Requirements Specification Document

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Revision History

Name	Date	Reason for Changes	Version
RSD	Oct 16, 2018	Rough Draft	0.9

1 Introduction

1.1 Purpose

The Uvic Food Bank and Free Store (FBFS) is UVic's own food bank for students and their families. The client has pointed out several problems with the current inventory and data management system in which we hope to solve by implementing a new web application system.

One of the problems facing customers of the FBFS is not being able to view current inventory that is available. By creating a web application, it will allow all customers to view the current up to date inventory. A critical issue which we wish to address is the abuse of the current FBFS system. Customers have found methods of unlawfully gaining more items than meant to be allowed. Customers of the FBFS should be monitored, and a flag on their account should be used to notify the volunteers and admins of unlawful habits. Additionally, the gathering of statistical data should be considered as well so admins can monitor inventory and usage statistics from an upper level management position.

Thus, the purpose of this Requirements Specifications Document 1.0 is to document a web application solution to solve the current problems that our client is facing with the current system in place at the FBFS.

1.2 Project Scope

A volunteer must be able to store customer information along with inventory going in and out of the FBFS. The objective is to have a proper system in place for the FBFS so that customers can know what items are in store. Customers must be able to view and track available inventory online while admins and volunteers add, update, or delete the inventory as it arrives and departs the FBFS. The benefits of this software include ease of use with minimal training and more convenient inventory tracking, as well as restrictions on abuse of allotments. Overall, the clients goals are to have an easy to use system, for users, which still meets the clients standards and other requirements as specified below.

1.3 Glossary of Terms

Term	Definition
FBFS	Food Bank & Free Store
UVic	University of Victoria
V-Number	Student Number
OneCard	Student card with student number on it
User	Volunteer, Admin and customer
Volunteer	Employee of the Food Bank and Free Store
Customer	Students and their Families
Must	Required to have
Should	Optional
Will	Feature/function will be implemented in final
System	Software implementation
Service	The process and facility to get stuff from the Food Bank & Free Store
Client	Jam stash organization and their employees
Device	Cell phone, laptop, tablet or computer
Donor	Someone who gives food, or household items and clothing to the Food Bank & Free Store
UI	User interface
Data	User information and family information including name and V-Number
Inventory	Items in possession of Food Bank & Free Store
Manage	Includes reading, creating, updating, and deleting
Access Control	Controlling who has access to data
Web Application	Our system, made in an internet accessible format
Lock out	When one user accesses a resource so no one else can then access that resource
Uvic Database	Database storing account and report information
Inventory Database	Database storing inventory information
Real time	Simulated immediate response of one minute as specified in NFR-2

1.4 References

[1] “Jamstash”, September, 2018. [Online]. Available: https://sites.google.com/view/jamstash/ . [Accessed: Sept. 24, 2018].

[2] Freedom of Information and protection of Privacy Act, Sept, 19, 2018.[Online]. Available: http://www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/96165_00 and regulations http://www.bclaws.ca/civix/document/id/loo90/loo90/155_2012 [Accessed: Sept 24, 2018].

[3] UVic Protection of Privacy Policy, June, 2017.[Online]. Available: https://www.uvic.ca/universitysecretary/assets/docs/policies/GV0235.pdf [Accessed: Sept 24, 2018]

1.5 Overview

Together the RSD is made up of eight total sections that encompass the proposed solution of a web application. The first section is a brief overview and overall description of the project scope. The second section describes the context and origin of the system being specified. The third section summarizes the major behaviors of the system. The fourth section covers all the requirements specified by the client. The fifth section covers the non functional requirements of the project. The sixth section covers an additional requirements of the project that may not be covered over the previous five sections. The seventh section contains the use case model, entity relationship diagram, data flow diagrams and glossary. Lastly, the eighth section is the appendix, where concerns and other items are placed, including UI models.

2 Overall Description

2.1 Product Perspective

The requested software is going to be a web application that replaces the current system, which means that the client does not have to upgrade or integrate the old system in any way. The new system must provide the user with the functionality and features required, as outlined in the clients RFP and in more detail within this document.

2.2 Product Features

There are many features as per the client's request. These features include: allowing users to view inventory of the FBFS (This requirement is a must), volunteers must be able to update the current inventory, customers must be able to view the current inventory remotely and volunteers

must be able to store customer information. Information being stored can be used to limit and track misuse.

2.3 User Classes and Characteristics

The primary user class are customers. Since UVic students make up the customers, it is important that the implemented UI and functionality correspond with the needs of the students. The admins and volunteers will be the ones managing the web-application, so it important that they have a good understanding of how the system will work. Nowadays, it is safe to assume that most users will be familiar with how to use a basic web-application. However, to ensure that users know to use the web-application, admins will be trained by B.S. consulting. It will then be the admins responsibility to train new volunteers on how to use the web-application. Also, new customers will be trained by volunteers or admins upon registering for an account. The training process will ensure that all users are familiar with the web-application.

2.4 Operating Environment

The operating environment must be a web browser. Google Chrome and Internet Explorer are the recommended browsers as they can be accessed on both desktop/laptop computers and mobile devices. The client has specified that customer data must be kept on a server on campus according to UVic privacy policy. Since the UVic database is being hosted by UVic, we cannot control the operating environment of the servers, therefore it is considered out of scope for this part of the project.

