Proposal of
Online Examination System

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1. Introduction:

In this world, the outcomes of several tests are used to carry out anything that must be upgraded. Whether testing software, programs, or people. This application is built around that idea. To be specific, the application's main idea is to skill test individuals at any level under the corresponding problem sets assigned by the teacher. This program can be used to completely replace the outdated and conventional method of conducting and attending exams.

Since technology has recently taken over the world. Everything appears to be improving over time, from food delivery to consumers' homes to financial sectors with online payment systems. The same educational system and the way it is managed appear to be trailing despite the daily advancement of technology. Why can't the educational sector employ the most advanced technology but sensitive industries like banking and medicine can?

People who have received an education in a field are better equipped to think, feel, and act in ways that promote success and increase both their own and their community's degree of happiness (Al-Shuaibi, 2014).

The application's main goal is to completely phase out paper-based evaluation.

1.1 Problem scenario:

i) Administration of evaluations using paper requires a lot of time. It can take many months to complete the cycle of administering the forms, collecting, and analysing the data, disseminating the results, and acting on the feedback (Explorance, 2013).

ii) The high expense of paper-based testing or evaluation is one of the main issues. The procedure, which includes printing the problem sets, giving out answer sheets to the participants, and paying the paper checker, ends in a bloated and pointless expenditure of money.

iii) Method for gathering data. When everything is kept in a paper file and packed up, it is challenging to view and reuse the same record in the future.

iv) Due to the exam papers' inflexible layout, there is less flexibility in the procedure. If the questions have errors, the document must be updated. Furthermore, it prohibits altering the questions.

v) A response that requires human effort or has low confidence (such as unreadable handwriting, is invalid, or is not valid based on the set norms) is to be evaluated (pappersurvey, 2021).

vi) A huge quantity of paper is used while giving tests on paper. Because of this, trees are needlessly taken down for paper.

1.2 Problem Solution:

i) As a solution to the problem, using the mode of technology that allows the eradication of the use of paper-based evaluation and examination is the best option. This application provides an easy user interface for all the participating members.

ii) Not only conducting and attending the evaluation process. The results will also be stated for each individual and will also be recorded for future purposes.

iii) As all the information or the records are being stored in a database, it makes it a lot safer, more manageable, and easier to handle the data properly.

iv) This application boosts the efficiency of work by properly utilizing the amount of force and reducing the time consumed.

v) With less paper being used and discarded during paper-based testing, fewer trees will need to be cut down, which will help preserve the environment.

vi) The cost of using and distributing materials to conduct an exam is also reduced by this application.

vii) It resolves issues with poor and atrocious handwriting and correct or incorrect responses depending on predetermined standards.

viii) This application is a suitable step to ensure that technology is used in education, enabling it to advance and improve institutional sectors.

ix) The technology makes it far simpler to correct issues with printing mistakes and last-minute alterations than paper-based testing. When conducting critical reviews and examinations, this is quite beneficial.

2. Aims and objectives:

The product aims to provide the enterprise with a system that allows replacing various evaluations and examinations that have been taken on a paper basis in the past. The product also allows them to store the record and the information of their participants and students and use that data for further purposes. The application is also aimed to be user-friendly in every context.

2.1 Objectives:

The objectives to achieve the aim are listed below:

i) To understand the working mechanism of a web application and learn to express the product through it.

ii) To research the features to be added to the application to make it fully useful.

iii) To research the tools, ide, and different software to enhance the application itself.

iv) To work with the data using the most appropriate database for better security and functionality of the product.

v) To learn and implement API to leverage the existing code on the different ends of the application (front end and back end).

vi) To provide a fast, efficient, secure, and trustable application to conduct and attend evaluation tests or examinations.

3. Expected outcomes and deliverables:

This app promises to its users that it will have a well-functioning web application with all the mentioned functionalities to achieve its aim. This app will allow an institute to have student progress data in digital form, helping to retrieve the information efficiently and effectively. This app will help to keep track of the past reports of both students and the institute.

