UTM

UNIVERSITI TEKNOLOGI MALAYSIA

SYSTEM ANALYSIS & DESIGN
SECTION-08

SECD2613

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1.0 Overview of the Project

Easytrack is a system that we proposed to enhance the efficiency of the security system and the safety measures in the area of the Sunway Lagoon Theme Park. We will collect information requirements and review the system requirements for the project. This project will identify information needed to the operating system.

There are some interactive methods for information gathering. First, We survey our customers by questionnaires using Google Forms to collect their information. We use nominal and scale queries to get more detailed data from different perspectives. After gathering requirements information, we develop a deep understanding of business capabilities based on precise information about people, goals, data, and processes.

Then,we will get information on the current systems based on AS-IS analysis using context diagrams in the following steps, which are described as high-level data flow diagrams (DFD). The context diagram describes all the flow of information and detailed overview of the current state of the process, culture, and capabilities in the entire system. Data flow diagrams are used to describe the external entities, data flows, data stores, and processes involved after creating the context diagram. Then, we need to draw a diagram 0 which is the explosion of the context diagram. After that, we create a child diagram as each process on diagram 0 may explode to child diagram. This helps us to control the signify completion of tasks or error conditions.

After the DFD, an entity relationship diagram (ERD) is constructed that describes the relationships between the entity sets. After ERD, data requirements and transaction requirements are generated. The task is finally completed, now we have a thorough understanding of the current system and data flow diagram, entity relationship diagram and information requirements.

2.0 Problem Statement

1. Lack of Real-Time Monitoring:

There is no centralized tracking system in place at Sunway Lagoon Theme Park's current security setup to keep an eye on visitors' movements in real time. In the absence of this ability, park management will find it extremely difficult to recognize and respond quickly to safety issues, like missing children or emergencies. This restriction impairs the park's ability to properly manage and mitigate potential risks and incidents in addition to jeopardizing the safety and wellbeing of its visitors.

2. Limited Communication Infrastructure:

At Sunway Lagoon Theme Park, staff members primarily communicate via walkie-talkies, which have a number of drawbacks. During emergencies, the use of walkie-talkies can cause communication breakdowns and make it more difficult to transmit vital information. Additionally, poor range or signal interference may make it more difficult for park employees to coordinate effectively, which could jeopardize the effectiveness and efficiency of emergency response operations. The necessity for a more durable and dependable communication infrastructure is highlighted by this reliance on antiquated communication technology.

3. Insufficient Surveillance Coverage:

A small staff team's manual patrols throughout Sunway Lagoon Theme Park may leave gaps in the monitor system. It's possible that some park areas are under- or unmonitored, which leaves them open to unreported safety incidents or security threats. The park's capacity to promptly and effectively identify and manage possible risks or incidents is weakened by this lack of thorough surveillance coverage. To increase overall security and safety in the park, it is essential to improve surveillance coverage through technological solutions or staff placement that is strategically planned.

4. Lack of Guest Accountability:

The absence of a centralized tracking system makes it challenging to hold guests accountable for their actions or whereabouts within Sunway Lagoon Theme Park. Without a mechanism to monitor guest movements and behavior, park management may face difficulties in addressing safety concerns or managing unruly behavior effectively. Establishing guest accountability measures, such as digital tracking systems or guest registration processes, is essential to enhance overall safety and security within the park. These measures not only promote responsible guest behavior but also enable park management to respond swiftly to safety incidents or emergencies.

3.0 Proposed Solutions

Easytrack is an extraordinary system that improves guest safety and security by providing seamless integration with existing security infrastructure. It can detect the location of the guest when the guests scan their ticket with the time recorder machine which will show guest's location to the theme park management .Easytrack can empower park management to effectively monitor guest movements and respond swiftly to emergencies. This system has the potential to revolutionize the way theme parks manage crowd control, ensuring a safer and more enjoyable experience for all visitors.

Technical feasibility

Easytrack requires a time recorder machine in different areas of the theme park ,strong database system and user-friendly interface for theme park management to know the guest's location.The current technical resources are sufficient for the new system.

Operational feasibility

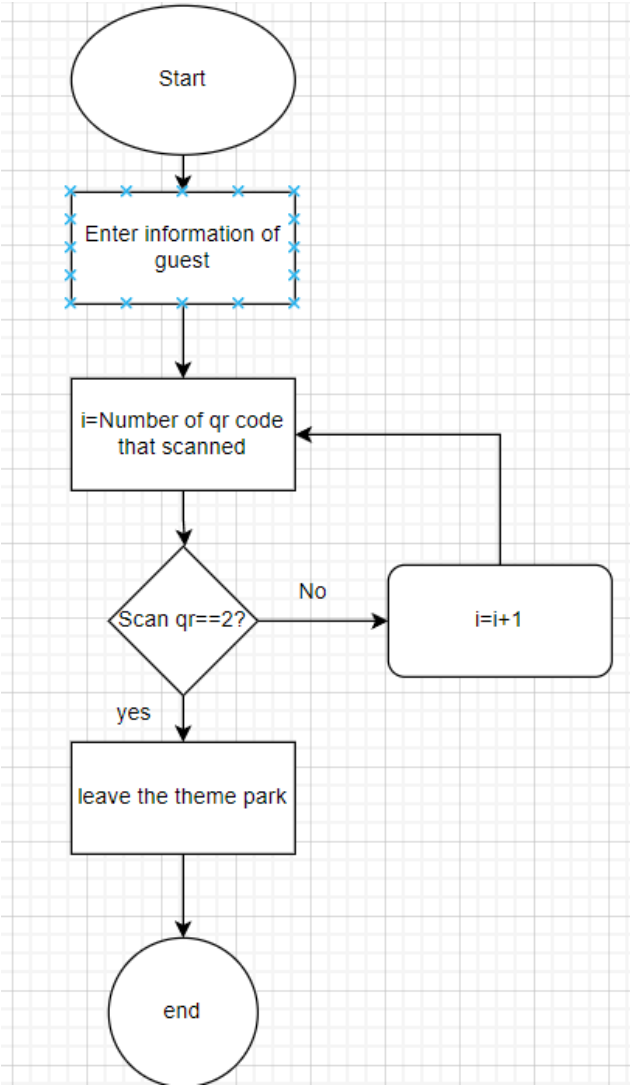
Easytrack is essential and needed for guests to ensure their safety and create an environment where guests can enjoy their trip with peace of mind.Besides,staff training will be provided so they can use Easytrack effectively and enhance overall operational efficiency.Human resources are available to operate the system once it has been installed.

4.0 Current Business Process/Workflow

Scenarios and workflow of ticket scanning system for guest:

1)Provide information to the workers on the counter so they can enter the guest's information.

2) The qr code of the ticket can only be scanned twice to make sure all the guests enter at opening time and leave at closing time.



Scenarios and workflow of ticket scanning system for theme park management:

1) Login to the Easytrack with your password.

2) Customizing according to preference.

3) Tick the radio button to select important options .

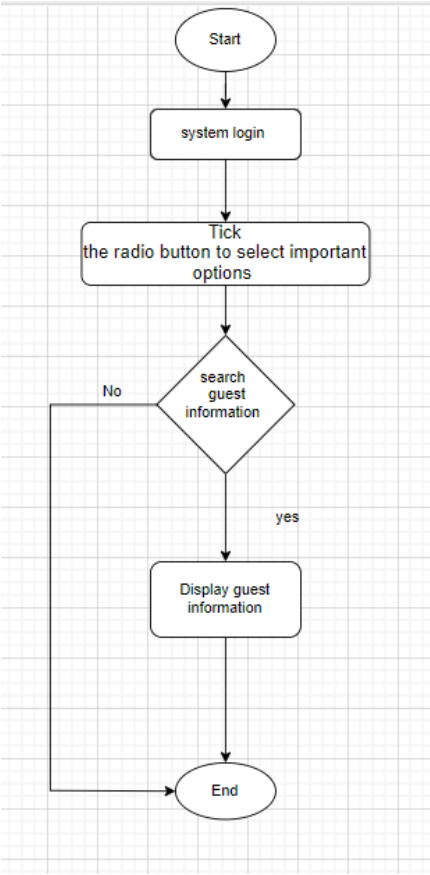
Option:

3.1 Name

3.2 Phone number

3.3 Date

4) The guests' information will be displayed on the screen if you search the guests' information by typing specific information in the text box.

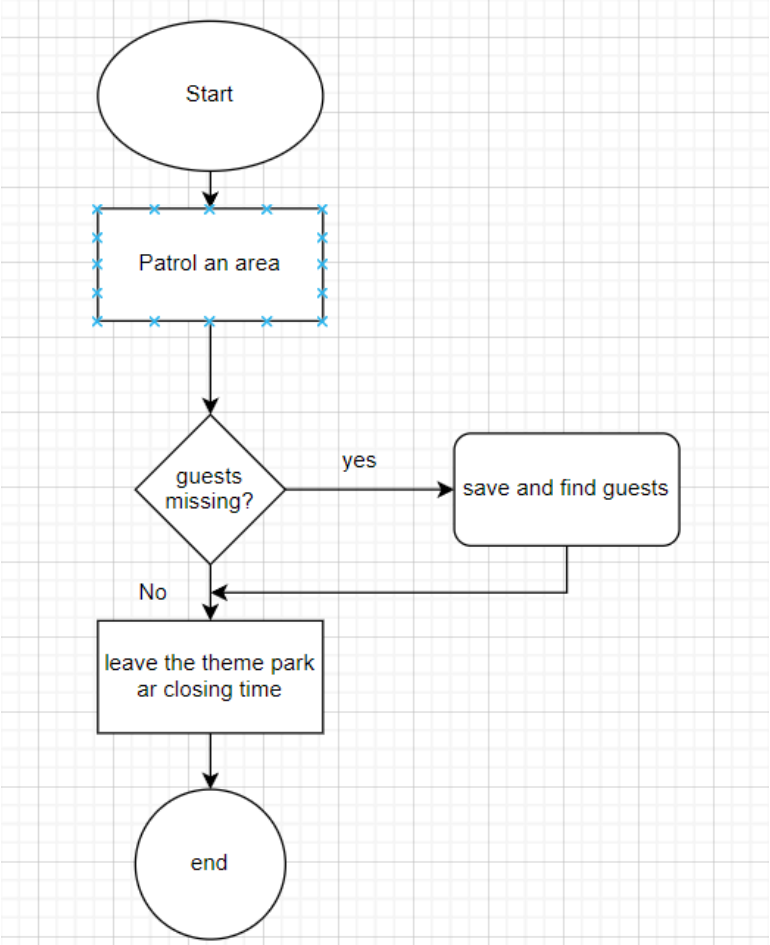


Scenarios and workflow of ticket scanning system for rescue team:

1)Patrol an area.

2)Get the information from the ticket scanning system if guests are missing.

3)Leave at closing time.



Proposed system

Scenarios and workflow of Easytrack for theme park management:

1) Login to the Easytrack with your password.

2) Customizing according to preference.

3) Tick the radio button to select important options .

Option:

3.1 Name

3.2 Phone number

3.3 Date

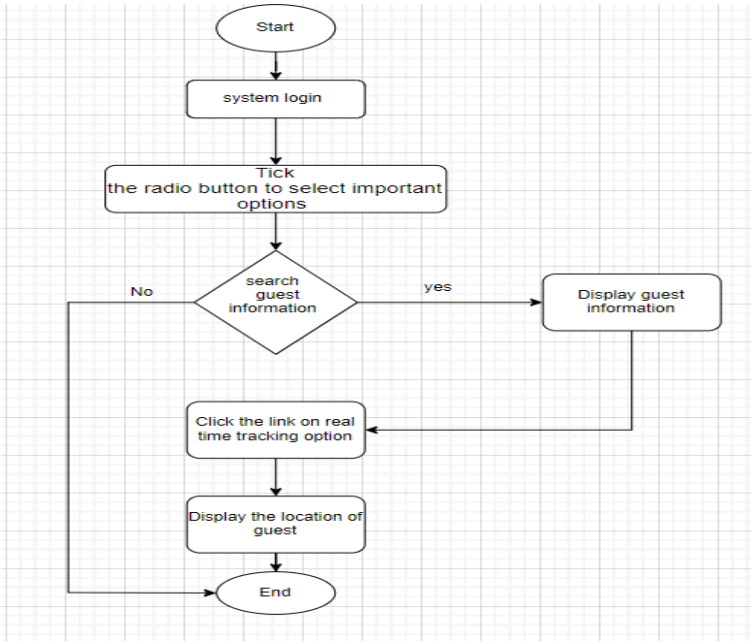
3.4 Time record

3.5 real-time tracking

4) The guests' information will be displayed on the screen if you search the guests' information by typing specific information in the text box.

