Reg : 20/03930.
Unit code: BSD 3106
 Unit: Final year project I

2.0 SYSTEMS REQUIRENTS

2.1 INTRODUCTION

The Kimathi Bus Reservation System is the product identified in this document. This the system requirements for the entire Bus Reservation System, encompassing both and backend components. The scope of this SRS include the complete range of required for self-service interactions with customers who select their destinations from Kimathi

INTENDED

The Bus Reservation System SRS document is intended for various stakeholders development, management, marketing, testing and documentation of the system. audience for this document include developers, users.

 Project

The Bus Reservation System is a software solution designed to experience by providing a seamless and self-service approach to book seats destination. The purpose of this system is to enhance easier booking of passenger improving overall efficiency in the transport This is done through enabling destined travelers by reserving tickets by personal info, number of seats, payment methods to be able to get a bus. This reservation of tickets eliminates the need for lengthy queues and manual paperwork, a more efficient and convenient experience for The system aims to create a positive impression, increase customer loyalty positive response to customer's selection of desired

Overalldescription

Userclasses and characteristics

The bus reservation system is designed to cater to two user classes based on characteristics. User classes for this system can be differentiated based on security privileges, technical expertise. The following user classes

1. **Travelers**- these are the primary users of the system. No logins are required services of booking a bus. The traveler use the system to reserve tickets, also can be allowed to re-print

2. **Administrato**r- these users have elevated privileges and access to the system's functions. They are responsible for maintaining the system, check all lists of reject reservations, and confirm payments. Admin requires a higher level of manage the high number of payments and reservations made in order to .

3. **IT Support**- this user class consist of technical staff who provide assistance and any system-related issues that arise. They require a deep understanding of technical architecture, interfaces and integrations. IT support personnel play a ensuring the system operates smoothly and addressing any technical challenges- Travelers are the most favored user class as their satisfaction and user impacts the success and reputation of the system. It is also important to provide the training and support to administrators, IT support to ensure effective system technical

2.2 Operating

The Kimathi Bus Reservation system is designed to operate in a specific environment hardware platforms, operating systems and other software components.

Hardware

1. **Hardware**- the system is designed to be compatible with various platforms,

including desktop computers, laptops, tablets and smartphones. It should run on

both Windows ensuring flexibility and accessibility

SOFTWARE

The software should be compatible with popular operating as Windows 10, Android. The system should be tested and optimized for smooth these operating systems to ensure an enticing user experience across
Software

- **MySQL**- Programming language that accesses created databases for all This is a multi-thread, multi-user, SQL relational database
- **PHP**- Has been used to develop dynamic web content and can be embedded with PHP is a fully defined language and can be used to develop graphical

- **HTML & CSS**- Has been used in corporately to define the content and website Semantic
- **UI**- The interface elements mostly used; dropdowns, buttons has been by Semantic UI to create great user
- A**PACHE HTTP SERVER**- open source cross-platform web server package, of the APACHE HTTP SERVER, MYSQL database and interpreters for scripts PHP

2.3 DESIGN&IMPLEMENTATION

The development of the Kimathi Bus Reservation System may be subject to certain limit the options available to the developers. These limitations could be :

1. **Hardware limitations**- The system development may face hardware limitations in timing requirement & memory usage. Software must be designed to operate within the available hardware resources to ensure optimal

2. **Security considerations**- Data security is of importance .the developer must security considerations such as access control, secure communication protection against

3. Maintenance responsibility- Proper maintenance of the system by ensuring and likely challages to occur in more use of the sytem.

4 **Regulatory policies**- The developer must adhere to corporate policies and requirements set by the transport industry. These policies may dictate data measures, privacy regulations, or specific protocols that need to be development

Assumptions
The following assumed factors could affect the requirements stated in the SRS Reservation Operating environment-

✓ The SRS assumes a certain development and environment, including specific versions of development tools, languages, operating systems and databases. Any updates to these could require modifications to the system's requirements to ensure and optimal

✓ Constraints and Limitations- SRS may make certain assumptions constraints and limitations, such as hardware resources, network regulatory compliance requirements.

If these assumptions are impact the system's requirements and necessitate adjustments to meet constraint of the System .

The Kimathi Bus Reservation System incorporates various system features efficient and convenient management of transport services. These organized based on their functionality and the user classes .

