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| Supermarket self checkout system |
| SWE 312 – User Interface Design |
| Phase 1 - Report |
|  |
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| **4/2/2010** |

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| The first phase of the document contains a use case model for the system, user analysis by identifying the characteristics of the users, task analysis by determining the tasks and developing their scenarios and identifying the user interface design requirements. |

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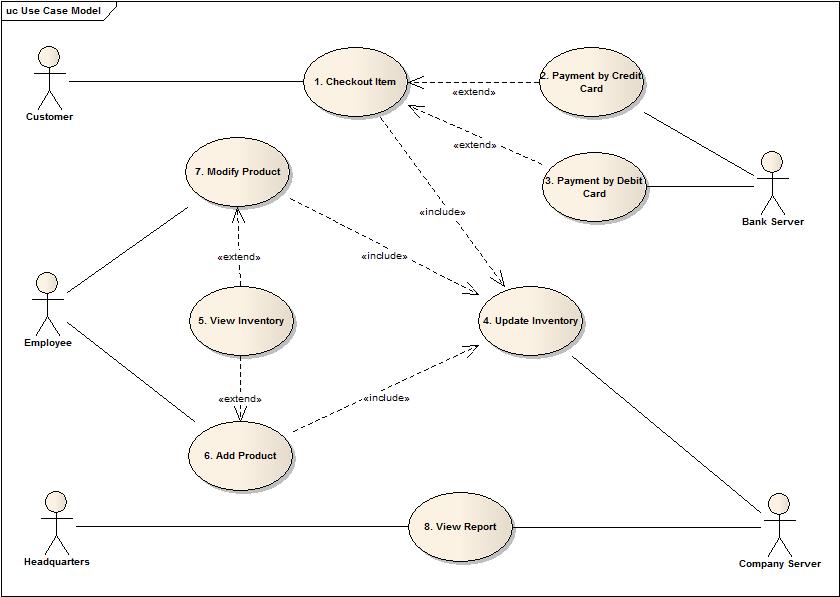
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USE CASE MODEL

# Use case model



USER ANALYSIS

# User Analysis

|  |  |
| --- | --- |
| **User characteristics** | **Customer characteristics** |
| **Age** | Will range in age from about 12 to 70 |
| **Sex** | Both male and female |
| **Physical limitations** | May be fully able-bodied or may have some physical limitations in relation to hearing , vision limitations, such as color blindness, mobility, use of hands or wheelchair use will be of varying heights |
| **Educational background** | May have minimal education qualifications (reading level) |
| **Computer/IT use** | May Know little about computers, how to use barcode reader and credit/debit card reader. |
| **Motivation** | May be very motivated to use the Supermarket Self-  Checkout System, especially when they can do their checkout quickly and avoid waiting in long lines at the cashiers. And depending on themselves to make the checkout. |
| **Attitude** | The reliability of the technology itself, and the attitude of the users toward computers. |

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| **User characteristics** | **Employee characteristics** |
| **Age** | Will range in age from about 20 to 50 |
| **Sex** | Both male and female |
| **Physical limitations** | May be fully able-bodied or may have some physical limitations in relation to hearing, vision limitations. |
| **Educational background** | May have medium education qualifications (high school).Also, some courses in accounting to deal with the inventory and stock issues. |
| **Computer/IT use** | May have good knowledge and skills in using computer. |
| **Motivation** | May be very motivated to use the Supermarket Self-  Checkout System, especially when he can update inventory data easily. |
| **Attitude** | The reliability of the technology itself, and the attitude of the users toward computers. |

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| **User characteristics** | **SSC headquarter characteristics** |
| **Age** | Will range in age from about 25 to 60+ |
| **Sex** | Both male and female |
| **Physical limitations** | May be fully able-bodied or may have some physical limitations in relation to hearing, vision limitations. |
| **Educational background** | May have medium education qualifications (high school). |
| **Computer/IT use** | May have minimal computer skills. |
| **Motivation** | May be very motivated to use the Supermarket Self-  Checkout System, especially when they can view the sales and inventory reports. |
| **Attitude** | The reliability of the technology itself, and the attitude of the users toward computers. |

