PROPOSAL

FOR A

POINT OF SALES INFORMATION SYSTEM DEVELOPMENT PROJECT

REQUESTED BY

MR SALAD

COMPILED BY:

Group 10 - "Leaf Green IT Solutions"

COENRAAD HUMAN	28410629
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DATE : 29TH MARCH 2018

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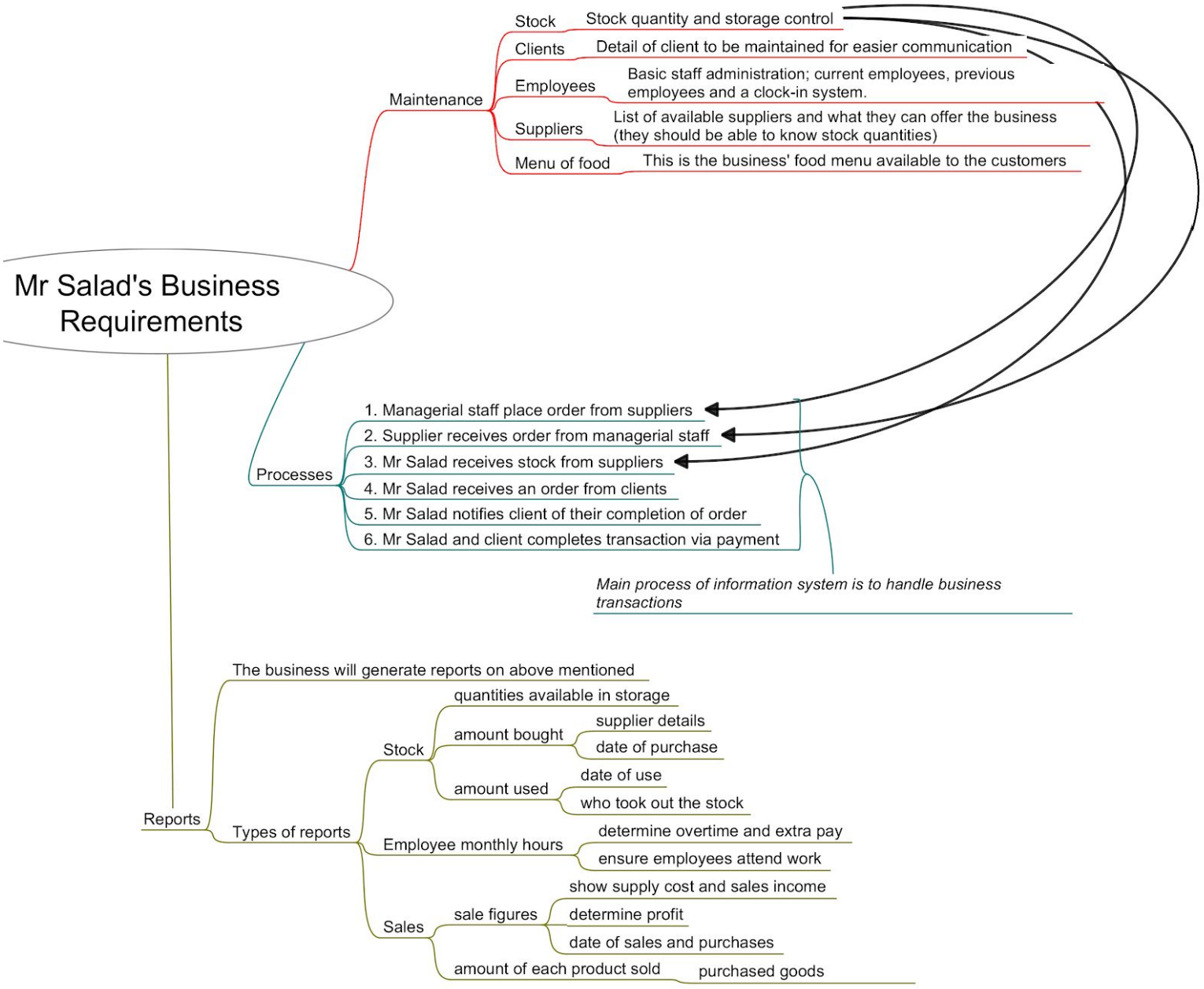
I SCOPE

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.