5) Option for real-time tracking

5.1 Click the link provided on the option and Easytrack will start to track the location of guests.



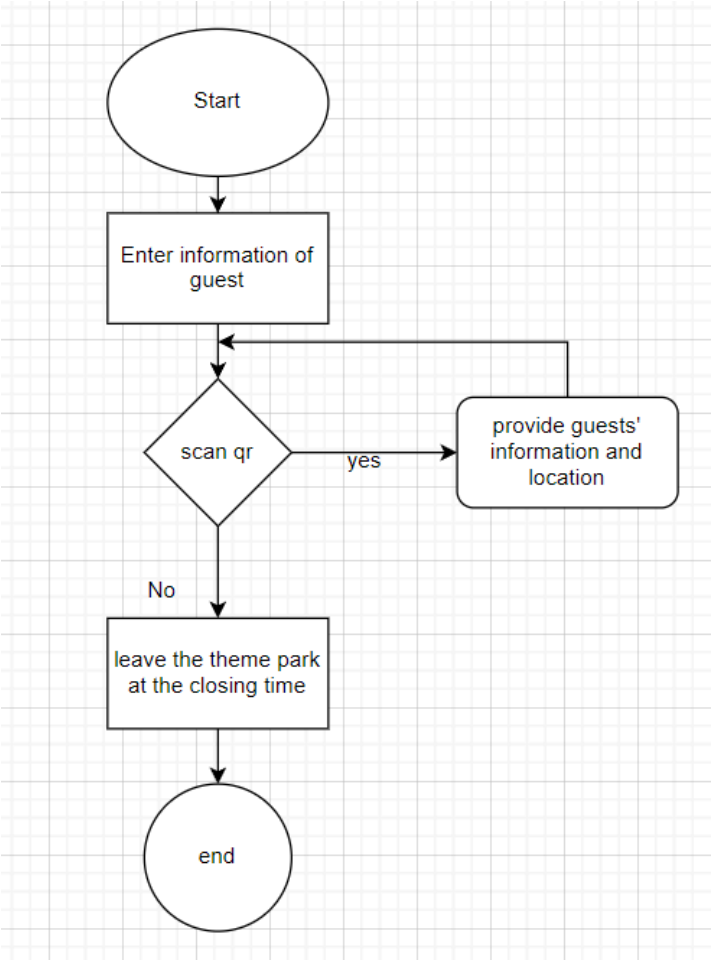
Scenarios and workflow of Easytrack for guest:

1) Provide information to Easytrack.

2) Scan the qr code of the ticket to the time recorder machine to make sure the guests' information is recorded to the system when entering the theme park.

3) The qr code will be scanned again on the different areas of the park so Easytrack can detect your location and make sure the real-time tracking is working.

4) Make sure all the guests leave at closing time.

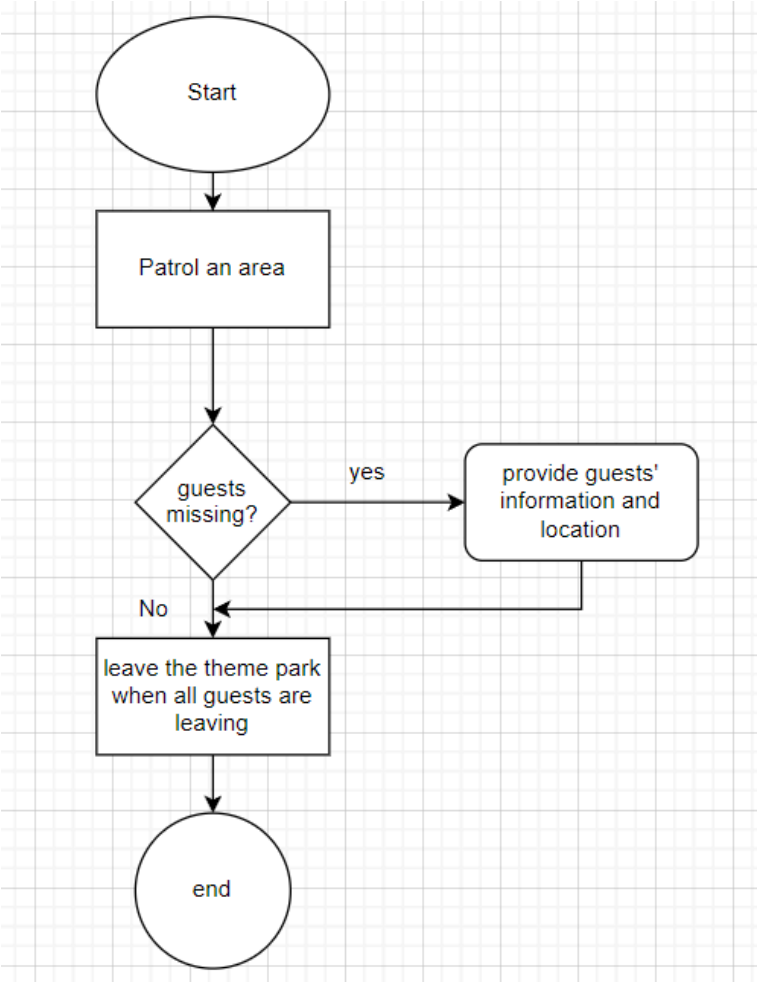


Scenarios and workflow of Easytrack for rescue team:

1)Patrol an area.

2)Get the guests' location and information from Easytrack if guests are missing.

3)Leave at closing time if all guests are leaving.



5.0 Logical DFD (AS-IS)

Context Diagram

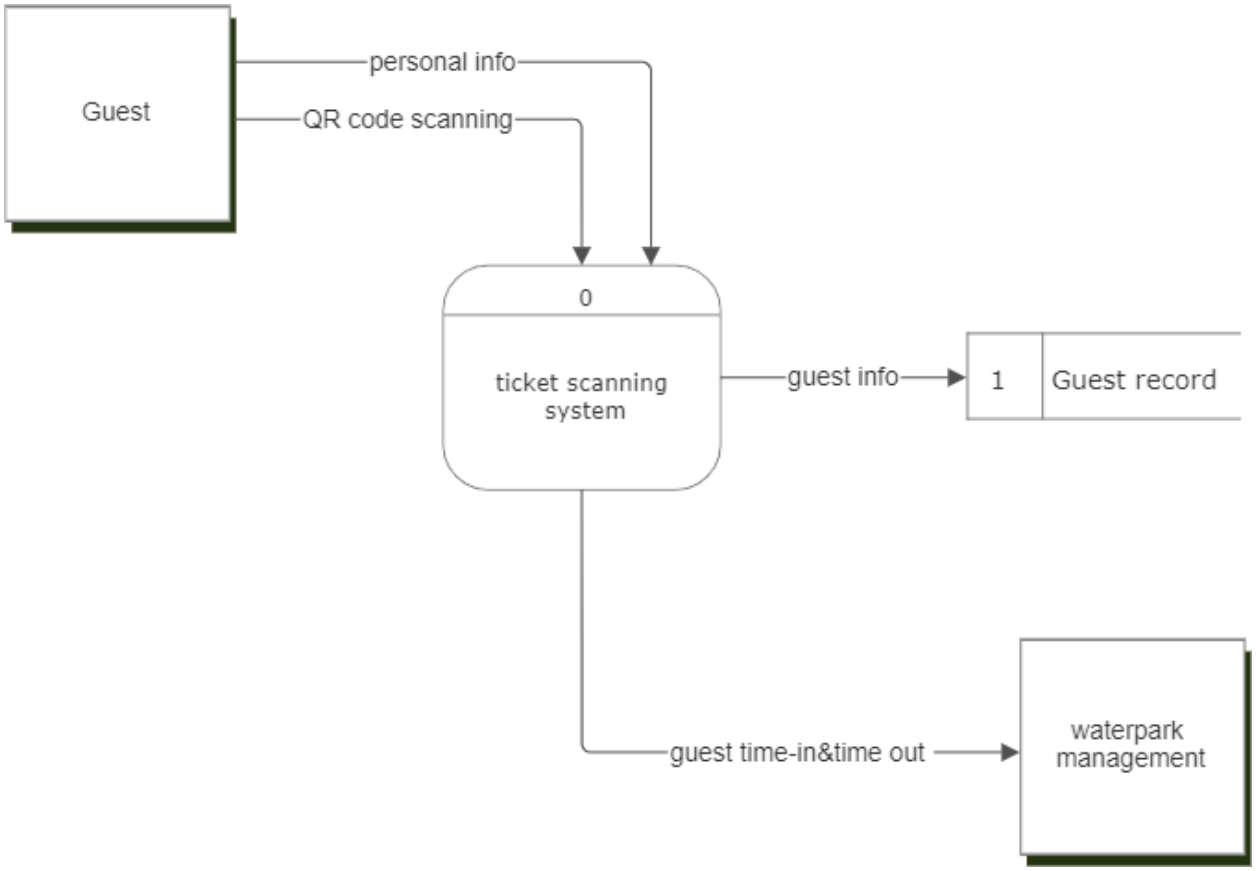
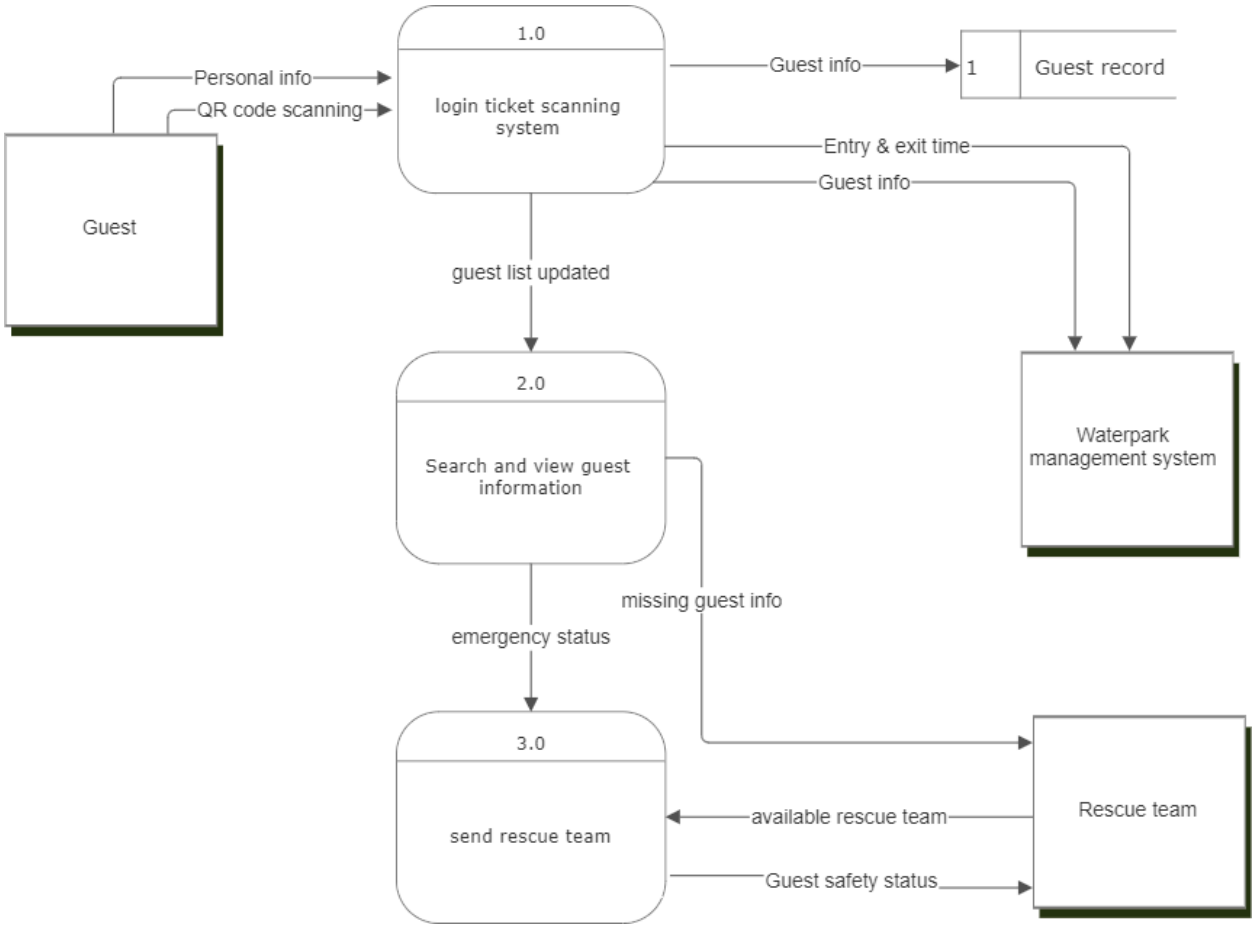
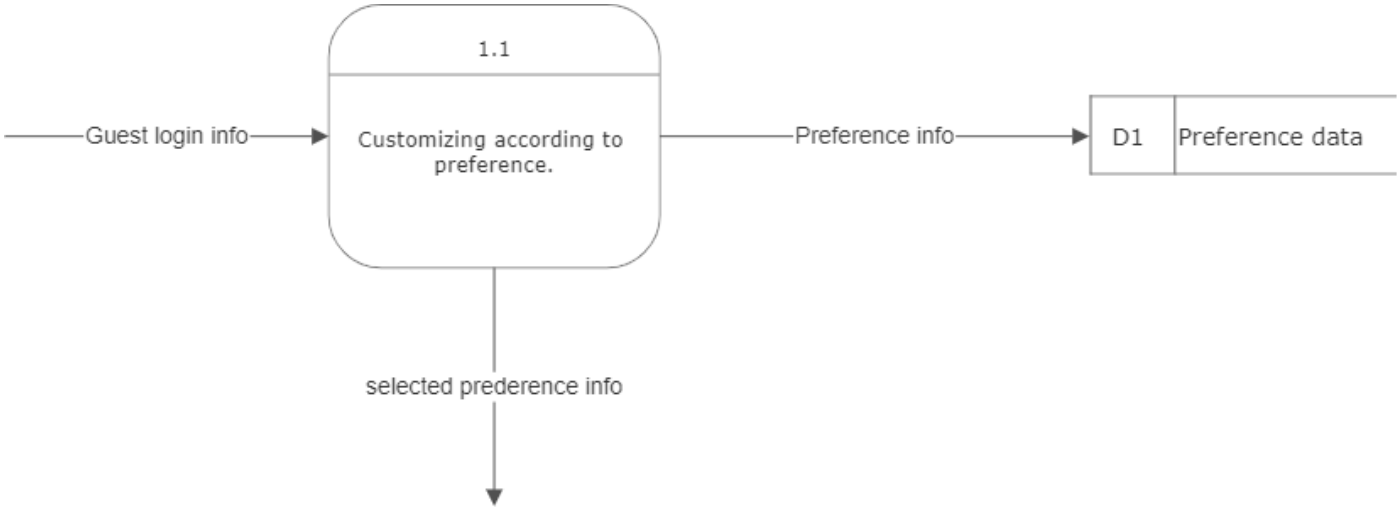


