University of Caloocan City
Congressional Road, Caloocan City
Computer Studies Department

Thesis/Capstone Proposal

MEMBERS/COURSE/YEAR/SEC.

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THESIS/CAPSTONE TITLE: SNAP PRINT

PROJECT CONTEXT:

The UCC Congress Campus serves a diverse student body that often requires printing services for academic purposes. Current printing solutions may be limited by accessibility and ease of use. SnapPrint addresses these issues by offering a self-service printing solution that operates with minimal intervention, promoting efficiency and independence among students. By focusing on PDF format compatibility and specific paper sizes, SnapPrint ensures that users can easily manage their printing needs in a familiar and accessible manner.

General Objective

To develop a coin-operated printing machine that offers an efficient and accessible printing solution for students at UCC Congress Campus, focusing on user-friendliness and document compatibility.

Specific Objectives

- Develop a printing machine prototype.
- Ensure accessibility inside UCC Congress Campus establishment.

- Prioritize user-friendliness in operation.
- Ensure compatibility with common document formats.
- Integrate coin-based functionality to facilitate easy payment and usage for printing services.
- Support file imports through QR code system and flash drives.

Scope

The SnapPrint project will focus on the design and implementation of a coin-operated printing machine located at the UCC Congress Campus. The machine will exclusively handle PDF file formats and support three paper sizes: Long, Short, and A4. The target user group for this study will be students attending UCC Congress Campus

Limitation

- Machines are reliant on a stable and uninterrupted power supply to function properly.
- The project only supports PDF files.
- The printer requires troubleshooting if it experiences a paper jam or any error.
- The project can only support long, short, and A4 paper sizes.
- The user cannot select a page to have multiple copies.
- The user cannot have a multiple copies per file.
- Files can only be imported using the default QR code provided by the SnapPrint system or via a flash drive.
- Payment must be made with the exact amount of coins.

Document Upload and Selection- Users can upload documents from their devices by scanning a default QR code, facilitating a straightforward and efficient document selection process. Additionally, users have the option to import files via flash drives, further enhancing accessibility.

Printing Options- Users can customize their printing preferences, selecting options such as color and paper size (Long, Short, A4). This flexibility allows students to tailor their print jobs according to their specific requirements.

Printing Process- The printing process is initiated once the user confirms their selections. This clear confirmation step ensures that users are satisfied with their choices before the printing begins.

Admin Functionality

- **Pricing Management**: Administrators can adjust printing prices as necessary to remain competitive and responsive to demand.
- **Performance Monitoring**: The system tracks profits and the number of printed pages, providing valuable data for assessing usage patterns and financial performance.
- **Issue Notifications**: Admins receive alerts when issues occur with the machine, enabling timely maintenance and minimizing disruptions to service.

BUDGET:

HARDWARE

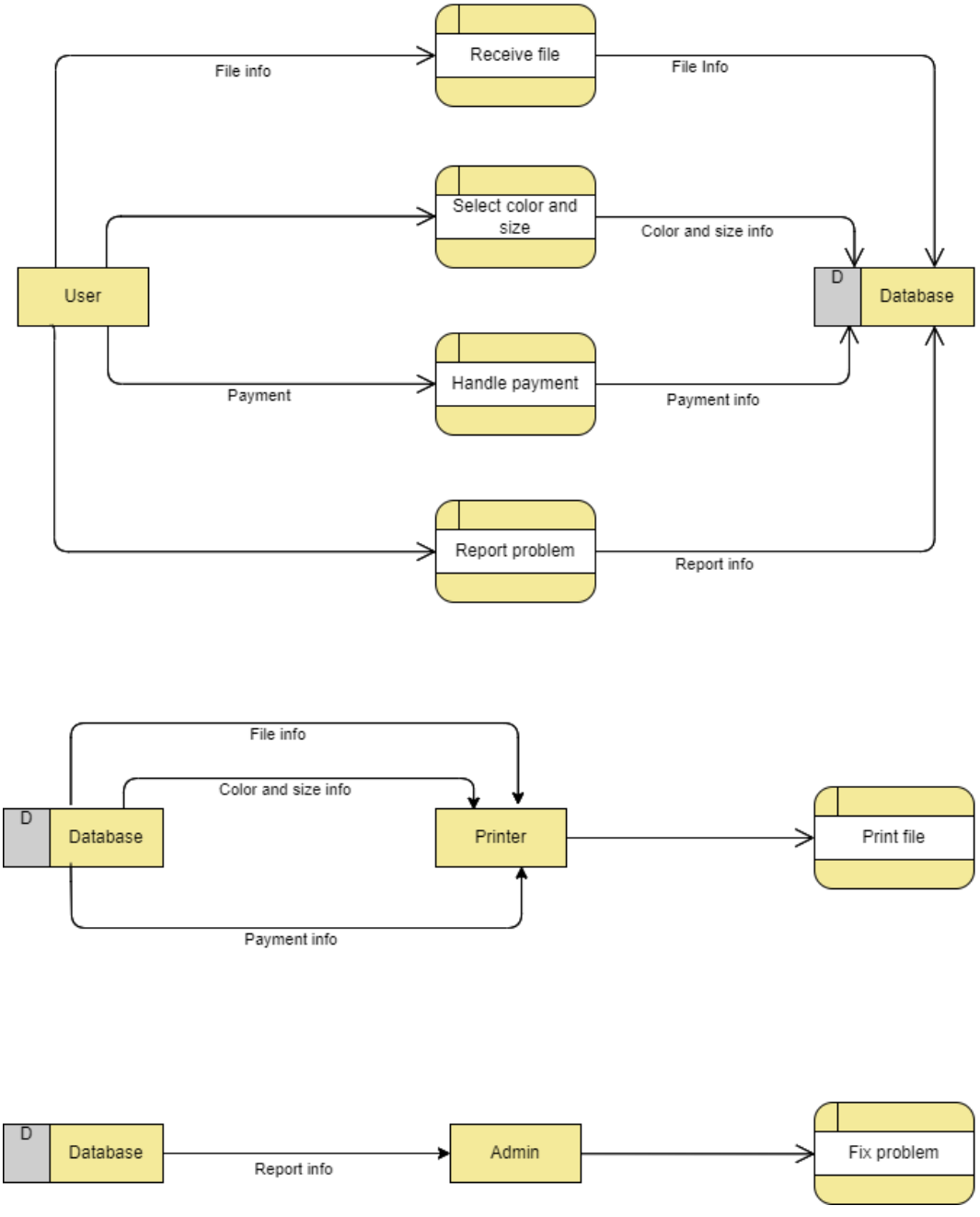
QUANTITY	PARTICULAR	PRICE	TOTAL PRICE
1	TOUCHPAD with MINI DESKTOP	4,500	4,500
1	COIN SLOT	400	400
3	ESP32	175	525
1	PRINTER	10, 000	10, 000
3	TRAY	125	375

3	DC MOTOR	120	360
1	BUCK CONVERTER	135	135
1	POWER SUPPLY	188	188
6	PICKUP ROLLER	189	1134
6	GEAR	35	210
3	PAPER SLIDE	150	450
2	L298D	95	190
		TOTAL:	18,467

