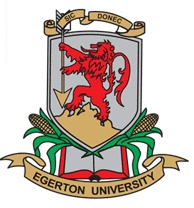
**EGERTON UNIVERSITY**



**SYSTEM DESIGN**

**DOCUMENT**

**FOR**

**EGERTON UNIVERSITY TRANSPORT**

**MANAGEMENT SYSTEM**

**PREPARED BY: PAUL CYRIL OYUNGU**

**REG NO: S13/21403/14**

**PROJECT SUPERVISOR: KIMANI NJOROGE**

**PROJECT COORDINATOR: DR. WILFRED GIKARU**

**DATE: 18/4/2018**

**VERSION 1.0**

***OVERVIEW***

**TABLE OF CONTENTS**

**1 INTRODUCTION**

* 1. **Purpose and Scope**

This software design document describes the architecture and system design of Egerton University Transport Management System(EUTMS)

This document contains a complete description of the design and architecture of the EUTMS. The basic architecture is a web based application that users will access the system through the web. The description of the architecture and design will mainly be on the:

* Login and registration process
* Booking process
* Database architecture
* Inventory and staff management process
  1. **Project Executive Summary**
     1. **System Overview**

EUTMS is responsible for managing most if not all activities done by the transport department of the university. The system will be broken down into several parts or modules to take care of the problem the system is trying to solve such as conflicting allocations, booking process, management of staff and inventory management

First off, there will be a login and registration section where users (transport manager, fleet assistant, mechanic head and head of department) of the system will login in or register if they don’t have an account. Login will need a staff id and a password that will be authenticated by the system and allowed into the system depending on the role. If the user has no account, the user will have to register with a staff id, an email address and a password

After login, each user will be redirected to their respective page depending on their role. A head of department would be allowed to make bookings, change a booking request by either rescheduling or canceling the booking request and later view the booking status. The fleet assistant would view requests, then allocated vehicle and driver depending on the availability of a vehicle or driver, after which a report would be sent to the transport manager on the allocation where there might be an allocation or none. The mechanic manager would use the system to add and allocate mechanics to vehicles, record replaced parts, provide vehicle status and make a request on equipment needed. The transport manager would then use the system to manage all users of the system, notify departments on allocation, provide requisition on equipment and add or remove drivers and vehicles.

The system ids going to automate this process by storing all data, coming up with a schedule, fix the conflicting allocations problem and show what spare parts are available

* + 1. **Design Constraints**

There are several design constraints and limitations that come up when coming up with the design such us:

* Flexibility – the design has to be able to deal with the changes in a module that might arise. Coming up with a design that can be easy to deal with errors in a module
* Acceptability - an assumption had to be made on the visual design being liked or not. Also the flow of activities in the system had to be assumed that it would be liked by the user
* Integration – the design of the system integrating with other external systems was a problem since it would affect the system overall working
  + 1. **Future Contingencies**

Here are some of the likely circumstance that might lead to changes in the system plan:

* Requirements – there might be changes in requirements where features might need to be added or removed in the system depending on the departments needed I that particular time
  1. **Document Organization**

The current document is organized as follows:

* System architecture – this presents the system architecture of the EUTMS project including its subsystems by viewing the system from various perspectives such as the hardware architecture, software architecture and the internal communication architecture
* File and database design – this presents the system’s file and database organization and design. Gives the full and final design of the system’s database management system files including non-database management system files
* Human machine interface – this presents the design of system’s and subsystem’s inputs and outputs related to the users in details
* Detailed design – this presents information on hardware design, software design, and internal communication design that will be integrated together into the system
* External interfaces – presents information on the systems that are not within the scope of the EUTMS
* System integrity controls – presents information on the security and level of access to some information on the system
  1. **Project References**

SDD sys\_design\_doc.pdf by Dr. Wilfred Gikaru

* 1. **Glossary**

EUTMS- Egerton University Transport Management System

SDD – System Design Document

Dr. - Doctor

1. **SYSTEM ARCHITECTURE**
   1. **System Hardware Architecture**
   2. **System Software Architecture**
   3. **Internal Communications Architecture**
2. **FILE AND DATABASE DESIGN**
   1. **Database Management System Files**

Egerton University Transport management system will store its data in a database that will have seven tables:

* Users
* Staff
* Drivers
* Vehicles
* Mechanics
* Spare Parts
* Requests
* Bus Allocation

