

**BINDURA UNIVERSITY OF SCIENCE EDUCATION**

**FACULTY OF SCIENCE EDUCATION**

**EDUCATIONAL TECHNOLOGY DEPARTMENT**



**A SCHOOL HYBRID VISTOR MANAGEMENT SYSTEM**

**BY**

**GONO BRIGHTON**

**(B1852130)**

**SUPERVISOR: MRS T MUKABETA**

**2025**

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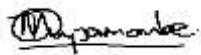
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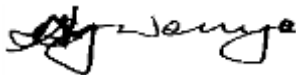
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## **DEDICATION**

I wish to dedicate this entire project report to my mother and father for their support they accorded to me ever since i was a child. I also thank them for the spirit of hard work, courage and determination they had instilled in me throughout my school days till today.

## **ACKNOWLEDGEMENTS**

Firstly, i would like to express my gratitude to the Almighty GOD, for the wisdom and understanding he had given to me. And to my family for the love and support they had provided throughout my life. I would also like to thank Mrs T Mukabeta whom i regard as my mentor and supervisor. I thank her for the expertise and intelligence she has displayed while supervising this project. I believe this good work is a result of her good guidance and cooperation. I cannot forget my lecturers in the Department of Computer Science in Science Education for the academic interactions and company they have accorded to me. May the Lord bless them.

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## **ABSTRACT**

The increasing need for enhanced security and efficient visitor management at Prince Edward has led to the development of the School Hybrid Visitor Management System. This system is designed to streamline the process of monitoring and managing visitors, combining the benefits of both digital and traditional methods. The system ensures the safety of students and staff by maintaining accurate and real-time records of visitor information, including entry and exit times. The School Hybrid Visitor Management System not only enhances security but also improves operational efficiency, reducing the workload on administrative staff and ensuring compliance with safety protocols. This abstract provides an overview of the system's functionalities, its implementation in educational settings, and its potential to transform visitor management in schools.

# **CHAPTER 1: PROBLEM IDENTIFICATION**

## **1.0 Introduction**

Prince Edward High School in Zimbabwe requires a hybrid visitor management system to efficiently manage and track visitors entering and leaving the school premises. This system aims to enhance security, streamline the visitor registration process, and provide accurate records of all visitors.

## **1.1 Investigation and Description of Current System/Literature on Existing Similar Systems**

Currently, Prince Edward High School uses a manual visitor logbook to record visitor details. This system is prone to errors, time-consuming, and lacks real-time data accessibility. Similar systems in other institutions have adopted digital solutions that integrate both manual and automated processes to improve efficiency and accuracy.

## **1.2 Statement of the Problem**

The existing manual visitor management system at Prince Edward High School is inefficient, error-prone, and unable to provide real-time data. There is a need for a hybrid system that combines digital and manual processes to improve accuracy, security, and efficiency in managing visitor records.

## **1.3 System Objectives**

- To automate the visitor registration process.
- To enhance security by tracking visitor movements.
- To provide real-time data access and reporting.
- To reduce errors associated with manual data entry.
- To integrate with existing security systems.

## **1.4 Description of the Proposed System**

The proposed system is a hybrid visitor management system that combines digital registration through Web Application and manual checks by security personnel. Visitors will register their details via a Web Application, and security personnel will verify and record their entry and exit manually. The system will store data in a centralized database accessible by authorized personnel.

## 1.5 Limitations/Challenges

- Initial setup cost for software.
- Training staff to use the new system.
- Ensuring data security and privacy.
- Integration with existing school security systems.

## 1.6 Scope/Delimitation of the System

The system will cover the registration, tracking, and management of visitors at Prince Edward High School. It will include web application for visitor registration, a centralized database for storing visitor information, and interfaces for security personnel to manage and verify visitor entries and exits.

## 1.7 Definition of Terms

**Hybrid System:** A system that combines both manual and automated processes.

**Visitor Management System (VMS):** A system for managing and tracking visitors.

**Centralized Database:** A database stored in a single location, accessible by multiple users.

## CHAPTER 2: REQUIREMENTS SPECIFICATION

### 2.1 Introduction

This chapter outlines the requirements for developing the hybrid visitor management system, including data, processing, software, and hardware requirements.

### 2.2 Requirements Analysis

A fact-finding plan is made to gather detailed requirements from stakeholders. Tools like interviews, surveys, and observation will be used to record and analyse data.

### 2.3 Data Requirements

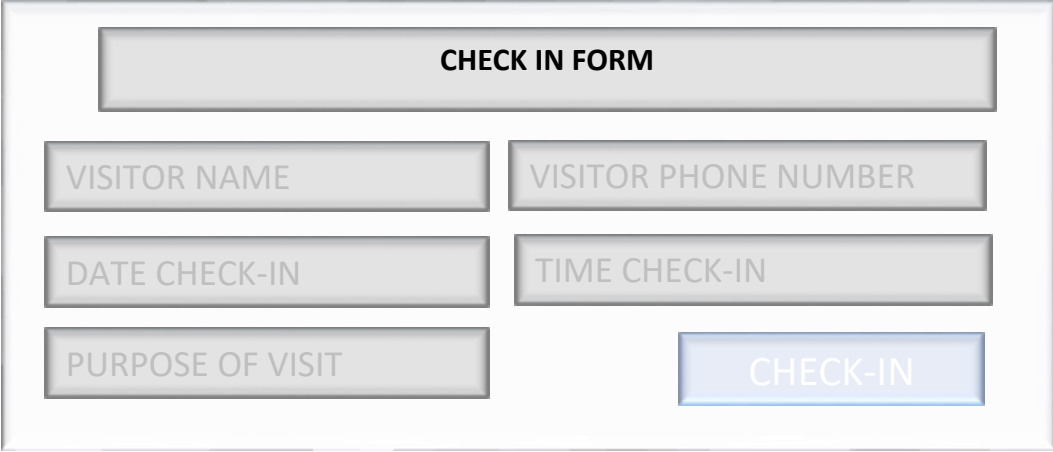
**Input:** Visitor details (name, contact information, purpose of visit) will be collected via web application portal and manual entry by security personnel.

