Requirements Engineering

Title of System

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Computing with Games Development/Software Development/Multi Media

Date Submitted: dd/mm/yyyy

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# Introduction/overview

**Normal** text here

# Functional Components

Include a ***hierarchy chart*** representing the functional components of your system in this section.

Use the MS Word Insert 🡪 SmartArt 🡪 Hierarchy object

Logical ordering of functional components is significant – the reader of this document should read about the functions in ***logical sequence***

Don’t forget to REMOVE the notes above ……….

# User Requirements

High level **abstract statements** describing the user requirements.

This should be consistent with the hierarchy chart in section 2.

Requirements to be listed in exactly same order as in section 2.

* **3.1** Linen
  + **3.1.1** The system will add new linen to the table of available linen.
  + **3.1.2** The system will update the details of the linen.
  + **3.1.3** The system will remove linen from the table of available linen.
* **3.2** Order
  + **3.2.1** The system will log orders from the customer.
  + **3.2.2** The system will calculate the cost and quantity of an order.
  + **3.2.3** The system will dispatch the linen for a required order
  + **3.2.4** The system will collect the laundry the customer wants cleaned
  + **3.2.5** The system will record the amount owed by the customer and if they have paid.
* **3.3** Customers
  + **3.3.1** The system will add customer details to a table of customers.
  + **3.3.2** The system will update a customer’s information.
  + **3.3.3** The system will remove any obsolete customer.
* **3.4** Admin
  + **3.4.1** The system will calculate the total yearly earnings of the company.
  + **3.4.2** The system will calculate the total earnings per customer.
  + **3.4.3** The system will track the amount of rejects.
  + **3.4.4** The system will track the cost of the rejects in a given time period.

# System Requirements

Include a brief overview of the system requirements.

Your hierarchy chart / User requirements summarise these……..

## System Level Use Case Diagram

A brief introduction of the high-level modules/components of the system…..

System level UC diagram to be included here….

## Manage Linen

### **Add Linen**

This function adds new linen to the system.

Manager

<<includes>>

<<extends>>

|  |  |  |
| --- | --- | --- |
| **Use Case Name** | **Add Linen** | |
| **Use Case Id** | 4.2.1 | |
| **Priority** | High | |
| **Source** | Manager | |
| **Primary Business Actor** | Manager | |
| **Other Participating Actors** | None | |
| **Description** | This function adds new linen to the system. | |
| **Preconditions** | None | |
| **Trigger** | None | |
| **Expected Scenario** | **Manager** | **System** |
|  | **Step 1:** The manager invokes the Add Linen function.  **Step 4:** The manager enters the following details:   * Linen\_Name * Sale\_Price * Cleaning\_Price * Pack\_Size | **Step 2:** The system determines the next Linen\_ID.  **Step 3:** Display the UI  **Step 5:** The system validates the data:   * All fields must not be blank. * The Linen Name must only contain letters. * The Hire and Cleaning Prices must be a positive number * Hire Price must be greater than Cleaning price * The Pack Size must be a positive whole number and a multiple of 5   **Step 6:** The system sets the Status to Active (“A”).  **Step 7:** The system sets the Item\_Earnings to 0.  **Step 8:** The system saves the following data to the Linen File:   * Linen\_ID * Linen\_Name * Hire\_Price * Cleaning\_Price * Pack\_Size * Status   **Step 9:** The system displays a confirmation message.  **Step 10:** The system clears the UI. |
| **Alternate Scenarios** | **Manager** | **System** |
| **Field Not Entered** |  | **Step 5:** Blank field detected.  **Step 6:** The system displays an error message: “Error, all fields must be entered.”  **Step 7:** Place cursor on first blank field and return to Step 4. |
| **Invalid Linen Name** |  | **Step 5:** Invalid linen name detected (e.g. numbers/symbols).  **Step 6:** The system displays an error message: “Error, invalid linen name, please re-enter.”  **Step 7:** Place cursor on the linen name field and return to Step 4. |
| **Invalid Sale/Cleaning Price** |  | **Step 5:** Invalid sale/cleaning price detected (e.g. not positive numbers with up to two decimal points).  **Step 6:** The system displays an error message: “Error, invalid sale/ cleaning price, please re-enter.”  **Step 7:** Place cursor at the offending field and return to Step 4. |
| **Invalid Pack Size** |  | **Step 5:** Invalid pack size detected (e.g. not positive whole numbers).  **Step 6:** The system displays an error message: “Error, invalid pack size, please re-enter.”  **Step 7:** Place cursor at the pack size field and return to Step 4. |
| **Sale Price less than Cleaning Price** |  | **Step 5:** Detected sale price less than cleaning price.  **Step 6:** The system displays an error message: “Error, sale price cannot be less than cleaning price.”  **Step 7:** Place cursor at the sale price field and return to Step 4. |
| **Conclusions** | The linen is added to the system | |
| **Post conditions** | Orders can now be made for the new linen. | |
| **Business Rules** | The pack size must be a multiple of 5.  The sale/cleaning price cannot be a negative number.  The Hire price must be greater than the cleaning price. | |
| **Implementation Constraints** | None | |

### **Update Linen**

This function updates the linen currently in the system.