To elaborate more on the deliverables (according to the acting users):

3.1 Primary deliverables:

3.1.1 Outcomes from the admin:

The admin has the highest control amongst the acting bodies in this application.

a) Register teacher/student/staff

b) Remove teacher/student/staff

c) Update teacher/student/staff

d) Post notice

e) Generate a report

3.1.2 Outcomes from the staff:

The staff is the support system. Questions and queries asked by other bodies are resolved by this body.

a) Register teacher/student

b) Remove the teacher/student

c) Update teacher/student/staff

d) Post notice

e) Generate a report

3.1.3 Outcomes from the teacher:

The teacher is the evaluation conducting body.

a) Remove the student

b) Generate a report

c) Conduct exam/quiz/evaluation/problem set

d) Set answers

3.1.4 Outcomes from the student:

The student is the body that attends the examination or the evaluation.

a) Give exam or quiz

b) View report

3.2 Secondary deliverables:

a) Login credentials are sent through email after registration.

b) Random password generator.

c) Password change option.

d) Digital/email marketing is open due to the availability of the student's email addresses.

The above outcomes and deliverables have been listed and elaborated according to the acting bodies of the application. The bodies functioning together provide an overall working online evaluation/examination application.

4. Project risks, threats, and contingency plans:

4.1 Project risks, and threats:

Software without risks, small failures, and bugs are next to impossible. So, some of the risk factors in this project may be:

i) Though the internet is available in every major city today, it might not be available in rural areas.

ii) Sometimes when an online exam is attended through different places (that is, students might be giving the exam from their homes), asking questions to the teachers might be inconvenient.

iii) Some technical issues. Technology at its best cannot be relied upon completely. Sometimes due to power cuts, the students might not be able to attend the evaluation at the expected time.

iv) Institutional data is very sensitive, and it must be handled carefully.

v) It might be a little difficult for small children to use the web application at first.

4.2 Project contingency plans:

It might be difficult to completely eradicate the risks and threats, but they can be minimized through the following ways:

i) Providing some data plan options to the students in case of internet problems and power cuts.

ii) Complete isolation of the internet cannot be addressed but most of the places having internet can have proper access to the application.

iii) Admin, staff, and the teacher to take caution if alteration is needed in the data.

iv) Provide a proper video on the usage of the application.

5. Methodology:

5.1 Selected methodology:

Prototyping Model (Evolutionary Prototyping):

The chosen methodology for this application is evolutionary prototyping.

Using the evolutionary prototyping method, the software developer or development team first produces a prototype. The final product is created after collecting initial consumer feedback and creating subsequent prototypes, each with enhanced or expanded features (Sherrell, 2013).

Prototyping Model Phases (SDLC phases):

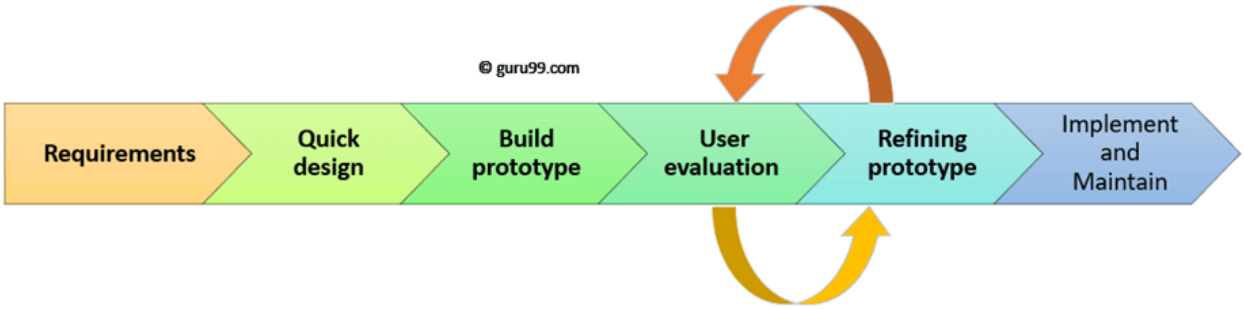


Figure 1 Prototyping Model Phases, (Martin, 2022)

i) Requirements gathering and analysis: The first step in prototyping is to do a requirement analysis. At this stage, the system's needs are thoroughly established. (Martin, 2022).

Throughout this process, I would ask the client questions to determine what they wanted from the product and move forward with their answers.

ii) Quick design: The second stage could consist of a quick design or a rough design. During this stage, the system's fundamental design is developed. But it's not a fully realized design yet. It provides the user with a quick overview of the system. The rapid design aids in the development of the prototype (naimishsahu08, 2021).