Registration Form

The registration form is displayed within a light gray border. At the top, a dark gray header bar contains the text "REGISTRATION FORM" in white. Below the header, there are five input fields arranged in two columns. The first column contains three fields: "ENTER NAME", "ENTER EMAIL", and "CHOOSE GENDER". The second column contains two fields: "ENTER PHONE NUMBER" and "ENTER PHYSICAL ADDRESS". To the right of the "CHOOSE GENDER" field is a blue button with the text "REGISTER" in white.

*Figure 1:Registration Form*

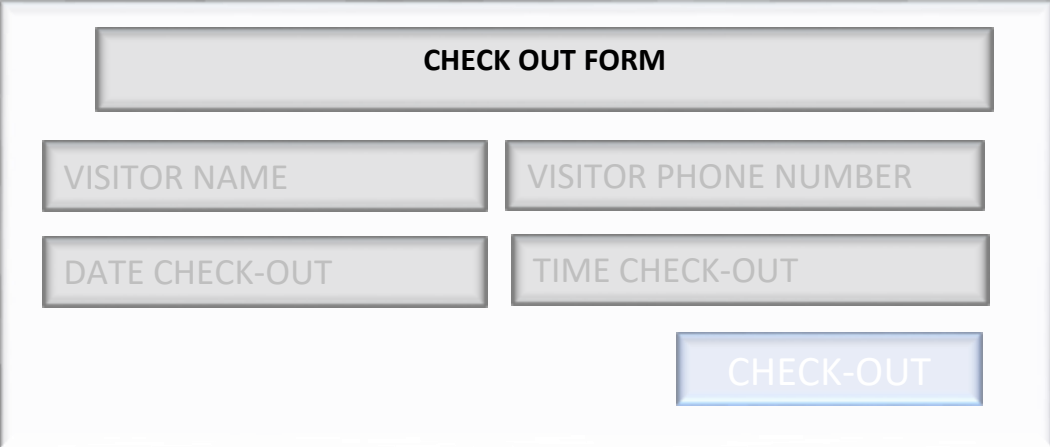
## CHECK IN FORM



A screenshot of a 'CHECK IN FORM' interface. The form is enclosed in a light gray border. At the top, there is a header bar with the text 'CHECK IN FORM'. Below this, the form is organized into two columns. The left column contains three input fields: 'VISITOR NAME', 'DATE CHECK-IN', and 'PURPOSE OF VISIT'. The right column contains two input fields: 'VISITOR PHONE NUMBER' and 'TIME CHECK-IN'. At the bottom right of the form, there is a blue button labeled 'CHECK-IN'.

*Figure 2:Check in*

## CHECK OUT FORM

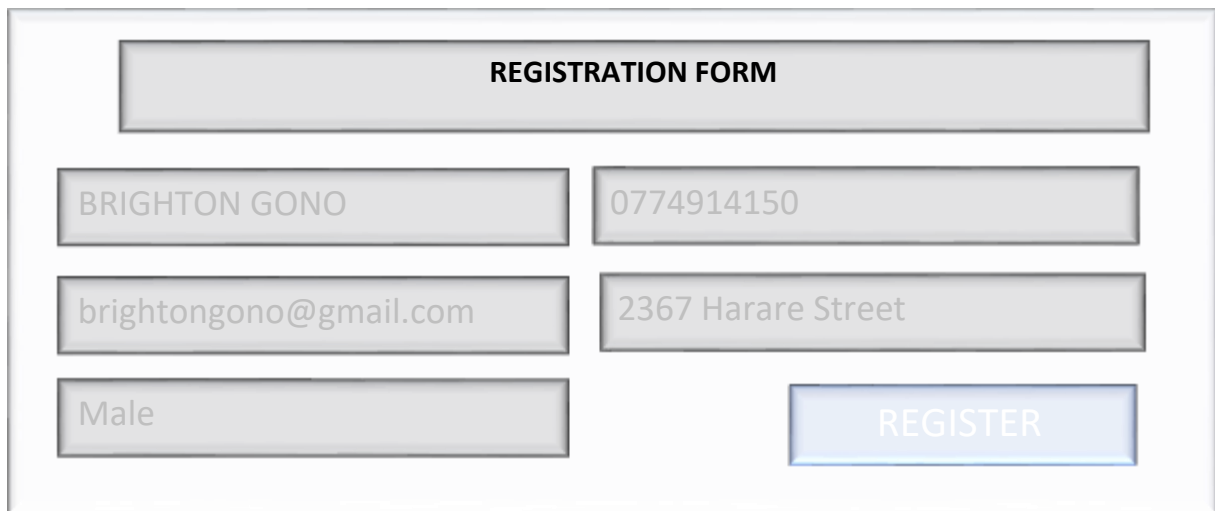


A screenshot of a 'CHECK OUT FORM' interface. The form is enclosed in a light gray border. At the top, there is a header bar with the text 'CHECK OUT FORM'. Below this, the form is organized into two columns. The left column contains two input fields: 'VISITOR NAME' and 'DATE CHECK-OUT'. The right column contains two input fields: 'VISITOR PHONE NUMBER' and 'TIME CHECK-OUT'. At the bottom right of the form, there is a blue button labeled 'CHECK-OUT'.

