Stock Handling System

A PROJECT REPORT SUBMITTED BY
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Abstract

Stock Handling System gives the following functions:

- Buy materials or get returned materials to the stock.
- Remove materials for the productions.
- Order productions and reversing productions to the customers.
- Get reject orders to the stock and reject materials from the stock.
- Update some functions.
- Search about the stock.
- Auto generate notifications about the current situation in the stock.
- View (Monthly, Yearly, daily) reports.

This system gives the most valuable function as rejecting and reversing productions. Some productions can be expired or some orders can be reject. Because the productions has not the standards. Therefore they happen to update the books of the stock. This process get long time and some invoices could be missed. The stock handling system give the help to this one. And the some orders can be reverse again to the customers. This is the most problematic incident. The system gives a well solutions for accomplish this task.

As well as this system can get returned materials as batches. When a material stock receive us, some stock could be missed. We inform the responsible companies about this situation and they return the missed stock. This system gives a well solutions for accomplish this task.

The company get about valuable ideas from view the reports. Reports give monthly, yearly and daily changes in the stock. It according to company can estimate what materials, what productions accomplish their needs.

Acknowledgment

First and foremost, my thanks and gratitude goes to my supervisor, Mr. Prasad Dammika Waduge for his support, assistance and accurate supervision.

Also my appreciation goes to my family for their prayers and unending support as well. My profound gratitude also goes to my lecturers who impacted knowledge into me.

As well as my appreciation goes to the SASKem.PVT (LTD) to give any information to succeeded my 1st semester project.

When it comes to talking about this project, the main target of the stock handling system is order, reject, reversing processes doing easily and accurately.

In other hand the productions have a standard known as mesh. This quality added to this system and therefore users get an awakening.

1.1 Problem Statement

After analyzing the SASKem Company one of the main issues I found was that the stock handling is doing fully manually. Some calculations are doing not using any calculators.

So sometimes they have a doubt about their stock. Because the calculations can be wrong.

The company is located nearly a small river. ”When a flood occurred moment this company submerge and the all documents are destroyed”, the company said. There is a main issue is everything notes in a papers. If miss any paper the company become very dangerous situation. This system has a database and the system has a backup system and the data will safety.

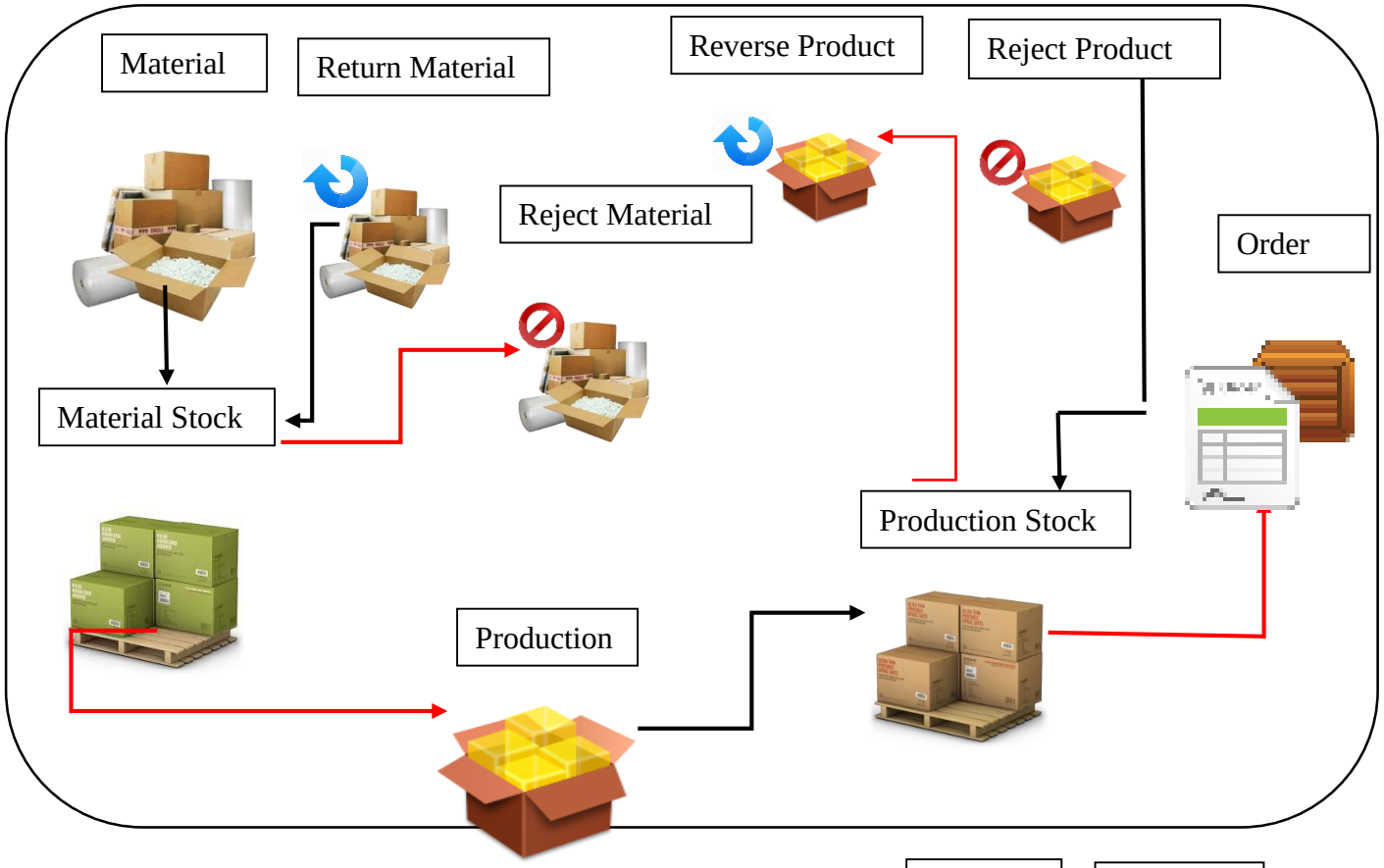


Figure 1.1.1: Current System

1.2 Approach

According to the well understanding of user requirements as a methodologies, Evolutionary model can be used. Because the system UIs depended only two weeks with the company for get users feedbacks. Requirements for the system were collected by analyzing the problem.

Following technologies and tools were used to develop this system.

- Development Languages

  - Javafx 8
  - MySQL

- Database system

  - My SQL

- Tools

  - Net Beans
  - Jasper Reports

2.0 Requirement Analysis Process

The main function of this business was identified. Further, can be investigated the current system problem and requirements for new system .After the analyzing, how the stock works in the company and orders and bills which are depend on what causes, can be identified.

2.1 Functional Requirements

The functional requirement is describing the behavior of the system as it relates to the system's functionality. Basic functional requirements of the system can be categorized as follows.

- ✓ **User Abilities**
  - User should be able to log in to the system.
  - A user can buy materials, order productions, get rejected productions and reverse productions mainly.
  - User can add, update, and remove some functions.
  - User can change the login settings in the system where admin.
  - When fill the forms in a function of the stock, user can set new companies, rename companies, set new productions, rename productions, set new materials, rename materials.
  - Every table in the system have common things such as remove, cancel ,update and undo. The user can use this common things to work easily.
  - Should be able to search the materials and productions in the stock.

- ✓ **Stock Management**
  - The system can buy materials, reject materials, get returned materials and remove materials in the stock.
  - The system can order productions, get reject productions, reverse productions in the stock.

✓ **Reports**

- Should be able to print the bill or invoice after the ordering process.
- Should be able to print a tax invoice after buy a material stock.
- Should be able to view monthly, yearly reports about the stock.

2.2 Use Case Diagrams

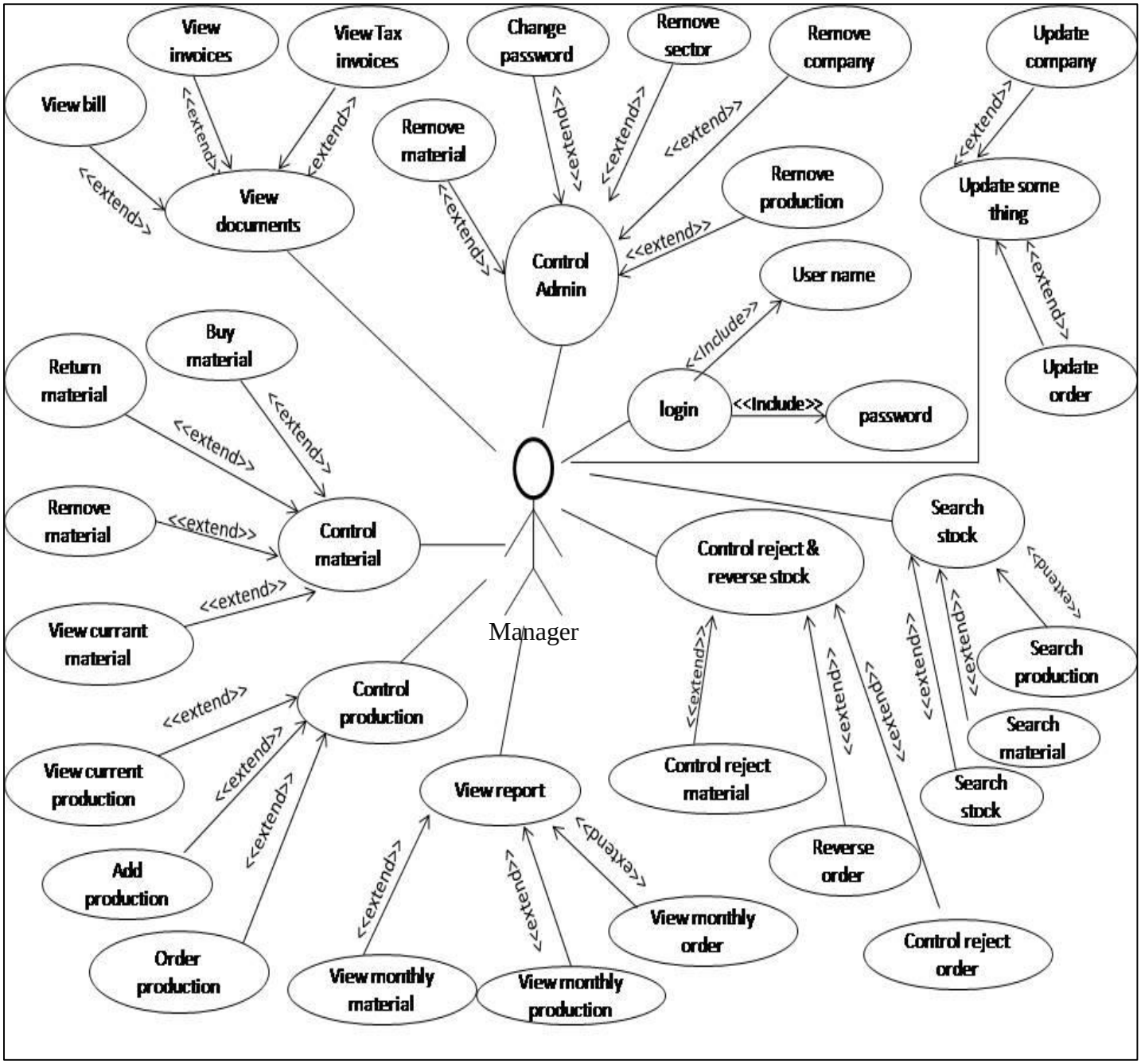


Figure 2.2.1: Use Case Diagram

2.3 Use Case Descriptions

- This stock handling system is using only manager of the company. Therefore manager is the only person, involve all of the functions in the system.

User Login

Use Case Name	Login
Actors Involved	Manager
Description	To work with this system before manager should login.
Preconditions	Manager have a valid password and user name to login this system.
Flow of Events	➢ Go to login page. ➢ Enter username and password. ➢ The system checks the username and password with registered user information. ➢ If user login details are valid, create a home page. ➢ If username and password are not valid user will get an error message.
Post conditions	If the user name and password are valid, the home page is displayed. And the login page is closed.

Table 1: User Login

Admin

Use Case Name	Control Admin
Actors Involved	Manager
Description	Manager can change password and remove company, sector, production and materials.
Preconditions	Manager fill the current password, new password, verify password and user name in the change password. When remove some items, first the item should select from the combo box.
Flow of Events	➢ Click the admin function. ➢ Show the change password. ➢ Fill the given fields and it shows messages about accurate. ➢ Select given combo box under a topic such as company, production, material etc. ➢ Click the remove button to remove that item from system.
Post conditions	If the password is changed, show message "password changed ! " . When remove a function, show message remove success!.

