Software Engineering Project

Requirements Analysis

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1. Introduction

The purpose of this user requirement document is to specify the requests that the users of the system at Aki's Bakery are expecting to use when the software is developed in order to develop software according to their needs.

This document is intended to be read by:

- All of the managerial personnel of Aki Bakery.
- All responsible for the management of the developments in question.
- Users which are anyone within the business that has to come into contact with this system that is under development.
- The persons that are actually going to build the system itself, which are the programmers.

1.1 Expectations

Developing a successful software that can meet the prospect of users and customers that
can stand up to the competitors in terms of quality. The user requirements analysis provides
direct descriptions of the quality, content and functionality that the user demands, such
demands can be categorized as functional requirements and non-functional requirements.

Functional requirements

• These describe the functionality that the system should provide and how these are to be performed within the new system. The functional requirements allows one to understand the tasks that involve the concept of why particular activities are being performed by users, what their limitation and preferences are.

Non-Functional requirements

• The non-functional requirements consists of the different types of users which can be the professionals and personal users, users characteristics description, subjective preferences and the environment in which the system will be used by the user.

1.2 Scope

The software implements a web based application that is able to execute relevant business processes when the respective module is chosen. The complexity of this software is hidden from the users and web-app-based-front-end for users to access the system increases the user friendliness and gives an ease when completing difficult or tiresome business processes.

1.3 List of definitions and abbreviations

Task – specification of application, configuration data, input and or output data files.

Aki Pro Plus- the name of the software being developed.

Web based application- an application or program that is accessed over a network connection using HTTP, rather than existing within a device's memory. Web-based applications often run inside a Web browser. However, Web-based applications also may be client-based, where a small part of the program is downloaded to a user's desktop, but processing is done over the Internet on an external server.

NAT – Network Address Translation.

1.4 General Description

Main Goal

Aki Pro Plus provides users with a web based system that can be used anywhere once they have access to the internet, which assists with major job processes. This system should be able to assist all its users such as delivery personnel, the bakers, and data entry staff and as well as the executive with their respective job processes.

General capabilities

The Aki Pro Plus system is designed to accomplish business processes at Aki's Bakery through a web-based interface. This web-based system uses resources such as apps, files/information and can be represented on a computer or any mobile devices.

Aki Pro Plus is accessed through the internet by internal users of the business such as delivery truck drivers, sales representatives, office workers as well as external users such as customers.

The system makes sure that no one without the correct credentials can access private information. The manager can set limits to who can have access or update to certain things based on their credentials for example a delivery van driver cannot change his own routes.

Aki Pro Plus will be easy for users to operate.

1.5 User characteristics

The following is the listing of the roles that will exist in the Aki Pro Plus system.

- Delivery Van Drivers: The delivery van drivers are responsible for getting orders to customers in a timely manner and recording their transactions.
- Office Workers: The Office staff assigns routes to delivery personnel, update and edit customer and ordering information. They also approve changes to standing orders.
- Customers: The customers place the orders and standing orders in which they wish to purchase from Aki Bakery.

Sales Representative: This person serves customers, is the bridge between management
and customers in respect the pricing and managing sales trends of the products through
daily call reports, weekly work plans and monthly analyses.

2. Functional Requirements

2.1 User Requirements

User: Delivery van Driver

- 1. The van driver shall be able to log into the system using his username and password and automatically retrieve his routes.
- 2. The van driver shall be able to view a single invoice
- 3. The van driver shall be able to view the invoices for a customer
- 4. The van driver shall be able to print an invoice
- 5. The van driver shall be able to sync his mobile device to the main Aki Pro Plus database, relaying and retrieving changes.
- 6. The van driver shall be able to access the cash account section of a customer's invoice.
- 7. The van driver shall be able to create a new cash account entry for on the spot sales.

User: Sales representative

- 1. The sales representative shall be able to log into the system using their username and password and retrieve their status.
- 2. The sales representative shall be able to modify standing orders.
- 3. The sales rep shall be able to generate customers order reports.
- 4. The sales representative shall be able to generate standing order reports.

User: Customers

- 1. The customer shall be able to make orders through the system.
- 2. The customer shall be able to edit orders.
- 3. The customer shall be able to create standing order.
- 4. The customer shall be able to make changes to standing order.

- 5. The customer shall be able to log on the system using their credentials.
- 6. The customer shall be able to access account information.
- 7. The customer shall be able to access order information.

User: Office workers

- 1. Office workers shall be able to log into the system using their credentials.
- 2. Office workers shall be able to generate orders for customers that call in to make orders.
- 3. Office workers shall be able to generate invoices.
- 4. Office workers shall be able to view the invoices for a customer

2.2 System Requirements

- 1. Aki Pro Plus shall be a web-based user interface software.
- 2. Aki Pro Plus system shall provide apps through which users can use to interact with system.
- 3. Aki Pro Plus system should provide a command-line interface through which users can use to interact with system.
- 4. The language content used in Aki Pro Plus should be English.
- 5. The system should allow access to any amount of users at the same time.
- 6. The system shall select the correct resources that are needed to process a task.
- 7. The system shall only give access to users with specific credential clearance for a specific task based on their job description.
- 8. The Aki Pro Plus system shall provide the means for users to use a method to idenetify themselves on the system.
- 9. The Aki Pro Plus system should be able to record the times at which a user accesses the system.
- 10. The Aki Pro Plus system shall be able to keep information for a very long time period such as standard recipes must be able to be accessed for more than a year.
- 11. The Aki Pro Plus system must allow persons with high clearance to make changes to the system i.e. IT personnel, maintenance personnel.
- 12. The Aki Pro Plus system shall be able to work with any time of operating systems, windows, mac, Linux.

- 13. The Aki Pro Plus system shall provide users with the means to add data files to the system.
- 14. The Aki Pro Plus system shall provide users with the means to delete data files to the system.
- 15. The functionality of the system should not be restricted when computers of users are behind a firewall or a NAT.
- 16. All applications in the Aki Pro Plus system should log what they are doing.

3. Non-Functional requirements

Authentication – The system must be able to authenticate users within the system It must be able to grant and revoke privileges in order to have a level of control for employees.

Robustness – The system should be able to ensure that the content and content services are available all the time. All system failure must be logged.

Maintainability – The system must be able to be updated easily,

Portability – All users would be able to run system on mobile hardware, since the system is based on the internet there would be no specific requirements regarding portability.

Usability – It would be easy to use, simple for someone with basic computer usage skills to understand for to use it.

User interface- Navigating through features present in the system should be easy.

Availability- This system must be able 24/7 and be extremely reliable.

Deployment- Mobile modules must be able to update through the internet.

Security- Username and password is required every time a user enters the system, or tries to make any changes on the system. A strict execution time would be present; if a user takes too long to complete a task the system would kick them out, having them to reenter their username and password.