2.5 Design and Implementation Constraints

One major constraint of the project is following the data storing policies of UVic. Since the FBFS is located on the UVic campus, the rules and regulations state that the server must be hosted by UVic on UVic servers and adhere to the UVic policies about data protection and privacy [3]. The minor constraint of the project is being limited to the functionality of a web application.

2.6 Assumptions and dependencies

One assumption is that the data collected and stored on UVic servers adheres to their policies outlined in the UVic Protection of Privacy Policy [3]. This means all user data is dependent on the UVic servers and its operating environment. The next assumption is that our web application will be able to interface with the UVic servers when it comes to features that manage accounts and inventory. Since this information will all be stored on the UVic servers, it must be able to function with unbarred access. As mentioned in section 2.3 of the RSD, it is assumed most customers can use a website. It’s assumed accounts are created inactive, and become active once an admin has verified the account.

3 System Features

3.1 Online Inventory

3.1.1 Description and Priority

SREQ-1 Inventory: There will be a viewable and interactive online inventory for the FBFS, which details what the current items are and is updated in real time by volunteers and admins This is of high priority to implement and is essential to the system.

3.1.2 Functional Requirements

SREQ-2 Real Time Updating: Users must have real time updates of the FBFS's inventory. This is a must for the clients, as they need real time updates in order to track incoming and outgoing items, while still keeping customers updated with what items are in the store. The requirement for this functional requirement comes from the clients RFP from section 2.0. Should the system fail to update, the inventory shown will be the most recent catalogue of the items

SREQ-3 Filtering of Inventory: Users must be able to search the online inventory through a search function, that will search the inventory database for matching entities to the users search entry. If the user inputs an invalid entry or an entity that does not exist in the inventory database, they will be met with an error message. This requirement was requested by the clients in the first client meeting.

3.1.3 Use Case(s) associated with the Feature or Functional Requirements

- **Manage Inventory**
  Actors: Admin, Volunteer
  Precondition: logged in admin/volunteer
  Steps: 1) go to manage inventory screen
  2) select UPDATE, ADD, DELETE, or READ option:
  UPDATE:
  1) Find the item that needs to be updated
  2) Increment the current amount by the amount received
  ADD:
  1) Create new entry of item received
  2) Publish new item with correct amount

  DELETE:
  1) Find the item that now has zero inventory
  2) Delete the item from the inventory page

  READ:
  1) Enter the inventory screen

2) Read through the inventory

Success Conditions: Inventory levels are correct; all items in the store display on the system.

- **View Inventory**
  Actors: Admin, Volunteer, Customer
  Precondition: None
  Steps: 1) Open up the web application in a browser
  2) View the current inventory
  Success Condition: Inventory is displayed on the main page
  Alternate Paths: Login to the system, display inventory page

3.2 Authentication with Customer Accounts

3.2.1 Description and Priority

Customers must have their own account to allow the FBFS to track customer limits and families as well as tracking customer statistics. Volunteers or admins can create an account for customers with a valid OneCard. Admins will be responsible for the customer account verification process. Customers with families must declare so when registering. Mitigating abuse of the service is another must have for the client and imperative for implementation. Authentication with customer accounts is of high priority.

3.2.2 Functional Requirements

SREQ-1 Accurate Tracking of customer limit: The customer limit will detail how much a customer can withdraw from the FBFS. Accurate tracking of customer limit must ensure that customers cannot abuse the FBFS. Customers may state that they are part of a family, however, the customers who do not qualify for the family limit must be disabled from gaining access to the family limit. Tracking of the customer limit in the system was requested by the clients in section 2 of their RFP.

SREQ-2 User Account Verification: Accounts will be verified by admins after an account has been created. Upon account creation, customers must provide a valid OneCard and student ID number for the admin to verify the account with. Verification must be implemented in the system due to the high customer abuse that can occur without it. The clients have specified in the RFP and client meetings that this functional requirement must be implemented due to the nature of abuse that can arise without it. If the customer does not provide a valid OneCard with a valid Student Number then the customer will not be allowed to use the FBFS services.

3.2.3 Use Case(s) associated with the Feature or Functional Requirements

- **Request Customer Account**
  Actors: Customer, Volunteer

Precondition: Customer does not have an existing account, customer is in the store

Steps: 1) Enter FBFS facility

2) Request a new account from volunteer or Admin

3) Show student card and answer questions (UVic ID, undergrad/grad, individual/family, international/domestic, meal plan/not)

4) Complete onboarding interview with volunteer or admin

Success condition: admin has all necessary information to begin account verification, and volunteer or admin creates the account

Alternate Paths: Don't have any information

1. Information invalid, no student card
2. Account not created

- **<u>Manage Customer Accounts</u>**

Actors: Admin, Volunteer

Precondition: logged in admin/volunteer account

Steps: 1) log in

2) go to manage customer account screen

3) select create, modify, delete option:

CREATE:

1) verify customer information/identity

2) active customer account

MODIFY:

1) modify customer information

2) save customer account

DELETE:

1) delete customer account

2) verify delete option

Success Condition: customer account generated; customer account modified; customer account deleted

Alternate Paths:

1) CREATE: page refreshed; feedback: more necessary information requested

2) MODIFY: page refreshed; feedback: information format not match

- **View Customer Account**

  Actors: Admin, Volunteer

  Precondition: logged in admin/volunteer account

  Steps: 1) logged in

  2) search customer account

  3) select account to view

  4) view customer account

  Success condition: customer account viewed

  Alternate Paths: screen feedback customer account not found; click to go back.

