ANALYSIS DOCUMENT

FOR A

POINT OF SALES INFORMATION SYSTEM DEVELOPMENT PROJECT

REQUESTED BY

MR SALAD

COMPILED BY:

Group 10 - "Leaf Green IT Solutions"

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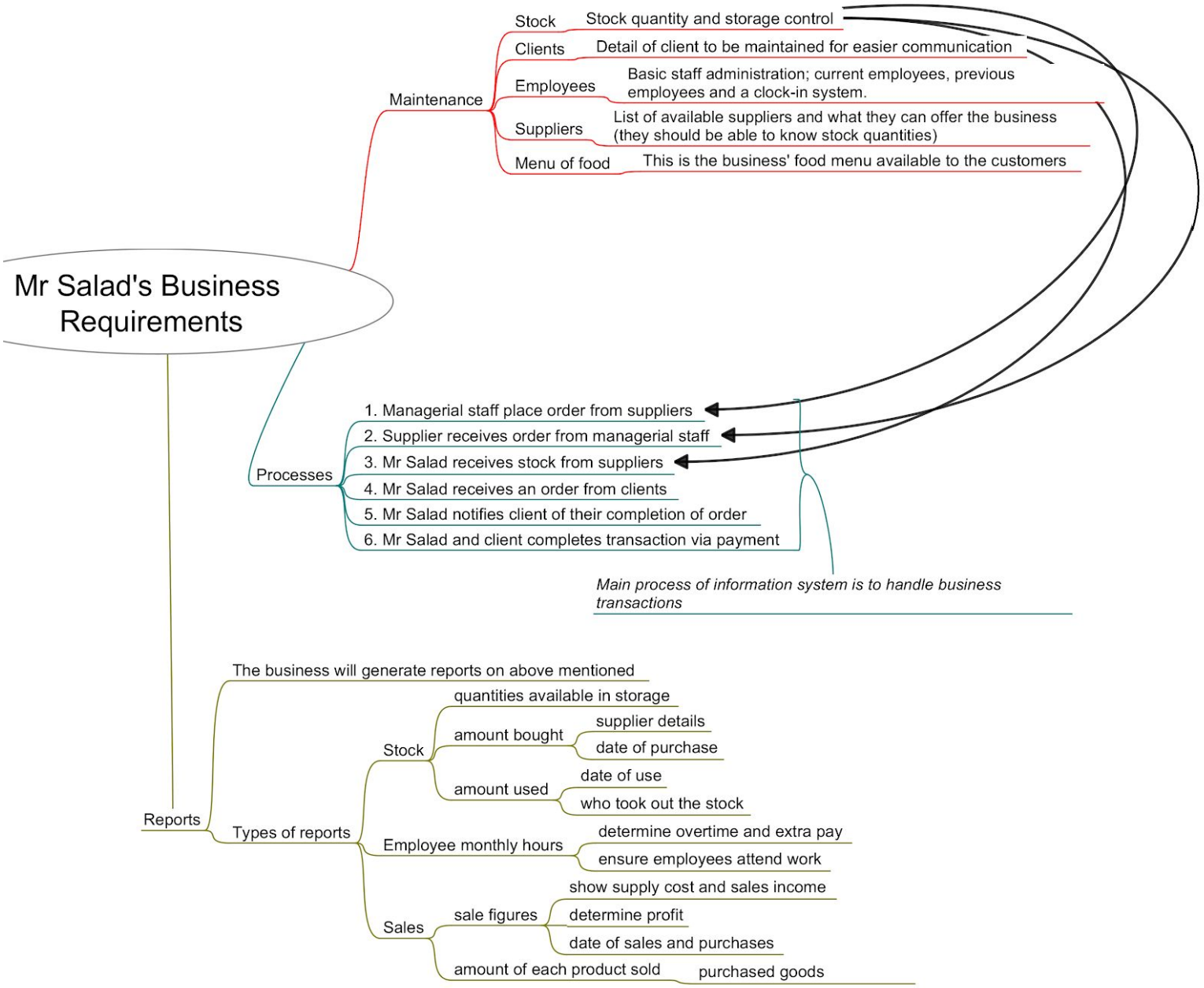
I SCOPE

The business deals with the sales of baked goods, homemade meals and platters for events. Mr. Salad's owner has requested for six months of analogue information of business to be transferred to the new information system for fluent integration. The information system will aim to provide the following business requirements in regards to their services provided to the consumer:



DETAILED BUSINESS REQUIREMENTS

MAINTENANCE:

- Stock management
    - The addition and removal of stock, based on customer sales and stock orders.
- Client management
    - Details regarding client contact information, as well as previous purchase orders.
- Employees
    - Clock-in system for staff.
    - Current staff in service details.
    - Previous staff details.
- Suppliers
    - Supplier details.
    - Supplier stock costs.
- Product
    - Keeping current ordering menu updated and available to consumer.

BUSINESS PROCESSES - TRANSACTIONAL ORIENTED:

- Ordering of stock.
    - Transaction between business and supplier recorded.
- Receiving of stock.
    - Updating stock amounts.
- Receiving order from client.
    - Updating stock amounts.
- Notifying client of finished order.
- Completing the transaction via payment.
    - Transaction between business and client recorded.

REPORTS GENERATED

- Stock
    - Realtime amounts after any sales or purchases.
    - Complete list of transactions occurred for stock within a certain time period (day, week, month and year).
- Staff
    - Monthly hours per staff member.
    - Wage calculation in terms of hours worked.
- Sales
    - Complete list of transactions occurred within a certain time period (day, week, month and year).

A PROJECT DESCRIPTION

The project will consist of the creating and maintaining a digital inventory of Mr Salad's stock. Managing human resources by producing hours, salary and bonus reports, based on the clock in system we are going to implement. The information system will produce financial reports based on business transactions. The above mentioned functions will improve business performance. According to our estimates the project will be completed within a year covering system initiation, analysis, design and implementation.

B DEFINITIONS AND ABBREVIATIONS

- An information system (IS) - "is an arrangement of people, data, processes, and information technology that interact to collect, process, store, and provide as output the information needed to support an organization".
- A transaction processing system (TPS) - "is an information system that captures and processes data about business transactions".
- Data – "raw facts about people, places, events, and things that are of importance in an organization".
- Information – "data that has been processed or reorganized into a more meaningful form for someone".
- Business Processes – "Tasks that respond to business events (e.g., an order). Business processes are the work, procedures, and rules required to complete the business tasks, independent of any information technology used to automate or support them".
- Waterfall development approach - "an approach to systems analysis and design that completes each phase one after another and only once".
- Computer-aided systems engineering (CASE) - "the domain of software tools used to design and implement applications".
- CASE repository – "system developers' database where developers can store system models, detailed descriptions and specifications, and other products of system development. Synonyms: dictionary and encyclopedia".
- PERT chart – "a graphical network model used to depict the interdependencies between a project's tasks".
- Gantt chart – "a bar chart used to depict project tasks against a calendar".
- Forward scheduling – "a project scheduling approach that establishes a project start date and then schedules forward from that date".
- System initiation - "the phase in system development in which the scope is defined and team hired".
- System analysis - "the process of studying a procedure or business in order to identify its goals and purposes and create systems and procedures that will achieve them in an efficient way".
- System design - "the process of defining the architecture, modules, interfaces, and data for a system to satisfy specified requirements".
- User input - "the input data which are provided by the user to the system".
- COTS - "a term that references non-developmental items (NDI) sold in the commercial marketplace and used or obtained through government contracts".
- GUI - "a graphical user interface is a human-computer interface (i.e., a way for humans to interact with computers) that uses windows, icons and menus and which can be manipulated by a mouse and/or keyboard".
- Encryption - "the process of converting information or data into a code, especially to prevent unauthorized access".

- FTP - “File Transfer Protocol is a standard Internet protocol for transmitting files between computers on the Internet over TCP/IP connections”.

