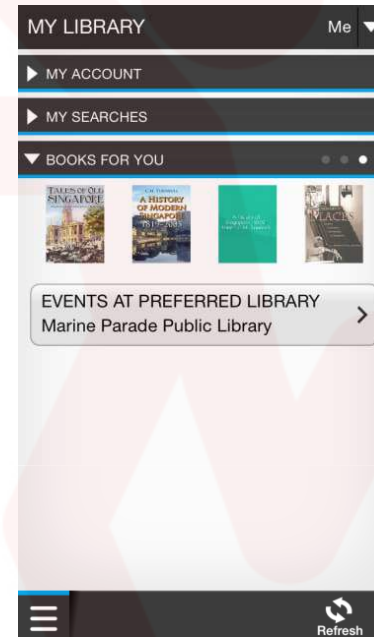
Books on photography

# NLB Mobile app



To Check-out an Item, scan barcode

Personalised recommendations



Multiple user profiles (family)

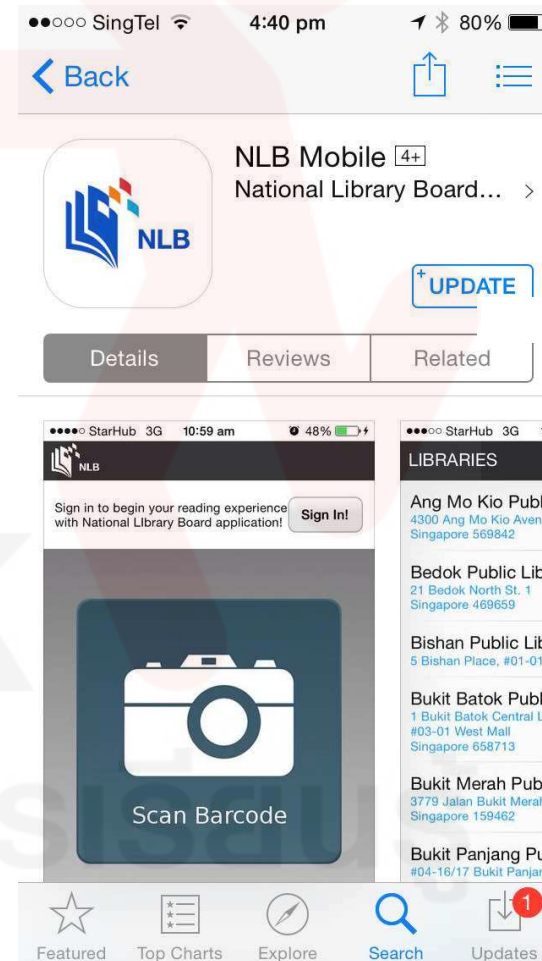
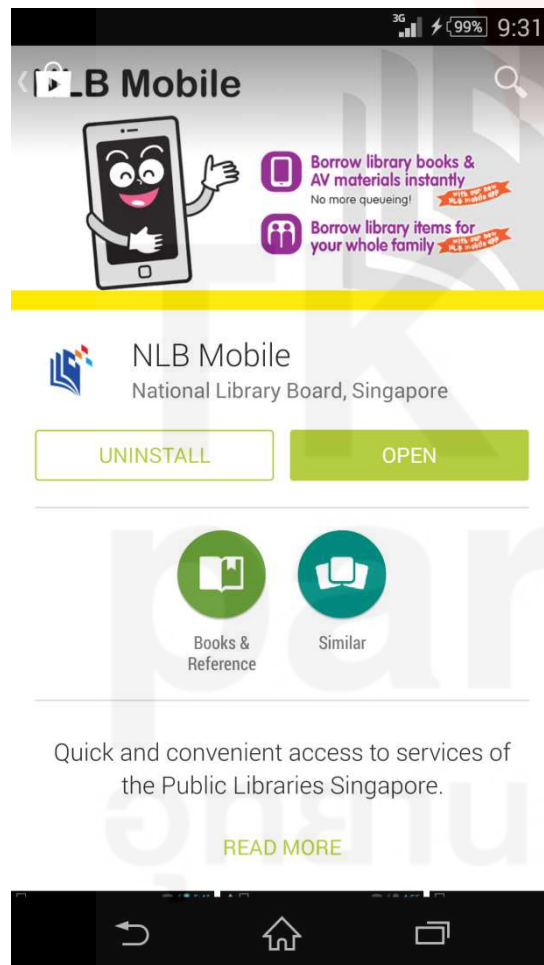
**Received the American Library Association (ALA) Presidential Citation for Innovation International Library Projects 2015**