Manager

<<includes>>

|  |  |  |
| --- | --- | --- |
| **Use Case Name** | **Update Linen** | |
| **Use Case Id** | 4.2.2 | |
| **Priority** | High | |
| **Source** | Manager | |
| **Primary Business Actor** | Manager | |
| **Other Participating Actors** | None | |
| **Description** | This function updates linen currently in the system. | |
| **Preconditions** | The Linen is already in the system. | |
| **Trigger** | No | |
| **Expected Scenario** | **Actor Action** | **System Response** |
|  | **Step 1:** The manager invokes the Update Linen function.  **Step 3:** The manager enters the Linen Name (or part of)  **Step 5:** manager selects the linen to be updated  **Step 7:** The manager updates any of the following fields:   * Sale Price * Cleaning Price * Pack Size | **Step 2:** The system displays the UI and prompts the user for the Linen Name.  **Step 4:** The system retrieves summary details from the Linen File for all items with matching name and display on UI  **Step 6:** The system retrieves all details for the selected linen item from the Linen File and displays on the UI for updating  **Step 8:** The system validates the data:   * All fields must not be blank. * The Linen Name must only contain letters. * The Hire and Cleaning Prices must be a positive number * Hire Price must be greater than Cleaning price * The Pack Size must be a positive whole number and a multiple of 5   **Step 9:**  The system saves the new data to the Linen file.  **Step 10:** The system displays a confirmation message.  **Step 11:** The system clears the UI. |
| **Alternate Scenarios** | **Actor Action** | **System Response** |
| **Linen Name Not Found** |  | **Step 4:** Linen name not found in the linen file.  **Step 5:** Display an error message: “Error, linen name not found in file, please re-enter.”  **Step 6:** Place cursor on linen name field and return to Step 4. |
| **Invalid Sale/Cleaning Price** |  | **Step 8:** Invalid sale/cleaning price detected (e.g. not positive numbers with up to two decimal points).  **Step 9:** The system displays an error message: “Error, invalid sale/ cleaning price, please re-enter.”  **Step 10:** Place cursor at the offending field and return to Step 8. |
| **Invalid Pack Size** |  | **Step 8:** Invalid pack size detected (e.g. not positive whole numbers).  **Step 9:** The system displays an error message: “Error, invalid pack size, please re-enter.”  **Step 10:** Place cursor at the pack size and return to Step 8. |
| **Sale Price less than Cleaning Price** |  | **Step 8:** Detected sale price less than cleaning price.  **Step 9:** The system displays an error message: “Error, sale price cannot be less than cleaning price.”  **Step 10:** Place cursor at the sale price field and return to Step 8. |
| **Conclusions** | The linen is updated in the Linen File | |
| **Post conditions** | None | |
| **Business Rules** | The sale/cleaning price cannot be negative.  The sale price must be greater than the cleaning price.  The pack size must be a multiple of 5. | |
| **Implementation Constraints** | None. | |

### **Remove Linen**

This function removes linen from the system.

Manager

|  |  |  |
| --- | --- | --- |
| **Use Case Name** | **Remove Linen** | |
| **Use Case Id** | 4.2.3 | |
| **Priority** | High | |
| **Source** | Manager | |
| **Primary Business Actor** | Manager | |
| **Other Participating Actors** | None | |
| **Description** | This function removes linen currently in the system. | |
| **Preconditions** | The Linen is already in the system. | |
| **Trigger** | No | |
| **Expected Scenario** | **Actor Action** | **System Response** |
|  | **Step 1:** The manager invokes the Remove Linen function.  **Step 3:** The manager enters the Linen Name. | **Step 2:** The system prompts the user for the Linen Name.  **Step 4:** The system checks the Linen file for the Linen Name matching the entered Linen name.  **Step 5:** The system retrieves the Linen details from the Linen table.  **Step 6:** The system sets the status to “I” (Inactive).  **Step 7:**  The system saves the new status of the linen to the Linen File.  **Step 8:** The system displays a confirmation message.  **Step 9:** The system clears the UI. |
| **Alternate Scenarios** | **Actor Action** | **System Response** |
| **Linen Name Not Found** |  | **Step 4:** Linen name not found in the linen file.  **Step 5:** Display an error message: “Error, linen name not found in file, please re-enter.”  **Step 6:** Place cursor on linen name field and return to Step 4. |
| **Conclusions** | The linen is removed from the Linen File. | |
| **Post conditions** | The linen can no longer be ordered. | |
| **Business Rules** | The Linen must remain in the Linen file for referential integrity. | |
| **Implementation Constraints** | None. | |

## Manage Orders

### **Log Order**

### **Cancel Order**

### **4.3.4.** **Dispatch Delivery**

### **Collect Laundry**

### **Record Payment**

## Manage Customers

### **Add Customer**

This function adds a new customer to the system.

