

Course Project report On

**PROJECT TITLE: MITS STORE MANAGEMENT**

*Submitted in*

**CSL 333 DATABASE MANAGEMENT SYSTEMS LAB**

**V<sup>th</sup> SEMESTER**

**ARTIFICIAL INTELLIGENCE AND DATA SCIENCE**

**AARYA M S ( MUT22AD002 )**

**ADITHYA S KUMAR ( MUT22AD008 )**

**ALISHA MARY SHIBU ( MUT22AD015 )**

**ARPITHA G H LALJI ( MUT22AD021 )**

**NANDANA R ( MUT22AD056 )**



***Muthoot  
Institute of Technology & Science***

**DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND DATA SCIENCE**

**MUTHOOT INSTITUTE OF TECHNOLOGY & SCIENCE**

**Varikoli, Puthencruz – 682 308**

# INTRODUCTION

**Overview:** The MITS Store Management System is an innovative solution aimed at transforming the traditional print request process at the MITS store. This project addresses the bottlenecks and inefficiencies that students and staff often encounter due to high demand, particularly during peak hours. With the growing reliance on printed materials for academic and administrative purposes, it has become essential to implement a structured approach that optimizes service delivery and enhances the user experience.

**Significance of the Project:** Efficient printing services are critical in an academic setting, where delays and overcrowding can cause significant disruptions. This project is not only a technological solution but also a move toward modernizing campus services, aligning with digital transformation initiatives, and responding to user expectations for streamlined service delivery.

**Purpose:** The primary purpose is to reduce wait times, improve customer satisfaction, and ensure a smooth operation that minimizes congestion. By introducing a digital platform, this project also aims to reduce manual management, allowing staff to focus on other tasks and contribute to a more organized store environment.

## **Scope and Limitations:**

- **Scope:** The system will handle print request submissions, manage queue prioritization, provide notifications, and store user data securely. It will be available as a web and/or mobile application for easy access by students and staff.
- **Limitations:** The initial version may focus on simple print jobs only, with future plans to expand functionality based on feedback. Additionally, the offline data access feature is limited to essential user details for privacy and security.

**Future Expansion:** Future versions of the system could include more advanced functionalities, such as wait time estimations based on current queue length, integration with digital payment platforms for paid services, and options for different types of print requests, like color printing or binding.

# OBJECTIVES

- **Primary Objectives:**

- **Reduce Wait Times:** The main objective is to significantly cut down the waiting period for users who require print services, ensuring that they can collect their documents without prolonged delays.
- **Manage Crowding:** By efficiently managing the queue, the system prevents excessive crowding within the store, creating a more pleasant and manageable environment for both users and staff.
- **Enhance Customer Satisfaction:** With a smoother and more predictable print service experience, users are expected to be more satisfied, which in turn improves the overall perception of the campus services.
- **Enable Offline Data Access:** An important goal is to ensure that the system remains functional and allows the administrator to access essential user details, even in case of server or network downtime.

- **Secondary Objectives:**

- **Optimize Store Operations:** Through better queue management, the system allows store staff to allocate resources more effectively, reducing workload and operational strain.
- **Introduce Digitalization to Traditional Services:** This project introduces a digital layer to a traditionally manual process, setting a precedent for other services on campus to adopt similar solutions.
- **Data Security and User Privacy:** A key objective is to implement robust security protocols for storing user information, ensuring that all personal data is protected and only accessible by authorized personnel.

- **Performance Metrics:**

- **Wait Time Reduction:** Measure the decrease in average wait time compared to pre-implementation levels.
- **Customer Feedback and Satisfaction:** Collect feedback to assess user satisfaction levels and identify any pain points for further optimization.
- **Efficiency of Offline Access:** Test the ease and reliability with which the administrator can access essential user data during system downtime.

# PROBLEM STATEMENT

- **Context:** The MITS store provides essential printing services for the MITS community, but the increasing demand, particularly during busy periods such as exam seasons and project submission deadlines, creates long queues and operational strain.
- **Core Problems:**
  - **Queue Congestion:** With multiple students and staff needing print services at the same time, the store often experiences high levels of congestion. This leads to overcrowded spaces, which not only cause frustration but can also be a safety hazard.
  - **Limited Manual Processing Capacity:** The current first-come, first-served manual processing method is inadequate for managing high demand efficiently, leading to slowdowns and prolonged waiting times.
  - **Lack of Predictability:** Users have no clear indication of how long they will need to wait or when their print request will be completed. This unpredictability often causes further crowding as users wait around the store for updates.
  - **System Downtime Issues:** During any technical outages, there is no reliable way to access essential user data, which disrupts service continuity and user experience.
- **Solution Rationale:**
  - **Automation and Queue Management:** The solution will introduce automation in handling print requests, which reduces reliance on manual intervention and improves the accuracy and speed of service delivery.
  - **Admin Management During Downtime:** Enabling admins to access stored user details even during system outages ensures minimal disruption to services, thus maintaining user trust and reliability.