Following diagram is a usecase that represents the Kimathi Bus System
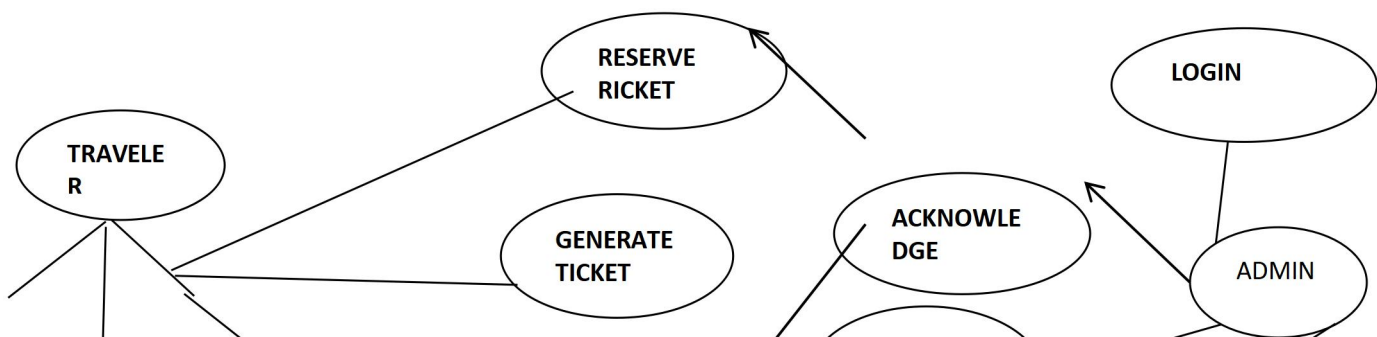
Here are some examples of system features.

Bus Reservation System

This is a crucial feature that allows travelers to book for seats for buses to destinations. It is of high priority as it directly contributes to enhancing customer and generate revenue .
 Priority component.
Benefit :(Enables travelers to conveniently reserve seats, increase customer and company

Penalty :(minimal penalty associated with implementing and reservation

Cost :(moderate implementation and maintenance costs, including hosting updates
Risk :(potential risk of technical issues or booking errors if not properly handled.

Stimulus/Response User action: traveler clicks on order System Response: the system generates an order reference no identical file.

User action: traveler fills booking details requiring; destination, travelling date

◆ System Response: loads the filled details and proceeds to contact User action: traveler fills details containing; full name, contact/mobile/ e-mail gender then click to submit
◆ System Response: loads the filled details and proceeds to User action: traveler fills the payment method used, transaction ID, and amount to pay, clicks on

◆ System Response: processes the entered details and proceeds to confirm and details User action: traveler confirms the submitted information to confirm and get a ticket.
◆ System Response: processes and generates Kimathi Bus Reservation System streamlines the booking process for travelers, conveniently book seats of given bus destinations.
By following the provided sequence, the system ensures a smooth user experience and effectively handles process benefiting both the traveler.

Reservation Management

Responsible for efficiently managing the company's accounts reservations/bookings made, rejecting nonviable reservations. It is of high directly impacts the company's operations, revenue generation and satisfaction.

Priority Component

Benefit: (Optimizes seat allocation, reduce errors

Penalty: (Require training for understanding the system

Cost: (moderate implementation and maintenance

Risk: (maintenance issues if not properly handled.

<u>Stimulus/Response</u>

User action: admin logs in to the system with correct username & System Response: processes filled in details and loads

User action: admin manage all bookings or reject System Response: System deletes rejected The Reservation management and accounting feature ensures efficient company resources.

The system assist admins in managing Kimathi optimizing operation and maintaining a high standard of customer

2.4 EXTERNAL INTERFACEREQUIREMENTS.

I. User

In the Kimathi Bus Reservation System, the software interfaces with the various components, each with its own logical characteristics. These designed to provide a user-friendly and intuitive

Userinterface

a) Order reference interface- this allows user to the generate order is used to list no of tickets

b) Booking interface- allows users to book bus seat/(s), destination, No of and dates for their preferred

c) Personal details interface- enables users to fill their personal details phone contacts

d) Billing and payment interface- allows travelers to select the payment with the transactional code to be submitted together with the confirmed paid e. Confirm details interface- the selected details from the booking to interface are confirmed and ensures that all that is well.

<u>**Logical characteristics**</u>

Screen layout: the interfaces should follow a consistent and user-friendly layout navigation menus, clearly labeled buttons and organized information

GUI standards: the interfaces should adhere to established GUI standards consistency across system.
Screen Constraints: the interfaces should be designed to fit within the display size limitations of the target devices, ensuring optimal

ii Hardware
The System possess logical and physical characteristics associated with the the software product and the hardware. These characteristics define the types, data and control interactions used in the system.

logical characteristics
The software interacts with the hardware components, ensuring compatibility functioning. The physical characteristics focus on the actual device and technology
a)   Supported devices: the software interfaces should be designed to hardware devices commonly used by users, such as desktop computers
b)   Data and control interactions: the software interacts with the hardware perform tasks such as capturing user input, display information on the controlling peripheral devices. The logical characteristics define how data signals are exchanged between the software and
c)   Communication protocols: the interfaces may utilize standard communication to enable data transfer and interaction between the software and hardware. of communication protocols include Ethernet or