Customer

Manager

|  |  |  |
| --- | --- | --- |
| **Use Case Name** | **Add Customer** | |
| **Use Case Id** | 4.4.1 | |
| **Priority** | High | |
| **Source** | Manager | |
| **Primary Business Actor** | Manager | |
| **Other Participating Actors** | None | |
| **Description** | This function adds a new customer to the system. | |
| **Preconditions** | Customer must fill in a Register Customer form. | |
| **Trigger** | None | |
| **Expected Scenario** | **Manager** | **System** |
|  | **Step 1:** The manager invokes the Add Customer function.  **Step 5:** The manager enters the following details:   * Company\_Name * Contact\_Number * Customer\_Name * Email * Street * Town * County * Eircode | **Step 2:** The system determines the next Customer\_ID.  **Step 3:** Retrieve Customer details from the Customer File and load on the form.  **Step 4:** The system displays the UI.  **Step 5:** The system validates the data:   * All fields must not be blank. * The Company Name, Customer Name, Town and County must only contain letters. * The Contact Number must be a valid phone number. * The Email Address must be a valid email address. * The Eircode must be a valid Eircode. * The Street, Town and County must all be a valid address. * The Street, Town and County address must match the Eircode address.   **Step 6:** The system sets the Status to Active (“A”).  **Step 7:** The system sets the Balance and Rejects to 0.  **Step 8:** The system saves the following data to the Linen File:   * Customer\_ID * Company\_Name * Contact\_Number * Customer\_Name * Email * Street * Town * County * Eircode * Status * Balance * Rejects   **Step 9:** The system displays a confirmation message.  **Step 10:** The system clears the UI. |
| **Alternate Scenarios** | **Manager** | **System** |
| **Field Not Entered** |  | **Step 5:** Blank field detected.  **Step 6:** The system displays an error message: “Error, all fields must be entered.”  **Step 7:** Place cursor on first blank field and return to Step 4. |
| **Invalid Company Name/ Customer Name/ Town/ County** |  | **Step 5:** Invalid Company name/ Customer Name/ Town/ County detected (e.g. numbers/symbols).  **Step 6:** The system displays an error message: “Error, invalid field detected, please re-enter.”  **Step 7:** Place cursor on the offending field and return to Step 4. |
| **Invalid Contact Number** |  | **Step 5:** Invalid contact number detected (e.g. not a valid phone number).  **Step 6:** The system displays an error message: “Error, invalid contact number, please re-enter.”  **Step 7:** Place cursor at the contact number field and return to Step 4. |
| **Invalid Email** |  | **Step 5:** Invalid email detected.  **Step 6:** The system displays an error message: “Error, invalid email, please re-enter.”  **Step 7:** Place cursor at the email and return to Step 4. |
| **Invalid Eircode** |  | **Step 5:** Invalid Eircode detected (e.g. not in the format “x99 xx9x”).  **Step 6:** The system displays an error message: “Error, invalid Eircode, please re-enter.”  **Step 7:** Place the cursor on the Eircode field and return to Step 4. |
| **Invalid Address** |  | **Step 5:** Invalid address detected (e.g. address does not match a real address).  **Step 6:** The system displays an error message: “Error, not an address, please re-enter.”  **Step 7:** Place the cursor on the street field and return to Step 4. |
| **Address Not Matching Eircode** |  | **Step 5:** Eircode not matching address detected.  **Step 6:** The system displays an error message: “Error, Eircode and address do not match, please re-enter.”  **Step 7:** Place the cursor on the street field and return to Step 4. |
| **Conclusions** | The customer is added to the system | |
| **Post conditions** | Orders can now be made for the new linen by the customer. | |
| **Business Rules** | None | |
| **Implementation Constraints** | None | |

### **Update Customer**

This function updates a customer currently in the system.