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

A PERFORMANCE, USABILITY, SECURITY, CONCURRENCY AND COMPATIBILITY, RELIABILITY, MAINTAINABILITY AND DOCUMENTATION

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.
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 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?) 3. Trustfull protocols -what are our protocol
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. ● what examples are there for preventative and corrective actions? ● 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 (what the hell did we follow to document this -_-) 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 CANDIDATE SYSTEM MATRIX

Characteristics	*Candidate 1*	*Candidate 2*	*Candidate 3*
Portion of System Computerised	Partial computerising of Mr Salad Business processes. Limited to supplier features.	New in-house application using C#, computerising large portion of Mr Salad Business processes. Local server hosting Microsoft Access database.	Since the system is analog, very little will be actually computerised.
Benefits	Simple and easy to use since it has in-depth support, furthermore it only needs to be installed and configured. A lot of time is saved.	Fully supports client's needs and specifications.	Minimal adjustments for the users, since it is merely an extension of the current system.

Servers and Workstations	Use existing hardware, though recommended requirements of COTS software will have to be met. Hardware will need upgrades. Local server will be required for COTS software.	Local installed server for central database for all users. Current workstation will suffice hardware requirements for in-house application.	Due to the nature of the analog system no servers are needed and the number of workstations are minimal.
Software Tools Needed	N/A since it is part of the pre-installed application.	Microsoft Access for database management. Microsoft Visual Studio for C# development.	Virtually none.
Application Software	Package solution and custom add-on software.	Custom solution; in-house development application.	Virtually none.
Method of Data Processing	FTP over local network.	FTP over online network; installed software/ offline server.	Analogue; paper-based.
Storage Devices and Implications	Reliable network hardware to server and workstation. Hard disk drive are not reliable storage. Will need array based server, which increases costs. Business will need service provider or trained staff to maintain server.	Microsoft Access Database with 100GB storage capability (subject to change based on client's workload).	Analogue storage system; paper-based.

V FEASIBILITY ANALYSIS MATRIX

Feasibility Criteria	*Weight*	*Candidate 1*	*Candidate 2*	*Candidate 3*
Description		Purchase an existing system.	Write a new in-house application using C# and Microsoft Office Access for a database.	Improve the current system to fit the user's needs.
Operational Feasibility	15%	Lack of integrated features. Does not fulfill complete business' requirements. Score: 65	Fully supports user-required functionality. Score: 100	Due to the manual system and lack of technical and real-time information system this could pose as a problem. Score: 100
Cultural Feasibility	15%	Same as candidate 2, however since the program is commercial it should have better documentation for training purposes. Score: 85	Users could possibly find the new system challenging and frustrating to learn and deal with. Score: 80	Users may find the existing system to be slow and ineffective. Score: 90
Technical Feasibility	30%	Purchased system will only be more suited by making add-on for the software. This requires constant development as updates are released and will cause unwanted down-time within the system (risk in loss of profit). Score: 70	Proposed solution requires coding an application in C# (.Net). The technical staff has extensive background in C# (.Net), due to its popularity for GUI based applications, external resources are widely available . Score: 95	The current users of the are comfortable and knowledgeable with the existing system, however management is concerned about the current analogue system in terms of flexibility to grow and adapt to possible business expansion. Score: 85

