# Project Plan
# for
# KFUPM Online Testing System (KOTS)

**Team 01**

3.1

12/2/2021

| **Name:** | **ID:** |
|---|---|
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| Abdul Ilah Al Omri | 201778150 |
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# Document History and Distribution

## 1. Revision History

| Revision # | Revision Date | Description of Change | Author |
|---|---|---|---|
| 1.0 | 10/6/2021 | Completed Section 1, 2, 3 | Entire team members |
| 2.0 | 12/2/2021 | Completed Section 4, 5.1-5.5 | Entire team members |
| 3.0 | 12/15/2021 | Completed the entire document | Entire team members |
| 3.1 | 12/19/2021 | Revised the Document and fixed previous phases issues | Entire team members |
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# Table of Content

# 1. Overview

This project aims to provide a web-based examination application that is accessible to students/candidates and administrators worldwide as well as corporate employees. The application will allow tests to be conducted online by allowing all students to simultaneously take the exam, and display the automatically generated results immediately after, which provides a great advantage over in person exams along with abolishing the need for pen and paper. This project is developed for KFUPM to enhance the educational process.

# 2. Goals and Scope

## 2.1 Project Goals

- Develop a high-quality working web application KOTS
- Develop an application that can be used by educational institutions as well as corporates.
- Ensure the flexibility of conducting exams virtually to effectively deal with the pandemic COVID-19.
- Automate the work of preparing and storing results information.
- Manage time consumed by calculating and publishing test results instantly.
- Develop a reliable system that is always available for use.

## 2.2 Project Scope

### 2.2.1 Included

- Hosting of the website.
- Functional tools to solve problems that occur within the exam.
- PDF manual to the administration on how to use the system.
- Administration login for admin's panel
- Candidate login for the application users.

### 2.2.2 Excluded

- Maintenance after delivering the system.
- The design of the system.
- Training of end-users.

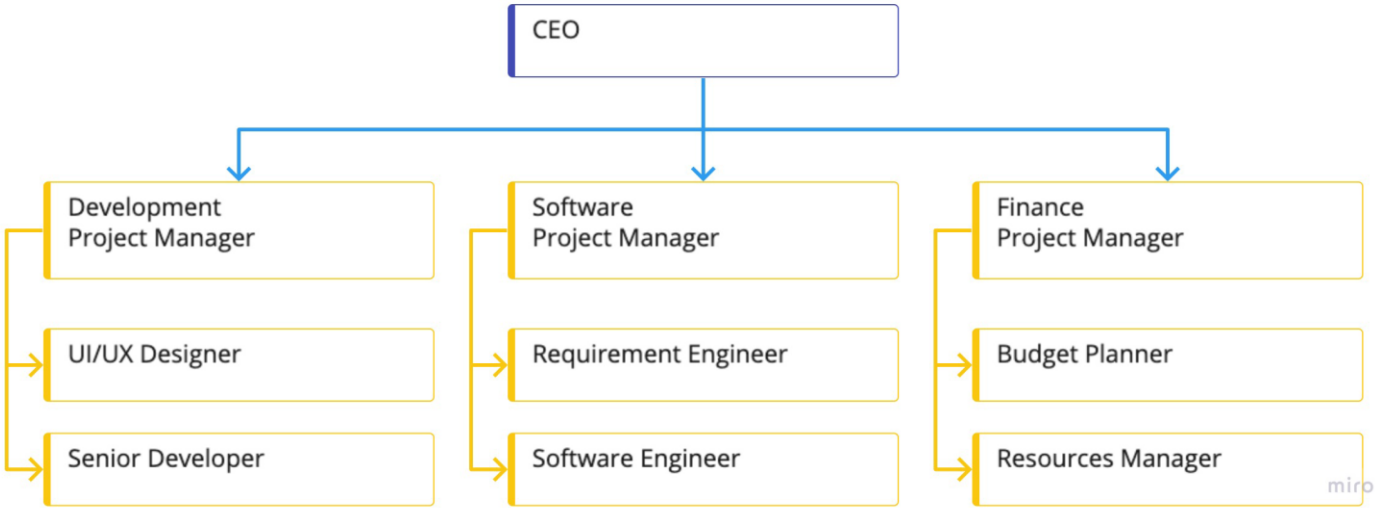
## 2.3 References


- Project Guidelines, September 17, KFUPM
- Software Project Management Plan templet, September 17, KFUPM
- miro.com