*Figure 3:Checkout output*

**Output:** Visitor logs, real-time visitor tracking reports, and security alerts.

## VISITOR REGISTRATION

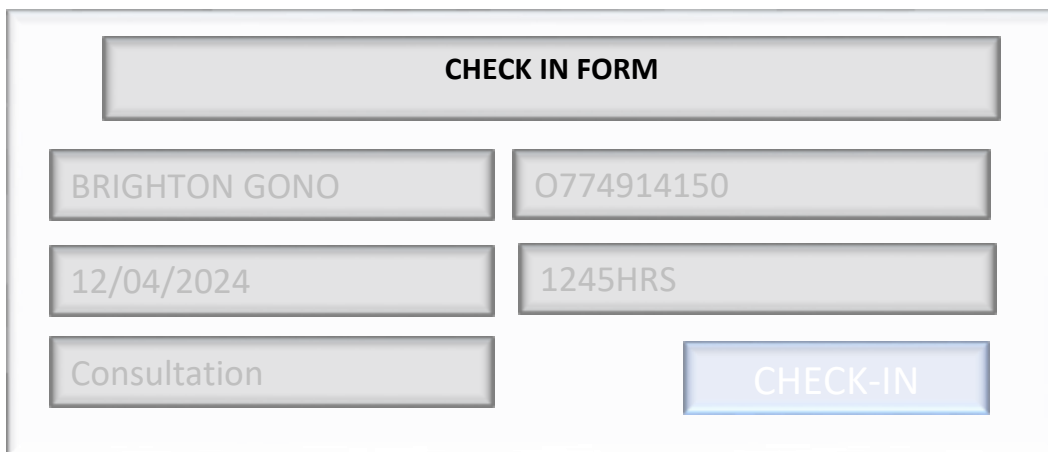


A UI mockup of a registration form. At the top is a header box labeled "REGISTRATION FORM". Below it are five input fields arranged in three rows: the first row has "BRIGHTON GONO" and "0774914150"; the second row has "brightongono@gmail.com" and "2367 Harare Street"; the third row has "Male". To the right of the "Male" field is a blue button labeled "REGISTER".

| REGISTRATION FORM      |                    |
|------------------------|--------------------|
| BRIGHTON GONO          | 0774914150         |
| brightongono@gmail.com | 2367 Harare Street |
| Male                   | REGISTER           |

*Figure 4:Visitor Registration Output*

## CHECK IN OUTPUT DESIGN



A UI mockup of a check-in form. At the top is a header box labeled "CHECK IN FORM". Below it are five input fields arranged in three rows: the first row has "BRIGHTON GONO" and "0774914150"; the second row has "12/04/2024" and "1245HRS"; the third row has "Consultation". To the right of the "Consultation" field is a blue button labeled "CHECK-IN".

| CHECK IN FORM |            |
|---------------|------------|
| BRIGHTON GONO | 0774914150 |
| 12/04/2024    | 1245HRS    |
| Consultation  | CHECK-IN   |

*Figure 5:Check in Output*

CHECK OUT OUTPUT DESIGN

CHECK OUT FORM

BRIGHTON GONO

O774914150

12/04/2024

1600HRS

CHECK-OUT

Figure 6:Checkoutput

VISITOR LOGS

HYBRID VISITOR MANAGEMENT SYSTEM

PE

| VISITOR NAME  | PURPOSE OF VISIT | ACTION           |
|---------------|------------------|------------------|
|               | CONSULTATION     | CHECKIN 1245HRS  |
| BRIGHTON GONO | CONSULTATION     | CHECKOUT 1600HRS |

Figure 7: Dashboard Report

2.4 Processing Requirements

The system will handle:

- Visitor registration and verification.
- Data storage and retrieval.
- Real-time tracking and reporting.
- Integration with security systems.

## **2.5 Software Requirements**

**Operating System:** Windows or Linux.

**Development Tools:** ASP.NET for web development, MySQL Server for database management.

## **2.6 Hardware Requirements**

Computers for security personnel.

Server for hosting the database and application.

## **2.9 Conclusion**

The planning phase will assist in the analysis and design stage of the proposed system to come up with the required resources and how best the resources that are available will be utilized .it will also assist in coming up with how to manage the time and the plan used to cross check if the deadlines are met.

## CHAPTER 3: DESIGN

### 3.1 Introduction

This chapter will focus on the design stage of the online content management system. Description of the interfaces that users will interact with, input and output design of forms and database design will be created; data flow diagrams and flow charts will be used to explain the process design.

