Personalized Shopping Assistant

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Contents

1 Terms, definitions and abbreviated terms

1.1 Terms and Definitions

- **OAuth**: Authentication protocol that allows one application to interact with another one on behave of the first one.
- **Firebase Cloud Messaging**: Cross-platform message and notification solution develop by Goodle.
- **Customer**: Type of user who is going to search and create order by purchasing products from merchants
- **Merchant**: Store that upload products to the platform, from which the customers are going to purchase
- **Driver**: User that fulfills the order generated by the customer
- **Order**: A list of items that was paid by the customer and fulfilled by the driver.
- **Cart**: Container that temporary holds a group of products that are going to be purchased.
- **Estimated time of Arrival**: The amount of time that an order is going to take before arriving to the customer.
- **Interaction**: Amount of touches required by the user to perform an action, if the device has a touch screen, or the amount of clicks a user performs, if the device has a non-touch screen.
- **2FA**: Authentication methods in which a particular device is used to grand access to a website or application, if two or more pieces of evidence confirm the user identity.

1.2 Abbreviated Terms

- **PSS**: Personal Shopper System
- **PSMS**: Personal Shopper Merchant System
- **PSDS**: Personal Shopper Driver System
- **PSSS**: Personal Shopper Server System
- **FCM**: Firebase Cloud Messaging
- **ETA**: Estimated time of Arrival

1.3 Assumptions and Dependencies

AS-1 The drivers are already sign up in the system when they send their driver application to the company

AS-2 The merchants are added into to the system outside of the application scope

AS-3 The merchants are going to submit products that are appropriate for all ages. *They are not going to upload drugs, guns, medical devices or sex toys*

AS-4 The merchants are already sign a contract that specify the types of products they can add in the platform

AS-5 Customers do not have support for 2FA

AS-6 PSS, PSMS, PSDS only talk with PSSS, using a request-response approach.