- Microsoft Project
- Cost and Budget Estimation

# 3. Project Organization

## 3.1 Project Organizational Structure




### 3.1.1 Project Team

| Team member | Role | Involvement duration (# of months) | Comment |
|---|---|---|---|
| Osama Al Fawaz | Budget Planner | 6 months | |
| Abdul ilah alomri | Resources Manager | 6 months | |
| Fahad Aloraini | UI/UX Designer | 6 months | |
| Abdurrhman Alqarawi | Requirement Engineer | 6 months | |
| Ayman Fadlallah | Software Engineer | 6 months | |
| Abdulrhman Gharsa | Project Manager | 6 months | |
| Omran Albedeiwy | Senior Developer | 6 months | |

# 4. Schedule and Budget

## 4.1 Schedule and Milestones

We used **MS Project** to develop the schedule of the project. The developed schedule is included in a separate file.

The schedule covers the five process groups with their respective activities and the sequencing of activities using Gantt Chart. The schedule also includes the WBS of the project.
The duration, start date, finish date, assigned resources are all addressed in the schedule. Milestones are clearly addressed and marked in the schedule for important dates and events.

## 4.2 Cost and Budget

### 4.2.1 Cost estimation

**Analogous estimation:**
**Click here to open**
**Google drive link:**
**https://docs.google.com/spreadsheets/d/1dkr1xfuMq1ScVyp0s5u-GXaJO9cjTuFZ/edit?usp=sharing&ouid=116908797694325579706&rtpof=true&sd=true**
**Check analogous sheet.**

**3-point estimate:**
**Click here to open**
**Google drive link:**
https://docs.google.com/spreadsheets/d/1dkr1xfuMq1ScVyp0s5u-GXaJO9cjTuFZ/edit?usp=sharing&ouid=116908797694325579706&rtpof=true&sd=true
check 3 point sheet.

### 4.2.2 Budget

**Click here to open**
**Google drive link:**
https://docs.google.com/spreadsheets/d/1dkr1xfuMq1ScVyp0s5u-GXaJO9cjTuFZ/edit?usp=sharing&ouid=116908797694325579706&rtpof=true&sd=true
check budget sheet.

# 5. Management Plans

## 5.1 Integration Management

### 5.1.1 Configuration Management Plan

We will use GitHub as the tool of configuration management to automate the process.
The methods that will be utilized to provide configuration identification, control, and release management are Promotion Branches, Enforce Change Traceability to Features/Problem Reports and finally, Use of Change Packages.
**Configuration Identification Management:** We will use unique file identifier to help us identify the provided information included in each file.
File Identifier: DocumentY_v3.0
Each file will include the following in the front page of the document:
Project Name: ProjectX
Document Title: DocumentTitleY
Date of Change:
The project manager or the responsible person:

**Configuration Control:** The project manager (Abdulrhman Gharsa) will be in charge of analysing the request and checking the requirements with the defined scope of the project, So it is possible to track how a change request will affect the project's specification and discuss it with the team member and stakeholders so it can be handled.

**Configuration Release Management:** After approving the request, the risks of involved changes will be evaluated, and the resources needed to deliver the change will be measured against the available resources. If the impact of the change is manageable, the team will go through and make required changes. This will ensure that we minimize the disruptions of changes.

### 5.1.2 Change management plan

There are three parties with the authority to approve changes to the project and they are the project sponsor, the project manager, and the Change Control Board. any stakeholder will have to submit a changes request.
We can track and monitor the changes by collecting, measuring, and disseminating performance information.

### 5.1.3 Delivery Plan

| # | Deliverable | Planned Date |
|---|---|---|
| D1 | Project charter | 11/1/21 |
| D2 | Project Schedule | 11/24/21 |
| D3 | Requirement document for the team | 1/5/22 |
| D4 | Software Requirements Specifications (SRS) for developers | 1/14/22 |
| D5 | functional version for testers | 7/14/22 |
| D6 | Final product | 8/22/22 |

## 5.2 Scope Management Plan

The project manager (Abdulrhman Gharsa) will be responsible for the project scope, project sponsors, team members, and stakeholders will have roles in establishing the project scope.

