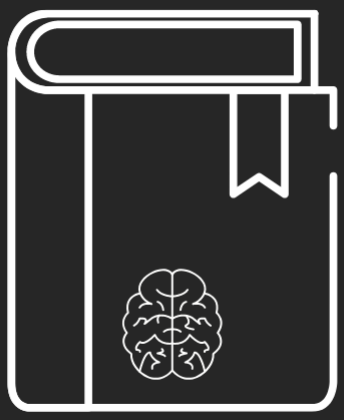

OpenMind - Online Software

Designed for Croxley School

Analysis Document

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Group Members

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Phase 1

Background Information

Croxley High School is a prestigious high school that spans over 3 different campuses. All of them opened back in the year 2018. The schools are private institutions with 120 learners each. Each senior phase has 72 learners in grades 10-12. Senior students have weekly tests, homework, assignments, projects and announcements to follow. Teachers mark and give students their work, feedback and results.

Problem Statement

Due to Covid-19 and concerns from parents, the school has decided to use a fully blended learning approach, even though the president has placed the country on level 1 lockdown with very little restrictions.

- With the rise of world globalization, the school is aiming to introduce new technologies and software in order to fully equip the senior students with the necessary skills to function independently in a university environment.
- The school also conducted a survey on past students and found that a lack of an automated system makes it hard for them to learn independence and operate online as soon as they get to university.
- The following processes are not automated:
    - Student progress analysis (done on paper, however there are no graphs to
    - properly depict any changes)
    - Test and assignment marking (manually done on papers, sometimes incorrectly done)
    - Releasing marks weekly (rarely ever done)
    - Sending out announcements (done by word of mouth)
    - Storing recent and past papers (done manually in a large file room)
- Therefore:
    - Students and teachers hardly see any form of progress or setbacks
    - Marking is often slow
    - Announcements are often misinterpreted or forgotten
    - Information recording is often lost or inadequate

Constraints

The system must be implemented by November 2022. The project could take longer than expected, which might cause it to be finished later than the scheduled date. Such time-consuming issues could be caused by a server update or launch activity that the team should complete before the users can access the system.

Exposure of the school's data to high risk will make it vulnerable to security threats. The risk might be caused by no budget allocated for the protection of the school's data.

The system is completely online. There might be connectivity issues. Also, students and teachers might find it difficult to navigate through the system as it will be completely new to them.

Scope Definition

The System is a Learning Management System (LMS) hosted online over the internet. The following will be provided:

- Store, maintain & process learners' and teachers' data
- Offer a variety of functions depending on who is the user (teacher or learner)
- Help facilitate limited everyday functions in the school
- A simple interface for users to be able to navigate easily around the system

The system must include functionality for the following:

- Maintenance of learners
- Maintenance of teachers
- Maintenance of tests & assignments
- Maintenance of announcements
- Providing tests & assignments feedback
- Providing announcements
- Extensive reporting, this includes average test & assignments marks text report, top 5 performing & underperforming learners text report, student weekly user report (sceptical about this one) and subject term average text report.
- Extensive help functionality

Project Goals

Our project aims to provide the following:

- Improved feedback.
- Effective communication.
- Secure online working environment.
- Workflow optimization.
- Better online learning.

Improved feedback

Learners should be able to receive timely feedback on their academic performance. When there are any misunderstandings, they will be able to ask questions. The feedback will also serve as a reminder of the pupils' knowledge and skills.

Effective communication

Provide a secure learning environment in which teachers may communicate important school information to pupils, such as forthcoming tests and assignment deadlines.

Secure online working environment

The system should ensure that the platform is secure for teachers and that their work is adequately organized so that they may split it appropriately. In general, mixing learners' data or log-in information should be avoided.

Workflow optimization

Teachers will be able to automate activities such as distributing work and scheduling assignments with the help of the system.

Better online learning

Since the goal is to create a system where learners may finish their schoolwork while at home, the system should be mobile and allow individuals to submit their work regardless of where they are.

Improvement Opportunities

- ✓ Provide functionality for writing test and quizzes on the system and provide immediate feedback
- ✓ Provide full lessons tabs, providing reading material, teacher's notes, lessons videos and outcome testing activities

Resources

Internal Resources

The suggested internal resources for the project are:

- System owner (Sponsor): Mr Henkel Staedtler – external HOD and owner of the Croxley private schools

Proposed System users

- School teachers
- Students (grade 10-12) from the three different Croxley schools

Budget

Man-Hour cost

Internal Cost = 20% of 2 people working 8 hours a day for 6 months @ R270/hour

= 20% (2 * 8 * 22.5 * 6 * 270)

= R116 640

Consultant Cost = 5 people working 3 hours a day for 6 months @ R543/hour

= 5 * 2 * 22.5 * 6 * 543

= 1 099 575

Total man-hour cost = R1 216 215

Hardware

Solid State Drive = R2 900

Software

Visual Studio Enterprise Subscription = R109 134

Web hosting = R139 p/m (R139 * 10 months) (= R1 390) (DA Business Web Hosting Packages)

Domain registering = R100

Software total = R110 624

****

Total = Man-Hour Cost + Hardware + Software

= R1 216 215 + R2 900 + R110 624

= R1 329 739

Schedule

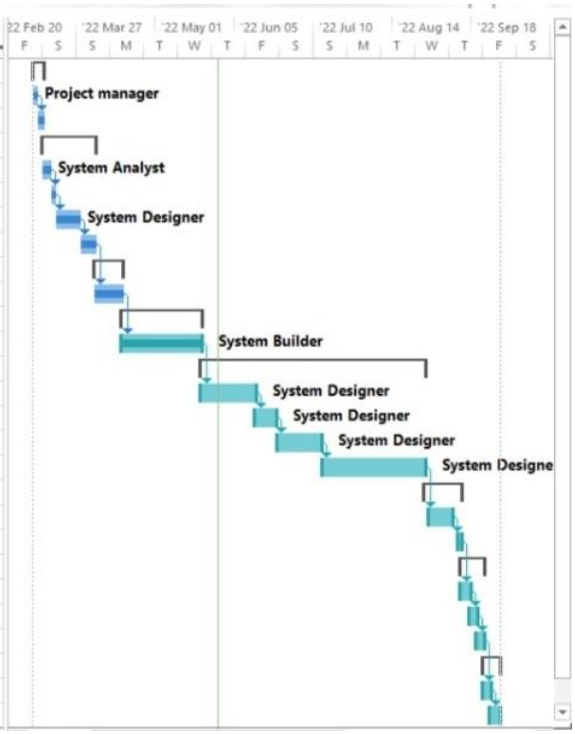
Project Steps	Steps Implemented	Start Date
Scope Definition	The scope definition will be included in the project proposal.	8 March 2022
Problem Analysis	The project proposal includes current problems including the proposed solutions, business opportunities, budget, and timetable for the events.	12 March 2022
Requirement analysis	Business prerequisite explanation	4 April 2022
Logical Design	Specification & logical system models • Arranging data into logical relationships	16 April 2022
Design Analysis	• Developing designs • Design Planning • Design Exploration • Design Optimisation	21 May 2022
Physical Design and Integration	• Physical design models • Detailed specification	28 August 2022
Construction and Testing	• Database • User interface • Test plan	13 September 2022
Installation	• Process of installing the project • Documented review • Updated logical system models • Updated physical models	23 September 2022

