AMAZON GO

SOFTWARE REQUIREMENTS SPECIFICATION

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1. Introduction

This is a Software Requirement Specification (SRS) document for Amazon company's Amazon Go system. In this document the software of the Amazon Go project has been described.

1.1 Purpose

By taking out the cashiers and the machines that read the product to calculate the cost of the products, Amazon Go makes the shopping easier with no lines to pay. Just walk out fashion of shopping provides and aims to give customers a better shopping experience with no lines to wait and provides a better payment method. Moreover, the investors are no more need to worry about the burden of the salary of the cashiers are gone.

1.2 Scope

The scope of Amazon Go is to provide customers a faster and more comfortable shopping. When a customer want to shop in Amazon Go he/she will need three things.

- Amazon Go app downloaded to his/her mobile phone.
- A credit card that is defined to the Amazon Go app.
- A generated QR code to check in the store

Amazon Go system has also a store staff to help customers when needed. In addition, there are other store staffs to provide the products to the store when there is no product.

The process goes like below

- Customer opens the app in his/her mobile phone and generate a QR code to check in the store and enters the store by using his/her QR code.
- When the customer takes a product the cameras and the sensors see the customer and the product and adds the product to the customer's Amazon Go application. While shopping occurs the database of the products will be updated.
- If the customer later decides not to take the product and leaves the product, again the cameras and sensors realises this and takes out the product from the customer's app. Store staff will be notified when there are not enough product available for consumers.
- After he/she completed his/her shopping he/she just leaves the store.When the customer leaves the store the cameras see that and take the payment

automatically from the credit card that defined to the customer’s Amazon Go application.

1.3 Product Overview

This part is for giving an overview about the system. In this part, you will learn general information about the system.

1.3.1 Product Perspective

Amazon Go is not a part of another bigger system but a system on its own. Of course, it gets help from other systems and companies such as banks, product owners and Amazon user accounts. Banks are for withdrawing the money from the customer, product owners are the suppliers of the products that will be sold in the store, and Amazon user accounts works for Amazon Go too. Since this is a system on its own, it consists of all the things it needs, such as user interface, worker interface, image processing systems, databases for products and users, web server. The users will use their Amazon account to use the store. The link of Amazon is https://amazon.com , in the upper right part, you can see the sign in part, and when you bring the mouse on it, you can see “start here” button which is used for signing up. Also Amazon application and Amazon Go application in order to sign up. For the staff, there will be another interface to let them work. The main and hardest part of the system is image processing software and the coordination of the system between the cameras and the sensors in the shelves.

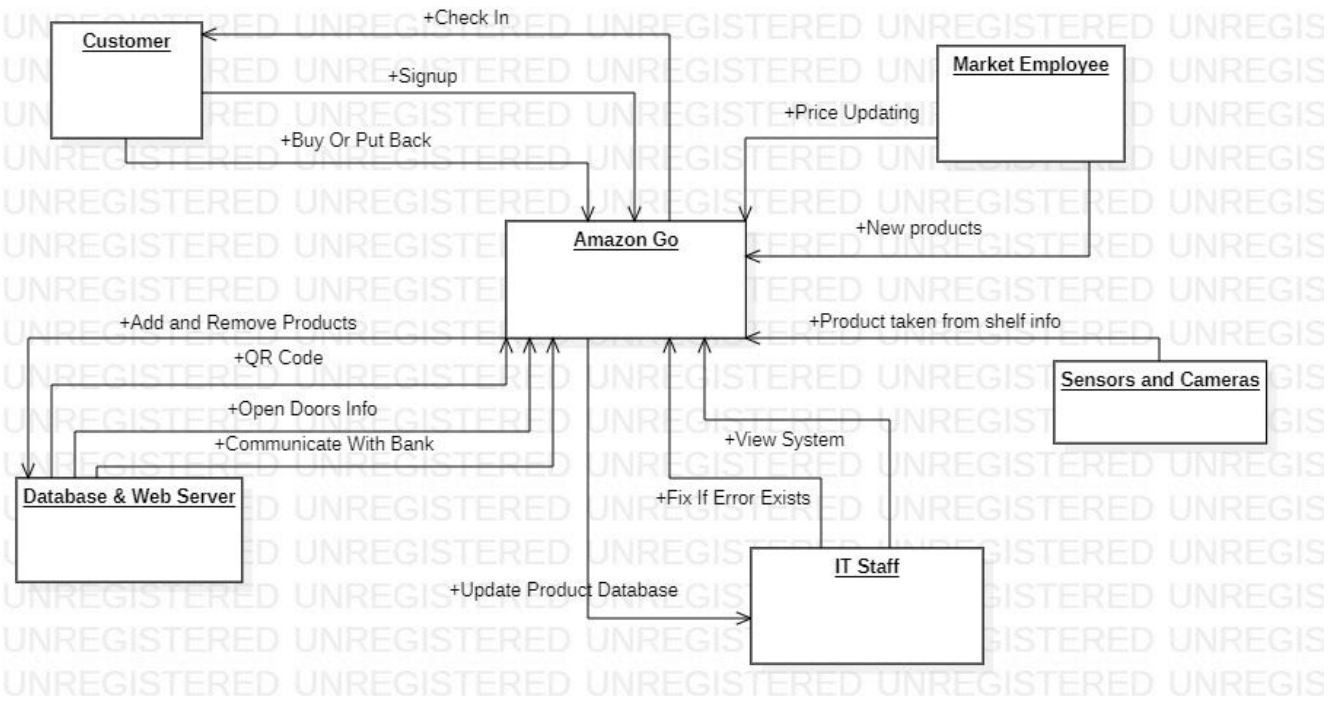

Figure 1: Context Diagram

1.3.1.1 System Interfaces

Amazon User Account API: Amazon Go communicates with Amazon, in order to save users to its database. Pictures, names, account informations of the user are got from the Amazon to the database.

Cameras and Sensors Interface: Cameras and sensors use complex software in order to track every detail in the store. The software updates the virtual shopping cart of the customer according to the things that the customer has bought and put back. The customer may put the things in different places and the next customer can take it from there. The software handles these. In some situations customers may want to buy products for their friends. For that to happen, it is needed to design our software in the way that when a person takes a product, it is added to the taking person's shopping cart, not the person that he/she gave the product to. The last thing that software does is to send the details of the shopping to the customer after they leave.

Worker Interface: Workers need to put new products in the shelves and make the system know that. In some situations, workers may need to change the places of the products. The other thing is, workers need to add new products and introduce these products to the system so the database is renewed.

Banking system API: After the shopping occurs, the customer needs to leave the store. After leaving the store, the system detects the leaving and informs the

system. After that the system communicates with the banks, in order to withdraw the cost of shopping.