### 3.2 System Overview

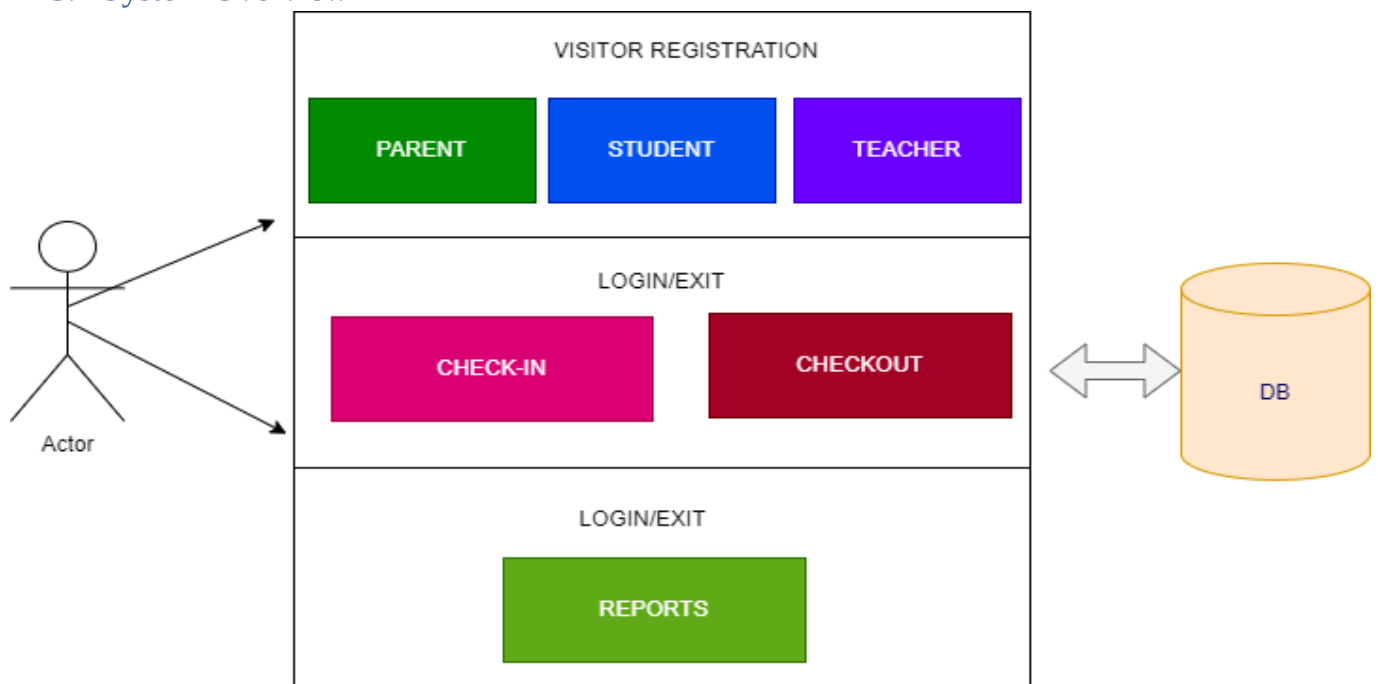


Figure 8: System Overview

### 3.3 User interface design

The graphic user interface enables the system user to interact with the system. The Hybrid Visitor system should be easy to use.

|          |                                        |
|----------|----------------------------------------|
| Username | <input type="text"/>                   |
| Password | <input type="password"/>               |
|          | <input type="button" value="Sign in"/> |

*Figure 9: Login Form*

Visitor registration form allow user to capture details of the new visitor and it consist of the follow as shown below

|               |                      |
|---------------|----------------------|
| ID Number     | <input type="text"/> |
| First Name    | <input type="text"/> |
| Last Name     | <input type="text"/> |
| Gender        | <input type="text"/> |
| Date of Birth | <input type="text"/> |
| Address       | <input type="text"/> |
| User Type     | <input type="text"/> |
| Phone Number  | <input type="text"/> |

Create Account

*Figure 10: Registration Form*

Below is the check-in input form

|             |                      |
|-------------|----------------------|
| ID          | <input type="text"/> |
| CheckinTime | <input type="text"/> |
| CheckinDate | <input type="text"/> |

*Figure 11:Checkin Design*

Below shows the checkout form

|                                         |                      |
|-----------------------------------------|----------------------|
| ID                                      | <input type="text"/> |
| CheckoutTime                            | <input type="text"/> |
| <input type="button" value="Checkout"/> |                      |

*Figure 12:Checkout Design*

### **3.4 Processes Design**

#### **3.4.1 Zero level dfd for hvs**

This is the Zero Level DFD of Hybrid Visitor System, where the researcher has elaborated the high-level process of Leave Management. It's a basic overview of the whole Hybrid Visitor System or process being analysed or modelled. It should be easily understood by a wide audience, including users, check-in and checkout. In zero level DFD of Hybrid Visitor System, and researcher has described the high-level flow of the Hybrid Visitor system

