**Proposal Document for Gate Pass System**

**Project Title:  
Gate Pass System for Tracking Laptops and Vehicles in Institutions**

**Abstract**

**The Gate Pass System is designed to securely track the entry and exit of properties such as laptops and vehicles into an institution. The system eliminates paper-based methods, enhances operational efficiency, and ensures secure property management. It uses unique codes for laptops and number plates for vehicles, allowing security officers to authenticate items at multiple gates through synchronized kiosks. The design ensures secure data management, real-time synchronization, and administrative control over item entries and exits.**

**1. Introduction**

**1.0 Background of Study**

**Educational institutions and businesses often face challenges in tracking and managing assets like laptops and vehicles entering and exiting their premises. Traditional paper-based systems are inefficient and prone to errors, leading to loss or mismanagement of valuable items. The proposed Gate Pass System addresses these issues by automating property tracking, improving security, and streamlining operations.**

**2. Problem Definition**

**2.1 Current Workflow**

**Currently, institutions rely on paper-based systems to log properties entering and exiting the premises. This workflow involves manual entry of details, which can lead to inaccuracies and inefficiencies.**

**2.2 Weaknesses of the Current System**

* **Manual Errors: Data entry is prone to human error.**
* **Inefficiency: Paper logs can be lost or difficult to track.**
* **Security Risks: Paper records lack encryption and are vulnerable to unauthorized access.**

**2.3 The Proposed Idea**

**The proposed system will automate property registration, entry, and exit, using unique codes and passwords for secure authentication. Data will be synchronized across all gates, providing real-time tracking of items. This system eliminates paper logs, ensuring accuracy and security.**

**3. Objectives**

**3.1 General Objective**

**To develop a Gate Pass System that automates the entry and exit of laptops and vehicles, ensuring secure and efficient tracking across multiple gates.**

**3.2 Specific Objectives**

* **Automate registration of laptops and vehicles.**
* **Implement secure authentication using unique codes and passwords.**
* **Enable synchronization of data across multiple gates.**
* **Provide an admin interface for tracking and generating reports.**

**4. Problem Justification**

**The current manual tracking methods are error-prone and inefficient. By automating the process, the proposed system will:**

* **Reduce errors: Minimize human input in logging data.**
* **Enhance security: Secure items with passwords and unique identifiers.**
* **Improve efficiency: Provide real-time tracking and reporting capabilities.**

**5. Literature**

**5.1 The Current System**

* **Manual Tracking: Institutions rely on paper logs to track items entering and exiting the premises.**
* **Security Risks: Data is often vulnerable to tampering and unauthorized access.**

**5.2 Challenges and Limitations of the Current System**

* **Inefficiency: Paper logs are slow to process and often lost or misplaced.**
* **Inaccuracy: Human errors during data entry cause discrepancies.**
* **Lack of Security: Paper-based systems can be easily accessed and manipulated.**

**5.3 Conceptual Design**

**The system will use kiosks to register items, generate unique codes, and authenticate items on entry and exit. The system will be synchronized across multiple gates, with an admin interface for managing properties and tracking logs.**

**6. Methodology**

**6.1 Model (Agile with Respective Phases)**

* **Planning Phase: Define project requirements and design the system architecture.**
* **Development Phase: Develop the kiosk software and centralized database.**
* **Testing Phase: Perform functional and security testing.**
* **Deployment Phase: Implement the system across multiple gates and integrate it with administrative systems.**

**6.2 System Requirements**

**6.1 Functional Requirements**

* **Registration: Capture item details and generate unique codes.**
* **Entry/Exit Authentication: Securely authenticate items at the gate.**
* **Synchronization: Real-time synchronization of data across all gates.**

**6.2 Non-Functional Requirements**

* **Highly Responsive: Ensure fast authentication and synchronization.**
* **Easy to Use: Simple, intuitive interfaces for security officers and administrators.**
* **Security: Data encryption and secure password management.**
* **Performance and Reliability: The system should handle multiple gates and large datasets efficiently.**

**7. System Design**

**7.1 Use Case Diagrams**

* **The Academic Institution (Posting): Administer registration and track items.**
* **The Account Owner: Register and authenticate their property.**
* **The Third Party: View or access logged item details (e.g., security officers).**

**7.2 Context Diagram**

**Illustrates how the system interacts with external entities (e.g., security kiosks, admin interface, database).**

**7.3 Level 1 DFD (Detailed Operations)**

**Shows detailed operations for:**

* **Registration: Capturing owner and item details.**
* **Entry/Exit Logging: Handling login and logout of properties with authentication.**

**7.4 Entity Relationship Diagram**

* **Laptop Details: Serial number, MAC address, owner ID, unique code.**
* **Vehicle Details: Number plate, owner ID, password.**
* **Owner Details: National ID, name, email, password.**
* **Entry/Exit Logs: Time and date of property movements.**

**7.5 Algorithm**

* **Registration:**
  1. **Capture item details (MAC, serial number, etc.).**
  2. **Generate a unique code for laptops or use the vehicle number plate.**
  3. **Save item and owner details in the database.**
* **Entry/Exit Authentication:**
  1. **Security officer inputs the unique code or number plate.**
  2. **Validate the code against the database.**
  3. **Prompt for the owner’s password.**
  4. **On successful password match, log entry or exit time.**

| **8. Schedule (8-Month Breakdown)**  **Month** | **Task** |
| --- | --- |
| **1** | **Project Planning, Requirement Gathering, Design** |
| **2** | **Software Development: Backend (Database & API)** |
| **3** | **Software Development: Frontend (Kiosk Interface)** |
| **4** | **Integration of Backend & Frontend** |
| **5** | **Testing (Functional & Security)** |
| **6** | **Deployment of Kiosks at Gates** |
| **7** | **Admin Interface Development** |
| **8** | **Final Testing, Documentation, and System Launch** |

**9. Budget (1.8 Million Ksh)**

| **Category** | **Cost (Ksh)** |
| --- | --- |
| **Human Resources** | **800,000** |
| **Development Tools** | **300,000** |
| **Third-Party Software/Tools** | **200,000** |
| **Hardware (Kiosks, Printers, etc.)** | **400,000** |
| **Total** | **1,800,000** |