1.3.1.2 User Interfaces

The user interfaces of Amazon Go can be viewed as 5 main parts:
1-No-member user
2-Customer
3-Market Employee
4-IT Staff
5-System Admin

No-member user: Customers first need to sign up to the system and add their bank card informations in order to be able to shop. Even before the registration, it should be better to give the users a quick explanation on how to use it. After the registration part, the application asks for bank card informations of the user. The user needs to add at least one payment method in order to be able to enter to stores. The user can update their payment methods (add/remove). But, when there is no payment method, the user mustn't be able to enter the store.

Customer: In the application, customers can look at the locations of the stores and look at their current and past receipts. They can have help from the IT staff and sign out when they want. The QR code always appears in front of the app for simplicity and easiness. When a customer is in front of a store, they can scan their QR to the QR reader in the entrance and the system recognizes the entrance, the software starts to track the customer. One of the most important details is that, the application has to send a notification to the user when an entrance happens for security reasons. One may get the QR code in some way and use it.

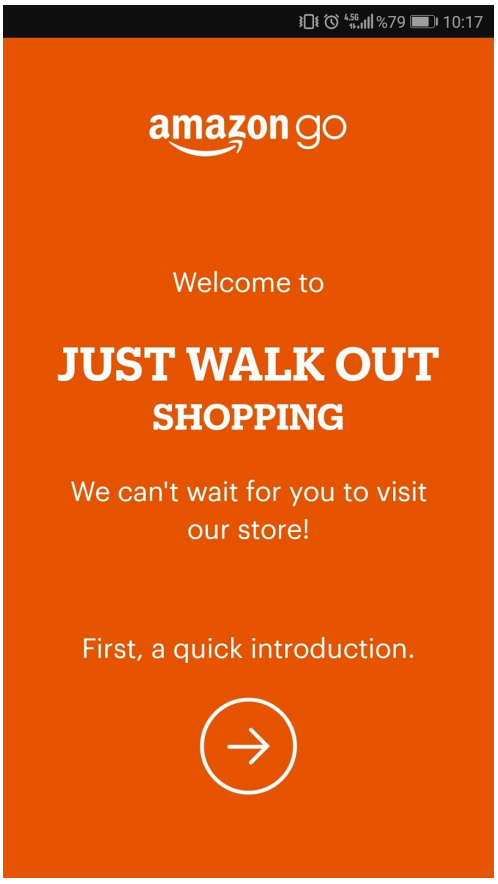

Figure 2: Quick Introduction Main Screen

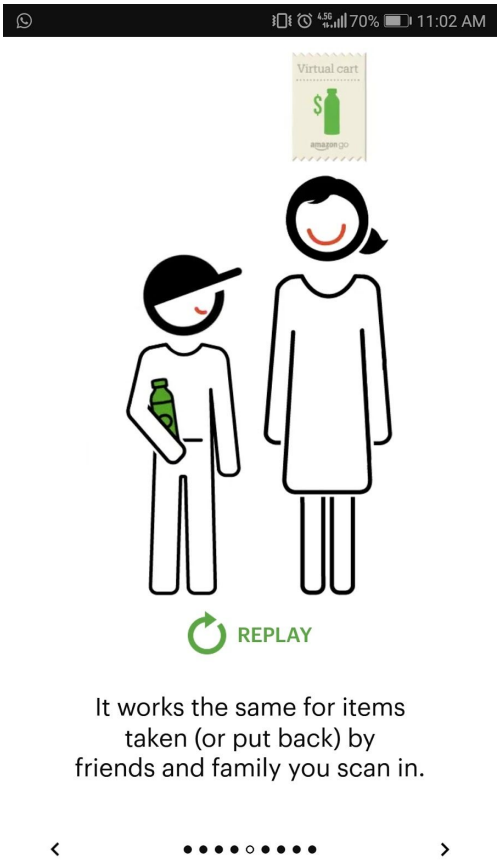

Figure 3: Quick Introduction-Continues

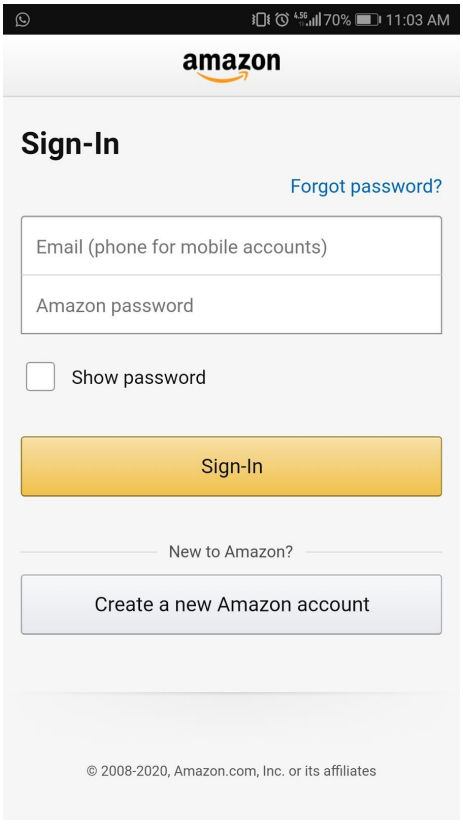

Figure 4: Sign-in Page

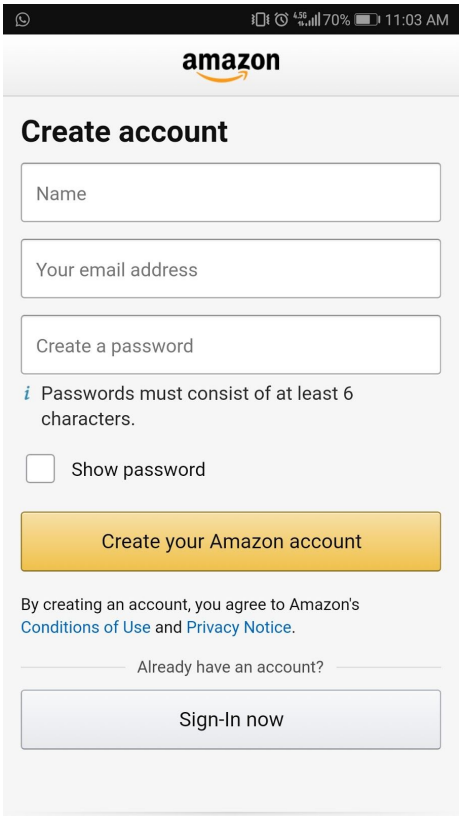

Figure 5: Sign-up page

After the entrance happens, customers may buy anything they want, the responsibility is to track every movement of the customer, and add it to the virtual shopping cart. And the customer just walks out. The receipt comes to the application. Even though we have a powerful software and hardware, in some situations we may face some mistakes. Even though we have a bare chance of mistake, we have to give the chance to delete the things that they say they didn't buy. Because we don't want to give the customers trouble of any kind.

