**1.1 Describe the domain context of a smart printing service for students at HCMUT. Who are relevant stakeholders? What are their current needs? In your opinion, what benefits HCMUT-SSPS will be for each stakeholder?**

**Domain Context**

The Student Smart Printing Service (HCMUT\_SSPS) is designed to streamline the printing needs of students across different campuses at HCMUT. With printers located strategically across buildings and rooms, students can easily access them for document printing. The system offers functionalities like document uploading, customizable printing options (such as paper size, page selection, and number of copies), and supports a variety of file formats determined by the Student Printing Service Officer (SPSO). Additionally, the service incorporates page balance management, where each student receives a default number of A4 pages per semester, with the option to purchase more pages. Authentication and payment processing is handled securely through HCMUT's SSO and BKPay systems. Reports on usage and activity logs are generated automatically, ensuring transparency and efficient monitoring.

**Stakeholders and Their Needs**

The primary stakeholders of the HCMUT\_SSPS include students, the Student Printing Service Officer (SPSO), and the university administration. Students need an efficient, cost-effective printing solution that allows flexibility in printing formats and easy access to printers. They also require detailed logging of their printing history and the ability to manage their page balance. The SPSO, responsible for managing the system, needs tools to oversee printer operations, monitor usage, configure settings (like file types and default page allocations), and generate reports. Meanwhile, the university administration requires a streamlined system that integrates seamlessly with existing infrastructure, such as online payments and authentication services, and provides data for administrative and financial planning.

**Benefits for Stakeholders**

The HCMUT-SSPS offers numerous benefits to all stakeholders. For students, it provides a user-friendly platform that enhances convenience by allowing mobile or web-based access to printers, detailed logging of printing activities, and an option to manage and purchase additional pages. For the SPSO, the system offers centralized control over printers and configurations, along with the ability to generate detailed reports on system usage, ensuring accountability and operational efficiency. Lastly, the university benefits from the seamless integration with existing services (such as BKPay and HCMUT SSO), helping to reduce administrative overheads while offering a scalable, reliable service that can meet the growing demands of the student body.

**1.2 Describe all functional and non-functional requirements that can be inferred from the project description.**

**Functional Requirements**

**For Students:**

1. The system shall allow students to upload document files in permitted formats.

2. The system shall allow students to choose a printer based on campus, building, and room.

3. The system shall allow students to specify printing options such as paper size, pages to print, print type (one-/double-sided), and number of copies.

4. The system shall display the student's page balance and calculate the required pages based on the printing configuration.

5. The system shall allow students to view their printing log for a specified time period with a summary of printed pages for each page size.

6. The system shall allow students to buy additional printing pages through an integrated online payment system (BKPay).

7. The system shall prevent students from printing if their page balance is insufficient.

**For SPSO (Student Printing Service Officer):**

1. The system shall allow the SPSO to add, enable, or disable printers in the system.

2. The system shall allow the SPSO to configure permitted file types for uploading.

3. The system shall allow the SPSO to configure the default number of pages assigned to students each semester.

4. The system shall allow the SPSO to view and filter printing logs of all students or a specific student over a selected time period.

5. The system shall automatically generate monthly and yearly usage reports, which can be viewed by the SPSO at any time.

6. The system shall allow the SPSO to set dates for assigning the default number of pages to students.

**For the System (General):**

1. The system shall authenticate all users through the HCMUT\_SSO authentication service before allowing access.

2. The system shall ensure that only permitted file types can be uploaded by students.

3. The system shall log each printing action, including student ID, printer ID, file name, start/end time, and pages printed for each page size.

4. The system shall automatically generate monthly and yearly reports on the usage of the printing system.

5. The system shall prevent students from printing pages if the selected pages exceed their page balance.

**Non-Functional Requirements:**

1. The system shall provide a responsive and user-friendly interface for both web and mobile applications.

2. The system shall ensure high availability, with 99.9% uptime during academic periods.

3. The system shall provide secure transactions and data privacy for all student-related activities, including payments through BKPay.

4. The system shall process printing requests and generate logs in real time to ensure accurate reporting.

5. The system shall be scalable to accommodate a growing number of students and printers across multiple campuses.

Use case diagram  
  
  