Diagram 0

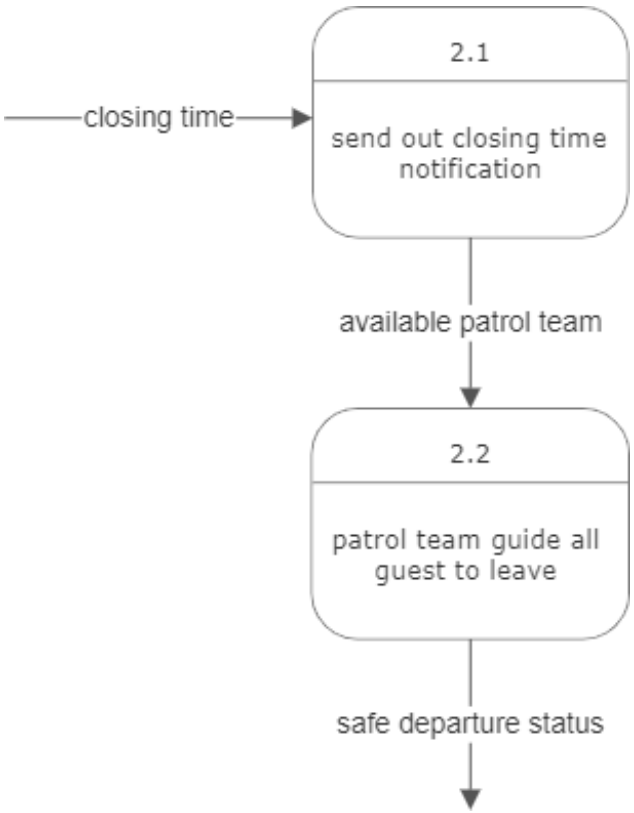

1.0
login ticket scanning system
Personal info
QR code scanning
Guest
Guest info
1
Guest record
Entry & exit time
Guest info
guest list updated
2.0
Search and view guest information
Waterpark management system
missing guest info
emergency status
3.0
send rescue team
available rescue team
Guest safety status
Rescue team

Child diagram

Process 1: Login to Easytrack



Process 2: search and view guest information



6.0 System Analysis and Specification
6.1 Logical DFD TO-BE system (Context Diagram, Diagram 0, Child)

Context Diagram

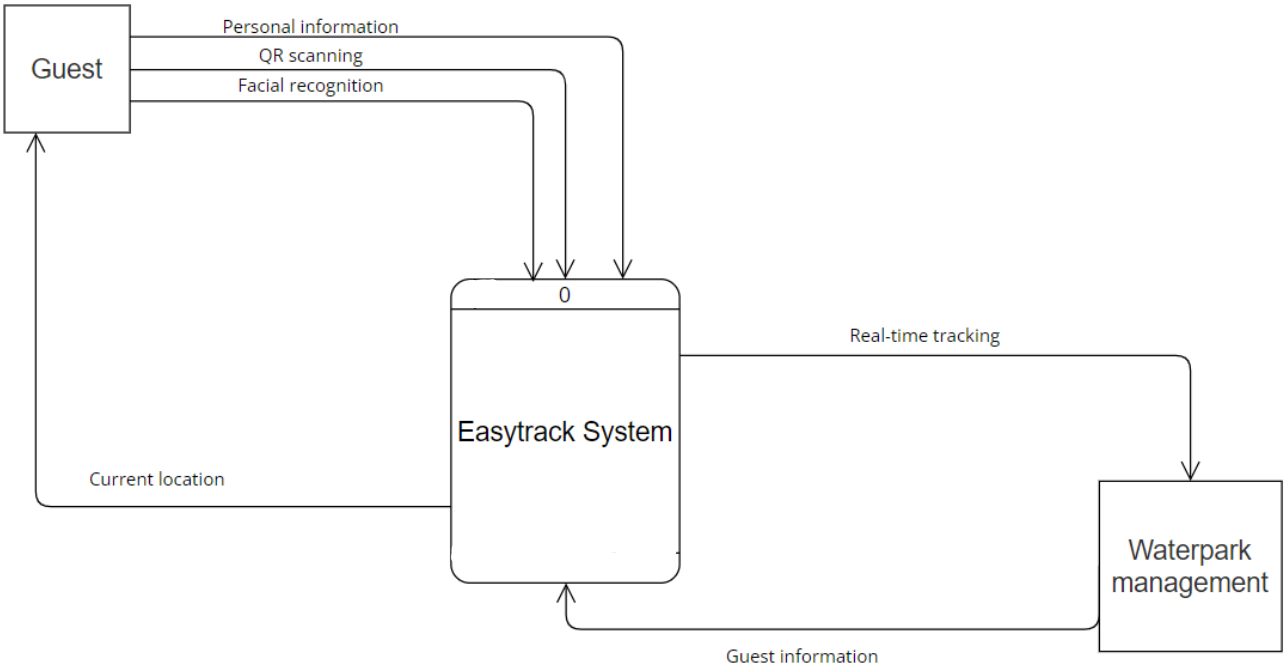
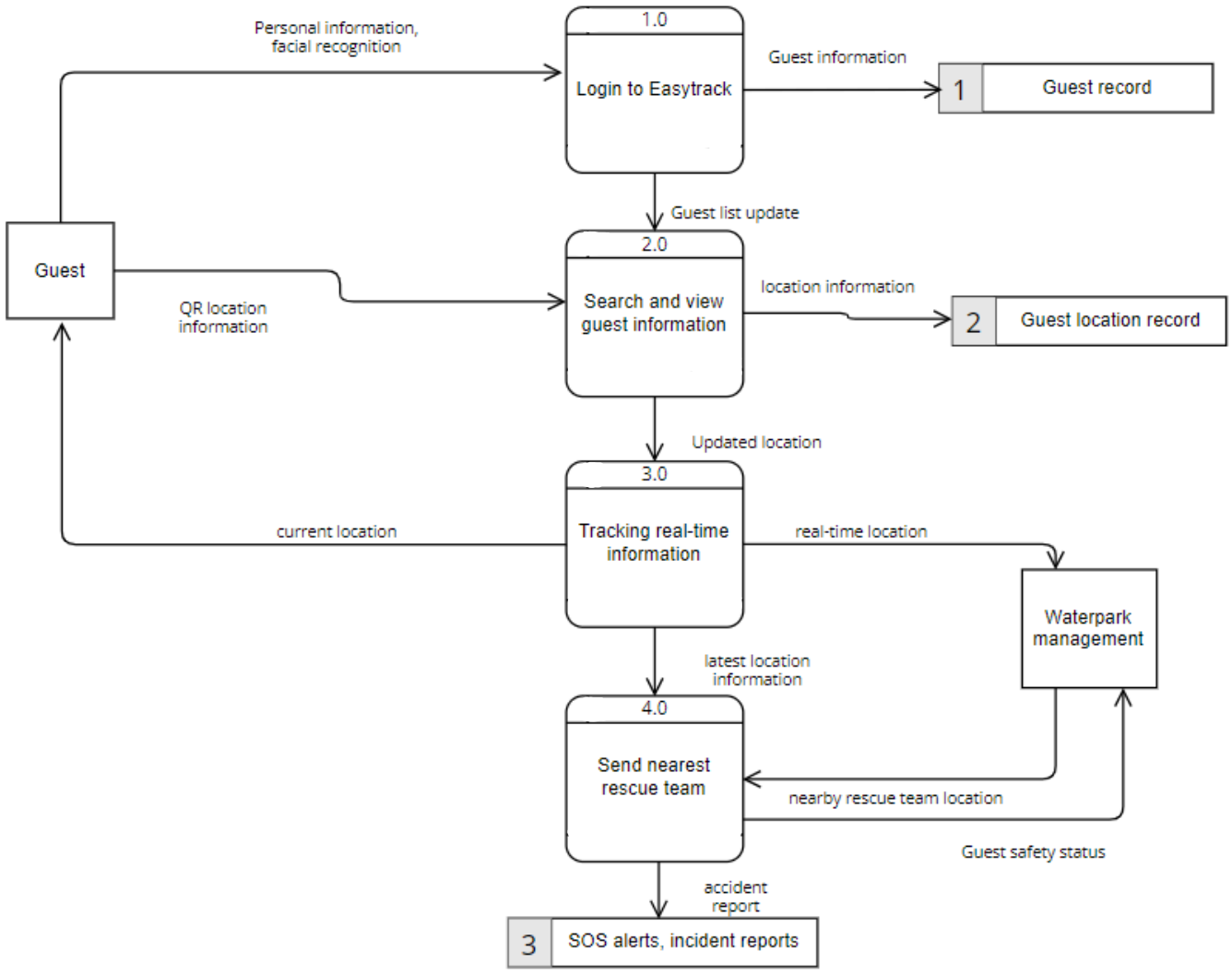
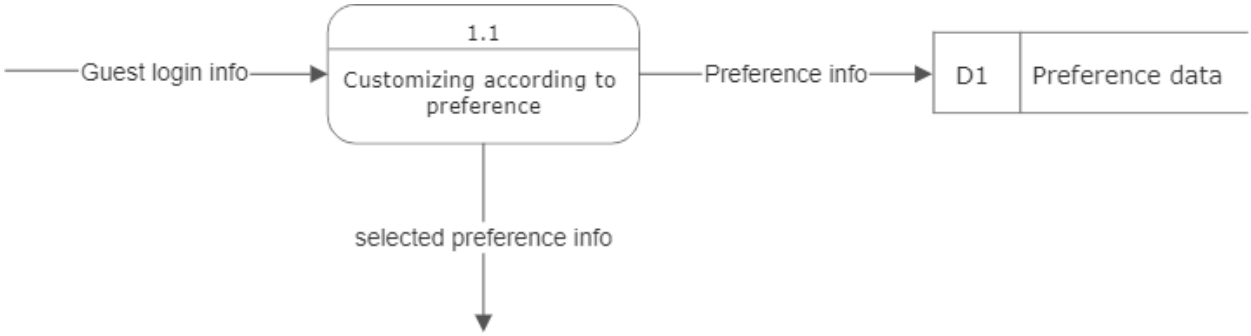


Diagram 0

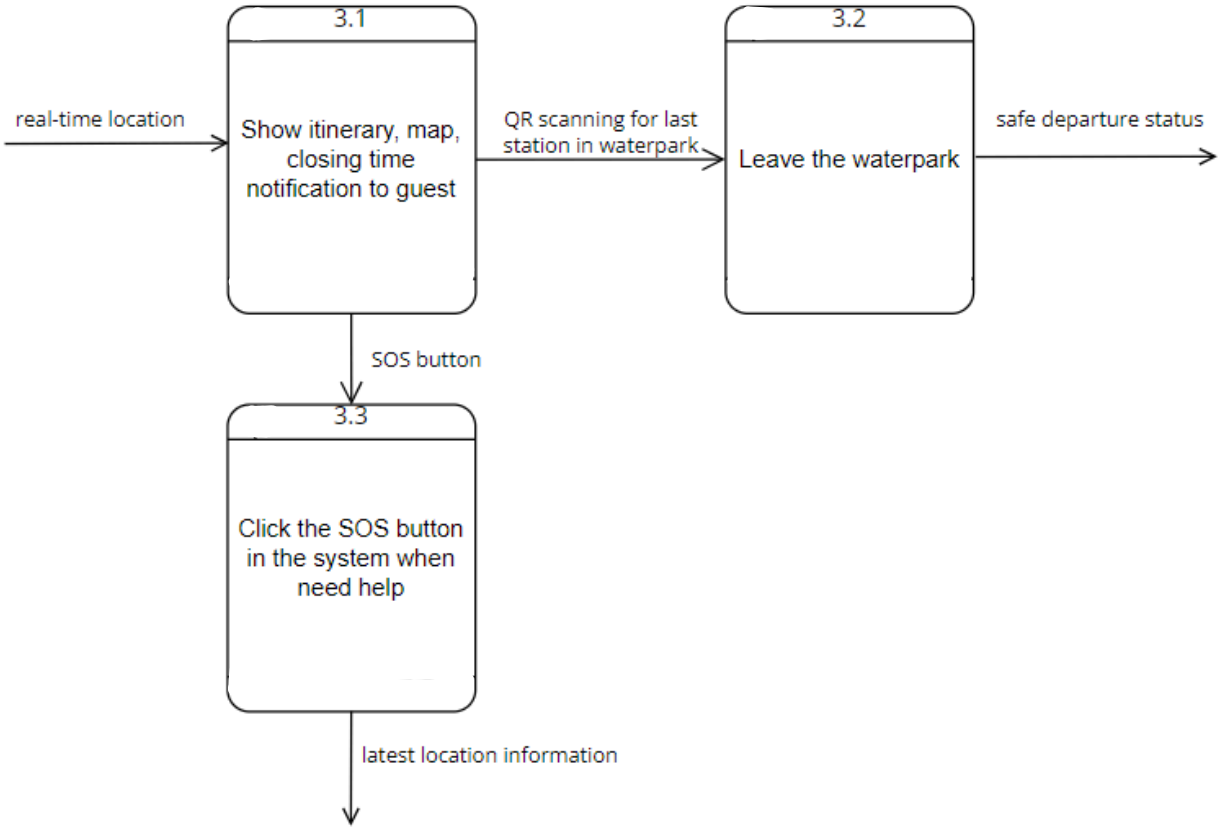

Personal information, facial recognition
1.0
Login to Easytrack
Guest information
1
Guest record
Guest list update
Guest
2.0
Search and view guest information
location information
2
Guest location record
QR location information
Updated location
3.0
Tracking real-time information
current location
real-time location
Waterpark management
latest location information
4.0
Send nearest rescue team
nearby rescue team location
Guest safety status
accident report
3
SOS alerts, incident reports

Child diagram

Process 1: Login to Easytrack



Process 3: Tracking real-time information



6.2 Process Specification (based on Logical DFD TO-BE)
Structured English is used to model and illustrate the process of the Logical TO-BE system based on the Logical DFD TO-BE.