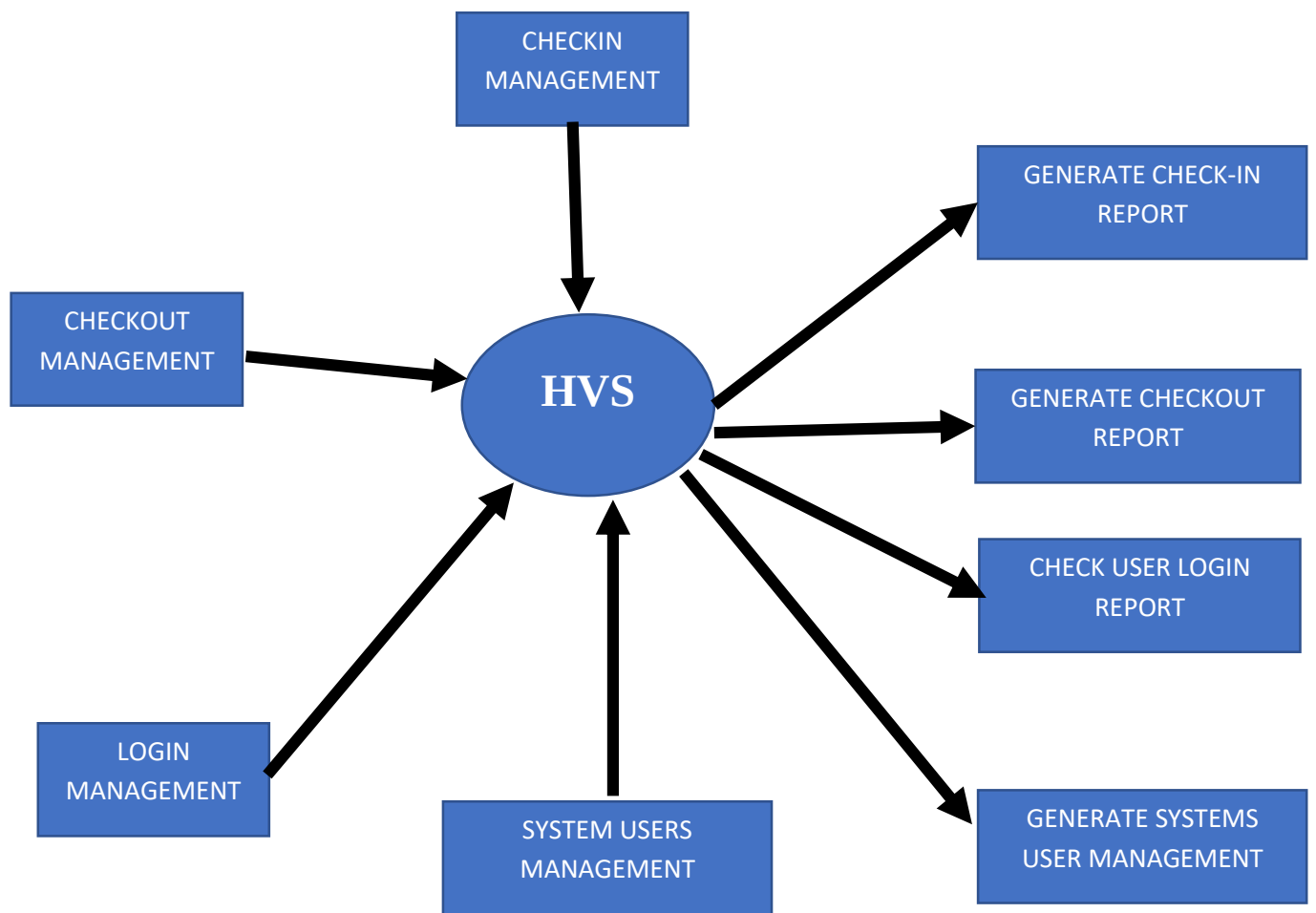


Figure 13:Zero level dfd for hvs

### 3.4.2 level 1 dfd for hvs

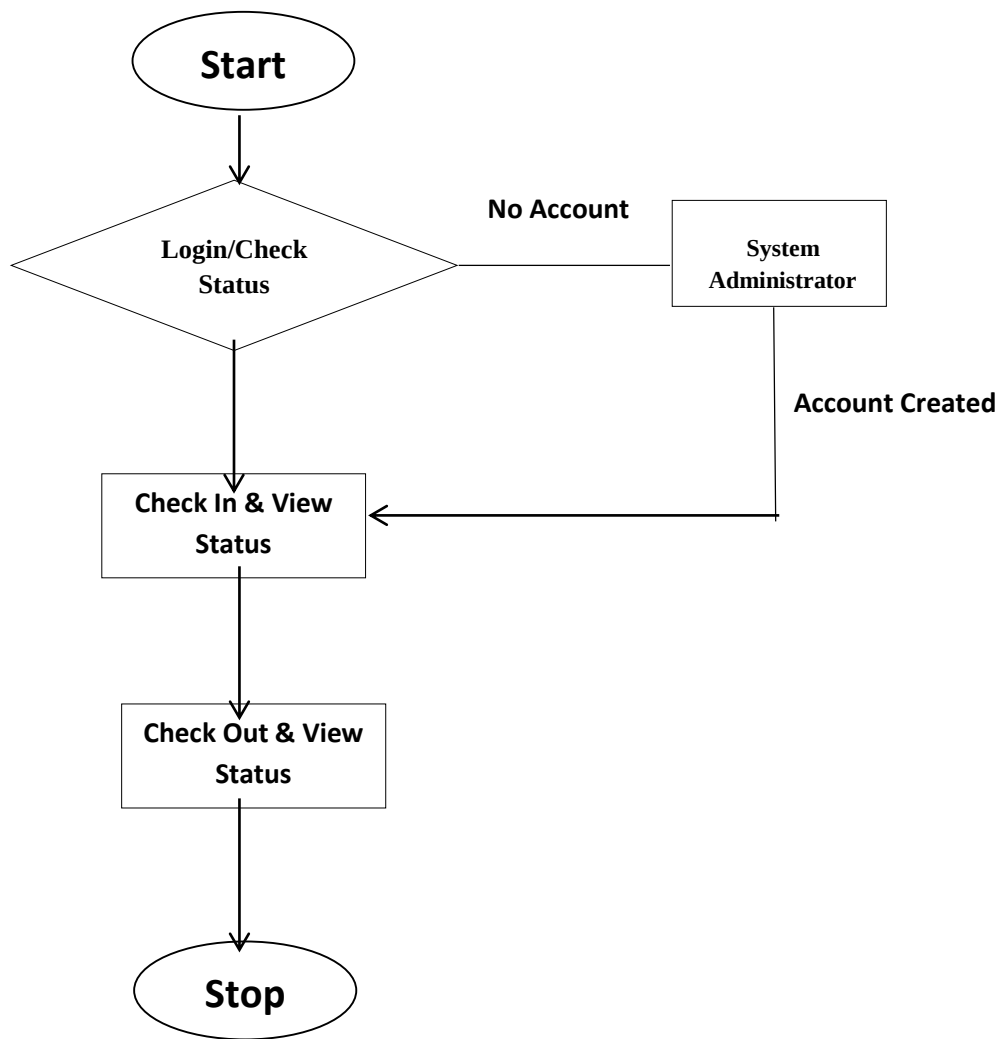


Figure 14:level 1 dfd for hvs

### 3.5 Module design

Module design involves breaking down the system into smaller, manageable components, each responsible for specific functionalities.

#### 3.5.1 User Management Module

- **Registration** - handles user sign-up and verification.
- **Authentication** - manages user login and session handling.
- **Profile Management**- allows users to update their personal information and settings.

#### 3.5.2 Visitor Management Module

- **Visitor Registration:** Tools for creating visitor account.
- **Check-in and Checkout Management:** manage visitor check-in and checkout information.

### 3.5.3 Report Management Module

- **Visitor Report:** check-in and Checkout Report daily, weekly, monthly and yearly report are generated.
- **Visitor Registration:** Generate report for visitor registered in system daily, weekly, monthly and yearly

### 3.6 Database Design

The system will store all the information belonging to Hybrid Visitor System in a MySQL Database. A database is a very effective method and tool to store data in a simple, safe and secure manner, while maintaining data relations and constraints and enforcing data integrity. Below is an E-R Diagram to illustrate Constraints and Relationships that exists in the school data.