To give the client information on the product's basic design, I would therefore give them a quick design of the product.

iii) Build of a prototype: Using the information obtained during rapid design, I would create a true prototype of the product at this step. It is a condensed form of the necessary system.

iv) Initial user evaluation: After creating a prototype, I would give it to the client for a preliminary assessment. The prototype-refinement process considers any necessary modifications and consumer requirements.

v) Prototype refinement: I would adjust the prototype as needed in response to the user's recommendations and criticisms if they were unhappy with the present version. The refinement procedure is carried on until the client's demands are satisfied. I would develop a final system based on the customer-accepted prototype after the client is satisfied with the finished outcome.

vi) Implementation of the product: When the final prototype is made, I will extensively test the system using the right testing techniques and put the final product to use.

vii) Maintenance of the product: I would perform routine maintenance on the product to ensure that it works well over the long term.

Reasons for choosing this methodology:

i) One of this methodology's main elements is its support for the product's evolving environment. This component makes it simpler to meet the client’s needs more effectively.

ii) This methodology offers a superior risk analysis as changes are encouraged.

iii) This methodology requires user participation in the product's development phase to provide a better product.

iv) There is room for improvement, which enables the addition of new and improved features to the product.

v) With this methodology, errors and functional gaps are found right away, enabling me to develop a better product.

6. Resource Requirements:

6.1 Hardware requirements:

i) Working PC (for development of the application)