6.2.1 Manage Guest Information

DO
READ login credentials
BEGIN IF
IF received valid credentials
    Access Easytrack system
    Customize system settings based on user preferences
    Select important options (Name, Phone number, Date, Time record, Real-time tracking)
    Store customized settings in database
ELSE continue
END IF
IF search for guest information
    Read guest information from database using search input
    Display guest information on screen
ELSE continue
END IF
IF real-time tracking enabled
    Click tracking link
    Start tracking guest's location
    Display real-time location information on screen
ELSE continue
END IF

END

6.2.2 Record Guest Entry and Movement

DO
READ guest-provided information
BEGIN IF
IF valid information provided
    Store guest information in Easytrack
    Scan QR code at entry
    Record guest entry time and information in system
ELSE continue
END IF
IF guest moves within park
    Scan QR code at various locations
    Record location and time in system
    Update real-time tracking information
ELSE continue
END IF
IF guest presses SOS button
    Retrieve guest's real-time location
    Send alert to rescue team with guest's location and SOS signal
    Display guest's location and status to rescue team
ELSE continue
END IF
IF closing time approaching
    Notify guests of closing time
    Display exit instructions on screen
ELSE continue
END IF
IF closing time
    Ensure all guests have exited
    Record guest exit time
    Update system status to reflect guest exit
ELSE continue
END IF

END

6.2.3 Locate Missing Guests

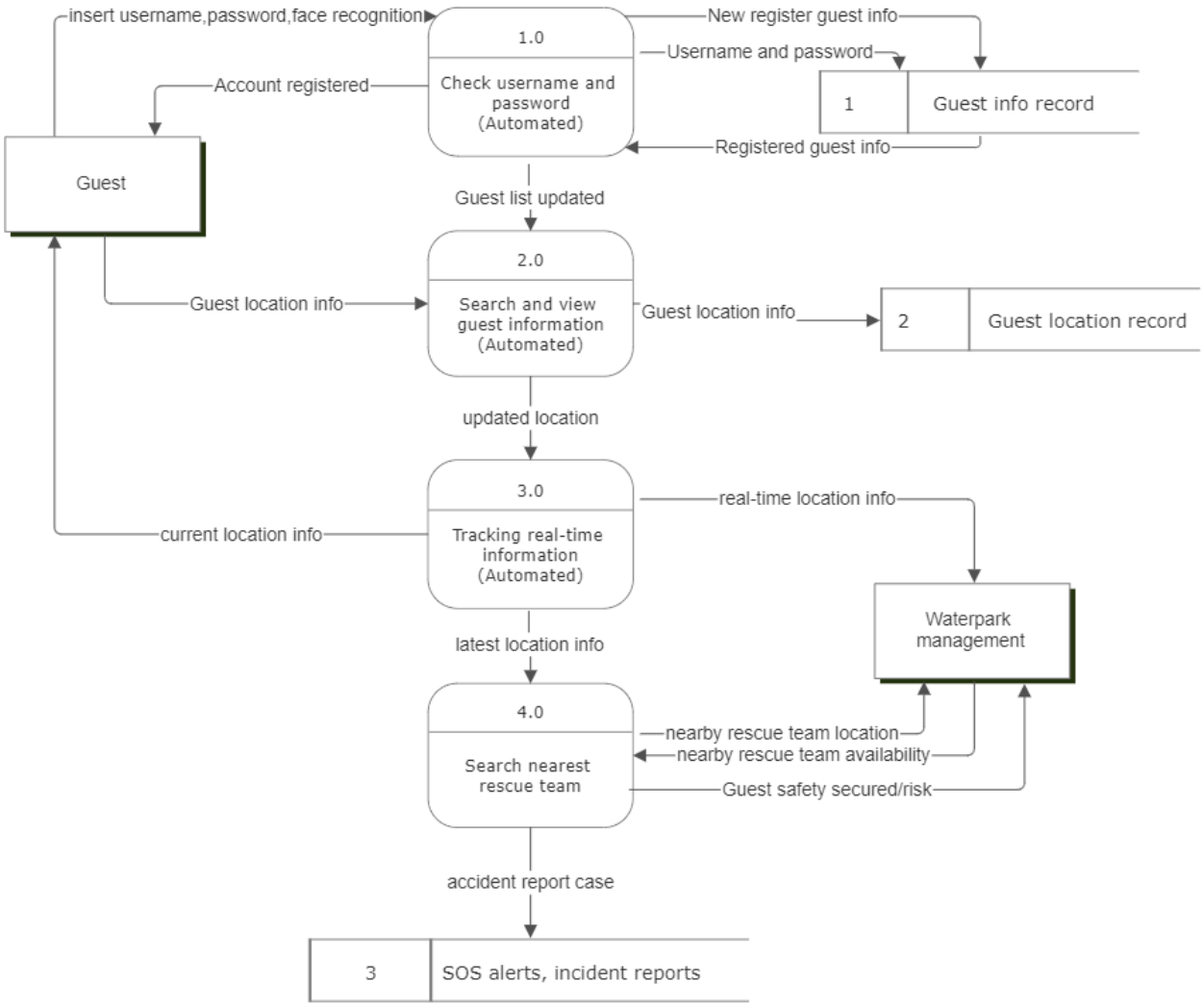
DO
READ patrol schedule
BEGIN IF
IF patrolling area
    Monitor guest activity
IF SOS button pressed
    Retrieve guest's real-time location from Easytrack
    Alert rescue team with guest's location and SOS signal
    Display guest's location and status to the rescue team
ELSE continue
END IF
IF closing time
    Ensure all guests have exited
    Record rescue team exit time
    Update system status to reflect team exit
ELSE
Continue
END IF