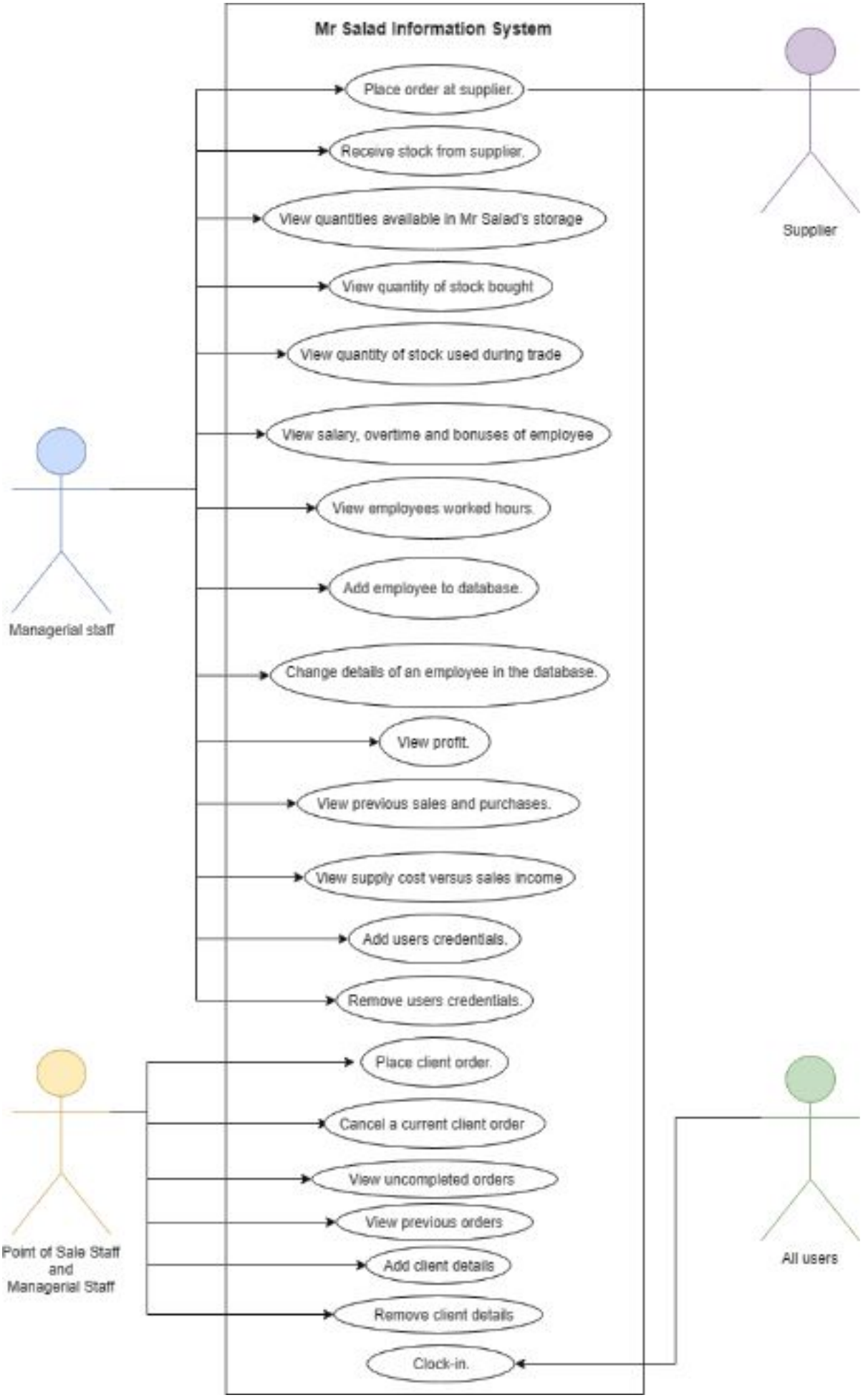
Economic Feasibility Payback: Net Present Value: Detailed Calculations:	20%	After the second year R7400 See attachment A Score: 80	After the first year R7500 See attachment A Score: 85	After the first year R3900 See attachment A Score: 65
Schedule Feasibility	10%	Less than 4 months. Score: 85	5-12 months. Score: 65	5 months. Score: 75
Legal Feasibility	10%	No foreseeable problems. Score: 100	No foreseeable problems. Score: 100	No foreseeable problems. Score: 100
Weighted Score	*100%*	*78*	*89*	*84.5*

VI USE-CASE GLOSSARY

USE-CASE NAME	*USE-CASE DESCRIPTION*	*PARTICIPATING ACTORS AND ROLES*
Place order at supplier.	An order is placed by Mr Salad at the supplier.	Administrators (Managerial staff)
Receive stock from supplier.	Mr Salad receives the stock ordered at the supplier	Administrators (Managerial staff)
View quantities available in Mr Salad's storage.	This describes the quantity of stock available in storage.	Administrators (Managerial staff)
View quantity of stock bought.	This describes the quantity of stock purchased from the supplier.	Administrators (Managerial staff)
View quantity of stock used during trade.	This describes the amount of the stock that has been used.,	Administrators (Managerial staff)
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.	Administrators (Managerial staff) POS Staff
Cancel a current client order	This cancel the current order of the client	Administrators (Managerial staff) POS Staff