# Where do I download the app?

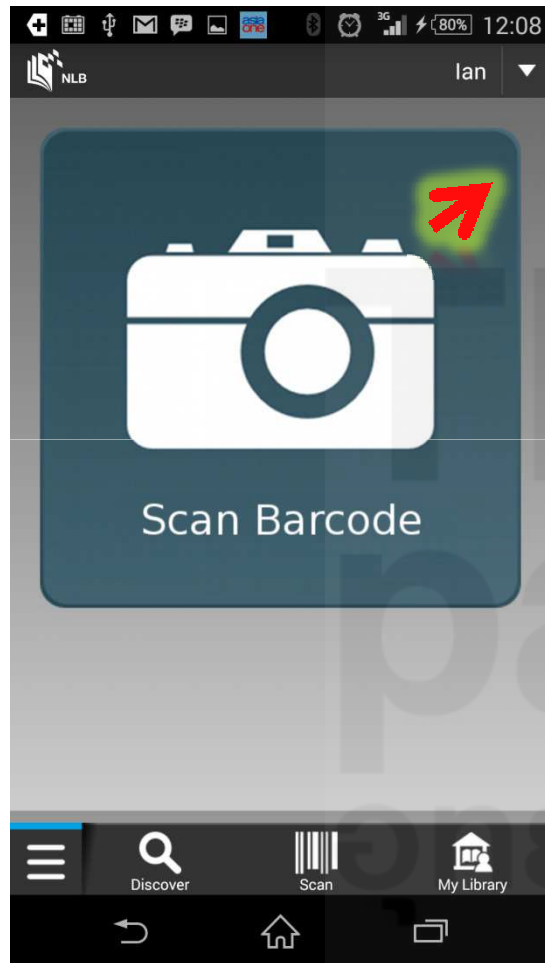
- Search for “NLB Mobile” in the Google Play Store and the Apple App Store



# App in Google PLAY / Apple app stores



# Checking out library book : steps





# Physical Library innovations

- ❖ Digital signage – improving library outreach
- ❖ Online library item locator – helping users find library materials
- ❖ Video analytics – learning more about users in the library
- ❖ Shelf-reading robot Proof of Concept