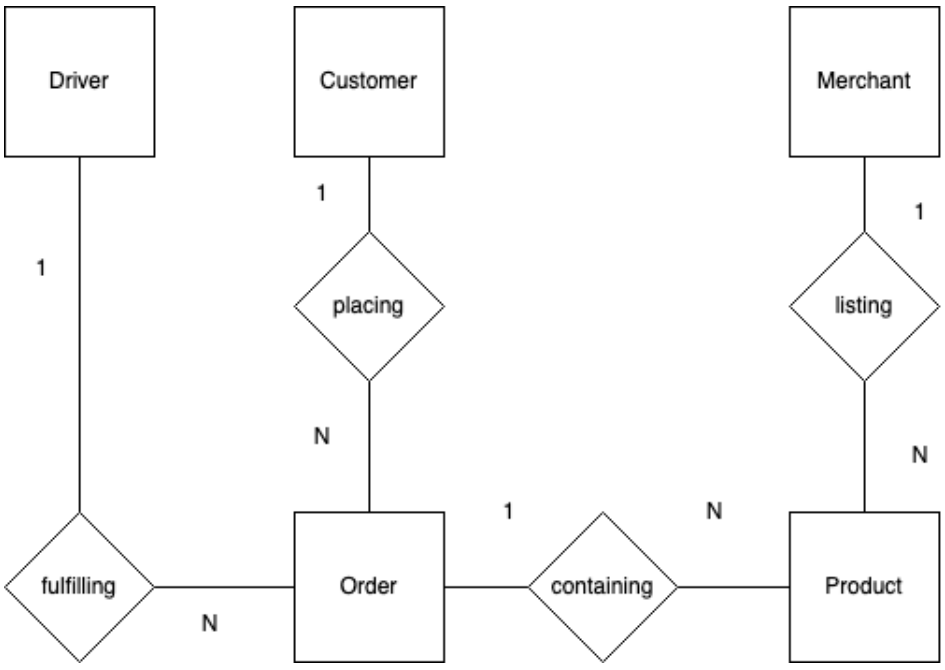

Figure 1: Logical Data Model

AS-7 Merchants have no more than 5 employees

AS-8 All the merchants, costumers and drivers operate inside the Hoboken area

AS-9 PSS have two versions mobile which is Android and a Web version

AS-10 PSMS has only a web version

AS-11 PSDS has only an Android version

AS-12 PSSS is an API server only

AS-13 Notifications in PSS (Mobile/Web) and PSDS are going to use FCM

1.4 Operating Environment

OE-1 The PSSS is going to run on AWS infrastructure

OE-2 Image assets are going to be stored in AWS S3

OE-3 New servers are going to be spin up on demand using EC2 VMS

OE-4 The PSSS can only be accessed by PSS, PSMS, PSDS

OE-5 Network requests coming from outside of US are going to be ignored

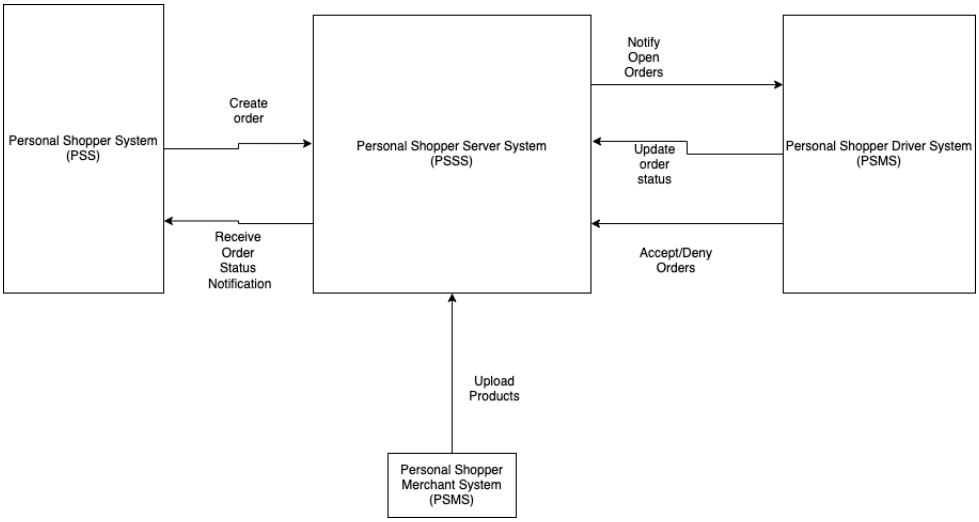

Figure 2: Context Diagram

2 System Requirements

2.1 Personal Shopper

SY-1 PSS shall enable a customers to register by requesting the following fields:

- Name
- Last name
- Phone number
- Email
- Password

SY-2 PSS shall enable customers to signup into the platform by using authorized public OAuth implementation:

- Google
- Apple

SY-3 PSS shall enable customers to login into the platform by using email and password

SY-4 The PSS shall enable customers to login into the platform by using authorized public OAuth implementation:

- Google
- Apple

SY-5 PSS shall enable customers to close an existing session

SY-6 PSS shall display a list of all the available merchants

SY-7 PSS shall display what is the customer current location inside a map

SY-8 When the customer is inside a merchant page, PSS shall enable the customer to search a product

- PSS shall display a list of products that show the name, image and short description that matches a search

SY-9 PSS shall enable customers to add a product to the cart

SY-10 PSS shall enable customers to add their payment information into the platform

SY-11 When the cart has one or more items, PSS shall permit the user to create an order

SY-12 PSS shall permit customer to cancel an order

SY-13 PSS shall permit customer to confirm that they received an order

SY-14 If the customer forgets its password, PSS shall request to user to enter its email address and shall an email with a temporary password

SY-15 If there is an issue with an order, PSS shall enable customers to open an ticket about the order

SY-16 PSS shall enable user to send a message to the driver

SY-17 PSS shall display drivers information:

- Phone Number
- Name
- Profile Picture

SY-18 PSS shall display the ETA from a pending order

- PSS shall display the ETA in terms of minutes

SY-19 PSS shall display merchants information

- Name
- Phone
- Email
- Address

2.2 Personal Shopper Merchant

SY-20 PSMS shall enable merchants to login into the platform by using email and password

SY-21 PSMS shall enable merchants to close an existing session

SY-22 PSMS shall enable merchants to add a product, by requesting the following required fields.