Secure transfer of data between the customers and Aki Pro Plus. Sensitive data should be either encrypted over SSL or through HTTPS connections.

System stability - the system must be able to deal with errors in the most efficient manner.

Distribution- new mobile client module versions will be distributed using the internet.

- 1. The system shall be able to perform its function under stated conditions for a specific period of time.
- 2. The system shall be able to quickly react to user input.

- 3. The system should be available for service when requested by end users.
- 4. The system should be dependable- the ability to deliver service that can be justifiably trusted by users.
- 5. The system should be scalable- the capability of the system to increase total throughput under an increased load when resources are added.
- 6. The system should be secure
 - 1. All system data should be backed up every 2 hours and the backup copies stored in a secure location.
 - 2. All external communications between the system's data server and clients shall be encrypted.
- 7. The system should have a well-formed graphical user interface.
- 8. The system shall have help facilities.
- 9. The system shall produce understandable error messages.
- 10. The system should provide a well-structured user manual.
- 11. The system should be able maintainable ability to be changed with new technology or to fix defects within the system

4. Use Cases

Customer Account Use Cases

*Assumption = Customer will have internet access

Use Case #1

| Use Case Name | Customer Login |
|---------------------------|---|
| Related | Must know username and password |
| Requirement | |
| Goal in context | Successful login |
| Pre-Conditions | Must have login credentials |
| Successful end conditions | User logs in successfully |
| Fail end condition | User unsuccessful in logging in |
| Primary Actor | Customer |
| Secondary Actor | - |
| Main Flow | User Opens application User Prompted for login credentials User would enter credentials User redirected to main menu |

| Use Case Name | Create new standing order |
|---------------------------|---|
| Related Requirement | Must know item names and quantities |
| Goal in context | Successfully creates standing order |
| Pre-Conditions | User must log in and have permissions create standing order |
| Successful end conditions | User successfully creates a standing order |
| Fail end condition | User is unable to create a standing order |
| Primary Actor | Customer |
| Secondary Actor | Office worker |
| Main Flow | User Opens application Opens Standing order module Select create new standing order |

| 4) Enter info | |
|---------------|--|
| 5) Save | |
| | |

| Use Case Name | Create new order |
|---------------------------|---|
| Related Requirement | Must know item names and quantities |
| Goal in context | Successfully creates order |
| Pre-Conditions | User must log in and have permissions create order |
| Successful end conditions | User successfully creates an order |
| Fail end condition | User is unable to create an order |
| Primary Actor | Customer |
| Secondary Actor | Office worker |
| Main Flow | User Opens application Opens order module Select create new order Enter info Save |

| Use Case Name | Edit standing order |
|---------------------------|--|
| Related Requirement | Must know item names, quantities, standing order date |
| Goal in context | Successfully edits standing order |
| Pre-Conditions | User must log in and have permissions edit standing order |
| Successful end conditions | User successfully edits a standing order |
| Fail end condition | User is unable to edits a standing order |
| Primary Actor | Customer |
| Secondary Actor | Office worker |
| Main Flo | User Opens application Opens Standing order module Searches for Standing order Selects standing order Edits standing order Save |

| Use Case Name | View Accounts information |
|---------------------------|--|
| Related Requirement | User must log in |
| Goal in context | User successfully views account information |
| Pre-Conditions | User must log in |
| Successful end conditions | User successfully views account information |
| Fail end condition | User is unable to view account information |
| Primary Actor | Customer |
| Secondary Actor | - |
| Main Flow | 1) User Opens application2) Selects account information |

Driver Use Cases

Use Case #1

| Use Case Name | Driver Login |
|---------------------------|--|
| Related Requirement | Must know username and password |
| Goal in context | Successful login |
| Pre-Conditions | Must have login credentials and internet access |
| Successful end conditions | User logs in successfully |
| Fail end condition | User unsuccessful in logging in |
| Primary Actor | Driver |
| Secondary Actor | Manager |
| Main Flow | 5) User Opens application6) User Prompted for login credentials7) User would enter credentials8) User redirected to main menu |

| Use Case Name | View invoice |
|---------------------------|--|
| Related Requirement | Must know Customer Name and date of invoice |
| Goal in context | Successfully view Invoice |
| Pre-Conditions | User must log in and have permissions to view invoices |
| Successful end conditions | User successfully views an invoice |
| Fail end condition | User is unable to view invoices |
| Primary Actor | Driver |
| Secondary Actor | Manager |
| Main Flo | 6) User Opens application 7) Opens View invoices module 8) Enters customer name 9) Selects invoice to view 10) Invoice loads and is viewable |

| Use Case Name | Record Cash Purchase |
|---------------------------|--|
| Related Requirement | User must know customer name and cash sale amount |
| Goal in context | User successfully records cash purchase |
| Pre-Conditions | User must log in and have permissions to view record cash purchases |
| Successful end conditions | User successfully records a cash purchase |
| Fail end condition | User is unable to record a cash purchase |
| Primary Actor | Driver |
| Secondary Actor | Manager |
| Main Flow | User Opens application Access Invoices Selects add new entry to cash account purchases Enters Cash Purchase info Saves invoice |

| Use Case Name | Process Returns |
|---------------------------|---|
| Related Requirement | User must know monetary amount of returns |
| Goal in context | User successfully processes returns |
| Pre-Conditions | User must log in and have permissions to view record returns |
| Successful end conditions | User successfully processes returns |
| Fail end condition | User is unable to record returns |
| Primary Actor | Driver |
| Secondary Actor | Manager |
| Main Flow | User Opens application Access Invoices Selects add new entry to cash account purchases Enters Cash Purchase info |

| 5) Saves invoice |
|------------------|
| |

| Use Case Name | Print invoices |
|---------------------------|--|
| Related Requirement | User must know customer name and date of invoice |
| Goal in context | User successfully prints invoice(s) |
| Pre-Conditions | User must log in and have permissions to view invoices |
| Successful end conditions | User successfully prints invoice(s) |
| Fail end condition | User is unable to print invoice |
| Primary Actor | Driver |
| Secondary Actor | Manager |
| Main Flow | 3) User Opens application 4) Access Invoices via order invoices or cash purchase invoices 5) Selects invoice and opens invoice 6) Selects print invoice |

| Use Case Name | Sync |
|---------------------------|--|
| Related Requirement | User must login |
| Goal in context | User successfully syncs device |
| Pre-Conditions | User must have internet access |
| Successful end conditions | User successfully syncs |
| Fail end condition | User is unable sync |
| Primary Actor | Driver |
| Secondary Actor | Manager |
| Main Flow | User Opens application Selects sync |