-End of Phase 1-

Phase 2

Project Plan

	Task Mode	Task Name	Duration	Start	Finish
1	✓	**Scope Definition**	**5 days**	**Tue 22/03/08**	**Sat 22/03/12**
2	✓	List problems, solutions, opportunities and directives	2 days	Tue 22/03/08	Wed 22/03/09
3	✓	Negotiate scope	3 days	Thu 22/03/10	Sat 22/03/12
4	✓	**Problem Analysis**	**17 days**	**Sat 22/03/12**	**Mon 22/04/04**
5	✓	Proposing solutions	3 days	Sat 22/03/12	Tue 22/03/15
6	✓	Business Opportunities	2 days	Wed 22/03/16	Thu 22/03/17
7	✓	Budget	7 days	Fri 22/03/18	Mon 22/03/28
8	✓	Schedule	5 days	Tue 22/03/29	Mon 22/04/04
9		**Requirement Analysis**	**11 days**	**Mon 22/04/04**	**Sat 22/04/16**
10	✓	Business prerequisite explanation	11 days	Mon 22/04/04	Sat 22/04/16
11	✓	**Logical Design**	**27 days**	**Sat 22/04/16**	**Sat 22/05/21**
12	✓	Arranging data into logical relationships	27 days	Sat 22/04/16	Sat 22/05/21
13		**Design Analysis**	**73 days**	**Sat 22/05/21**	**Sun 22/08/28**
14		Developing Designs	18 days	Sat 22/05/21	Tue 22/06/14
15		Design Planning	8 days	Tue 22/06/14	Thu 22/06/23
16		Design Exploration	15 days	Fri 22/06/24	Wed 22/07/13
17		Design Optimisation	33 days	Thu 22/07/14	Sun 22/08/28
18		**Physical Design and Integration**	**13 days**	**Sun 22/08/28**	**Tue 22/09/13**
19		Detailed Specification	9 days	Tue 22/08/30	Fri 22/09/09
20		User Interface	2 days	Mon 22/09/12	Tue 22/09/13
21		**Construction and Testing**	**9 days**	**Tue 22/09/13**	**Fri 22/09/23**
22		Database	5 days	Tue 22/09/13	Sat 22/09/17
23		User Interface	3 days	Sat 22/09/17	Tue 22/09/20
24		Testing	4 days	Tue 22/09/20	Fri 22/09/23
25		**Installation**	**6 days**	**Fri 22/09/23**	**Fri 22/09/30**
26		Intalling the project	2 days	Fri 22/09/23	Mon 22/09/26
27		Documented review	5 days	Mon 22/09/26	Fri 22/09/30



	Task Mode	Task Name	Duration	Start	Finish	Predecess	Resource Names
1	✓	**Scope Definition**	**5 days**	**Tue 22/03/08**	**Sat 22/03/12**		
2	✓	List problems, solutions, opportunities and directives	2 days	Tue 22/03/08	Wed 22/03/09		Project manager
3	✓	Negotiate scope	3 days	Thu 22/03/10	Sat 22/03/12	2	
4	✓	**Problem Analysis**	**17 days**	**Sat 22/03/12**	**Mon 22/04/04**		
5	✓	Proposing solutions	3 days	Sat 22/03/12	Tue 22/03/15		System Analyst
6	✓	Business Opportunities	2 days	Wed 22/03/16	Thu 22/03/17	5	
7	✓	Budget	7 days	Fri 22/03/18	Mon 22/03/28	6	System Designer
8	✓	Schedule	5 days	Tue 22/03/29	Mon 22/04/04	7	
9		**Requirement Analysis**	**11 days**	**Mon 22/04/04**	**Sat 22/04/16**		
10	✓	Business prerequisite explanation	11 days	Mon 22/04/04	Sat 22/04/16	8	
11	✓	**Logical Design**	**27 days**	**Sat 22/04/16**	**Sat 22/05/21**		
12	✓	Arranging data into logical relationships	27 days	Sat 22/04/16	Sat 22/05/21	10	System Builder
13		**Design Analysis**	**73 days**	**Sat 22/05/21**	**Sun 22/08/28**		
14		Developing Designs	18 days	Sat 22/05/21	Tue 22/06/14	12	System Designer
15		Design Planning	8 days	Tue 22/06/14	Thu 22/06/23	14	System Designer
16		Design Exploration	15 days	Fri 22/06/24	Wed 22/07/13	15	System Designer
17		Design Optimisation	33 days	Thu 22/07/14	Sun 22/08/28	16	System Designer
18		**Physical Design and Integration**	**13 days**	**Sun 22/08/28**	**Tue 22/09/13**		
19		Detailed Specification	9 days	Tue 22/08/30	Fri 22/09/09	17	
20		User Interface	2 days	Mon 22/09/12	Tue 22/09/13	19	
21		**Construction and Testing**	**9 days**	**Tue 22/09/13**	**Fri 22/09/23**		
22		Database	5 days	Tue 22/09/13	Sat 22/09/17	20	
23		User Interface	3 days	Sat 22/09/17	Tue 22/09/20	22	
24		Testing	4 days	Tue 22/09/20	Fri 22/09/23	23	
25		**Installation**	**6 days**	**Fri 22/09/23**	**Fri 22/09/30**		
26		Intalling the project	2 days	Fri 22/09/23	Mon 22/09/26	24	
27		Documented review	5 days	Mon 22/09/26	Fri 22/09/30	26	

Definitions, Acronyms and Abbreviations

The following are abbreviations, acronyms and definitions used in the phase 2 section of the document.

Abbreviations & Acronyms

FAST – Framework for the application of Systems Thinking

DB – Database

COTS – Commercial Off-The-Shelf

Wt. – Weight

Definitions

Gantt chart: bar chart used to display the project progress by using a calendar

PIECES: the process of improving performance; data and information; economics; control; efficiency; and security.

Project Description and Scope

The main objective of this project is to provide an automated system for the prestigious Croxley schools. This is to digitalise learning for their senior students in order to equip them with the vital skills required to function independently and effectively when they reach university level(s). Our system should supply users with an extensive Help functionality, and learners should be added to the school's DB according to their grade and subjects of their choice. Therefore, the process of registering learners on to the system will be easy and quick for teachers. Learners normally receive assignments in class in the form of hardcopies. However, with the help of the system, they will be digital. This will also make it relatively easy for teachers to give learners study materials while working online. The system will use a formal approach for its development and implementation, known as the FAST methodology, which follows several phases of development and implementation.

The system should fulfil the following functional requirements:

- Maintenance of learners.
- Maintenance of teachers.
- Maintenance of tests feedback and assignment feedback.
- Maintenance of announcements.
- Maintenance of test and assignments documents
- Providing announcements.
- Providing tests and assignments feedback.
- Extensive reporting, which includes average of tests and assignment marks text report, top 5 performing and underperforming students text report and subject term average text report.

Furthermore, the system should fulfil the following non-functional requirements:

- Extensive Help function.
- Secure system's access for each user by provision of unique identifiers, so that it's not easy for outsiders to access the system.
- Queries to the database should be quick.
- The DB will most likely cater for approximately 24 learners from different grades, Learners will be grouped according to the grade they are doing and subjects, in the DB.
- The system will cater for 2 users, the teacher and learner. The teacher will have access to most of the functionalities and the learner will have access to a limited number of functionalities.

Functional Requirements – Data Requirements

Maintenance of Learners

ADD

INPUT ADD	PROCESSING	OUTPUT

• Name & Surname
• ID Number
• Address
• Grade
• Select subject from the list of subjects
• Email address
	• If the generated userID is similar to an existing userID in the DB, give an informative message.
	• Validate that:
	  ○ All input is entered & are correct
	  ○ ID number is numeric, 13 characters in length and does not contain letters
	  ○ Grade is numeric
	  ○ Email address is in the correct format
	• After the user has clicked the "register" button and no error was encountered, the information of the learner will be saved on the DB.
		• Warning message if a similar userID exists in the DB.
		• Message indicating that learner is successfully registered on the system.