View uncompleted orders	All uncompleted orders can be viewed. It shows the current progress of the order.	Administrators (Managerial staff) POS Staff
View previous orders	All previous orders can be viewed.	Administrators (Managerial staff) POS Staff
Add client details	A new client profile can be created or the details of current clients can be changed.	Administrators (Managerial staff) POS Staff
Remove client details	Details of the client can be removed. Current client profiles can also be removed.	Administrators (Managerial staff) POS Staff
View overtime, bonuses and salary.	Overtime pay, bonuses and salaries are calculated according to the amount of hours worked. View all overtime.	Administrators (Managerial staff)
View employees worked hours.	Overview of selected employee work hour are display according to time-frame selected.	Administrators (Managerial staff)
Add employee to database.	A new employee's details are added to the business database.	Administrators (Managerial staff)
Change details of an employee in database.	Details of current employees can be changed if needed.	Administrators (Managerial staff)
View profit.	Overview of sales and profit are displayed according to selected time-frame.	Administrators (Managerial staff)
View previous sales and purchases.	Overview of specified sales and to whom according user selection.	Administrators (Managerial staff)
View supply cost and sales income	Comparative overview of cost of supplies vs sales income is displayed according to selected time-frame.	Administrators (Managerial staff)
Clock-in.	All registered employees to clock-in, when they arrive and leave work. This is recorded on the system.	All Users
Add users credentials.	Add authorised user to login to system.	Administrators (Managerial staff)
Remove users credentials.	Remove previous authorised from system.	Administrators (Managerial staff)

VII USE-CASE MODEL DIAGRAM



VIII DATA, QUESTIONNAIRES AND FACT-FINDING TECHNIQUES

A QUESTIONNAIRE

Choose the most suitable option for each question.

1. Is the current system proficient?
    - ❑ Yes
    - ❑ Somewhat
    - ❑ No
2. Is there room for improvement?
    - ❑ Yes
    - ❑ Maybe
    - ❑ No
3. Which aspects can be improved? (*May choose more than one*)
    - ❑ The financial system - sales and purchases
    - ❑ The stock management system
    - ❑ The human resource management system
    - ❑ The client information system
    - ❑ Other
4. Is the user interface simple enough and adapted to the business' needs?
    - ❑ Yes, everything's clear
    - ❑ It can get confusing sometimes
    - ❑ No, almost unusable
5. Are all the necessary interface components included?
    - ❑ Yes, nothing more is needed
    - ❑ Mostly but lacking some
    - ❑ No, many components lacking
6. Who are the main users of the system? (*May choose more than one*)
    - ❑ Owner/ Stakeholders
    - ❑ Managerial Staff
    - ❑ Employees
    - ❑ Labourers (Cleaning etc)
    - ❑ Suppliers
    - ❑ Clients
7. Is the system reliable?
    - ❑ Yes
    - ❑ No
8. Would you recommend anything to be changed or added?
    - ❑ Yes,please change/ add:

      _____

      _____
    - ❑ No

B INTERVIEW

Interviewee: Ronel Fritze, System owner and manager

Date: 17 March 2018

Time: 2:00 PM

Place: Mr Salad

Subject: System information and requirements gathering

Time allocated	**Interview questions**	**Response to the question**
1 min	State the object of the interview: To gather information about what requirements there are concerning the system and what can be improved on from the current system.	
3 min	What are the most important parts of the system that are used for daily transactions? **Follow up**	The Financial system is a really important component of the business. Our human resources and inventory systems are also important.
3 min	What do you need included in the new financial system? **Follow up**	The financial system needs to keep track of all purchases, all sales and any other transactions. The financial system also needs to show a gross income, expenses and profit.
3 min	What do you need included in the new human resources system?	This part of the system needs to manage human resources. That includes a clock-in system for employees to use. We can then determine how many hours each employee spends at work. This helps us to calculate salaries and bonuses.
3 min	How many employees would need to use the new system? Which parts of the system do they need access to?	The system owner and managerial staff would be the main users of the system and they should have full access. Employees working with storage, would use the inventory system and so forth. Mainly, the employees use the clocking system.
3 min	Are there any important security requirements?	The financial information should only be available to the managerial staff and owner. Other sensitive information like salaries and bonuses should be kept safe.
2 min	Should reports on all parts of the system, eg financial, human	Yes, we would like to have as many reports as possible available. Daily,

	resources and inventory, be produced?	weekly, monthly and yearly overviews.
1 min	Conclude interview. Thank interviewee	
19 - 26 min	Total allocated time for interview	
7 min	Follow up questions if needed	

IX SUMMARY, FUTURE & FURTHER PLANNING

A SUMMARY

After our research and reviewing our candidates available to us. It has become clear that the best course of action would be to build an in-house application.