Order Processing Use Cases

Use Case #1

| Use Case Name | Create standing order |
|---------------------------|---|
| Related Requirement | Must know standing order day, items and quantity |
| Goal in context | Successful creation of standing order |
| Pre-Conditions | Must have customer information and access to create standing orders |
| Successful end conditions | User creates standing order successfully |
| Fail end condition | User unsuccessfully creates standing order |
| Primary Actor | Office Worker |
| Secondary Actor | Manager |
| Main Flow | 9) User Opens application 10) Selects Standing order module 11) Select create standing order 12) Enter standing order info 13) Save |

Use case #2

| Use Case Name | Create order |
|---------------------------|---|
| Ose Case Maille | Create order |
| Related | Must know order day, items and quantity |
| Requirement | |
| Goal in context | Successful creation of order |
| Pre-Conditions | Must have customer information and access to create order |
| Successful end conditions | User creates order successfully |
| Fail end condition | User unsuccessfully creates order |
| Primary Actor | Office Worker |
| Secondary Actor | Manager |

| Main Flow | 1) User Opens application |
|-----------|----------------------------|
| | 2) Selects order module |
| | 3) Select create new order |
| | 4) Enter order info |
| | 5) Save |

| Llas Casa Nama | Democratic and if the standing and an |
|---------------------------|--|
| Use Case Name | Request to modify standing order |
| | |
| Related | Must know customer name, sales trends/reports, item names and quantities |
| Requirement | |
| Goal in context | Successfully edits standing order |
| Pre-Conditions | User must log in and have permissions edit standing order |
| Successful end conditions | User successfully edits a standing order |
| Fail end | Hear is unable to edite a standing order |
| condition | User is unable to edits a standing order |
| Primary Actor | Customer |
| Secondary | Office worker |
| Actor | |
| Main Flo | 11) User Opens application |
| | 12) Opens Standing order module |
| | 13) Enters customer to search for |
| | 14) Select customer |
| | 15) Select standing order for customer |
| | 16) Edit info |
| | |
| | 17) Save |
| | |

| Use Case Name | Generate orders |
|---------------------------|--|
| Related Requirement | Must know order days, items and quantity |
| Goal in context | Successful creation of orders |
| Pre-Conditions | Must have customer information and access to create orders |
| Successful end conditions | User creates orders successfully |
| Fail end condition | User unsuccessfully generate orders |
| Primary Actor | Office Worker |
| Secondary Actor | Manager |
| Main Flow | User Opens application Selects order module Select generate orders Enter orders' criteria Generate |

| Use Case Name | Generate invoice |
|---------------------------|--|
| Related | Must know order date, customer name |
| Requirement | |
| Goal in context | Successful generation of invoice |
| Pre-Conditions | Must have access to orders and generate invoices |
| Successful end conditions | User successfully generates invoice |
| Fail end condition | User unsuccessfully generate invoice |
| Primary Actor | Office Worker |
| Secondary Actor | Manager |
| Main Flow | User Opens application Selects order module |

| 3) | Search for customer |
|----|---------------------|
| 4) | Select order |
| 5) | Generate invoice |

Sales Rep Use Cases

Use Case #1

| Use Case Name | Sales Rep Login |
|---------------------------|--|
| Related | Must know username and password |
| Requirement | |
| Goal in context | Successful login |
| Pre-Conditions | Must have login credentials |
| Successful end conditions | User logs in successfully |
| Fail end condition | User unsuccessful in logging in |
| Primary Actor | Sales Rep |
| Secondary Actor | - |
| Main Flow | 14) User Opens application15) User Prompted for login credentials16) User would enter credentials17) User redirected to main menu |

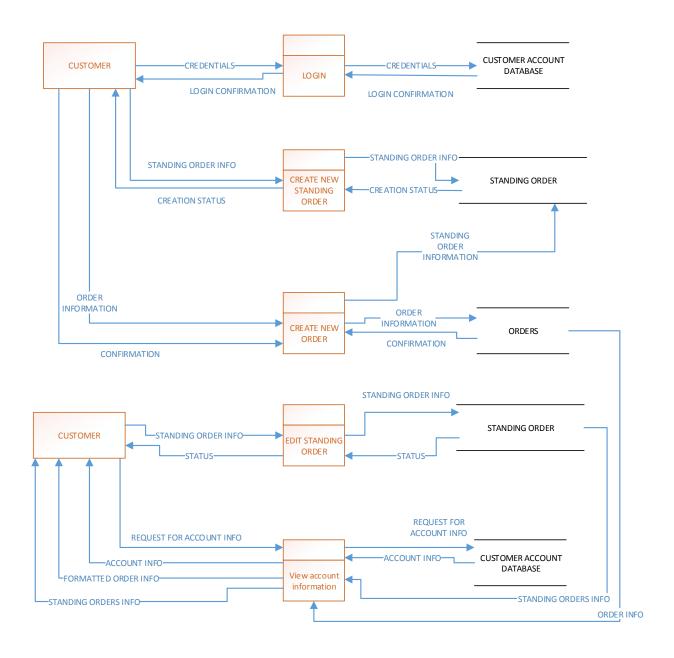
| Use Case Name | Request to modify standing order |
|---------------------------|--|
| Related Requirement | Must know customer name, sales trends/reports, item names and quantities |
| Goal in context | Successfully edits standing order |
| Pre-Conditions | User must log in and have permissions edit standing order |
| Successful end conditions | User successfully edits a standing order |
| Fail end condition | User is unable to edits a standing order |
| Primary Actor | Customer |
| Secondary Actor | Office worker |
| Main Flo | 18) User Opens application19) Opens Standing order module20) Enters customer to search for21) Select customer |

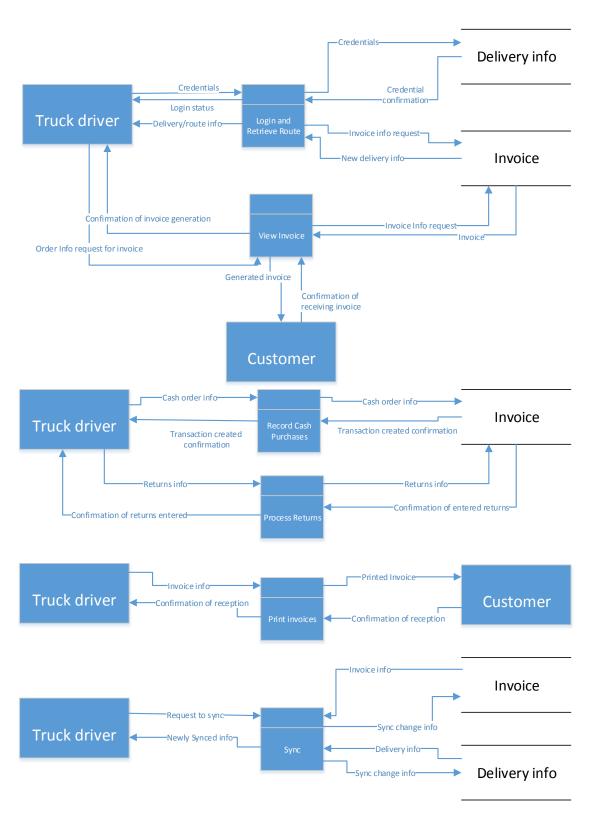
| 22) Select standing order for customer |
|--|
| 23) Edit info |
| 24) Save |
| |