II FUNCTIONAL REQUIREMENTS

A INPUTS, OUTPUTS AND PROCESSES

INPUTS	OUTPUTS	PROCESSING
User clocks in/out using a clocking system.	User’s hours are logged for security purposes and control in terms of finances.	The time and date of the login is stored in the database along with the logout time and date.
Administrative users can add new user to the system.	User is added to the system.	New user’s information gets added into the system’s database to allow the user access to the system.
Click login button.	An error message is shown that the information was incorrect or the user is logged into the system.	The user’s login information is compared to current values in the system and the user’s is then allowed or denied access.
Click logout button.	User is taken back to the homepage.	Current user is logged out of the system and returned to the homepage.
Click reports button.	Managerial user can select between different types of reports.	A new menu will be shown with new options about the different types of reports the user can choose from..
Click sales report.	Display all sales reports to the user.	User is taken to a page that shows relevant sales figures.
Click employee report.	User is shown a next interface that displays employee overtime, bonuses, work hours.	User is taken to a interface that displays data queried from the server.
Click inventory report.	User is shown quantities of stock available.	User is shown an interface that displays data queried from the server.

Click to add order	Client's order is placed and payment is given.	Creates a pay slip for the client. Stock values are updated.
Click to cancel order.	Current order is canceled. User is returned to the point of sales system.	Order list is cleared, no values will be changed. The user is taken back to the point of sales system.
Click uncompleted orders.	User is shown an interface that shows all orders currently being made.	System checks for orders that have been paced but not yet completed, these orders are then shown to the user.

B INTERFACE

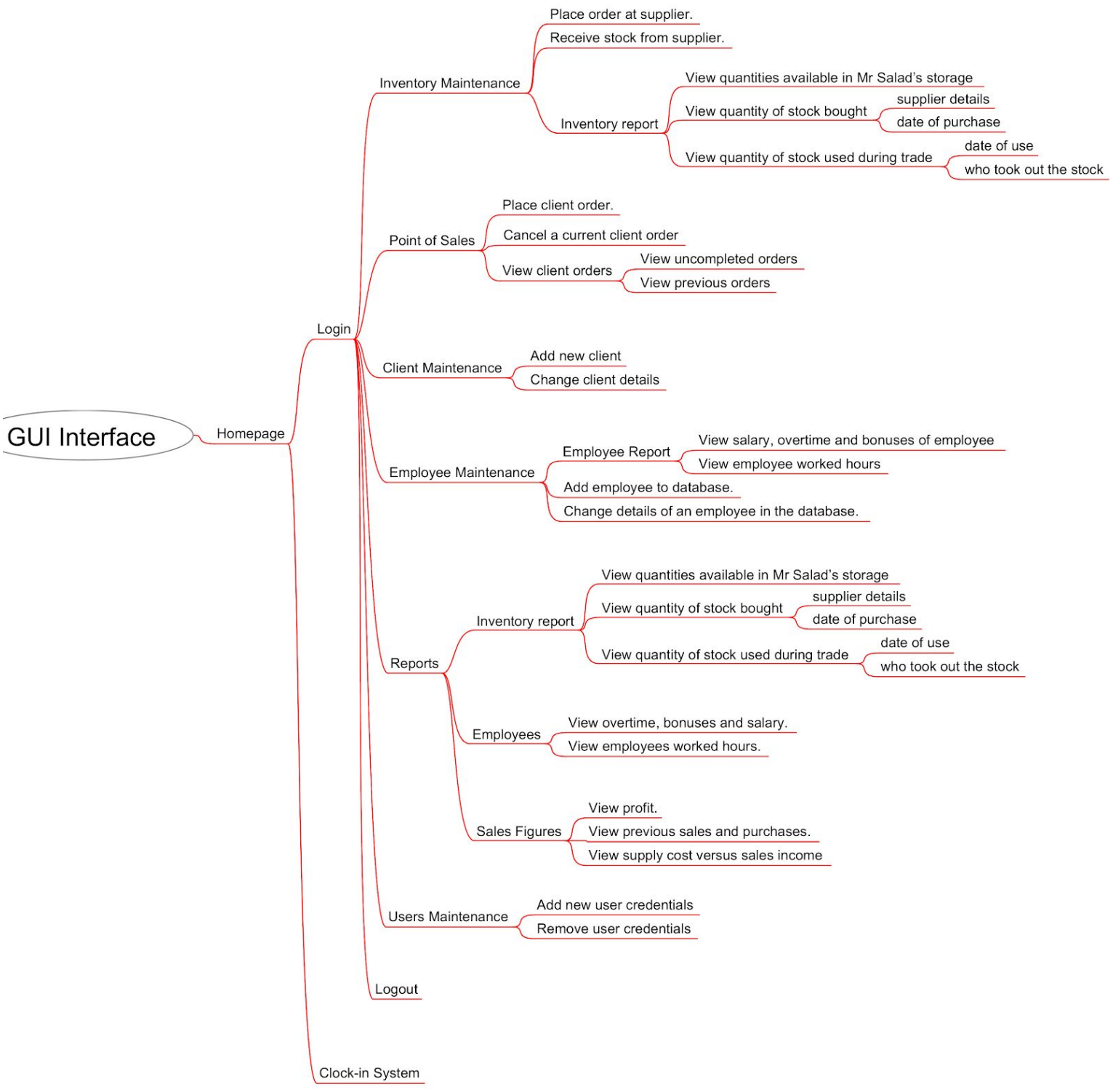


Figure 1: Interface Diagram

C DESCRIPTION OF THE INTERFACE

Homepage will consist of options to login (with their given credentials) or use the clock-in system, this ensures that all users can easily clock-in when they arrive at work and when they leave work.

When logged in users of the applications will have access to certain divisions depending on their user privileges, *administrative_user* (managerial staff), *financial_user* (point of sale staff) and *user* (all users):

1. Inventory Maintenance (*administrative_user*)
    a. Place order at supplier - this function allows the user to make and order to the supplier.
    b. Receive stock from supplier - this function allows the user to book newly received stock from
    c. supplier into system, this confirms that all items were received.
    d. Inventory report
        i. View quantities available in Mr Salad's storage - this reports give an overview of available inventory in Mr Salad's storage.
        ii. View quantity of stock bought - this reports previous and awaiting stock purchased from suppliers.
        iii. View quantity of stock used during trade - this reports an overview of stock used during trade (figures are retrieved from sales).
2. Point of Sales (*administrative_user* and *financial_user*)
    a. Place client order - this allows for an order by clients to be placed into system.
    b. Cancel a current client order - this allows for selected order by client to be canceled.
    c. View client orders - this allows users to view all current orders that need to be finished.
3. Client Maintenance (*administrative_user* and *financial_user*)
    a. Add new client - this allows for user to add new client, with their details.
    b. Change client details - this allows for the user to update/change a current selected client's details.
4. Employee Maintenance (*administrative_user*)
    a. Employee report
        i. View salary, overtime and bonuses of employee - this allows user to view selected employee's salary, overtime and bonuses of employee.
        ii. View employee worked hours - this allows user to view selected employees worked hours.
    b. Add employee to the database - this allows new employee to be added to the system.
    c. Change details of an employee in the database - functionality to change/update an employee's details whom is registered on the system.
5. Reports (*administrative_user*)
    a. Inventory
        i. View quantities available in storage - this reports give an overview of available inventory in Mr Salad's storage.
        ii. View quantity of stock bought - this reports previous and awaiting stock purchased from suppliers.
        iii. View quantity of stock used during trade - this reports overview of stock used during trade (figures are retrieved from sales).

   b. Employees
      i. View salary, overtime and bonuses of employee - provide cost of an selected employee in terms of worked hours.
      ii. View employee worked hours - This provides overview of an selected employee worked hours for a selected time period.
   c. Sales Figures
      i. View profit - provides overview profit (based on supplies and human resources) over a selected period of time.
      ii. View previous sales and purchases - provides report to view sales and purchases made based on user's selected time period.
      iii. View supply cost versus sales income - this provides an overview of supply expenses vs sales income of a selected period of time.
6. User Maintenance (*administrative_user*)
   a. Add new user credentials - add new authorised user to access the system and set their privileges.
   b. Remove user credentials - remove registered credentials on the system.
7. Logout - this allows current signed-in user to logout of the system, to make system available to another user.