3.3 Statistics Gathering

3.3.1 Description and Priority

The FBFS will be able to gather and keep track of user data to find where inventory comes from and where it goes as well as customer demographics. The FBFS has data collection and tracking as a medium priority, due to the admins making use of the statistics for inventory assistance and misuse prevention.

3.3.2 Functional Requirements

SREQ-1 Access Authority: Only admins must have the authority to enter data records and edit data records. Access Authority was requested by the clients in the second design meeting.

SREQ-2 Statistics Generation: Admins must be able to generate a statistics report based on filters on the data records. These filters allow for a more specific statistics report on the demographic that the admin wants. This requirement was requested by the clients in section 2 of their RFP.

3.3.3 Use Case(s) associated with the Feature or Functional Requirements

- **Takes Item**

  Precondition: FBFS has item in stock. Customer has an account.

  Steps: 1) Customer walks into store.

  2) Customer requests item/s from volunteer

  3) Volunteer validates UVic ID with system

  Success Condition: Customer's ID is visible and correct. Customer receives item/s

  Alternate Path:

a. Customer's ID is not in the UVic database. Volunteer adds account with necessary information.
b. Customer's ID does not match current data based on UVic ID card.
c. Customer has hit limit for week and is denied item/s.

- **Gives Item**

  Actors: Donor, Volunteer

  Preconditions: In store, Have item

  Steps: 1) give item to Volunteer
  2) volunteer accept / deny
  3) volunteer updates inventory

  Success Condition: Volunteer Accepts item

  Alternate Paths: Volunteer denies item

- **Manage Inventory**

  Actors: Admin, Volunteer

  Precondition: logged in admin/volunteer

  Steps: 1) Log into the system
  2) go to manage inventory screen
  3) select UPDATE, ADD, DELETE, READ option:
  UPDATE:
  1) Find the item that needs to be updated
  2) Increment the current amount by the amount received
  ADD:
  1) Create new entry of item received
  2) Publish new item with correct amount
  DELETE:
  1) Find the item that now has zero inventory
  2) Delete the item from the inventory page
  READ:
  1) Enter the inventory screen
  2) Read through the inventory

  Success Condition: Inventory levels are correct; all items in the store display on the system

- **Browse Inventory**

  Actors: Admin, Volunteer, Customer

  Preconditions: Access to internet; A device to browse the internet

  Steps: 1) Go to the FBFS web application

  2) Click on Inventory

  Success Condition: Inventory is visible and easy to read.

  Alternate Paths: Site is down and needs to be fixed.

- **Generate Statistic Reports**

  Actors: Admin

  Pre-Conditions: logged in admin account; has data tracking

  Steps: 1) log in

  2) go to report screen

  3) choose filters (check the boxes that apply)

  4) generate report

  Success Conditions: Report generated

  Alternate Paths: No data, no filters selected, wrong filters (reset) -> Error printed, page reset

4 External Interface Requirements

4.1 User Interfaces

IREQ-1 Different Views: Depending on which user class is in logged in (customer, volunteer or admin), the web application must display different views. Each view will allow the user to only see what their user class is allowed to access.

IREQ-2 Update Notifications: Volunteers and admins should be able to send out update notifications to customers.

IREQ-3 Search Bar: Users should be able to enter search terms to help filter inventory so that users can specifically find what they are looking for.

IREQ-4 Inventory Management: Volunteers and admins will have a button that will allow them to enter an inventory management screen to increase/decrease the items current inventory.

IREQ-5 Generate Reports: Admins will have the ability to generate statistical reports upon entering the reports screen. These reports will be displayed in the browser for the admin.

IREQ-6 Manage Customers: Admins and volunteers will have the ability to manage customer accounts by entering the “Manage Accounts” section.

IREQ-7 Create Account: Managers will be able to create and verify customer and volunteer accounts, and volunteers will be able to create customer accounts.

4.2 Hardware Interfaces

IREQ-8 Device compatibility: The system must be accessible on all personal computers, mobile devices and laptops with a recent version (released after 2007) of Windows, MacOS, Linux, Android, or IOS

4.3 Software Interfaces

IREQ-9 Data storage: The web application must not write any information to the user’s computer. The web application will transfer all data via the internet. All data will be stored on the UVic database and adhere to their storage policies.

4.4 Communications Interfaces

IREQ-10 Browser compatibility: The system must be accessible via the Internet and will be optimized for Internet Explorer (Version 11.0.85 and beyond) and Google Chrome (Version 69.0.3497.92 and beyond).

5 Other Non Functional Requirements

5.1 Performance Requirements

NFR-1 Response time: The system must respond to queries within three seconds of making the request of the system.

NFR-2 Inventory Update time: When a Volunteer or Admin modifies the inventory, they must have their changes viewable under one minute. This time frame gives a simulation of the real time updating in SREQ-2 but a realistic implementation. It will seem real time and that is what the client wants.

NFR-3 Simultaneous Changes: When updating existing stock in the inventory database, the system will use a plus/minus implementation to solve multiple uses, and accuracy will be taken care of in store. When adding or removing items from the inventory database, the inventory database must be locked out for the duration of the change. For the UVic database, the database will be locked out when any changes are made.