CHANGE

INPUT DATA	PROCCESSING	OUTPUT

• UserID & Password
• Name & Surname
• ID Number
• Address
• Grade
• Select subject from the list of subjects
• Email address
	• Display all the attributes of the entered userID and allow user to make changes
	• Validate that:
	  ○ All input is entered & are correct
	  ○ ID number is numeric, 13 characters in length and does not contain letters
	  ○ Grade is numeric
	  ○ Email address is in the correct format
	• After the user has clicked the "update" button and no error was encountered, the information of the learner will be saved on the DB.
		• Warning message if a similar userID exists in the DB.
		• Message indicating that the learner information has been successfully updated in the DB.

DELETE

INPUT DATA	PROCCESSING	OUTPUT
• UserID & Password	• Display all attributes of selected userID • After the user has clicked "delete" the userID and its attributes are removed from the DB table.	• Message including the userID to indicate that the learner information has been successfully removed from the DB.

Maintenance of Teachers

ADD

INPUT DATA	PROCCESSING	OUTPUT

• Name & Surname
• ID Number
• Address
• Grade teaching
• Select subject teaching from a list of subjects
• Email address
	• If the generated userID is similar to an existing userID in the DB, give an informative message.
	• Validate that:
	  ○ All input is entered & are correct
	  ○ ID number is numeric, 13 characters in length and does not contain letters
	  ○ Grade is numeric
	  ○ Email address is in the correct format
	• After the user has clicked the "register" button and no error was encountered, the information of the teacher will be saved on the DB.
		• Warning message if a similar userID exists in the DB.
		• Message indicating that teacher is successfully registered on the system.

CHANGE

INPUT DATA	PROCCESSING	OUTPUT

• UserID and Password
• Name & Surname
• ID Number
• Address
• Grade teaching
• Select subject teaching from a list of subjects
• Email address
	• Display all the attributes of the entered userID and allow user to make changes
	• Validate that:
	  ○ All input is entered & are correct
	  ○ ID number is numeric, 13 characters in length and does not contain letters
	  ○ Grade is numeric
	  ○ Email address is in the correct format
	• After the user has clicked the "update" button and no error was encountered, the information of the teacher will be updated on the DB.
		• Warning message if a similar userID exists in the DB.
		• Message indicating that the teacher information has been successfully updated in the DB.

DELETE

INPUT DATA	PROCCESSING	OUTPUT
• UserID & Password	• Display all attributes of selected userID • After the user has clicked "delete" the userID and its attributes are removed from the DB table.	• Message including the userID to indicate that the teacher information has been successfully removed from the DB.

Maintenance of Test & Assignments Documents

ADD

INPUT DATA	PROCCESSING	OUTPUT

• Document name
• Grade
• Select subject from a list of subjects
• Download link
	• If similar document name exists in the DB indicate to the user with an informative message.
	• Validate that:
	  ○ All input is entered and correct
	  ○ Grade is numeric
	  ○ The subject has been selected
	• After the user has clicked the "upload" button and no error was encountered. The document is added on the DB.
		• Warning message if a similar document name exists in the in the DB.
		• Message indicating that the document has been uploaded successfully to the DB.

CHANGE

INPUT DATA	PROCCESSING	OUTPUT

• Document name
• Document name
• Grade
• Select subject from a list of subjects
• Download link
	• Display all the attributes of the document name and allow user to make changes
	• Validate that:
	  ○ All input is entered and correct
	  ○ Grade is numeric
	  ○ The subject has been selected
	• After the user has clicked the "upload" button and no error was encountered. The document is added on the DB.
		• Warning message if a similar document name exists in the in the DB.
		• Message indicating that the document has been uploaded successfully to the DB.

DELETE

INPUT	PROCCESSING	OUTPUT
• Document name • Subject selected from a list • Grade	• Display all the attributes of the document name. • After the user has clicked the "delete" button. The document is removed from the DB.	• Message including the document name to indicate that the document has been successfully removed from the DB.

Maintenance of Test and Assignment Feedback

ADD

INPUT DATA	PROCCESSING	OUTPUT

• UserID
• Feedback type
• Grade
• Subject selected from a list
• Learner mark
• Total marks
	• If the userID is not found in the DB indicate to the user with an informative message
	• Validate that:
	  ○ All input is entered and correct
	  ○ Grade, learner mark and total marks are numeric
	  ○ The subject has been selected
	• After the user has clicked the "Upload" button the learners mark percentage will be uploaded on the marks DB.
		• Warning message if the userID does not exists in the DB.
		• Message indicating that the mark percentage has been successfully uploaded to the DB.

CHANGE

INPUT DATA	PROCCESSING	OUTPUT

• UserID
• Feedback type
• Grade
• Subject selected from a list
• Learner mark
• Total marks
	• Display all the attributes of the userID and allow user to make changes
	• Validate that:
	  ○ All input is entered and correct
	  ○ Grade, learner mark and total marks are numeric
	  ○ The subject has been selected
	• After the user has clicked the "Update" button the learners mark percentage will be updated in the marks DB.
		• Warning message if a similar mark associated with the userID exists in the in the DB.
		• Message indicating that the mark has been updated successfully in the DB.

DELETE

INPUT DATA	PROCESSING	OUTPUT
• UserID	• Display all the attributes of the userID. • After the user has clicked the "Delete" button the learners mark percentage will be removed in marks DB.	• Message including the userID to indicate that the percentage mark has been successfully removed from the DB.

Maintenance of Announcements

ADD

INPUT DATA	PROCCESSING	OUTPUT

• Event name
• Event type selected from a list
• Event date
• Event duration
	• If an event with the same name is found in the Announcement DB, indicate to the user with an informative message
	• Validate that:
	  ○ All input is entered and correct
	  ○ The date is in the correct format
	  ○ The event duration is numeric
	• After the user has clicked the “add” event button, the event must be added to the events DB.
		• Warning message if a similar event exists in the DB.
		• Message indicating that the event has been successfully added to the announcements DB.

CHANGE

INPUT DATA	PROCCESSING	OUTPUT

• Event name search
• Event type selected from a list
• Event date
• Event duration
	• Display all the attributes of the selected search event and allow user to make changes
	• Validate that:
	  ○ All input is entered and correct
	  ○ The date is in the correct format
	  ○ The event duration is numeric
	• After the user has clicked the “update” event button, the event must be updated in the events DB.
		• Warning message if a similar event exists in the DB.
		• Message indicating that the event has been successfully updated in the announcements DB.

DELETE

INPUT DATA	PROCCESSING	OUTPUT
• Event name search	• Display all the attributes of the selected search name, • After the user has clicked the “Delete” button the event will be removed from the announcements DB.	• Message including the event name to indicate that the event has been successfully removed from the announcements DB.

Functional Requirements – Processes

Providing announcements

INPUT DATA	PROCCESSING	OUTPUT
• UserID & Password • Click on the announcements button	• Display of all events and their dates. • After the "Upcoming events" button has been clicked, the dates are highlighted on the calendar.	• The dates of the events will be highlighted on the calendar