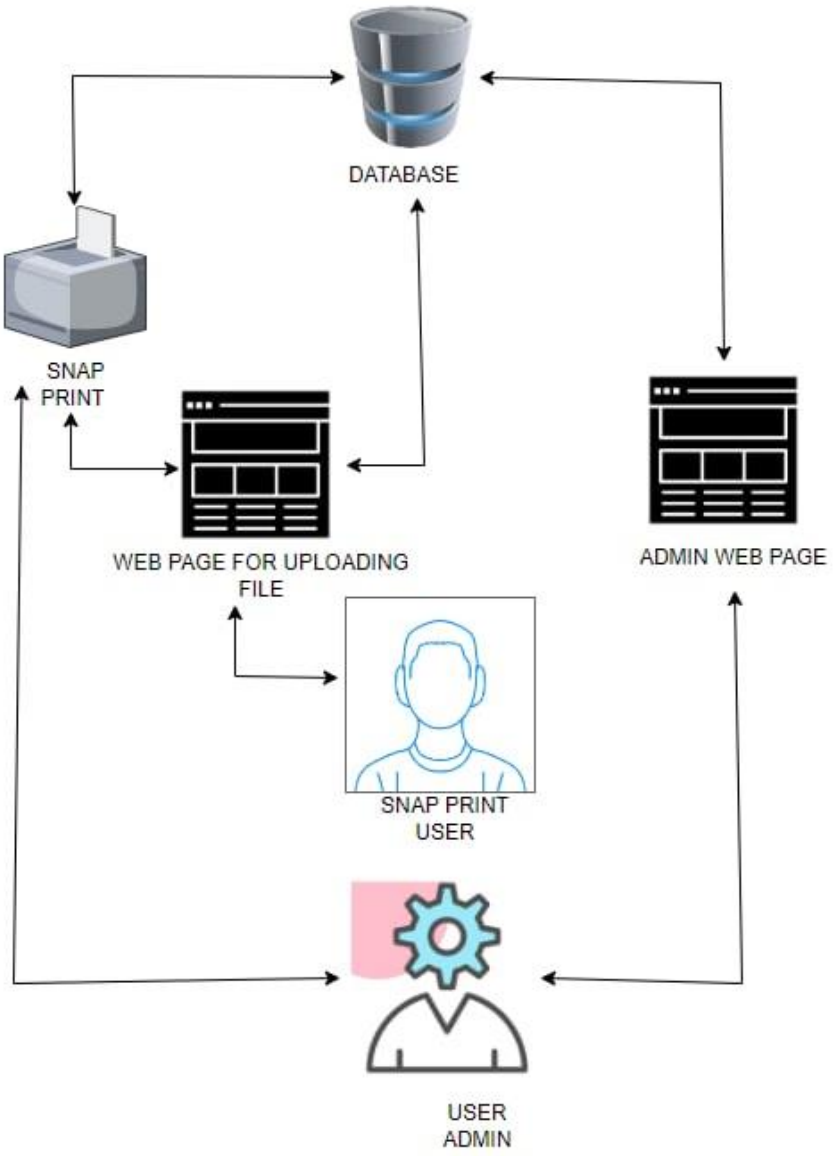
IPO DIAGRAM:

INPUT	PROCESS	OUTPUT
User Side: -Upload their PDF files using a default QR code or thru flash drive. -Insert the amount of payment required for printing services. -Select the desired paper size (Long, Short, A4). -Choose between colored or grayscale printing. Admin Side: -Refill paper stock (Long, Short, A4) and ink levels. -Change and update the pricing for printing services, including colored or grayscale options. -Records profit and number of printed papers.	-The system verifies the file format, ensuring only PDF files are accepted. -The system checks the inserted coins for correct amount and validity. -The system prepares the document for printing based on the selected paper size. -The machine prints the document once the payment is confirmed and the file is ready.	-SnapPrint

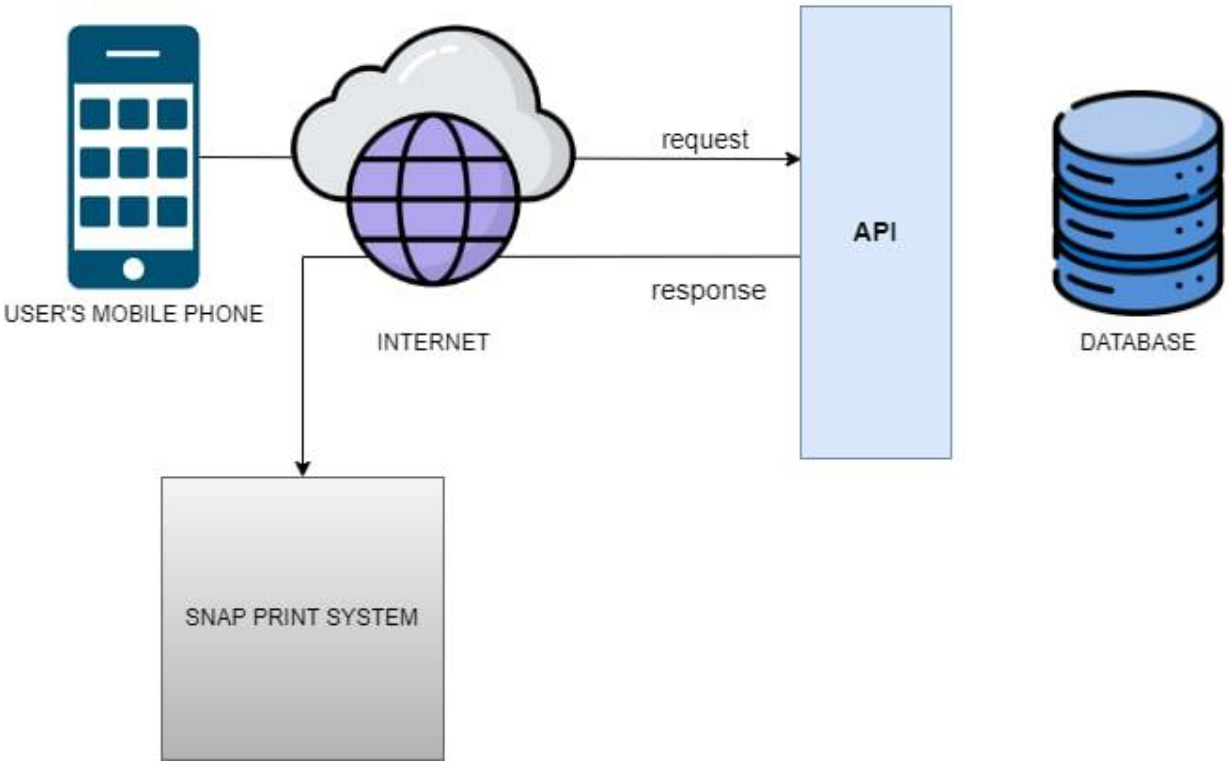
DATA FLOW DIAGRAM:



SYSTEM ARCHITECTURE DIAGRAM:



NETWORK DIAGRAM:



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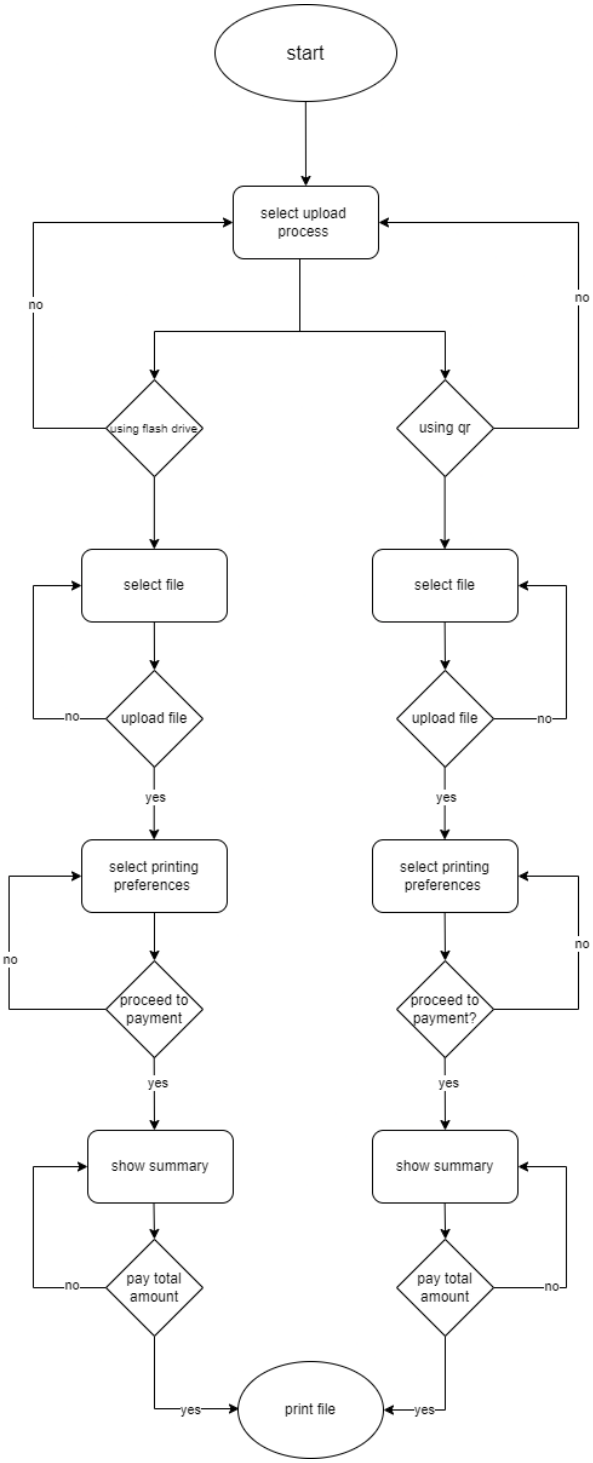
SYSTEM FLOWCHART:



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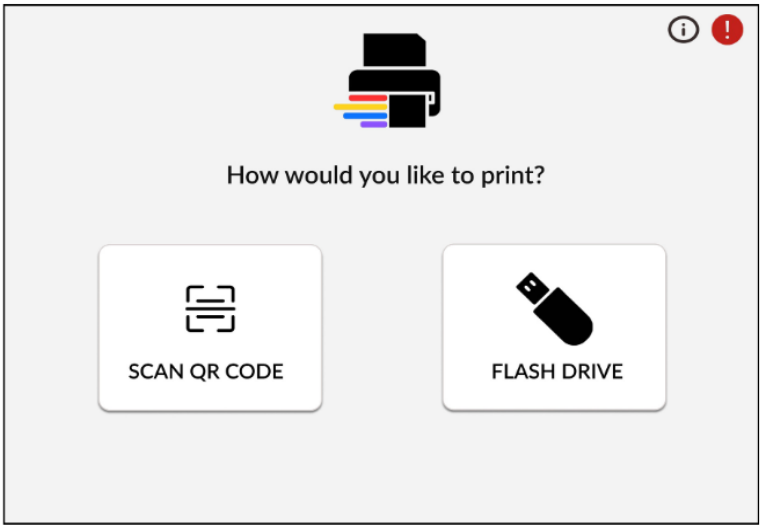
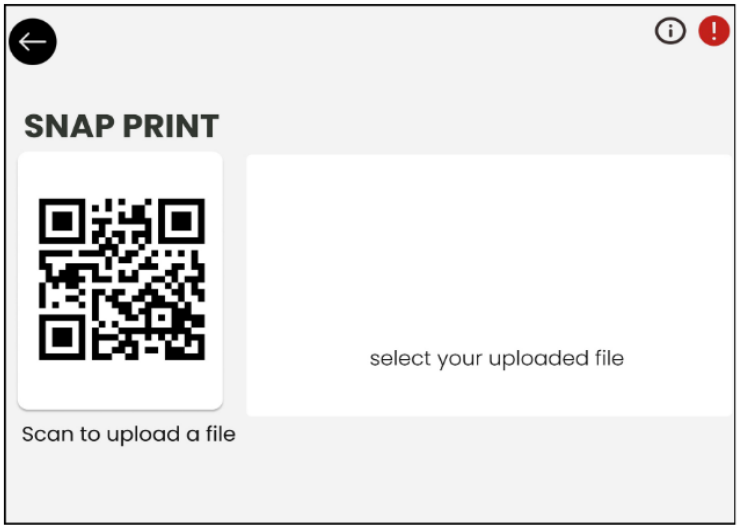
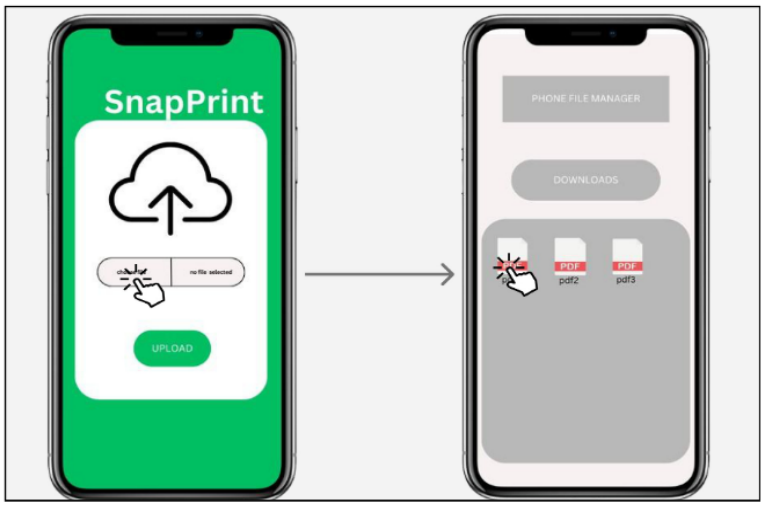
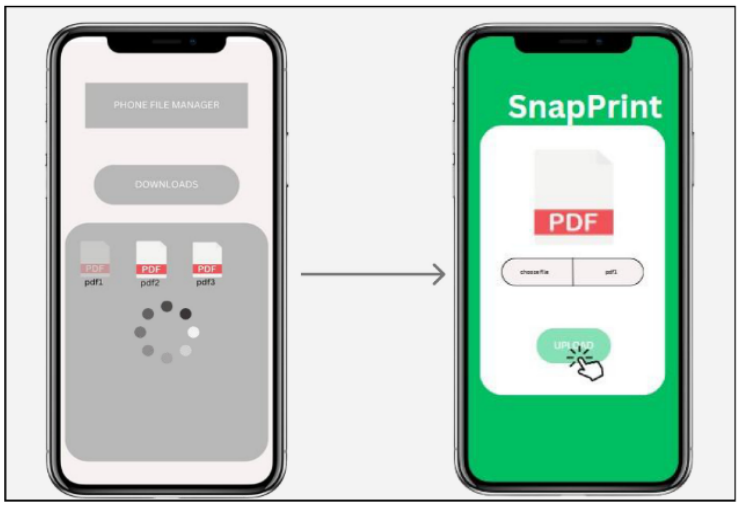
PROTOTYPE:

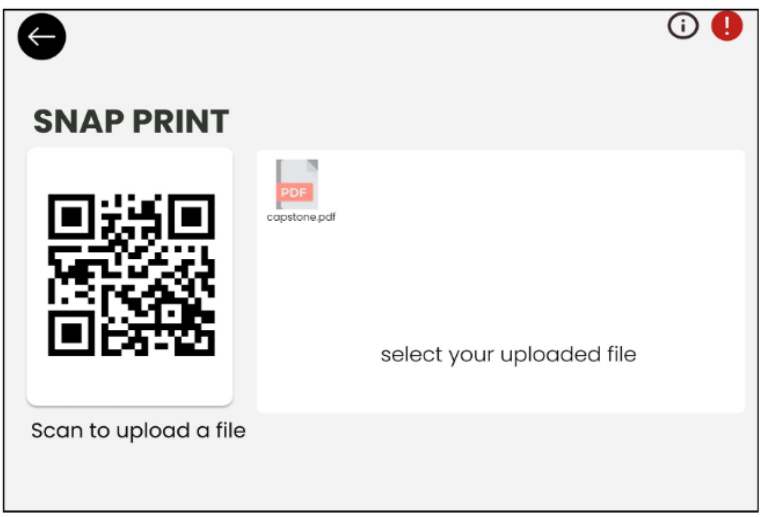
USER SIDE: THROUGH QR CODE











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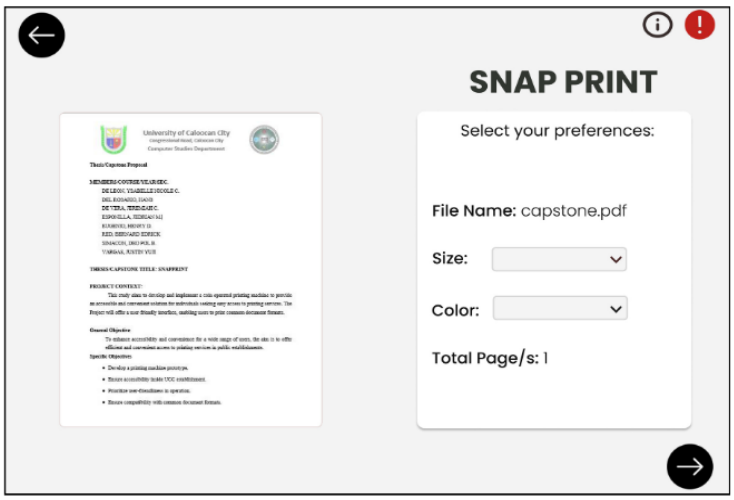