Table 2: Admin

Material

Use Case Name	Control Material
Actors Involved	Manager
Description	Manager can buy material, return material, remove material and view the current materials in the stock and this shows using a pie chart.
Preconditions	Manager can fill the fields in buy material, return material and remove material before enter data to database. To view the current Material, should select the material from combo box.
Flow of Events	➢ Click the material function. ➢ Show the menu and can select buy, remove, return or view UI s. ➢ After fill the fields of each UI and press the buy, remove, return buttons .Then database update. ➢ The pie chart of view is made as selected material amount.
Post conditions	After press buy, remove, return material buttons, showing information messages as it success. Especially when press buy button, preview a UI known as buy tax preview and it prints the tax invoice.

Table 3: Material

Production

Use Case Name	Control Production
Actors Involved	Manager
Description	Manager can add production, order production and view the current production in the stock and this shows using a pie chart.
Preconditions	Manager can fill the fields in add production. Order production before enter data to database. To view the current production, should select the production from combo box.
Flow of Events	➢ Click the production function. ➢ Show the menu and can select add, order or view production UI s. ➢ After fill the fields of each UI and press the add, remove, return buttons .Then database update. ➢ The pie chart of view is made as selected material amount.
Post conditions	After press add, order production buttons, showing information messages as it success. Especially when order button pressed, it shows known as order preview UI and it prints the bill or Orders.

Table 4: Production

Reject and Reverse

Use Case Name	Control Reject and Reverse
Actors Involved	Manager
Description	Manager can reject, reverse production and reject materials from the stock.
Preconditions	Manager can fill the fields in reject, reverse production and reject material before enter data to database.
Flow of Events	➢ Click the Reject and reverse function. ➢ Show the menu and can select reject production, reverse production or reject material UIs. ➢ After fill the fields of each UI and press the reject, reverse buttons .Then database update.
Post conditions	After press reject , reverse buttons, showing information messages as it success.

Table 5: Reject and Reverse

Update

Use Case Name	Update Something
Actors Involved	Manager
Description	Manager can update order and update company. The company deal with invoices. Therefore the orders can be update. As well as the dealing company details can be changed.
Preconditions	Manager can fill the fields in update company and update order. Before update these things firstly select the company or the po of applicable order.
Flow of Events	➢ Click the update function. ➢ Show the menu and can select Update Company or update order UI s. ➢ After fill the fields of each UI and press the update buttons .Then database update.
Post conditions	After press update buttons, showing information messages as it success. Especially when update order button pressed, it shows known as order preview UI and it prints the updated Order.

Table 6: Update

Search

Use Case Name	Search Stock
Actors Involved	Manager
Description	Manager can search about the behavior of material stock and production stock. And search about the one by one material and production.
Preconditions	If select a material or production, it shows the aspect of how change the stock with dates. If select a date, then shows how stock change that applicable date.
Flow of Events	➢ Click the search function. ➢ Show the menu and can select search production, search material and search stock UI s. ➢ After select material or production from the combo box it shows the applicable data from database.
Post conditions	When select another production or material in ui, before selected material data cleared and loaded new data for applicable material or production.

Table 7: Search

Documents

Use Case Name	View Documents
Actors Involved	Manager
Description	Manager can view applicable documents for company such as bill, tax invoices and invoices.
Preconditions	Manager can select one of thing from bill, invoice, tax invoice from the menu and all have combo boxes to select po, grn no etc.
Flow of Events	➢ Click the Document function. ➢ Show the menu and can select tax invoice, invoice, bill UI s. ➢ After select combo boxes and then load an applicable jasper report with data from database.

Table 8: Documents

Reports

Use Case Name	View Reports
Actors Involved	Manager
Description	Manager can view applicable Reports for company such as monthly receive materials, view monthly orders, view monthly productions. These reports give the details under the applicable year.
Preconditions	Manager can select one of thing from above set and all have combo boxes to year and month.
Flow of Events	➢ Click the Report function. ➢ Show the menu and can select monthly orders, monthly productions and monthly receive material UI s. ➢ After select combo boxes and then load an applicable jasper report with data from database.

Table 9: Reports

3.0 Materials Used

Several tools and technologies were used to develop the system. InnoDB used as the relational database server. Jasper Report used get Reports. Interfaces are designed by using Scene builder application.

3.1 Methodology

3.1.1 Software Development Methodology

After completing requirement analysis process of the project, Evolutionary model was the preferred methodology to manage the all processes of software development life cycle.

Below diagram explain the process of evolutionary method:

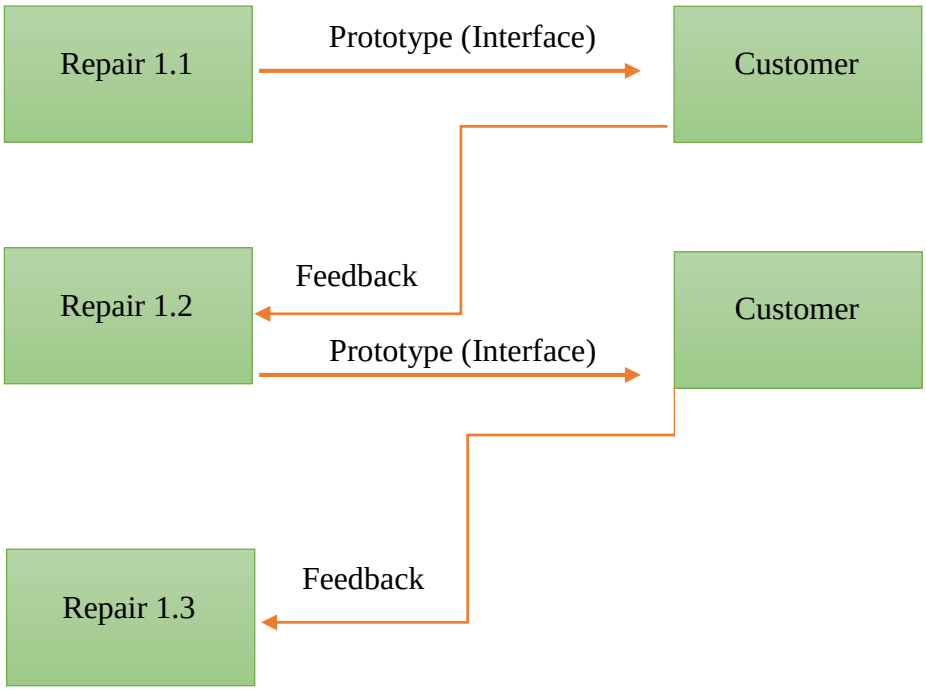


Figure 3.1.1.1: Evolutionary Model cycle

In the evolutionary method we use only prototypes for get customer feedbacks. After analyze all the business functions, creates the system. Evolutionary model have two types.

- Reuse

  If the prototypes are not complex, can use that all for develop.

- Throughout

  If the prototype is more complex, happen to create new prototype for this one.

3.2 ER Diagram

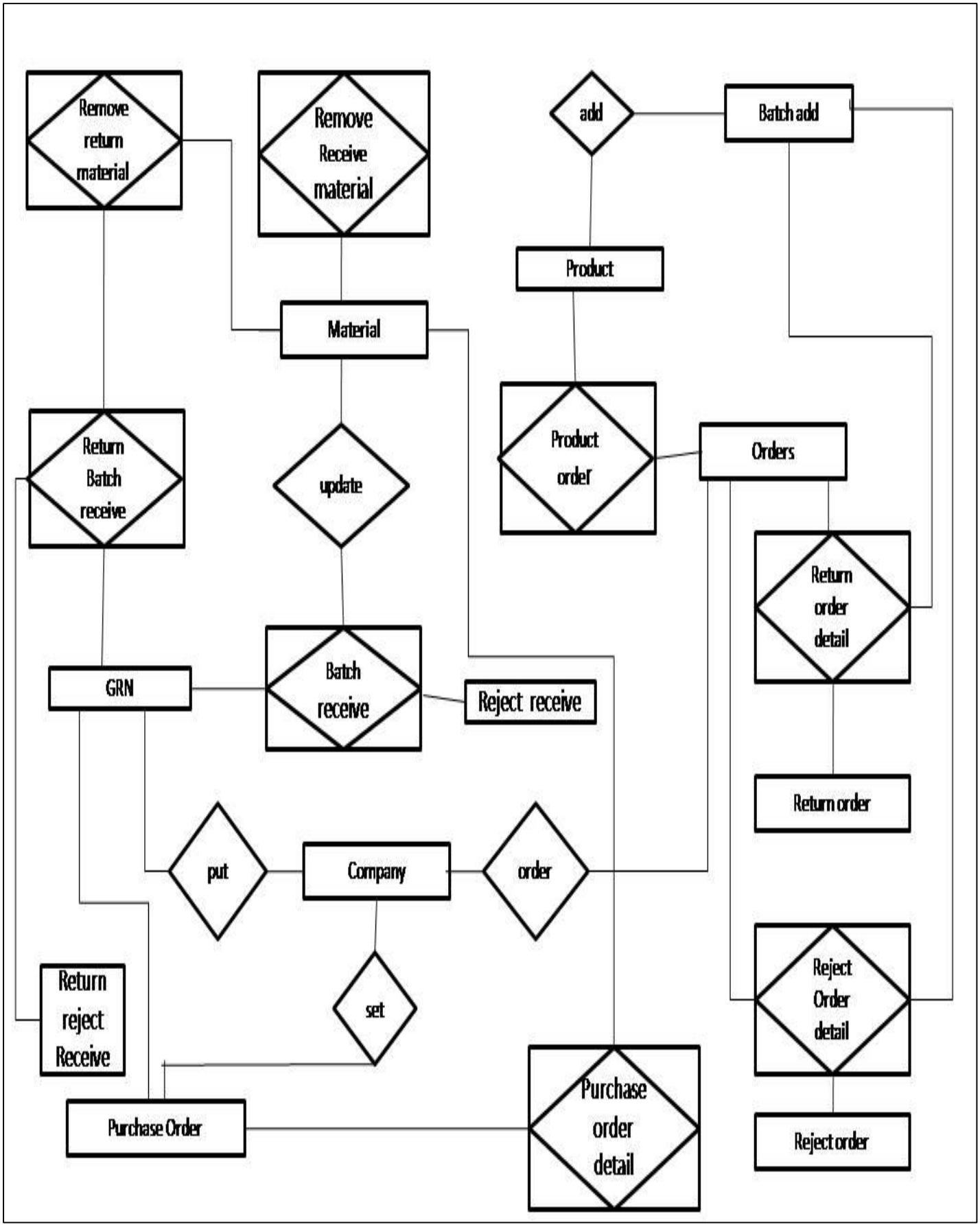


Figure 3.2.1: ER Diagram

3.2 Logical Schema

Figure 3.2.2: Logical Schema

3.3 Interface Design Interfaces are designed by using

Scene Builder application.

3.4 User Interfaces

User login Interface

Figure 3.4.1: User Login interface

This is the User Login of the stock handling system. Enter a valid user name and password and then click the green button to visit the home page.