Providing Test & Assignments Feedback

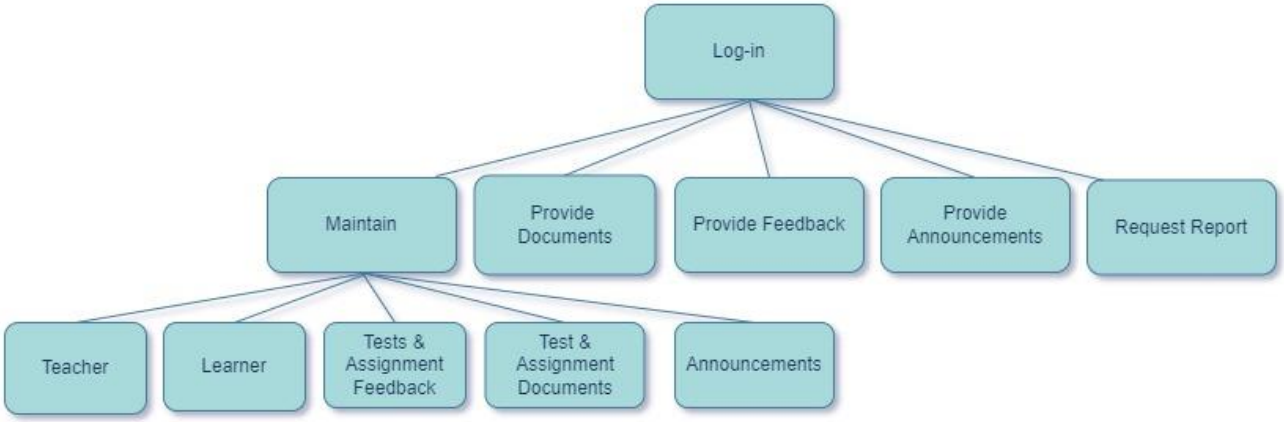
INPUT DATA	PROCCESSING	OUTPUT
• UserID & Password • Click on the feedback button • Grade and subject selected from a list	• If the userID does not exist in the DB, inform the user. • After the user has clicked the "display feedback" button. Display of the all the learner's marks.	• If the userID does not exist in the DB, inform the user with an informative message. • A display list of all the learner's marks.

Extensive Reporting

INPUT DATA	PROCCESSING	OUTPUT

• UserID & Password
• Grade & Subject
• Report type selected from a list.
	• If the userID does not exist in the DB, inform the user.
	• Validate that:
	  ○ All input is entered and correct
	  ○ The grade is numeric
	• After the user has clicked "Generate report" button, a text file must be written.
		• If the userID does not exist in the DB, inform the user with an
		• A message including the report type, to indicate to the user that the report has been written successfully.

Functional Requirements – Interface Requirements



Non- functional requirements

REQUIREMENTS	PIECES CATEGORIES
• Extensive Help function.	Efficiency of People and Processes
• Secure system's access for each user by provision of unique identifiers, so that it's not easy for outsiders to access the system.	Security
• The DB will most likely cater for approximately 24 learners from different grades, Learners will be grouped according to the grade they are doing and subjects, in the DB.	Performance, Information and Data
• Queries to the database should be quick.	Performance
• The system will cater for 2 users, the teacher and learner. The teacher will have access to most of the functionalities and the learner will have access to a limited number of functionalities.	Control or Security

Candidate Systems Matrix

Characteristics	CANDIDATE 1: AS-IS	CANDIDATE 2: COTS package software solution	CANDIDATE 3: Custom Designed Solution
The portion of the school's system that will be covered by the candidate. A brief description of all of the aspects of the schools' system that would be computerized in this candidate.	Everything is covered by the candidate. Only the marks and learners' names are computerised in the teacher's computer. This means that learning process and progress will be delayed. - Learners will not receive feedback on time (tests and assignments marks; private comments from the teachers on how each learner performed; and how they should improve) - No effective communication - Keeping track of learner's performance would not be effective. - Upload and store previous and recent exam paper or extra learning material.	The candidate will only be able to cover all the learners and teachers requirements except the ability to provide evaluation reports for learner's progress analysis.	The system that will be implemented will be able to cover learners and teachers' requirements. It will also cover functions that are not implemented in a pre-purchased system function such as: - providing evaluation reports for learner's progress analysis.
Benefits A brief description of the business benefits that would be realized for this candidate.	Insignificant costs	The system can be executed right away but it will lack important aspects such as providing evaluation reports for learner's progress analysis. Learners will be able to receive feedback from the teachers however teachers will not be able to automate learners progress on graph to depicts learners' progress.	The system is designed according to the user requirements or user satisfactory. Learners will be able to log into their account to receive timely feedback on their assignment. Teachers will log into their accounts to automate activities and send learners announcements.
Additional software A description of the software needed to support the candidate's basic functions and capabilities**.**	N/A	The server will use Linux. Microsoft Database is required to support the candidate's database.	Microsoft Database to support the candidate's database capabilities.

Servers and Workstations A description of the servers and workstations needed to support this candidate.	All the announcements are communicated on paper. Marks, feedback and documents are provided in a physical.	An entry level computer with Linux is required. Oracle is needed to send announcements to learners and provide test and assignment marks. Lastly, learning material must be uploaded.	Installation of an entry - level computer with user friendly feature is required for Microsoft Access server. Computer must be compatible to Microsoft windows installed.
Software Tools Needed Software tools needed to design and build the candidate Not generally applicable if applications software packages are to be purchased.	N/A	N/A	The candidate will be programmed in the C# language using Visual Studio 2022. The database(s) will be constructed in Microsoft Access. The candidate will be usable on any compatible Microsoft Windows.
Method of Data Processing Generally, some combination of online, batch, deferred batch, remote batch, and real-time.	Teachers must go through a list of learners in order to assign marks. For the school to send announcement the school admin worker must print the announcement on the paper in a physical form.	All the data is processed in real time on a server.	To process data computer in use will adhere to real time on workstation and the database will be updated in a time when needed.
Application Software A description of the software to be purchased, built, accessed, or some combination of these techniques.	The school system is required to have any computer to assign students with marks and print their report card and announcements in a physical form.	The candidate system is a simple school system that is used to automate or provide test and assignment feedback. Sending announcements to learners and uploading learning material for learners. However, it cannot provide evaluation report for learners' progress analysis. It is feasible to additional aspects because the software is open source. However, it may be time consuming to execute this addition. By combining the candidate with another system, a full operating system can be	Microsoft windows will not be purchased because is already owned. The candidate system will cover all the teachers and learners' requirements, such as - The editing, removal, and additional of learners' accounts in the database. - The editing removal and addition of school subject. - The ability for learners to choose the subject that they want. - The ability to provide evaluation reports for learner's progress analysis. Teachers will make use of the average marks of learners in science or mathematics class to track learners

		implemented. Implementing this system might be difficult due to different programming style.	progress each and every term, and to see whether pass rate is increasing or declining.
Output Devices and Implications A description of output devices that would be used, special output requirements, (e.g., network, pre-printed forms, etc.), and output considerations (e.g., timing constraints).	N/A	The COTS system will display the output and the system will be viewable on teachers or learner's gadgets when they log into their account.	For the output of the system, learners will view the output from their personal computers using a built-in standard notepad. Teacher can view the report on a monitor, or they can print them.
Input Devices and Implications A description of Input methods to be used, input devices (e.g., keyboard, mouse, etc.), special input requirements, (e.g., new or revised forms from which data would be input), and input considerations (e.g., timing of actual inputs).	N/A	Input from the keyboard and mouse will be used to navigate through the GUI.	Input from the keyboard and mouse will be used to navigate through the GUI. The learners' marks are required to evaluate the report and track progress analysis.
Storage Devices and Implications A brief description of what data would be stored, what data would be accessed from existing stores, what storage media would be used, how much storage capacity would be needed, and how data would be organized.	The class list contains information about learners E.g., full names and which stream they belong to: math or science. They are stored in files or cabinets. These files can sometimes get lost.	Using server all the candidate satisfactory are met. Dropbox or google drive will be used to store data on the storage device over internet.	Workstation Computers hard drive or server will be used to store candidate's database.
Output Software The software needed by the system to display certain forms of output from the system.	N/A	The candidate bought system is independent of other output applications and formats.	The system produces text files outputs, so a standard Notepad application can be used to read the text files.