NFR-4 Capacity: FBFS regularly provides service for 600 -1200 total customers with 120 new customers added per year.

NFR-5 Account removal: Accounts must be removed from storage one year after the user leaves UVic.

NFR-6 Time or space Bound: One hundred users are expected to be able to use the remote system at any one time without issues.

NFR-7 Downtime: The system must have less than 10% downtime per month where the system does not work as specified in the requirements above.

NFR-8 Usability: Customers looking at what the FBFS has in stock must see updates in real time (NFR-2) so they have an accurate reference of what they can get. Similarly, customers should be able to reach all parts of the system within five page changes. Volunteers and admins should have more options, but the same five page changes to get to them.

5.2 Safety Requirements

NFR-9 Access Control: Access control should be implemented such that only admins can access statical data/reports. Family data will only be accessible to volunteers and admins.

NFR-10 Data release: Users' data must not be released to unaffiliated parties and customer statical data must not be released.

5.3 Security Requirements

NFR-11 Privacy policy: All user data must be on a UVic server or closed system and must follow UVic policies for protection of private information. Privacy of personal information must be kept inaccessible to unaffiliated groups, and only accessible to the FBFS without written consent. Only volunteers and admins in the organization can access personal data and the accessible personal data must conform to the Uvic Protection of Privacy Policy [3].

NRF-12 ID Verification: Customers must also require a valid V-Number to use the service and false/additional V-Numbers must be prevented for the same customer. Volunteers must check

name (from the UVic database) and V-number to verify the customer. Customers who register as a family are expected to be telling the truth, this portion of the system will run on an ‘honor’ basis as requested by the clients.

5.4 Software Quality Attributes

NFR-13 Inventory Management time: Volunteers and Admins must be able to manage inventory within five minutes of receiving an order from a customer, but preferably within seconds.

NFR-14 Account Creation time: Volunteers and Admins should be able to create and manage a customer account within ten minutes maximum, excluding admin verification of customer accounts.

NFR-15 Training time: Volunteers should be able to create and manage a customer account within ten minutes maximum, excluding admin verification of customer accounts.

NFR-16 Readability: Customers must be able to read the inventory with ease.

6 Other Requirements

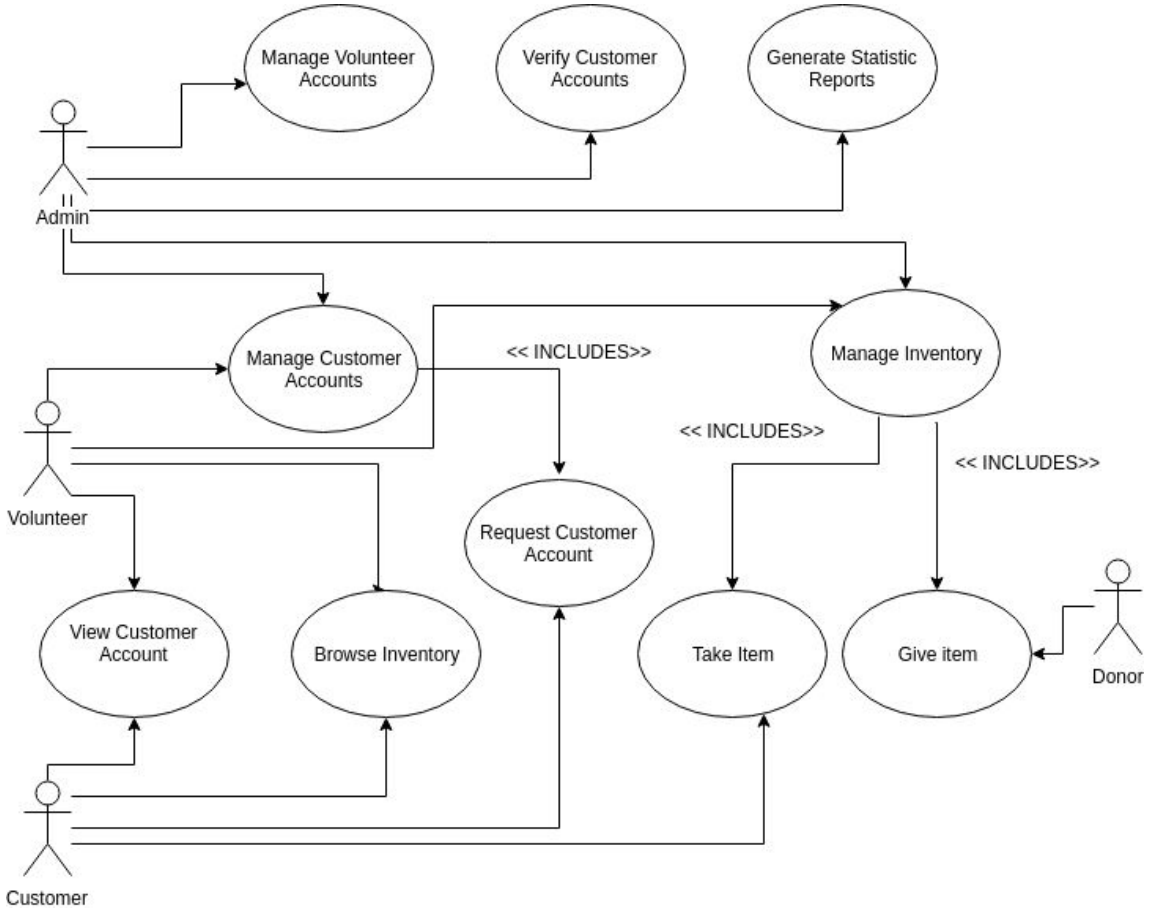
Currently, the client has specified that they would like a newsletter that users can view in order to see daily/weekly changes in the stock of the FBFS. This requirement is a low priority and may not be completed in early software versions.