This is due to the flexibility it provides the business to cover all aspects of their needs:

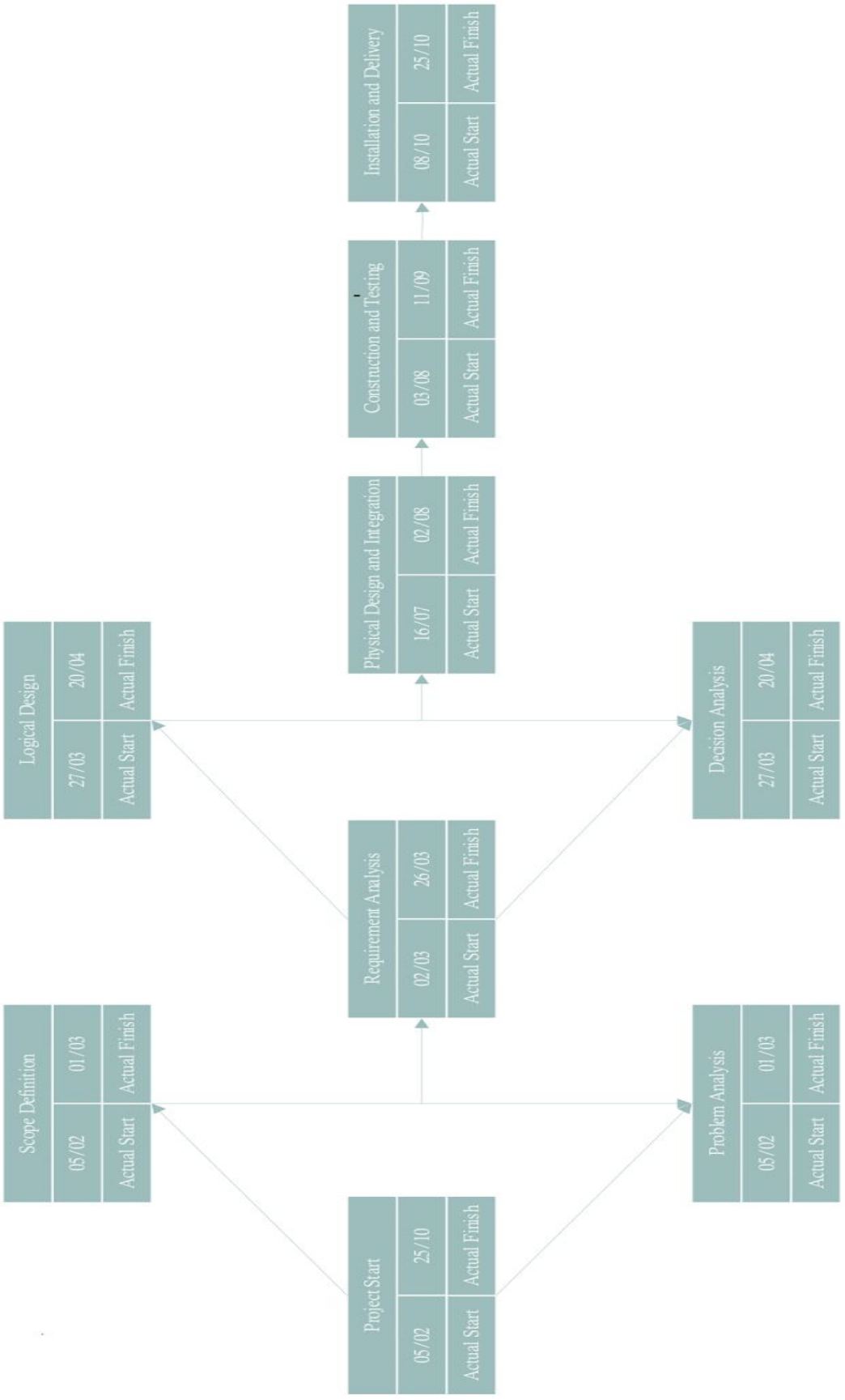
- Providing increased control over business resources; namely inventory maintenance and human resources.
- Assistive financial reports for ease in financial bookkeeping.
- Opportunity to ease this information system-less business into using an information system.
- Providing ample opportunity for system to grow with business.