Home page Interface

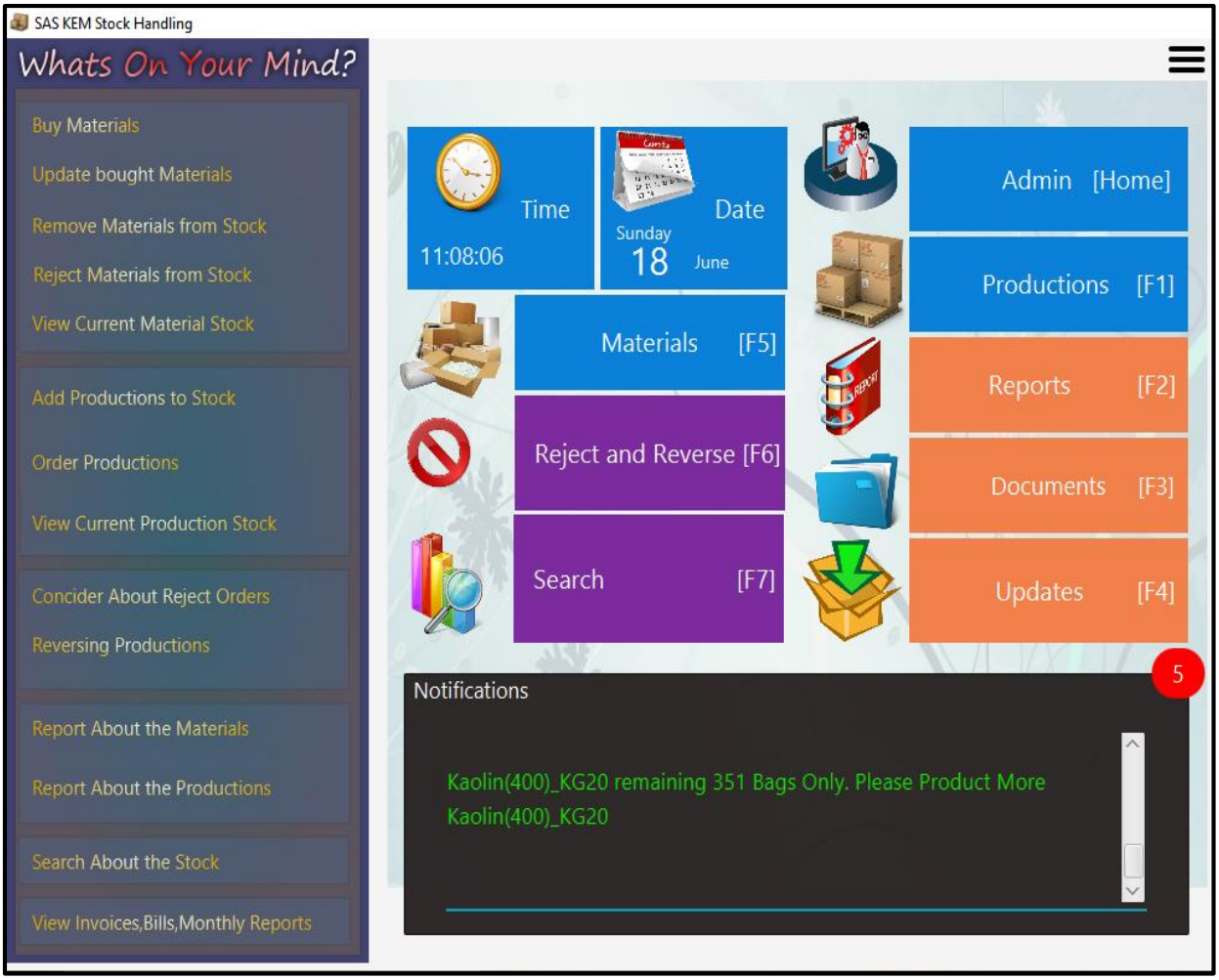


Figure 3.4.2: Home Page Interface

This is the home page of the stock handling system. This interface have several functions. Time and date displayed in two boxes and the system functions are mentioned in other boxes.

The side pane always describes the things that the system gives.

The black colored text area shows the stock needs. When the stock has not enough productions or materials, the text area give notifications for users. The red colored label has a number. It shows the amount of notifications.

Common things

Before describe the inside of the system, should introduce the common things of the system.

- New Material

If add a new Material to the system, this button placed in the applicable ui and it set a tool tip for identify. If press the add button after filling the all fields, the new Material is added. If press the cancel button, the UI is closed. The material id is auto generated.

Figure 3.4.3: Introduce Material

- New Production

If add a new Production to the system, this button placed in the applicable ui and it set a tool tip for identify. If press the add button after filling the all fields, the new Production is added. If press the cancel button, the UI is closed. The Production id is auto generated.

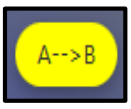
Figure 3.4.4 : Introduce Production

- New Company

If add a new Company to the system, this button placed in the applicable ui and it set a tool tip for identify. If press the add button after filling the all fields, the new Company is added. If press the cancel button, the UI is closed. The company id is auto generated.

Figure 3.4.5: Introduce Company

- Rename Material



If rename a material in the system, this button placed in the applicable ui and it set a tool tip for identify. If press the rename button after select from combo box and filling the all fields, the material is renamed. If press the cancel button, the UI is closed.

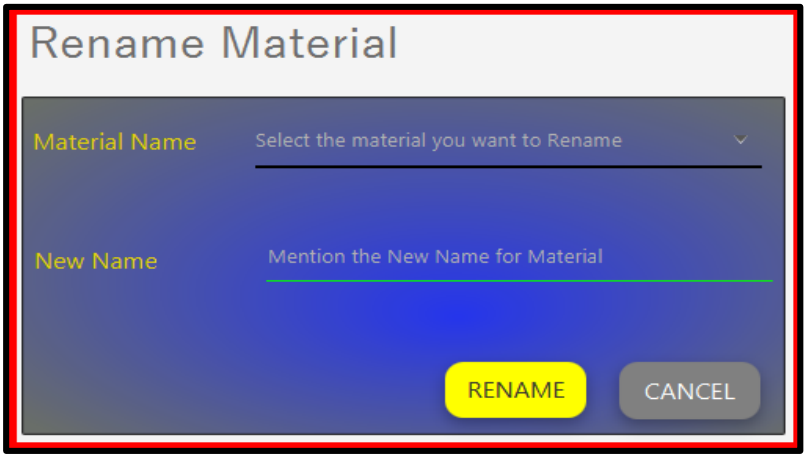
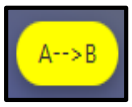


Figure 3.4.6: Rename Material

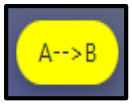
- Rename Production



If rename a production in the system, this button placed in the applicable ui and it set a tool tip for identify. If press the rename button after select from combo box and filling the all fields, the production is renamed. If press the cancel button, the UI is closed.

Figure 3.4.7: Rename Production

- Rename Company



If rename a company in the system, this button placed in the applicable ui and it set a tool tip for identify. If press the rename button after select from combo box and filling the all fields, the company is renamed. If press the cancel button, the UI is closed.

Figure 3.4.8: Rename Company

- Table

The stock handling system tables have common features. Below table is an example.

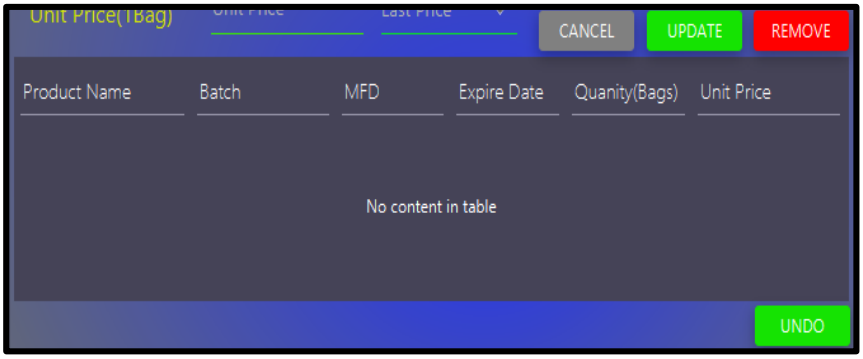


Figure 3.4.9: Example Table

- Cancel Button (Gray Colored)--→When select a row in the table, the button clear the selection.
- Update Button (Green Colored)--→When select a row, the details of row, set to the lines above the table. Then, change the details of lines and click the update button. Then change the details of selected row in table.
- Remove Button (Red Colored)--→If need to remove a row from the table, click the remove button.
- Undo Button (Green Colored)--→When remove a row, the row does not exist in the table. But if pressed the undo button, the removed row added again to the table.

Buy Material Interface

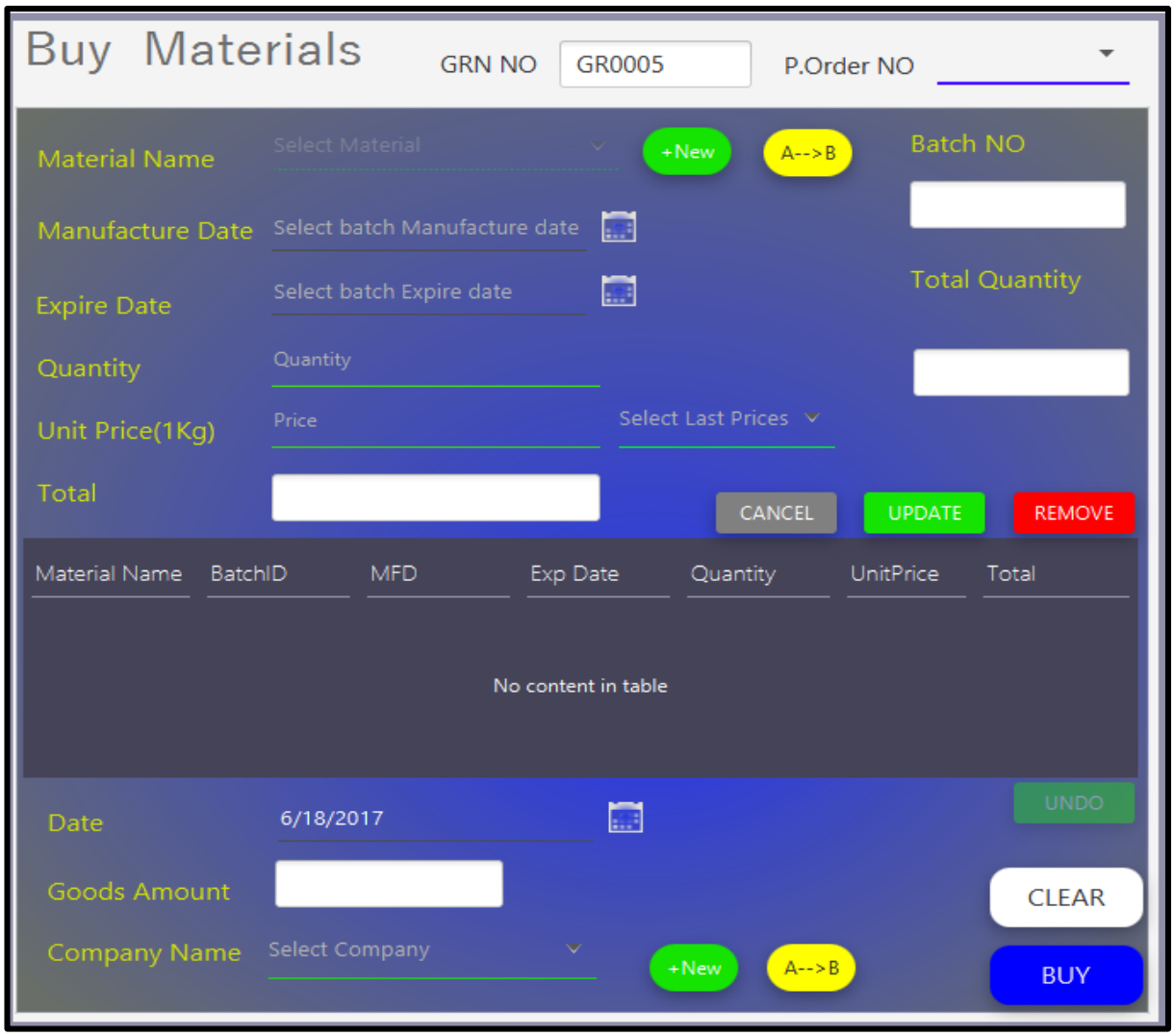


Figure 3.4.10: Buy Material

This interface use to buy materials to the stock. The grn no is auto generated. Firstly user should select a P.Order no from the combo box. Then material combo box is enabled and user can select a material. Then batch no is auto generated and the total quantity is filled automatically. After that user can fill the manufacture date, expire date and quantity fields. The unit price field is filled automatically and user can choose last unit prices from the combo box. Press the ENTER button on the price field and then calculate the total price on total text field. Then press the ENTER on total field and the filled data added to the table. Then clear the all fields. User can added data to the table this aspect continuously.

Next user can fill the date and select a company before CLICK the buy button. The goods Amount field fill automatically. After all CLICK the buy button and database updated. If user CLICK the clear button, clear the whole interface. Remember, if you missed any field, an ERROR message is showed.