ii) Internet connection

6.2 Software requirements:

i) Python (Django framework) - Backend

ii) JavaScript (React) - Frontend

iii) Database

iv) API

v) HTML and CSS - Frontend

vi) Balsamiq - Wireframe

vii) Git/ GitHub - Version Control

7. Work breakdown structure:

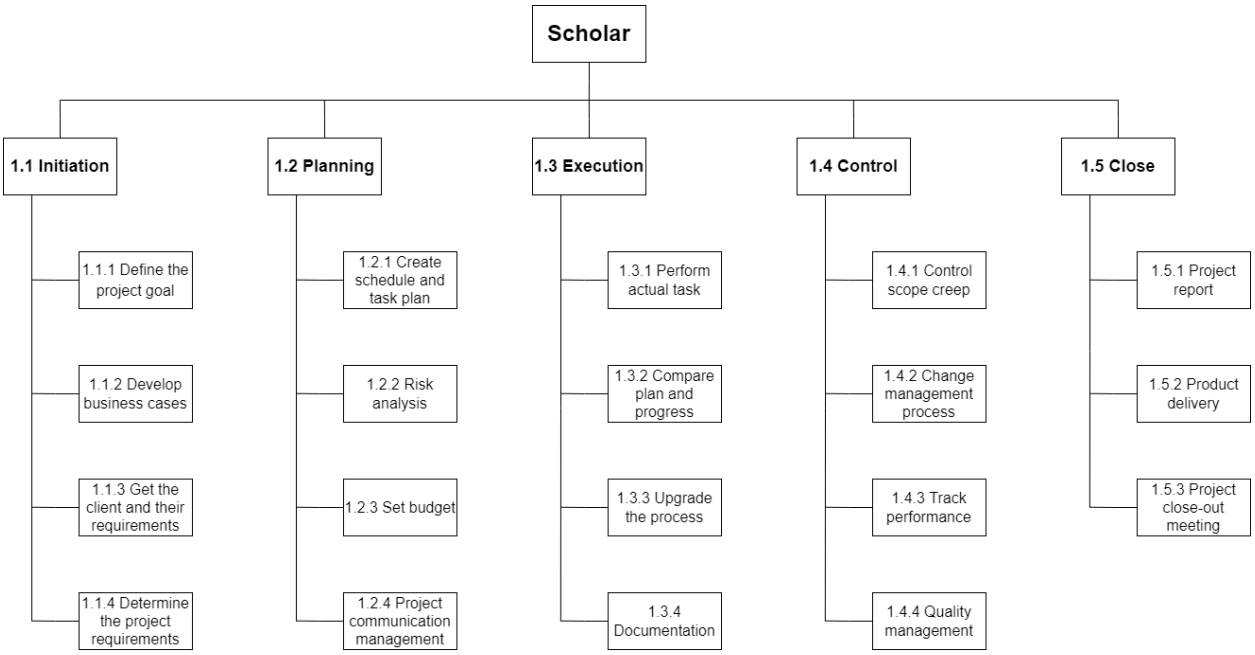


Figure 2 Work breakdown structure

8. Milestones:

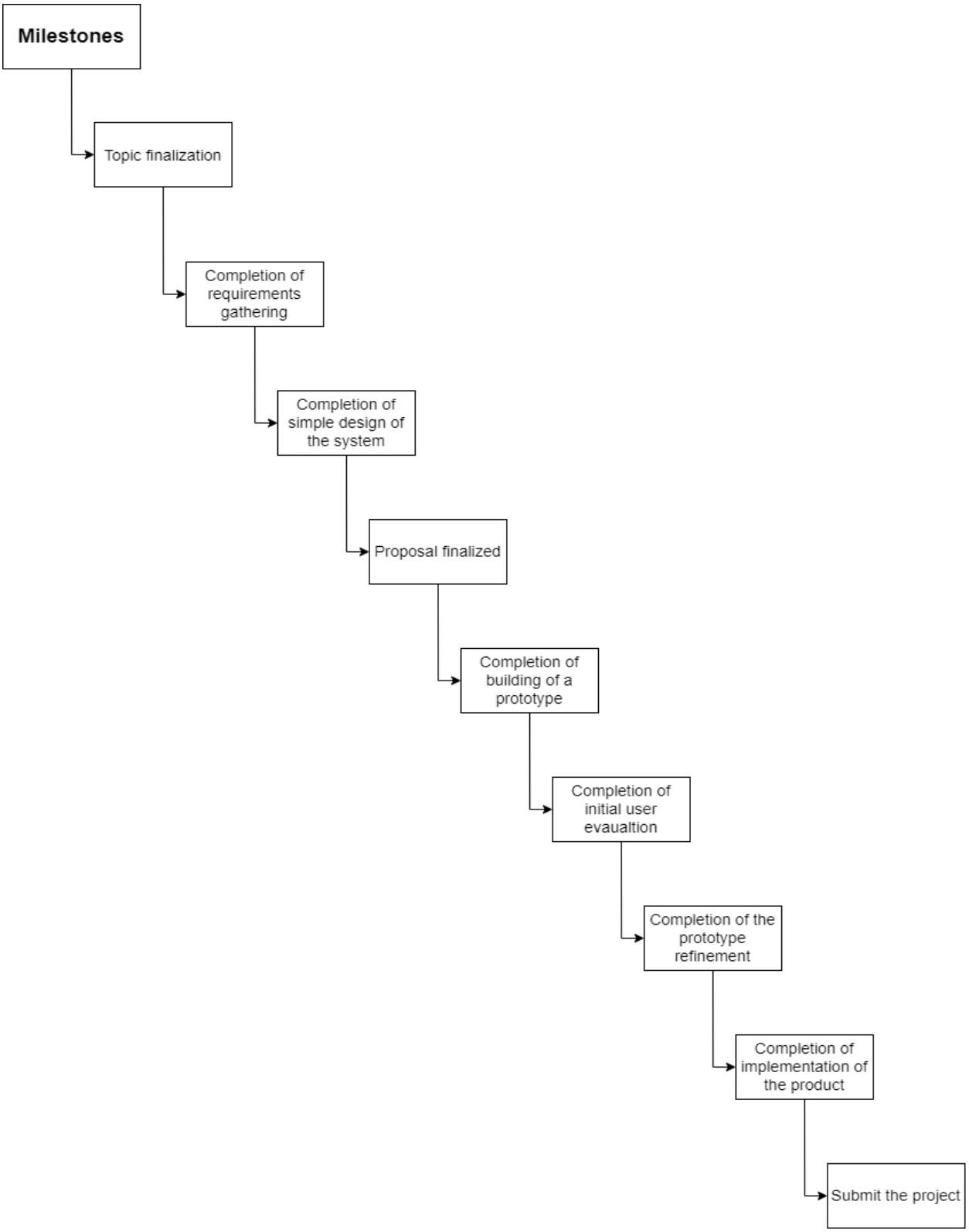


Figure 3 Milestones

9. Gantt Chart

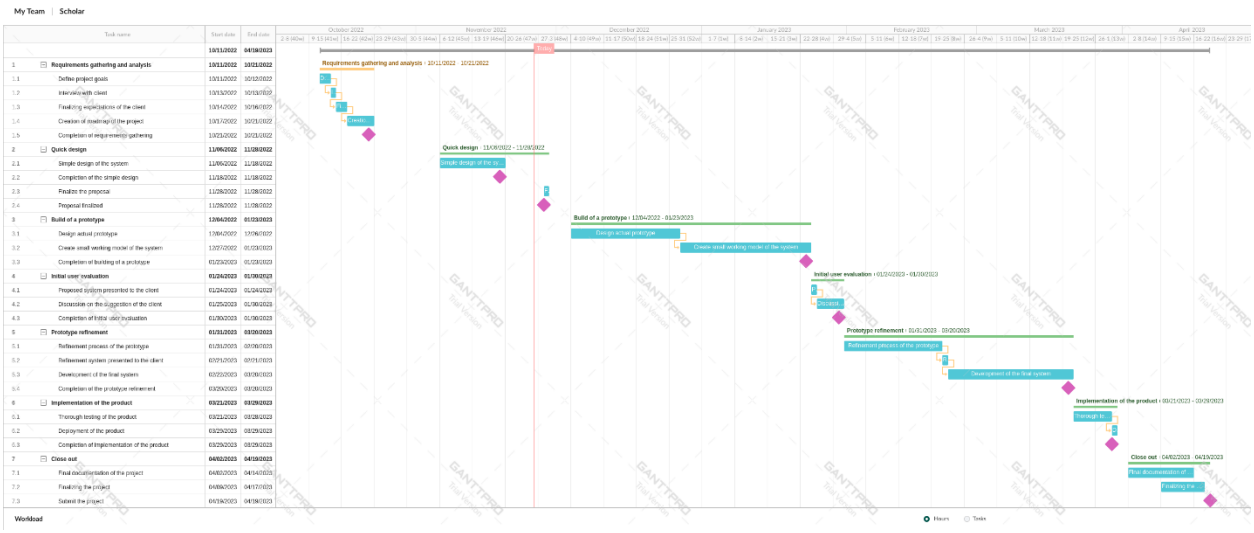
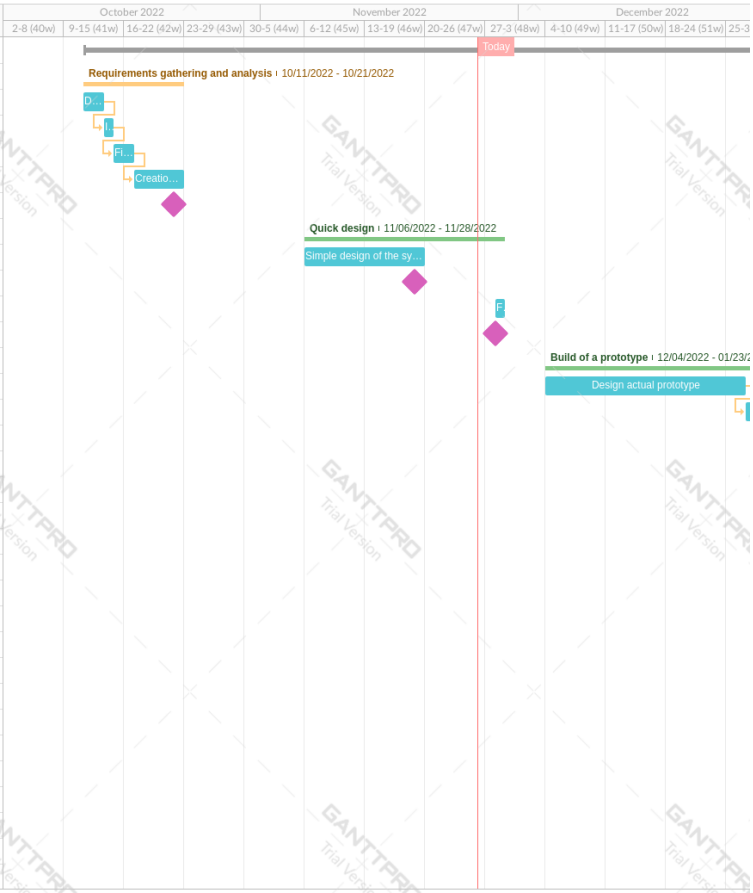


Figure 4 Gantt chart (full view)