- Name
- Description
- Picture
- Weight

SY-23 PSMS shall enable merchants to update a selected product

SY-24 PSMS shall enable merchants to delete a selected product

- PSMS shall display a message dialog that request a confirmation from the merchant

SY-25 PSMS shall enable merchants to disable a product

SY-26 PSMS shall enable merchant to enable products that were previously disabled

SY-27 If the merchant forgets its password, PSMS shall request to user to enter its email address and shall an email with a temporary password

2.3 Personal Shopper Driver

SY-28 The PSDS shall enable merchants to login into the platform by using email and password

SY-29 The PSDS shall enable merchants to close an existing session

SY-30 If the driver forgets its password, PSMS shall request to user to enter its email address and shall an email with a temporary password

SY-31 If the driver receives an order requests, PSDS shall request to press a button with the title "Accept" to accept an order

SY-32 If the driver receives an order requests, PSDS shall request to press a button with the title "Decline" to accept an order

SY-33 If the driver already accept an order, PSDS shall enabled the user to decline the order

SY-34 PSDS shall enable the driver to mark an order as delivered

SY-35 If the driver mark an order as delivered, PSDS shall request the user to take a picture of the delivery.

SY-36 PSDS shall enable the driver to press a button that sends a signal to PSSS that notifies to the customer that the driver it's on its way to the merchant

SY-37 PSDS shall enable the driver to press a button that sends a signal to PSSS that notifies to the customer that the driver it's at the merchant and it's working in the order

SY-38 PSDS shall enable the driver to press a button that sends a signal to PSSS that notifies the customer that the driver it's on its way to the deliver the order to the customer

SY-39 If the driver requires to reach out to the driver, PSDS shall display the phone number of the customer

SY-40 PSDS shall display a list of all the orders that the drivers performer in the last 30 days

SY-41 PSDS shall display what is the driver current location inside a map

SY-42 If the driver requires technical support, PSDS shall display a technical support phone number

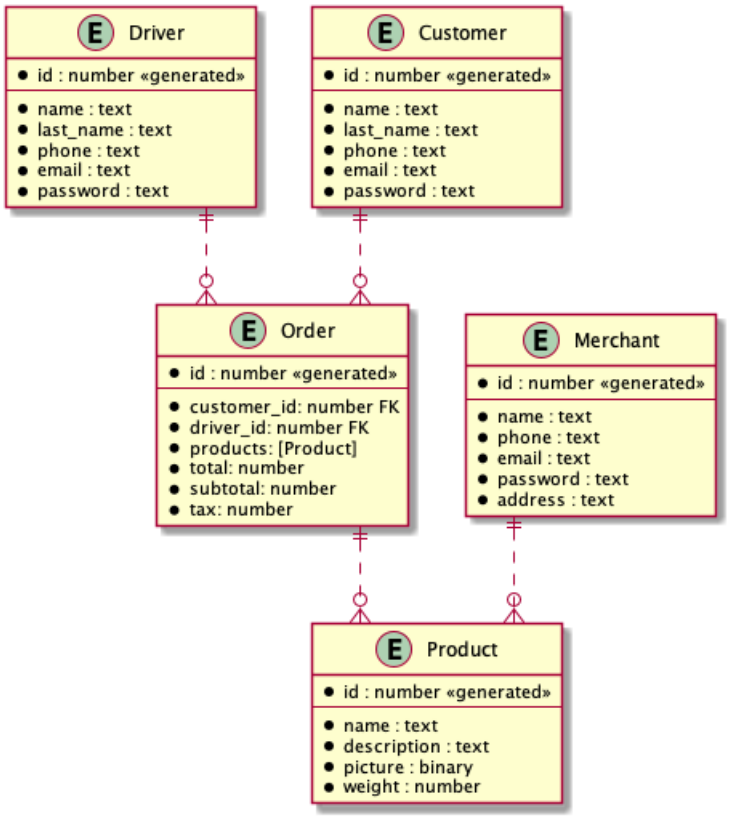

Figure 3: Data Model Diagram

3 Security Requirement

SEC-1 The PSS shall require an email and password access to log in

SEC-2 PSS password must no less than 8 characters, 1 special character, and 2 numbers.

SEC-3 The PSS shall not store passwords in plain text, it shall salt the passwords and encrypt using SHA-2 algorithm

SEC-4 The PSS shall display an error message in the case of a failure in a transaction in order to protect customer data

SEC-5 The PSS shall allow customers to file any reports with their orders by sending an email to the support email address with the order number and issue details.

SEC-6 The PSS shall ask the customer whether or not their order has arrived if it is 1 hour after they create the order

SEC-7 The PSS shall allow users to delete their own account, this is also shared with the PSMS and the PSDS

SEC-8 The PSS shall allow users to disable their own accounts for a certain period of time up to 1 year

SEC-9 The PSS shall not store any credit card information, it will use an authorized, PCI Compliant, provider. (PayPal).

SEC-10 The PSS shall ignore all network request that comes outside of US.