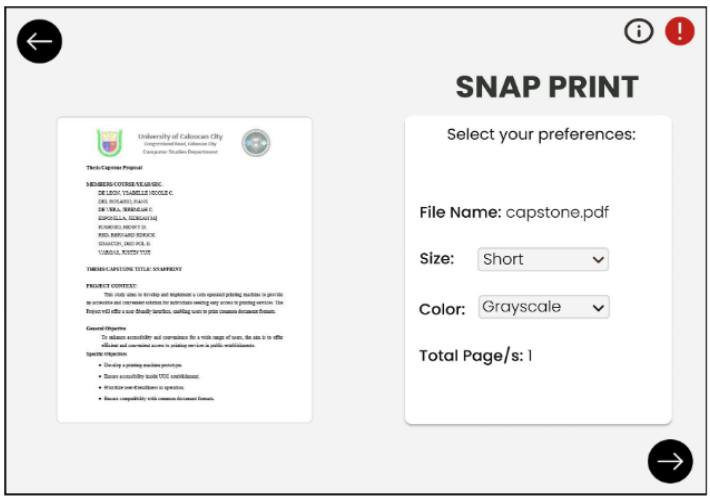

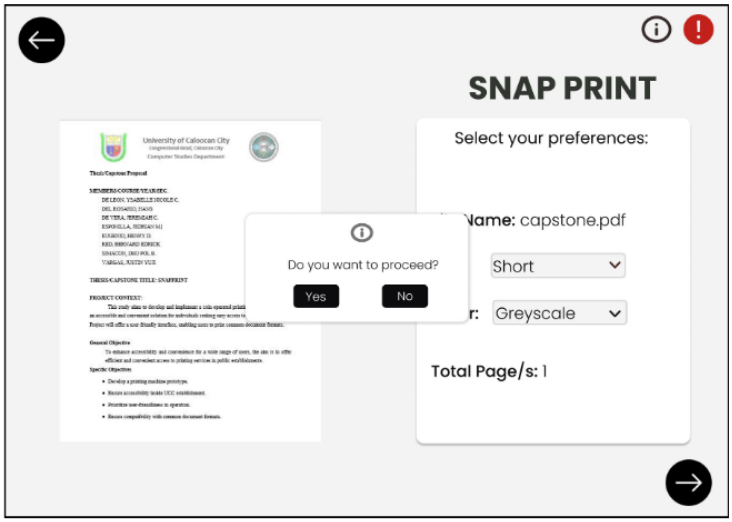

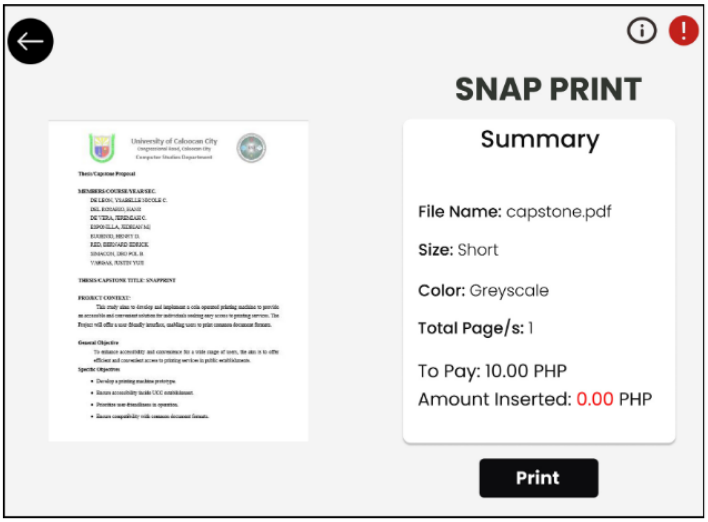

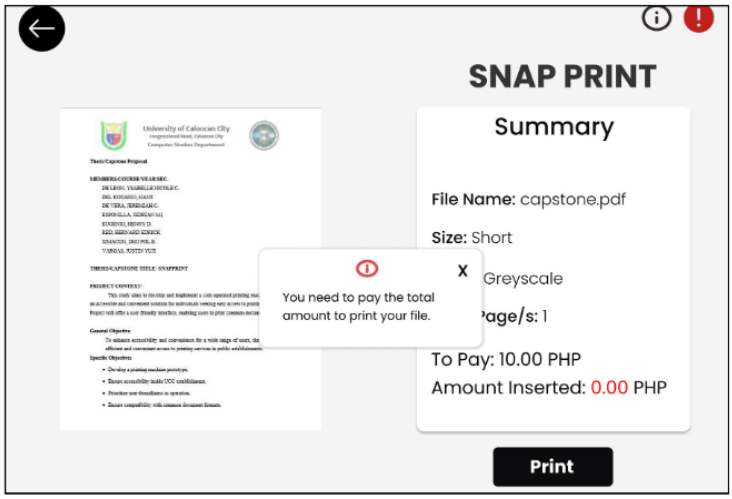

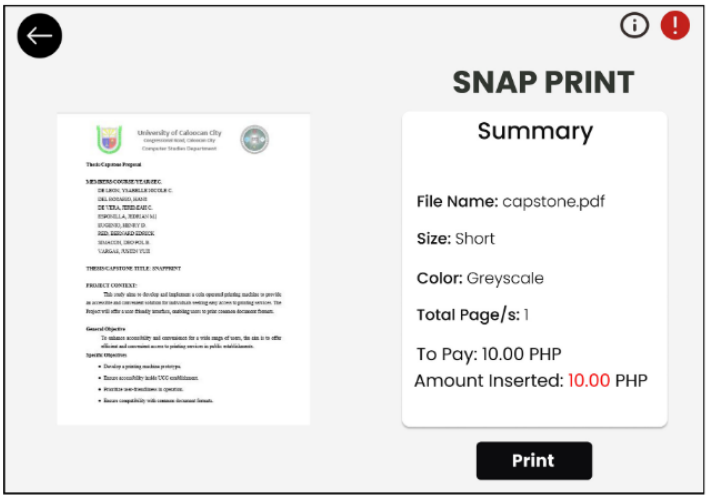

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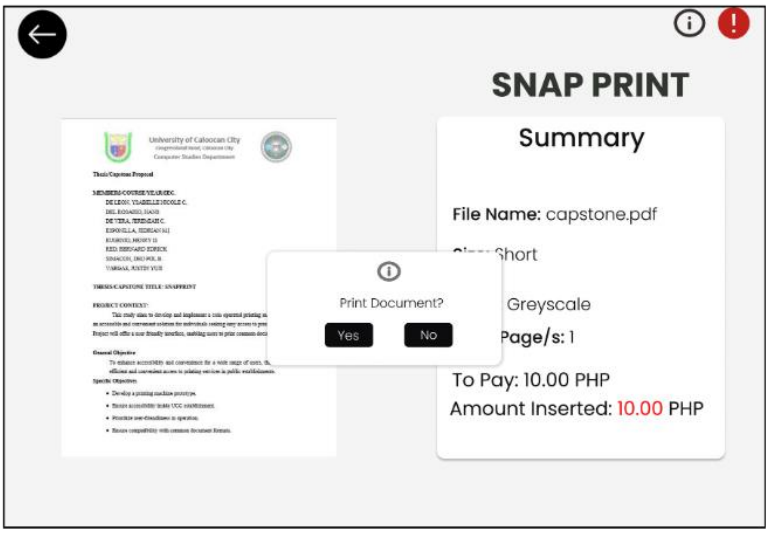