My Team | Scholar

	Task name	Start date	End date
		10/11/2022	**04/19/2023**
1	**Requirements gathering and analysis**	**10/11/2022**	**10/21/2022**
1.1	Define project goals	10/11/2022	10/12/2022
1.2	Interview with client	10/13/2022	10/13/2022
1.3	Finalizing expectations of the client	10/14/2022	10/16/2022
1.4	Creation of roadmap of the project	10/17/2022	10/21/2022
1.5	Completion of requirements gathering	10/21/2022	10/21/2022
2	**Quick design**	**11/06/2022**	**11/28/2022**
2.1	Simple design of the system	11/06/2022	11/18/2022
2.2	Completion of the simple design	11/18/2022	11/18/2022
2.3	Finalize the proposal	11/28/2022	11/28/2022
2.4	Proposal finalized	11/28/2022	11/28/2022
3	**Build of a prototype**	**12/04/2022**	**01/23/2023**
3.1	Design actual prototype	12/04/2022	12/26/2022
3.2	Create small working model of the system	12/27/2022	01/23/2023
3.3	Completion of building of a prototype	01/23/2023	01/23/2023
4	**Initial user evaluation**	**01/24/2023**	**01/30/2023**
4.1	Proposed system presented to the client	01/24/2023	01/24/2023
4.2	Discussion on the suggestion of the client	01/25/2023	01/30/2023
4.3	Completion of initial user evaluation	01/30/2023	01/30/2023
5	**Prototype refinement**	**01/31/2023**	**03/20/2023**
5.1	Refinement process of the prototype	01/31/2023	02/20/2023
5.2	Refinement system presented to the client	02/21/2023	02/21/2023
5.3	Development of the final system	02/22/2023	03/20/2023
5.4	Completion of the prototype refinement	03/20/2023	03/20/2023
6	**Implementation of the product**	**03/21/2023**	**03/29/2023**
6.1	Thorough testing of the product	03/21/2023	03/28/2023
6.2	Deployment of the product	03/29/2023	03/29/2023
6.3	Completion of implementation of the product	03/29/2023	03/29/2023
7	**Close out**	**04/02/2023**	**04/19/2023**
7.1	Final documentation of the project	04/02/2023	04/14/2023
7.2	Finalizing the project	04/09/2023	04/17/2023
7.3	Submit the project	04/19/2023	04/19/2023



Workload

Figure 5 Gantt chart (Larger view 1)