| Use Case Name | Generate reports | | |
|---------------------------|--|--|--|
| Related Requirement | Must know customer name, item name, sales date range | | |
| Goal in context | Successfully generates Reports | | |
| Pre-Conditions | User must log in and have permissions generate reports | | |
| Successful end conditions | User successfully generates a report | | |
| Fail end condition | User is unable to generate a report | | |
| Primary Actor | Sales Rep | | |
| Secondary Actor | - | | |
| Main Flo | 6) User Opens application 7) Open Report module 8) Select trend report type 9) Select customer 10) Enter report criteria | | |

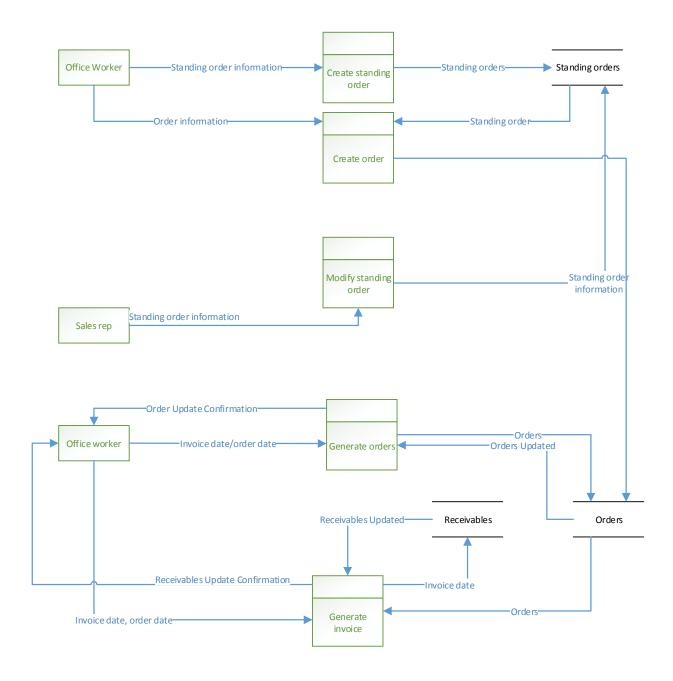
5.. Data Flow Diagrams

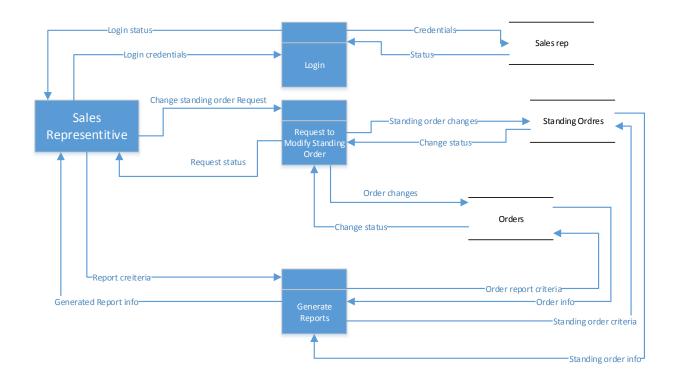
Customer Account DFD





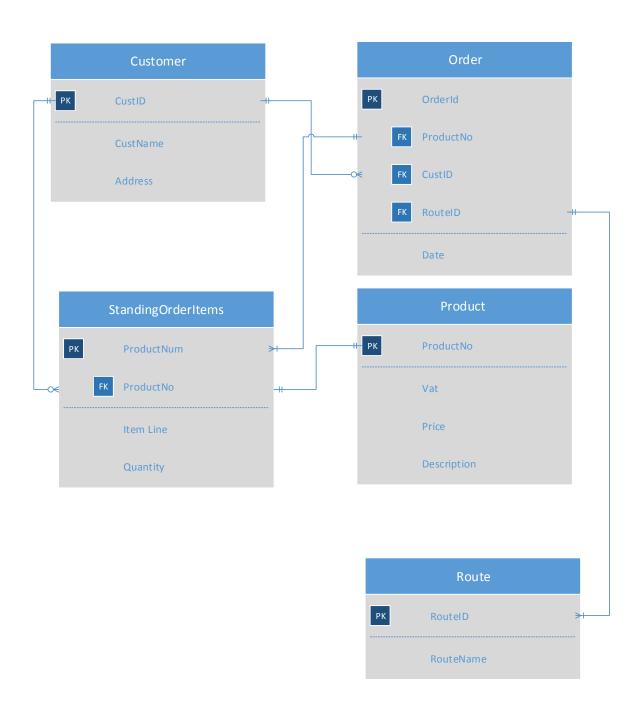
Order Processing DFD



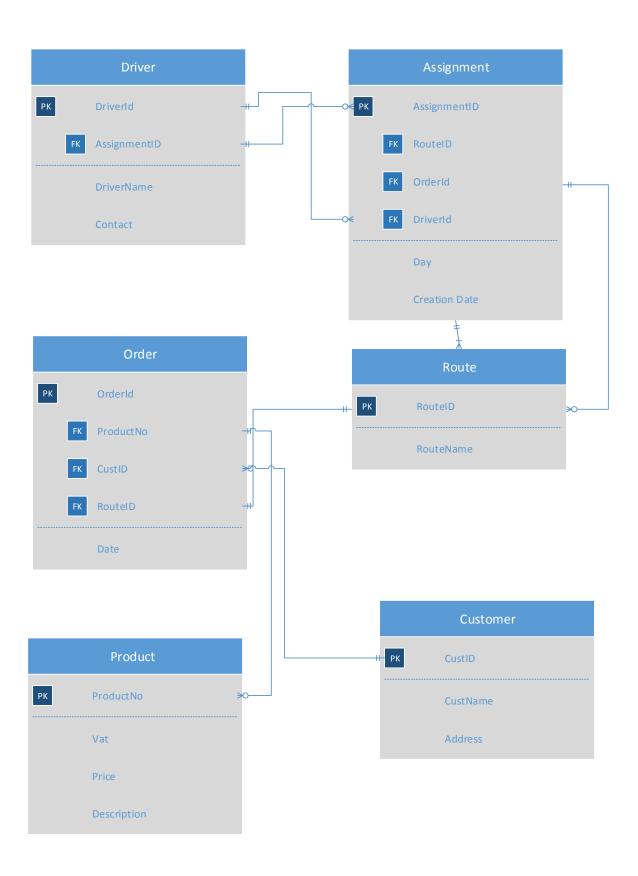


6. Entity Relationship Diagrams

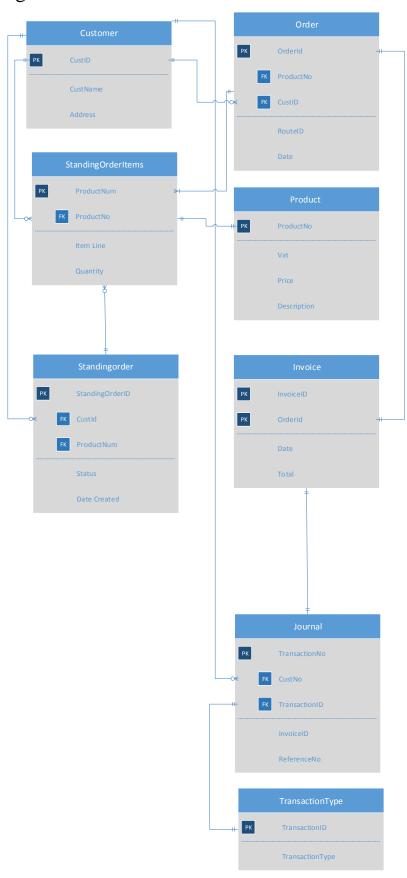
Customer ERD



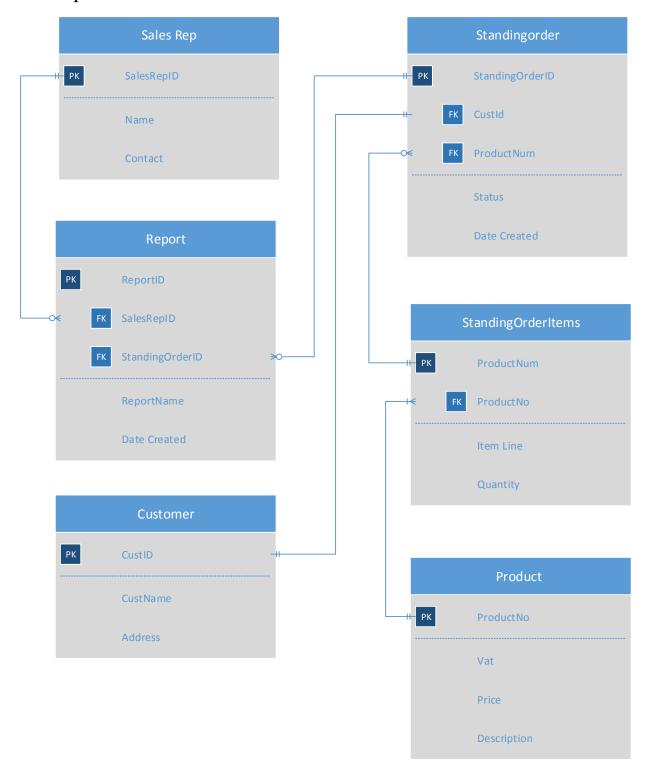
Delivery ERD



Order Processing



Sale Rep ERD



7. Resource Diagrams

Invoice

| Action | Input Parameter | Output | Description |
|--------|---|--|--|
| GET | Customer Name/ Invoice Date/Token | Invoice number/ item entries/invoice dates/prices/discounts | Retrieves one invoice |
| POST | Operation/Item name, quantity/customer name | JSON object – with a string to show status of request(successful, failed and why) | Operation = Creating Returns information posted to relevant invoice |
| DELETE | Invoice number/ invoice date/ customer name/token | JSON object – with a string to show status of request(successful, failed and why) | Deletes one chosen invoice |

Order