III NON-FUNCTIONAL REQUIREMENTS

PERFORMANCE	The system we are going to implement for Mr. Salad needs to meet certain requirements, closely follow the schedule we have created and deliver the outputs we have specified. The success of the system will be measured by these above mentioned components. The success of the performance component will be determined by: ● The Visual Studio code executing without errors and runs smoothly without mistakes. ● Using GitHub as a CASE repository for versioning/quality control as well as making it the central system for all the project data. ● Backing up our data so that we can access the System easily to make improvements upon. ● Performance checking by us as well as by a third party professional, that is objective, to maintain and upgrade the level of performance.
USABILITY	We have closely been in contact with the system owner to ensure that the system will meet all requirements as specified by the system users and owner. This ensures that when the system is implemented into the business there weren't any misunderstandings regarding the inputs, outputs and how the system should function. This will ultimately ensure that the users utilize the system and that they don't decide that the system we have created doesn't fulfill their needs and end up scraping it. The success of this non-functional requirement depends on: ● Our system being user friendly.

	● Easy to understand. ● Able to integrate seamlessly with existing business processes.
SECURITY	The proposed system we are going to create for Mr. Salad will have additional security features to monitor who is allowed to gain access to certain parts of the implemented system, store data in a secure location and format as well as have secure communication channels for our data. ● The reports delivered by our system will be printed out monthly and be stored as hard copies for up to 5 years. This ensures that if system failure occurs the digital data is backed up. ● The digital data will also be backed up on GitHub as mentioned in the performance non-functional component. ● The system will be accessible by all users but only managerial staff will be permitted to see the financial,stock and employee reports. The level of access is determined by the users login details and this then forms part of our functional requirements.
CONCURRENCY AND COMPATIBILITY	The system will be able to handle multiple computations executing simultaneously as well as the following: ● The system will have a maximum amount of 50 users that can be added into the system. If the owner then wish to add more than 50 users they would have to consult with us again seeing as our system won't register more than 50 users. ● There won't be a maximum amount of clients or suppliers that can be added. ● System will be able to support a database of an 100GB.
RELIABILITY	1. Notice about system transactions and processes 2. System log implemented to see what user issues commands. 3. Trustful network; local and not exposed to internet.
MAINTAINABILITY	The system will be running for a long time therefore it will regularly need preventative and corrective actions. These actions will be maintained by us for up to a year after the system has been implemented. After the trial period we will continue to work with Mr Salad to improve the system functionality and features through versioning. ● Before the system is implemented we will thoroughly test each components of our system by entering a diverse range of data. ● We will also manually test our exception handling for when data has been entered incorrectly.

DOCUMENTATION	We followed the FAST methodology to document the different levels of our system design and analysis. We started the project by first documenting the project proposal then our requirements, according to requirements definition report, and lastly documenting our analysis. These different parts will all be brought together when we deliver our presentation on the system we plan on implementing for Mr Salad.

IV USE-CASE

A USE-CASE GLOSSARY

#	NAME	DESCRIPTION	PRIMARY ACTOR	SCOPE	PRIORITY	IMPLEMEN-TATION COMPLEXITY
UCS-001	Place order at supplier.	An order is placed by Mr Salad at the supplier.	Managerial Staff	In	High	Intermediate
UCS-002	Receive stock from supplier.	Mr Salad receives the stock ordered at the supplier	Managerial Staff	In	High	Beginner
UCS-003	View quantities available in Mr Salad’s storage.	This describes the quantity of stock available in storage.	Managerial Staff	In	High	Intermediate
UCS-004	View quantity of stock bought.	This describes the quantity of stock purchased from the supplier.	Managerial Staff	In	Medium	Beginner
UCS-005	View quantity of stock used during trade.	This describes the amount of the stock that has been used.	Managerial Staff	In	Medium	Advanced
UCS-006	Place client order	The order of the client is placed and preparation can start. If the client does not have a profile, then a new profile for the client is created.	POS Staff	In	High	Beginner
UCS-007	Cancel a current client order	This cancel the current order of the client	POS Staff	-	Medium	Intermediate
UCS	View uncompleted	All uncompleted orders	POS Staff	-	High	Beginner

-008	orders	can be viewed. It shows the current progress of the order.				
UCS -009	View previous orders	All previous orders can be viewed.	POS Staff	-	Low	Intermediate
UCS -010	Add Client Details	A new client profile can be created or the details of current clients can be changed.	POS Staff	-	Medium	Beginner
UCS -011	Remove/Change Client Details	Details of the client can be removed. Current client profiles can also be removed.	POS Staff	-	Low	Intermediate
UCS -012	View Overtime, Bonuses and Salary	Overtime pay, bonuses and salaries are calculated according to the amount of hours worked. View all overtime.	Managerial Staff	In	Medium	Intermediate
UCS -013	View employees worked hours	Overview of selected employee work hour are display according to time-frame selected.	Managerial Staff	In	Medium	Intermediate
UCS -014	Add Employee to Database	A new employee's details are added to the business database.	Managerial Staff	-	Medium	Beginner
UCS -015	Change Details of an Employee in Database	Details of current employees can be changed if needed.	Managerial Staff	-	Medium	Intermediate
UCS -016	View Profit	Overview of sales and profit are displayed according to selected time-frame.	Managerial Staff	In	Medium	Intermediate
UCS -017	View Previous Sales and Purchases	Overview of specified sales and to whom according user selection.	Managerial Staff	In	Medium	Advanced
UCS -018	View Supply Cost and Sales Income	Comparative overview of cost of supplies vs sales income is displayed according to	Managerial Staff	In	Medium	Advanced

		selected time-frame.				
UCS-019	Clock-in	All registered employees to clock-in, when they arrive and leave work. This is recorded on the system.	Everyone	-	Low	Beginner
UCS-020	Add Users Credentials	Add authorised user to login to system.	Managerial Staff	-	Low	Intermediate
UCS-021	Remove Users Credentials	Remove previous authorised from system.	Managerial Staff	-	Low	Advanced

B HIGH-LEVEL USE-CASE NARRATIVES

1 ADD CLIENT DETAILS

Author(s): Coenraad Human *Date: 2018/04/20*
Version: 1

Use-Case Name:	Add Client Details	Use-Case Type Business Requirements:
Use-Case ID:	UCS-014	
Priority:	Medium	
Source:	Requirement	
Primary Business Actor:	Client	
Other Participating Actors:	POS Staff	
Other Interested Stakeholders:	Managerial Staff - Interested in activity in order to plan new promotions. Managerial Staff - Interested in activity for possible future income.	
Description:	This use case describes the event of a new client submitting an order at the store for one of the menu items. This new client's information is saved for future use by the store and to optimize the efficiency of the store. Once the order is completed this information is used to inform the client of completion of the order. When client comes to receive the order in store, this information will be used to reference order to client and complete the transaction.	

2 CHANGE DETAILS OF AN EMPLOYEE IN DATABASE

Author(s): Corne Kooij *Date: 2018/04/20*
Version: 1

Use-Case Name:	Change Details of an Employee in Database	Use-Case Type: Business Requirements:
Use-Case ID:	UCS--015	
Priority:	Medium	
Source:	Requirement	
Primary Business Actor:	Employee	
Other Participating Actors:	Managerial Staff	
Other Interested Stakeholders:	Managerial Staff - Interested in correct employee information.	
Description:	The managerial staff corrects or changes the current information on a certain employee in the system to ensure that any/all employee's stored information is correct. This will ensure that administrative errors are kept to a minimum to any tasks related to employee details.	