TASK ANALYSIS

# Task Analysis

## Checkout Items

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| **Use Case Number** | 1 | | | |
| **Use Case Name** | Checkout Items | | | |
| **Author** | 1. Abdulaziz 2. Shaeq | | | |
| **Date of Creation** | 18 March 2010 | | | |
| **Precondition(s)** | None | | | |
| **Successful Post Condition** | The customer has successfully used the system to purchase any item available in the store and the inventory is updated. | | | |
| **Actors** | Customer | | | |
| **Summary** | This functionality helps the customer to self checkout products available in the supermarket. | | | |
| **Related Use Cases** | 2.Payment by Credit Card  3.Payment by Debit Card  4.Update Inventory | | | |
| **Flow of Events** | **Basic Flow** | | | |
| **Step Number** | **Steps** | | |
| 0 | The system is idle and there is a button displayed that says, “Start”.   * **E1: Machine out of order.** | | |
| 1 | The user presses the start button. | | The system displays a message that says, “Do you have a loyalty card?” There are two options “Yes” or “No”. |
| 2 | If the user possesses a loyalty card he is going to click “Yes”. | | The system is going to ask the user to swipe the card on the barcode reader.   * **A1: The user pressed “No”.** |
| 3 | The user swipes the loyalty card on the barcode reader. | | The system validates the card and generates a message confirming that the loyalty card has been successfully confirmed. |
| 4 | The user confirms the message. | | The system displays a new screen asking the user to choose the type of purchases.   * **A2: Barcode Items** * **A3: Non-Barcode Items.** |
| 5 | The user clicks the “Subtotal” button to check his total purchases. (This step could happen at any time during the process) | | The system displays the subtotal (total purchase + taxes) to the user. |
| 6 | When the user is done passing his purchases he presses the “Total” button. | | The system displays the receipt containing the total price and the purchased items along with the price after the discount (if any).  The system asks the user how would he like to pay for his purchases:   1. Cash. 2. Debit Card. 3. Credit Card. |
| 7 | The user chooses how would he like to pay | | The system response is explained in the alternative flows below according to the user’s choice.   * **A4: Cash.** * **A5: Debit Card.** * **A6: Credit Card.** |
| 8 |  | | The system prints the receipt and displays a leave-taking message.  The use case ends. |
| **Alternate Flow: A1 (The user pressed “No”)** | | | |
| 1 | | The system returns to step 4 of the basic flow. | |
| **Alternate Flow: A2 (Barcode Items)** | | | |
| 1 | | The system asks the user to swipe the coded items along the barcode reader. | |
| 2 | | The user swipes the items along the barcode reader. | The system displays the item on the screen along with the price. Every time the user swipes an item, a beep is generated. If the beep is not heard then the item is not scanned properly. |
| 3 | | User is done passing his items he clicks “Total” button. | The system goes to step 6 of the basic flow.   * **A3: User wants to scan Non-Barcode Items.** |
| **Alternate Flow: A3 (Non-Barcode Items)** | | | |
| 1 | | The system asks the customer to choose the type of items to weigh:   1. Vegetables. 2. Fruit. | |
| 2 | | The user chooses the type of grocery to weigh. | The system displays a list of the chosen category and asks the user to select one. |
| 3 | | The customer selects the item to weigh. | The system asks the customer to put the item on the weight scale.   * **The user selects A2. (select bar-coded item)** * **The flow returns to step 1 of A3.( select vegetable/fruit)** * **The flow returns to step 6 of the basic flow.(select “Total”)** |
| 4 | | The customer puts item on the weight scale. | If it is weighed properly then a beep is generated. If the beep is not heard then the item is not weighed properly. The system displays the weight on the screen and adds the item to the list of purchases. Then the flow returns to step 3 of A3. |
| **Alternate Flow: A4 (Cash)** | | | |
| 1 | | The system asks the user to place the bills in the cash reader and the coins in the coin reader. | |
| 2 | | The customer puts the money in the slots and clicks “Pay”. | 1. The system calculates the change and dispenses the money through the bill dispenser and the coins through the coin dispenser.  * **E3: Cash not entered.**  1. The system prints the receipt using the receipt printer. 2. Use case 4 “Update Inventory” is executed. 3. The station goes back to an idle state and the use case ends. |
| **Alternate Flow: A5 (Debit Card)** | | | |
| 1 | | Use case 3 “Payment by Debit Card” is executed. | |
| **Alternate Flow: A6 (Credit Card)** | | | |
| 1 | | Use case 2 “Payment by Credit Card” is executed. | |
| **Error Flow: E1 (Machine out of order)** | | | |
| 1 | | The system displays a message that the machine is out of order and the use case ends. | |
| **Error Flow: E2 (Connection Error)** | | | |
| 1 | | The system displays a message that the connection to the bank server could not be established. | |
| 2 | | The use case ends. | |
| **Error Flow: E3 (Cash not entered)** | | | |
| 1 | | The system does not detect any cash entered by the user. | |
| 2 | | The use case ends. | |