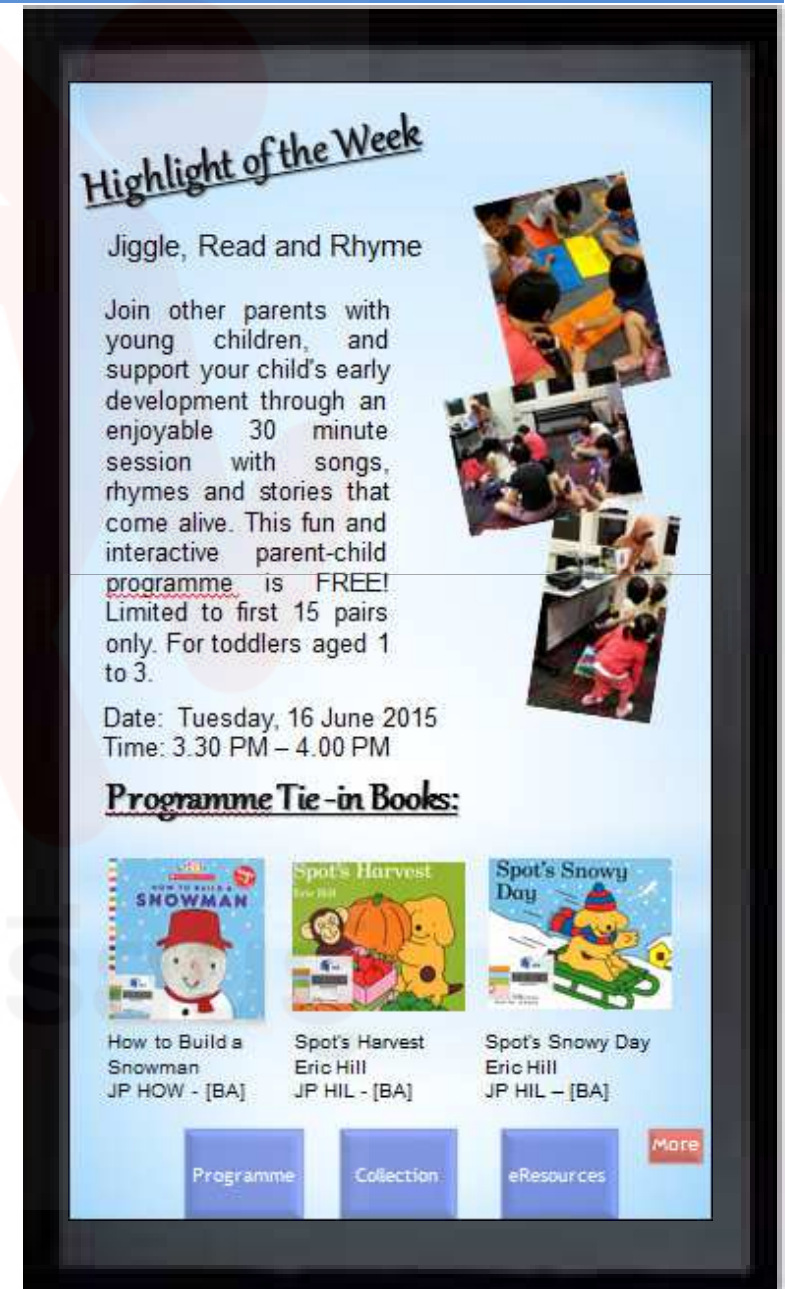
Welcoming entrance with window display & ceiling features  
Step onto *new grounds* of Pasir Ris library...  
Library presence with graphic

## Digital Signage



# Digital Signage

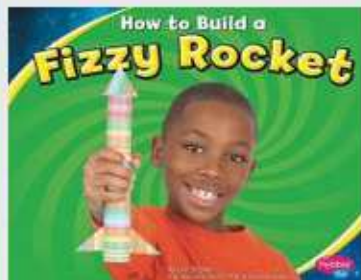
- A digital bulletin board to highlight
  - Events happening in the library
  - Related books to tie in with programmes
  - Promotions
  - Library membership information



# Online Item Location Service

- Online catalogue (OPAC) provides map of library indicating the shelf where item is located
- Descriptions on physical signage and digital locations on OPAC are synchronised
- Outcomes:
  - Improved and increased findability of the items
  - Increased self-service

# Item Location Service



Additional information  
for this title

**Title:** **How to build a fizzy rocket** / by Lori Shores.  
**Creator:** Shores, Lori  
**Publisher:** Mankato, Minn. : Capstone Press, c2011.  
**Physical Description:** 24 p. : col. ill. ; 24 x 29 cm.  
**Series Title:** **Pebble plus. Hands-on science fun**  
**Notes:** Includes bibliographical references (p. 23) and index.  
**Audience:** "RL: K-1; IL: PreK-2"--P. [4] of cover.  
**Abstract:** "Simple text and full-color photos instruct readers **how to build a fizzy rocket** and explain the science behind the activity"--Provided by publisher.  
**Identifier:** (ISBN) 9781429655736 (pbk)  
 (13014) 9781429644314 (library binding)  
**Language:** English  
**Other Title(s):** **Fizzy rocket**  
**Subjects:** **Rockets (Aeronautics) -- Models -- Juvenile literature**  
**Science -- Experiments -- Juvenile literature**  
**BRN:** 13700627