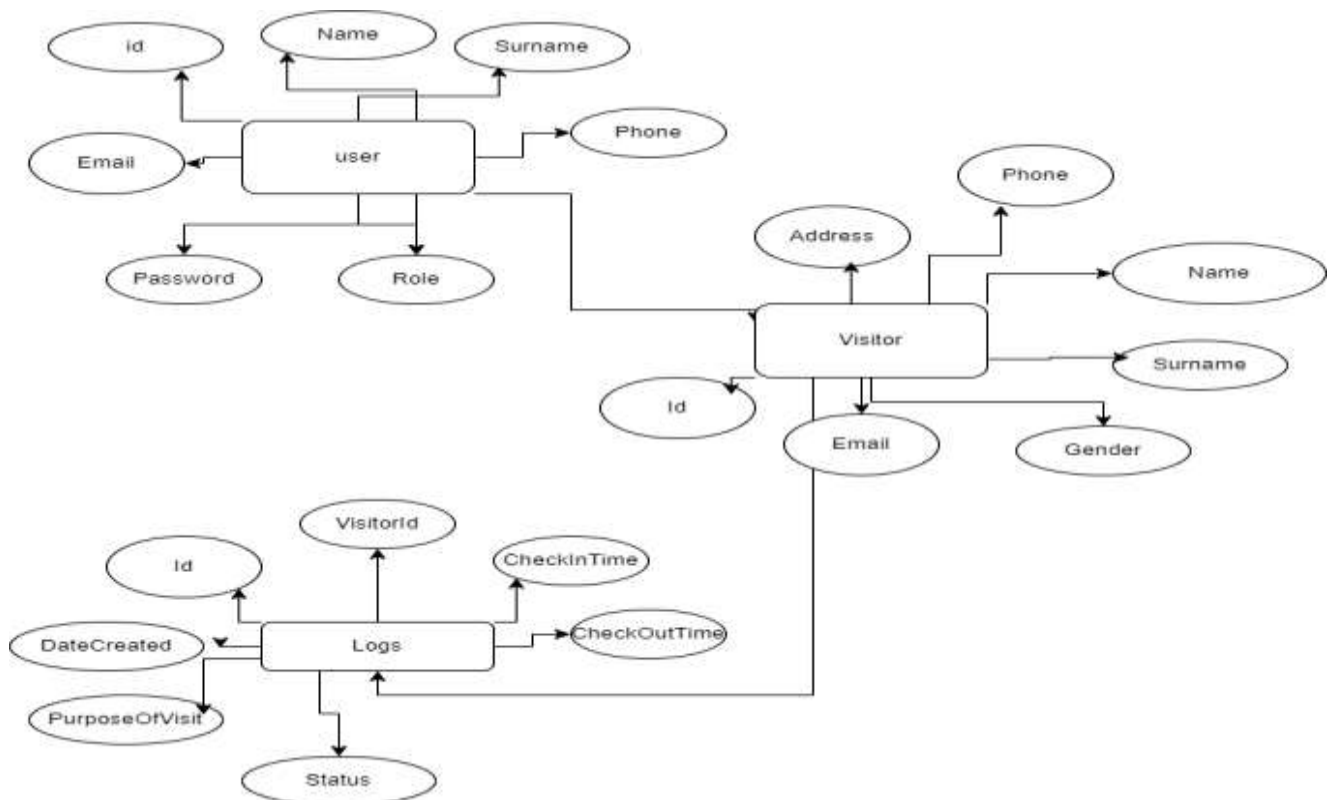


Figure 15: ER Diagram

#### Key Components of a Database Schema

- **Tables:** Represent entities in the database. Each table consists of rows (records) and columns (attributes or fields).
- **Columns/Fields:** Define the data types and properties of the data stored in each column.

- **Primary Key:** A unique identifier for each record in a table.
- **Foreign Key:** A field in one table that uniquely identifies a row of another table, creating a relationship between the tables.
- **Indexes:** Enhance the speed of data retrieval operations on a table.
- **Constraints:** Rules enforced on data in the tables to ensure accuracy and reliability. Examples include NOT NULL, UNIQUE, CHECK, and FOREIGN KEY.
- **Relationships:** Define how tables relate to each other, usually through foreign keys. Common relationships include one-to-one, one-to-many, and many-to-many.

### **User Table**

```
CREATE TABLE Users (
    id INT PRIMARY KEY,
    Name VARCHAR(100),
    Email VARCHAR(100) UNIQUE,
    Password VARCHAR(100),
    Role VARCHAR(50)
);
```

### **Visitor Table**

```
CREATE TABLE visitors (
    id INT PRIMARY KEY,
    Name VARCHAR(100),
    Surname VARCHAR(100),
    Email VARCHAR(100) UNIQUE,
    Address VARCHAR(100),
    Gender VARCHAR(100),
    Phone VARCHAR(50) NULL,
    DateCreated DATE Timestamp
);
```

### **logs Table**

```

CREATE TABLE logs (
    id INT PRIMARY KEY,
    VisitorId INT FOREIGN KEY,
    CheckInTime Timestamp
    DateVisited Date
    Purposeofvisit TEXT
    CheckOutTime VARCHAR(100) NULL,
    Status VARCHAR(50) Default("PENDING"),
    DateCreated DATE Timestamp,
    FOREIGN KEY (VisitorId) REFERENCES visitors(id),
);

```

*Table 1: User Table*

| Field name | field type | field size |
|------------|------------|------------|
| id         | integer    | 11         |
| Email      | Varchar    | 150        |
| password   | Varchar    | 150        |
| Name       | Varchar    | 100        |
| Role       | Varchar    | 30         |
| Phone      | Varchar    | 15         |

*Table 2:Visitor Table*

| Field name | field type | field size |
|------------|------------|------------|
| id         | integer    | 11         |
| Name       | Varchar    | 100        |
| Surname    | Varchar    | 100        |
| Email      | Varchar    | 100        |
| Phone      | Varchar    | 15         |
| Address    | Varchar    | 150        |
| Gender     | Varchar    | 15         |

*Table 3:Logs Table*

| Field name | field type | field size |
|------------|------------|------------|
| id         | integer    | 11         |

|                        |           |           |
|------------------------|-----------|-----------|
| VisitorId( <b>FK</b> ) | Integer   | 11        |
| CheckInTime            | Timestamp |           |
| PurposeOfVisit         | Text      |           |
| CheckOutTime           | Varchar   | 200       |
| Status                 | Varchar   | 150       |
| DateCreated            | Date      | Timestamp |
|                        |           |           |

### 3.7 Class Diagrams

Class diagrams are used to model the static structure of the system by representing classes, attributes, methods, and relationships among objects.

