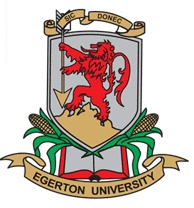
**EGERTON UNIVERSITY**



**SYSTEM REQUIREMENT**

**SPECIFICATION**

**FOR**

**EGERTON UNIVERSITY TRANSPORT**

**MANAGEMENT SYSTEM**

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**VERSION 1.0**

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## REVISION HISTORY

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Date** | **Reason for change** | **Version** |
| **EUTMS\_SRS** | **23/2/2018** | **Initial release** | **Version 1.0** |
|  |  |  |  |

## INTRODUCTION

## 1.1 Purpose

The software requirements specified in this document are of Egerton University transport management system. It describes a whole system that will have a login and registration feature, booking feature, report and schedule generation and the management of vehicles, drivers, inventory and mechanics. It describes the requirements of each part of the system

## 1.2 Document Conventions

Bolded word with numbers are topics with subtopics

Bullet lists are crucial points in a given section

Italicized words are sections to note

## 1.3 Intended Audience and Reading Suggestions

This document entails the system requirements specifications of the system. The system requirements should be read by project manager, users, testers, system development and coding team and documentation writers

This document starts with an *overall description* of the system to be designed. The audience above should read through all this. Users of the system can skip the design and implementation constraints and assumption and dependencies of the overall description.

The next section of this document is the *system features* that has detailed description of the features of the system, response sequences, functional requirements, technical issues and dependencies with other requirements. The whole of this section is very important for the testers, project manager and development and coding team. They should read through all of this section carefully. Users can read the description and response sequences subsections of the features

The next section of this document is the *external interface requirements* that has user interface, hardware interface, software interface and communication interface. Users only need to read the user interface subsection. The rest of the audience reads through every subsection in the section

There is the *nonfunctional requirements* section with performance requirements, safety requirements, security requirements, software quality attributes and other requirements attributes that will be read my project manager, testers, development and coding teams

The next section is the *preliminary object-oriented domain analysis* that will be read only by development and coding team. It entails back end information on structural fundamental objects that must be modeled within the system to satisfy its requirements (Gikaru SRS page 6)

The next section is *the preliminary budget and schedule* that has information on funds needed in system development and how long it is going to take to develop the system with the duration of each activity during system development. Project manager and the development and coding team read this section

The last section has *other requirements* such as references and appendix that has acronyms, abbreviations, analysis models and issues list. This section can be read by project manager, development and coding team, users and documentation writers

## 1.4 Project Scope

Today all the work at the time of taking transport services is done manually by ink and paper, which is very slow and consuming much efforts and time. The growing number of activities in the department, management and handling of this records is becoming difficult

The system will have the following objectives:

* To automate request and booking of vehicles
* To formulate a schedule
* To automate inventory management
* To automate driver and mechanic management
* To make records available at all times

This will ease activities done by the transport department since they will be able to easily come up with schedules, easy access to any records at any given time, easy report generation, easy management of staff and inventory since the details will be readily available and easy to know available slots available for booking

The system will therefore have the modules below:

* Login and registration
* Bookings
* Schedule and report
* Inventory management
* Driver management
* Vehicle management
* Mechanic management

## 2. OVERALL DESCRIPTION

## 2.1 Product Perspective

This Egerton University Transport Management System is the first of its kind since it is replacing the old manual system that is currently being used by the transport department. There has been no transport system in the department before

## 2.2 Product Features

The main features of this system are as follows:

* Automated booking of vehicles by departments
* Automated inventory management
* Automated staff and vehicle management
* Maintain a record of department’s activities at all times
* Login and registration

## 2.3 User Problem statement

## 2.4 User Objectives

Users of this system are the transport manager, fleet assistant, mechanic manager and head of departments of the university. All of this users expect the following objectives and requirements from the system:

* **Login and registration** – users expect the system to have a login and registration feature of the users
* **Booking** – users expect the system to have a booking feature where bookings requests are done on the system by departments and viewed by transport department where the requests can be accepted or denied and a feedback sent back. Users also expect the system to allow change in requests
* **Schedule generation** – transport department manager expects the system to easily come up with a schedule of all accepted booking at any time it is needed
* **Records management** – the transport department expects the system to maintain a record of all activities of the department in order to get rid of manual filing. This records should be easily accessed by the user depending on their clearance. Transport department manager is expected to view all records of vehicles, inventory and staff whereas users making booking requests should be able to see the record of requests they have made and they have been accepted or not

## 2.5 Operating Environment

The system needs to have a computer with the following minimum hardware and software configuration:

* RAM: 4gb
* Processor: intel core i3 1.7GHz
* Operating system: windows 7, windows 8, windows 10
* HDD: 170GB
* Database: PostgreSQL 10.0.1
* A browser

Besides the above there needs to be an internet connection to facilitate a connection between the department staff and other departments. The users of the system need to have basic computer knowledge.

## 2.6 Design and Implementation Constraints

Some of the issues that will limit options available to the developer are:

* **Hardware limitations –** the memory in some computers may not be enough to handle the system effectively
* **Time –** the time allocated for development of the system may not be enough to come up with a system with all the requirements
* **Maintenance –** it has not been made clear who will be responsible for the maintenance of the system once it is done
* **Tools –** there is need of some crucial items or tools that are required in development of the system that might not be readily available
* **Funds** – money needed to purchase the necessary equipment may not be enough. This creates a problem when it comes to the efficiency of the system because if it lacks some components it may not work as it’s supposed to.

## 2.7 User Documentation

Below is the user documentation that the user needs

* User manual-this will be a guideline on how the system works and how the user is expected to use expected to use the system depending on the user category
* On-line help – is an online guideline that will be available to the use

## 2.8 Assumptions and Dependencies

## 2.9 User Constraints

Below are some constraints that will affect designing of the system

* **Time** – time is a big factor when it comes to system development. All processes involved require time. There is a schedule for each stage in development and if a stage takes longer than required, it drags the rest of the stages making the competition of the projected take longer than the scheduled period. There is a risk of the project taking longer.

1. **SYSTEM FEATURES**

## 3.1 Login and Registration

3.1.1 *Description and Priority*

Involves users registering and the login in after registration. This is a high priority feature since it ensures the security of the system. Ratings (relative scale of 1 to 9) of the components are as shown below

* Benefits-7
* Cost -5
* Risk -3
* Penalty – 0

3.1.2 *Stimulus/Response Sequences*

The users will first register in a registration form with details such as staff id, email, password setting then submit the information. They will then login with the staff id and password entered during registration to access either booking page or management page. The transport manager will be set by the developer/administrator then the rest of users with management privileges will be set by the transport manager

3.1.3 *Functional Requirements*

To meet the requirements of this feature, the system should be able to:

* REQ-1: Easy interface login and register
* REQ-2: Easy integration with database to fetch passwords

3.1.4 *Technical Issues*

There is need of a database to capture registration details and passwords

3.1.5 *Dependencies with other requirements*

Booking of vehicle depends on the below requirements:

* Ability of system to maintain records of registration

## 3.2 Booking Request

3.2.1 *Description and Priority*

Booking requests will involve head of departments and the transport department fleet assistant. This is a high priority feature since the information from this will be used as part of schedule produced. Ratings (relative scale of 1 to 9) of the components are as shown below

* Benefits-7
* Cost -5
* Risk -2
* Penalty – 1

3.2.2 *Stimulus/Response Sequences*

The head of departments will make a booking request by filling details such as date, department, number of people then submit. The request will be viewed by the transport department fleet assistant who will either accept or reject the request made and send a feedback that will be seen by the normal user

3.2.3 *Functional Requirements*

To meet the requirements of this feature, the system should be able to:

* REQ-1: Have end-to-end functions for booking requests
* REQ-2: Have an easy interface to find booking form and requests list
* REQ-3: Have an easy interface to track booking record

3.2.4 *Technical Issues*

There is need of a database to capture the request data

3.2.5 *Dependencies with other requirements*

Booking of vehicle depends on the below requirements:

* Ability of system to maintain records of department-requests need to be recorded
* Login and registration – users need to register and login before they can make requests