7 Analysis Models

7.1 Use Case Model

The Use Case Diagram below (fig. 1) shows the actors and behaviours of the system. The actors include the admins, volunteers, customers, and donors. Each actor has a set of actions that they can accomplish with the new system. Admins must be able to manage accounts of both volunteers and customers. Volunteers must be able to manage the customer accounts. Customers must be able to browse the inventory, and volunteers must be able to manage the inventory. When a customer takes an item the volunteer must update the inventory. Similarly when a donor gives an item, the volunteer must update the inventory.

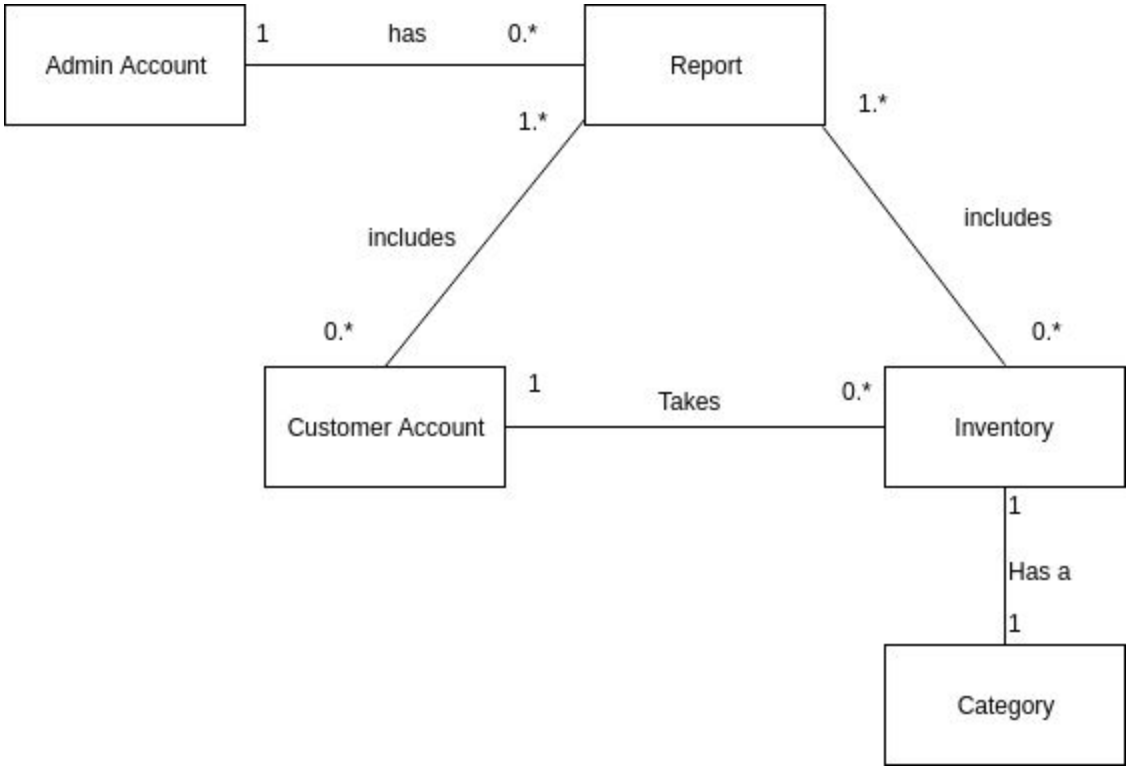
Figure 1: Use case model



7.2 Entity Relation Diagram

The Entity Relation Diagram below (fig. 2) shows how the entities relate in the system. An admin account must have a list of reports that they have generated for future reference. A report must have a list of customer accounts and inventory that have been tracked in the report. An inventory item must have a category associated with it for easier searching and filtering. A customer account must have a name, v-number, and a list of known family members. Inventory must have the name, quantity, and the associated category. Category must have a name.