1. Gather potential scope change requests from any project stakeholder, such as the project team, clients, and sponsors.
2. Document the request using a Scope Change Request Form.
3. Enter the request into the Scope Change Log for tracking purposes.
4. The person who made the request should demonstrate the value of change and how will it meet the project goals.
5. Investigate the request further and see how much it will impact the budget and the schedule of the project.
6. Present the scope change request, alternatives, business value, and project impact to the sponsor for a decision, and see whether he authorizes it.
7. Document the resolution or course of action.
8. If the request for a scope change is authorized, the appropriate tasks and WBSs are added to the work plan to guarantee that the change is carried out.
9. If necessary, the project budget and schedule should also be revised.
10. The current Project Definition Charter should be updated if an approved scope change results in a substantial change to the project.

## 5.3 Procurement Management Plan

The procurement management plan define how it will be managed from developing the procurement document till the closing of contract. It will define the approach that will be used and the responsibilities of team members.

After doing the procurement analysis. We have come up with the need of outsourcing some items. We will use expert judgment and market research to select best supplier for our project and how the contract will be managed. Bidders' conference will be conducted later as the project proceeds. This is an initial procurement plan. However, it can change with time as more details are available.

**Procurement Responsibilities:** The team project manager (Abdulrhman Gharsa) will be responsible for requesting and approving all resources and the project manager can assign a member to take his place in his absence.

**Procurement definition:** what items will be procured and under what condition. Since items that must be procured for a project can be made internally before requesting it.

| Items/Service | Justification | Needed By |
|---|---|---|
| Servers | It is needed to stay on schedule | IT department |
| ItemX | | |

**Type of Contract:** contract will be fixed price contract for all items.

**Procurement Risks**: Identify all potential risks associated with procurement. Depending on the contract type, the items purchased, vendor reputation, project scope uncertainties, schedule, and budget.

| Risks | Possibility of occurrence | Possible Solution |
|---|---|---|
| ServiceA will arrive late | High | Adjust project schedule |
| | | |

**Performance Metrics of procurement activities:** to ensure that the project will stay on schedule.

| *Ordered by* | *amount* | *item* | *Vender* | *Cost per unit* | *Date of delivery* |
|---|---|---|---|---|---|
| *IT department* | *3* | *servers* | *Dimofinf* | *300$* | *6 Nov* |
| *IT department* | *3* | *servers* | *IBM* | *600$* | *10 Nov* |
| *IT department* | *1* | *DBMS server* | *Amazon* | *900$* | *9 Dec* |
| *Deveolpment team* | *9* | *MacBook pro M1* | *X-cite* | *999$* | *10 Oct* |

**Sponsor Acceptance:** Acknowledgment from the project sponsor that they have reviewed and approved the procurement management plan for the project. Any changes to the plan will be addressed with them.

## 5.4 Schedule Management Plan

The project schedule will be created using **Microsoft Project**. Which will also be used to create the Gantt Chart, WBS, and the milestones.
The Work breakdown structure and milestones were estimated using expert judgment and the experience from working on similar projects and based on the specifications of this project.

Abdulrhman Gharsa who is the project manager and Omran Albedeiwy, a senior developer, will be responsible for developing and maintaining the work breakdown structure through the life of the project. However, the team will give regular updates to Abdulrhman Gharsa and Omran Albedeiwy so that they can make sure that the project is on schedule by checking the completeness of the Gantt Chart.

Abdulrhman Gharsa and Omran Albedeiwy will also be responsible for notifying the team of any changes that occur in the schedule to ensure that the team will follow the schedule.

The project manager, Abdulrhman Gharsa, can make changes to the schedule as he sees fits for the success of the project.

## 5.5 Cost Management Plan

Osama Al Fawaz, *the budget planner of the project,* will be the person responsible for managing the cost throughout the project duration. Osama asks for approval to changes to the budget of the project from the project manager Abdulrhman Gharsa.

Any changes to the budget should be discussed with the financial team and then approved by the CEO

The cost performance is quantitatively measured by the project manager using EVM so that he ensures that we do not spend more than the budget of it and the reserve for that month.

## 5.6 Quality Management Plan

Planning a process to reach a well fitted outcome is the purpose of the quality management plan(QMP). We will do the quality management plan according to following three factors:

1. **Quality roles and responsibility:**

   There will be reviews by an outside team as well as having peer reviews.

   In addition, coding standards by the IEEE will be used by the members of the developing team.