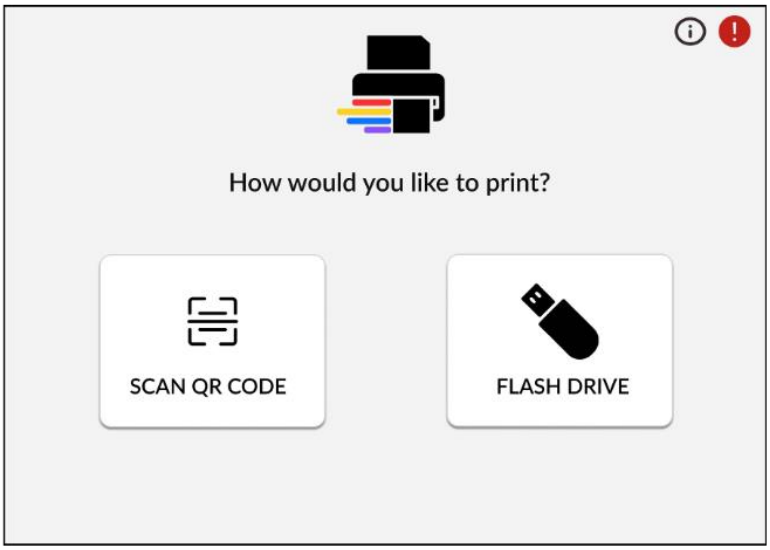
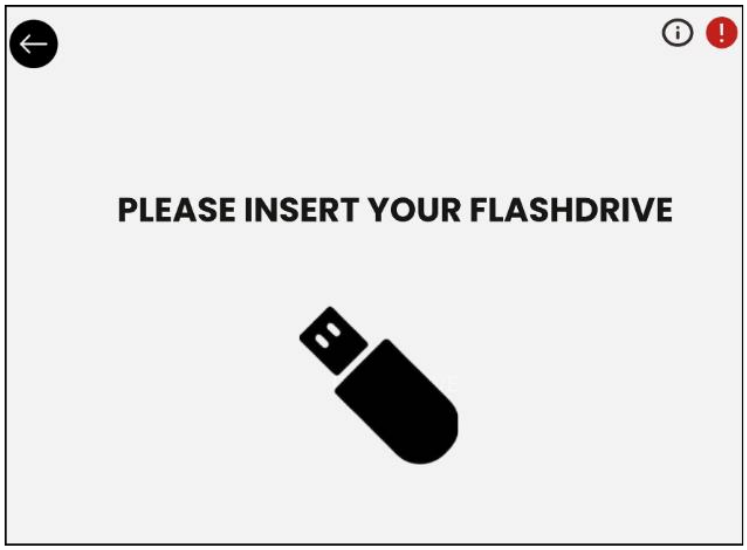
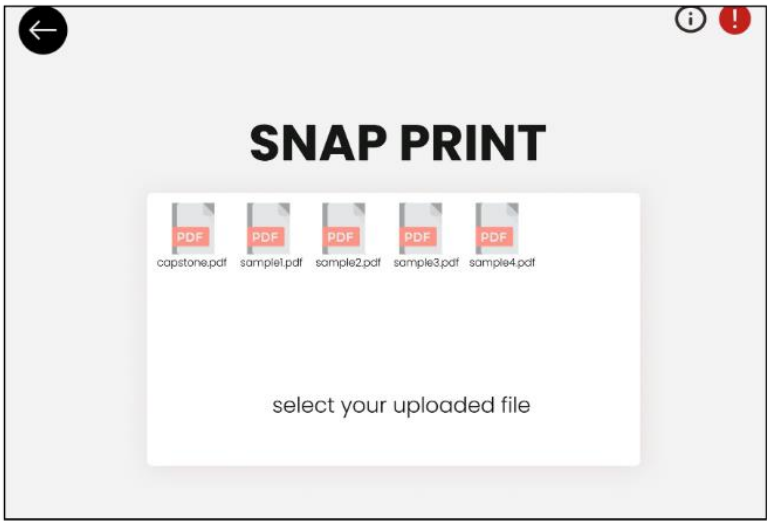
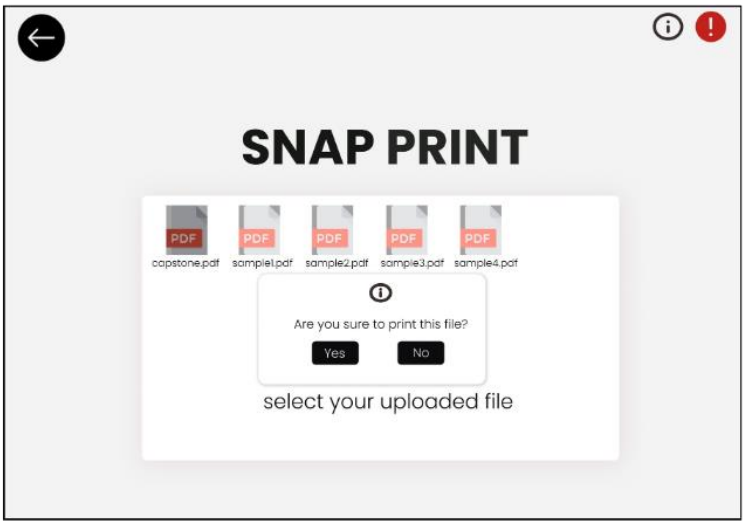


USER SIDE: THROUGH FLASH DRIVE









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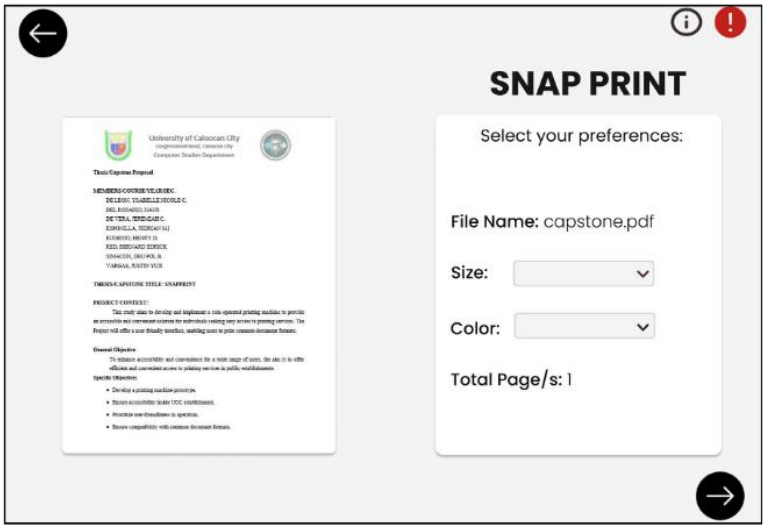