## 3.3 Schedule and Records Generation

3.3.1 *Description and Priority*

Details on booking request and approval are stored in a database. This makes it easy to view records at all times. This is a high priority feature since the system is supposed to save time and management of files. The schedule is one of the key outputs of the system making this a high priority. Ratings (relative scale of 1 to 9) of the components are as shown below

* Benefits-9
* Cost -4
* Risk -3
* Penalty – 0

3.3.2 *Stimulus/Response Sequences*

The schedule will be viewed by the fleet assistant and the heads of departments on their pages. There will be a button to view schedule on both pages and once clicked it will view a record on booked days. A list of the schedule will also be generated if needed. Reports will also be generated

3.3.3 *Functional Requirements*

To meet the requirements of this feature, the system should be able to:

* REQ-1: Have a simple database to keep track of all records
* REQ-2: Have an easy interface and integrated workflow to apply for booking facility by end user

3.3.4 *Technical Issues*

There is need of a database to capture the request data

3.3.5 *Dependencies with other requirements*

The above feature depends on the following features:

* Vehicle booking (schedule generation)
* Management of drivers and mechanics (report generation)
* Management of inventory and vehicles (report and schedule generation)
* Login and registration – users need to register and login first

## 3.4 Driver, Mechanic, Vehicle and Inventory Management

3.4.1 *Description and Priority*

The system will have a record of mechanics, drivers, inventory and vehicles that will be used to manage them all and make analysis based on them. This a medium priority feature. Ratings (relative scale of 1 to 9) of the components are as shown below

* Benefits-9
* Cost -4
* Risk -3
* Penalty – 1

3.4.2 *Stimulus/Response Sequences*

Driver and vehicle details will be added by the transport manager on his page and details on trip allocation will be done by the fleet assistant. Both transport manager and fleet assistant will be able to view records of drivers and vehicles and their progress. Mechanic manager will have a page will add mechanics and inventory/spare parts. He will also add details on used spare parts. He will also be keeping track on mechanic activities such as vehicle that a particular mechanic is servicing and put the details in the system

3.4.3 *Functional Requirements*

To meet the requirements of this feature, the system should be able to:

* REQ-1: Interface to fill details on drivers, mechanics, inventory and vehicles
* REQ-2: Measurement of service quality
* REQ-3: Track maintenance of a particular vehicle

3.4.4 *Technical Issues*

There is need of a database to capture the request data

3.4.5 *Dependencies with other requirements*

This feature depends on:

* Login and registration – users need to register and login first
* Records from the database

## 4. EXTERNAL INTERFACE REQUIREMENTS

## 4.1 User Interfaces

The user interface will have the following:

* **Login page -** will have the system name and frame to login. There will be a slot toinsert staff id and password and a login button. There will be another button link below the forgot pass word link for user registration. Slots to add staff id, email and password will be there and a register button
* **Management page –** will have a dashboard with options to add or remove drivers and vehicle. There is an option to view the schedule and a list of all system users (with a button to remove user)
* **Fleet assistant page –** has a dashboard with option to accept or deny bookings. There is a n option to view the schedule.
* **Mechanic manager page -** has a dashboard with slot to add mechanics and inventory. There are buttons to view mechanics’ work progress and inventory used and what is available
* **Department heads page –** has a dashboard with options to make booking,make changes i.e. cancel booking or reschedule, and an option to view booking status and a list of the bookings made by the user

The interface will be intuitive. As a web app it will be simple to use. No much training will be provided it is expected that 95% of users will be able to use the app without any training.

## 4.2 Hardware Interface

The web based system operates on any hardware device such as a smartphones or PCs that can be able to run a web browser at a good speed and access the internet. The device to be used must have a web browser installed and running to be able to access and use the system.

## 4.3 Software Interfaces

The system is a web application therefore it will communicate using a server.