END

7.0 Physical System Design

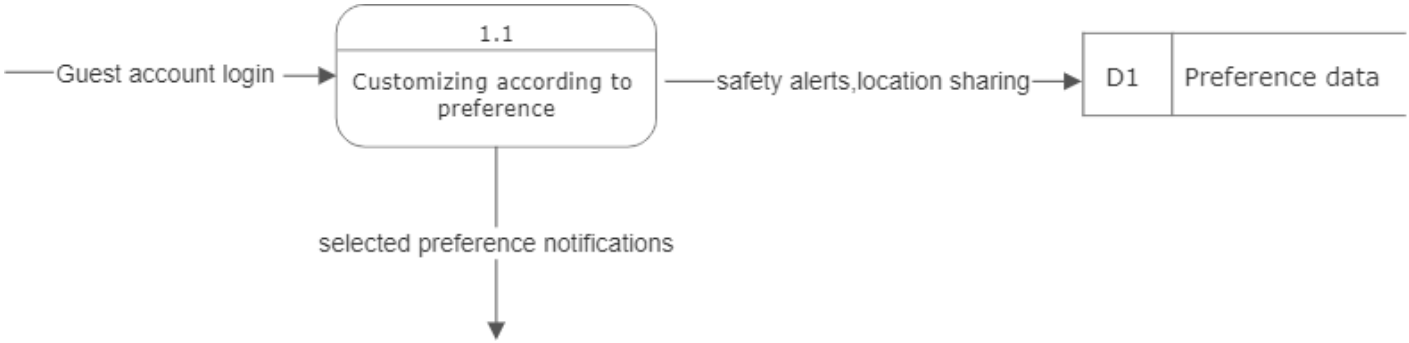
7.1 Physical DFD TO-BE system

7.1.1 Level 0 Diagram

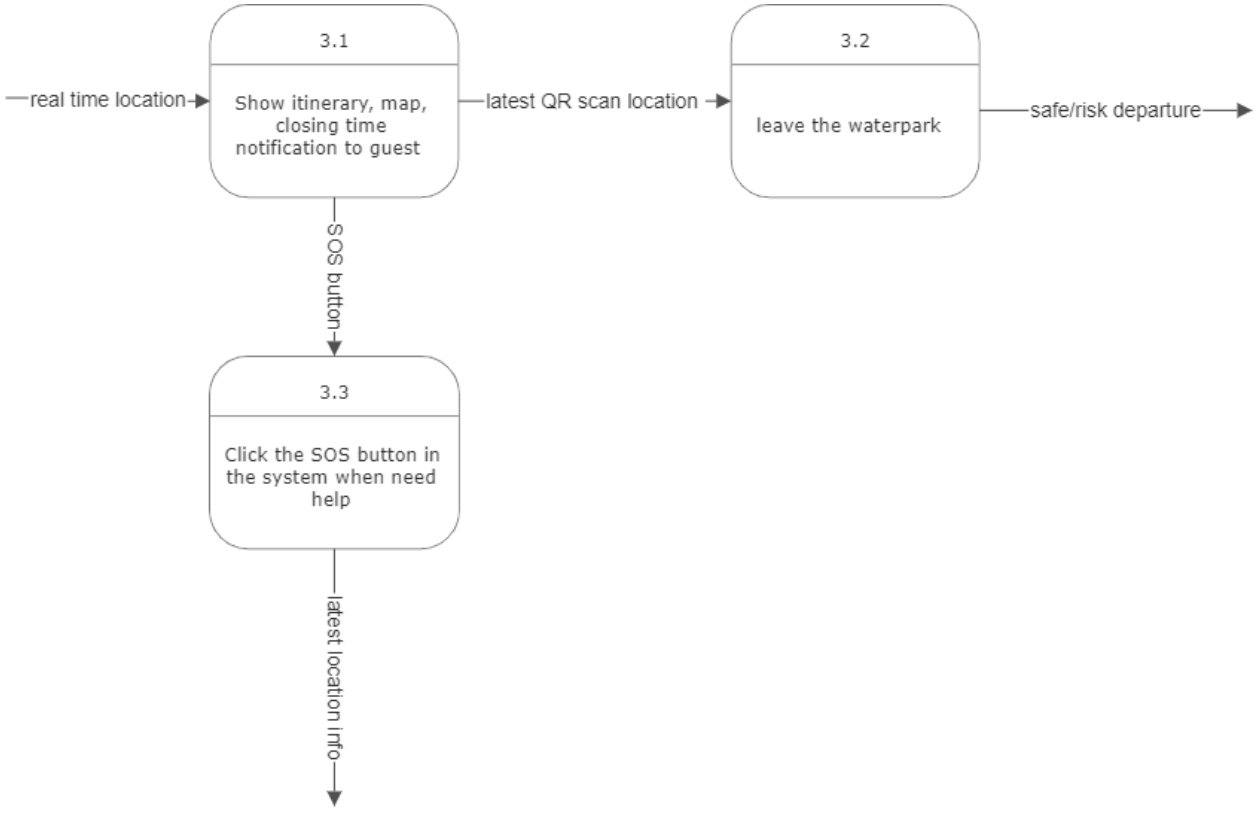


7.1.2 Child diagram

Process 1: Login to Easytrack

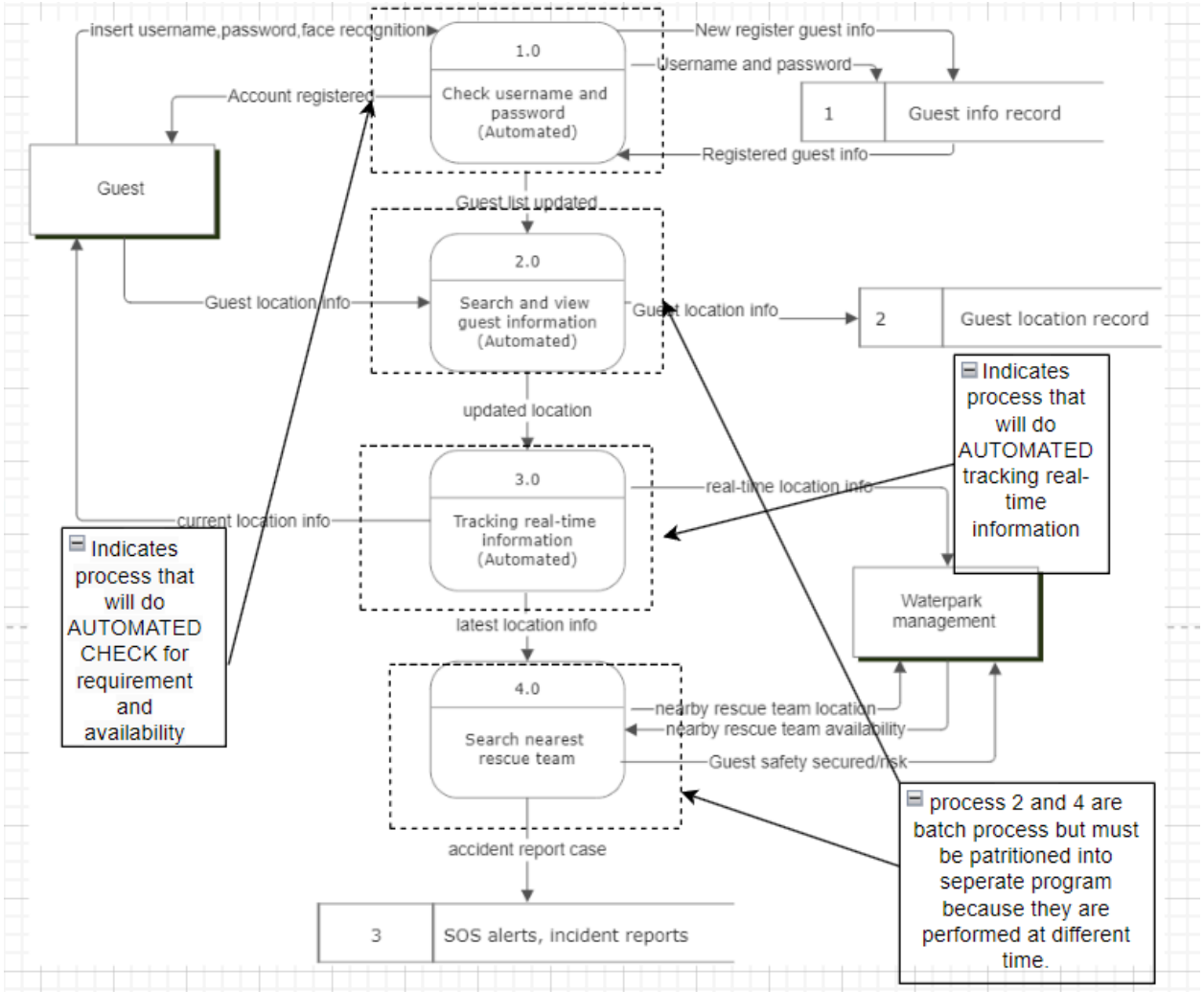


Process 3: Tracking real-time information



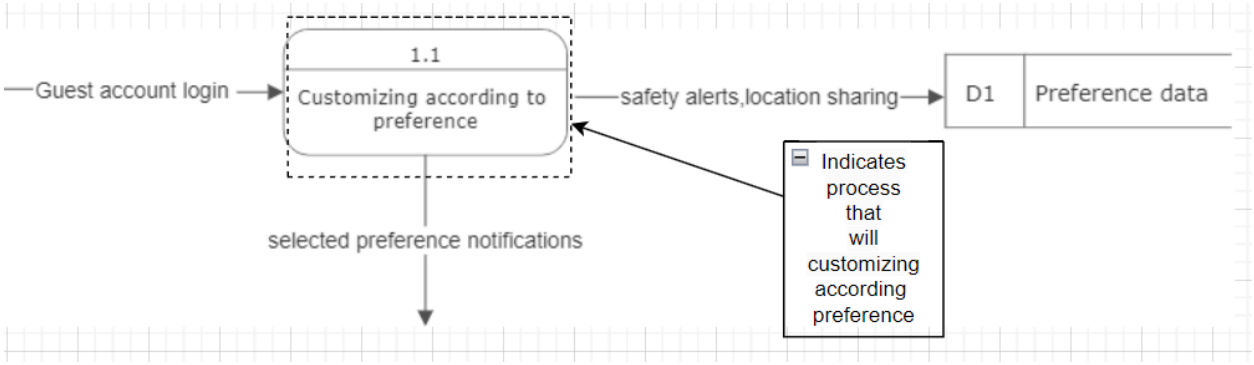
7.1.3 Partitioning

Diagram 0

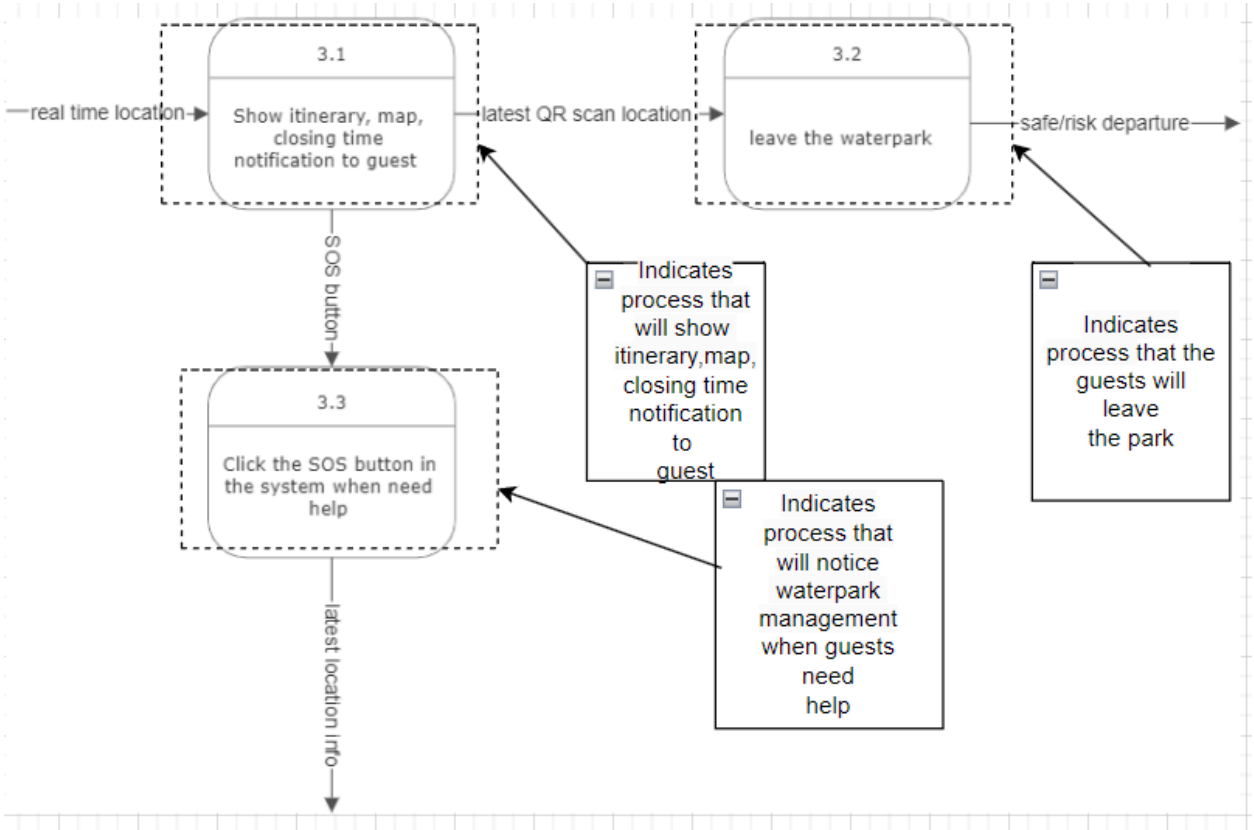


Child diagram

Process 1: Login to Easytrack



Process 3: Tracking real-time information



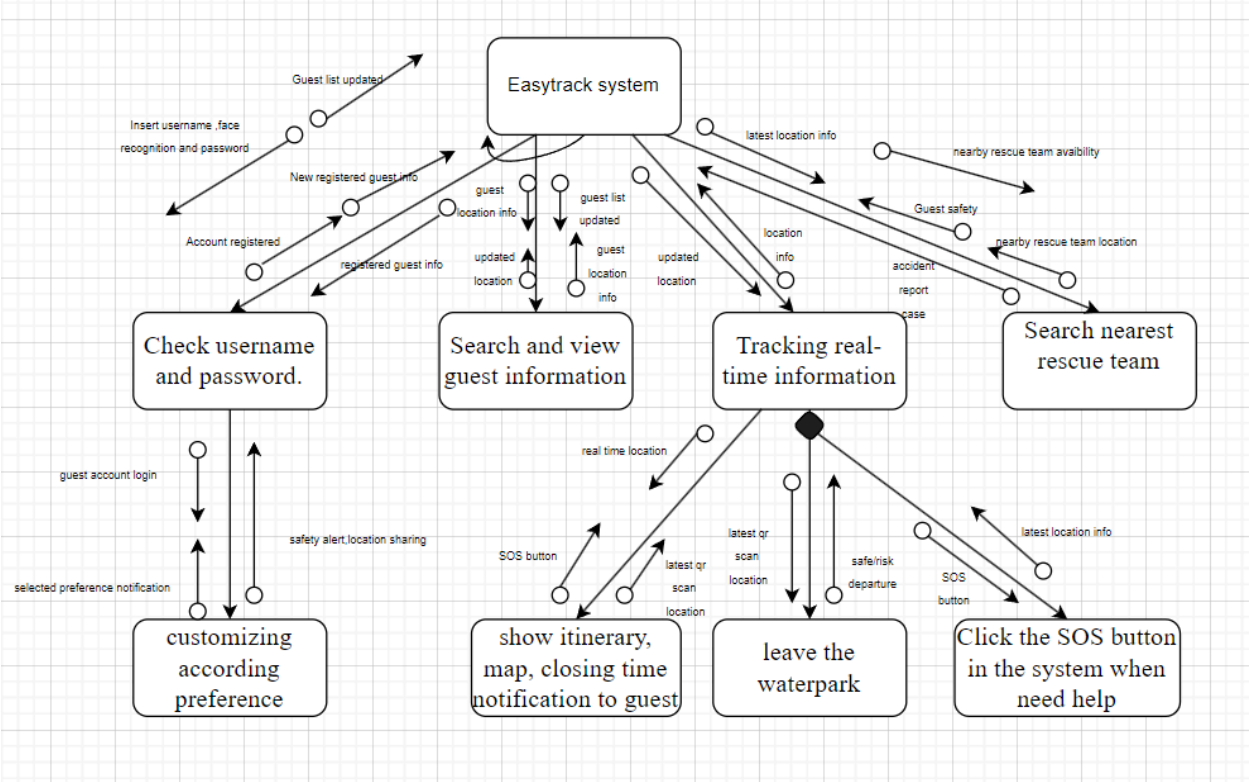
7.1.4 CRUD Matrix

Activity	Guest info	Guest location	Incident report	Rescue team location
Guest login	R	R		
Search and view guest information	CU	CU		
SOS alert			C	
Tracking real-time information		RU		
Search nearest rescue team				R
Leave theme park	D	D		

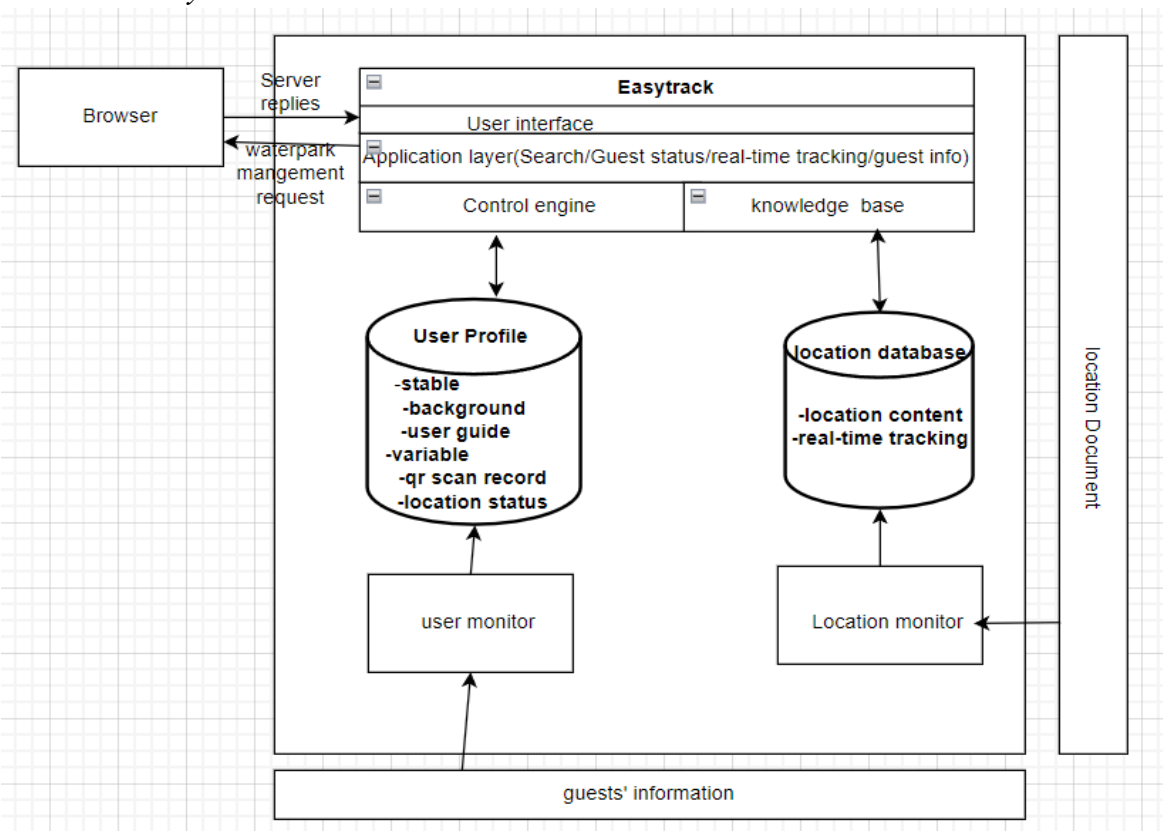
7.1.4 Event Response Table

Event	Source	Trigger	Activity	Response	Destination
Guest login	Guest	Insert username,password,face recognition	Check username and password. Account registered	Account registered	Guest
Guests search and view guest information	Guest	Guest location info	Search and view guest information		
Guests use qr scan location	Guest	Real-time location info	Tracking real-time information	Real-time location info	Waterpark management
Waterpark management send guests' location to the nearest rescue team	Waterpark management	Nearby rescue team location Guest safety secured	Search nearest rescue team	Nearby rescue team availability	Waterpark management