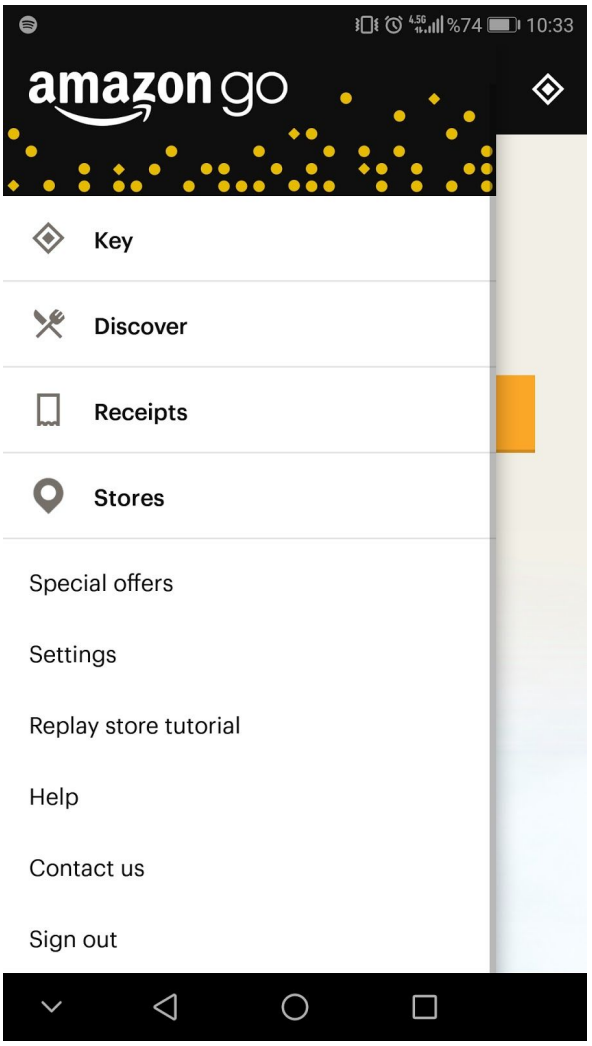

Figure 6: Inside The Application

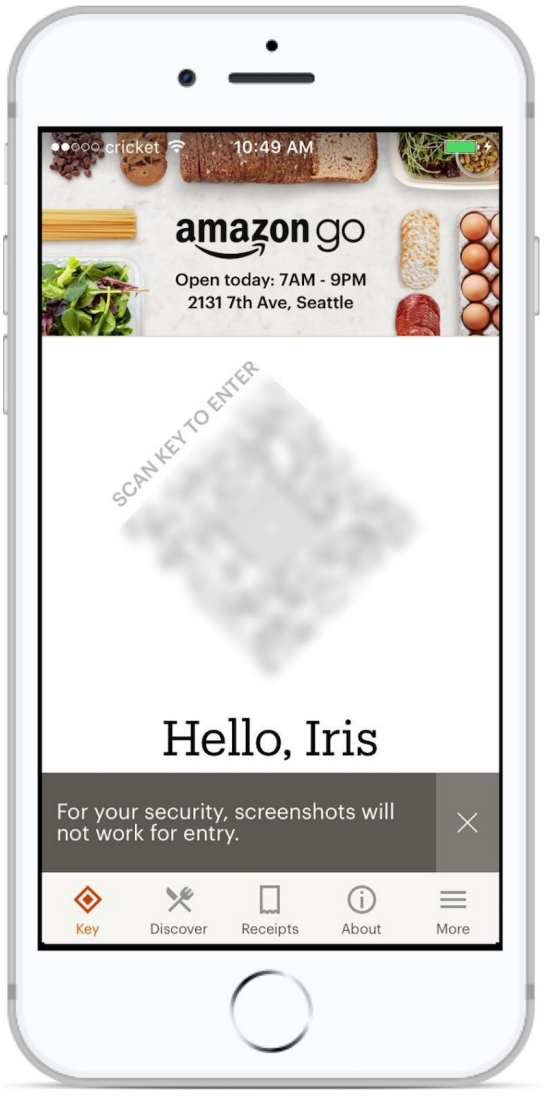

Figure 7: QR Code Page

Employee Interface: Employees will have another application/device in order to be able to add things to the shelves and change the locations of the products. Employees also update the prices of the products on the screens after communicating with the IT staff. Also the market will notify the employees when a product finishes on the shelves. In some situations, people may act weirdly, maybe scatter the products, the software may warn the employees.

IT staff:IT staff adds new items to the database and work with the market employees. It staff additionally updates the database like renew prices, add discounts etc.

System Admin: System Admin views the market, observe if there is any problem. The software warns the system admin in a different case like a customer scattering the products or changing the places of products desperately. System admin may inform market employee in these situations.

1.3.1.3 Software Interfaces

Database: Amazon Go uses databases in order to hold the products, barcode numbers, images of them and their prices, the customers, the past receipts of the customers as well as the IT staff, admins, employees, the amount of current products.

Application: Application is needed to sign-in, sign-up, add payment methods and use the store. The users may need to use other applications (such as mail app and messaging app) for confirmation but other than that the only thing a customer needs is the application. Application will have a tutorial on how to use the store. The main screen has the QR code identifying the customer.

OS: Operating system will be Android, Windows phone or IOS operating system.

Employee apps: Employees, IT staff and system admin will have another type of application/device in order to do their job. These apps will let them manage database, update products after informing the system.

Image Processing/Sensor Softwares: The hardest part of the system is this part. The system should detect every detail of the customers. The first thing the system will do is to save the posture of the new coming customer in order not to mix the customer with the others. It should look at every step of the customer. When the customer takes a product, it should detect it by using cameras and sensors and add it to virtual shopping cart. When they put the product back it should be removed from the virtual shopping cart.

1.3.1.4 Communication Interfaces

Amazon Go uses Local Network in order to detect the customer entrance, IT staff-employee- system admin communication but uses HTTP/HTTPS connection in order to inform the customer when entered to the store and to communicate with bank and send receipt after customer leaves the store.

1.3.1.5 Memory Constraints

The memory is needed in order to save the people's locations and movements. The total amount of memory should be large enough to hold the products' information, customers' information shopping details etc.

1.3.1.6 Operations

User Operations:

- Sign up
- Sign in
- Check in
- Buy
- Put Back
- Add-remove bank card details

Store staff operations:

- Add products to shelves
- Help customers

IT Staff:

- Update product databases
- Add items to database

System Admin:

- Fix it there is any errors
- View System

Sensors and Cameras:

- Send open the doors info, Customer got in-out info
- View customers
- Send products taken - put back info
- Update product database

These operations will be handled more deeply in Functions section 3.2.

1.3.2 Product Functions

No	Functionality	Description
1	Sign-up	Non-member users join to the project by downloading the Amazon Go app and giving their credit card information and register to app.
2	QR code	After signing up the Amazon Go app will generate a QR code for the user to enter the store.