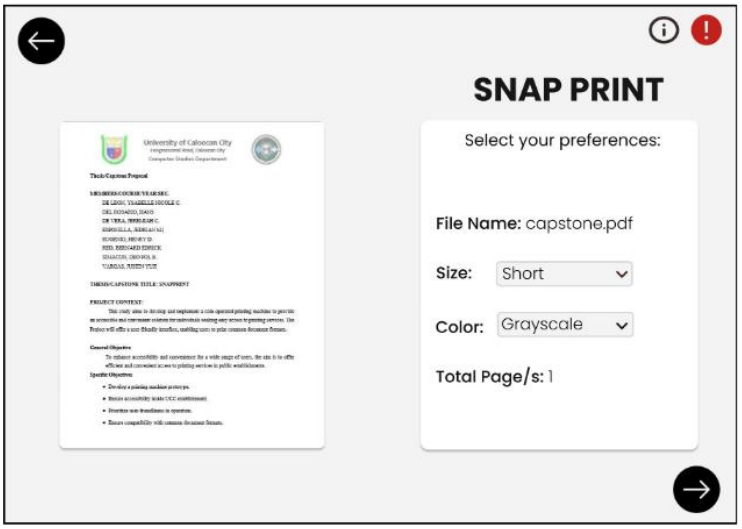

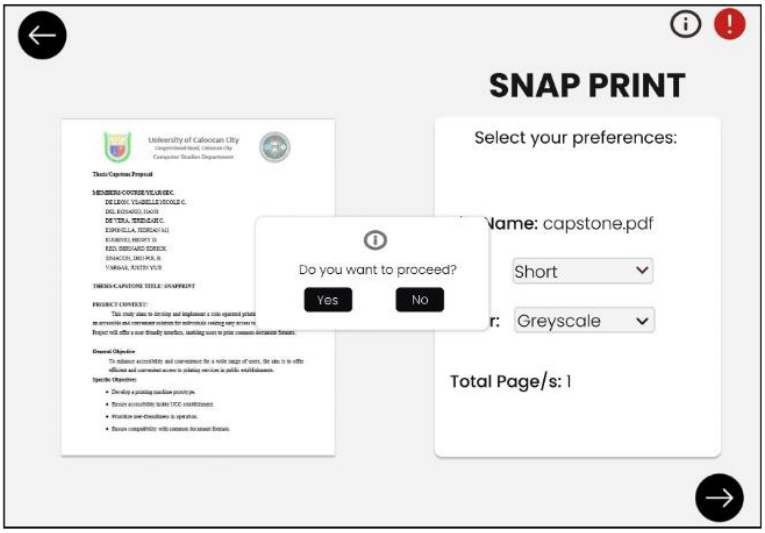

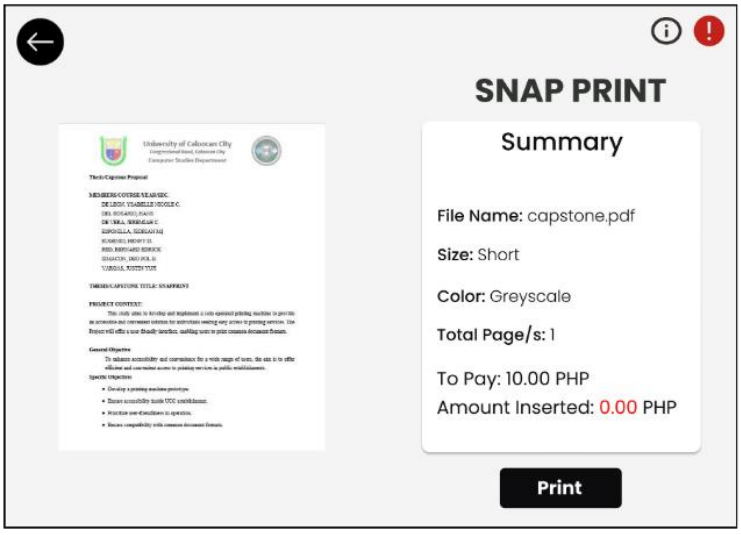

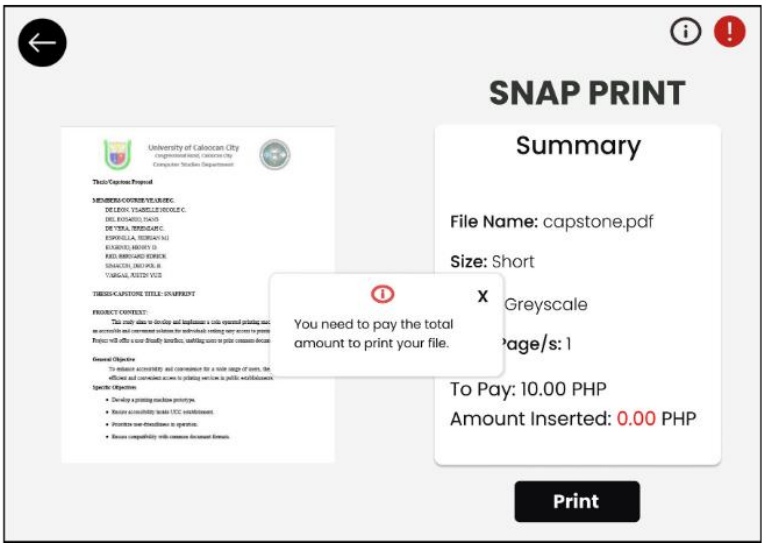

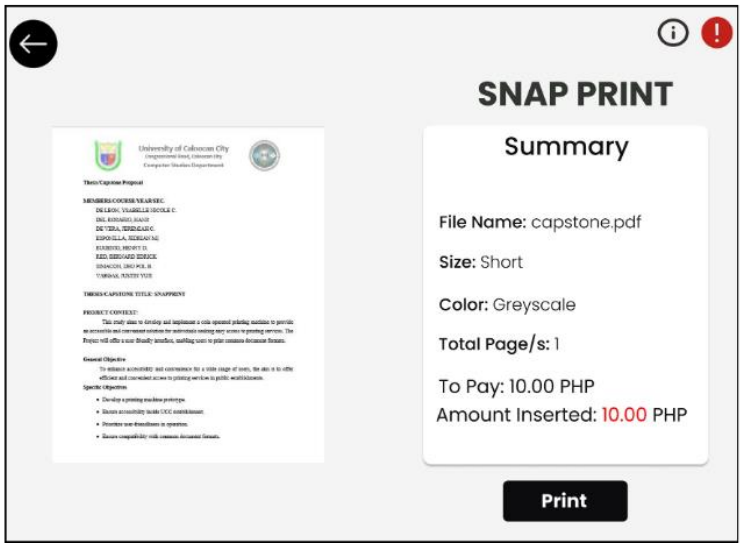

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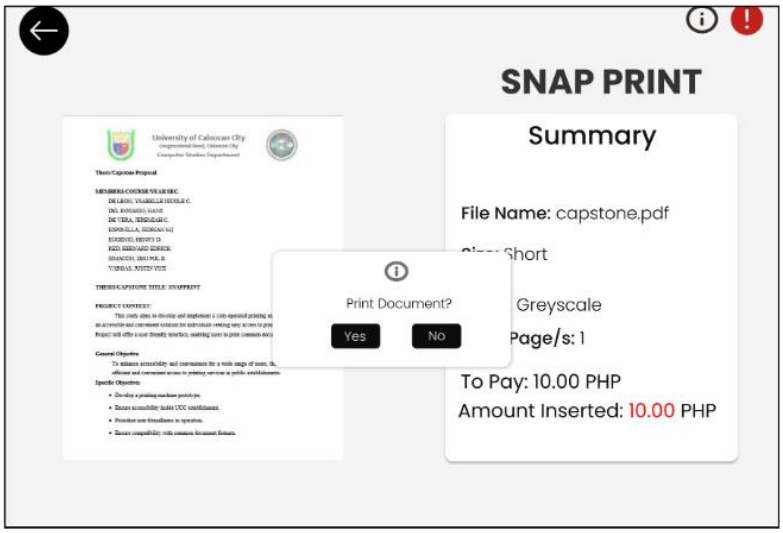
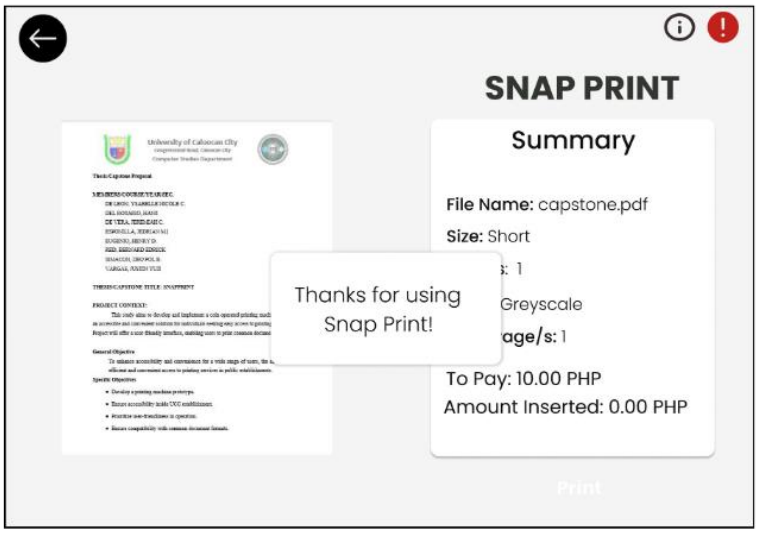
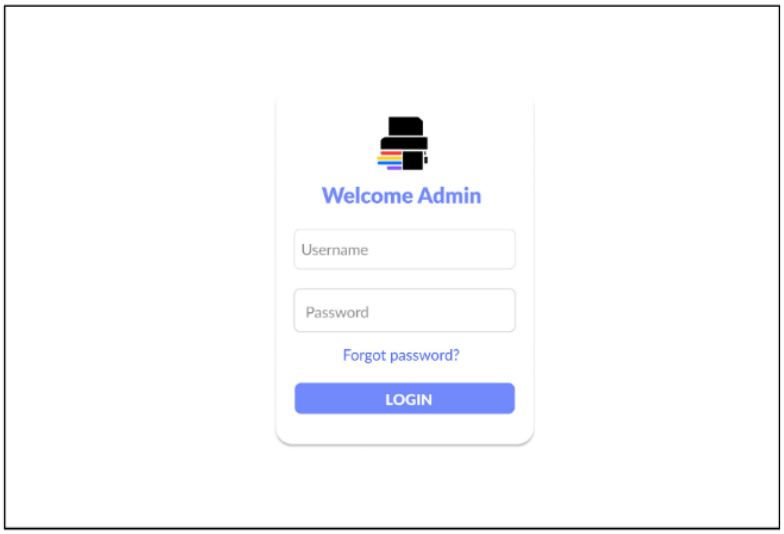
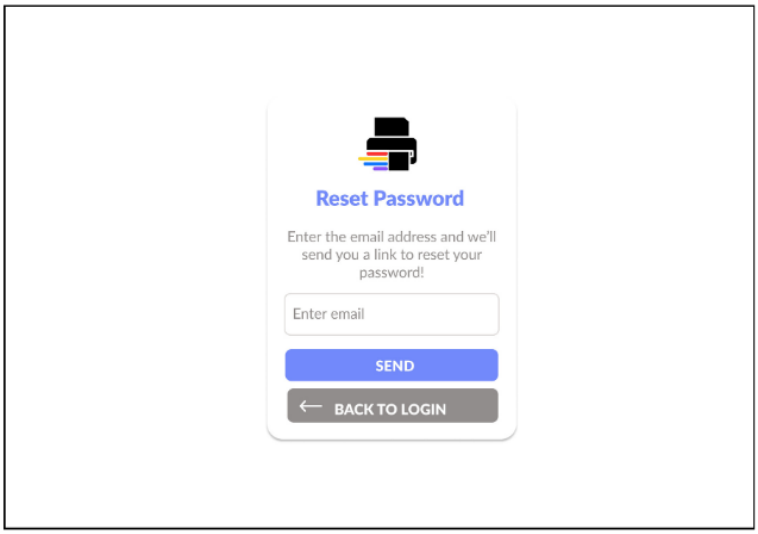
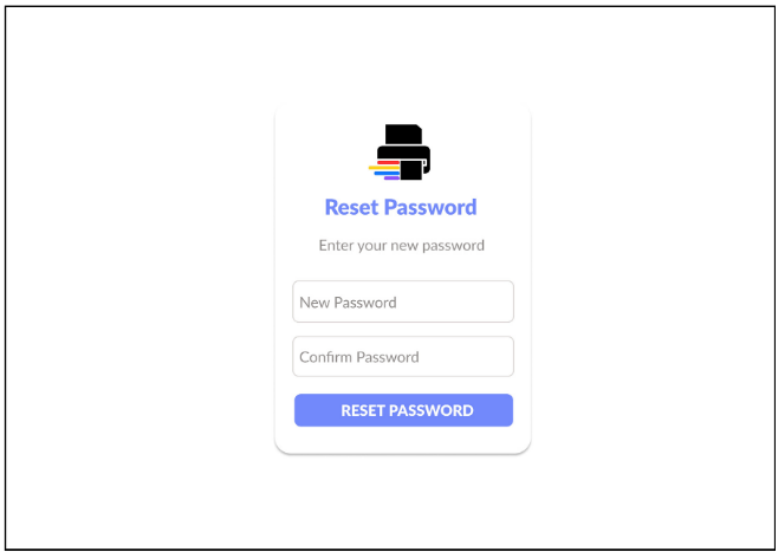