Feasibility Analysis Matrix

Description	Wt.	Candidate 1: AS –IS	Candidate 2: COTS Package Software Solution	Candidate 3: Custom Designed Solution
Technical feasibility	25	The team can only use but not change this candidate. Score: 0	This candidate is easily accessible so it can be installed at any time. But developing the system might be a very tedious process and the team might encounter difficulties when modifying the system due to different programming styles that they are not use to. Score: 45	This candidate will be programmed using C# programming language and software database (SQL) because they are familiar to the SQL database and C#, and they feel comfortable working with the two. Score: 75
Operational feasibility	8	The candidate solution which is currently used in school does indeed fulfil learners and teachers' requirements. However, it is not efficient because learners and teacher couldn't work from during covid as a result this was hindering the school learning progress. Also, teachers are not able to provide evaluation reports for learners' progress analysis they cannot tell whether the pass rate is increasing or decreasing. Score: 25	This candidate will perform most of the activities that will satisfy the user requirement. However, it will not Provide evaluation reports for learner's progress analysis. The benefit of this candidate is that teacher will be able to send announcement easily and quickly and upload extra learning material any time learners can also access the material and read it. Progressive learning. Score: 65	This candidate will satisfy users requirements. It will contain aspect that will allow teachers to provide evaluation reports for learner's progress analysis. This will ensure progressive learning because teachers track how learners are performing that help them improve where they are lacking. The system will contain friendly user interface and simple GUI that user can easily navigate. Score: 80
Risk feasibility	20	The candidate use data in mostly physical form (e.g., they most print) print and distributing could be time consuming and they might get lost. Score: 0	Implementing and modifying this system is difficult because of the different programming language used. The possibility of failure might be high. Score: 25	The project team are comfortable and familiar with the programming language that they are going to use also the software, So the risk of failing to implement the system is at minimum. Score: 85

Economic feasibility The cost to develop: Payback period: Net present value: Detailed calculation:	23	N/A N/A N/A N/A Score: 100%	Approximately R 150000 Unknown time frame/period. Because the system is an investment. Score: 90%	Approximately R1 216 215 Unknown time frame/period. The system is an investment. Score: 70%
Schedule feasibility	8	If this candidate is chosen, they will be no modification or change made. Score: 8	Because the team members are not familiar with the coding language used its not certain that the implementation of the system will be done within the given time frame, it might take longer than scheduled. (5 months needed). Score: 35	Because the project team are more familiar with the programming language and software so, it will be easy for the team to start developing the system from scratch and there more likely to finish developing the system within schedule (12 months needed). Score: 75
Cultural feasibility	8	The users are struggling with this candidate also opposing its way of working. Score: 0	The users are satisfied by the manner in which this candidate works but are hesitant to execute it because it's difficult. Score: 85	The user might be intimidated by this software and the way it operates because they are not use to this kind of system. Therefore, the system will be made with friendly user interface and simple GUI, it will be designed to meet users' expectation and requirements. This system will ensure that learners learn how to operate online software so that they become independent when there in university. Score: 65
Legal feasibility	8	There are no legal problems with this candidate. Score:100	There are no legal problems with this candidate. Score :100	There are no legal problems with this candidate. Score: 100

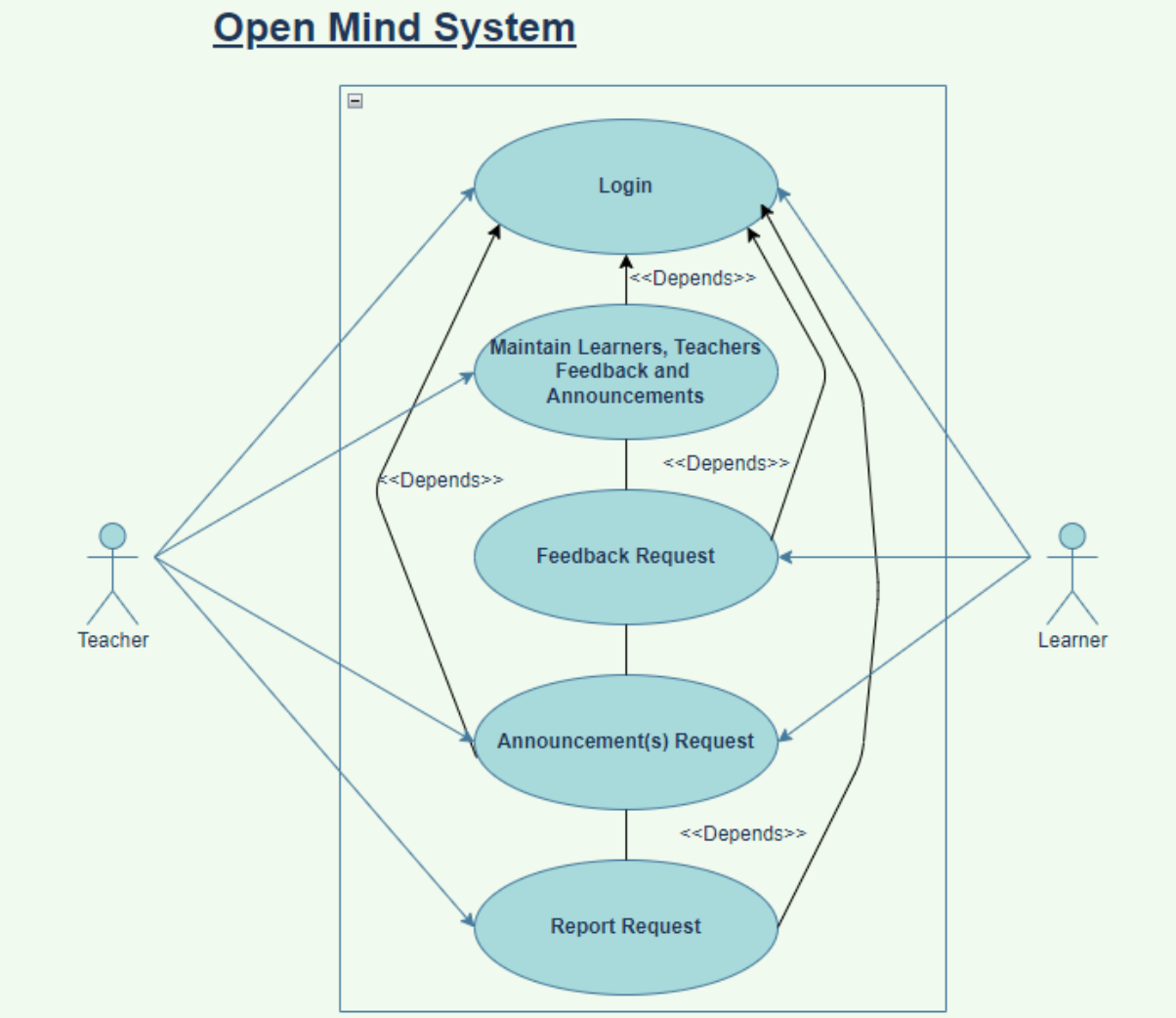
Weighted feasibility	100%	33.64%	62.05%	77.45%

Use-Case

Glossary

Name	Description	Participating Actors and Roles
Log into System	The event where a user get access to the system by providing a username and password.	Learners & Teachers
Maintain Learners	The event whereby details of a new learner are added or an existing learner's details are updated or removed from the system.	Teachers
Maintain Teachers	The event whereby details of a new teacher are added or an existing teacher's details are updated or removed from the system.	Teachers
Maintain Tests Feedback and Assignments Feedback	The event where feedback of both new tests and assignments are added, removed or changed.	Teachers
Maintain Announcements	The announcements are either added, changed or removed.	Teachers
Provide Test Feedback and Assignment Feedback	The event where new tests feedback and assignment feedback are provided to learners by means of adding them to the system.	Learners & Teachers
Provide Announcements	The event where new announcements are provided to learners by means of adding them to the system.	Learners & Teachers
Request Report	The event where text reports are requested from the system and also viewed on the system. A hard copy can also be printed.	Teachers

Model Diagram



Section: Interview Planning

Interviewee: Henkel Staedtler, System Sponsor and School Owner

Location: Croxley High School, Johannesburg Campus

Time: 09h00

Date: 23 May 2022

Interview reason: In order to further understand the current system issues and what is required by the users, namely the interphase students and teachers.