Return Material Interface

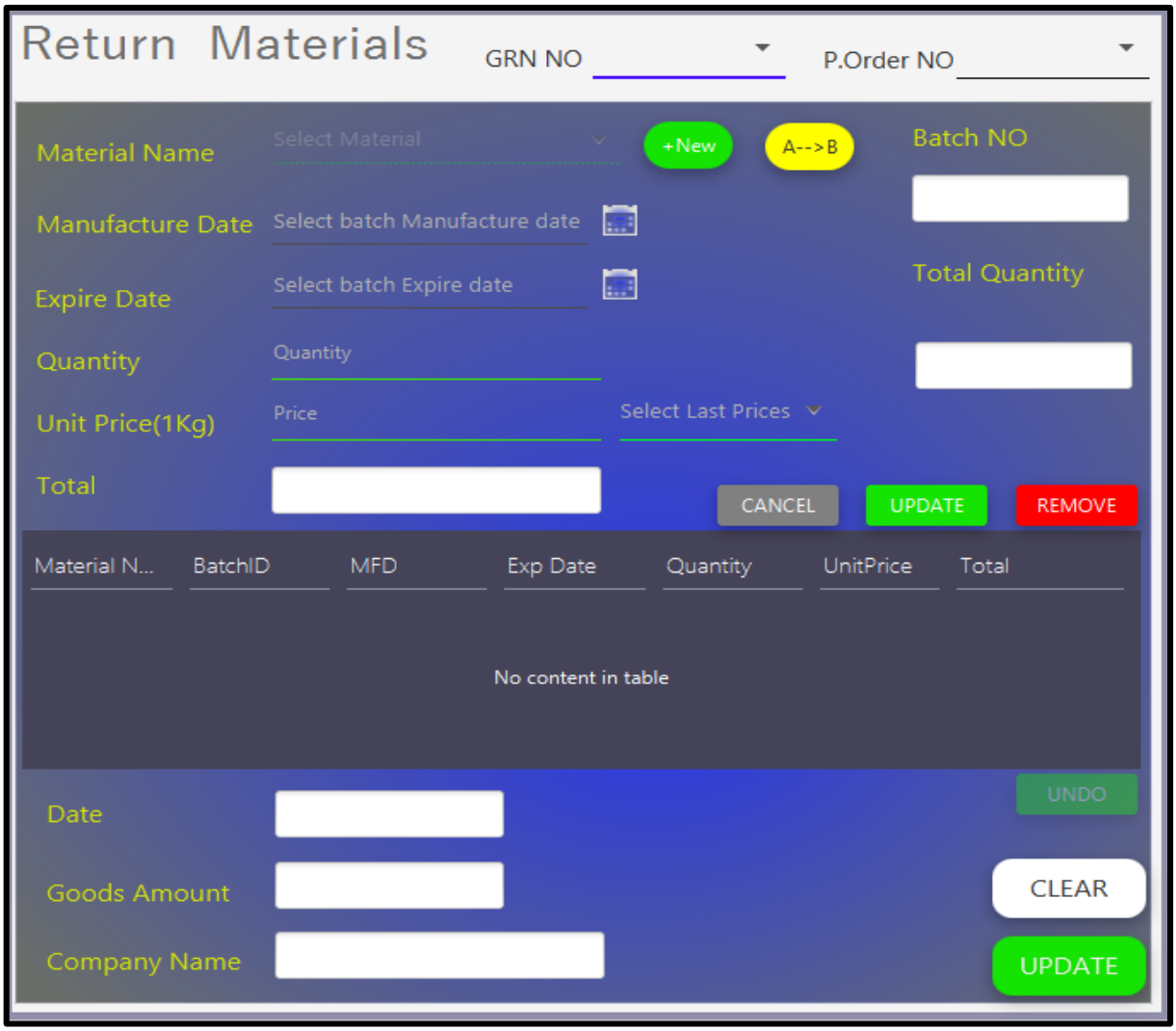


Figure 3.4.11: Return Material

This interface use to get returned materials. When we bought some materials, sometimes any material amount can be lose. Then the responsible company return that material stock. Firstly user should select the grn no or P.Order no. Then enable the material combo box and select the material. Then the new batch is auto generated. As well as the total quantity field is filled automatically. After that fill the manufacture date and expire date and the quantity fields. The unit price field fill automatically and the user can select a last unit prices from the combo box. Then press ENTER button and calculate the total price automatically in the total price text field. After that press the ENTER button on the total and this time data added to the table. User can added data to the table this aspect continuously.

Date, goods amount, company name text fields are filled automatically. If User CLICK update button, the database is updated. . If user CLICK the clear button, clear the whole interface. Remember, if you missed any field, an ERROR message is showed.

Remove Material Interface

Figure 3.4.12: Remove Material

Firstly select a material from material combo box. Then select a batch. User can select material from two batches. One batch is material directly received. Other batch is material returned. After that total and batch quantities displayed automatically. Then the quantity and sector fields enabled and user should fill these fields. Manufacture date and expire dates are filling automatically. After select the sector and the remove time set to the remove time text field. Then press the ENTER button on the remove time text field and data added to the table. User can added data to the table this aspect continuously.

Next fill the date field. But the field fill with default date as today. Then CLICK the remove button and the materials remove from the stock. If user CLICK the clear button, clear the whole interface. Remember, if you missed any field, an ERROR message is showed.

Remove Material Interface

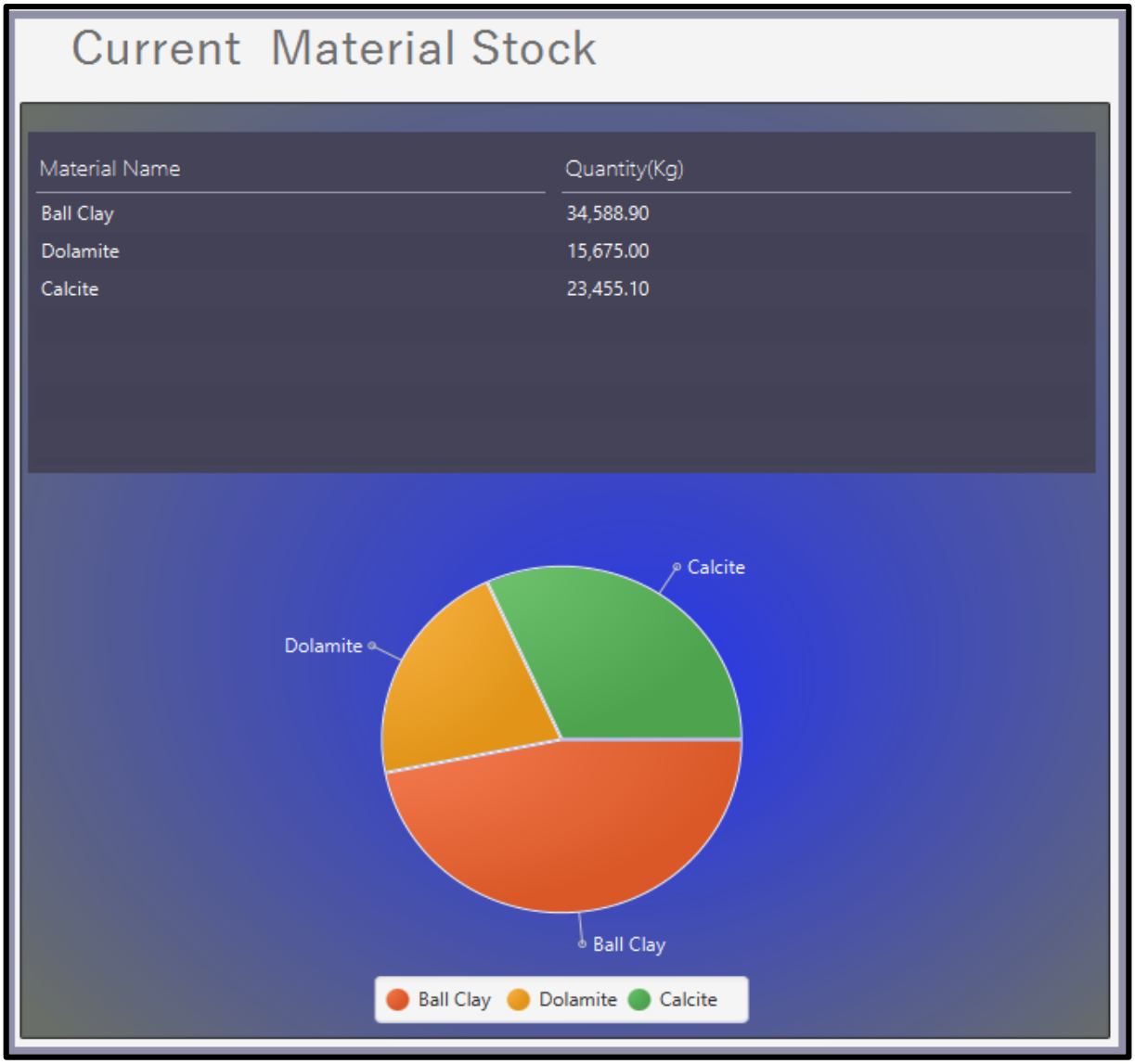


Figure 3.4.13: Current Material

This is the current material stock. The table shows the material names and applicable amounts. The pie chat is made using the above table data. User can get an idea about the behavior of material stock.

Reject Material Interface

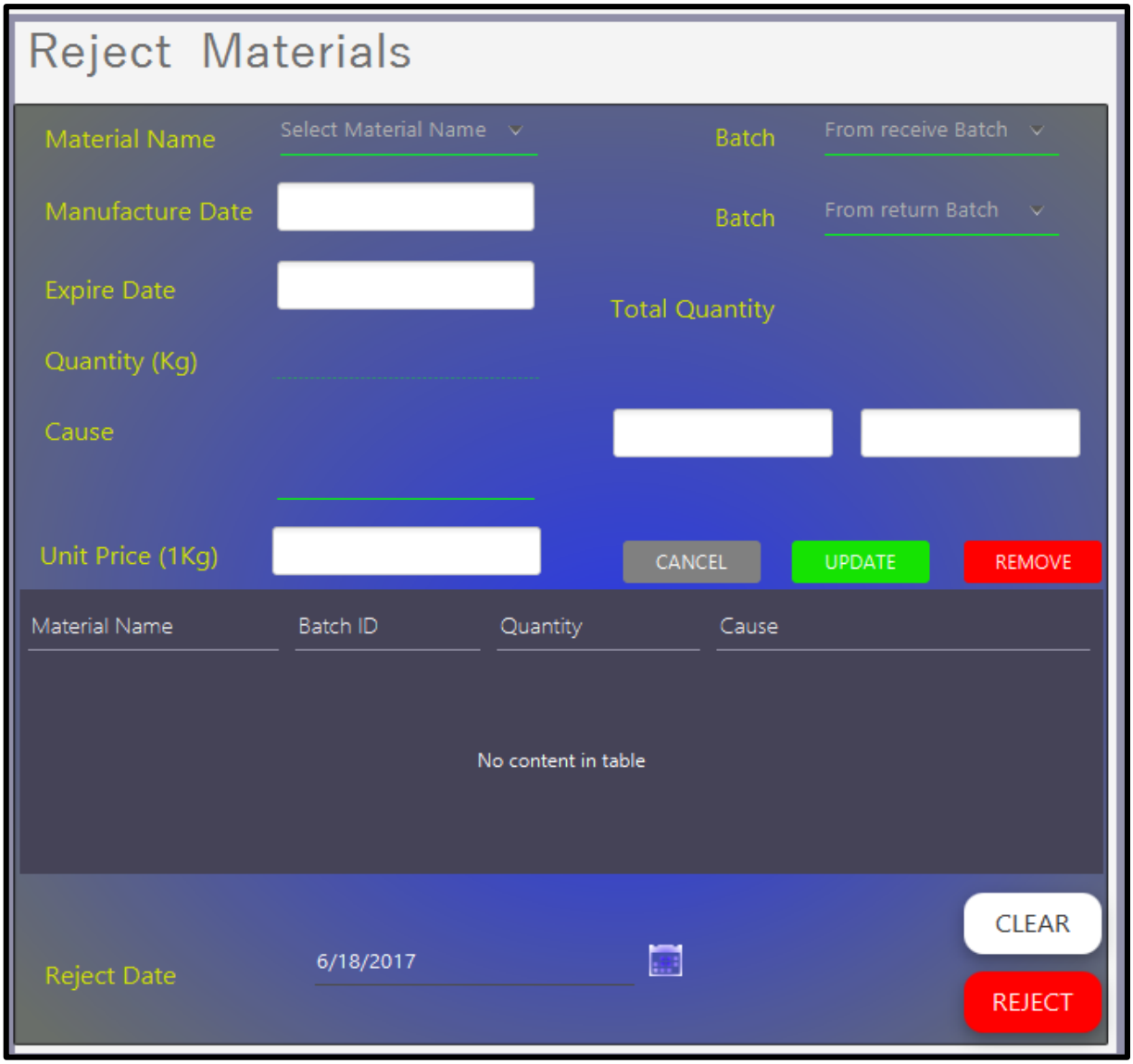


Figure 3.4.14: Reject Material

Firstly select a material from material combo box. Then select a batch. User can select material from two batches. One batch is material directly received. Other batch is material returned. The manufacture date and expire date is filled automatically. As well as the total quantity and batch quantity fields fill with choosing the batches. Then the quantity field is enabled and the user can put any quantity and press ENTER. Then write the cause to reject the material stock and press the SHIFT key. Now the unit price is filled automatically. Then press the ENTER key and data added to the table. User can added data to the table this aspect continuously.