## Holdings:

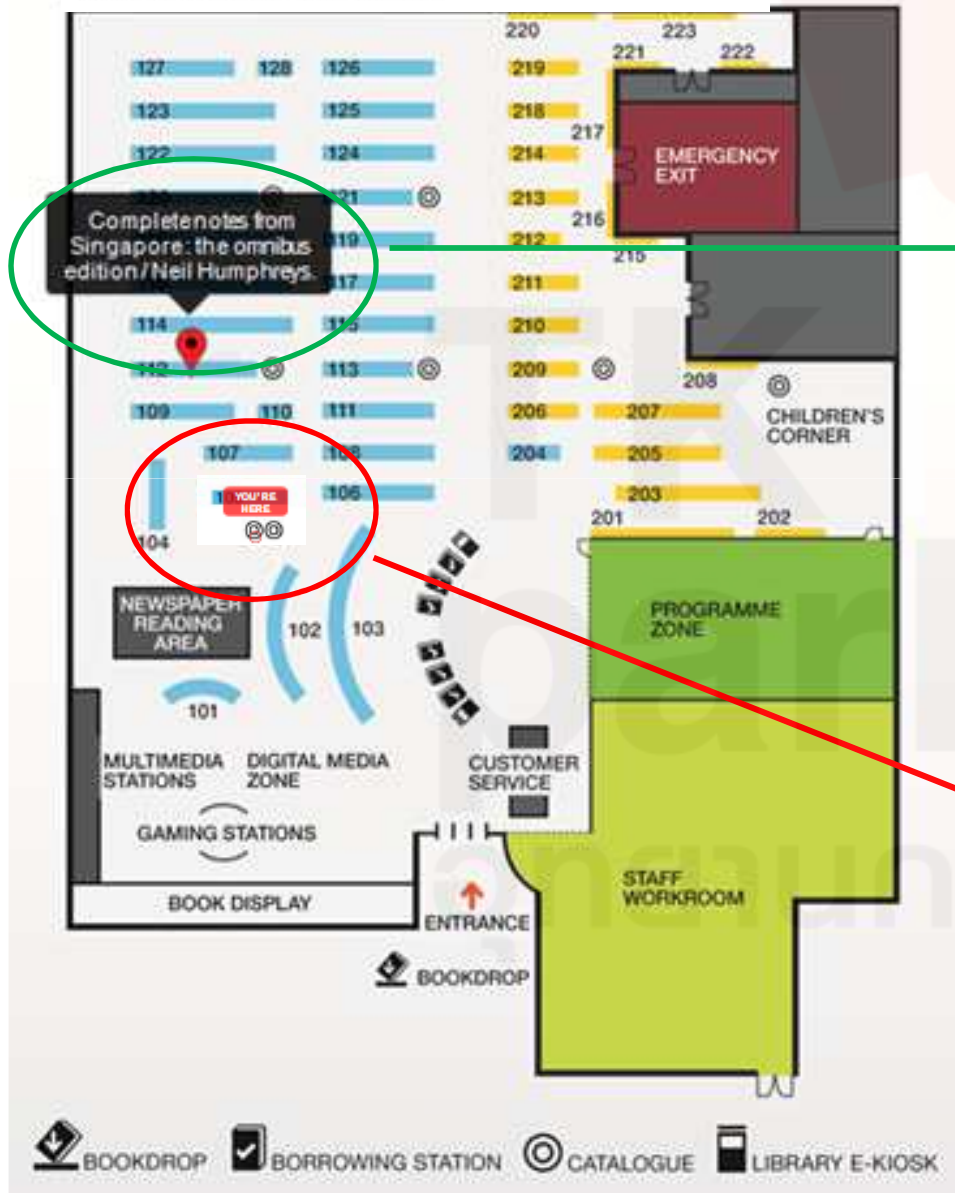
Library	Location	Call Number	Status/Desc
Bishan Public Library	Children's Collection, Information Books	English 621.43 SHO	Available
Bukit Batok Public Library	Junior Lending Picture Book	English 621.43 SHO	Onloan - Due: 14 Jul 2015
Bukit Merah Public Library	Junior Lending Picture	English	Available