There will be a database to store data that will be entered in the system. PostgreSQL 10.0.1 database will be used in this case. The system can use any version of windows 7, windows 8 and windows 10

A browser will be needed in order to access the system

## 4.4 Communications Interfaces

The system being a web application and network oriented, users can communicate via the network. This will be enabled by the TCP/IP protocol. The Internetworking protocols will be assumed to apply in this instance, such as HTTPS protocol for encryption of sensitive information e.g. password while in transit. Users are expected to give their email address during registration that’s going to be used in case users forgets their password. The browser links user to web server hosting the application to make much usable and accessible

## 5. OTHER NONFUNCTIONAL REQUIREMENTS

## 5.1 Performance Requirements

The Egerton University Transport management system accuracy will depend on the timely and accurate entry of booking details and persons details by the respective users since the output of the system is based in this entries that will be saved in systems database.

## 5.2 Safety Requirements

The system might have a risk of any person registering to the system making the database have a lot of dumb data. To safeguard such issues, the users are required to use their staff id that is unique to every staff member in the university

## 5.3 Security Requirements

The system being web based. there will be login page with staff id that is unique to each staff member hence avoiding any person from registering to the system and login. All users should also be cautious to avoid giving personal information such as staff id and passwords to unknown people or even other users of the system

The system is going to use Cross-Site Request Forgery (CSRF) token which will make sure only users who are authorized can access the system. It avoids the issue of a person forging himself or herself as a user of the system

## 5.4 Software Quality Attributes

The system will be available to all registered users of the system at all times accessible through a web browser either on mobile phones or computers. Bookings will be made on a simple form and submitted to the fleet assistant (the system has a well-integrated work flow from booking and feedback to the booking). Once the bookings are made data is analyzed by functions and displayed on a schedule

The system doesn’t require users to undergo training since the user interface is easy and self-explanatory

## 6. PRELIMINARY OBJECT-ORIENTED DOMAIN ANALYSIS

## 6.1 Inheritance relationship

## 6.2 User Classes and Characteristics

## 6.2.1 Abstract or Concrete

Schedule

Registration

Management

## 6.2.2 List of Super classes

Below is a list of super classes

* Users
* Drivers
* Mechanics
* Inventory
* Database
* Main

## 6.2.3 List of subclasses

Below is a list of sub classes

* UserModel
* DriverModel
* MechanicModel
* SparepartsModel
* AddDriver
* AddMechanic
* AddInventory

## 6.2.4 Purpose

Will be added as the project progresses

## 6.2.6 Attributes

Will be added as the project progresses

## 6.2.7 Operations

Will be added as the project progresses

## 6.2.8 Constraints

Will be added as the project progresses

## 7. Preliminary Budget and Schedule

Below is the schedule of how long the project will take and the processes involved with their duration

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Duration Activity** | **Jan**  **2018** | **Feb**  **2018** | **March-April**  **2018** | **May-June**  **2018** | **July**  **2018** | **July**  **2018** | **August**  **2018** | **August**  **2018** |
| **Problem definition** |  |  |  |  |  |  |  |  |
| **Feasibility study and analysis** |  |  |  |  |  |  |  |  |
| **Requirement** **Analysis** |  |  |  |  |  |  |  |  |
| **System Design** |  |  |  |  |  |  |  |  |
| **Coding** |  |  |  |  |  |  |  |  |
| **Compiling and Testing** |  |  |  |  |  |  |  |  |
| **System Integration** |  |  |  |  |  |  |  |  |
| **User Documentation** |  |  |  |  |  |  |  |  |
| **Testing and Debugging** |  |  |  |  |  |  |  |  |
| **Presentation** |  |  |  |  |  |  |  |  |

|  |  |
| --- | --- |
| **TASK/ITEM** | **COST** |
| Requirement collection | Ksh 5000 |
| Computer, soft wares, internet | Ksh 180000 |
| Maintenance | Ksh 40000 |
| Testing and implementation | Ksh 54000 |
| Total | 279 000 |

## 8. OTHER REQUIREMENTS

Apart from the above resources, the following are also needed:

* Internet - there is the need of an internet connection for the web application to run well online with a preferred domain name
* Database – the system will use PostgreSQL 10.0.1 database to store data

## 8.1 References

## 8.2 Appendix A: Glossary of definitions, Acronyms and abbreviations

**COD** – Chair of Department

**SRS –** System Requirement Specification

**ID** – Identification

**Ksh –** Kenyan Shillings

## Appendix B: Analysis Models

## Appendix C: Issues List