Next fill the date field. But the field fill with default date as today. Then CLICK the reject button and the materials remove from the stock. If user CLICK the clear button, clear the whole interface. Remember, if you missed any field, an ERROR message is showed.

Reject Order Interface

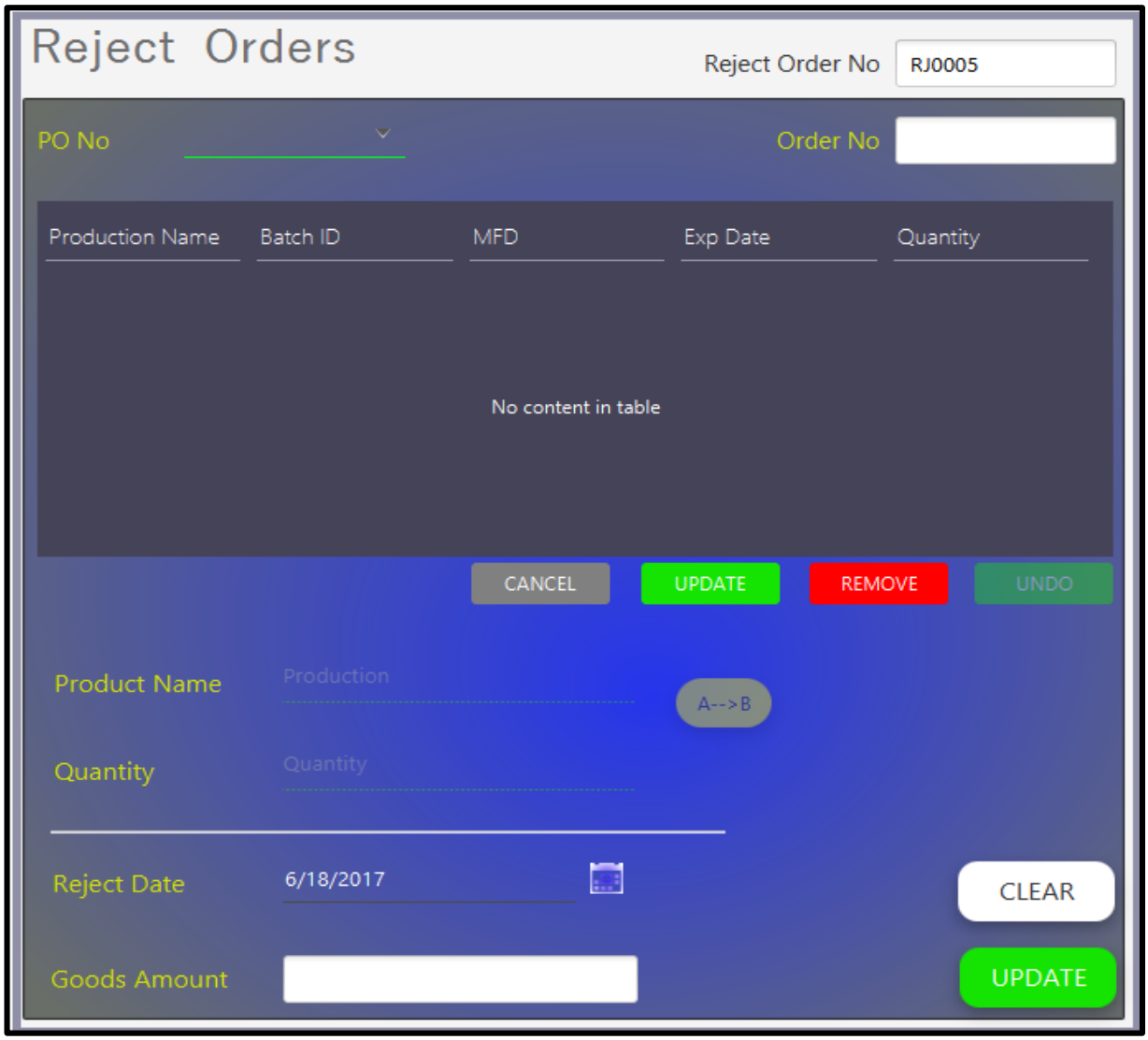


Figure 3.4.15: Reject Order

This interface use to get the reject orders to the stock. The reject order no is auto generated. User should select a PO no for applicable company or customer. After that the applicable order no is set to the order text filed automatically. Then select a po no and the table fill with applicable data for po. Now user can select the necessary items from the table and user can update and remove the data. However finally the table has only rejected items. The goods amount field is fill automatically.

Next fill the date field. But the field fill with default date as today. Then CLICK the update button and the items again updated to the stock. If user CLICK the clear button, clear the whole interface. Remember, if you missed any field, an ERROR message is showed.

Reversing Production Interface

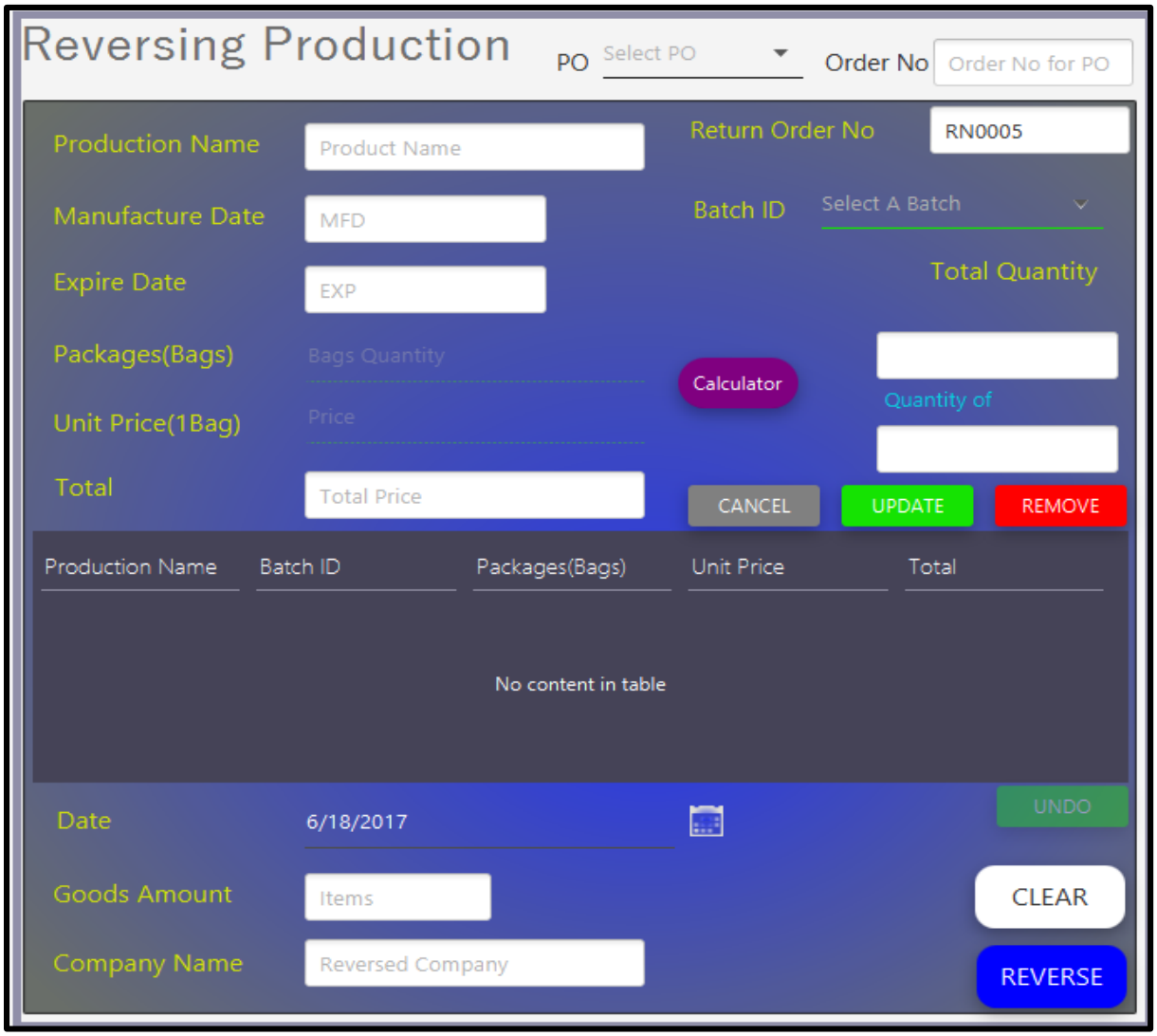


Figure 3.4.16: Reversing Production

When order a production, sometimes the ordered stock amount is not received to dealing companies. This time the missed productions send again under applicable PO. This interface use to do this process. Firstly user should select a po and this time order no filled automatically and the return no auto generated. As well as the table fill with applicable data and the company field filled. Then user can select the send again list from table and user can update that data. However now table has only send again items. As well as the item field filled automatically. User can able to use the calculator.

Next fill the date field. But the field fill with default date as today. Then CLICK the Reverse button and the items again updated to the stock. If user CLICK the clear button, clear the whole interface. Remember, if you missed any field, an ERROR message is showed.

Search Product Interface

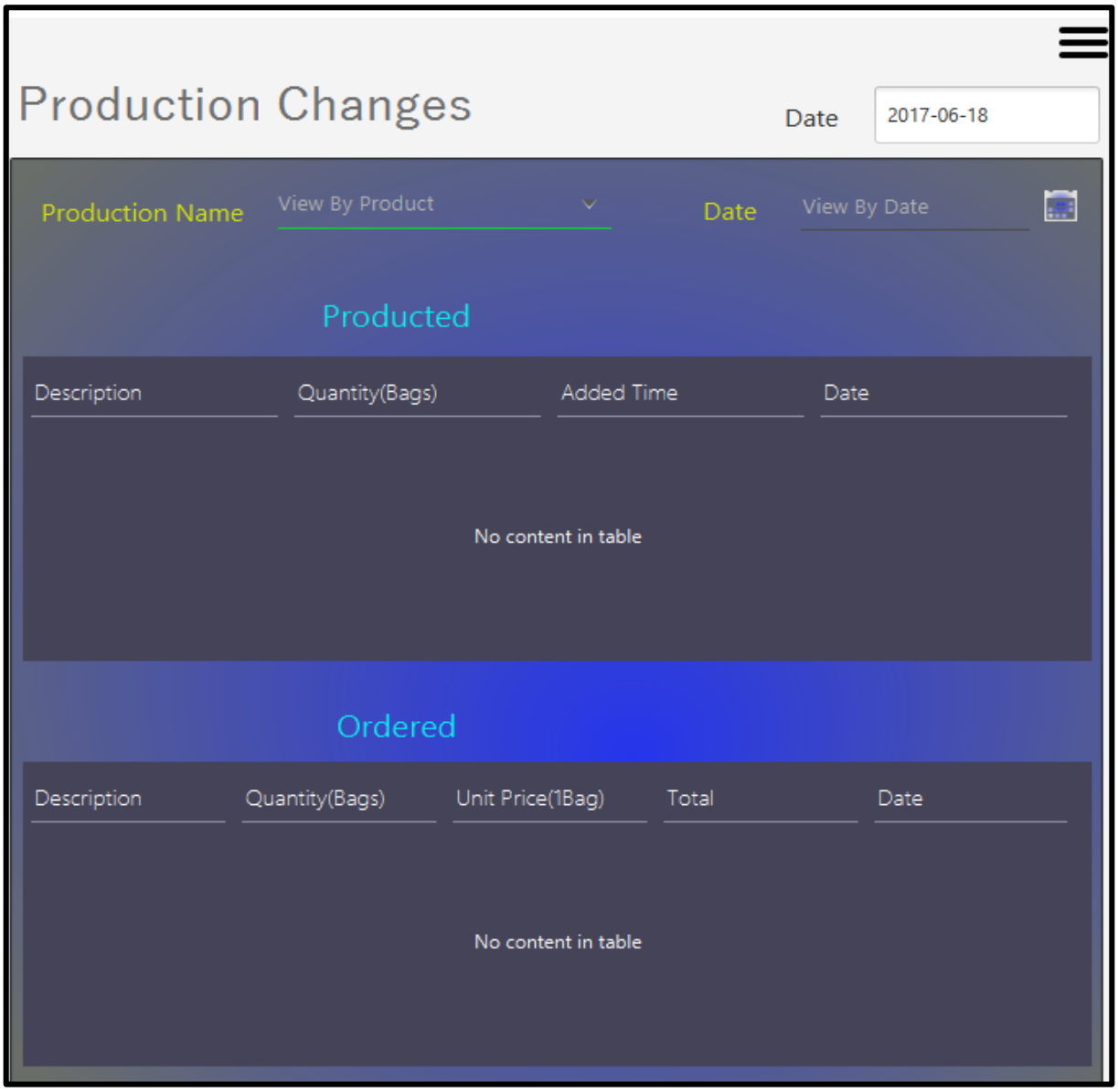


Figure 3.4.17: Search Production

This user interface show the behavior of productions. How happen the productions producing and ordering? Firstly user select a production from production combo box. Then the tables show the producing and ordering of applicable productions. As well as user can get a view about the day by day. If user select a date, the tables show the behavior of production stock according to applicable date.