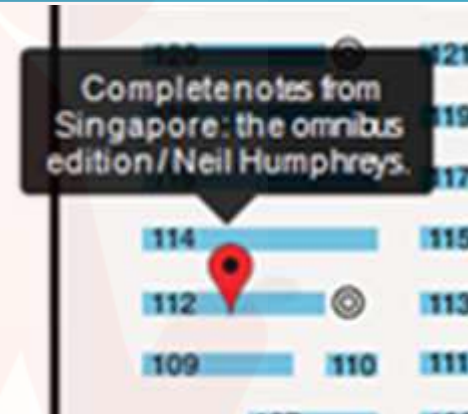
# Item Location Map

Children's Collection, Information Books, Shelf 201

@Serangoon Public Library, Level 4R



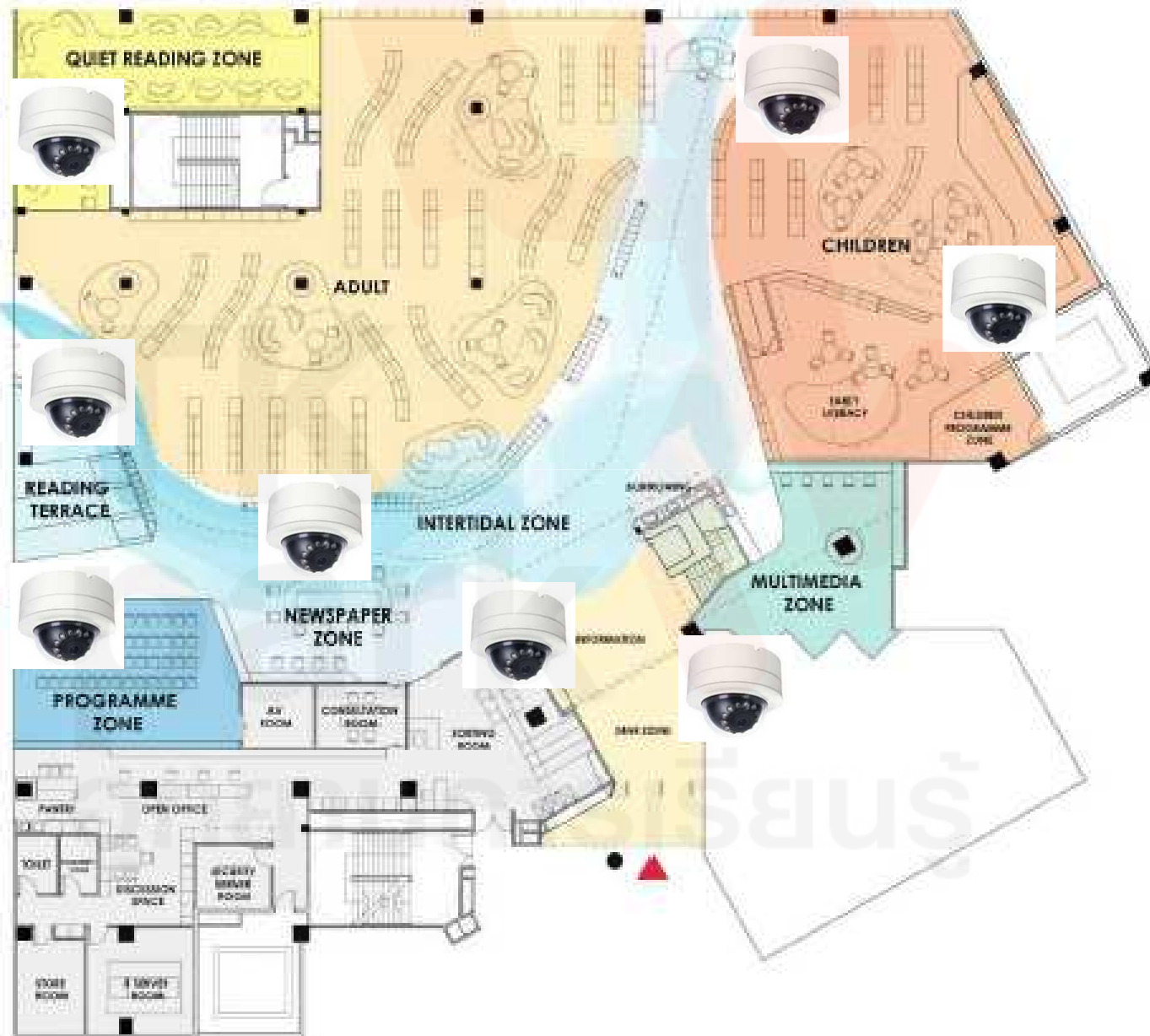
Indicates location of Item



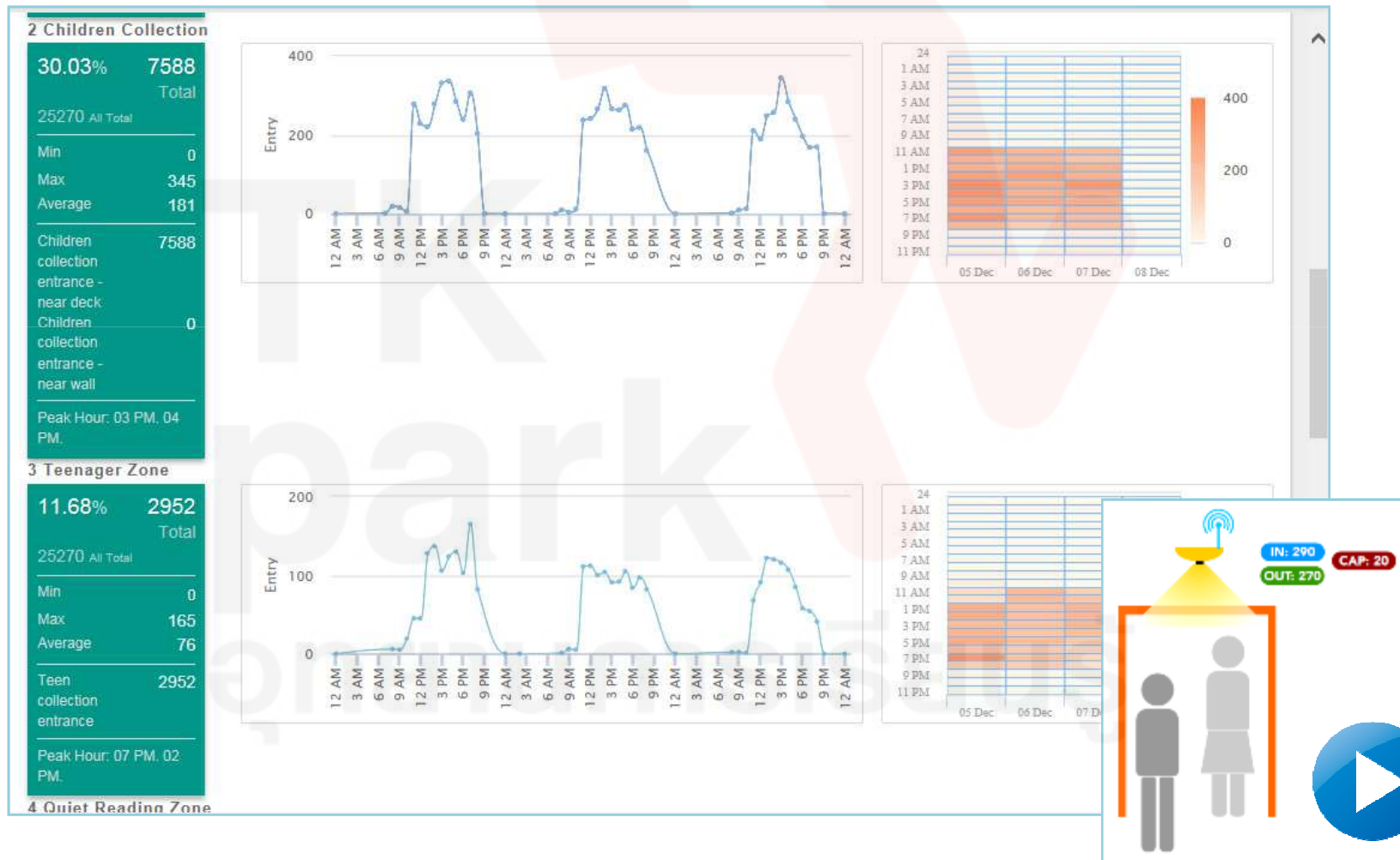
Displays "where you are" (OPAC station)