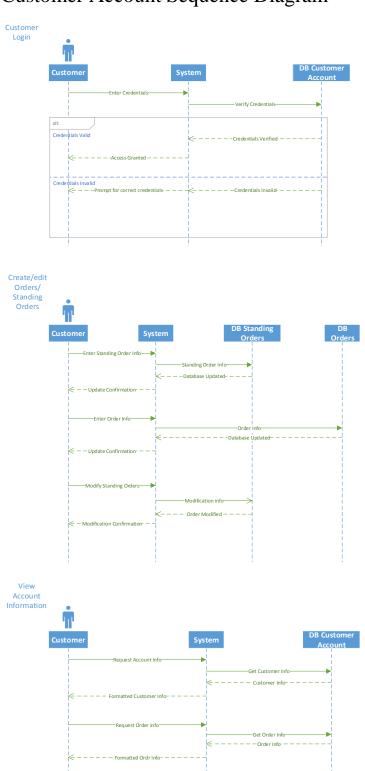
| Action | Input Parameter | Output | Description |
|--------|---|--|--|
| GET | Customer Name/ Order Date/Token | Order number/ item entries/invoice dates/prices/ discounts | Retrieves one order |
| PUT | Item Name/ Quantity/price/ discount/ token | JSON object – with a string to show status of request (successful, failed and why) | Operation= 'generate', 'generate selected', 'delete orders', 'change date' |
| POST | Operation/Item name, quantity/customer name/token | JSON object – with a string to show status of request (successful, failed and why) | Operation= 'generate', 'generate selected', 'delete orders', 'change date' |
| DELETE | Order date/ customer name/token | JSON object – with a string to show status of request | Deletes all orders for a given day |

Standing Order

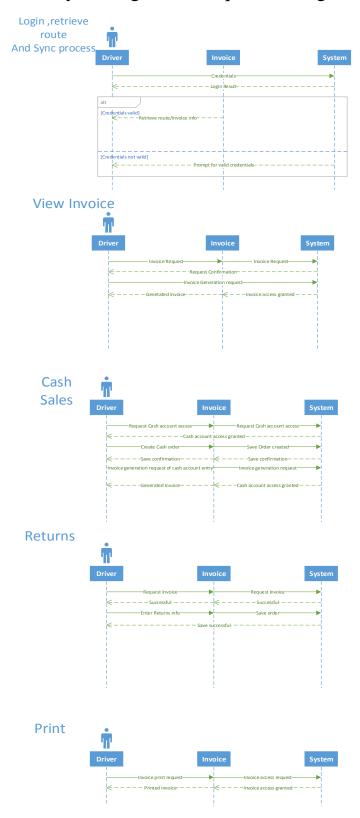
| Action | Input Parameter | Output | Description |
|--------|---|--|--|
| GET | Customer Name/ Standing Order Date/Token | Standing Order number/ item entries/invoice dates/prices/ discounts | Retrieves one standing order |
| PUT | Item Name/ Quantity / price/ discount/ token | JSON object – with a string to show status of request (successful, failed and why) | Operation= 'generate', 'generate selected', 'delete orders', 'change date' |
| POST | Operation/Item name, quantity/customer name/token | JSON object – with a string to show status of request (successful, failed and why) | Operation= 'generate', 'generate selected', 'delete orders', 'change date' |
| DELETE | Standing order date/ customer name/token | JSON object – with a string to show status of request | Deletes all standing orders for a given day |