Allocated Time	Interview Question/Action	User Response
3 Min	Give an overview of why this interview is conducted: The reason for this interview is to understand the issues faced by the school and caused by the current system used at the Croxley High Schools. What are the issues and why is it of utmost importance that the electronic system must be created?	
1 Min	How does the interphase operate without and electronic system? [Follow up question]	Everything is written down, stored or printed manually.
4 Min	How does the interphase keep a record of all the students' progress; teachers' announcements; test papers; etc?	News letters are printed out every 2 weeks; test papers are stored in a storage room; student progress is loosely monitored and reported by word of mouth.
5 Min	Describe how this hinders the processes that take place around the school?	Everything is a slow process. Feedback and changes around the interphase take a while to reach teachers and students. This causes a lot of mistakes as there is no way of verifying information.
3.5 Min	What do you wish could be recreated or changed?	A less time-consuming system to quicken the processes around the school. The school needs to be more efficient in document storing. Communication must be improved.
4 Min	Should we succeed in creating a system that will meet all your requirements, will you be willing to pay for it? In order for us to maintain the system, a fee should be paid as well. A detailed budget list is available to be viewed.	Yes. The fee will be paid if it is within the school budget and is reasonable. Also, the system and user requirements should be fulfilled completely up to satisfaction.

Questionnaire

The following is a complication of questions that should be answered in order to further understand the problems of the interphase current system and user requirements.

Close-ended Questions

10 Teachers were asked to complete the table of questions. The overall majority answers were taken.

Rate the following from:

1 – Completely Disagree/False
2 – Disagree
3 – Somewhat true, somewhat false
4 – Agree
5 – Completely Agree/ True

The current system:	1	2	3	4	5
Is user-friendly.		●			
Is time-consuming to use.					●
Stores data and information accurately.		●			
Beneficial to all users.	●				
Is reliable.			●		
Is up to standard and quality.	●				

How often do you give students back their scripts (Select 1)?

- ○ 5 Days Later
- ○ 1 Week Later
- ○ 2-3 Weeks Later
- ◉ 1 Month Later
- ○ Never

Combination questions

Do you think the current system requires changes? State why below:

☒ Yes ☐ No

The current system requires changes because the school needs to keep up with the times. Croxley needs to update the way processes are run.

Do you think a completely new system is required/is a good idea? Explain why:

☒ Yes ☐ No

Students will learn how to use an online management system before they get to university. Teachers will be able to work more quicker and efficiently.

Do you think it will be easy to implement the new system to the interphase and teachers? Please explain your answer:

☐ Yes ☒ No

An electronic system has never been used. It will take some time, if not a lot, for both the students and teachers to get the hang of it.

What needs to be mostly focused on the most (Check 2)?

☐ Efficiency

☒ Security: student and teacher passwords; sign-in; etc

☒ User-friendliness, interface and responsiveness

☐ Storage and database

☐ Other (Please specify below)

Open-ended Questions

What happens when students are unable to write a test?

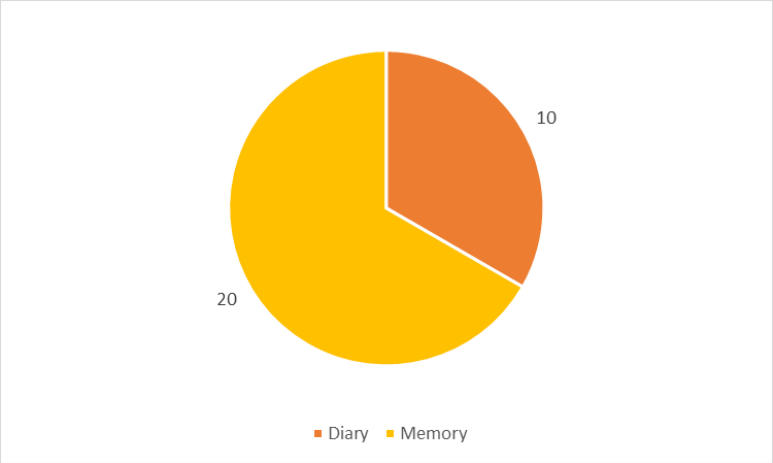
The test is postponed to a later time. Sometimes, it is completely cancelled.

Findings and Research

Students (30)

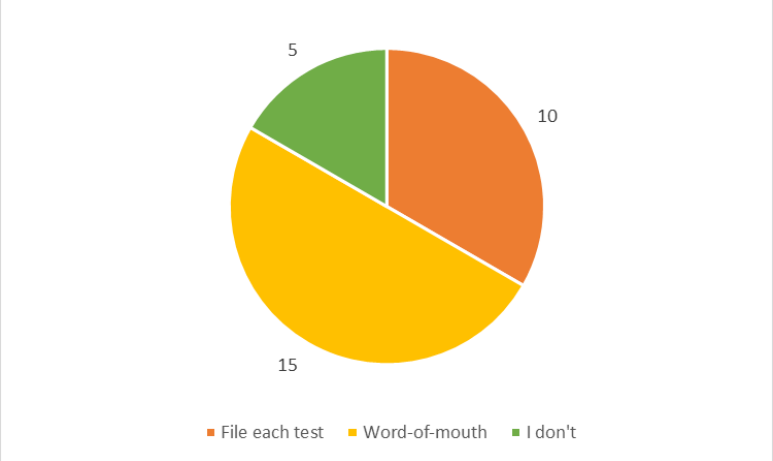
How do you keep up with announcements?

Answer	Count
Diary	10
Memory	20



How do you view or monitor your progress?

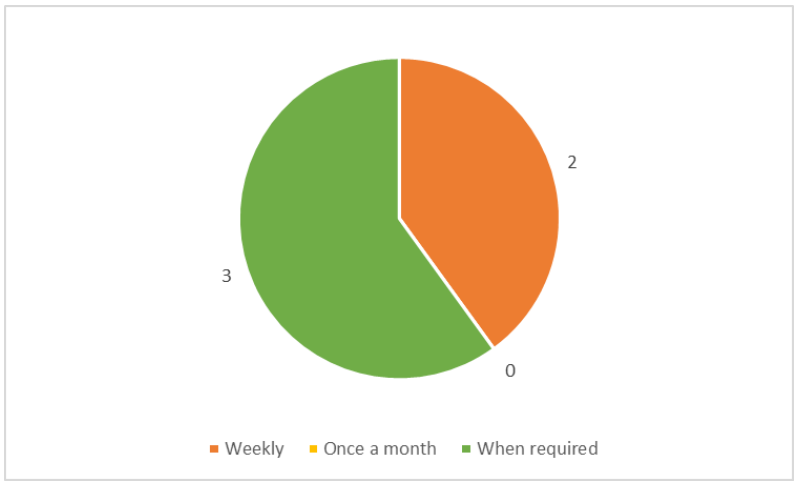
Answer	Count
File each test	10
Teachers' word-of-mouth	15
I don't	5



Teachers (5)

How often do your students write tests?