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| **Use Case Number** | 2 | | | |
| **Use Case Name** | Payment by Credit Card | | | |
| **Author** | 1. Abdulaziz 2. Shaeq | | | |
| **Date of Creation** | 18 March 2010 | | | |
| **Precondition(s)** | There is a payment to be made for the items and a connection to be made to the bank server. | | | |
| **Successful Post Condition** | The customer has successfully paid for the purchased items and his/her account has been deducted. | | | |
| **Actors** | Bank Server | | | |
| **Summary** | This functionality allows the user to be flexible with their payments to the super market. They have the choice to pay through credit cards, debit cards or by cash. | | | |
| **Related Use Cases** | 1.Checkout Item | | | |
| **Flow of Events** | **Basic Flow** | | | |
| **Step Number** | **Steps** | | |
| 1 | The system asks the customer to swipe his credit card in the card reader. | | |
| 2 | The customer swipes the credit card. | | 1. The system prints the transaction receipt and the purchases receipt using the receipt printer.  * **E1: Bank Connection Error.** * **A1: Credit Limit Reached**  1. Use case 4 “Update Inventory” is executed. 2. The station goes back to an idle state and the use case ends. |
| **Alternative Flow A1: Credit Limit Reached** | | | |
| 1 | The system informs the customer that their credit limit has reached and the flow goes back to step 1 of the basic flow. | | |
| **Error Flow: E1 (Bank Connection Error)** | | | |
| 1 | | The system displays a message that the connection to the bank server cannot be made. | |
| 2 | | User accepts the message and the use case ends. | |

## Payment by Credit Card

## Payment by Debit Card

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| **Use Case Number** | 3 | | | |
| **Use Case Name** | Payment by Debit Card | | | |
| **Author** | Abdulaziz  Shaeq | | | |
| **Date of Creation** | 18 March 2010 | | | |
| **Precondition(s)** | There is a payment to be made for the items and a connection to be made to the bank server. | | | |
| **Successful Post Condition** | The customer has successfully paid for the purchased items and his/her account has been deducted. | | | |
| **Actors** | Bank Server | | | |
| **Summary** | This functionality allows the user to be flexible with their payments to the super market. They have the choice to pay through credit cards, debit cards or by cash. | | | |
| **Related Use Cases** | 1.Checkout Item | | | |
| **Flow of Events** | **Basic Flow** | | | |
| **Step Number** | **Steps** | | |
| 1 | The system asks the customer to swipe his credit card in the card reader. | | |
| 2 | The customer swipes the card. | | The system prompts the user to enter his PIN. |
| 3 | The customer enters the PIN. | | 1. The system prints the transaction receipt and the purchases receipt using the receipt printer. 2. Use case 4 “Update Inventory” is executed. 3. The station goes back to an idle state and the use case ends.  * **A1: Incorrect PIN** * **E1: Connection Error.** * **A2: Insufficient funds.** |
| **Alternative Flow: A1 (Incorrect PIN)** | | | |
| 1 | The system displays a message that the PIN entered is incorrect and prompts the user to re-enter the PIN and warns the user that he has three more tries. | | |
| 2 | The customer enters the password. | | The flow returns back to step 2 of the basic flow. |
| **Alternative Flow: A2 (Insufficient funds)** | | | |
| 1 | The system displays a message that he has insufficient funds and flow returns to step 1 of the basic flow | | |
| **Error Flow: E1 (Bank Connection Error)** | | | |
| 1 | | The system displays a message that the connection to the bank server cannot be made. | |
| 2 | | User accepts the message and the use case ends. | |