III MODELS

A CONTEXT DATA MODEL

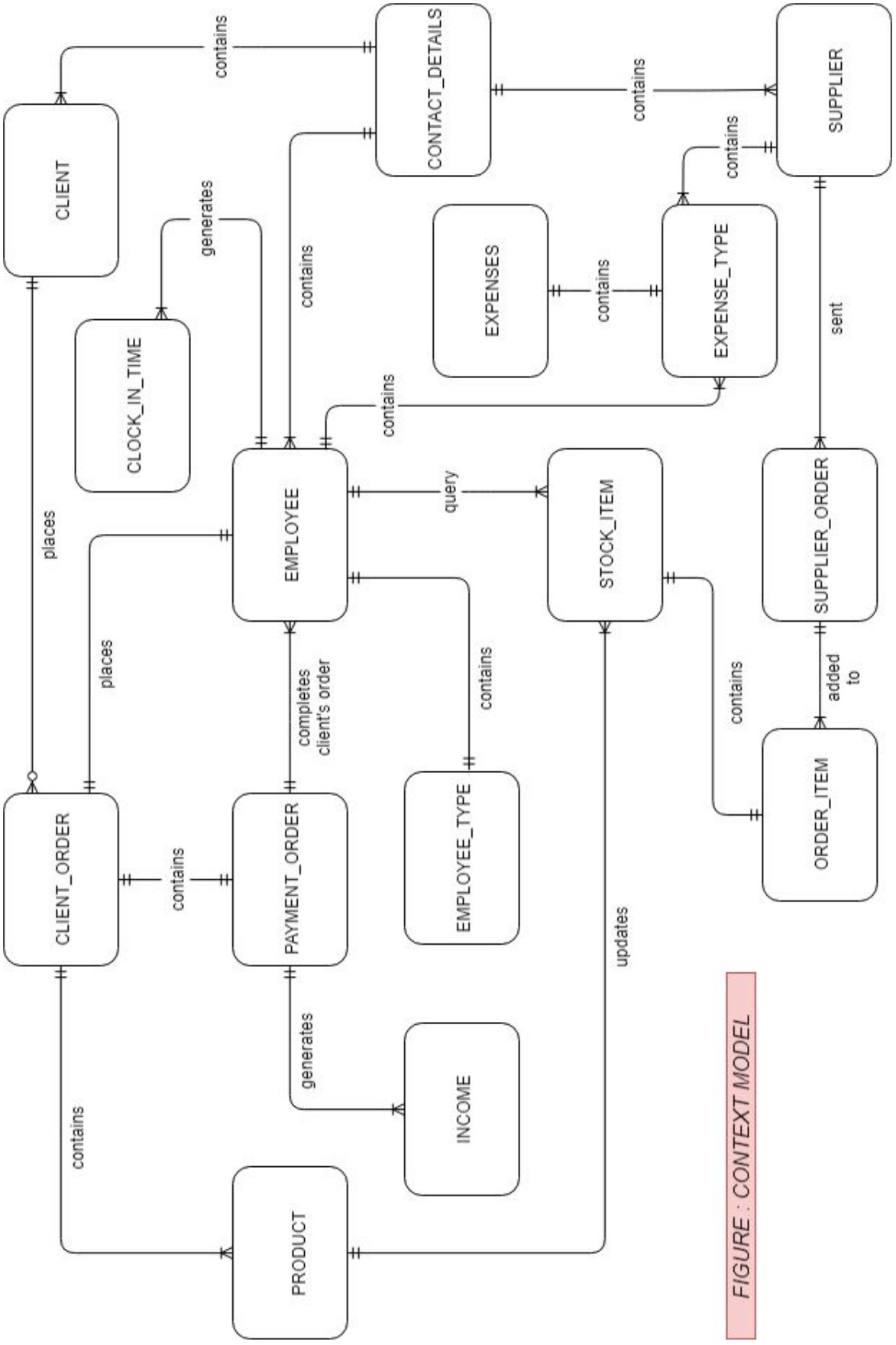


FIGURE : CONTEXT MODEL

B KEY BASED DATA MODEL

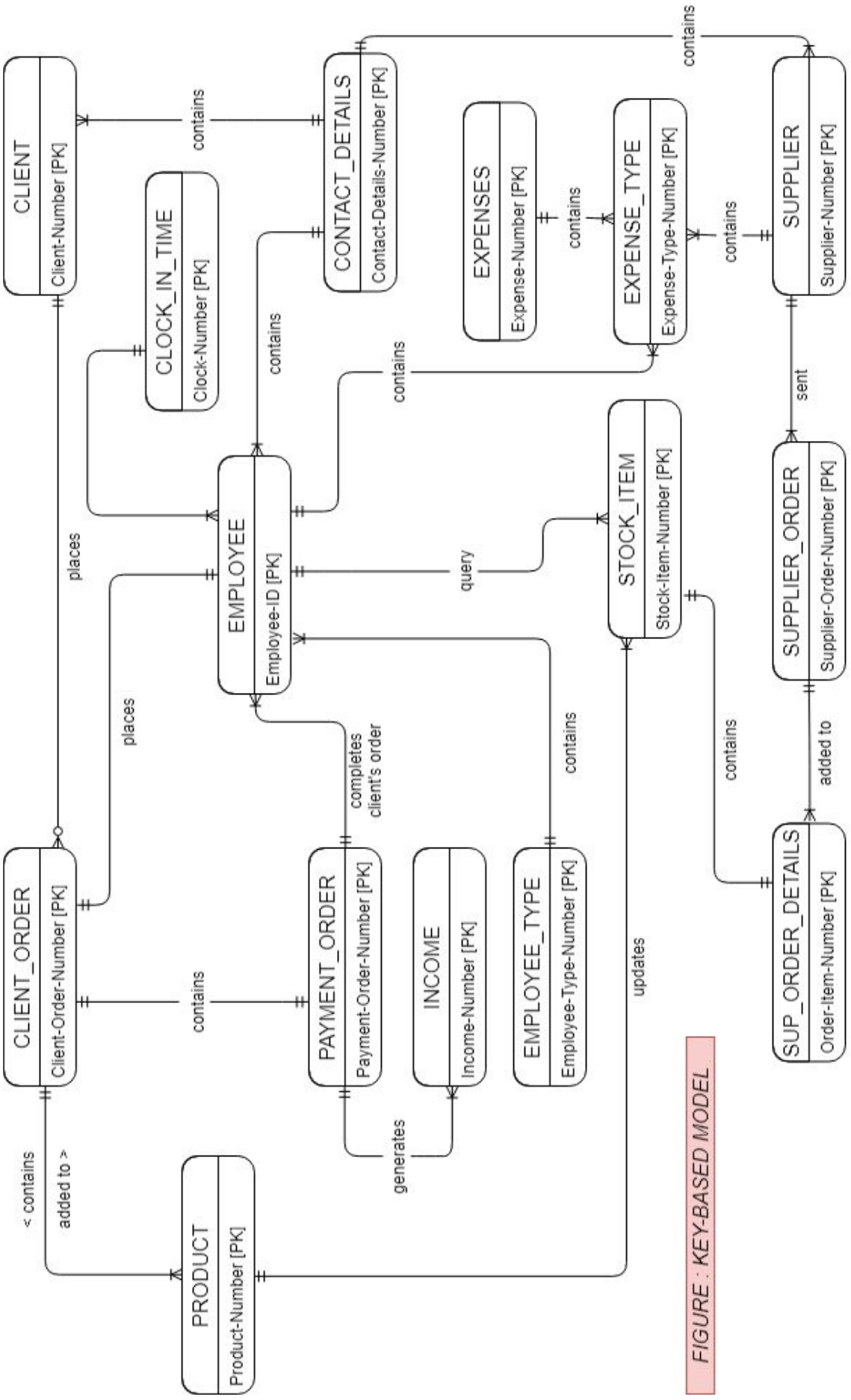


FIGURE : KEY-BASED MODEL

C FULLY ATTRIBUTED DATA MODEL

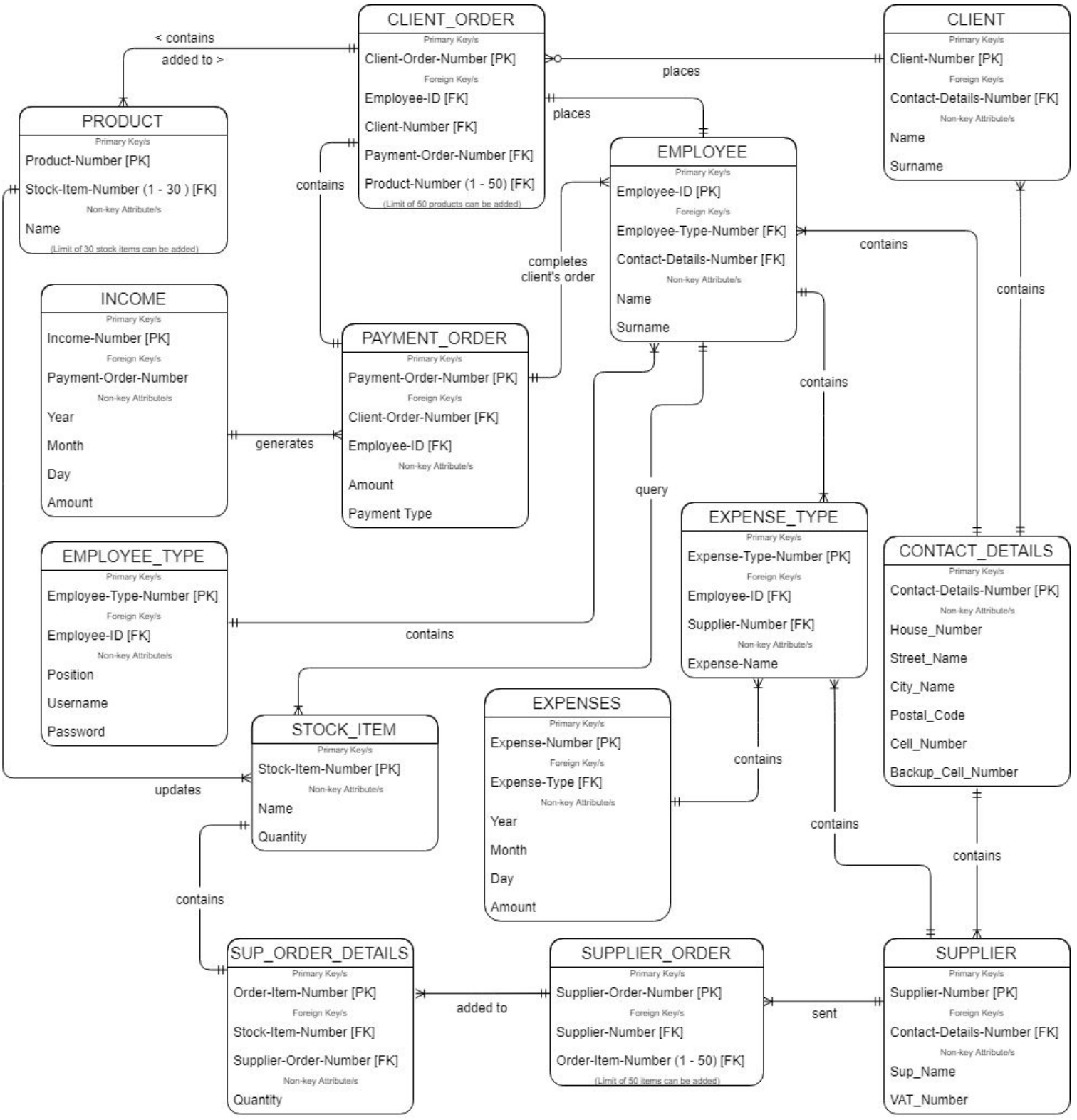


FIGURE : FULLY ATTRIBUTED DATA MODEL

VI CRUD MATRIX

Location / Entity .Attribute	Employee (Point of Sales)	Employee (Administrator / Managerial)	Employee
CLIENT			
.Name	CRU	CRU	X
.Contact-Details-Number	R	R	X
.Client-Number	CRU	CRU	X
.Surname	CRU	CRU	X
CONTACT_DETAILS			
.Contact-Details-Number	X	R	X
.House-Number	SCRU	SCRU	S
.Street-Name	SCRU	SCRU	S
.City-Name	SCRU	SCRU	S
.Postal-Code	SCRU	SCRU	S
.Cell-Number	SCRU	SCRU	S
.Backup-Cell-Number	SCRU	SCRU	S
CLIENT_ORDER			
.Client Order Number	CRU	CRU	X
.Employee	CRU	CRU	X
.Client-Number	CRU	CRU	X
.Payment-Order-Number	R	R	X
.Product-Number	CRU	CRU	X
SUPPLIER			
.Supplier-Number	X	CRUD	X

INDV = Individual ALL = ALL SS = Subset X = No Access
S = Submit C = Create R = Read U = Update D = Delete

.Contact-Details-Number	X	R	X
.Sup-Name	X	CRUD	X
.VAT-Number	X	CRUD	X
PRODUCT			
.Product-Number	CRU	CRU	X
.Stock-Item-Number	R	R	X
.Name	CRU	CRU	X
SUPPLIER_ORDER			
.Supplier-Order-Number	X	CRUD	X
.Supplier-Number	X	CRUD	X
.Order-Item_number	X	CRUD	X
PAYMENT_ORDER			
.Payment-Order-Number	R	R	X
.Client-Order-Number	R	R	X