8. Sequence Diagrams

Customer Account Sequence Diagram

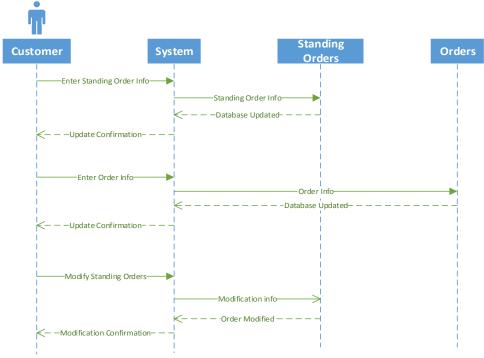


Delivery Management Sequence Diagram

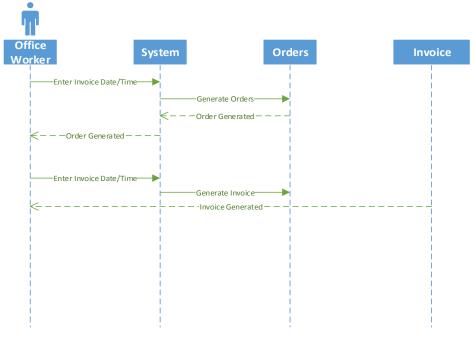


Order Processing Sequence Diagram

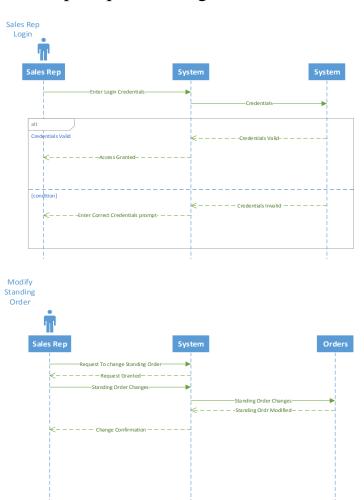


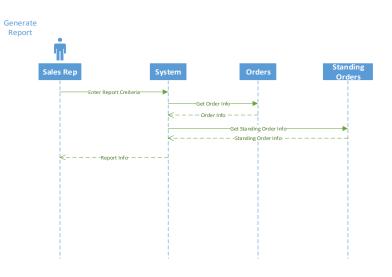




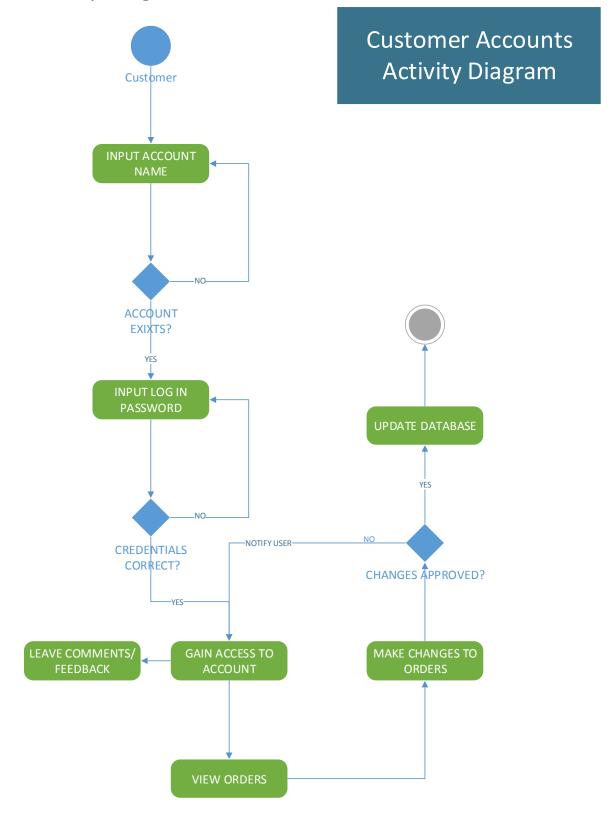


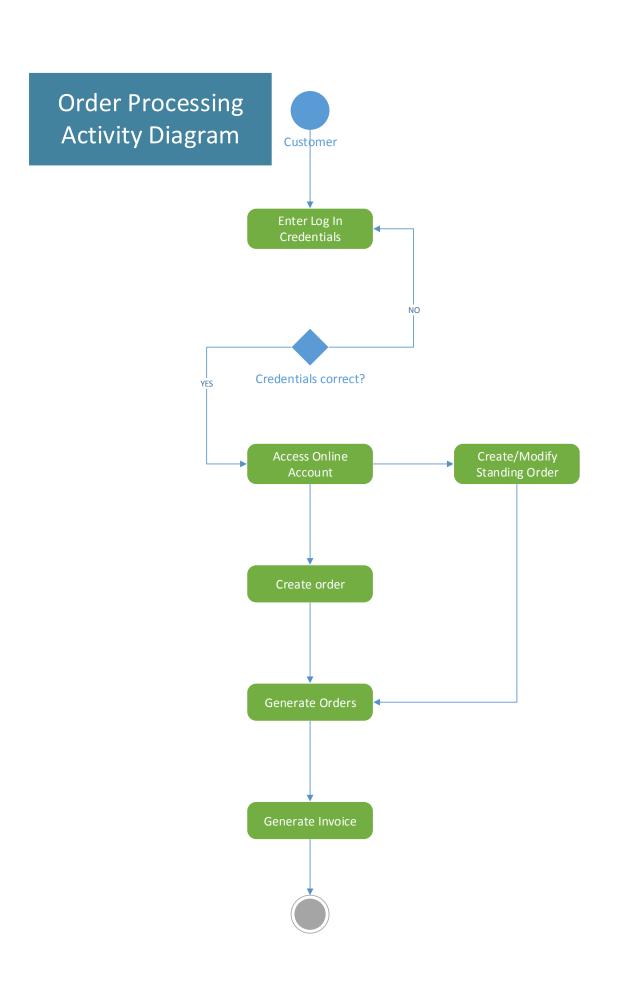
Sales Rep Sequence Diagram

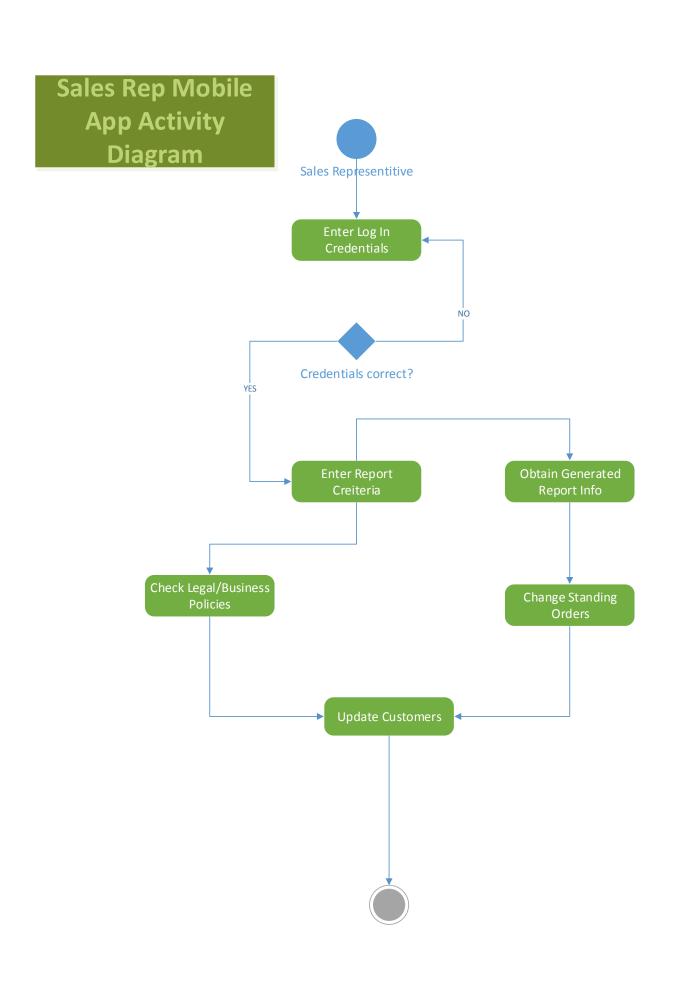