SEC-11 The PSSS shall log all information regarding the server status into a log file.

SEC-11.1 PSSS shall log the utilized RAM every 5 minutes

SEC-11.2 PSSS shall log the utilized CPU every 5 minutes

SEC-11.3 PSSS shall log all search queries

SEC-12 PSSS shall considered that a request is coming from a secure environment if the communication protocol is HTTPS and a valid JWT is sent in ‘Authorization‘ header

SEC-13 A security audit shall be performed in all the dependencies that are add it to the project

SEC-14 A system security audit should be performed each year

SEC-15 The PSD shall have a 2 factor authentication procedure as an option

SEC-16 PSMS requires 2FA procedure for authentication

SEC-17 The PSD shall only allow the driver to log in from one device at a time

4 Quality Attributes

4.1 Availability

AVL-1 The PSSS shall be available at least 99.9% during holidays, from 01:00 AM to 23:59 PM

AVL-2 The PSSS shall be available at least 99% during the day on regular days (days that are not holidays), from 9:00 AM to 7:00 PM.

AVL-3 The PSSS shall be available at least 90% during the night on regular days (days that are not holidays), from 01:00AM to 8:59 AM and from 7:01 PM to 11:59 PM.

4.2 Installability

INS-1 The PSS (Mobile) should be installed from Google Play Store

INS-2 The PSDS (Mobile) should be installed from Google Play Store

INS-3 Installing PSSS requires that a trained operator perform the installation

4.3 Interoperability

IOP-1 The PSS shall be able to exchange data with PSSS via HTTPS

IOP-2 The PSDS shall be able to exchange data with PSSS via HTTPS

IOP-3 The PSMS shall be able to exchange data with PSSS via HTTPS

4.4 Performance

PER-1 The PSSS (Web) shall take no longer than 2s when loading a page.

PER-2 The PSSS (Mobile) shall take no longer than 3s when loading a view.

PER-3 The PSSS shall take no longer than 2 seconds when searching for products.

PER-4 The PSSS shall take no longer than 5 seconds when the customer pay for the order.

PER-5 The PSSS shall take no longer than 5 seconds when the customer log in.

PER-6 The PSSS shall take no longer than 3 seconds to logout.

PER-7 The PSDS shall take no longer than 3 seconds to accept an order.

PER-8 The PSDS shall take no longer than 3 seconds to reject an order.

4.5 Reliability

REL-1 No more than 5 orders out of 1,000 can be lost due to software errors.

REL-2 The PSSS shall not be down for more than 3600 consecutive seconds.

4.6 Robustness

Offline means the software is running but it lose internet connections with the application server.

ROB-1 If PSDS goes offline, it will try to reconnect to PSMS in intervals of 10 seconds.

ROB-2 If a message is sent from PSDS to PSSS and PSDS is offline, PSDS is going to store the message in a queue and send the message when it reconnects.

ROB-3 If a message is sent from PSS to PSSS and PSS is offline, PSS is going to store the message in a queue and send the message when it reconnects.

ROB-4 PSDS, PSS, PSMS shall have empty input fields by default and display an error message in case a required input field is empty.

4.7 Usability

Supported OAuth accounts: Google, Facebook, Apple.

For the context of usability a workflow is going to be any combination of views, buttons, actions and inputs that helps a user to achieve a goal.

USE-1 A first time user of PSS shall be able to create an order, with a cart already filled, in no longer than 3 seconds

USE-2 A first time user of PSS shall be able to sign up in no longer than 2 minutes

USE-3 A first time user of PSS shall be able to sign up in no longer than 20 seconds, if the user have a supported OAuth account

USE-4 A first time user of PSS shall be able to sign in no longer than 5 seconds

USE-5 A first time user of PSS shall be able to sign in no longer than 3 seconds, if the user have a supported OAuth account

USE-6 A first time user of PSS shall be able to search for an item and add it to the cart in no longer than 20 seconds

USE-7 A first time user of PSDS shall be able to sign in no longer than 5 seconds

USE-8 A first time user of PSDS shall be able to accept an order in no longer than 10 seconds

USE-9 A first time user of PSDS shall be able to deny an order in no longer than 10 seconds

USE-10 A first time user of PSDS shall be able to logout in no longer than 5 seconds

USE-11 A first time user of PSDS shall be able to mark that it's on its way to the merchant store, in no longer than 3 seconds

USE-12 A first time user of PSDS shall be able to mark that it's on its way to the costumer, in no longer than 3 seconds

USE-13 A first time user of PSMS shall be able to add a new product in no longer than 2 minutes.