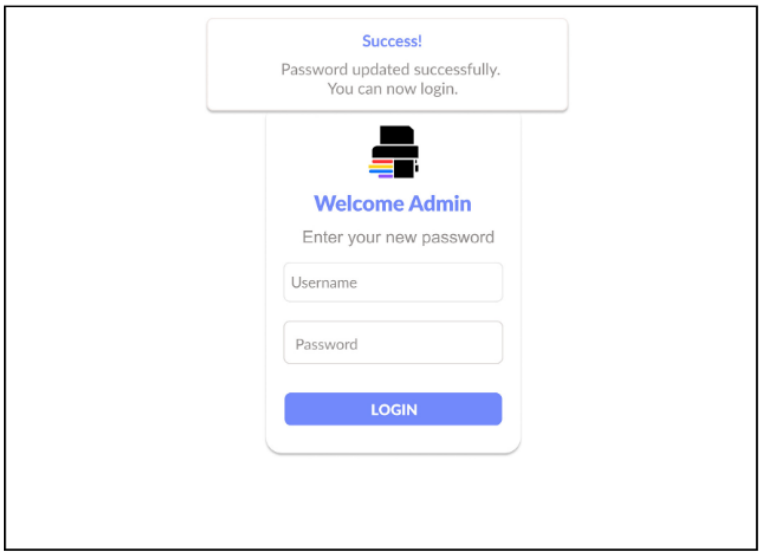


ADMIN SIDE









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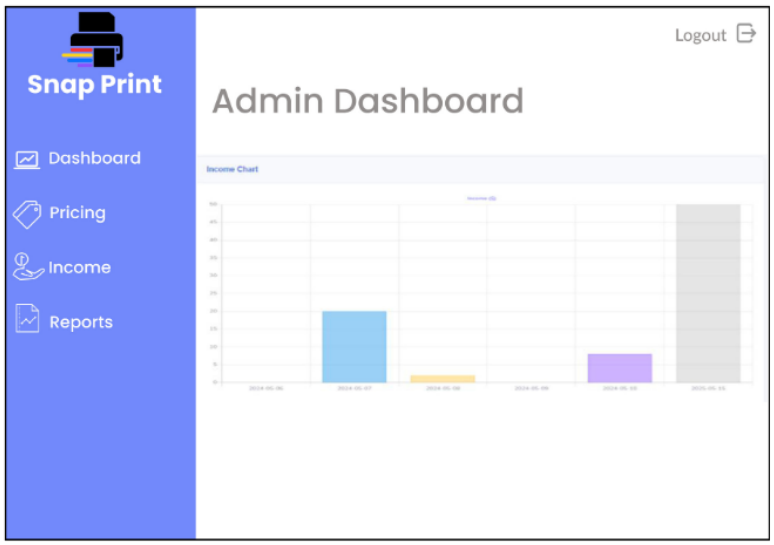