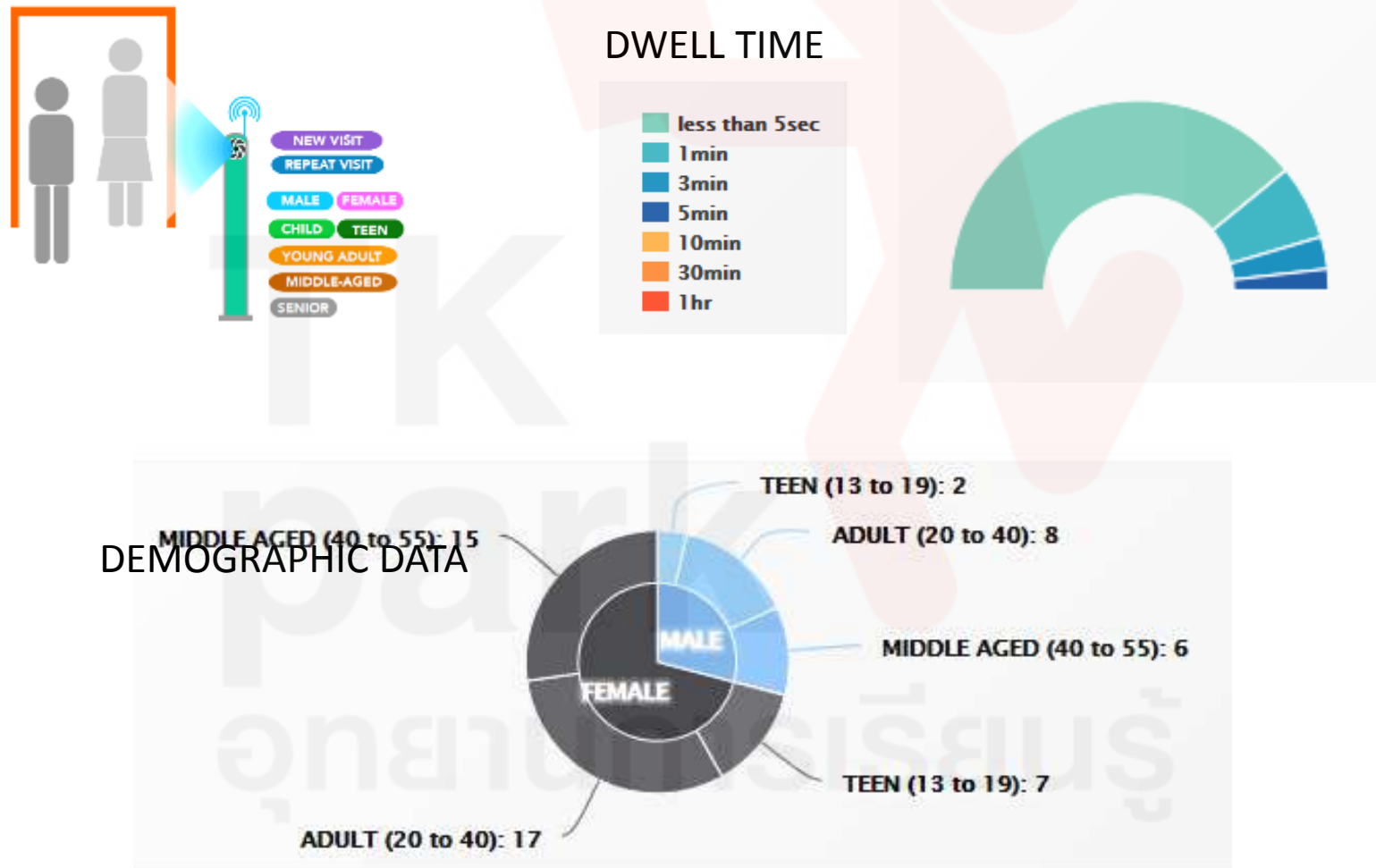
# Video Analytics – capturing users' footprint