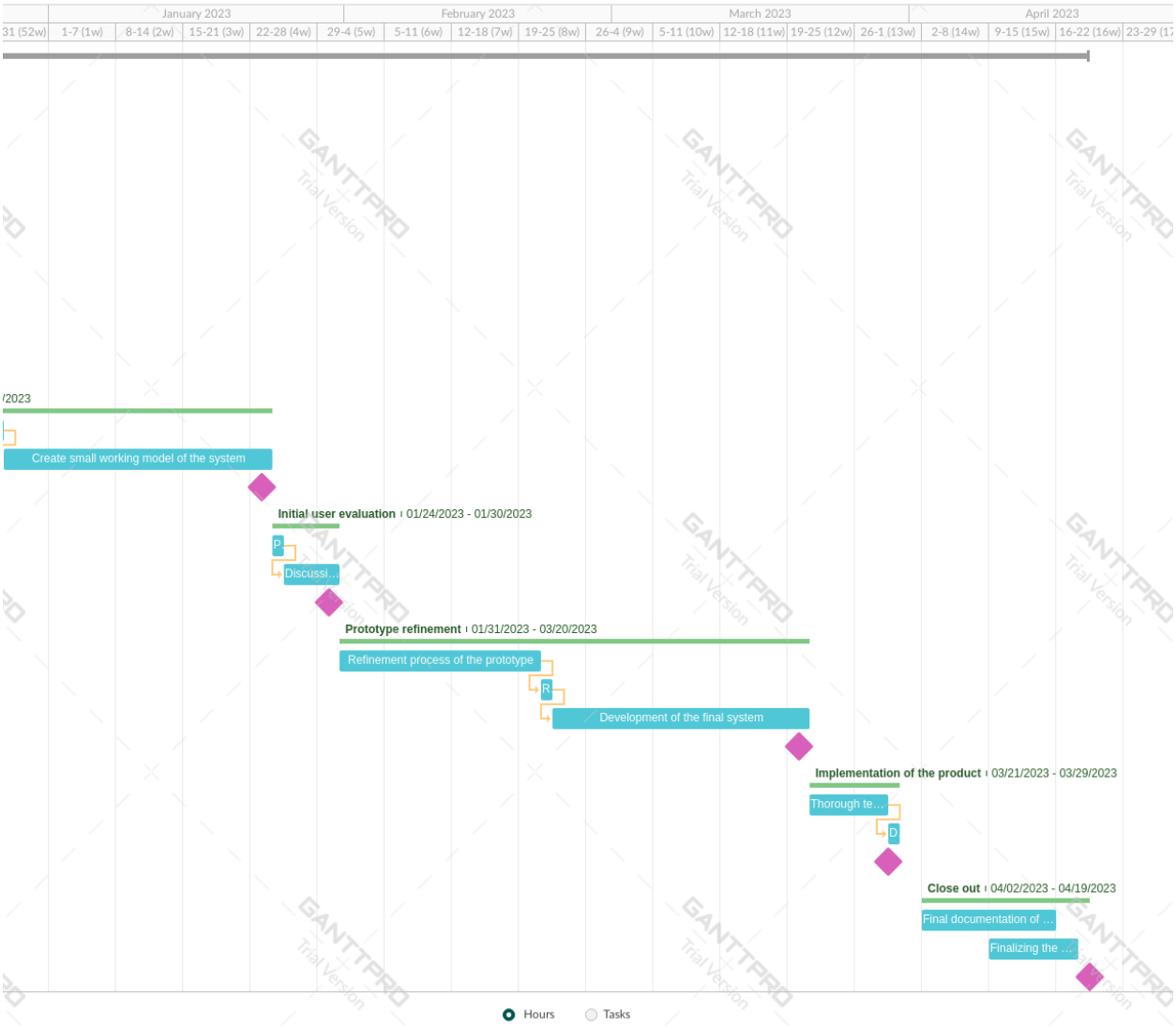


Figure 6 Gantt chart (Larger view 2)

10. Conclusion:

The overall goal of this application is to conduct and evaluate examinations and skill tests in an innovative and contemporary manner. For many institutional areas, the application is a huge aid. A clever interaction in the evaluation process is made possible by the application. With the use of this program, the time spent creating, disseminating, and waiting for results can be greatly reduced.

The notion and the concepts are new and are quite perplexing in some cases. But these difficulties are to be overcome by detailed research work and implementation of the research done. The application or the project isn’t only limited to this. This will be a great opportunity to learn the working mechanism of different tools used and would be a great assist for other future tasks as well.

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12. Appendix:

Methodology continued:

12.1 Considered methodologies:

12.1.1 Waterfall Methodology:

According to the waterfall technique, software development is carried out in a sequential or linear fashion. Several jobs make up the project's division, with phases denoting the highest-level grouping. For a phase to be declared complete and include clear departure criteria, which is frequently a sign-off from the project stakeholders, the phases must be completed in the correct order (Sherman, 2015).

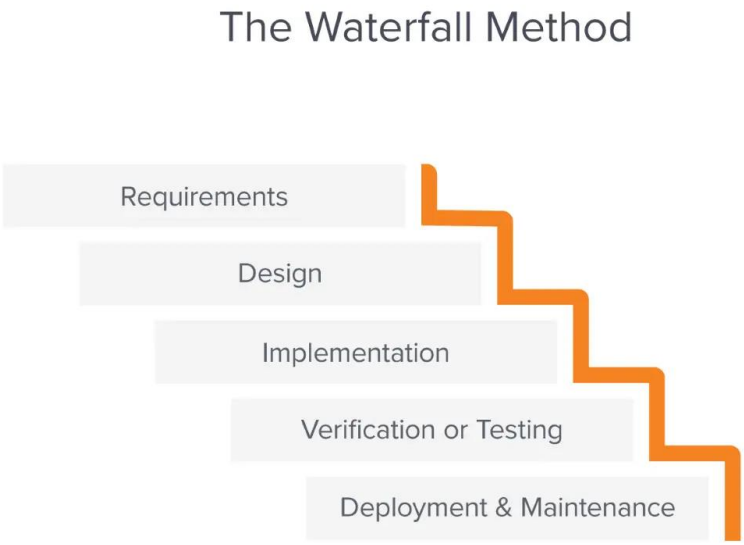

Figure 7 Waterfall Methodology (Team, 2022)

Reasons for not choosing this methodology:

i) Waterfall methodology heavily relies on teams following a set of steps that keep them always moving forward. The system can almost never be changed in traditional versions. As my product requires frequent changes in the design and implementation as required by the client.

ii) My product requires involvement of client in processes like requirement gathering and initial user evaluation. As an internal process, the Waterfall methodology lays little attention on the end user or client involved in a project.