.Employee-ID	SR	SR	X
.Amount	CRU	CRU	X
.Payment Type	CR	CR	X
SUP_ORDER_DETAILS			
.Order-Item-Number	R	R	X
.Stock-Item-Number	R	R	X
.Supplier-Order-Number	R	R	X
.Quantity	CRU	CRU	X
EMPLOYEE			
.Employee-ID	S	SRU	S
.Employee-Type-Number	X	CRU	X

INDV = Individual ALL = ALL SS = Subset X = No Access
S = Submit C = Create R = Read U = Update D = Delete

.Contact-Details-Number	X	R	X
.Name	S	SRU	S
.Surname	S	SRU	S
STOCK_ITEM			
.Stock-Item-Number	R	R	X
.Name	R	CRUD	X
.Quantity	R	CRUD	X
EMPLOYEE_TYPE			
.Employee-Type-Number	X	R	X
.Employee-ID	S	SRU	S
.Position	X	CRUD	X
.Username	X	CRUD	X
.Password	X	CRUD	X
.Hourly-Rate	X	CRU	X
INCOME			
.Income-Number	X	R	X
.Amount	S	CRU	X
.Payment-Order-Number	X	R	X
.Year	S	CRU	X
.Month	S	CRU	X
.Day	S	CRU	X
EXPENSES			
.Expense-Number	X	R	X
.Expense_Type	X	CRU	X
.Year	X	CRU	X

INDV = Individual ALL = ALL SS = Subset X = No Access
S = Submit C = Create R = Read U = Update D = Delete

.Month	X	CRU	X
.Day	X	CRU	X
.Amount	X	CRU	X
EXPENSE_TYPE			
.Expense-Type-Number	X	R	X
.Employee-ID	S	SCRU	X
.Supplier-Number	X	CRU	X
.Expense-Name	X	CRU	X
CLOCK_IN_TIME			
.Clock-Number	S	SRU	S
.Employee-ID	S	SRU	S
.Year	S	SRU	S
.Month	S	SRU	S
.Day	S	SRU	S
.Start-Time	S	SRU	S
.End-Time	S	SRU	S

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S = Submit C = Create R = Read U = Update D = Delete