## Update Inventory

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| **Use Case Number** | 4 | | |
| **Use Case Name** | Update Inventory | | |
| **Author** | Hussein | | |
| **Date of Creation** | 18 March 2010 | | |
| **Precondition(s)** | This functionality is executed when a change is made to the inventory. In this case when an employee adds or modifies a product or when a customer purchases a product. | | |
| **Successful Post Condition** | The inventory has been updated successfully. | | |
| **Actors** | Company Server | | |
| **Summary** | This functionality keeps the store manager and the headquarters updated on the quantity of products available in a particular branch. | | |
| **Related Use Cases** | 1.Checkout Item  6.Add Product  7.Modify Product | | |
| **Flow of Events** | **Basic Flow** | | |
| **Step Number** | **Steps** | |
| 1 | The system receives messages from the use case to update. It takes in the new quantity of the products and then updates them to the Company Server and the use case ends.   * **A1: New quantity is below warning limit.** * **E1: Connection to Company Server failed.** | |
| **Alternate Flow A1: (New quantity is below warning limit)** | | |
| 1 | The system creates an inventory message and prints it on the supermarket printer and is store in a message buffer, which is sent to the company headquarters at night, and the use case ends. | |
| **Error Flow: E1 (Connection to Company Server failed.)** | | |
| 1 | | The system displays a message that the connection to the company server cannot be made and stores the results into a buffer so that the stocks can be updated later and the use case ends. |

## View Inventory

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| **Use Case Number** | 5 | | |
| **Use Case Name** | View Inventory | | |
| **Author/Source** | Maitham | | |
| **Date of Creation** | March 18, 2010 | | |
| **Precondition(s)** | The use case is called by either add product or modify product. | | |
| **Successful Post Condition** | The user can view the entire inventory from the company server. | | |
| **Actors** | None | | |
| **Summary** | This functionality helps the user view the inventory of the supermarkets. | | |
| **Related Use Cases** | 6. Add Product.  7. Modify Product | | |
| **Flow of Events** | **Basic Flow** | | |
| **Step Number** | **Steps** | |
| 1 | The use case begins when the user executes either add product or modify product. | The system displays the entire inventory from the company server.   * **E1: Connection to Company Server failed.** |
| 2 | The user clicks “OK” when he finishes checking the inventory and the use case ends. |  |
| **Error Flow: E1 (Connection to Company Server failed)** | | |
| 1 | The system displays a message that the connection with the company server could don’t be established. | |
| 2 | The user confirms the message and the use case ends. | |

## Add Product

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| **Use Case Number** | 6 | | |
| **Use Case Name** | Add Product | | |
| **Author/Source** | Maitham | | |
| **Date of Creation** | December 5, 2009 | | |
| **Precondition(s)** | The employee should be logged in to the system | | |
| **Successful Post Condition** | A product is added to the inventory and the inventory is updated. | | |
| **Actors** | Employee | | |
| **Summary** | The user will add a product by specifying the name of the product , description, company, etc. | | |
| **Related Use Cases** | None | | |
|  | **Basic Flow** | | |
| **Step Number** | **Steps** | |
| 1 | The use case begins when the user clicks “Add Product”. | The system prompts the user to enter all the essential information for adding a product:   1. Product Name. 2. Description. 3. Company Name. 4. Price. 5. Discount. 6. Quantity. 7. Product Type.  * **A1: User clicks view inventory.** |
| 2 | The user enters the required information. | The system displays a confirmation message stating that the product has been added.   * **A2: Product Exists.** * **A3: User missed a required field.** * **E1: Unable to access database.** |
| 3 | The user confirms the message. | The use case ends. |
| **Alternate Flow: A1 (User clicks view inventory)** | | |
| 1 | Use case 5 “View Inventory” use case is executed. | |
| 2 | The flow returns back to step 1 of the basic flow. | |
| **Alternate Flow: A2 (Product Exists)** | | |
| 1 | The system displays a message that the product already exists in the system. | |
| 2 | The user confirms the message and the flow goes back to step 1 of the basic flow. | |
| **Alternate Flow: A3 (User missed a required field)** | | |
| 1 | The system notifies the user that he has missed a required field and marks them and the flow goes back to step 1 of the basic flow. | |
| **Error Flow: E1 (Unable to access database)** | | |
| 1 | The system displays a message that the system is not able to access the database to make any additions or modifications. | |
| 2 | The user confirms the message. | |
| 3 | The use case ends | |