Search Material Interface

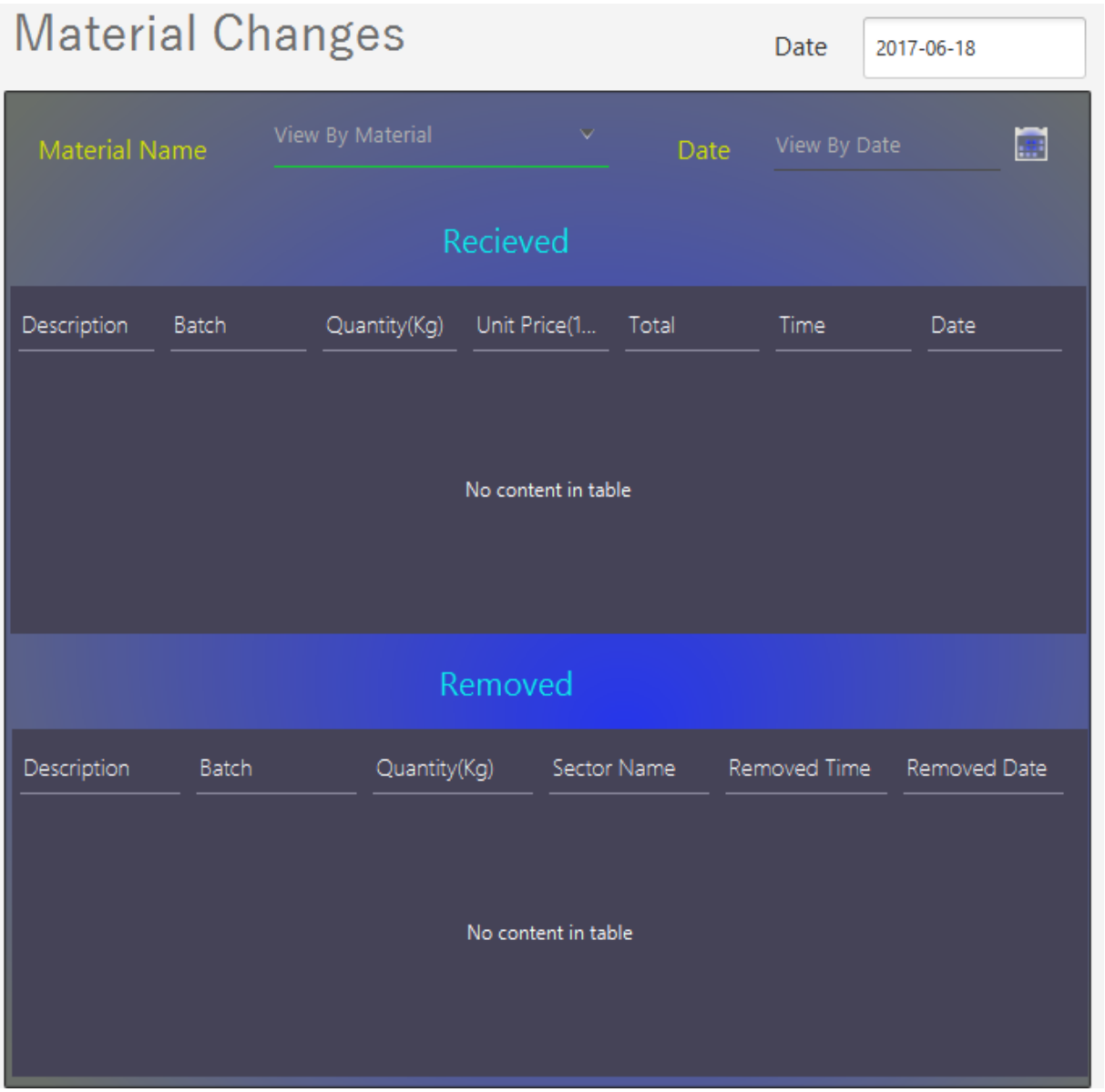


Figure 3.4.18: Search Material

This user interface show the behavior of Materials. How happen the materials receiving and removing? Firstly user select a material from material combo box. Then the tables show the receiving and removing of applicable materials. As well as user can get a view about the day by day. If user select a date, the tables show the behavior of material stock according to applicable date.

Search Material Interface

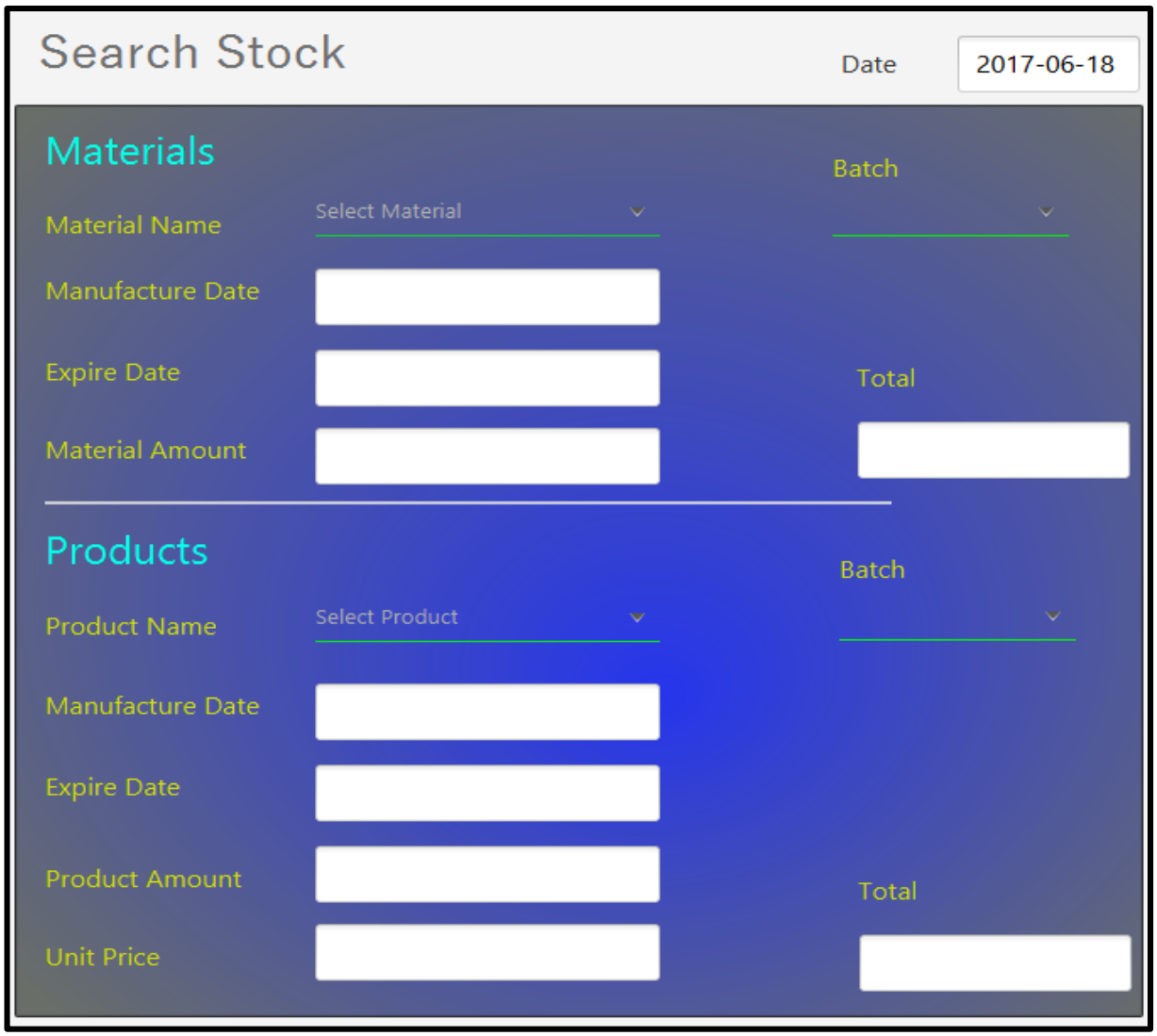


Figure 3.4.19: Search Stock

This interface show the current material or production amounts one by one. Firstly select the material or production. Then select the batch. The batches are loaded to batch combo box and the batches are applicable with the materials or productions. Then user can see the applicable material manufacture date, expire date, amount and the total quantity. Or user can see the applicable production manufacture date, expire date, produced amount, unit price and the total quantity.

Admin Interface

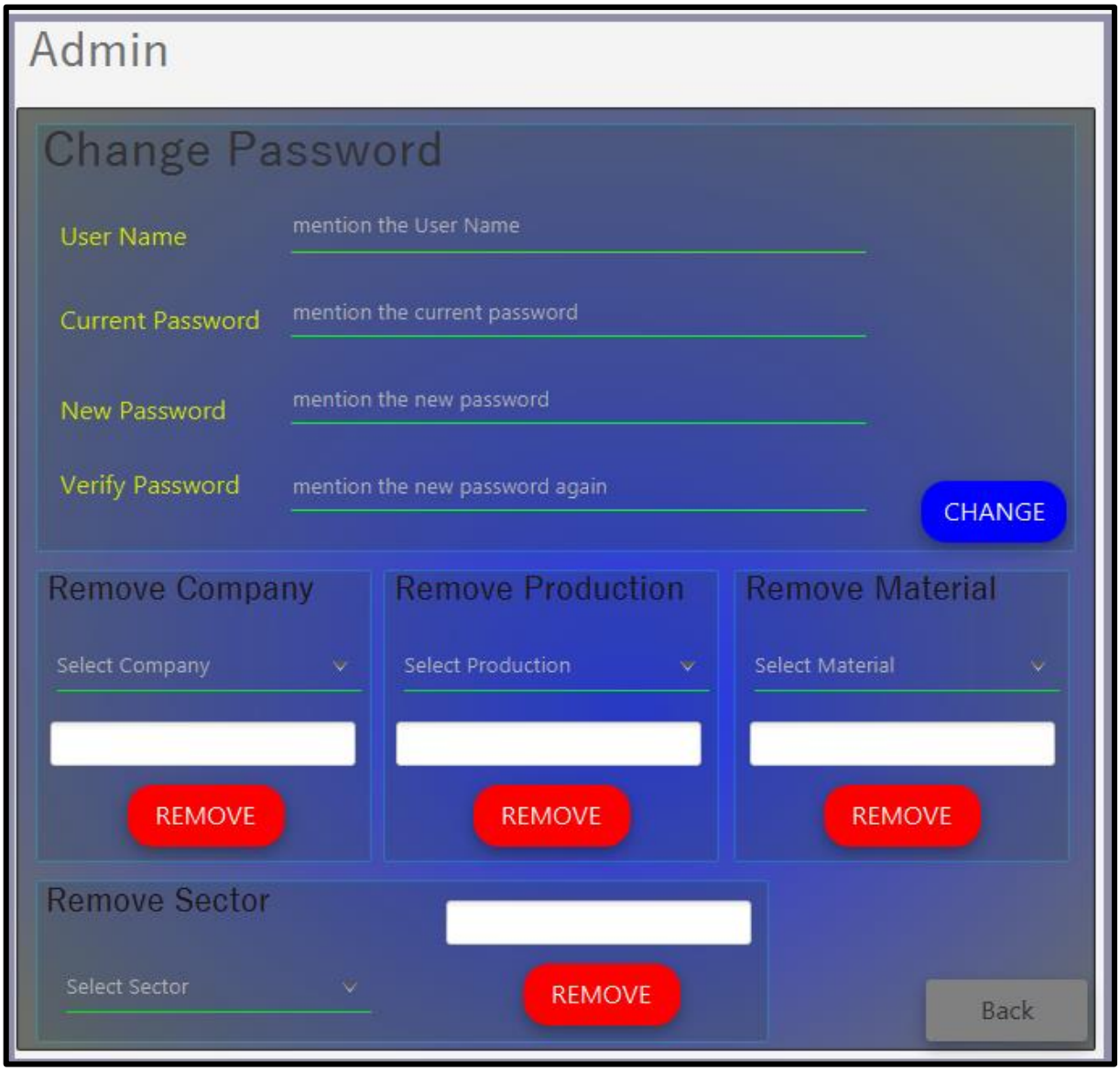


Figure 3.4.20: Admin

This interface has several functions. Firstly user can change the password. Therefore User should fill the user name, current password, new password and verify password. User should include the 8 letters password and it should has 2 symbols. Then password is strong.