**STAFF**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **column** | **constraints** | **Data type** | **size** | **Description** |
| 1.StaffId | Primary key | Character varying | 15 | Unique identifier of staff |
| 2.Contact |  | Character varying | 15 | Contact of staff member |
| 3.Email |  | Character varying | 100 | Email of staff member |
| 4.Name |  | Character varying | 200 | Name of staff member |
| 5.Department |  | Character varying | 100 | Department of staff member |

**USERS TABLE**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Column** | **constraints** | **Data type** | **size** | **Description** |
| 1.StaffId | Primary key, Foreign key | Character varying | 15 | Staff id of the user |
| 2.Password |  | Character varying | 100 | Password of user |
| 3.Role |  | Small integer | 2 | Role of the user |

**DRIVERS TABLE**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Column** | **constraints** | **Data type** | **size** | **Description** |
| 1.StaffId | Primary key, Foreign key | Character varying | 15 | Staff id of the user |
| 2.Availability |  | Boolean |  | Availability of the driver |
|  |  |  |  |  |

**MECHANICS TABLE**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Column** | **constraints** | **Data type** | **size** | **Description** |
| 1.StaffId | Primary key, Foreign key | Character varying | 15 | Staff id of the mechanics |
| 2.Availability |  | Boolean |  | Availability of the mechanic |
|  |  |  |  |  |

**VEHICLES TABLE**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Column** | **constraints** | **Data type** | **size** | **Description** |
| 1. Number\_plate | Primary key | Character varying | 11 | Unique identifier to vehicle |
| 2.Vehicle\_type |  | Character varying | 15 | The type of vehicle |
| 3.Engine\_capacity |  | Character varying | 10 | The capacity of the engine |
| 4.Capacity |  | Integer | 11 | Capacity of vehicle |
| 5.Driver\_id | Foreign key |  | 15 | driver Identifier |
| 6.Mechanic\_id | Foreign key |  | 11 | mechanic Identifier |

**SPARE PARTS TABLE**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Column** | **constraints** | **Data type** | **size** | **Description** |
| 1.Spare\_parts\_id | Primary key | Integer | 11 | Unique identifier to spare part |
| 2.Amount |  | Integer | 11 | Quantity of spare part |
| 3.Name |  | Character varying | 100 | Name of the spare part |
| 4.Cost |  | Integer | 11 | Cost of the spare part |
| 5. Description |  | Character varying | 100 | Description of the spare part |

**REQUESTS TABLE**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **column** | **constraints** | **Data type** | **size** | **Description** |
| 1.Request\_id | Primary key | integer | 11 | Unique identifier to request |
| 2.Deptrequesting |  | Character varying | 100 | Department making the request |
| 3.Reason |  | Character varying | 100 | Reason for requesting |
| 4.Travel\_date |  | Timestamp without time zone | 10 | Day and time of travelling |
| 5.Return\_date |  | Timestamp without time zone | 11 | Day and time of travelling back |
| 6.Destination |  | Character varying | 40 | Destination |
| 7.Travellers\_desc |  | SmallInt | 1 | Type of travelers i.e. staff |
| 8.Capacity |  | Integer | 11 | Number of travelers |
| 9.User\_id | Foreign key |  | 15 | User Identifier |
| 10.Confirm\_status |  | Boolean(default=false) |  | Shows if request is confirmed or denied |

**BUS ALLOCATION TABLE**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **column** | **constraints** | **Data type** | **size** | **Description** |
| 1.REquest\_id | Primary key, Foreign key | Integer | 11 | Unique identifier to booking made |
| 2.Driver fee |  | integer | 11 | Fee paid to driver |
| 3.Fuel money |  | integer | 11 | Fueling cost |
| 4.Vehicle\_id | Foreign key |  | 11 | Vehicle Identifier |
| 5Estimated distance |  | integer | 11 | Estimated distance of travel |
| 6.Driver\_id | Foreign key |  | 15 | Driver Identifier |

* 1. **Non-Database Management System Files**

1. **HUMAN-MACHINE INTERFACE**
   1. **Inputs**
   2. **Outputs**
2. **DETAILED DESIGN**
   1. **Hardware Detailed Design**
   2. **Software Detailed Design**
   3. **Internal Communications Detailed Design**
3. **EXTERNAL INTERFACES**
   1. **Interface Architecture**
   2. **Interface Detailed Design**
4. **SYSTEM INTEGRITY CONTROLS**