VII PROCESS MODELS

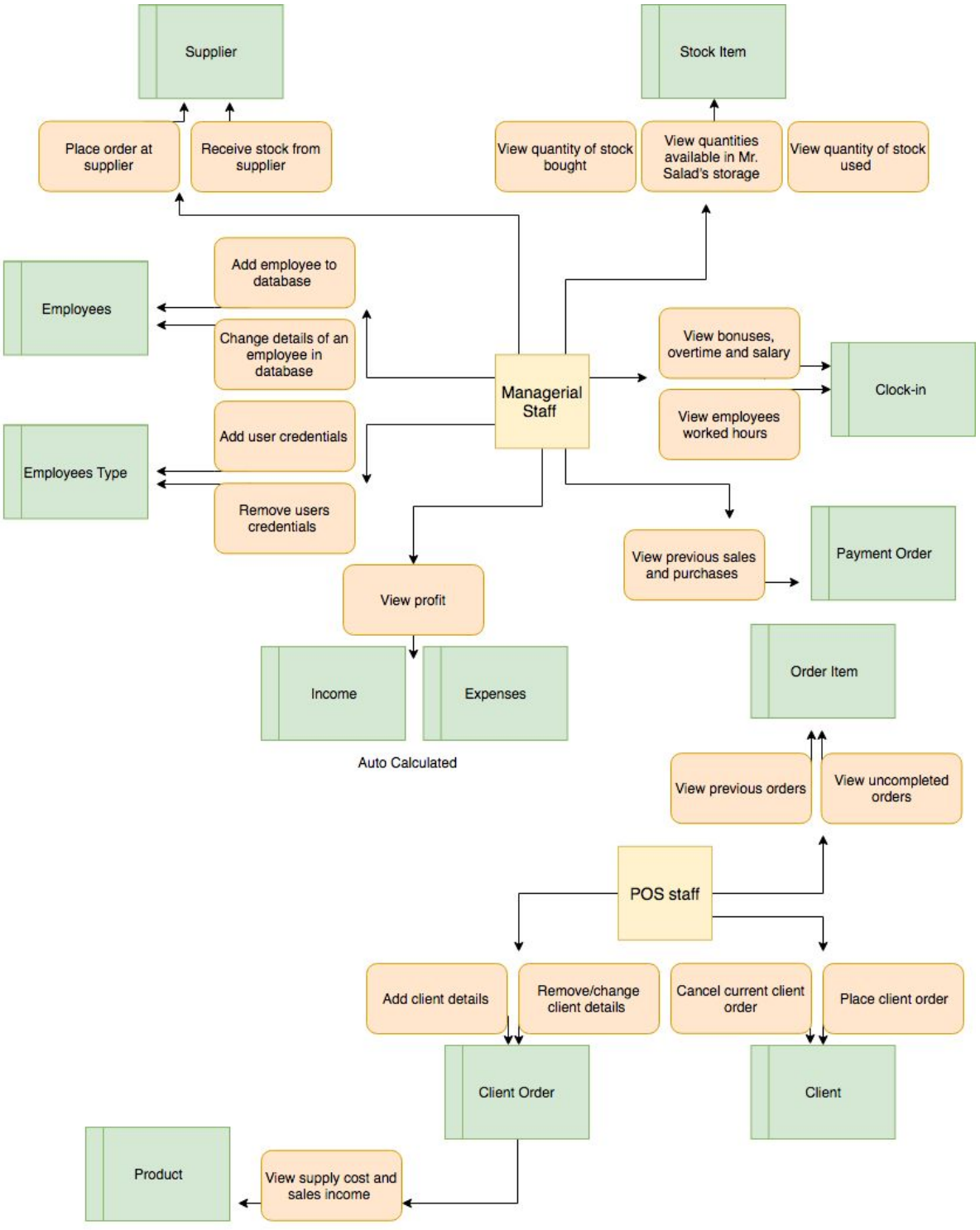

FIGURE : PROCESS MODEL

VIII PROTOTYPE EXAMPLES

A CLIENT DETAILS

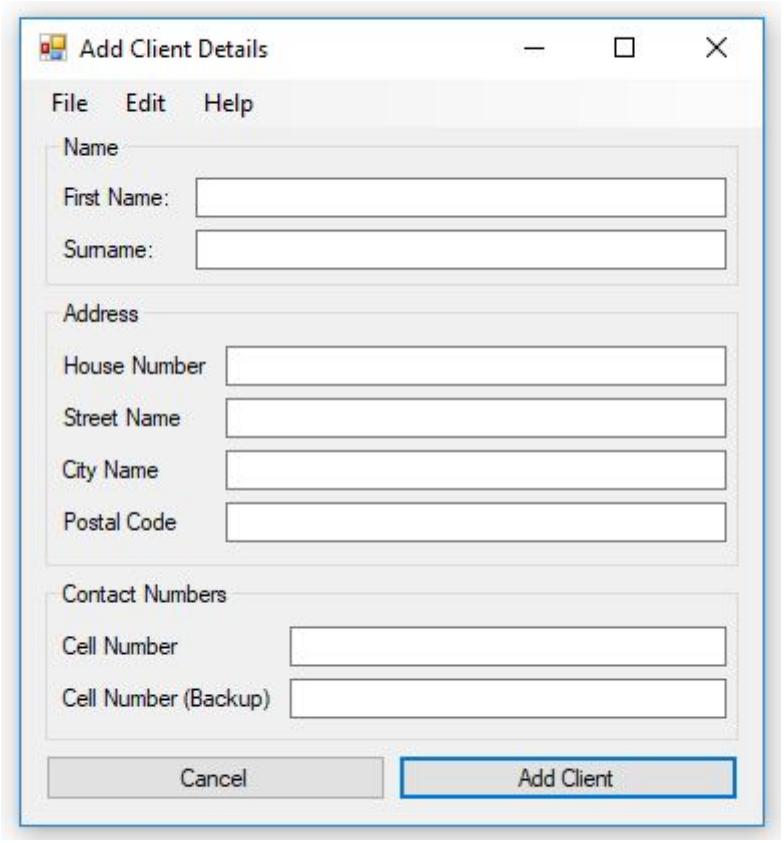

Figure 1: Add Client Details GUI

A new client is added to the systems database in the ‘Add Client Details’ form.

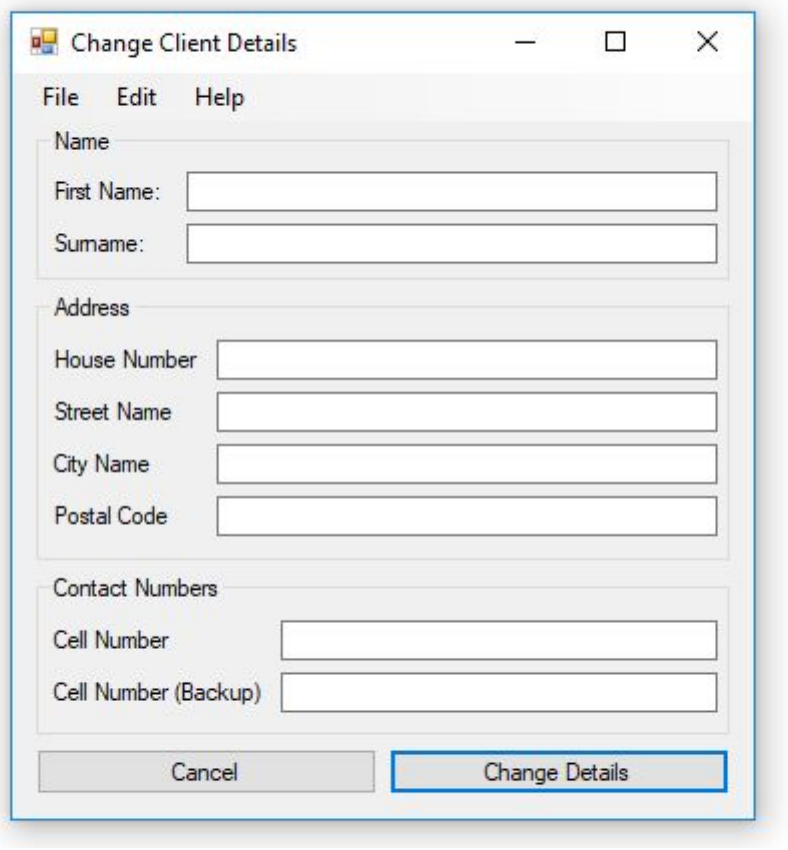

Figure 2: Main form to change client details graphic user interface

The ‘Change Client Details’ form is used when a user would like the change details of a client in existing database. All required fields need to be filled and then ‘Change Details’ button is clicked to update the database.