# Knowing use levels of the services in library via entry and exit counts



# Use levels and profile of library users



# Video Analytics

## ➤ What we measure

- Number of users
- Age and gender
- How long do they stay at each service (based on unique face ID)

Area	People Counting/ Crowd density	Audience profiling/ Dwell time
Main Entrance	✓	✓
Teens Collection	✓	✓
Newspaper Zone	✓	
4 Digital Displays		✓
Children's Collection	✓	✓
Children's deck	✓	
Programme zone	✓	
Quiet reading zone	✓	
Adult Collection	✓	



# Video Analytics – Real-time dashboard



# Video Analytics - Outcomes



To push relevant content and personalised recommendations to users based on profiling, to enhance user experience.



To capture length of stay at each service to maximise library resources and spaces



To understand user behaviour, to improve planning of spaces

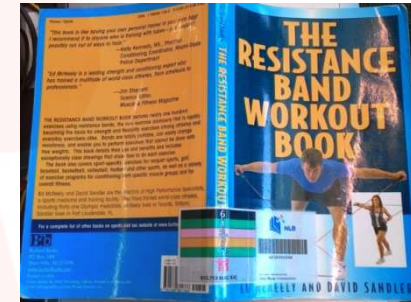
# Shelf Reading Robot : Working at Night

- Proof of Concept (POC) of robotics shelf reading
- Initial trial in 2015

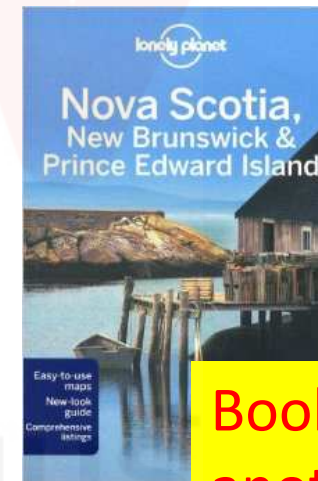


# Observations from POC

- Found missing books
  - Found books from other libraries
    - Hard to be identified in daily shelf-reading as book is in “correct” shelf
- Misplaced items were identified
  - Especially useful for books that are very thin and sometimes hidden behind other books
- Library users can locate books more easily



Missing book  
found



Book found in  
another  
library

## Next Steps

- POC demonstrated the technical viability to design a robotics system to improve shelf-reading of books
- Full library trial will be conducted. Enhancements include:
  - Stronger battery power unit
  - Auto-charging capability
  - More robust robot enclosure
  - Tighter integration with Library Automation System