3	Check-In	Member user get in the store by checking-in.
4	Open Doors Info	The entrance of the store has door and it opens automatically when customer gets in with a QR and opens again when the customer goes out
5	Update Product Database	When there is a new product to be selled in the store the IT staff will add that product to the database or when an existing product's quantity has been increased, it will be updated
6	View System	IT staff will be able to view the whole system to be sure that everything is okey.
7	Product Taken from shelf info	When a product taken from the shelf the cameras and sensors will know that product and add it to the customers' app
8	Add or Remove products to buy list	The products can be added to the customer's app when he/she take it or can be taken out from the customer's app when he/she leaves it
9	Adding New Product	Market employee will put the new product to the appropriate shelf and IT staff will update the database
10	Buy or Put Back	When a customer takes a product from the shelves the product's quantity will be decreased or if the product has been put to the shelves after it has been taken it's quantity is increased.
11	Fix If Error Exists	System admin will be notified or see the errors in the system and fix them by using his/her software skills
12	Communicate with Bank	After a user buys something from the store and leaves the store, the information on what he/she bought and the total price will be sent to the Web Server. Web Server communicates with the bank and withdraws the amount from the bank account.

Table 1: Product Functions

1.3.3 User Characteristics

The target user of Amazon Go system can be divide into 3 parts as non-staff members (end-users and workers), system admins and IT staff. IT staff should expertise in their fields and they also need to handle the IT staff UI. End user must

have the basic knowledge about using a mobile app , how to download and how to sign in etc. Workers should know the basics of the systems to help to customers when they are stuck with entering store or wonder about something. For this purpose store staff will be informed about the system.

1.3.4 Limitations

- **Regulatory policies:** Users' credit card information will be saved in the Amazon Go app since it is private and can be used by someone else it shouldn't be public and should be encrypted to be sure that nobody could reach it except the user himself/herself.

- **Hardware limitations :** Cameras and sensors should detect the product as fast as possible and add the item to the customers' app and should communicate with the app with no delay. Since the space of the store will be limited the cameras and the sensors should be small enough not to take much space in the store.

- **Interfaces to other applications:** There is no such limitation since the system will only use the amazon go app.

- **Parallel operation:** Parallel operations is required since there will be multiple customer in the store at the same time. Sensors and cameras should watch all customers if they take or leave the product.

- **Audit functions:** Since the Amazon Go app will contain the credit card information of the customer the payment will be automatically done after the shopping finished. This must be strict not to take less or more money from the customer.

- **Control functions:** To make the system consistent the control mechanism belongs only to system admins.

- **Higher-order language requirements:** System should be written for multiple phone operating systems such as Andorid and IOS. For android java for IOS swift or other multi-platform object-oriented programming languages should be used.

- **Signal handshake protocols:** To be able to add or drop the product from the customer's app cameras and sensors should communicate with each other and with the Amazon Go app as well. TCP will be used for database and HTTP protocol will be used for connections of the system.

- **Quality requirements:** Reliability is the most important priority for the system. Every customer can only reach their own application and use their own QR code to enter the store.

- **Criticality of the application:** The credit card information is critical and must be private only to the user so it must be kept safely in the database and any misjudgement of the customer's shopping can give damage to the system either having extra product's money or less money although the product has been taken so the camera's and sensors must cope with the issues that the customer take or leave the product.

- **Safety and security considerations:** Since there will be a store staff waiting to help customers to get in the store, there won't a worry about someone who tries to get in the store without checking in. In addition to that, database should be immune to any type of attacks or failure.

- **Physical/mental considerations:** There is no stated physical/mental mental considerations of the system.

1.4 Definitions

Term	Definition
Non-Member User	People that don't signed up for Amazon Go app.
Member User	Peopçe that signed up for Amazon Amazon Go app.
UI	User Interface
Cameras	Cameras that watches the people inside the store and their interactions with the products in the market.
Sensor Fusion	Sensors that keep track of the products.
Database	A database of products.
QR Code	Unique QR codes that belongs to different customers.
Computer Vision	Technology to identify, detect, classify and measure things.
Deep Learning Algorithm	Algorithm to learn the behaviours in the market.
API	Application programming interface

Table 2: Definitions

2. References

This document is written with respect to IEEE 29148-2011 standard:

IEEE. (2011, December 1). 29148-2011 - ISO/IEC/IEEE International Standard - Systems and software engineering -- Life cycle processes --Requirements engineering.
Retrieved from http://ieeexplore.ieee.org/document/6146379/ on March 12, 2018. doi:
10.1109/IEEESTD.2011.6146379

Other sources:

-Amazon Go main page: https://www.amazon.com/b?ie=UTF8&node=16008589011
-News on Amazon Go: Inside Amazon Go, a Store of the Future
https://www.nytimes.com/2018/01/21/technology/inside-amazon-go-a-store-of-the-future.html by Nick Wingfield, January 2018