12.1.2 Agile methodology:

Through the course of the project's software development lifecycle, agile approach promotes constant testing and development. The Agile methodology for software testing comprises concurrent development and testing as compared to the Waterfall model (Hamilton, 2022).

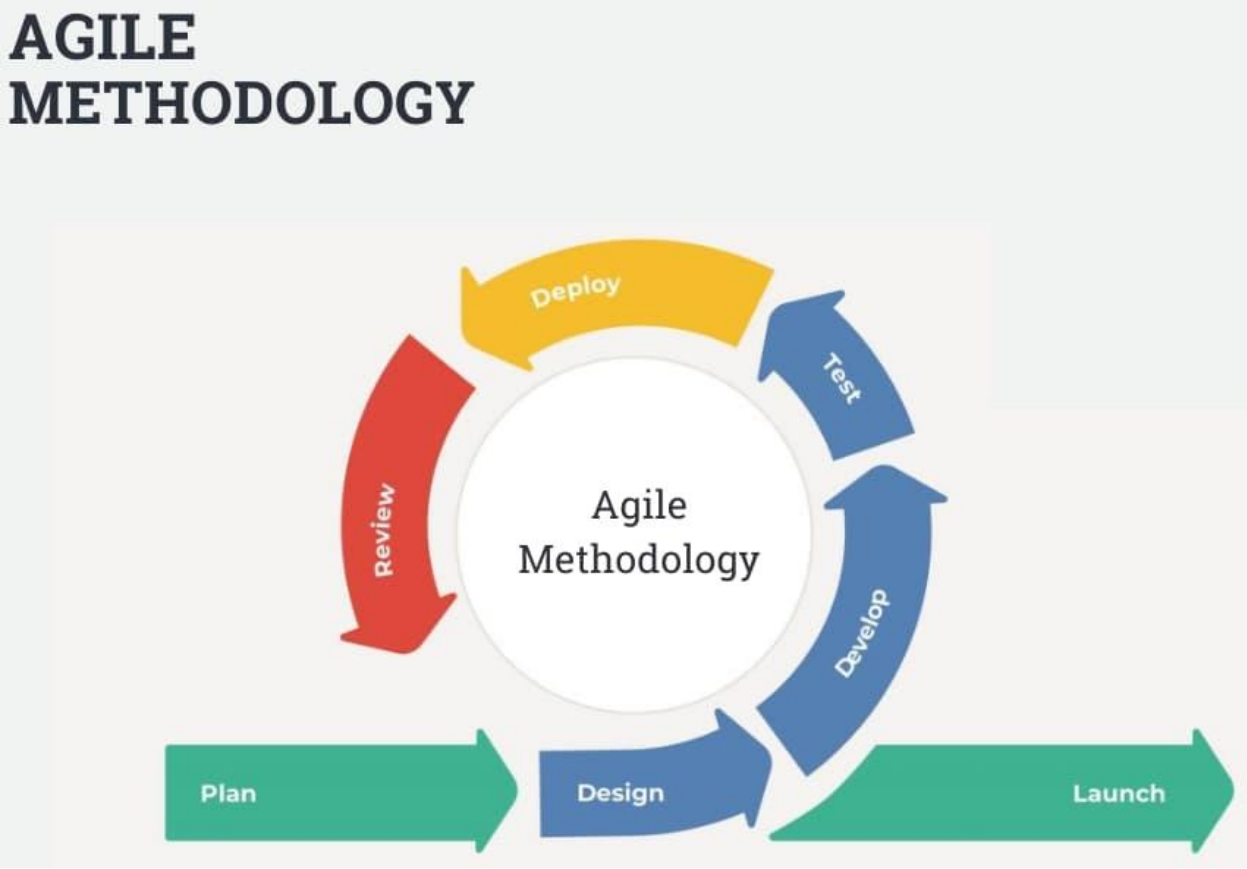

Figure 8 Agile methodology (InterQuality, n.d.)

Reasons for not choosing this methodology:

i) Agile iterations are ideal for software development because they allow for the steady creation of smaller deliverables. However, this level of fragmentation would not work with a long-term project. My product is a long-term project and therefore this methodology is not suitable.

ii) Agile methodology condenses massive volumes of data into shorter user stories with scant details. It will be difficult for a me as a result to comprehend the client requirements.