# DESIGN AND DEVELOPMENT

- **System Architecture:** The MITS Store Management System is designed with a dual-user interface to serve both students and administrators (admins). Built using Flask for backend functionality and HTML for the front end, the application includes a secure database for storing user and request information. This modular design facilitates future updates and expansions.
- **User Roles:**
  - Student User: The student interface provides a streamlined, user-friendly experience focused on submitting and tracking print requests.
    - Home Page: Offers quick access to core features.
    - Features:
      - About Us: Contains an overview of Muthoot Institute of Technology and Science (MITS), providing students with information about the college's history, mission, and academic environment.
      - Services: Enables students to submit new print requests .
      - Sign Out: Ensures secure logout to protect user data.
  - Admin User: The admin interface includes advanced features for managing print requests, viewing user data, and overseeing queue operations.
    - Home Page: Summarizes current requests and user activity.
    - Features:
      - About Us: Includes details about MITS College, helping admins provide relevant information to users.
      - Order Details: Allows admins to monitor, manage, and prioritize print requests efficiently.
      - Student Details: Provides access to a student database for viewing profiles and request history, enhancing personalized service.
      - Sign Out: Secure logout to control access and protect sensitive data.

- **Technologies Used:**

- Backend: Flask powers the backend, handling request processing, queue management, and database interactions. Flask's lightweight framework allows flexible and fast development.
- Database: A SQL-based database stores user profiles, order details, and queue information, ensuring data security and persistence.
- Front-End: HTML is used for developing a responsive, user-friendly interface for both student and admin roles.

- **Key Features:**

- Queue Management Algorithm: A well-optimized algorithm organizes requests based on arrival and priority, reducing wait times and efficiently handling high demand.
- Admin Offline Access: Admins can access essential user data even during system downtimes, maintaining service continuity.

- **Development Stages:**

- User Interface Design: HTML is used to create a simple and intuitive interface for students, with additional management tools for admins.
- Backend Development with Flask: Flask supports core functionality like request processing, queue management, and data interactions.
- Database Setup and Offline Access: A secure SQL-based database is implemented, with offline capabilities for admin use during system outages.

# FINAL PROJECT OUTCOME

The MITS Store Management System successfully addressed the main objectives of reducing queue times, minimizing crowding, and enhancing customer service at the MITS store. By introducing a digital queue management and print request submission system, the following outcomes were achieved:

- **Reduction in Queue Length and Waiting Time:** The system's queue management algorithm effectively organized and prioritized print requests. As a result, students no longer need to physically wait in line, leading to shorter queue lengths and improved flow within the store.
- **Enhanced User Experience for Students:** The user-friendly student interface enables students to submit requests, track the status of their orders, and receive notifications when their print jobs are complete. This has increased satisfaction by keeping students informed and reducing unnecessary trips to the store.
- **Improved Efficiency for Store Administrators:** The admin interface, designed for managing print orders and user data, has streamlined operations within the store. Admins now have a centralized platform to view, manage, and prioritize print requests. Furthermore, offline access capabilities enable admins to view essential information even during network outages, ensuring service continuity.
- **Successful Use of Flask and HTML for Web Development:** The development process using Flask for the backend and HTML for the front end proved to be effective, resulting in a functional and responsive web application that meets the specific needs of both students and admins.
- **Scalability and Future Enhancements:** The modular architecture of the MITS Store Management System allows for future updates and potential feature expansions. Planned future improvements include payment integration for

print services and further optimization of the queue management algorithm to handle larger volumes of requests.

## CONCLUSION

- **Project Successes:**
  - The MITS Store Management System achieved its goals of reducing queues, improving customer satisfaction, and enhancing the store's operational efficiency.
  - The system has proven successful in handling peak loads, and the feedback received indicates a notable improvement in user experience.
- **Impact:**
  - Reduced crowding and wait times have made the store environment more accessible and efficient, contributing to a positive atmosphere for both users and staff.
  - By implementing digital solutions, the project aligns with broader digital transformation goals, paving the way for similar innovations across campus services.
- **Challenges and Resolutions:**
  - **Load Management:** High demand required fine-tuning the queue algorithm, which was successfully addressed through iterative testing.
  - **Downtime Data Access:** Ensuring reliable offline access for admins posed initial challenges, but these were resolved with data caching solutions.
- **Future Enhancements:**
  - Potential improvements include adding real-time wait time predictions, online payment options, and more detailed notification preferences for users.
  - Project Successes:
    - The MITS Store Management System achieved its goals of reducing queues, improving customer satisfaction, and enhancing the store's operational efficiency.



- The system has proven successful in handling peak loads, and the feedback received indicates a notable improvement in user experience.
- Impact:
  - Reduced crowding and wait times have made the store environment more accessible and efficient, contributing to a positive atmosphere for both users and staff.
  - By implementing digital solutions, the project aligns with broader digital transformation goals, paving the way for similar innovations across campus services.
- Challenges and Resolutions:
  - Load Management: High demand required fine-tuning the queue algorithm, which was successfully addressed through iterative testing.
  - Downtime Data Access: Ensuring reliable offline access for admins posed initial challenges, but these were resolved with data caching solutions.

# REFERENCES

## Technical Resources:

- Open Source:  
<https://github.com/hanzohasashi33/College-admission-management-system/blob/master/app.py>
- Flask documentation for backend development.
- Bootstrap documentation for UI components.