3. Specific Requirements

3.1 External Interfaces

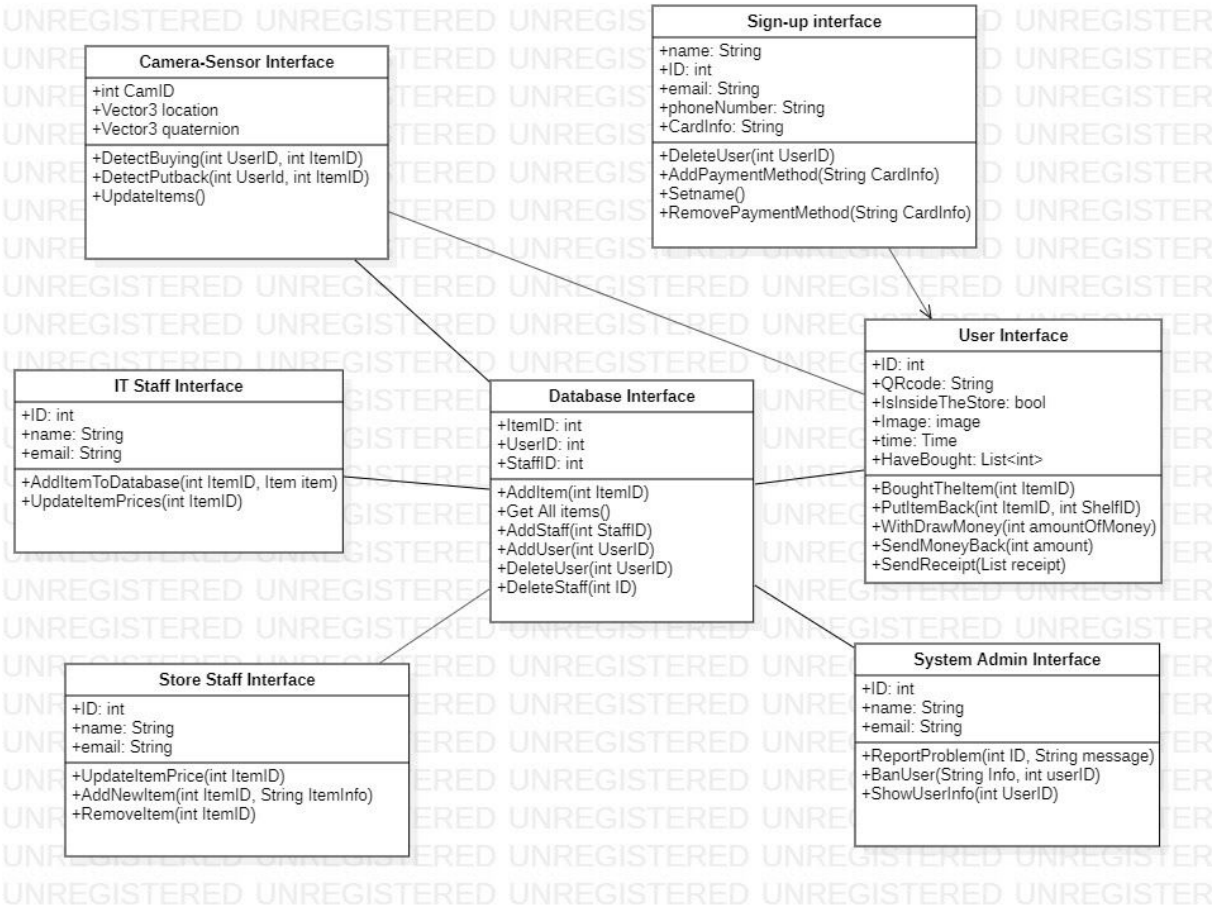

Figure 8: External Interfaces Class Diagram

Sign up Interface: Sign up interface is used in order to register people into Amazon Go database. People need to save their name, ID, password, email and additional informations in the Amazon Go database. If the ID is duplicate or ID has unwanted symbols, the system should throw an error. Timing is not important and memory is not a deal for this interface. Input data is click and text inputs.

User Interface: This is used by customers, customers need to enter to the store, after that whenever they buy something the system -coordinated with cameras and sensors- detects buying and when they put it back, it detects again and adds/removes it from the virtual cart. When customer gets out, the system detects and sends receipt to the customer and withdraws the amount of money needed.

Store Staff Interface: Store staff updates the prices of items according to the information they get from IT staff. They adds to and removes from the shelves.

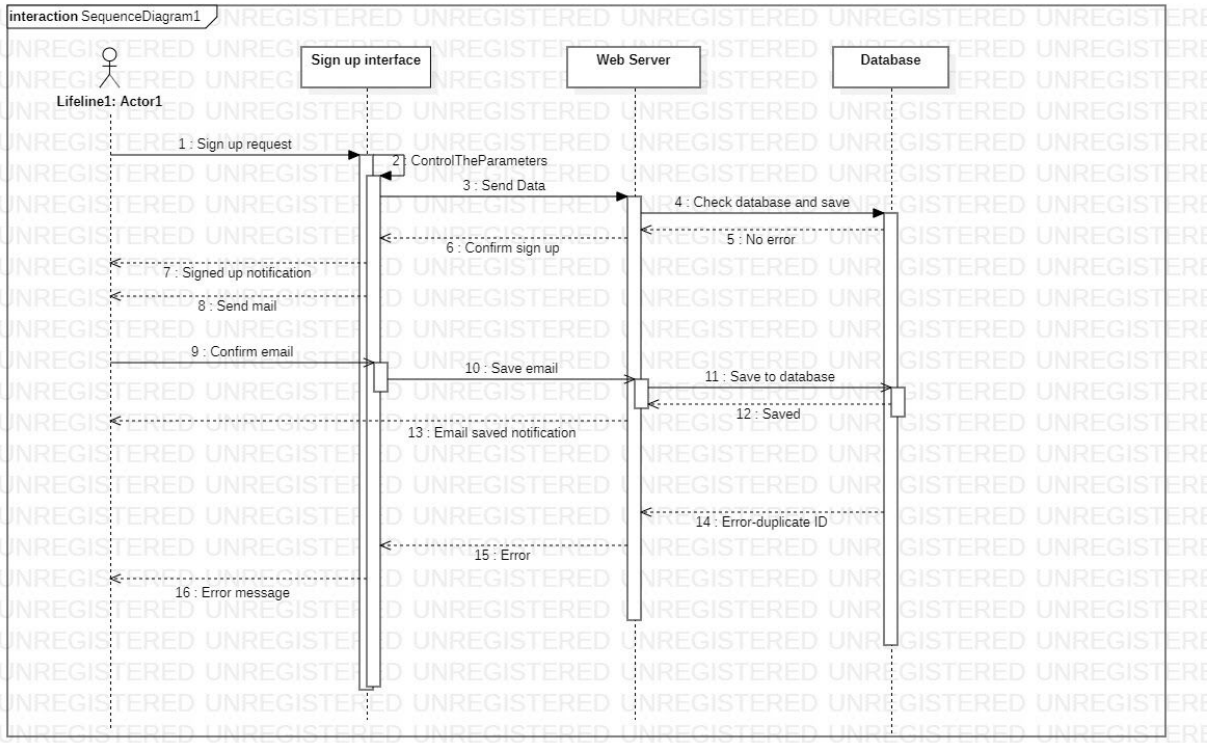

Figure 9: Sign-Up Sequence Diagram

IT Staff Interface: IT staff updates the prices and adds items to the database and informs the store staff. Store staff changes it in the store.

Admin Interface: Admins need to report problems. The system shows in case of any problem and admin observes these and reports them. In some cases, customers may act problematically and admins may ban the user. And admins can see the informations of customers.

Camera and Sensor Interface: Cameras and sensors detects every movement in the store. Shops of customers are detected by these. So this system is about customers. Also this interface is interacted with the database, since the products must be removed from the database when they are bought.

Database Interface: Database is related with everything since everything and everyone is added to the database. Admins and IT staff have the ability to change the database in some direct ways. Admins can change everything in the database (Of course, there must be some hierarchy), the IT staff can add and remove products. When the customers buys something, it is removed from the database. Also when a person enrolls to Amazon Go, he/she is saved in the database.