7.1.4 Structure Chart



7.1.5 System Architecture

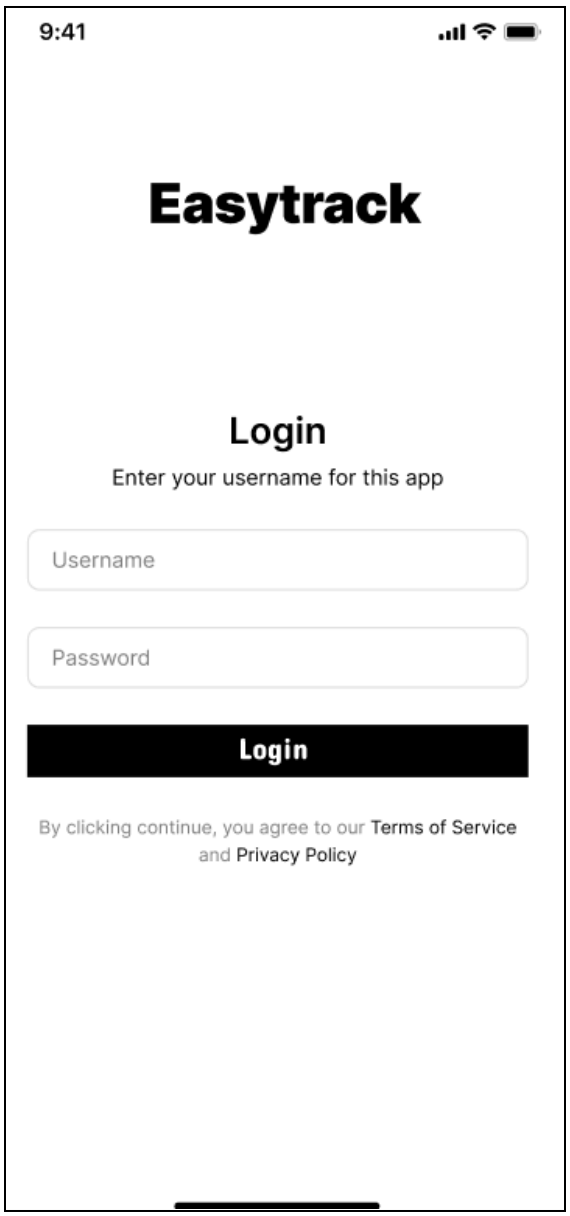


8.0 System Wireframe

8.1 Input Design

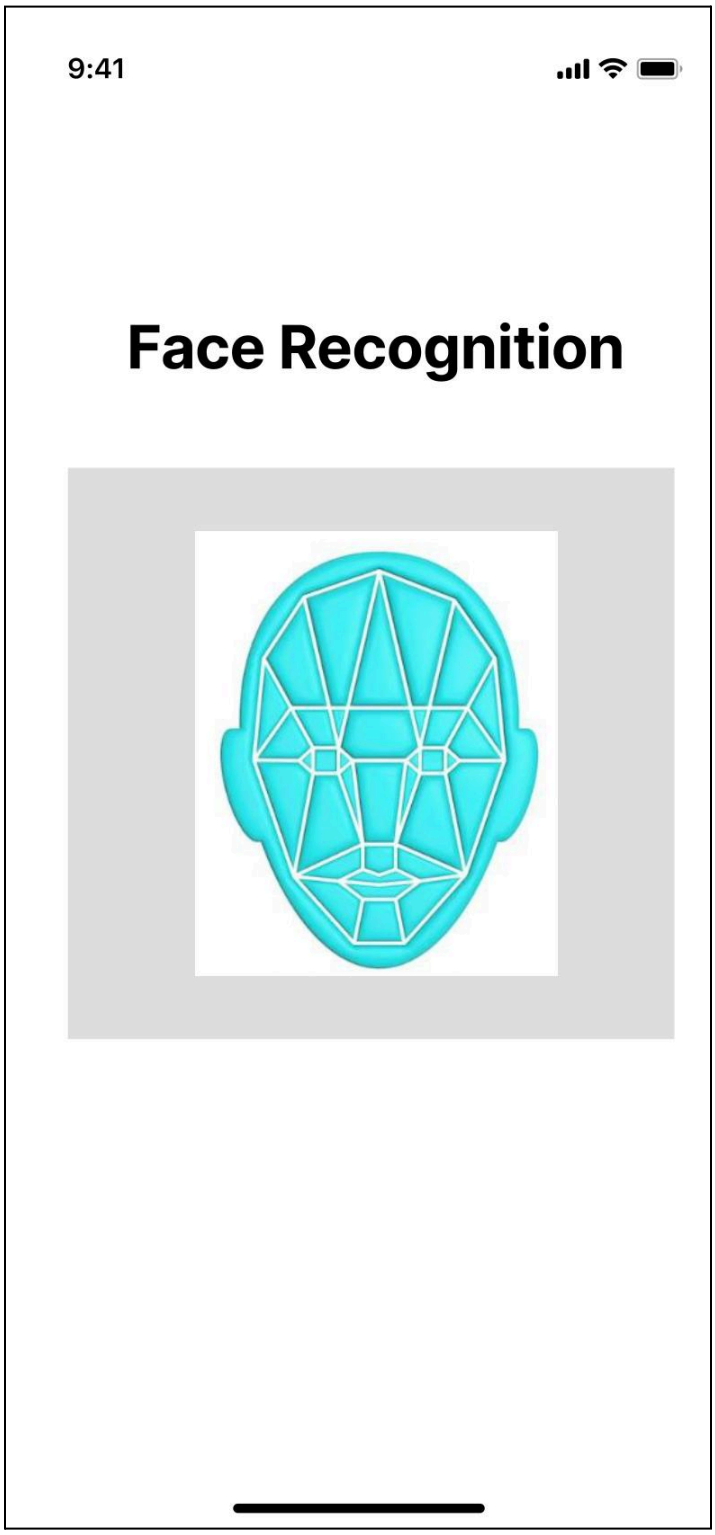
8.1.1Guest's view

1) Login page



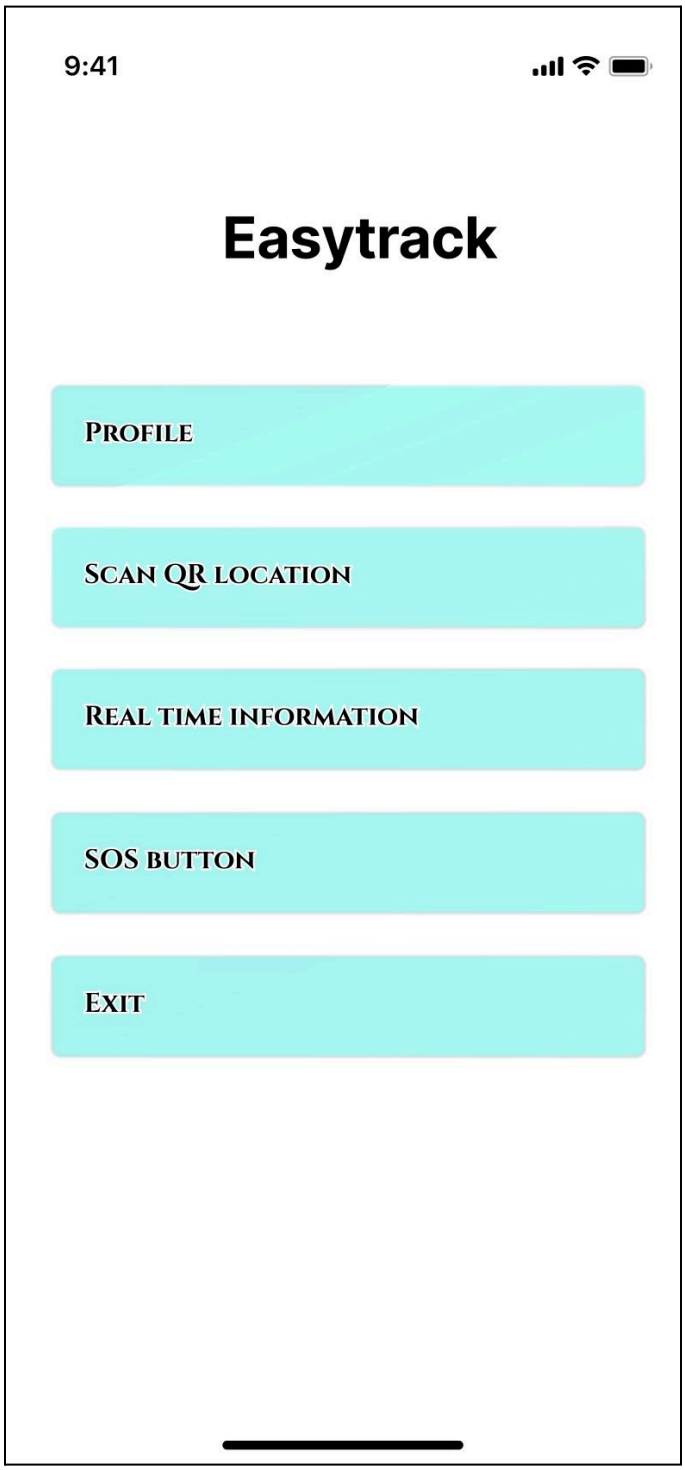
Description: Guests can log in Easytrack from here with a valid username and password.

2) Face recognition



Description: Guests need to complete face reading to complete his/her profile setup.

3) Main menu

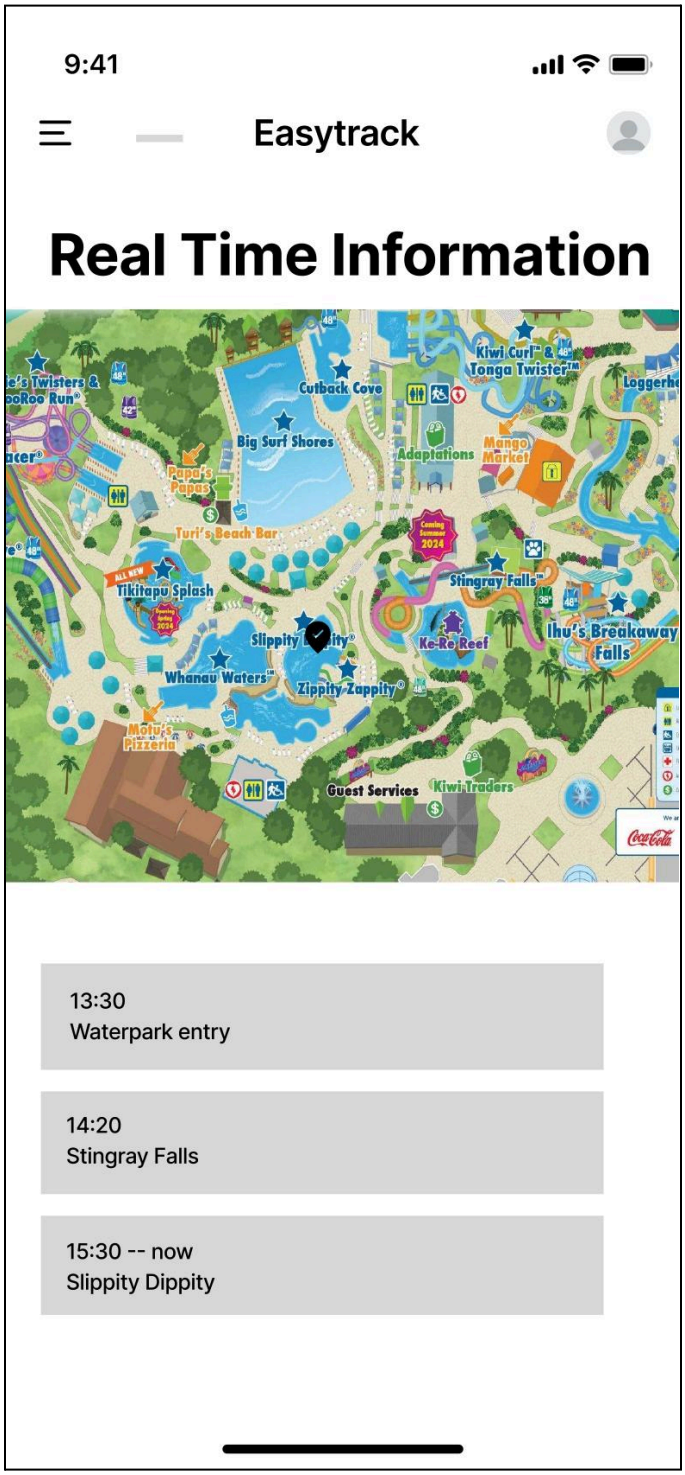


Description: After user log in to the system, there will be provided 5 functions, which are profile, scan QR location, real-time notification, SOS button and exit.