Figure 2: ER diagram

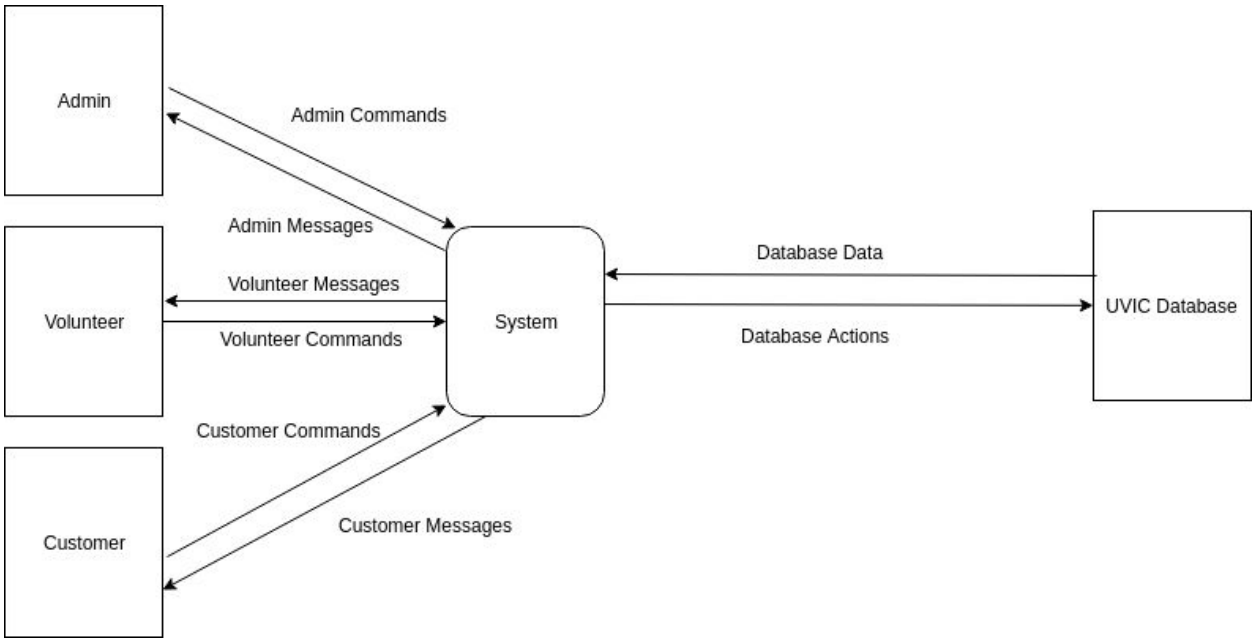


7.3 Data Flow Diagrams

7.3.1 Context Diagram

The Context Diagram below (fig. 3) shows the entities that interact with the system. The database is an external UVic system so is treated as an entity. The UVic database is used for storing sensitive account and report information. Commands are actions allowed by the system, and messages are information sent from the system.