USE-14 A first time user of PSMS shall be able to remove a product in no longer than 15 seconds.

USE-15 A first time user of PSMS shall be able to update a product in no longer than 1 minute

USE-16 A first time user of PSMS shall be able to login in no longer than 5 seconds

USE-17 A first time user of PSMS shall be able to logout in no longer than 5 seconds

USE-18 A single workflow would be consider user-friendly as long as the user makes 4 mistakes or less out of 100 times repeating the same workflow. *A mistake is any action that the user performs that he didn't intent to (E.g. Button miss clicks, invalid characters on input fields, wrong text format)*

USE-19 For the systems PSMS, PSS, PSDS, 98% of first time users should be able to use the applications without needing any help.

USE-20 A user of PSS should be able to create an order from an already filled car in no more than 4 interactions

USE-21 A user of PSS should be able to create an order from an empty cart in no more than 8 interactions. For an order of a single item.

USE-22 A user of PSDS should be able to complete a delivery in no more than 2 interactions

USE-23 A user of PSDS should be able to signal a customer that it's on its way to the store in no more than 2 interactions

USE-24 A user of PSDS should be able to signal a customer that it's on its way to the complete the order in no more than 2 interactions

USE-25 A user of PSMS should be able to add a product in no more than 2 interactions

USE-26 A user of PSMS should be able to update a product in no more than 2 interactions

USE-27 A user of PSS should be able to edit their own profile in no more than 2 interactions

4.8 Efficiency

EFF-1 The PSSS should have at least 30% of processor capacity and memory available to the application shall be un-usued at the planned peak load conditions

4.9 Modifiability

MOD-1 Classes must follow the SOLID principles

MOD-2 Functions calls required at least 80% of testing code coverage

MOD-3 Public functions must be above protected functions

MOD-4 Protected functions must be above private functions

MOD-5 All merges to master must come from the CI server

MOD-6 All test must pass before pushing changes to the remote repository

MOD-7 All changes push to a release branch must be peer-reviewed.

MOD-8 Public and protected functions must include a comment that explains the functionality

MOD-9 Variable must be descriptive in nature, abbreviations must be avoided

MOD-10 Constants must be all uppercase, if the constant have more than one word they would be separated by an underscore

MOD-11 Functions and variables must begin with a lower case

MOD-12 Classes will be capitalize

MOD-13 Variables and functions must be written in camel case

MOD-14 Composition must be preferred over inheritance

MOD-15 Lines would not exceed more than 80 characters, including white spaces

MOD-16 Code format should be applied before committing

4.10 Portability

POR-1 Modifying the Android version to the latest version shall require changing no more than 5% of the source code

POR-2 PSMS, PSS (Web) shall support:

- Chrome 89, 88, 87
- Latest version of Safari
- Firefox 87, 86, 85
- Microsoft Edge 89, 88, 87

POR-3 PSDS, PSS (Mobile)

- Android 12, 11, 10

4.11 Reusability

REU-1 Web components must be reused between PSS (Web) and PSMS.

REU-2 Authentication mechanism must be shared between PSS (Mobile) and PSDS

REU-3 At least 45% of application architecture shall be reused between PSS (Mobile) and PSDS.

REU-4 2FA (2-Factor Authentication) mechanism shall be shared across all the systems

REU-5 JWT token signing and token rotation mechanism shall be shared across all the systems

4.12 Scalability

SCA-1 The system should scale up the system horizontally, if the system gets 95% of CPU or RAM utilized, which ever comes first. The system will spin up 2 servers with the same operating system and environment but with 80% less memory than the original server.

SCA-2 The system will scale down to 1 (original server) if the one of the previous spin up server, has less than 95% of CPU usage during 3600 consecutive seconds.

4.13 Verifiability

VER-1 The staging environment configuration shall be identical to the production configuration environment to avoid irreproducible testing failures.

VER-2 A tester shall be able to configure if the application is running in testing, develop or production mode

4.14 Constraints

CON-1 Developers can only use open source libraries or tools that are either Apache or MIT license.

CON-2 Google Pay and Apple Pay are the only supported payment providers

CON-3 The data interchange format must be JSON

CON-4 The authentication/authorization mechanism between applications is going to be JWT

CON-5 JWT tokens are going to expired after 24 hours

CON-6 The database that is going to be used in the project must be MySQL