We found with the feasibility matrix that the best candidate is the in-house solution due to:

- It fully supports user-required functionality.
- Proposed solution requires coding an application in C# (.Net). The technical staff has extensive background in C# (.Net), due to its popularity for GUI based applications, external resources are widely available .
- No foreseeable legal problems or issues.

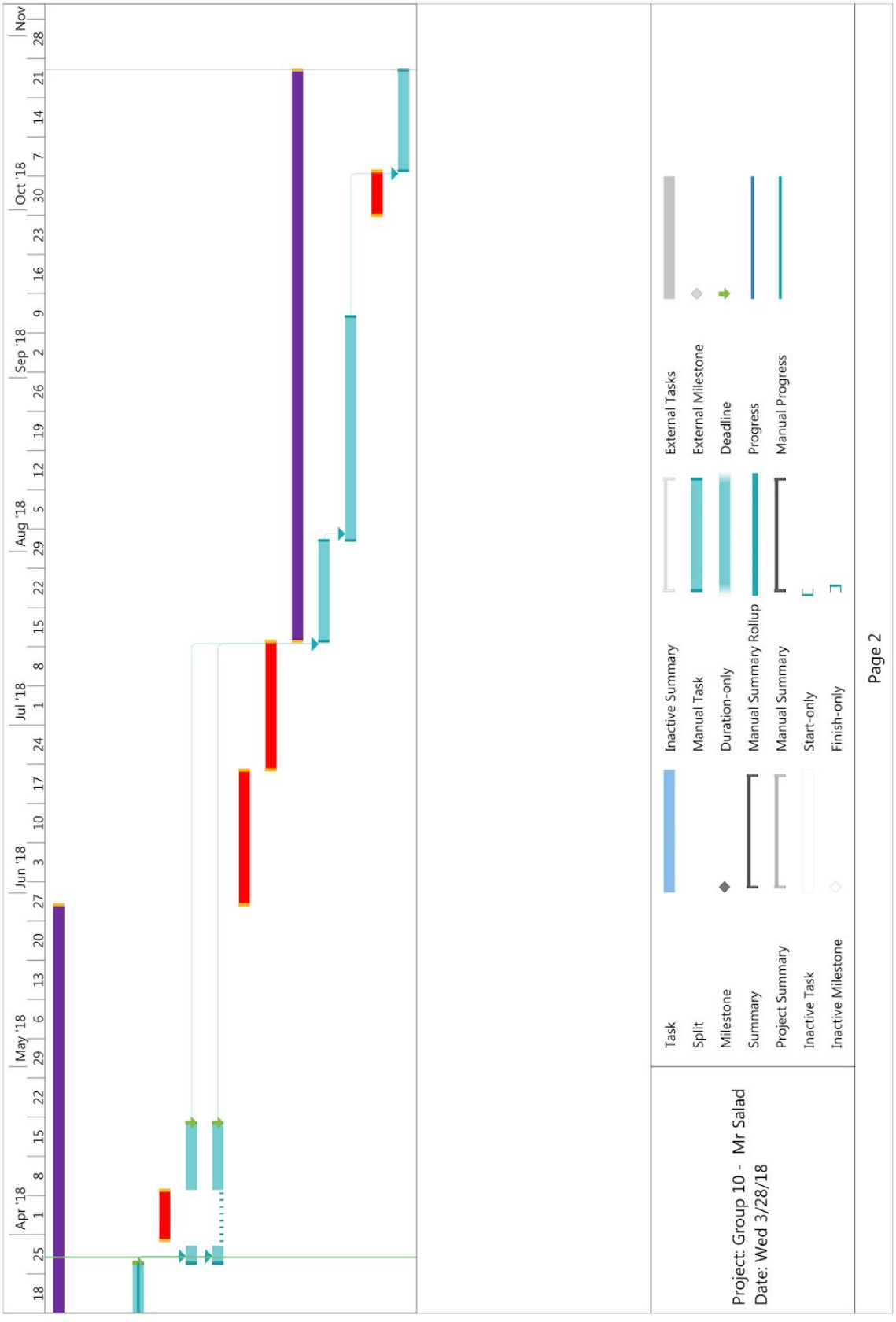
Considering the above mentioned information we strongly suggest going forward with an in-house development application for this project.