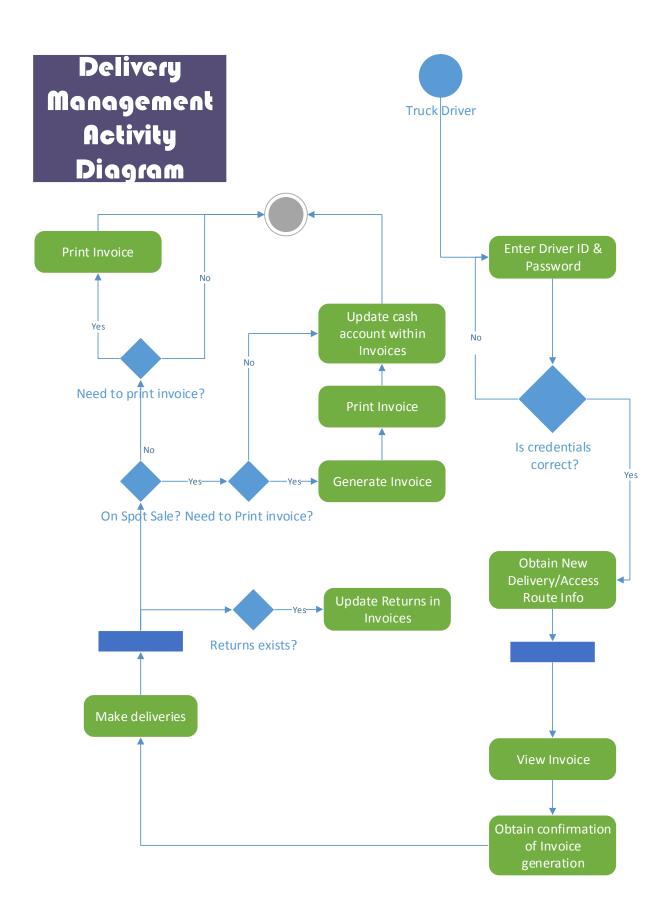


9. Activity Diagrams









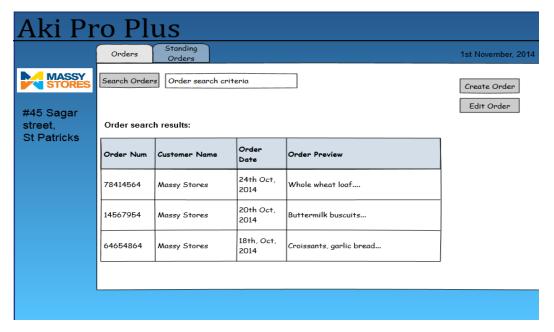
10. <u>User Interface Design Screenshots</u>

Customer

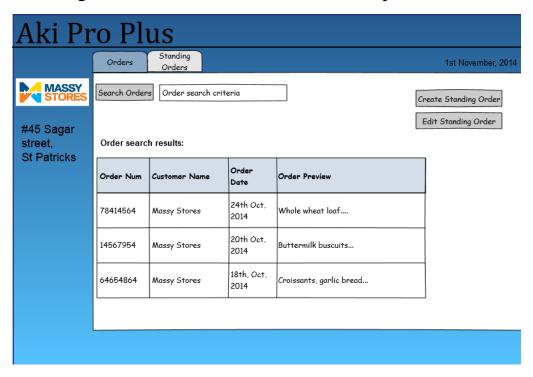
Customer Login Screen



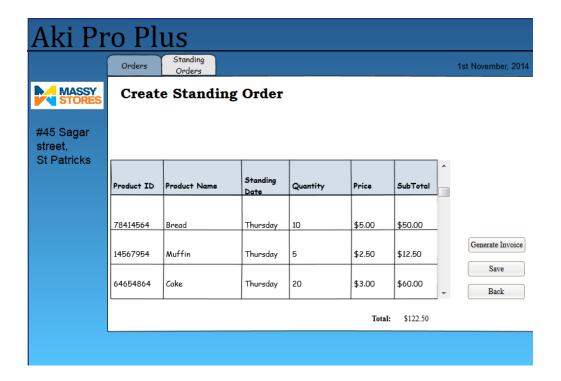
Default page when logged in as Massy Stores. Shows Orders tab with various options.



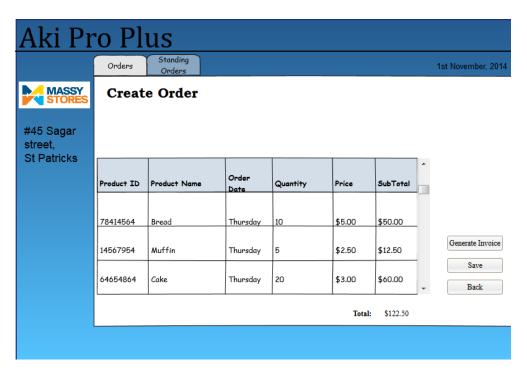
Standing Order tab is shown with various options.