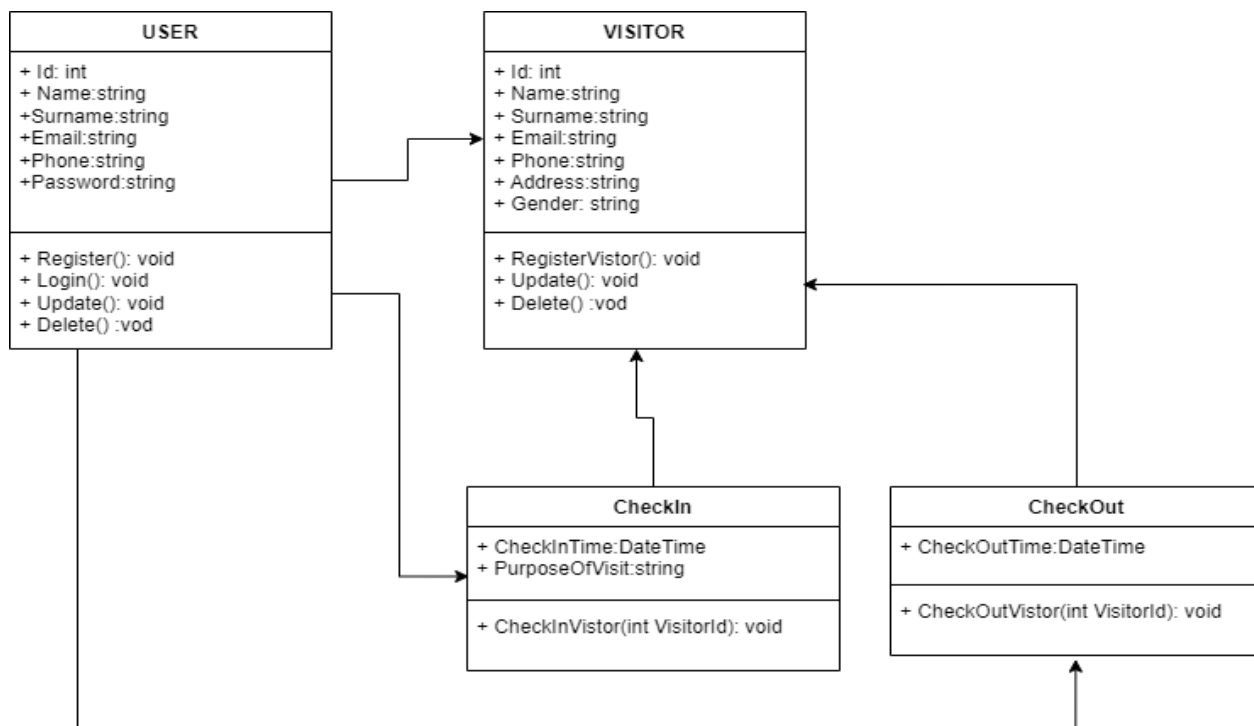


Figure 16: Class Diagram

### 3.8 Conclusion

The system design for the Hybrid Visitor System encompasses comprehensive interface design, intuitive menu design, robust system architecture, and modular design principles. Each aspect is crafted to provide an efficient, user-friendly, and scalable solution for Hybrid Visitor System



## CHAPTER 4: CODING AND TESTING

### 4.0 Introduction

This chapter is mainly concerned with testing the system. Coding involves turning program into specific instructions that are executed by the computer system.

### 4.1 Test cases

In validation testing we ensure that all the data entered was displayed properly on the view screen and that we got the expected results.

#### 4.1.1 Test Case 1: Invalid login



Figure 17: Test Case 1: Invalid login

#### 4.1.2 Test Case 2: Successful Logged in

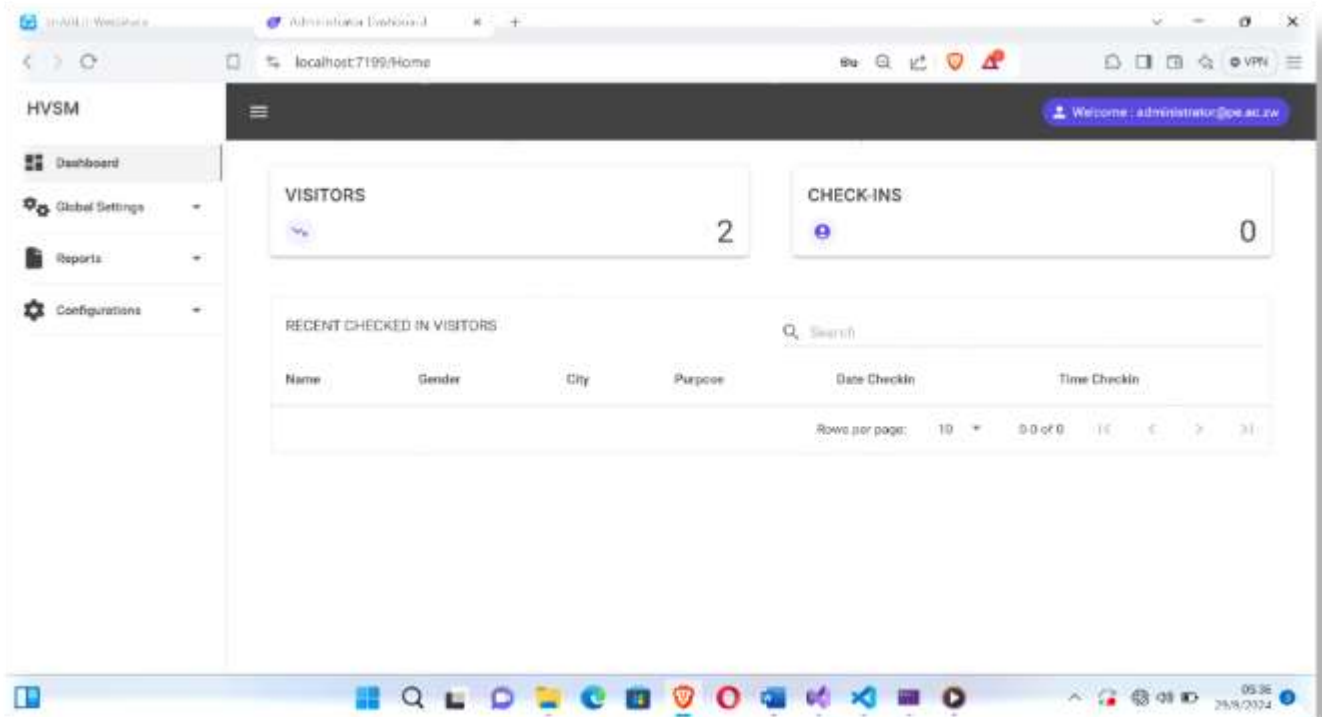


Figure 18: Test Case 2: Successful Logged in

#### 4.5. Conclusion

This chapter presented the Testing cases. The chapter also looked at the testing strategies used in system testing. Now that the system has been developed and tested successfully, the next chapter will focus on the implementation plan of the proposed system.