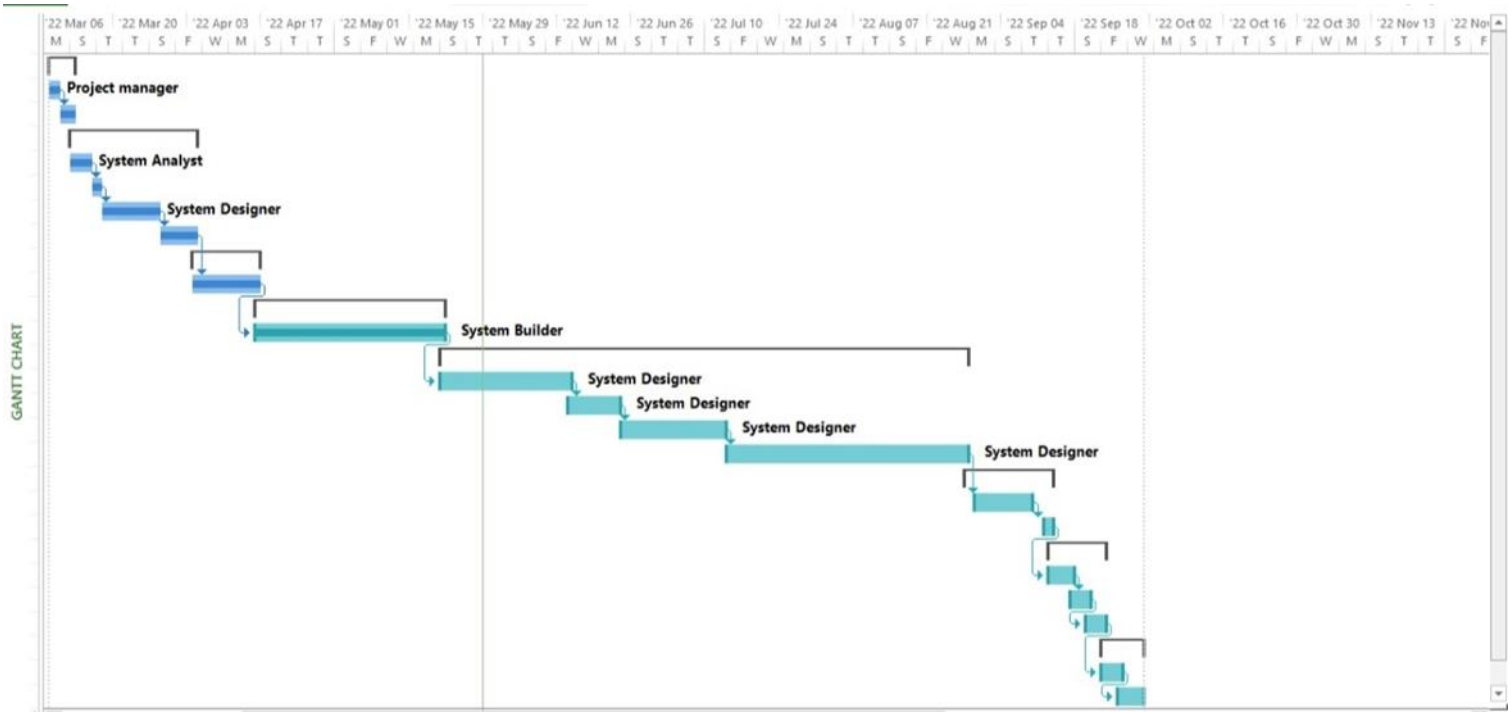
Answer	**Count**
Weekly	2
Once a month	0
When required	3



Summary, future & further planning

This document covered the requirements for the Croxley High School electronic system. It concludes the Requirements Analysis Phase for the projects. The following phases of the project have been completed: Scope definition, Problem Analysis, Requirement Analysis and Logical Design. After the Requirements document has been accepted, the project team will move to the next phase of the project which is Design Analysis. The design analysis will begin on the 21st of May 2022.

Gantt Chart



-End of Phase 2-

Phase 3

The following part of the document includes a few revised areas from Phase 1 and Phase 2, as well as a fully attributed data model and process model.

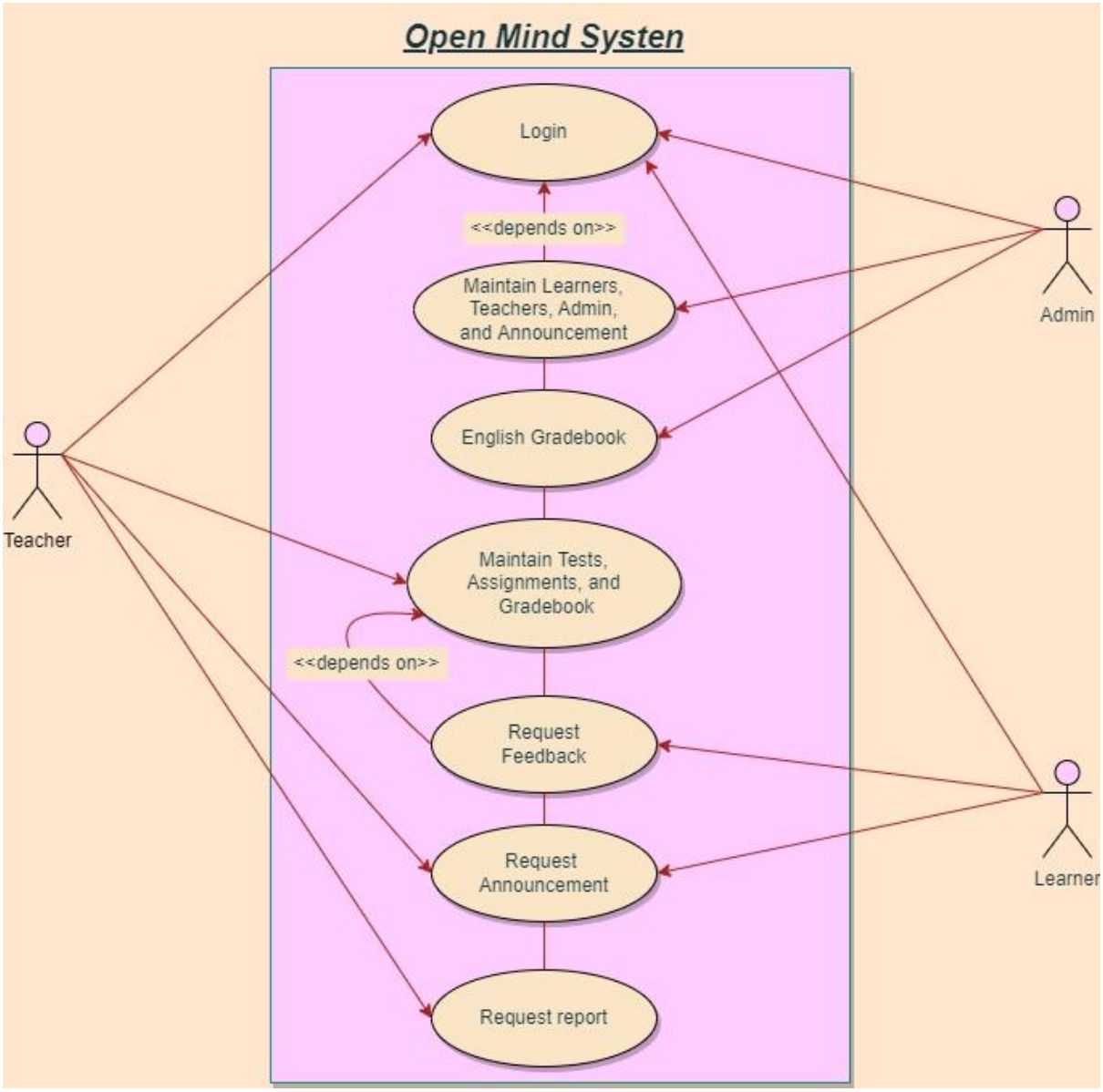
Revised/Updated parts include:

- *Project Scope (with the Scope Definition)*

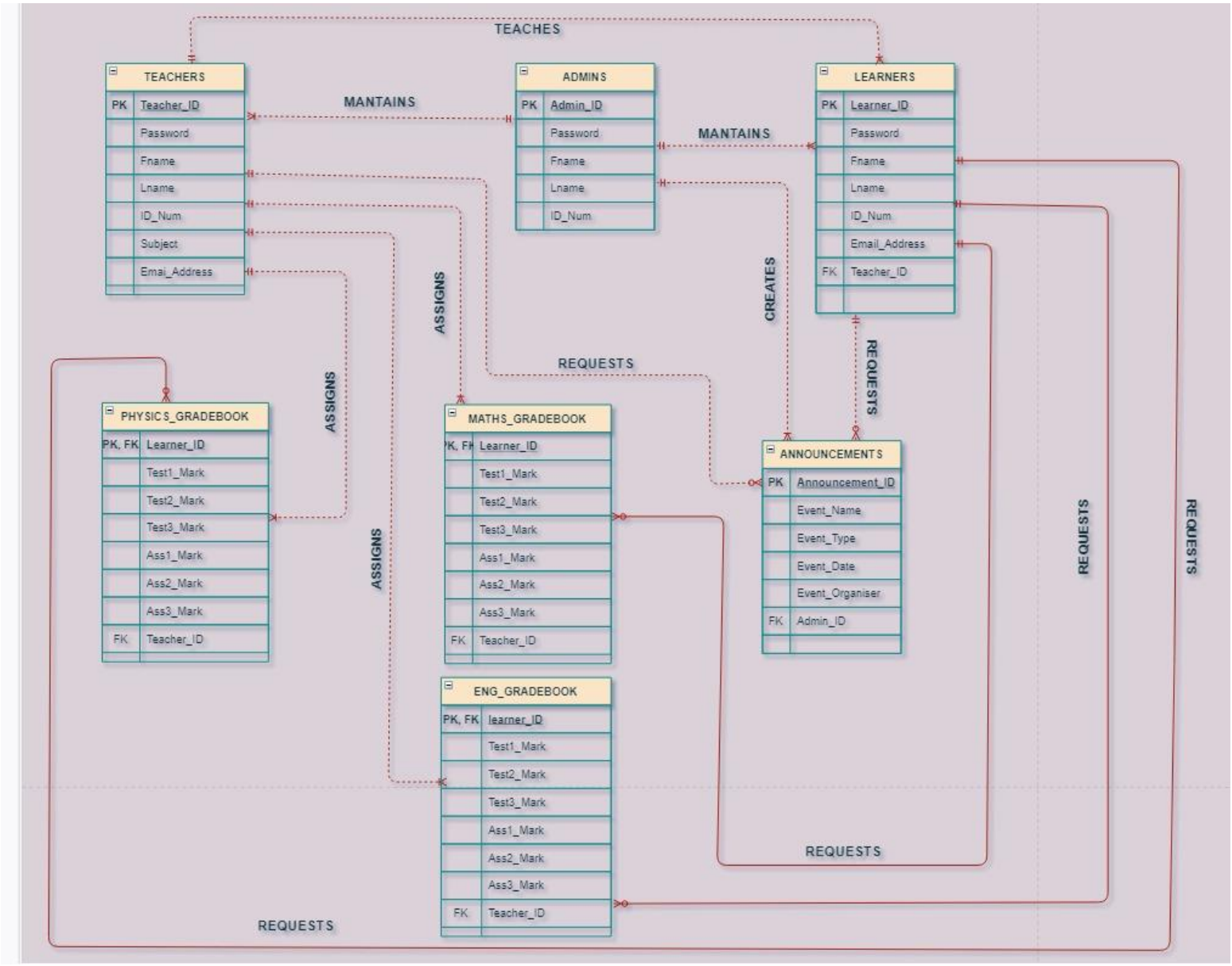
Updated Project Scope

OpenMind is an online Learning Management System. Functional requirements include maintenance of admin, teachers, learners, tests and assignments feedback, as well as announcements. The users of the system are the teachers, learners, and admin worker.
Functionalities such as extensive reporting of tests, assignments, and average marks will be included. Finally, a short report depicting the learners' performance from highest to lowest marks will also be available.

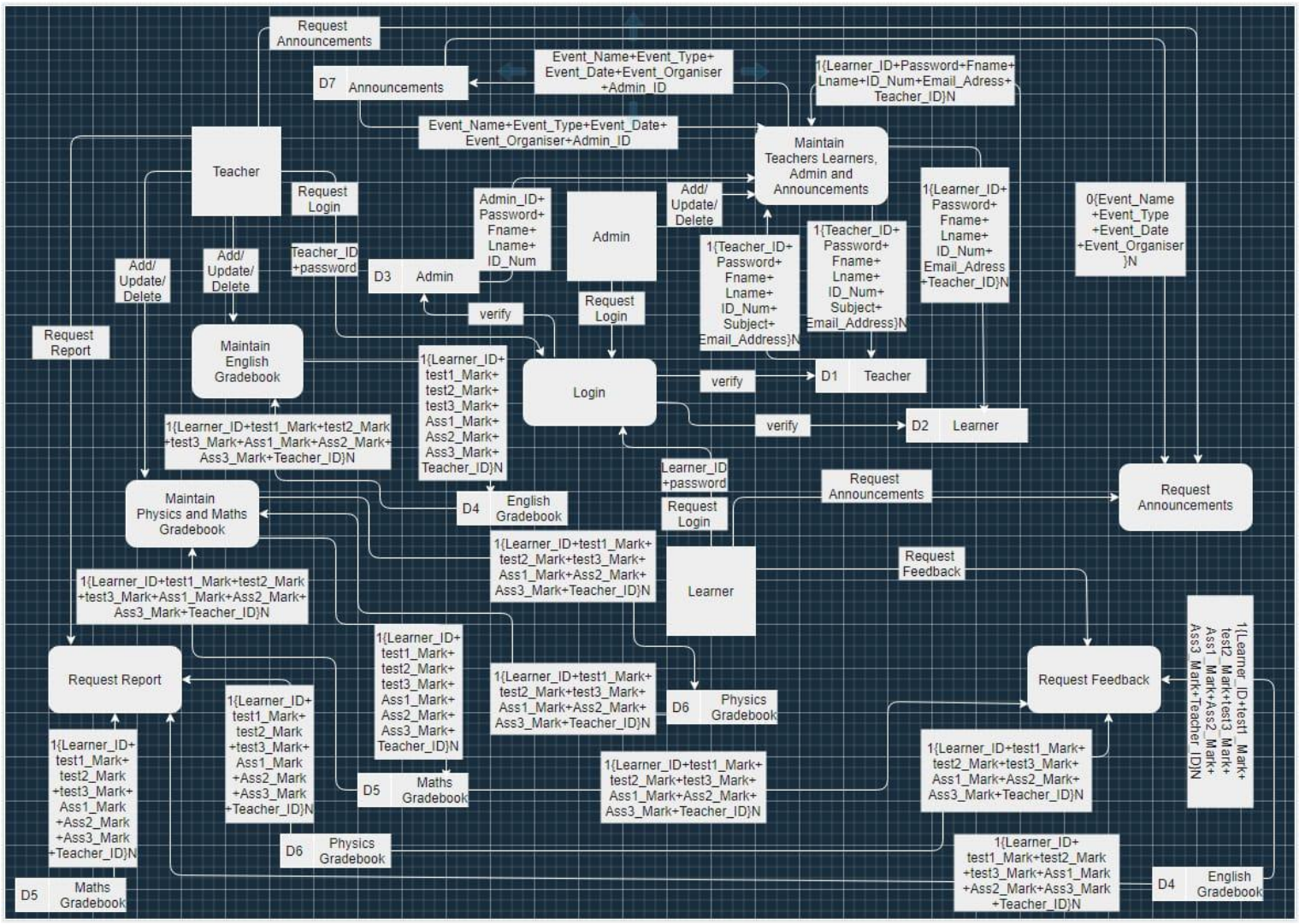
OpenMind Use Case Diagram



OpenMind Data Model



OpenMind Process Model



-End of Phase 3-