Manager

Manager

|  |  |  |
| --- | --- | --- |
| **Use Case Name** | **Update Customer** | |
| **Use Case Id** | 4.4.2 | |
| **Priority** | High | |
| **Source** | Manager | |
| **Primary Business Actor** | Manager | |
| **Other Participating Actors** | None | |
| **Description** | This function updates a customer currently in the system. | |
| **Preconditions** | The Customer is already in the system. | |
| **Trigger** | No | |
| **Expected Scenario** | **Actor Action** | **System Response** |
|  | **Step 1:** The manager invokes the Update Customer function.  **Step 3:** The manager enters the Customer Name.  **Step 7:** The manager updates any of the following fields:   * Sale Price * Cleaning Price * Pack Size | **Step 2:** The system prompts the user for the Customer Name.  **Step 4:** The system checks the Customer file for the Customer Name matching the entered Linen name.  **Step 5:** The system retrieves the Linen details from the Linen table.  **Step 6:** The system displays the UI.  **Step 8:** The system validates the data:   * The Sale and Cleaning Prices must be a positive number with up to two decimal places * The Pack Size must be a positive whole number.   **Step 9:**  The system saves the new data to the Linen file.  **Step 10:** The system displays a confirmation message.  **Step 11:** The system clears the UI. |
| **Alternate Scenarios** | **Actor Action** | **System Response** |
| **Linen Name Not Found** |  | **Step 5:** Linen name not found in the linen file.  **Step 6:** Display an error message: “Error, linen name not found in file, please re-enter.”  **Step 7:** Place cursor on linen name field and return to Step 4. |
| **Invalid Sale/Cleaning Price** |  | **Step 9:** Invalid sale/cleaning price detected (e.g. not positive numbers with up to two decimal points).  **Step 10:** The system displays an error message: “Error, invalid sale/ cleaning price, please re-enter.”  **Step 11:** Place cursor at the offending field and return to Step 8. |
| **Invalid Pack Size** |  | **Step 9:** Invalid pack size detected (e.g. not positive whole numbers).  **Step 10:** The system displays an error message: “Error, invalid pack size, please re-enter.”  **Step 11:** Place cursor at the pack size and return to Step 8. |
| **Conclusions** | The linen is updated in the Linen File | |
| **Post conditions** | None | |
| **Business Rules** | The sale/cleaning price cannot be negative.  The pack size must be a multiple of 5. | |
| **Implementation Constraints** | None. | |

### **Remove Customer**

This function removes a customer from the system.

Manager

|  |  |  |
| --- | --- | --- |
| **Use Case Name** | **Remove Customer** | |
| **Use Case Id** | 4.4.3 | |
| **Priority** | High | |
| **Source** | Manager | |
| **Primary Business Actor** | Manager | |
| **Other Participating Actors** | None | |
| **Description** | This function removes linen currently in the system. | |
| **Preconditions** | The Linen is already in the system. | |
| **Trigger** | No | |
| **Expected Scenario** | **Actor Action** | **System Response** |
|  | **Step 1:** The manager invokes the Remove Linen function.  **Step 3:** The manager enters the Linen Name. | **Step 2:** The system prompts the user for the Linen Name.  **Step 4:** The system checks the Linen file for the Linen Name matching the entered Linen name.  **Step 5:** The system retrieves the Linen details from the Linen table.  **Step 6:** The system sets the status to “I” (Inactive).  **Step 8:**  The system saves the new status of the linen to the Linen File.  **Step 9:** The system displays a confirmation message.  **Step 10:** The system clears the UI. |
| **Alternate Scenarios** | **Actor Action** | **System Response** |
| **Linen Name Not Found** |  | **Step 5:** Linen name not found in the linen file.  **Step 6:** Display an error message: “Error, linen name not found in file, please re-enter.”  **Step 7:** Place cursor on linen name field and return to Step 4. |
| **Conclusions** | The linen is removed from the Linen File. | |
| **Post conditions** | The linen can no longer be ordered. | |
| **Business Rules** | The Linen must remain in the Linen file for referential integrity. | |
| **Implementation Constraints** | None. | |

# System Model

The following dataflow diagrams have been produced for the system:

## Level-0 DFD

## Level-1 DFD

## Level-2 DFD (Process P1: Title)

## Level-2 DFD (Process P2: Title)

## Level-2 DFD (Process P3: Title)

# Data Model (Class Diagram)

Brief introduction……

## Class Diagram

Object Model – UML Class Diagram

Class diagram shows objects & attributes

## Relational Schema

Relational schema for the data requirements - Using ***bracket notation***

## Database Schema

A definition of the database to be implemented.

This includes primary key, foreign key and other constraints to be implemented.

# Conclusion

# Appendices

## Appendix A – Title

## Appendix B – Title

Might include:

* **Lookup / Reference tables**
* **Sample reports / Listings**