3.2 Functions

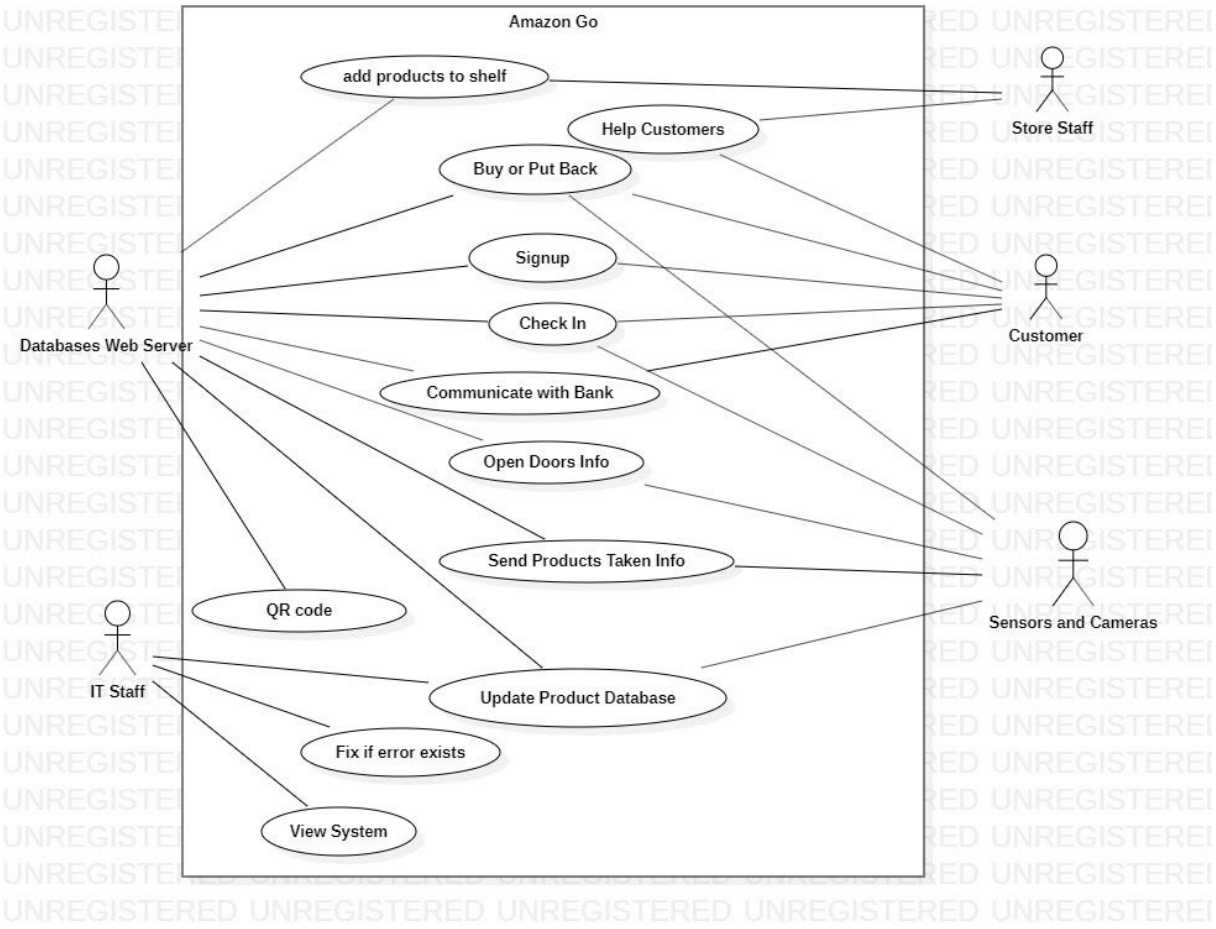

Figure 10: Use Case Diagram

Use case name	Signup
Actors	No-member User and Web Server
Description	No member user uses Amazon to enroll to the system with bank info and name etc important info
Data	Name, email, phone number, bank info, address, picture
Preconditions	Users have to have Amazon app downloaded and have a credit card associated with a bank account
Stimulus	Ads and try it button on Amazon
Basic Flow	Step 1 - User clicks on the ad and gets directed to the Signup page Step 2 - Fills in the required information on the page and continue Step 3 - The user is sent an email to an email account and a message to the phone number to confirm.

Alternative Flow	-
Exception Flow	If the user doesn't provide the required information, they get an error message.
Postconditions	User is saved to the database and gets an informative email in order to get used to the situation

Table 3: Signup

Use case name	Buy or Put Back
Actors	Customers, Databases, Sensors, and Cameras
Description	The user takes a product or puts it back.
Data	The view from the cameras and information from the sensors
Preconditions	1-User has to have signed up 2-User have to enter to the store.
Stimulus	The good looking of the products, prices and special orders
Basic Flow	Step 1 - User takes the product and puts it somewhere or handles it. Step 2 - Cameras and sensors detect the product being taken using the software
Alternative Flow	Step 1 - User takes a product and puts it somewhere else. Step 2 - Cameras and sensors detect the taken product and the new place it has. Step 3 - The same customer or another customer takes the product. Step 4 - Devices detect the taken thing again.
Exception Flow	-
Postconditions	The user has a bill sent to his/her app.

Table 4: Buy or Put Back

Use case name	Check-In
Actors	User, Web Server
Description	The user reads the QR code in the app to the machines on the entrance of the store and the door gets opened.
Data	The QR code generated by the Web Server
Preconditions	1 - User has to be signed up 2 - User has the app downloaded 3 - The user uses the app to inform the system about his/her entrance.
Stimulus	The ads, cheap and high quality products
Basic Flow	1-User signs up and has the app downloaded 2-User decides to enter the store and clicks on the "Enter the store" button on the app 3-QR code is generated and sent to the app

	4-User scans the QR code to the machine and the door gets opened if the QR is as expected.
Alternative Flow	-
Exception Flow	Users may try to enter with another QR or may try to enter by jumping above the entrance. The cameras and staff will inform the system and get the customer out.
Postconditions	-