## **CHAPTER 5: IMPLEMENTATION/DEPLOYMENT**

### **5.1 Introduction**

This chapter outlines the steps for deploying the system at Prince Edward High School. The deployment phase involves translating the system design into a functional and working system. This includes developing the actual code, setting up the necessary infrastructure, and ensuring that all components work together seamlessly.

### **5.2 Conversion Plan**

Plan the transition from the manual system to the hybrid system, including data migration and system setup. This is a technical process by which the new system replaces the old system. There are several approaches to system conversion that could be adopted:

#### **5.2.1. Parallel Conversion**

The conversion method to be used is parallel conversion. This method allows both the new and old system to operate fully for a specific period of time. Both systems operate side by side until the project development team and end users agree to switch over to the new system after satisfaction that the new system will be able to run independently without complexities.

#### **5.2.2. Phased changeover**

The system is implemented in stages or modules across the organization. Phased changeover gives part of the system to the organization and costs are relatively moderate as the system is implemented in stages rather than at once. Risks of failure are also moderate because the risk associated is limited to the module being implemented.

#### **5.2.3. Pilot Conversion**

Both the old and new systems operate at the same time but at a pilot site. The rest of the organization continues using the old system. This is to say that the system would have to be used by a selected group of users who would further assess its acceptability and functionality.

#### **Advantages**

- Moderate costs for there would be the utilization of one site to run both systems
- Moderate risk of failure as the system would have been installed at the pilot site.
- The developed system would have been placed at actual site and tested before actual use.

#### **5.2.4. Direct change over (Recommended strategy)**

Direct changeover is the implementation of a new facility, system, process, product or procedure at a point in time. The term implies a major change that is launched all at once as opposed to a more conservative approach such as a phased implementation or parallel run. The old system is immediately replaced by the new system and is abandoned at once. This approach has been chosen because there are no risks associated with moving away from the old system. Furthermore, implementing a fees management system is not complex. This method would be efficient in that it would minimise duplication of work and it is not costly because only one system will be in operation.

### **5.3 User Manual**

The user manual provides detailed instructions for all users of the HVS, including Admin, and users. Key sections of the user manual include:

#### **5.3.1 Introduction**

- Overview of the HVS
- System requirements
- Getting started guide

#### **5.3.2. User Roles and Responsibilities**

- Description of different user roles (Administrator, User)
- Role-specific functionalities and permissions

#### **5.3.3. Navigation**

- Interface overview
- How to navigate the dashboard
- Accessing check in and check out logs

### **5.4 User Training**

Training is going to facilitate delivery of the right training to the right people at the right time in order for efficient and proper use of the system to be achieved. Training will be provided to the end users before operating the system. The system developer will carry out in-house training to the users. Training will be done on how to easily navigate through the system. The

system developer will train all the users on how to access their authorized options and their functions. Below is a list of personnel that the system developer identified for training:

Teacher, Headmaster, Student, Parent

The following training technique will be followed:

- demonstrations and walk through
- charts

#### **5.4.1. Demonstrations**

Demonstrations will enable the systems analyst to demonstrate to the users how to use the system. The systems analyst will demonstrate the procedures for prompting the password, entering data, checking records, and printing of various reports.

#### **5.4.2. Charts**

Charts will enable users to follow the procedures in trying to familiarize with the system. The trainer will put data on charts for use to be applied to the real system.

#### **5.4.3. Advantages**

- Reduce costly mistakes
- Motivates the workers
- Speeds up processing
- In-house training is cheap

### **5.5 Conclusion**

The deployment of the Hybrid Visitor System marks a significant milestone in enhancing digital clocking in and out. The process, encompassing thorough planning, installation, configuration, and testing, has ensured a stable and secure platform tailored to the needs of users, and administrators. The comprehensive user manual provides essential guidance for all users, facilitating smooth adoption and usage. Initial results indicate strong user engagement and system performance, laying the groundwork for future enhancements and continued success in visitors' environments.

## **CHAPTER 6: EVALUATION AND CONCLUSION**

### **6.1 Introduction**

This chapter evaluates the system and discusses future developments. Having successfully completed all the phases, there is need to appraise the performance of the newly developed system to see whether it managed to meet all objectives and functional requirements that were specified in the proposal and analysis phases respectively. This will enormously aid to maintaining the system, as maintenance is an ongoing process that needs ongoing programs to support it.

### **6.2 Evaluation of the System**

This process is done on a regular basis to ensure that the newly implemented system is a true solution to the defined problem by meeting the objectives for which it was developed to address. Periodic review, audit or monitoring of the system will be held with users and the developer so as to ensure the system is operating properly and meets the organization's objectives. The process also ensures that the newly implemented system meets the project objectives as stated in the first chapter. Errors encountered in the use of the system need to be corrected. The purposes of review are as follows:

- To determine if specified objectives have been met and if are still being met
- To ensure that the users are using the system correctly
- To check for maintainability and flexibility of the system in the organization
- To highlight shortfalls in the development process so that any mistakes can be rectified in future systems.

### **6.3 Future Plans/Developments**

Initially the systems analyst will carry out reviews on a monthly basis and later on do it quarterly, then finally half a yearly. This is because during the first days there may be problems arising or they may have been identified and need to be corrected as soon as possible.

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