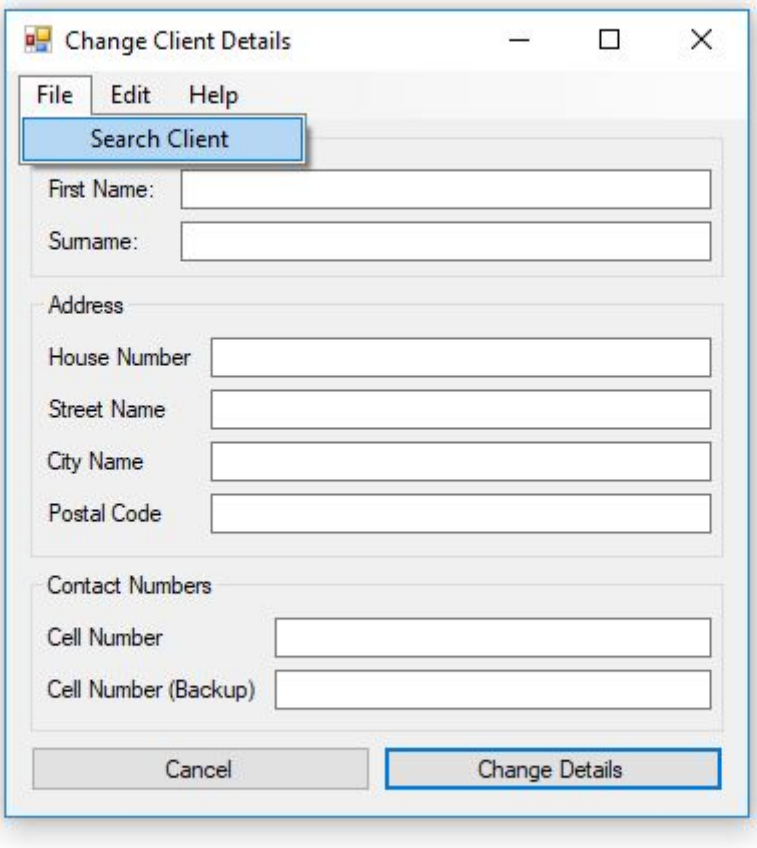

Figure 3 : Select client to be changed on the change client details form.

When ‘File’ and the ‘Search Client’ is selected in menu strip the user is taken to the ‘Search Client Details’ form.

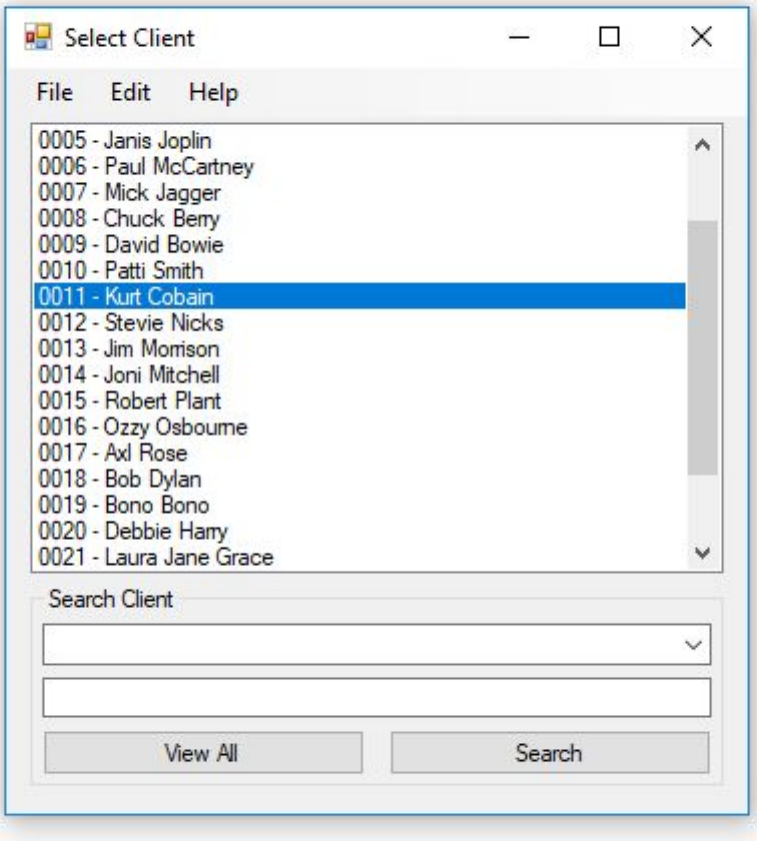

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Figure 4 : Main form to select client details to be changed (graphical user interface).

When you want to search for a specific name in the database you can start by entering the persons name in the ‘Search Client’ textbox, which should automatically filter the database so that only customers matching the criteria is displayed. When the search button is clicked after a person's name has been entered the program will also display all clients matching the criteria.

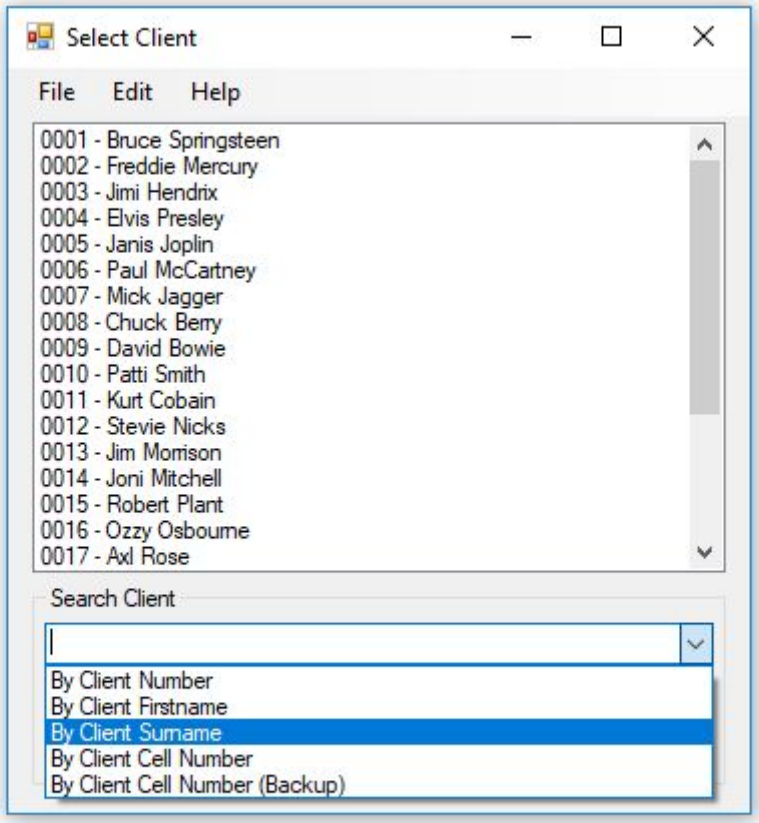

Figure 5 : Details that can be selected for search in select client details graphical user interface.

When selecting the ‘Search Client’ drop down box you as the user can decide according to what criteria you’d like to search through the database.

B STOCK ITEMS

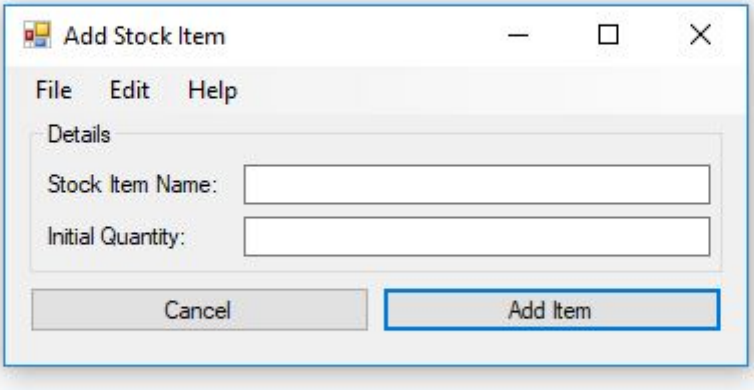

Figure 1 : Add stock main graphical user interface.

The ‘Add Stock Item’ form is used when the user would like the add an item to the database.