B PERT CHART


Installation and Delivery
25/10
08/10
Actual Finish
Actual Start
Construction and Testing
11/09
03/08
Actual Finish
Actual Start
Physical Design and Integration
02/08
16/07
Actual Finish
Actual Start
Logical Design
20/04
27/03
Actual Finish
Actual Start
Decision Analysis
20/04
27/03
Actual Finish
Actual Start
Requirement Analysis
26/03
02/03
Actual Finish
Actual Start
Scope Definition
01/03
05/02
Actual Finish
Actual Start
Problem Analysis
01/03
05/02
Actual Finish
Actual Start
Project Start
25/10
05/02
Actual Finish
Actual Start

C GANTT CHART

ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	% Complete
1		Semester 1	82 days	Mon 2/5/18	Tue 5/29/18		0%
2		Scope Definition	19 days	Mon 2/5/18	Thu 3/1/18		100%
3		Problem Analysis	19 days	Mon 2/5/18	Thu 3/1/18		100%
4		Requirement Analysis	17 days	Fri 3/2/18	Mon 3/26/18	2,3	100%
5		*Unavailable : Recess*	7 days	Sat 3/31/18	Sun 4/8/18		0%
6		Logical Design	13 days	Tue 3/27/18	Fri 4/20/18	4	0%
7		Decision Aanalysis	13 days	Tue 3/27/18	Fri 4/20/18	4	0%
8		*Unavailable : Examinations*	18 days	Wed 5/30/18	Fri 6/22/18		0%
9		*Unavailable : Recess*	17 days	Sat 6/23/18	Sun 7/15/18		0%
10		Semester 2	74 days	Mon 7/16/18	Thu 10/25/18		0%
11		Physical Design and Integration	14 days	Mon 7/16/18	Thu 8/2/18	6,7	0%
12		Construction and Testing	28 days	Fri 8/3/18	Tue 9/11/18	11	0%
13		*Unavailable : Recess*	7 days	Sun 9/30/18	Sun 10/7/18		0%
14		Installation and Delivery	14 days	Mon 10/8/18	Thu 10/25/18	12	0%


Apr '18
May '18
Jun '18
Jul '18
Aug '18
Sep '18
Oct '18
Nov
Project: Group 10 - Mr Salad
Date: Wed 3/28/18
Task
Split
Milestone
Summary
Project Summary
Inactive Task
Inactive Milestone
Inactive Summary
Manual Task
Duration-only
Manual Summary Rollup
Manual Summary
Start-only
Finish-only
External Tasks
External Milestone
Deadline
Progress
Manual Progress
Page 2

X ATTACHMENT A

COTS

Cash Flow Description	Year 1	Year 2	Year 3	Year 4	
Development Cost	-8500				
Operation and Maintenance Cost	-1600	-3100	-2000	-1700	
Time-adjusted costs	-2700	-3400	-2100	-2200	
Present value of costs	-12800	-6500	-4100	-3900	
Total present value of lifetime costs					-3900
Benefits from using a new system	2500	3100	4500	5900	
Time-adjusted benefits	3000	2400	4100	5400	
Present value of benefits	5500	5500	8600	11300	
Total present value of lifetime benefits					11300
Net present value	-9000	-1000	4500	7400	7400

In-house development

Cash Flow Description	Year 1	Year 2	Year 3	Year 4	
Development Cost	-5400				
Operation and Maintenance Cost	-2000	-2800	-1700	-1800	
Time-adjusted costs	-2100	-2400	-2000	-1800	
Present value of costs	-9500	-5200	-3700	-3600	
Total present value of lifetime costs					-3600

Benefits from using a new system	2500	2700	3700	5400	
Time-adjusted benefits	3000	2700	4000	5700	
Present value of benefits	5500	5400	7700	11100	
Total present value of lifetime benefits					11100
Net present value	-4000	200	4000	7500	7500

System Upgrade

Cash Flow Description	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Tota l**
Development Cost	0				
Operation and Maintenance Cost	-2200	-2500	-1700	-1800	
Time-adjusted costs	-3400	-2800	-2000	-2200	
Present value of costs	-5600	-5300	-3700	-4000	
Total present value of lifetime costs					-4000
Benefits from using a new system	2500	2800	3300	3700	
Time-adjusted benefits	3000	3200	3000	4200	
Present value of benefits	5500	6000	6300	7900	
Total present value of lifetime benefits					7900
Net present value	-100	700	2600	3900	3900