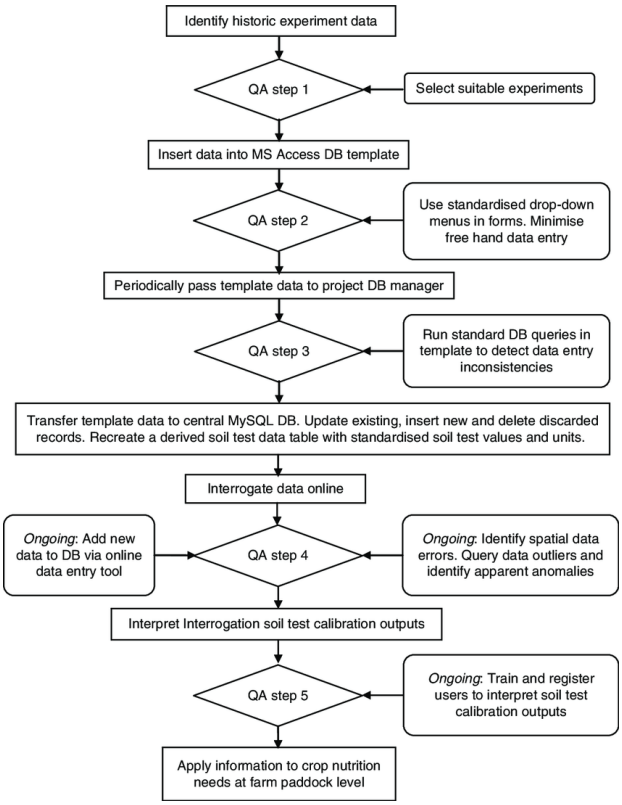
2. **Quality assurance:**

To ensure the quality, coding standards will be used as well as following "code reviews best practices".

After that peer reviews will be conducted. We will also involve students and instructors from KFUPM to test for the user acceptance

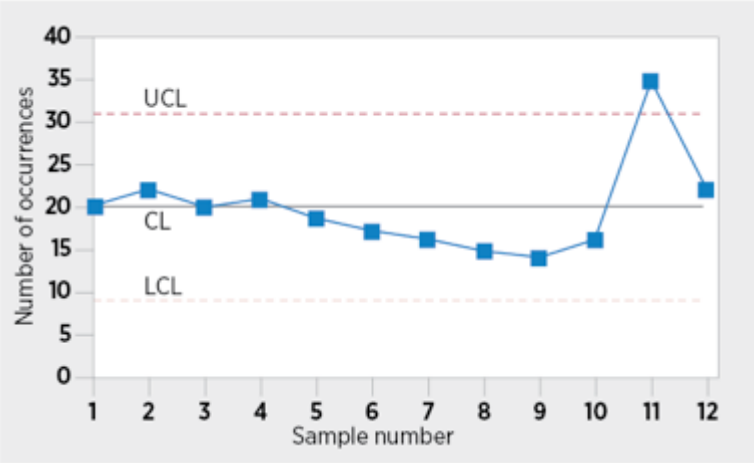
3. **Quality monitoring and control:**

we will use different tools and techniques for Quality monitoring and control depending on the issues we run into throughout the life of the project, and the problems that we need to monitor and control.




- We will use a flowchart to document the processes of an activity or program to help us understand and visualize what is going on and what are the flaws.

- Control chart will be used to study how the process will change over time. Where we will be plotting the data in a timely order. And we can measure the performance by setting the upper and lower bounds of the acceptable performance.




## 5.7 Resource Management Plan

**Staffing plan :** The most important thing to consider is to determine the goals that should be achieved and make the resources be aware of it (updates, changes…etc.). In addition, the factors that impacting Personal Availability should be considered such as vacation, emergency situations, illness…etc. Moreover, we should also Conduct Gap Analysis to determine and compares what we have currently with what we need such as are the gaps (if there are some) due to heavy workloads during high seasonal demand periods…etc.

| **Resource** | **Source / Requirements** | |
|---|---|---|
| Project Team (Full and Part Time Staff) | *NAME* | *ROLE and Duration* |
| | Osama Al Fawaz | Budget Planner, 6 months |
| | Abdul ilah alomri | Resources Manager, 6 months |
| | Fahad Aloraini | UI/UX Designer, 6 months |
| | Abdurrhman Alqarawi | Requirement Engineer, 6 months |
| | Abdulrhman Gharsa | Project Manager, 6 months |
| | Omran Albedeiwy | Senior Developer, 6 months |
| | Ayman Fadlallah | Software Engineer, 6 months |
| Equipment | 1– 7 PCs supporting windows 10<br>2- PC accessories (Cams, mouses, keyboards etc….)<br>3- 7 Desks with chairs<br>4- 7 Monitors for the PCs | |

| | |
|---|---|
| Software Tools | 1- Microsoft temas<br>2- Web storm IDE<br>3- Micorosoft planner<br>4- Github<br>5- Slack |
| Other Essentials | 1- Internet connection<br>2- A place to work in with a break room and in a good condition |