Physicalcharacteristics of the System
a)   Input devices: the interface should support different input devices, such as mouse, and touchscreens allowing users to input
b)   Output devices: the software interfaces with output devices, including printers to present
c)   Data storage devices: the software may interact with physical storage hard drives to store and retrieve data related to the bus reservation

Iii. Software

PHP is a programming language that has been used to develop bus It automates bus reservations and enables travelers to book for a seat to their destination. The components involved
1. **Database:** the Kimathi Bus Reservation System relies on MySQL database to store travelers' information, reservation details, billing and other
2. **Operating System:** PHP codes can run on various operating systems, including Desktop (e.g, Windows 10), or other compatible
3. **Integrated commercial Components:** Kimathi Bus Reservation System may external commercial components to enhance its functionality. For example, it could with payment gateways like M-PESA, banks to operate

a. Data items coming into the-traveler information: Name, contact details, identification-payment information: transaction

b. Data items going out of the-Reservation Confirmation: displayed on the screen when order is-Payment Receipts: displayed on the screen when ticket for a destination

iv. Communication

The Bus Reservation System may require various communication functions with travelers as they book for their destinations. Here the requirements :

i. Web browser
The system will include a web-based interface for travelers to make admins to manage bookings. It requires communication with web browsers using HTTPS for secure

ii. **Electronic**
The system will utilize forms to collect travelers' information during the Forms can be presented through the web interface. The form data can be HTTP POST requests or suitable protocols, depending on the system's

iii. **Communication**
The system will adopt communication standards such as HTTP for web-based FTP for file transfer with external systems. The choice of standards depends on communication requirements and integration with external

2.5 Non-functional

A. Performance

Performance requirements for Kimathi Bus Reservation System are ensure a smooth and efficient user experience. Here are some requirements that developers should

System Requirement:
The system should respond to user interactions within 1 Rationale: travelers using Kimathi Bus Reservation web interface responses when making bookings. A fast response time satisfaction

BookingProcessing Requirement.
The system should process booking request within 3 Rationale: travelers should be able make bookings without delays. This requirement ensures that the system can handle booking promptly

ConcurrentUser Requirement
 the system should support a minimum of 100 users without significant degradation in Rationale: the system may experience a high volume of user Ensuring that the system can handle a sufficient number of users without performance

DatabaseResponse Requirement:

Database queries should return results within 1 Rationale: fast database response times are crucial to ensure retrieval and provide

real-time System Requirement:
the system should have an uptime of at least Rationale: the system should be available to travelers at all times, disruptions and ensuring reliable access to bus reservation services. can result in traveler dissatisfaction and potential

Data Requirement:
Updates to booked seats should be reflected across 5 Rationale: to provide accurate information to travelers and prevent bookings, the system should synchronize data in near real-time. Timely help maintain consistency across various interfaces and prevent-Payment Processing: Payment transactions should be authorized and processed seconds of the traveler's payment

B) Safety

The Kimathi Bus Reservation System should meet various requirements related to protection and compliance. Key points
1. Traveler data protection: The system should ensure security and confidentiality of data in compliance with data protection regulations and also implement encryption and access
2. Privacy Consent: The system should obtain consent from travelers regarding the and usage of their personal data, provide clear privacy policies, and allow data
3. Compliance with Regulations: the system should comply with local regulations related to safety, privacy and traveler protection and best
4. Safety Certifications: Depending on the jurisdiction and industry, the system satisfy safety certifications such as UL Certification or
5. Accessibility: The system should comply with accessibility standards, enabling travelers with disabilities through features like keyboard navigation and compatibility.

C) Security Requirements

Kimathi Bus Reservation System must adhere to security and privacy requirements to data and ensure compliance with regulations. They **Data Protection and Privacy:**

The system should comply with data implement measures to safeguard travelers'

data, handle access requests, clear privacy External Policies and Regulation: The

system must comply with industry regulations and guidelines related to data security

Other Requirements

 Kimathi Bus Reservation System may have other requirements that are not in the include

Database -The system should use a reliable and scalable database management system to manage traveler's data, bookings and other relevant information. The database should efficient data retrieval and manipulation operations, ensuring optimal system.

 Legal - The system must comply with applicable laws and regulations related to data privacy, accessibility, and any other relevant legal obligations in the jurisdiction .

Performance - Specify performance objectives related to response time, system scalability to system performance under varying loads and usage .

Documentation

The project should include documentation, such as system architecture, instructions, and user manuals to aid in system understanding, deployment maintenan