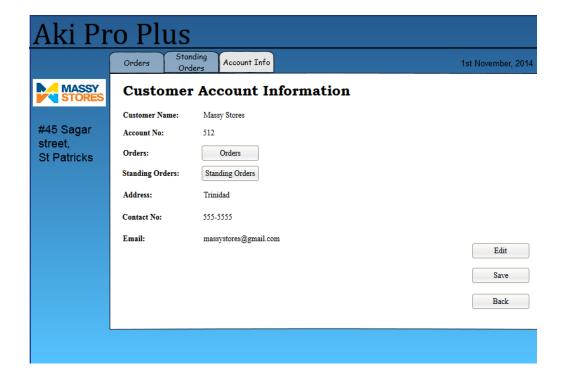
Standing Order tab is shown with various options.



Create Order option is shown with other various options.



Customer Account option is shown with other various options.

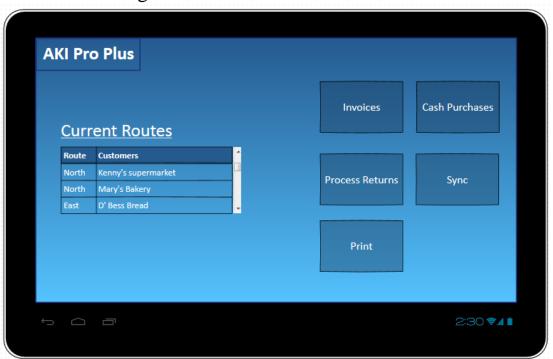


Driver

Driver log in



Driver Home Page



Driver Invoices



Driver Cash sales



Driver Returns



Driver Sync

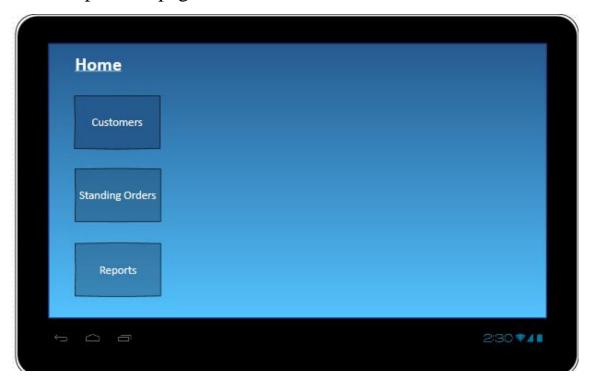


Sales Rep

Sales Rep login



Sales Rep Home page



Sales Rep Standing Orders



Sales Rep Reports

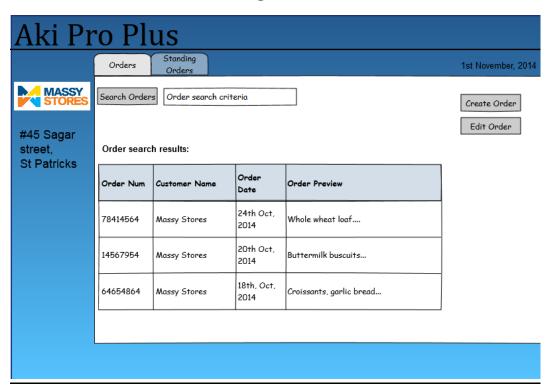


Order Processing

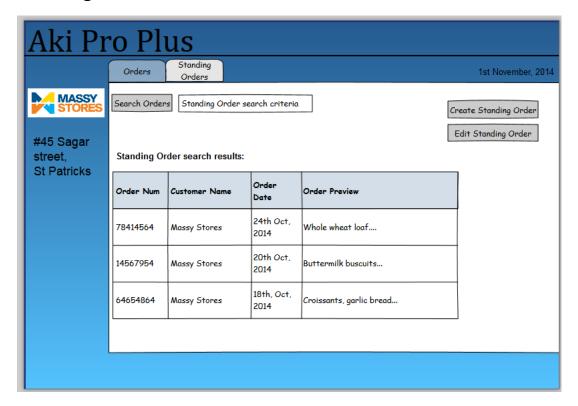
Login



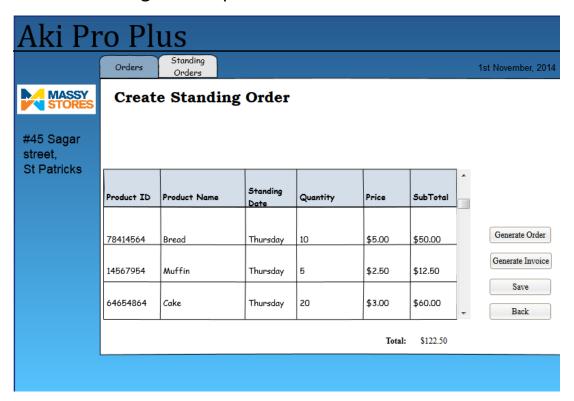
Default order screen after login



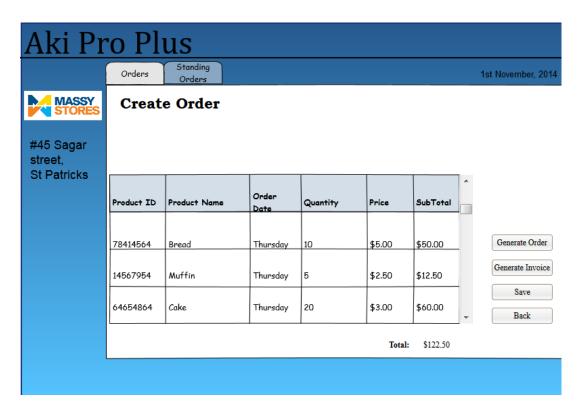
Standing Order tab



Create Standing Order option



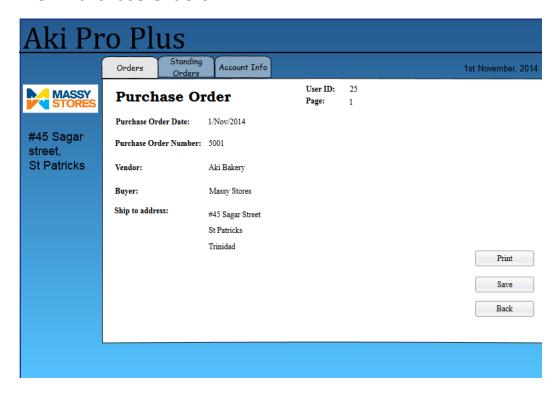
Create Order option



View Customer account info



View Purchase Orders



View Invoice Option