Table 5: Check-In

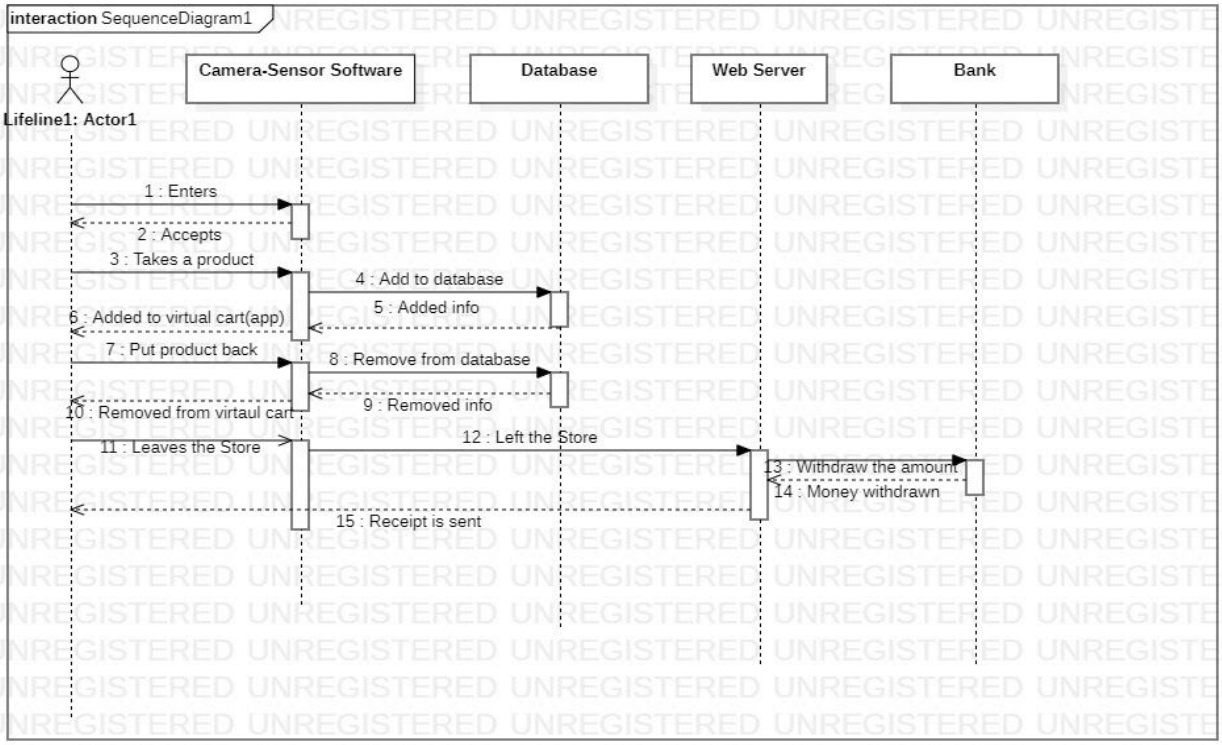

Figure 11: Shopping Sequence Diagram

Use case name	Help Customers
Actors	Store Staff, Customer
Description	When customers can't use or can't understand the app, store staff will help them to use the app and enter the store.
Data	App
Preconditions	User must come to the store
Stimulus	Shopping is easier on Amazon go.
Basic Flow	1 - Customer comes to the store. 2 - Ask for help from the store staff. 3 - Store staff helps the customer to use the app and enter the store.
Alternative Flow	1 - Customer pass in front of the store.

	2 - Customer wonders about the store and asks the store staff. 3 - Store staff inform the customer and customer leaves or want to try the store.
Exception Flow	-
Postconditions	The customer leaves the store with or without the products he/she bought

Table 6: Help Customers

Use case name	Communicate with Bank
Actors	User, Web Server
Description	After a user buys something from the store and leaves the store, the information on what he/she bought and the total price will be sent to the Web Server. Web Server communicates with the bank and withdraws the amount from the bank account.
Data	The products are taken
Preconditions	The user has to be signed up and entered the store.
Stimulus	-
Basic Flow	Step 1-Customer enters to the store Step 2-Customer buys something and his/her virtual shopping cart is updated. Step 3-Customer gets out of the store. Step 4-The web server is informed with the details of the customer. Step 5- The web server communicates with the bank Step 6-Money is withdrawn from the account
Alternative Flow	Cash may be accepted too in some stores.
Exception Flow	-
Postconditions	The user is informed of the products that she/he has taken from the store and the costs of the products.

Table 7: Communicate with Bank

Use case name	Add product to shelf
Actors	Store staff, Databases
Description	When the product on the shelves is decreased store staff gets notified and the staff goes and takes some product from the storage if there is no product in the storage too the stafff informs the base storage to take some product to the store. When the products come the store staff puts them to the shelves and the databases get updated.
Data	Products
Preconditions	The customers should take the product to decrease the number of the product.

Stimulus	The consumers need the products.
Basic Flow	1 - Store staff takes the product from the storage. 2 - Store staff puts the product to its shelf.
Alternative Flow	-
Exception Flow	There is no product left either in the main storage or in the local storage.
Postconditions	The shelf is filled with the products.

Table 8: Add Product to Shelf

Use case name	Update Product Database
Actors	IT Staff, Database
Description	IT Staff changes the qualifications of the products in case of need, or add new items to the database.
Data	The price, weight, etc qualifications of the existing and new products.
Preconditions	IT Staff must have an admin username and password and the product must exist and should be in the storage for updating purposes.For adding new items, products must be bought from other sources.
Stimulus	The changing informations, and supply the customers needs.
Basic Flow	Step 1-IT Staff is informed with the new information that the products have or with a brand new product to be added. Step 2-IT Staff changes the information about the products or add the new item to the database with the quality it has. Step 3-The new qualifications, quantity and prices are updated for the updated product.
Alternative Flow	-
Exception Flow	-
Postconditions	The product must be available for customers to buy in the store.

Table 9: Update Product Database

Use case name	Open Doors Info
Actors	Web Server, Sensors and Cameras
Description	The entrance of the store has door and it opens automatically when customer gets in with a QR and opens again when the customer goes out.
Data	QR code, Customer’s location information
Preconditions	A customer with a generated QR code or a customer that tries to get out the store.
Stimulus	Lets customers to get out of the store or get in to store easily.

Basic Flow	Step 1- Customer makes the door to read the QR from his/her mobile phone Step 2- Customer gets in the store when the door opens.
Alternative Flow	Customers get out of the store with just walking out.
Exception Flow	Customers can try to jump over the doors.
Postconditions	Customers gets in the store to shop or they are out with the products they bought.

Table 10: Open Doors Info

Use case name	Send Products Taken Info
Actors	Sensors and Cameras, Web Server
Description	When a customer takes a product from any shelf , the cameras and sensors realises this and gives info to web server.
Data	Images of customer and product
Preconditions	Customer should be in the store and the products should be in shelves
Stimulus	To know the price of the product
Basic Flow	Step 1- Customer walks in store and sees the product he/she looks for. Step 2- Customer takes the product
Alternative Flow	-
Exception Flow	-
Postconditions	The product the customer takes is no more in the shelf.

Table 11: Send Products Taken Info

Use case name	QR Code
Actors	Web server
Description	Web server generates a unique QR code for every member user. And when reading, web server gets the information of the QR code from the gates of the store and if there is a match with its generated QR code web server understand that to allow customer to enter the store.
Data	Mac address of the mobile phone, QR code
Preconditions	Non-member user should download the Amazon Go app to hs/her mobile phone.QR code must be generated and the gates of the store must read it.
Stimulus	To be able to enter to store.
Basic Flow	Step 1- Non-member user downloads the Amazon Go app. Step 2- Non-member user sign ups the app Step 3- Web server generates a QR code for the customer. Step 4- User makes the machine on the entrance read the QR code.

	Step 5- Web server tells the gate to open the door.
Alternative Flow	Step 1- Non-user member don't know how to get in the store. Step 2- Ask for help to the store staff. Step 3- Store staff help to customer to get in the store by making the app generate a QR code for the customer.
Exception Flow	There may be some erroronous generated QR which doesn't allow customer to enter the store.
Postconditions	Customer has his/her QR code in his/her mobile phone which allowed him/her to enter the store..