4) Scan QR location

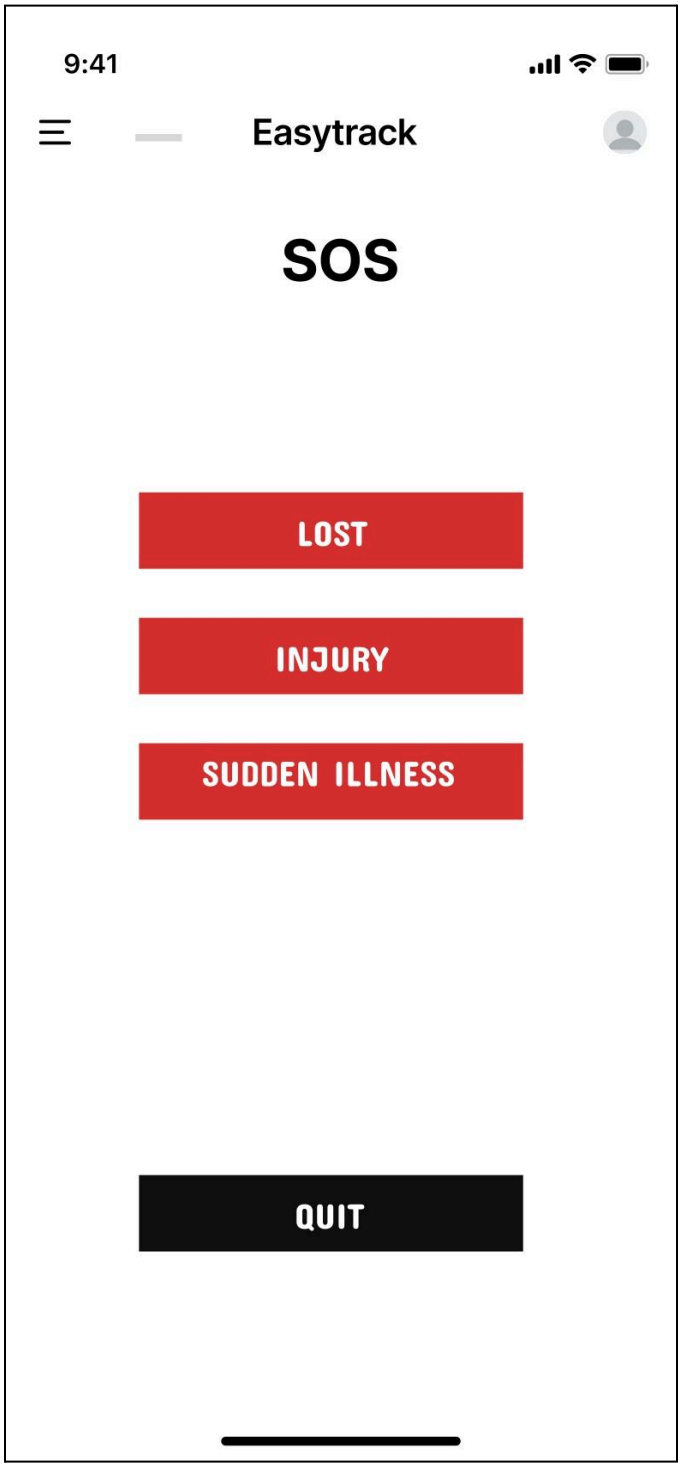
Description: Shown a scanner for guests to scan the latest visited location in the waterpark.

5) Real-time information



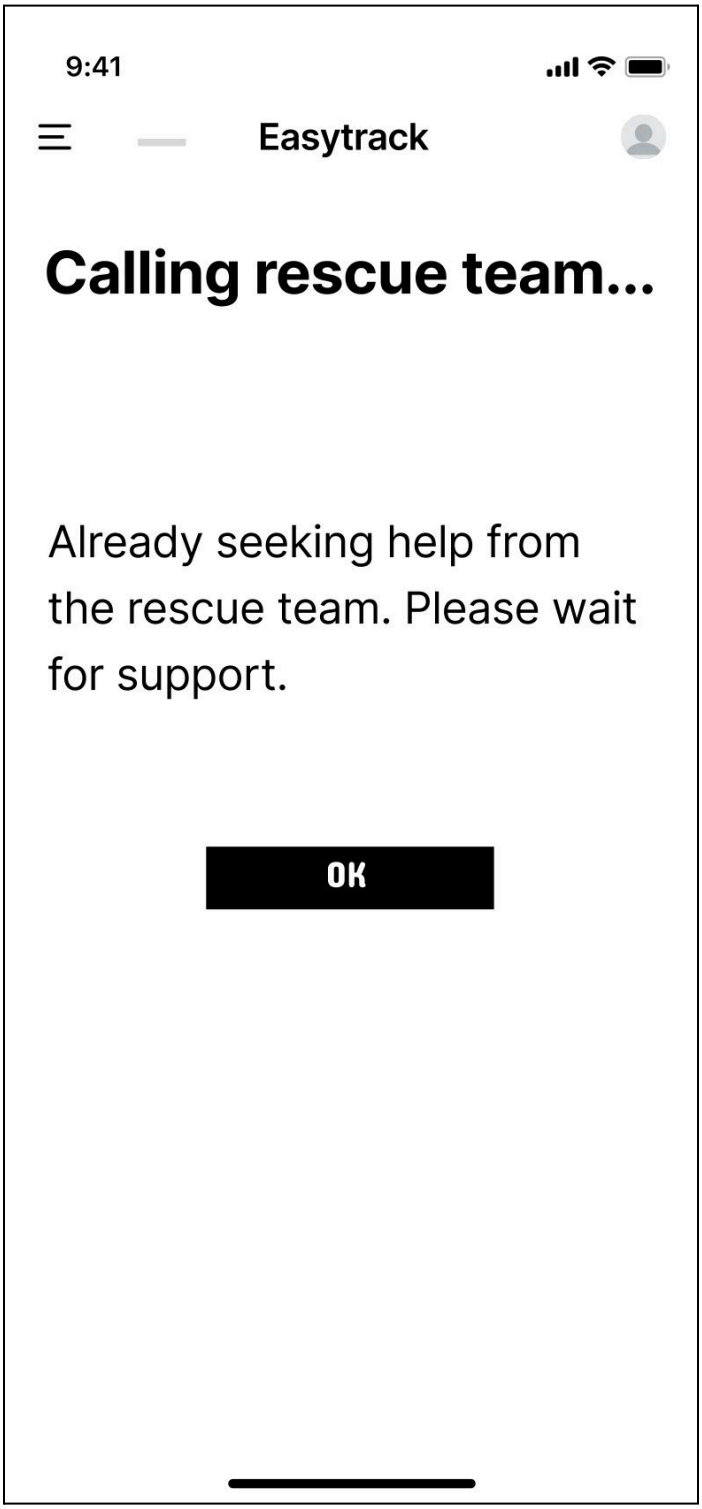
Description: Show guest's itinerary and map of the waterpark.

6) SOS Button



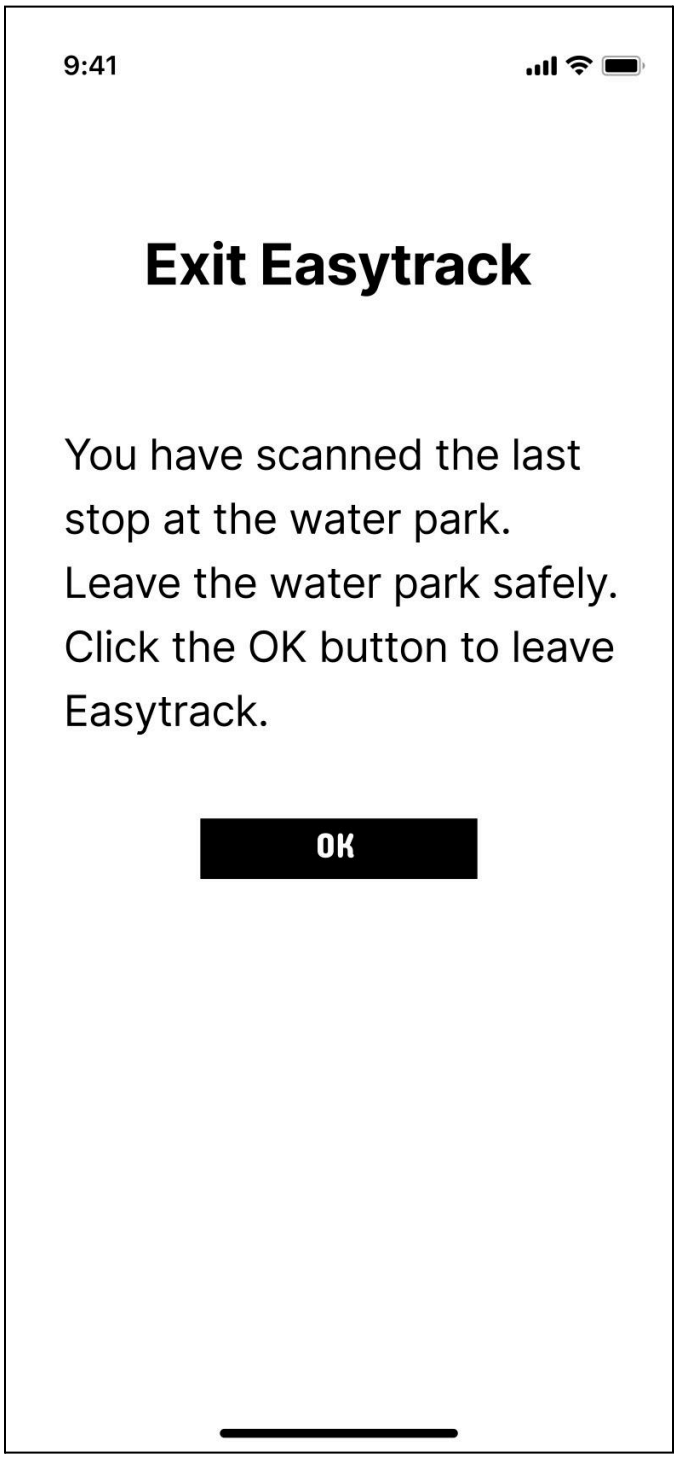
Description: Guests click the SOS button when they need help.

7) Calling rescue team



Description: Show to the guest that the system had called for help.

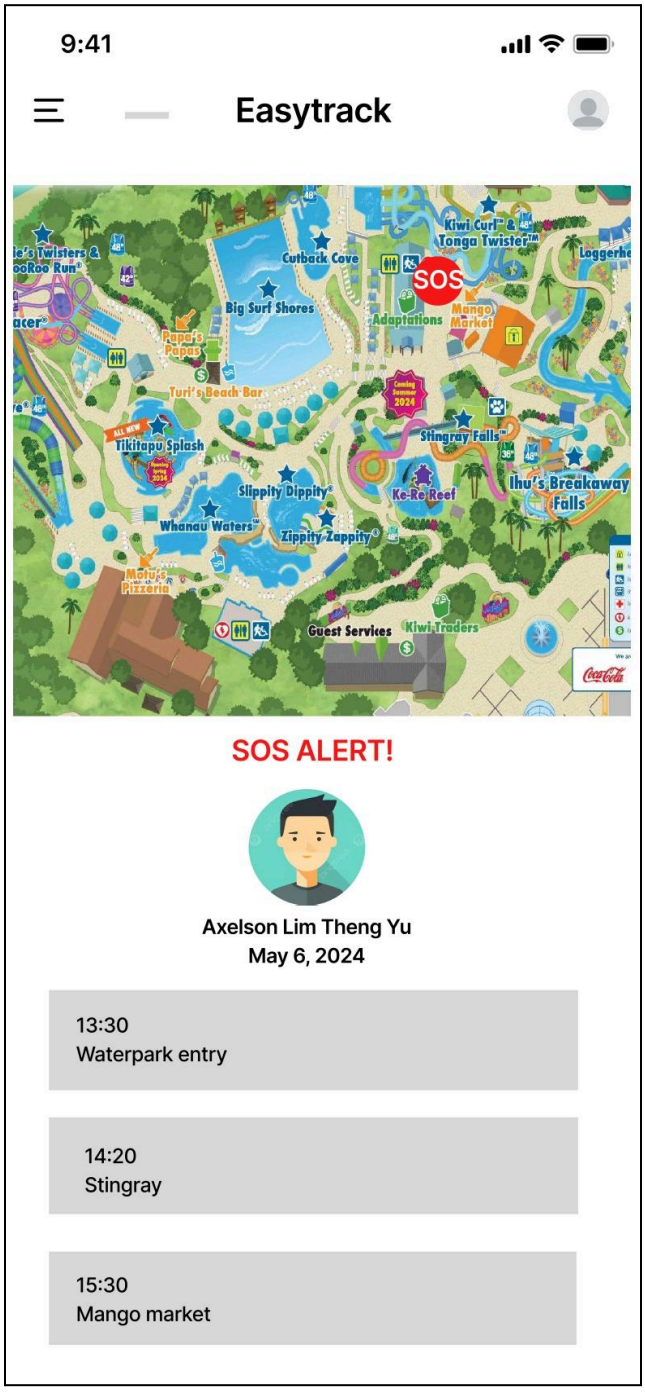
8) Exit system



Description: Guests will exit the system when they are leaving from the waterpark and scanning the last QR code of the entrance.