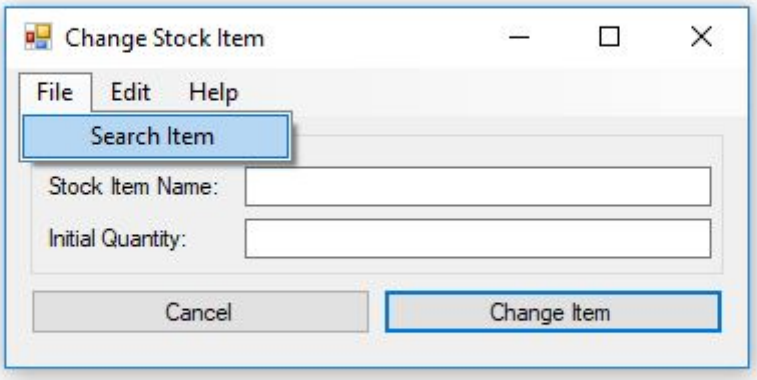

Figure 2: “Search Item” button that brings up a form to select item to be changed.

When ‘File’ and ‘Search Item’ is selected on the menu strip the user is taken to the ‘Search Item’ form.

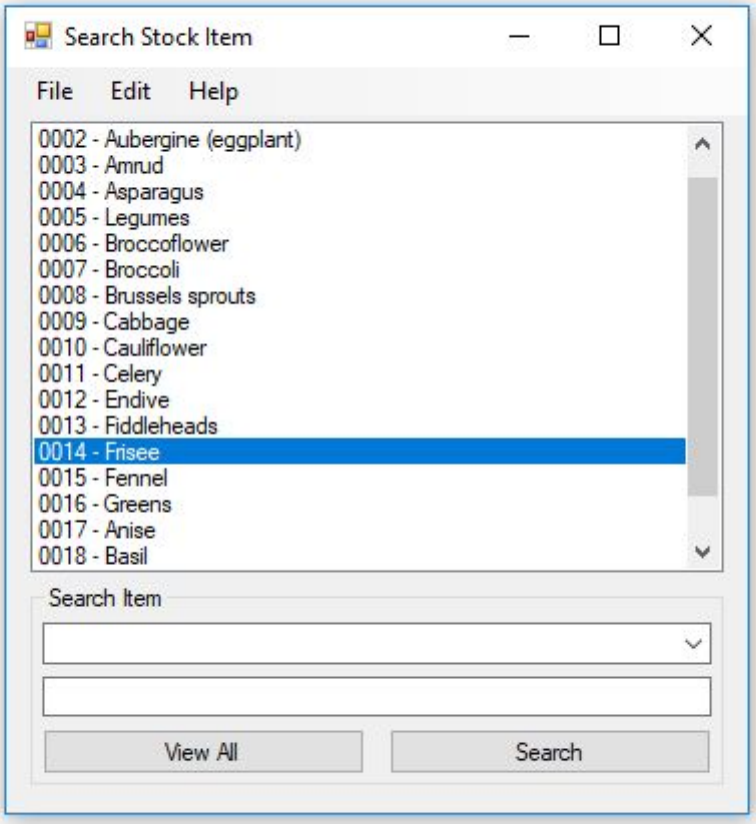

Figure 3: Main graphical user interface to select stock item to be changed.

The ‘Search Stock item’ form is called when user would like to look for a specific item in the database of the business. When the ‘View All’ button is clicked all data in database is displayed and when the ‘Search’ button is clicked only items meeting criteria entered into the textbox is displayed.

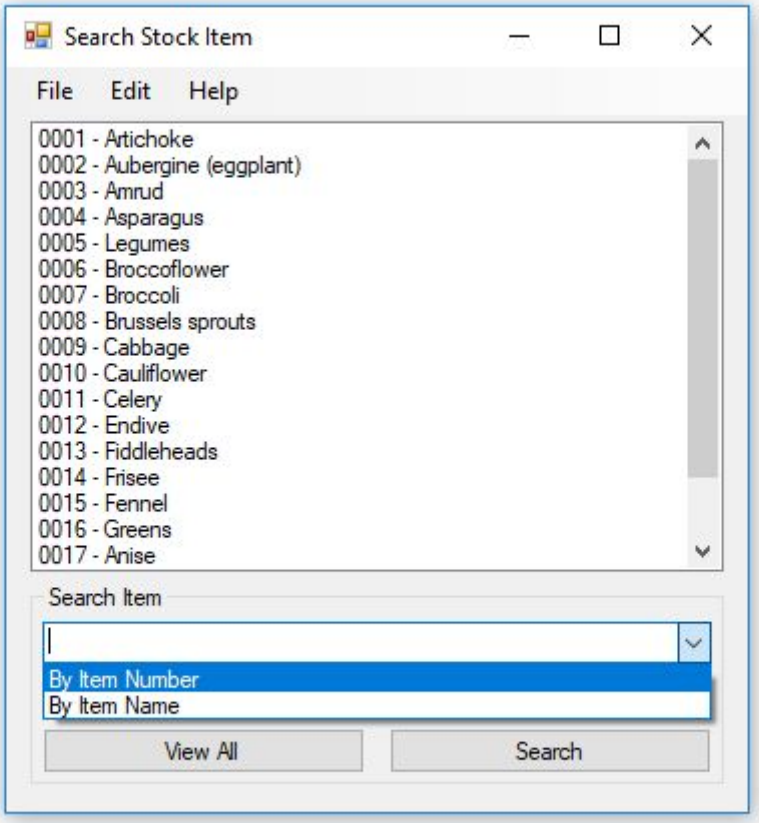

Figure 4: Details that can be selected for search in search graphical user interface.

When the ‘Search Item’ drop down list is selected the user can specify how they’d like to order the database.

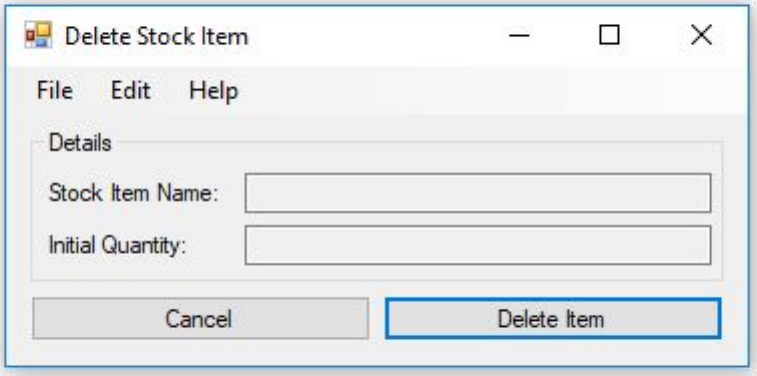

Figure 5 : Main graphical user interface for deleting a stock item.

The ‘Delete Stock Item’ form is used when the user would like to remove an item from the stock database.

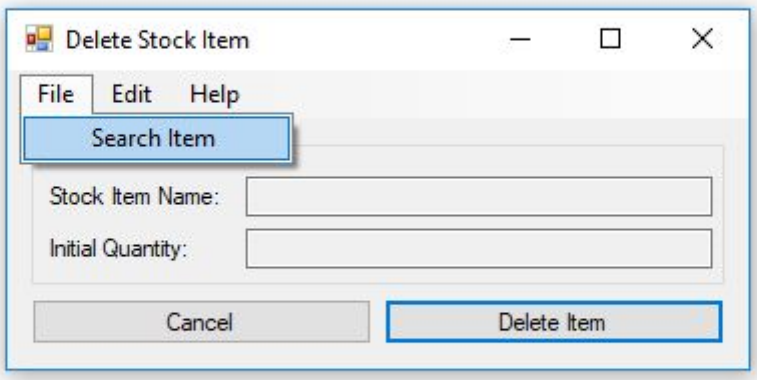

Figure 6: “Search Item” button that brings up a form to select item to be deleted.

When ‘File’ and ‘Search Item’ is selected on the menu strip the user is taken to the ‘Search Item’ form.

Thereafter previous graphical user interfaces are brought up shown in figure 3 and 4 to select the item to be deleted.