Table 12: QR Code

Use case name	Fix If Error Exists
Actors	System admin
Description	System admin will be notified or see the errors in the system and fix them by using his/her software skills
Data	Error message
Preconditions	System's functions must work.
Stimulus	System should be sustainable
Basic Flow	Step 1- There become and error and system admin notified or system admin realised by himself/herself. Step 2- System admin fix the problem..
Alternative Flow	-
Exception Flow	-
Postconditions	The system works perfect.

Table 13: Fix If Error Exists

Use case name	View System
Actors	System Admin
Description	System admin view system to see if there is a problem.
Data	Products and its quality information, customers and their location, store staff and their location.
Preconditions	System should be working
Stimulus	Sustainability is required to system to work.
Basic Flow	Step 1- System admin view the system time to time to see if the system work without any problem
Alternative Flow	-

Exception Flow	-
Postconditions	System is okey and if there is a problem it is already fixed.

Table 14: View System

3.3 Usability Requirements

- The application must be user-friendly
- System admin should be able to manipulate database.
- Application must have the QR code in the very front.
- Users should be able to delete a product from their virtual cart in case of risky situations.
- System should allow the users enter with two people.
- Camera and sensors softwares must work coordinately.

3.4 Performance Requirements

- The system should be able to handle 1000 people.
- The sign-up timing should be less than 2 seconds.
- The time to enter to the store should be less than 1 second.
- Cameras need to detect any buying situation in less than 0.5 seconds in order to prevent any mistakes.
- Databases should work concurrently
- The delivering time of receipt can be up to 5 minutes, but if the customer wants a faster time, we must reduce it to 15 seconds.

3.5 Logical Database Requirements

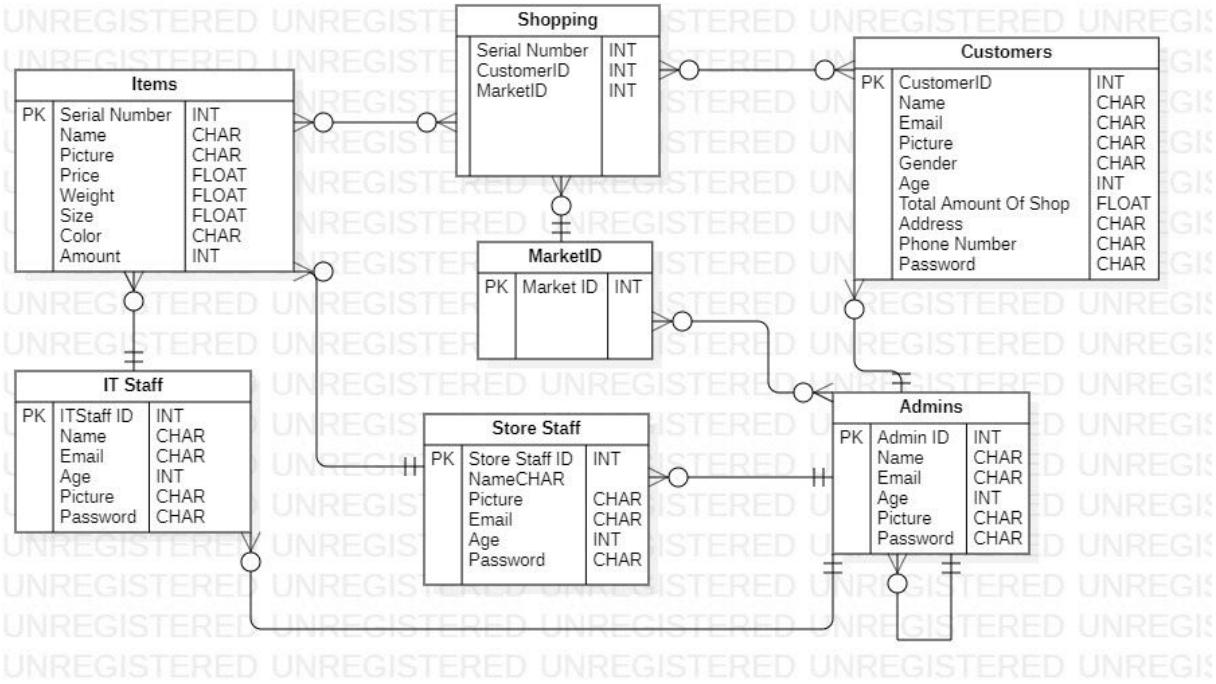

Figure 12: Logical Database Requirements Class Diagram

- Admins can change Store Staff and IT Staff table and the general admin can change the other admins.
- IT Staff can add or remove item in the Items table.
- Store Staff can change the amount of items in the table.
- Shopping table is to hold one shopping of customers. Since a customer can have multiple shoppings and an item can be bought by lots of customers, the relationships are many to many.
- Market ID should be added to shopping table to let us know the market the customer had shopping.
- Images are held with their paths.
- The total amount of shops, age and gender of the customer is held in case of any further change in the app. We may send ads to the customers according to their age and gender etc.
- We shall give permission to one admin for changing every table in the database.
- The Shopping table holds only the current information of the shop, so when the customer leaves the store, the things that the customer received will be sent to the web server and removed from the table.
- When a customer signs up, he/she is added to the customers table.
- Cameras and sensor will change the shopping table. When a customer gets in, the Camera and sensor system is informed with the CustomerID of the

customer. So when somebody buys something, it is added to the shopping table.
- Total amount of shop is changed by the web server according to the receipts of the customers.

3.6 Design Constraints

- Shopping information must be hold in database in case of any legal problem.
- The legal details must be shown to the customers in the app to show the customers their rights.
- The laws must be considered.

3.7 Software System Attributes

a) **Reliability :** Probability of error shall not be more than 0.01% and this must be the case for all databases, camera and sensor software and web server. The customers should trust us. Also report messages should be checked if there are any abnormal or malicious events by the system admin/IT staff
b) **Availability :** Our aim is not to have any unavailability but of course there will be problems. The unavailability time and should be 3 minutes for one week.
c) **Security :** The informations of the customers shall not be accessible by the people other than admins. The passwords should be kept by crypto technics. IT staff and store staff should not be able to look at the informations of the customers. System should be protected against any cyber attack.
d) **Privacy :** The system shall not be accessible by other people and the views of the cameras shall be accessible just in case of a legal situation and in no other case.
e) **Maintainability :** System should let new admins and staff be added. In order to have new staff, new programmers and new markets, the documentation should be nice. There can be different types of documentations for programmer, for hardware laying people such as electricians.
f) **Portability :** System should let us lay more cameras, the cameras should be able to understand their positions for simplicity.

3.8 Supporting Information

Amazon Go is based on a humanless system except the store staff that helps customers and the IT staff to control the flow of the system. This project is a step to make shopping a humanless process.
Accounts of the users are stored in Amazon’s own servers and kept private to the user only.