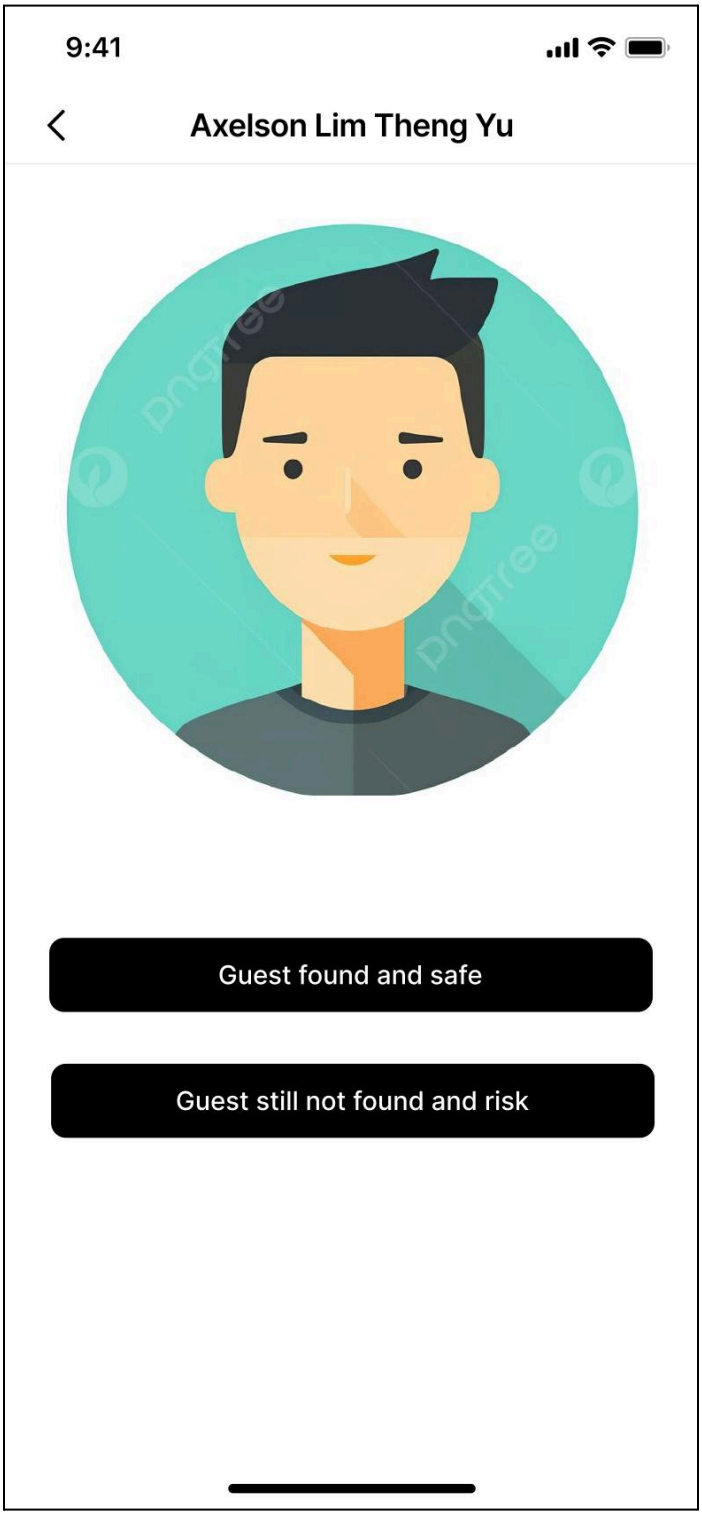
8.1.2 Rescue teams' view

1)SOS notification



Description: The nearest rescue team will receive SOS notification and guest's location

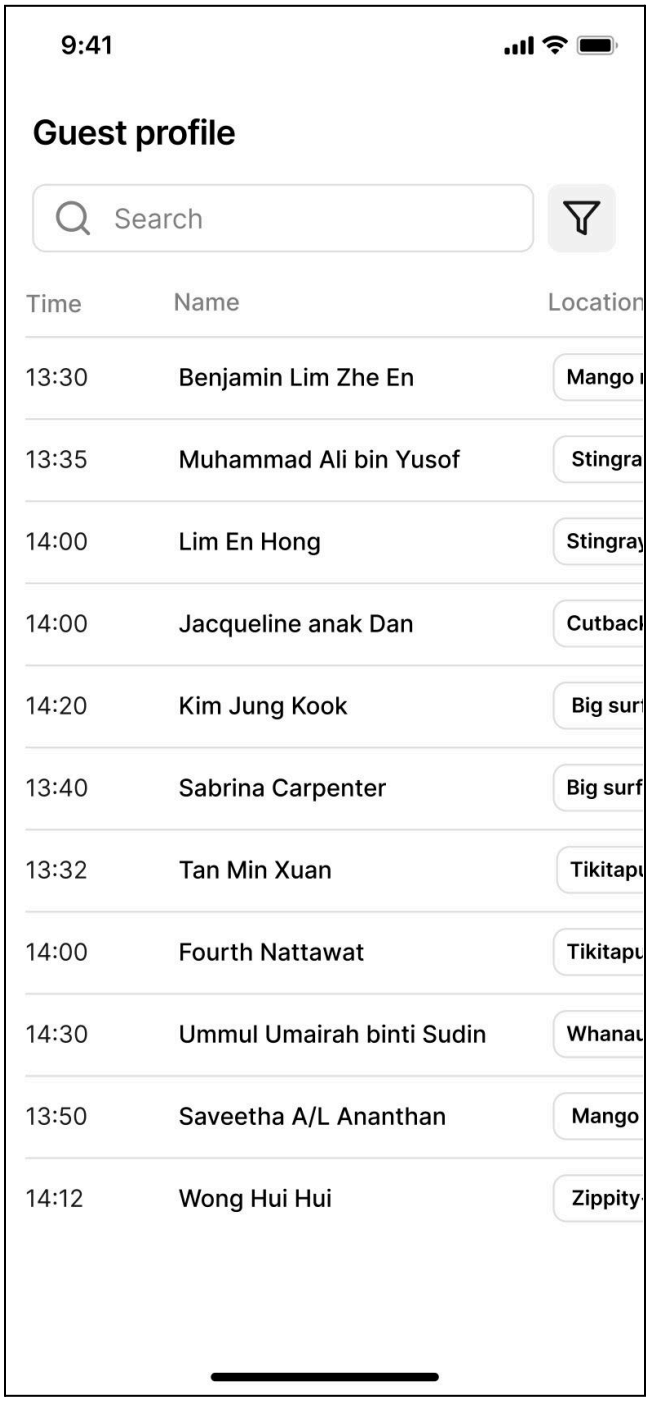
2) Update guest status



Description: After the rescue team gives help to the guest, they will update the guest status.

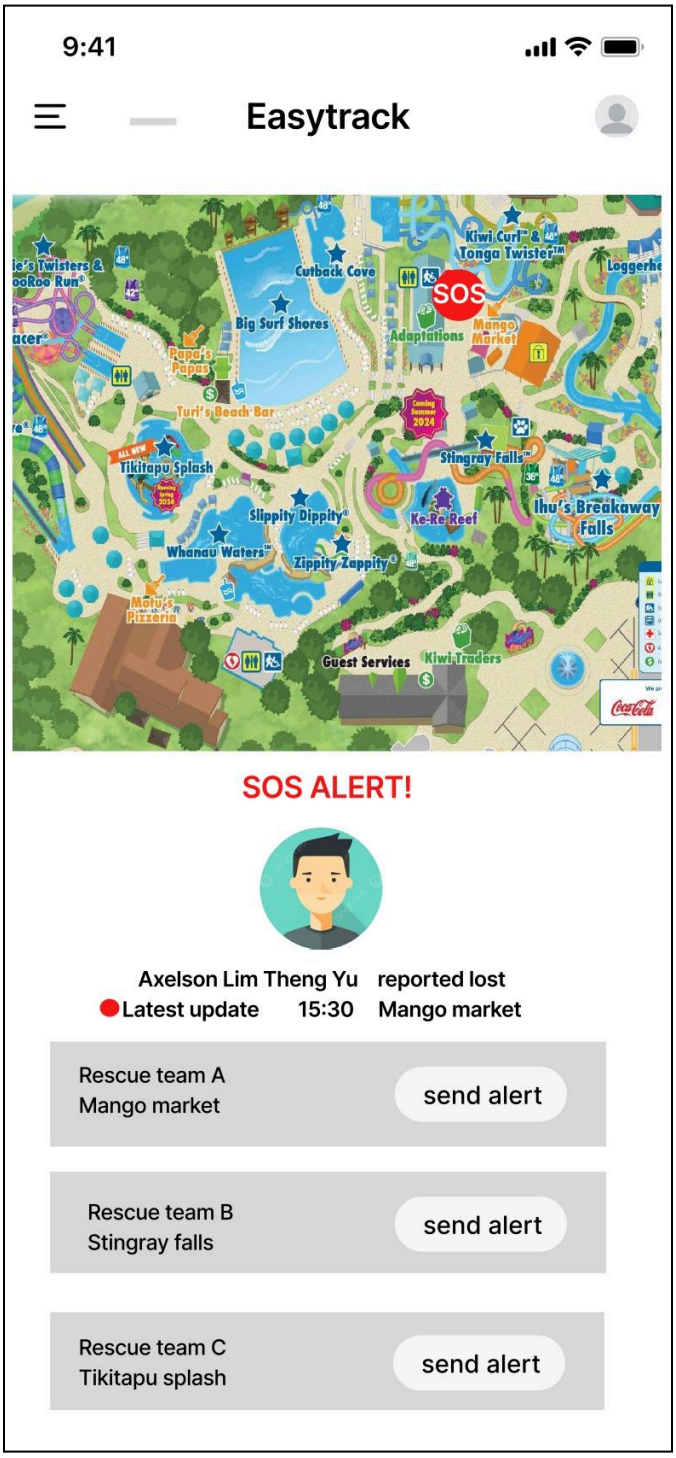
8.1.3 Management team' view

1)Guests' information



Description: Management team can search for the guests' information.

2) Receive SOS information and notify nearest rescue team

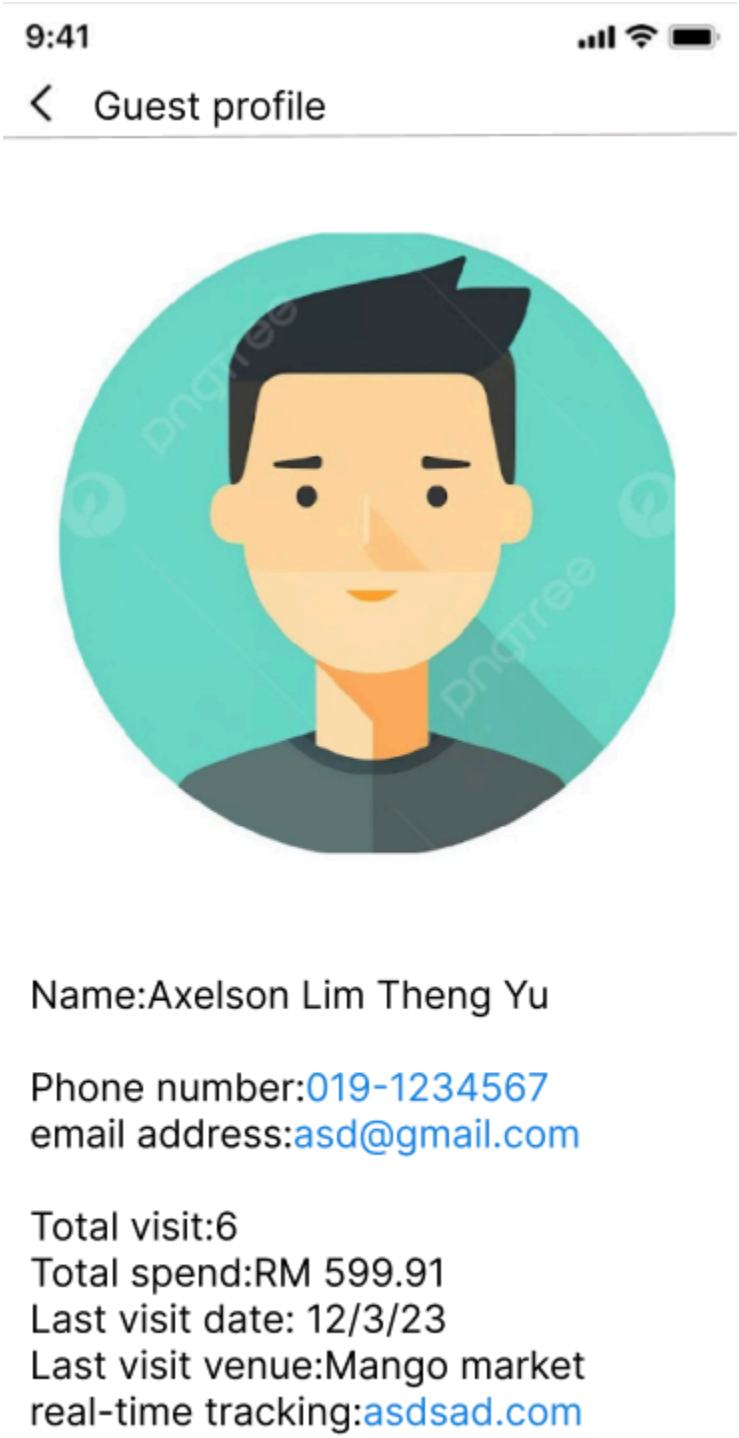


Description: Management team receive SOS information from guest and notify nearest rescue team to give help to the guest.

3) Receive guest status and location from rescue team

Description: Management team receive guest status and location from rescue team

8.2 OutputDesign
Guest info



Guest profile report

	Name	Phone.number	email.address	Total.visit	Total.spend.RM.	Last.visit.date	Last.visit.venue	real.time.tracking
1	Lim hui hui	123-4567890	asdsd@gmail.com	3	234	12/3/2022	Mango market	asdasd.com
2	asdfq	345-1234567	asdfq@gmail.com	2	123	12/3/2022	Stingray Fall	asdasd.com
3	asd asd	123-1231232	lasdlss@gmail.com	6	876	12/3/2022	Stingray Fall	asdasd.com
4	wer ewr	234-2342343	asdsjld@gmail.com	3	675	12/3/2022	Mango market	asdasd.com
5	qwe qwe	123-1232345	ayuisd@gmail.com	2	678	12/3/2022	Kiwi Traders	asdasd.com
6	lkj jkl	546-4564565	asyuiy@gmail.com	12	2342	12/3/2022	Kiwi Traders	asdasd.com
7	gvc	789-8997898	ertd@gmail.com	5	678	12/3/2022	Mango market	asdasd.com
8	klhtfh	789-8908909	tyutyu@gmail.com	3	236	12/3/2022	Whanau waters	asdasd.com
9	sadkjn	345-5676876	cbvd@gmail.com	4	747	12/3/2022	Mango market	asdasd.com

9.0 Summary of proposed system

Thus, our group has a complete analysis and design phase. In this phase, we show how *EasyTrack* can be done by the user. We have done workflow for several scenarios, logical DFD (AS-IS System) and logical DFD TO-BE system. Based on the logical DFD TO-BE system, we have done process specification on three different scenarios which are to manage guess information, to record guest entry movement and to locate guest missing. We have also done a physical DFD TO-BE system to show how the logical processes will be implemented. In the system wireframe part, we provide images that we expect in the user interface from the point of view the guest and the point of view of the management team member.