SUPPLEMENTARY SCHEDULE MANAGEMENT SYSTEM SOFTWARE REQUIREMENTS SPECIFICATION (SRS) DOCUMENT

Khartoum University 4th Year Students

Faculty of Engineering, University of Khartoum, Khartoum, Sudan

Date: 8 February 2023

REQUIREMENT DOCUMENT HISTORY:

Document revisions:

Version	Primary Author(s)	Description of Version	Date
Initial (1.0)	• Requirement Engineering Working Group: - Mugtba Mirghani - Mohamed Ahmed - Mohammed Ashraf - Monzer Omer - Ahmed Alsiddig	Initial draft.	8/02/2023

Document review & approval:

Reviewers	Version Approved	Signature	Date

1. INTRODUCTION

1.1 Purpose of requirements document

While assisting system stakeholders in gaining a better grasp of the project, this document provides a full explanation of the requirements for the Supplementary Schedule Management System that University of Khartoum fourth-year students will be developing. The Associated University Teachers and Employees, especially Ms. Ruaa and Dr. Rania (Head of the Registrar's office), are the main recipients of this document.

1.2 Scope of the product

The Registrar's office is in charge of determining the best schedule for the student's supplementary exams. It is also expected to distribute exam monitors based on their availability on the specified schedule.

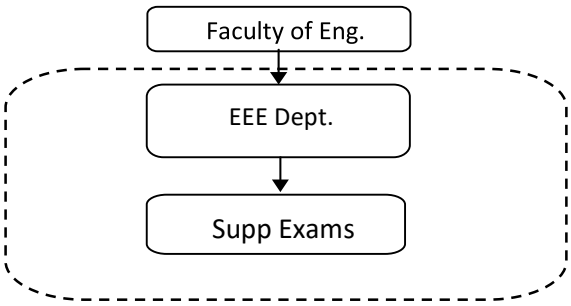

Figure 1. Scope of Product

Figure (1) depicts the system boundaries with a dotted line, which will help the registrar's office set the required schedule for supplementary exams, in which it is preferred for each exam to be as far away from the next one as possible - a fair gap for each student.

1.3 Definitions, acronyms and abbreviations

The following terms are used in this document and described as:

FoE: **F**aculty **o**f **E**ngineering.

EEE Dept: **E**lectrical and **E**lectronics **E**ngineering department held at University of Khartoum.

1.4 References

- Meetings:

- 4th year students with Ms Ruaa & Ms Marwa, on 8th February 2023 to discuss the problems.
- 4th year students with Dr. Rania, Head of Registrar's office on 9th February 2023 to discuss available solutions.

1.5 Overview of the remainder of the document

The rest of this document describes in detail the functionality proposed for the proposed system and its quality requirements, followed by appendices.

2. GENERAL DESCRIPTION

2.1 Product perspective

In the current process, the registrar receives the first student's data and creates a schedule for his exams, which is then revised based on the data received from the second student, and so on.

The registrar also manually calls the available exam monitors and confirms their availability in the specific schedules, after which the schedule is developed based on their responses. Figure (2) depicts the current configuration of the scheduling process for students and monitors, taking into account that there are some common subjects for all Engineering students, the dates for which are received from the FoE and are not expected to change.

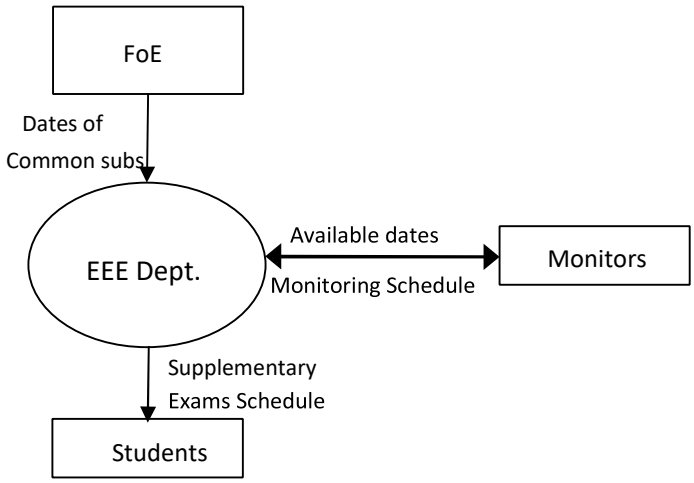

Figure 2. System Configuration

The problems with the current system are that it is a time-consuming and tedious process that it may not be fair to all students, and that conflicts in monitors' schedules may occur.

This proposed system employs a web-based interface that receives tables containing the data of students who have not passed the exams. It then formulates the optimal schedule while keeping in mind that there are some common subjects with other departments (for example, Engineering Management, Vectors, Differential Equations, etc.) that should have a fixed date for all departments.

The system also generates this schedule based on the availability of the exam monitors, who are supposed to specify their monitoring availability dates.