Figure 3: DFD Level 0

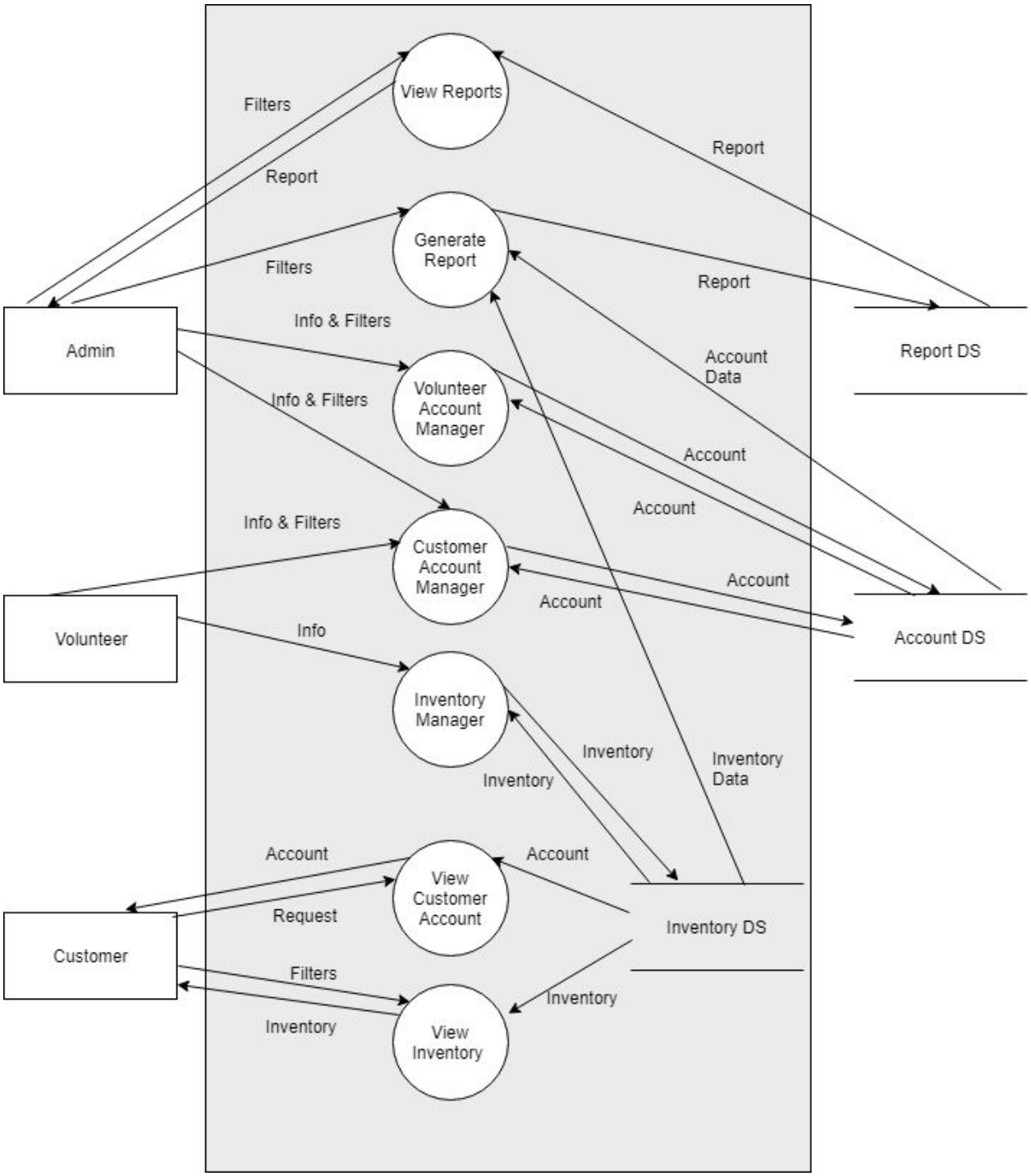


7.3.2 DFD Level 1

The Data Flow Level 1 Diagram below (fig. 4) shows a more detailed flow of data through the system. Admins have full access to the system. Generating a report is limited to admins only and reports will be saved for future references. Admins must also be able to manage volunteer and customer accounts.

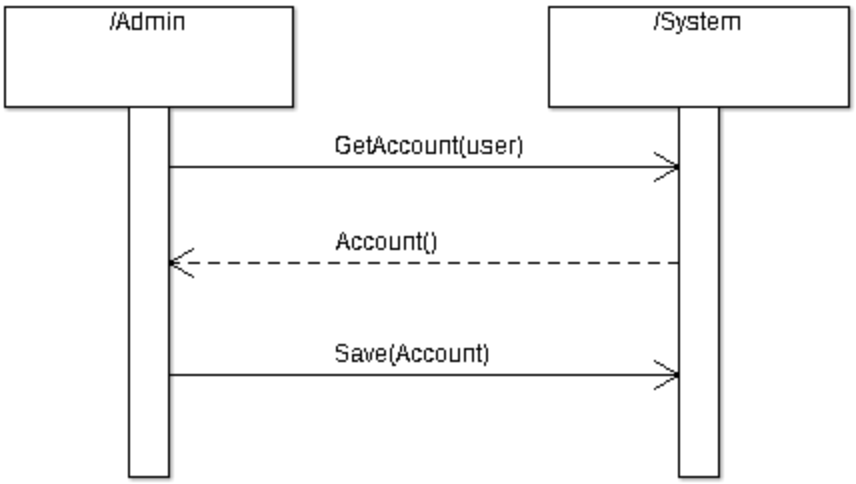
Volunteers must be able to manage the inventory and customer accounts. A customer must be able to view current inventory in stock as well as their own account to keep updated on their weekly limits. In fig. 4, the report and account datastores are saved within the UVic Database and the inventory is saved in the internal inventory database.