Other functions has remove items from the system. All functions have to select an item firstly and then remove it. Remember, if you missed any field, an ERROR message is showed.

Add Production Interface

Figure 3.4.21: Add Production

This interface use to add production to stock. Firstly select a production and then auto generate a batch no to it. As well as total quantity field filled automatically. Then user should fill the manufacture date and the expire date. After that user should quantity. Then user can select the last unit prices from the combo box or type a price. Then press the ENTER button and data added to the table. . User can added data to the table this aspect continuously.

Next fill the date field. But the field fill with default date as today. Then CLICK the add button and the materials remove from the stock. If user CLICK the clear button, clear the whole interface. Remember, if you missed any field, an ERROR message is showed.

Order Production Interface

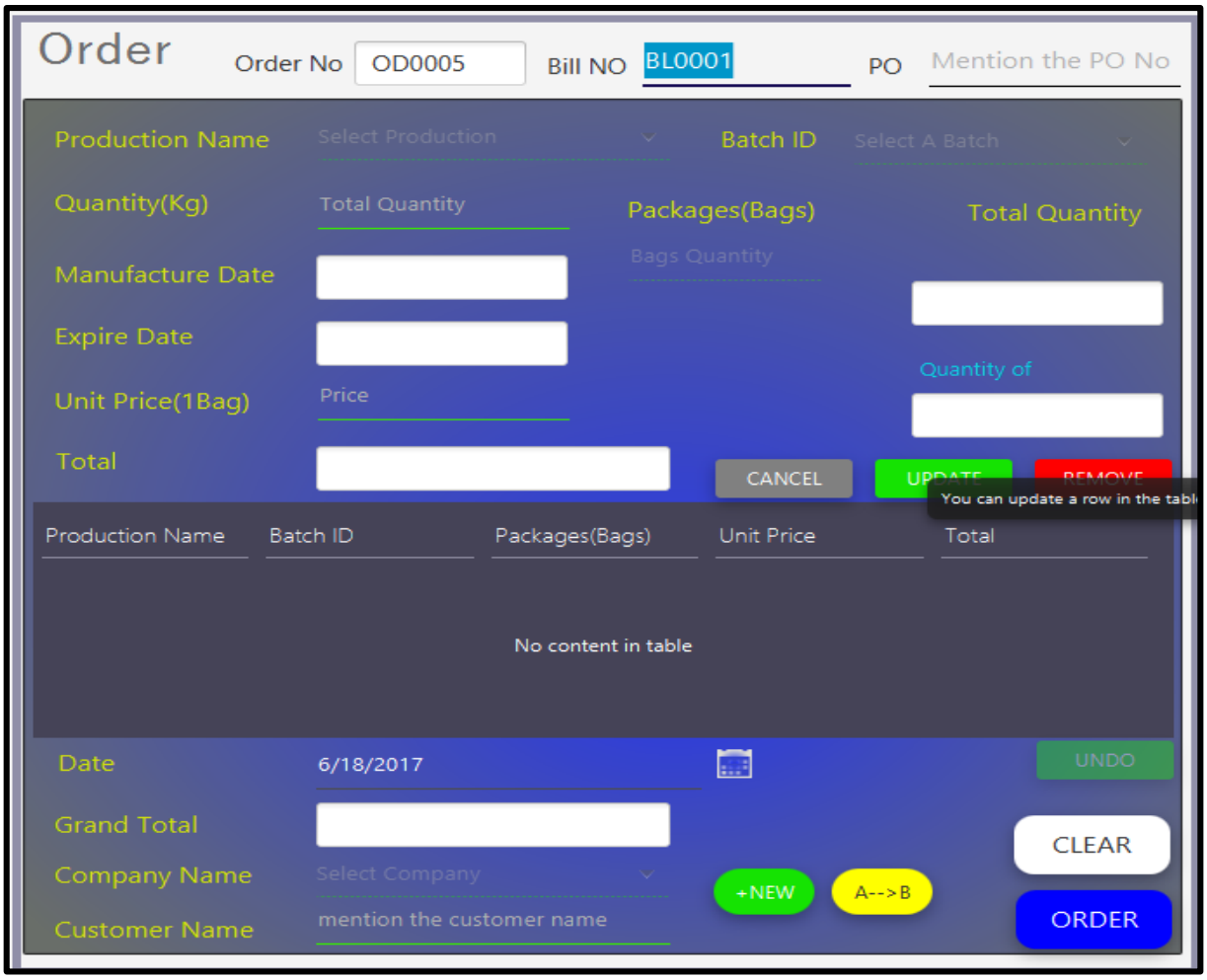


Figure 3.4.22: Order Production

This interface use to order productions. User can select a bill or dealing company PO no. The bill no is auto generated. Then select bill or PO number, the order no is auto generated and the production combo box is enabled. Then select a production and put the quantity and press the ENTER. Then batch is enabled and select a loaded batch. Now the packages are calculated and show automatically. After that press the ENTER button and put the price or get the generated price. Then press ENTER on unit price and calculate and show the total price on total. Then press the ENTER button on total and data added to the table. The grand total is calculated automatically. User can added data to the table this aspect continuously.

Next fill the date field. But the field fill with default date as today. If the user select bill, the customer name only enabled or the user put a po, the company only enabled. Then CLICK the order button and the materials remove from the stock. If user CLICK the clear button, clear the whole interface. Remember, if you missed any field, an ERROR message is showed.

Current Production Interface

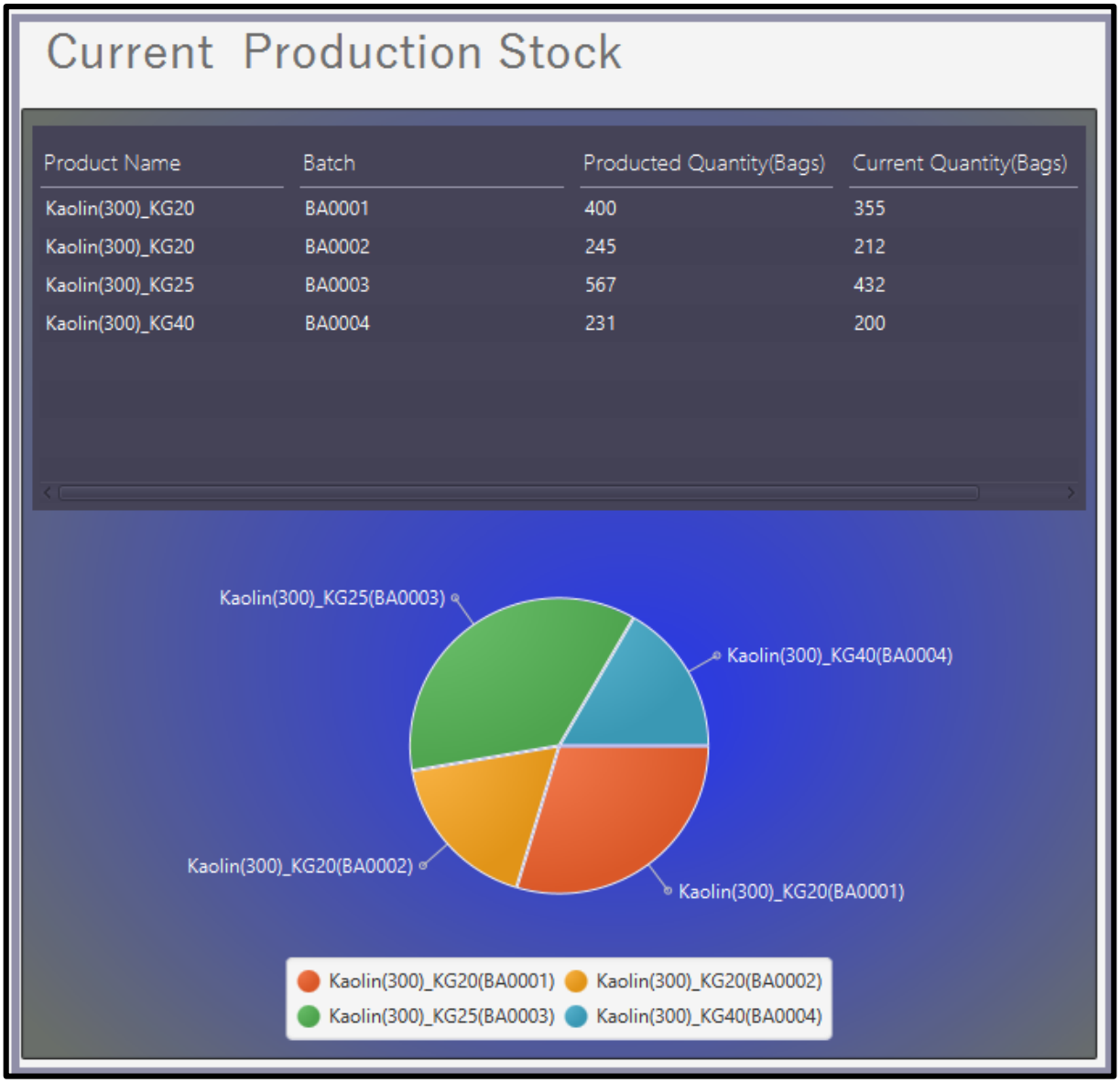


Figure 3.4.23: Current Production

This is the current production stock. The table shows the production names, batches, produce quantity and current quantity. The pie chat is made using the above table data. User can get an idea about the behavior of production stock.

Monthly Material Receive Interface

Figure 3.4.24: Monthly Material Receive

This interface use to get a jasper report. User can select a year and select a month for get this report. Report shows the monthly changes in material receiving.

Monthly Production Interface

Figure 3.2.25: Monthly Production

This interface use to get a jasper report. User can select a year and select a month for get this report. Report shows the monthly changes in productions.

Monthly Order Interface

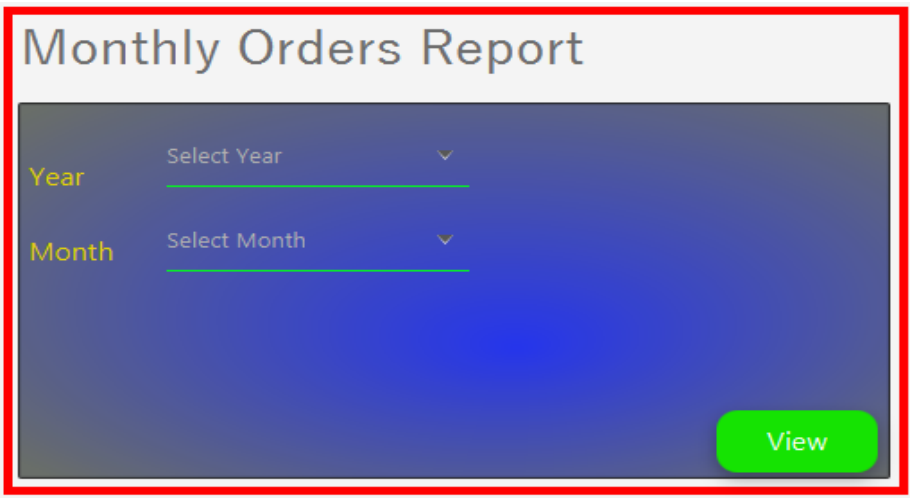


Figure 3.4.26: Monthly Order

This interface use to get a jasper report. User can select a year and select a month for get this report. Report shows the monthly changes in Orders.