## 5.8 Communication Management Plan

- The report will be made every week, at least once between stakeholders.
- The main goal is to give stakeholders enough information so they can be informed and can give us their appropriate decisions, and communication with stakeholders may be good news or bad news.
- There are three basic meetings. The first one takes the requirements and signs the contract, the second to follow up on the work, and the third before handing over the project.
- Meetings will be monthly
- The official means of communication between the organization and the client organization is e-mail, and in the case of a meeting, it will be at the company's headquarters.

| Communication Type | Description | Frequency | Format | Participants/ Distribution | Deliverable | Owner |
|---|---|---|---|---|---|---|
| Status Report | E-mail to describe where the project stands | Monthly | In-Person | Project Sponsor | Status Report | Abdulrhman Gharsa |
| Progress Report | Describe what the project has accomplished | Weekly | E-mail | Project stakeholders | Progress Report | Abdulrhman Gharsa |
| Forecasts | Predicting the status of the project | Monthly | In-Person | Project Sponsor, Stakeholders | Forecasts Report | Abdulrhman Gharsa |
| Project Review | Present metrics and status to team and sponsor | Monthly | In-Person | Project Sponsor, Team, and Stakeholders | Status and Metric Presentation | Abdulrhman Gharsa |
| Project Team Meeting | Meeting to review the status of the project before presenting it to | Weekly | In-Person | Project Team | Report of outcomes | Abdulrhman Gharsa |

| | | | | | | |
|---|---|---|---|---|---|---|
| | the stakeholders | | | | | |
| Construction Status | Report outlining weekly progress and issues | Weekly | E-Mail | Project Team | Construction Status Update | Abdulrhman Gharsa |

## 5.9 Risk Management

To best meet project objectives and improve success by anticipating problems and avoiding them, we will be considering managing risks to be part of the project development. And to make sure that we achieve our goal of identifying and managing all the risks related to the project, we will be following a number of steps or process.

1. **Identifying Risks:** we will find what potential events might hurt or enhance the project development. We will be conducting Brainstorming group sessions to generate ideas or solutions to the possible problems using our experience from working on similar projects. A *Risk Register* will be completed to list all the identified risks.
2. **Performing Qualitative and Quantitative Risk Analysis:** We will assess the likelihood and impact of the identified risks. This will help in determining the risk's magnitude and priority. We will be using a probability/impact matrix. And a decision tree to help us analysis and select the best course of action of uncertain future outcomes.
3. **Planning Risk Responses:** After identifying and analyzing the risks, we will decide on the approach needed to response to each risk. We will use the basic response strategies based on whether it is a negative or positive risk.
4. **Implementing Risk Response:** After planning the approach for responding to risks. We will respond to the risk by identifying if it is a positive or negative risk. For each major risk, a plan will be created to mitigate or exploit it to enhance the project performance. The created plan will then be discussed to decide on how to resolve the risk.
5. **Monitor Risk:** We will ensure that appropriate risks responses are applied, all identified risks are tracked, identify and analysis the new risks that occur, and evaluate the effectiveness of our risk management throughout the project development. We will be using our generated Gantt Chart to help in monitoring the risks and conduct meetings when needed to manage the risks.

   The project manager (Abdulrahman Gharsa) will be responsible for the risk management of the project.

### 5.9.1 Risk Register

| # | R | Risk | Description | Category | Root Cause | Triggers | Potential Responses | Risk Owner | Probability | Impact | Status |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | Long loading time | Application's servers take too long to response to a user request. | Project | Bad Servers | User Complaints. | Change to a different server provider. Buy more servers | Project Manager (Abdulrhman Gharsa) | Medium | Medium | Closed |
| 2 | 1 | Design Issues | System design was not reviewed by the architect. | Project | Team member absence. | Lack of communication | Hire an architect from outside the company. | Ayman Fadlallah | Medium | High | Closed |
| 3 | 5 | Employee Training | Employees are facing difficulties using the system. | User Experience | Lacking Experience. | User mistakes, lower outcome | adjust UI/UX to be usable for new employees, Add tutorial. | Fahad Aloraini | Low | Low | Open |
| 4 | 3 | Features Test | New features are untested, or tests are uncompleted | Testing | Delaying the development of the system. | Behind schedule. | Conduct meeting with team members to review schedule of developing new features. | Omran Albedeiwy (Senior Developer) | Low | High | Open |
| 5 | 4 | Delay of delivering procurement | Contracted procurements services are arriving late of schedule. | Project | Not upholding the agreement of the procurement contract | Schedule is falling behind. Lack of services. | Contact vendor to discuss the problem and possible approach to solve it. | Abdul ilah alomri | Low | Medium | Open |