2.2 Product functions

The following specific functionalities will be provided by the system services:

1. Develop an algorithm for determining the best schedule.
2. Provide a method for efficiently distributing the monitoring staff.
3. Determines the number of exam halls available in the specific schedule dates based on the number of students taking the exams.

2.3 User characteristics

The primary user in the new system:

Registrar Office Employee – This is an employee of the Registrar Office at the University of Khartoum, FoE in charge of student’s affairs.

- Obtain supplemental table from EEE Dept.
- Receives a list of available monitoring personnel.
- Creates an optimal schedule using the data collected from the monitor's list.
- Creates the optimum schedule.

2.4 General constraints

Table (1) depicts the general constraints on the proposed system which are related to system development.

Constraint	For system development
May pose potential problem	• The availability of samples of data sources used to operate the current system • The availability of monitor schedules to be used on the system.
Should not pose major problem	• Utilization of specific programming tools • Team members' current optimization knowledge. • The project's complexity, as it includes technical support components.

Table 1. General Constraints

2.5 Assumptions and dependencies

The following assumptions and dependencies apply to the proposed system:

- There is Available PCs for the working staff as well as services such as Electricity.
- There is available Monitoring Staff to monitor the Examination process.
- Examination Halls are in a good condition.
- Actors in system are willing to use system (after training on system).

3. SPECIFIC REQUIREMENTS

The functions listed in Section (2.2) are described in this section in terms of (1) how the specific system functionality is provided; and (2) indicating various information of specific (high level) requirements for the functionality, such as technical issues, dependences with other requirements, and criticality[1] for overall system operation. It also describes the system's quality attributes.

3.1 System functions

Req (1):
Description: The system shall develop an algorithm for determining the best schedule.
Technical Issues:

Pre-conditions:

- Availability of data in a particular format.
- The system's user received training.

Post-condition:

- The formulated supplementary table will be downloaded to the user's pc as an excel file.

Dependencies: Web Server component.
Criticality: 5

Req (2):

1. Description: The system shall provide a method for efficiently distributing the monitoring staff.

Technical Issues:

Pre-conditions:

- The availability of monitoring personnel's schedules.

Post-condition:

- The formulated monitoring schedule will be downloaded to the user's pc as an excel file.

Dependencies: Web server components.
Criticality: 3

[1]
Criticality scale starts from 1 for very low through 5 for very high where values are described as:

1. Very Low: Items that can be eliminated should serious system constraints encountered.
2. Low: Items that are extra functionalities that may be evaluated for possible elimination.
3. Medium: Items that are strongly desired by the users of the system.
4. High: Items which are required in the system in order for lower criticalities to function.
5. Very High: Items that are mission critical and that the system cannot function without.

Req (3):
Description: Determines the number of exam halls available in the specific schedule dates based on the number of students taking the exams.

Technical Issues:

Pre-conditions:

- Availability of data related to exam halls.

Post-condition:

- A list of the available exam halls will be shown to the user.

Dependencies: Req (1); Web server components.
Criticality: 2

3.2 System Quality

The overall system has the following quality attributes (regarded as quality requirements or constraints that are imposed on how the system is developed). They include the following for this system:

Performance requirements:

• The system must not be slow in obtaining the optimal table.
• The system must be scalable because it will be used later in setting the table that includes common subjects between departments.
•The system must be trustworthy to the user.
• The system must be reusable by other departments.

Interface requirements:

• The system shall implement a simple interface for the system user (ease of learning and use should be experienced by users after two weeks of training).

• The system must be visually appealing while providing clear and unambiguous content.
• The system user's interface will be in English.

Maintainability requirements:

• The system must be open source in order to be easily repaired in the future.

• New modules will be developed with the expectation that the system will be expanded to include additional functionality (such as setting supplementary table for the FoE).

•Code documentation and a good programming style (which improves readability).

Inter-operability requirement:

The system must be open architecture in order to be linked to other (related) applications such as the University database in the future.

Security requirements:

The system must be offline and can only be used by approved users.

APPENDIX: Requirement gathering and analysis

During the requirement gathering and analysis process, the requirement engineering working group created the following tables:

name	Actor	Description
Dr.Rania	Head of Registration Office	Provides the necessary documents, establishes the exam supplementary tables, and organizes the monitoring staff.
Ms.Ruaa	Registration Assistant	Assists Dr. Rania in establishing the necessary Tables.
Ms.Marwa	Registration Assistant	Assists Dr. Rania in establishing the necessary Tables.

Table A.1 Description of Actors of the System.

Khartoum University 4th year students Team Members

Name	Role (s)
1. Monzer Omer	Team leader.
2. Mohammed Ashraf	Requirement Engineer.
3. Mugtba Mirghani	Coding team leader.
4. Mohammed Ahmed	Testing Team Leader.
5. Ahmed Alsiddig	Requirement Engineer assistant.
6. Mariam	Project supervisor