Order preview Interface

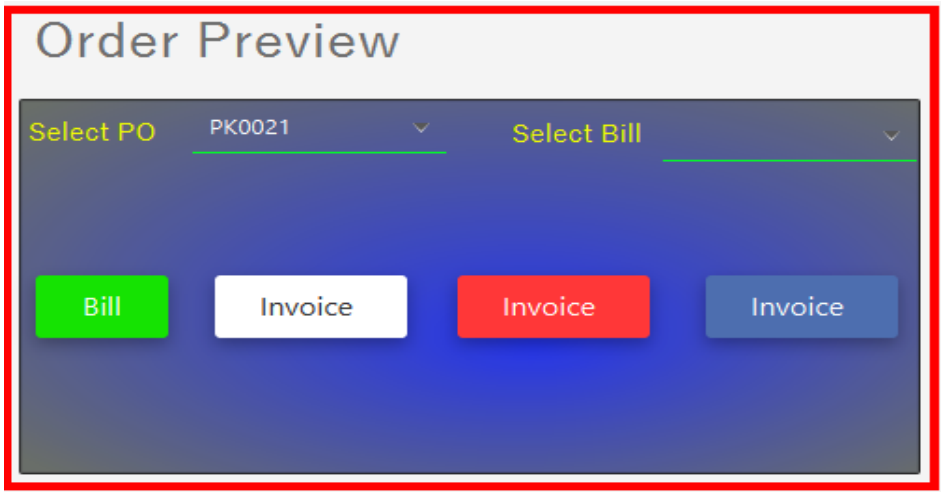


Figure 3.4.27: Order Preview

This interface use to get a jasper report. User can select a PO or bill for get this report. Report shows the invoice or bill. User can get three color invoices as white, red, medium blue.

Tax invoice preview Interface

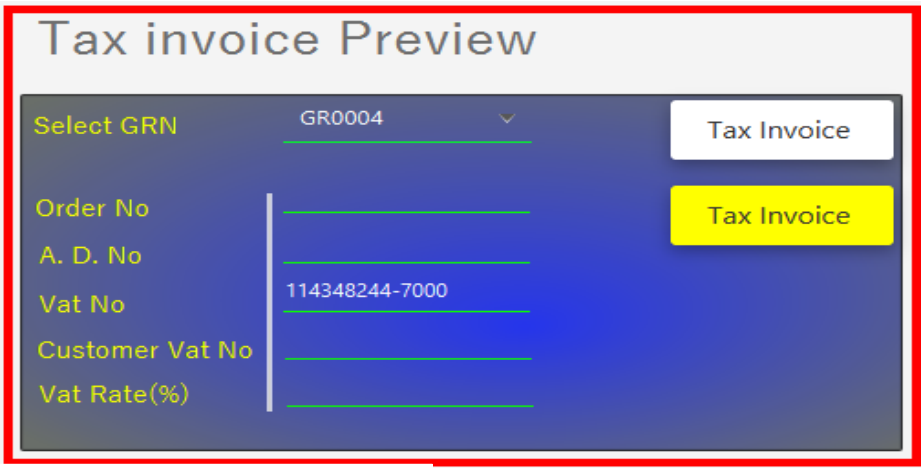


Figure 3.4.28: Tax Invoice

This interface use to get a jasper report. User can select a grn no. And the user fill the order no, A.D. No, vat No, customer vat No and the vat rate. The report is generated using these all fields. User can get two color reports as white and yellow.

Update Order Interface

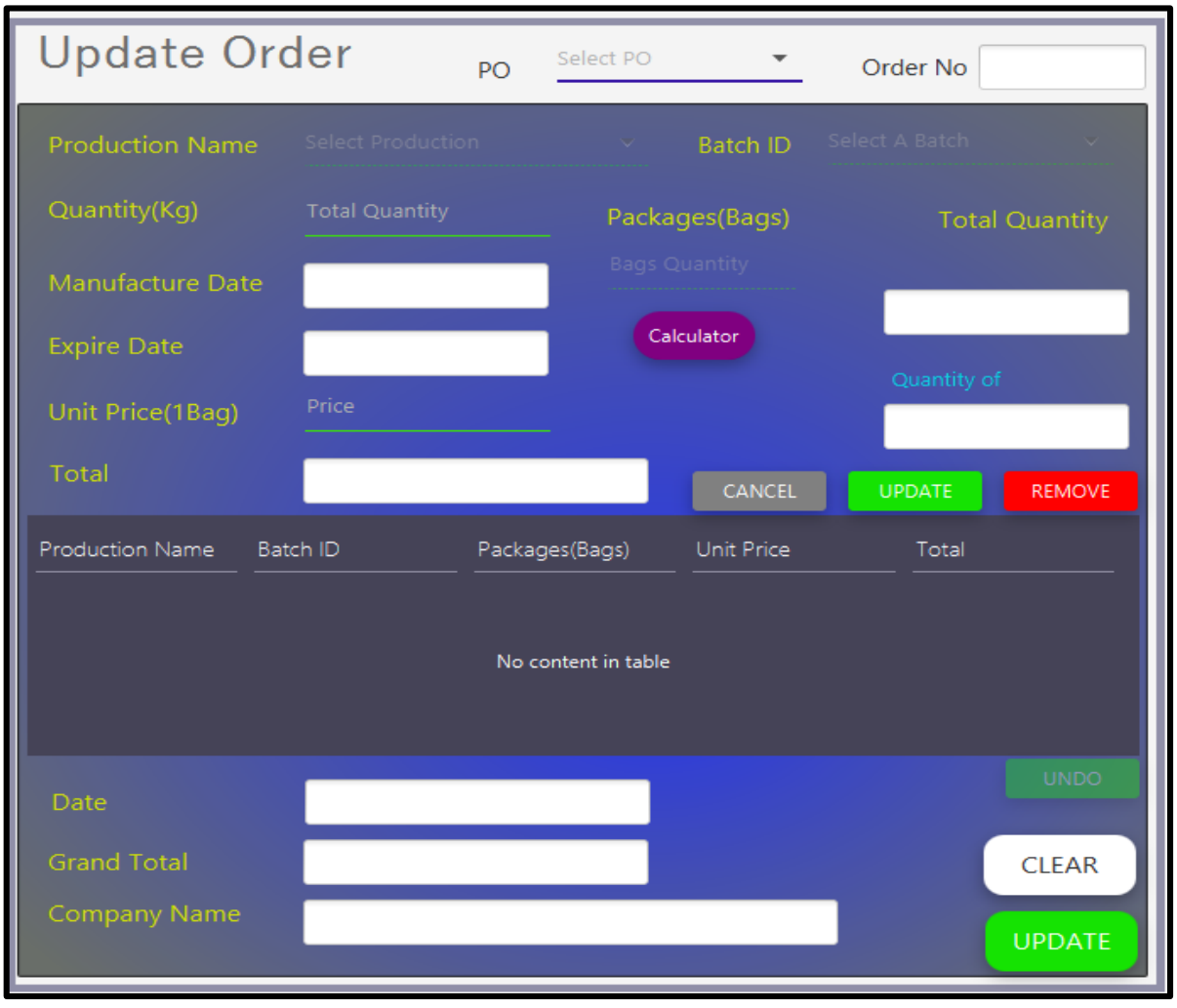


Figure 3.4.29: Update Order

This interface use to update an order. Because some invoices are update within 2 or more days. Firstly select a PO. Then generate an order no and table fill with data. Date, grand total and company name fields are filled automatically. Now user can select the row that need to update and updated it. User can use the calculator its necessary. Don't remove any other items from the table. Updated and not updated both items should has exist in the table.

If user CLICK the update button, the order is updated. If user CLICK the clear button, clear the whole interface. Remember, if you missed any field, an ERROR message is showed.

Update Company Interface

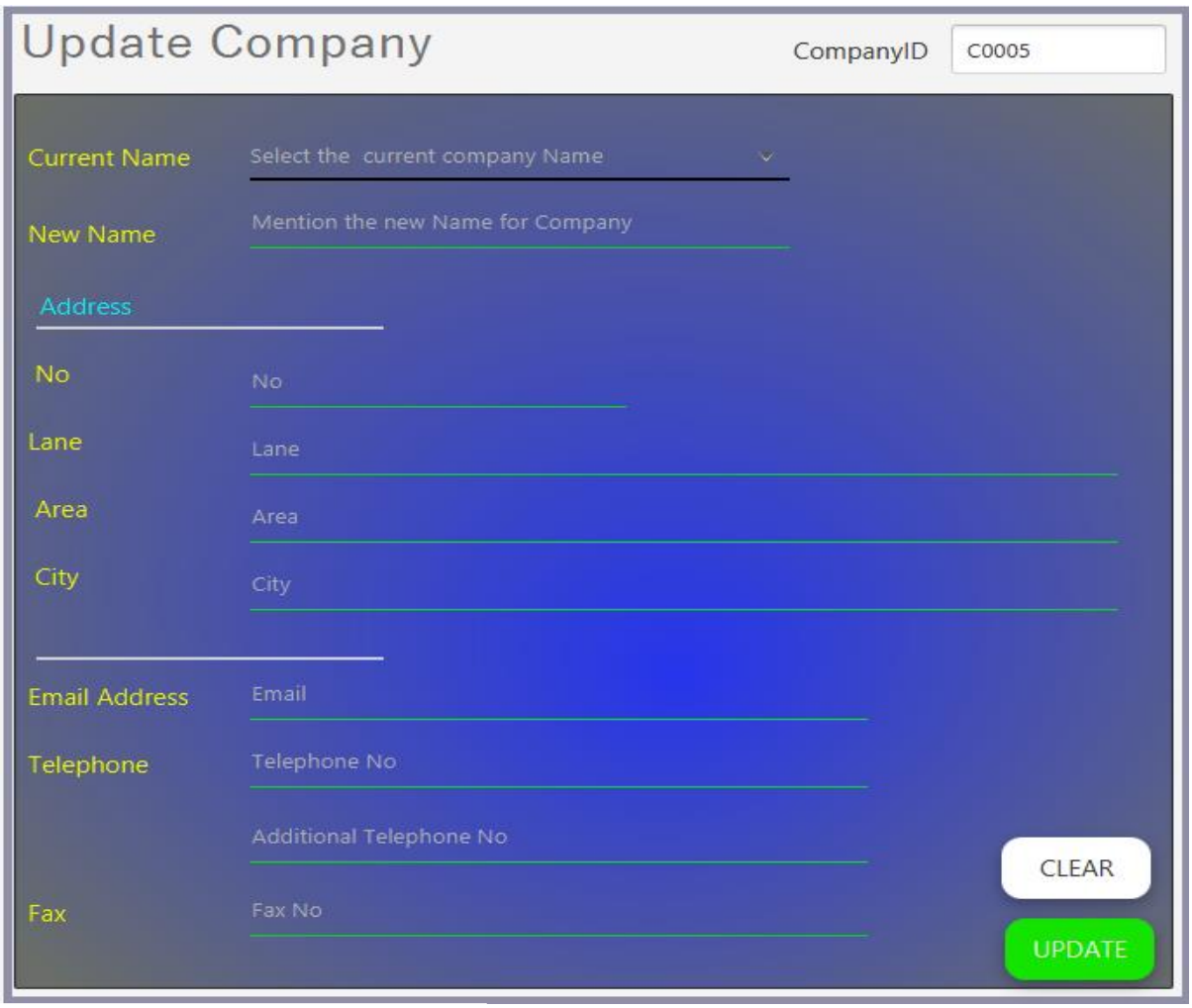


Figure 3.4.30: Update Company

Sometimes the dealing company details can be changed. That moment use this interface. The city field, fax no field and the additional telephone no field are not necessary to fill. If user CLICK the update button, the company is updated. If user CLICK the clear button, clear the whole interface. Remember, if you missed any field, an ERROR message is showed.

3.5 System Design

The system has a layered architecture. It can be divided as follows.

01. Database Layer
    - This layer stores actual data.
    - SQL database system was used to store data

02. Programming Layer
    - All the logics and methods were included in this layer.
    - Singleton, MVC, Factory, Dao patterns were included in this layer.

03. User Interfaces
    - User interacts with this layer.

When user works with this system interfaces act as the media for input details. Next it connects with the programming layer. Programming layer holds the logics and methods. Singleton, MVC, Factory, Dao design patterns were applied in this layer. In the MVC, the programming layer is divided. At the Factory, makes loosely couple and high cohesion through the divided parts. At the Dao, the database layer remove from the controller.

References.

References

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http://www.kompass.com
[Accessed 16 06 2017].