## 5.10 Stakeholders Management Plan

**Identifying Stakeholders:**

| Name | Position | Internal/External | Project Role | Contact Information |
|---|---|---|---|---|
| **Mohammed Alshayeb** | KFUPM Representative | Internal | Project Sponsor | Mohammed@kfupm.edu.sa |
| **Omran Albediwy** | Senior Developer | Internal | Team member | Omran@gmail.com |
| **Abdulrhman Gharsa** | Software Engineer | Internal | Project Manager | Abdulrhman@gmail.com |
| **Ayman Fadlallah** | Software Engineer | Internal | Team member | Ayman@gmail.com |
| **Abdul-ilah al-omari** | Resource Manager | Internal | Team member | Abdulilah@gmail.com |
| **Abdulrhman Al-qarawi** | Requirement Engineer | Internal | Team member | Alqarawi@gmail.com |
| **Osama Fawaz** | Budget Planner | Internal | Team member | Osama@gmail.com |
| **Fahad al-oraini** | UI/UX Developer | Internal | Team member | Fahad@gmail.com |
| **Abdullah Masod** | HR | Internal | Support staff | Masod@gmail.com |
| **Musaad Al-khaldi** | CEO | Internal | Executive | Musaad@gmail.com |
| **Ministry of Education** | Regulator | External | Provide rules and regulations | MOE@gov.sa |
| **IBM** | Vendor | External | Provide Servers | Stephen@IBM.com |
| **Amazon** | Vendor | External | Provide DBMS servers | vendor@Amazon.com |
| **X-cite** | Vendor | External | Machines vendor and responsible for | vendor@X-cite.com |

| | | | | |
|---|---|---|---|---|
| | | | the machines warranty | |
| **Waleed Al-asd** | Student | External | End-User | Waleed@gmail.com |
| **Abdullah Hakeem** | Instructor | External | End-User | Hakeem@gmail.com |

**Stakeholders Power/Interset Diagram:**


**Stake Holder Management Strategy:**

Stakeholders will be managed depending on the area of their power/interest. The stakeholders in the monitor area will be monitored on regular basis to make sure that they provide the services needed for the project. Stakeholders in the inform area will be informed by the decision made to the project by upper management, immediately since they are critical to the project. Stakeholders in the satisfy area will be contacted and be present in major parts of the project. While “work

with stakeholders” area is the important one they will be the ones who make the calls with the involvement of the project manager.

# 6. Development Process

The development process we are using for the online examination software is the waterfall process.

We have dedicated a lot of time for defining and documenting the requirements.

We first gathered the functional and non-fictional requirements using multiple techniques:

1- Brainstorming: we used this technique to mostly gather the generic requirements.
2- Document analysis: we reviewed the requirements provided by KFUPM regarding the system.
3- Interviews: for any unclear requirements.
4- Focus groups: with representatives from all actors.
5- Survey/questionnaire: to improve the user experience.

After collecting and documenting the requirements we designed the program while upholding the best design principles and architecture.

Then, we started with the implementation using the functional requirement (to decide on things like programming language) and applying our earlier design.

Then, we thoroughly tested the software using several techniques including: unit testing, component testing, integration testing, and acceptance testing.

Finally, we deployed the application on the agreed platforms (web, IOS, Android).

Reasons behind choosing the waterfall model:

1- We put a lot of effort into ensuring our requirements are stable and rarely susceptible to change if at all.
2- Any changes would have minor impact on our different phases.
3- Using the waterfall model we can focus on the design phase to make sure we use the most efficient design and architecture patterns. This is important for an examination system to minimize and try to eliminate any problems for the users mid examination.
4- This is relatively small project which works well with the waterfall model and requirements are easily understandable.
5- The project will be well documented for future expansion or alteration.

# 7. Abbreviations and Definitions

| Abbreviations | Definitions |
|---|---|
| WBS | Work Breakdown Structure |
| CCB | Change Control Board |
| UI | User Interface |
| UX | User Experience |
| CEO | Chef Executive Officer |
| EVM | Earned Value Management |
| HR | Human Resources |
| QMP | Quality Management Plan |