Figure 4: DFD Level 1

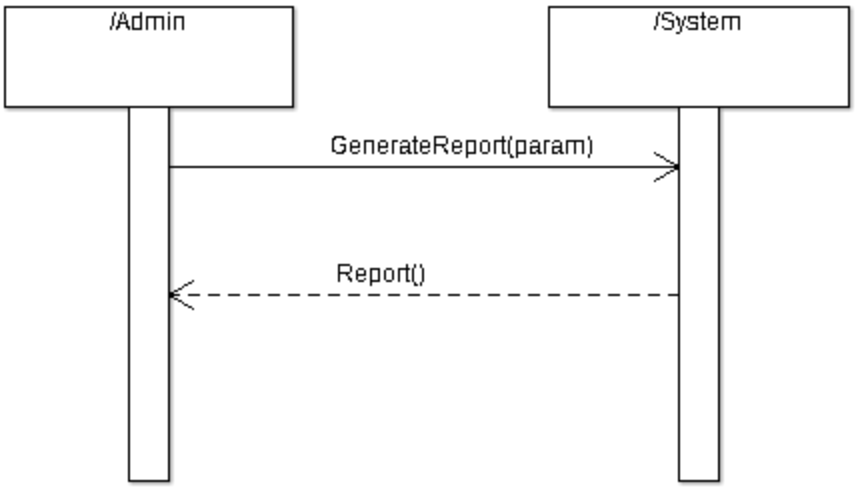


7.4 Use Case Sequence Diagrams

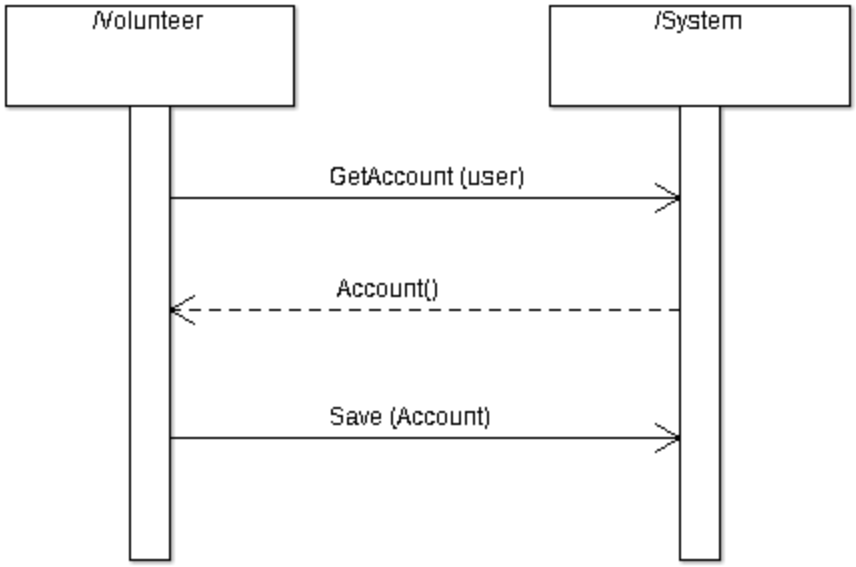
Admin manage volunteer accounts



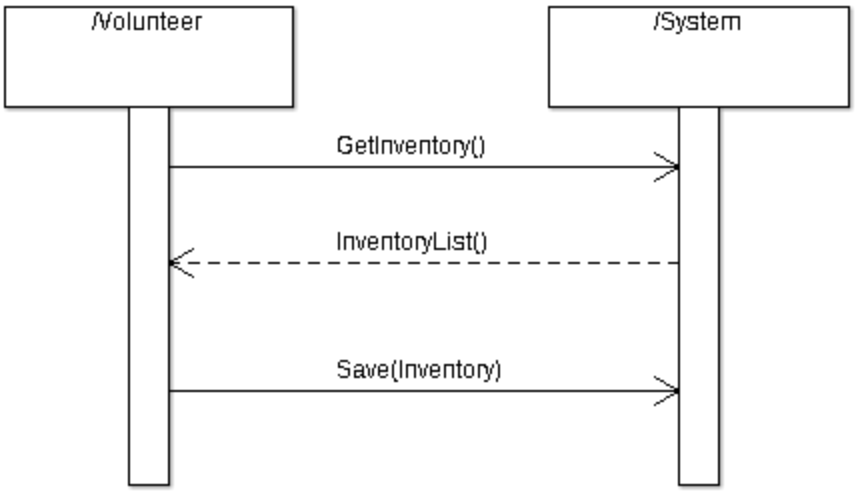
Admin generate report



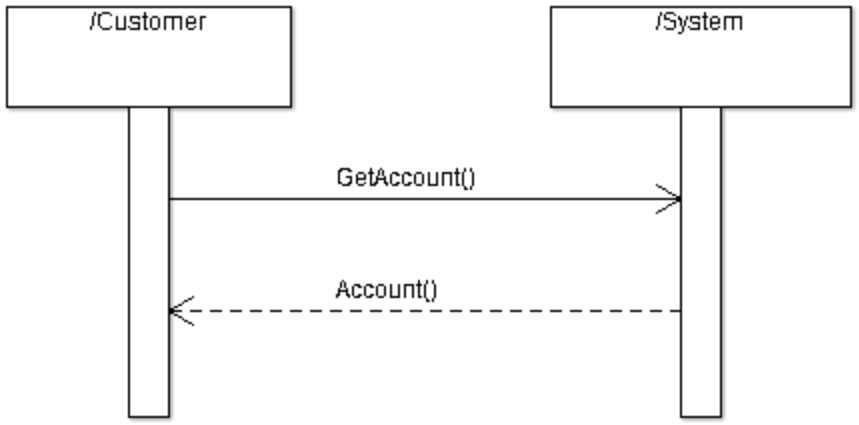
Volunteer manage customer account



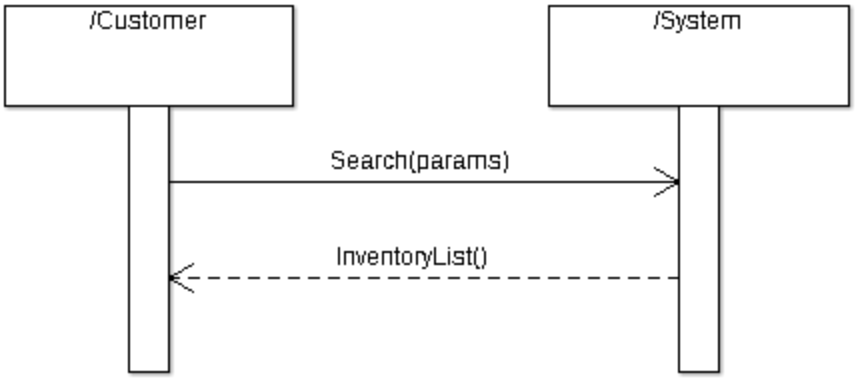
Volunteer manage inventory



Customer view personal customer account



Customer view current inventory with search



Appendix

Main UI Model:
https://xd.adobe.com/view/4d79f1fd-1802-4820-7537-ad75ddb2f68c-3b48/?fbclid=IwAR33X-7vUwtkxg_eGb_iPjyV8BDQtXc_XLdAGw4XnNR5Z-lhEhxYCVhABaE&fullscreen

Alternate UI Model:
https://xd.adobe.com/view/69c289f1-fe42-4d03-620f-a6b009e85610-1ff3/?fbclid=IwAR0volltqSmfy-7BtktDFPgVq8OPNsqLcWcX8RGzddkEUxFJzlr9GkrZYmI&fullscreen

Appendix: Issues List

- Suppose an admin deems a customer account not viable. Should the system log that V-number as denied? (Thus when the volunteer pulls it up they are aware the account was deleted) Likewise when an account deactivated after a year, should a seperate message be displayed to inform the volunteer ‘expired’?