## Modify Product

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| **Use Case Number** | 7 | | | |
| **Use Case Name** | Modify Product | | | |
| **Author** | Abdulaziz Alamoudi | | | |
| **Date of Creation** | March 18, 2010 | | | |
| **Precondition(s)** | * The user is logged in. * The product that the user intends to modify must exist in the inventory. | | | |
| **Successful Post Condition** | The products information is modified (description, quantity, …etc). | | | |
| **Actors** | Employee | | | |
| **Summary** | The user is going to modify the related information of the product (description, quantity …etc) then the system is going to display the new information of the product and update the inventory. | | | |
| **Related Use Cases** | 1. Update Inventory. 2. View Inventory. | | | |
| **\Flow of Events** | **Basic Flow** | | | |
| **Step Number** | | **Steps** | |
| **User Action** | **System Response** |
| 1 | | The user will select modify product. | The system will display a window showing:   1. Name of the product. 2. Product’s number. 3. Description. 4. Type of the product. 5. Price. 6. Discount. 7. Quantity.  * **A1: User clicks view inventory.** * **E1: Connection with the server failed.** |
| 2 | | The user modifies the required information. | The system displays the updated information. Also the inventory is updated.  The use case ends. |
| **Alternate Flow: A1 (User clicks view inventory)** | | | |
| 1 | Use case 5 “View Inventory” use case is executed. | | |
| 2 | The flow returns to the step 1 of the basic flow. | | |
| **Error Flow: E1 (Connection with the server failed)** | | | |
| 1 | The system displays a message that the system is not able to establish a connection with the company server. | | |
| 2 | The user confirms the message and the use case ends. | | |

## View Report

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| **Use Case Number** | 8 | | |
| **Use Case Name** | View Report | | |
| **Author/Source** | Yasser | | |
| **Date of Creation** | March 18, 2010 | | |
| **Precondition(s)** | The user should be logged in to the system. | | |
| **Successful Post Condition** | The report is displayed to the user. | | |
| **Actors** | * Headquarters. * Company Server. | | |
| **Summary** | This use case is simply used to view the report. It is Executed by users in the headquarters and retrieved from the company server. | | |
| **Related Use Cases** | None | | |
| **Flow of Events** | **Basic Flow** | | |
| **Step Number** | **Steps** | |
| 1 | The use case begins when the user clicks “View Report”. | The system displays the information retrieved from the company server.  - **E1: Connection with the server failed.** |
| **Error Flow: E1 (Connection with the server failed)** | | |
| 1 | The system displays a message that the system is not able to establish a connection with the company server. | |
| 2 | The user confirms the message and the use case ends. | |

USER INTERFACE ANALYSIS

# User Interface Requirements

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| --- | --- |
| **User characteristics** | **User Interface Requirements** |
| Age range from 12 to 70 | SSC touch screen height needs to accommodate users of varying height. |
| May be fully able-bodied or may have some physical limitations | SSC screen height needs to accommodate able-bodied users as well as users with walking sticks or those who use wheelchairs. |
| May have some physical limitations in relation to hearing | All user inputs should have both clear visual and auditory feedback. |
| May have some physical limitations in relation to sight | Screen text should be of a reasonably large font. |
| May have some physical limitations in relation to use of hands | Touch screens should have target areas that are large enough to locate and be sensitive enough to respond to users with decreased strength in fingers or hands. |
| Little or no experience of computer/IT use | The application should be easy to use and easy to learn and friendly user interface. |

**END OF DOCUMENT**