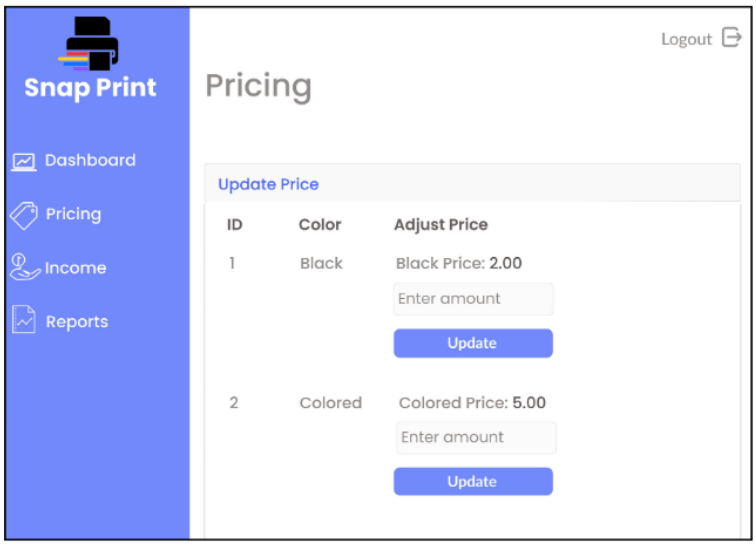

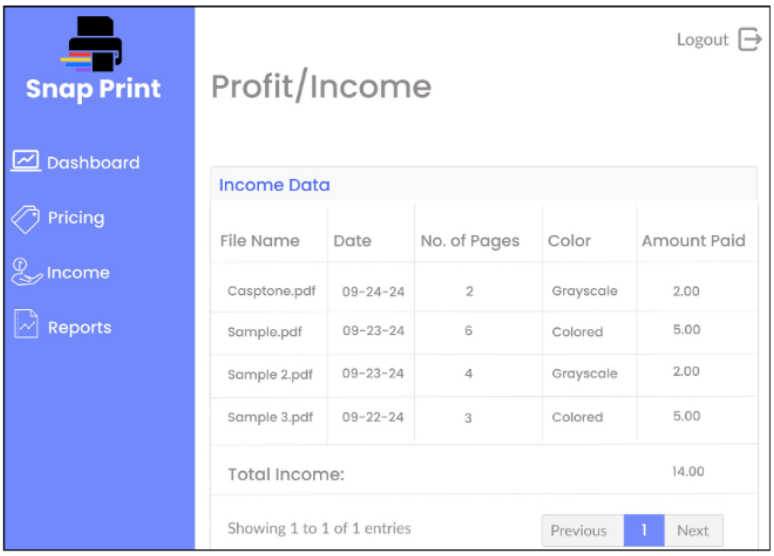

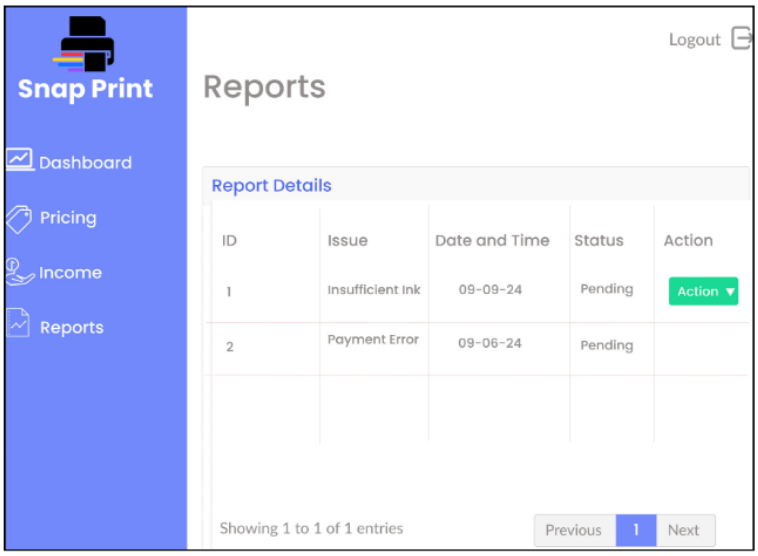

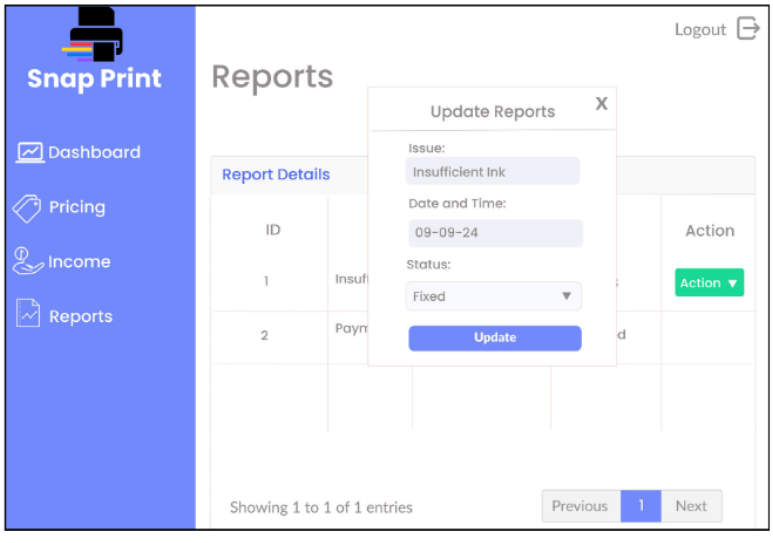

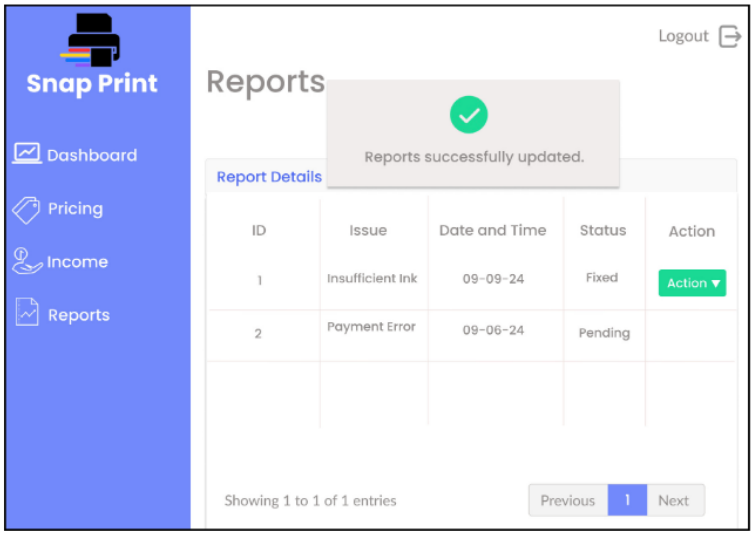

REASON(s) / JUSTIFICATION(s) IN CHOOSING THE PROJECT:

The "SnapPrint: Coin Operated Printing Machine" project was chosen to address accessibility issues by providing convenient, self-service printing services available at all times, enhancing efficiency and minimizing wait times for students. It responds to the digital trends of document creation by exclusively supporting PDF formats, encouraging independence among students who can manage their printing needs without staff assistance. The coin-based payment system offers a cost-effective solution for budget-conscious users, while the user-friendly interface, featuring QR code and flash drive support, simplifies the document import process.

Give at least (5) evidences that your proposed project is workable (feasible)

1. **High Demand**

   -Students at UCC Congress Campus require convenient printing options. The increasing reliance on digital documents for academic work creates a significant need for easy access to printing services. The SnapPrint machine addresses this demand by providing a solution that overcomes the limitations of traditional printing services.

2. **Easy to Use**

   -The SnapPrint machine is designed with user-friendliness in mind, allowing students to print documents without the need for advanced technical skills. By enabling file imports through a QR code and flash drive, SnapPrint simplifies the printing process, making it suitable for a busy campus environment.

3. **Self-Service Option**

   -The self-service functionality of the SnapPrint machine empowers students to print their documents independently. This feature not only saves time but also reduces reliance on campus staff for assistance with printing, catering to students with varied schedules.

4. **Focused on Specific Needs**

   -By exclusively supporting PDF file formats and specific paper sizes (Long, Short, and A4), SnapPrint streamlines its operations. This focused approach simplifies the machine's design

and functionality, making it easier to develop, maintain, and troubleshoot, thereby enhancing the overall feasibility of the project.

5. **Cost-Effective Operation**

   -The coin-operated payment system provides an efficient way to manage transactions without requiring complex cash handling or credit card processing. This method aligns well with the typical financial habits of students, who often prefer using coins for small transactions. Additionally, the design of the machine will prioritize energy efficiency, ensuring it can operate effectively within a university environment.

EXPECTED CONTRIBUTIONS TO THE GROWTH OF KNOWLEDGE IN INFORMATION TECHNOLOGY:

-A self-service, coin-operated printing model, showcasing how technology can meet specific educational needs, even with a single printer capable of supporting three paper sizes through innovative motor use.

-Emphasizes user-friendliness through a QR code system, highlighting the importance of designing technology that enhances user interaction.

-Reduces wait times because of the automation of printing services and improves access, demonstrating how self-service technology can enhance efficiency in educational settings.

-Can provide valuable data on technology usage patterns, informing future educational technology designs.

-Can serve as a model for other institutions, providing a framework for implementing similar printing solutions in various academic environments.

Emphasize on the contribution of knowledge your project can give once it has been developed.

The successful development and deployment of the project can serve as a valuable source of knowledge and inspiration for advancing various aspects of information technology, particularly in the design, deployment, and management of public-use system

SYSTEM REQUIREMENTS

Hardware Requirement:

1. **4 GB RAM:** Ensures the system can handle multiple tasks simultaneously, such as processing print jobs, managing the user interface, and handling file uploads without lag or slowdowns.
2. **500GB HDD:** Provides ample storage for printer drivers, transaction logs, and temporary user files. It also ensures enough space for system updates and future scalability.
3. **Printer:** Tt handles printing uploaded files, providing quick, accessible prints in different paper sizes.
4. **ESP32 (Arduino Microcontroller):** Controls key functions like coin validation and printer access, linking the payment system to the printers. It ensures users can only print after successful payment.
5. **Touchpad with Mini Desktop:** Provides an intuitive and user-friendly interface for selecting print options, confirming payments, and navigating system functions.
6. **Pickup Roller:** Moves the paper from its tray to the printer's tray, ensuring smooth paper flow during the printing process. This mechanism helps prevent paper jams and ensures a reliable paper feed.
7. **DC Motor:** Controls the pickup roller, ensuring precise movement of paper from the tray to the printer. It powers the roller's motion, ensuring efficient paper handling.
8. **Coin Slot:** A key part of the payment system, allowing users to insert coins. It is connected to sensors that verify the correct amount before enabling printing.
9. **Buck Converter:** Ensures that the system's components receive the correct voltage, converting power from the main supply to the appropriate levels needed by the microcontroller and sensors.
10. **Power Supply (12V 3A):** Provides stable power to the system, ensuring consistent operation of printers, the microcontroller, and the touchpad interface, even with continuous public use.

11. **L298D (Motor Driver):** Controls the movement of the DC motors that operate the coin mechanism and other mechanical functions, ensuring smooth and accurate operation.
12. **Raspberry Pi:** Acts as the system's core processor, managing communication between the touchpad, microcontroller, and printers. It runs the software that processes print jobs, tracks payments, and handles user interactions.

Software Requirements:

1. **Windows OS:** The operating system serves as the foundation for running the printing machine's software and drivers.
2. **Visual Studio 2022 .Net Framework:** Visual Studio 2022 with the.NET Framework will be used to create and customize the software interface for controlling printing operations and coin acceptance.
3. **PDF Viewer:** A PDF viewer software will be installed, allowing users print PDF files.

Proposed by:

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Approved by:

RAUL GUTIERREZ