Task 1: REQUIREMENT ELICITATION

1.1 Relevant stakeholders and the benefits of HCMUT_SSPS

Nowadays, in a developing country like Vietnam, the quality of life is steadily improving, leading to increasing demands from people, especially in the context of higher education institutions where students require access to modern technologies that aid in their learning and work processes. Faced with this situation, universities have commenced integrating science and technology into education to meet student requiments also solve their problems. There are numerous issues that students need to have resolved, among which is the matter of printing. In more details, students sometimes encounter some problems about limited access to printer which can lead to long queues and delays in printing important documents; cost of printing outside the university maybe higher than standard cost; in printer compatibility problems, not all devices are compatible with university printers, students may have trouble printing from their laptops, tablets, or smartphones, especially if the university doesn't provide clear instructions or technical support, printer malfunctions can be detected usually such as paper jams, ink/toner issues, or connectivity problems, which leads to disrupt printing services for everyone. Attempts have been made to enhance student satisfaction, noticeably the Student Smart Printing Servive of HCMUT (HCMUT_SSPS), which helps to organize and manage all printers in the university's campus.

The internal stakeholder of the HCMUT_SSPS project are Student Printing Service Officer (SPSO) and the external ones are students. Besides, the university is the project sponsor and owner, internal resources of it are BKPay (payment systems) and HCMUT_SSO (authentication services). HCMUT_SSPS are in need of a centralize system to help with printers management, arrangement and administration. It can decide the maximum number of printers are allowed; manage features such as add, enable and disable some printers, viewing printing history, configuration of each printer; arrange location of each printer; limit file types. On the other hand, students require a system that enables them to print a document by uploading the file to the system, self-select a printer in campus, specifying printing preferences such as paper size, pages to be printed, one or double-sided, number of copies, etc. In addition, the system also permits students to buy some more pages for printing in online payment system BKPay, authenticate allowed users by the HCMUT_SSO.

SCMUT_SSPS will benefit all stakeholders by improving the efficiency and effectiveness of printing documents. It will also satisfy all of the requiments of each stakeholder with an easy-to-use system, detailed instructions and user-friendly interface which help stakeholders get used to it rapidly. Prevent wasting time on printing also some malfunction problem. In a nutshell, the implementation of the HCMUT_SSPS software project will yield positive outcomes, contributing to the enhancement of the student

learning environment and facilitating greater access to advanced technological models for students.

1.2 Functional and non-functional requirements

1.2.1 functional requirements

SPSO:

-As a SPSO, I would like to set up restrictions for allowable file types.

-As a SPSO, I would like to view the printing history of all students or a student for a time period (date to date) and for all or some printers.

-As a SPSO, I would like the system must display the printing history in a clear, user-friendly, and visually intuitive manner.

-As a SPSO, I would like to manage features such as add/enable/disable a printer.

-As a SPSO, I would like to manage other configuration of the system such as changing the default number of pages, the dates that the system will give the default number of pages to all students.
-As a SPSO, I would like to received the reports of the using also student feedback of the printing system at the end of each month and each year and are stored in the system, and can be viewed by the SPSO anytime.

Student:

-As a student, I would like to print documents in several easy steps.

-As a student, I would like to choose which printer to use.

-As a student, I would like to know if the printer is busy and which printers are available.
-As a student, I would like the system must show all the printing properties such as paper, size, pages to be printed, one or double-sided, number of copies, etc.

-As a student, I would like to know which file types are permited.

-As a student, I would like to view my printing history for a time period together with a summary of number of printed pages for each page size.

- As a student, I would like to view available number of A4-size pages left.

-As a student, I would like to buy more pages for printing in online payment system such as BKPay

-As a student, I would like to login the system with my university Google account.

-As a student, I would like to report if the printers have some problems, provide feedback to enhance this system.

1.2.2 Non-functional requirements

-The system shall have a database if its data becomes excessively large.

-The system shall handle real-time data from a few dozen to a few hundred users at the moment.

-The system (mobile app) shall be compatible with most popular smartphone models currently in use.

-The system shall respond to user resquests within a timeframe of no more than 1 second.

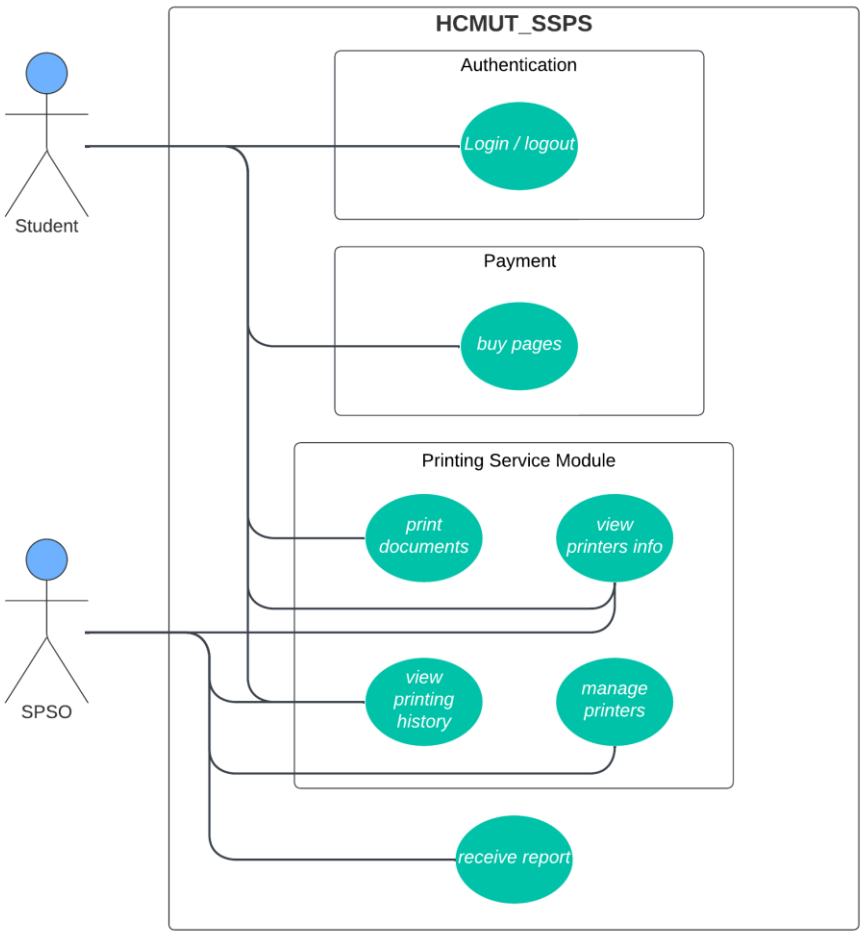
-The system shall support Vietnamese with the prossibility of English in the future.

-The system shall include a tutorial mode for new users.

-The system shall be secure to prevent hacking, cheating, and the leakage of students' information.

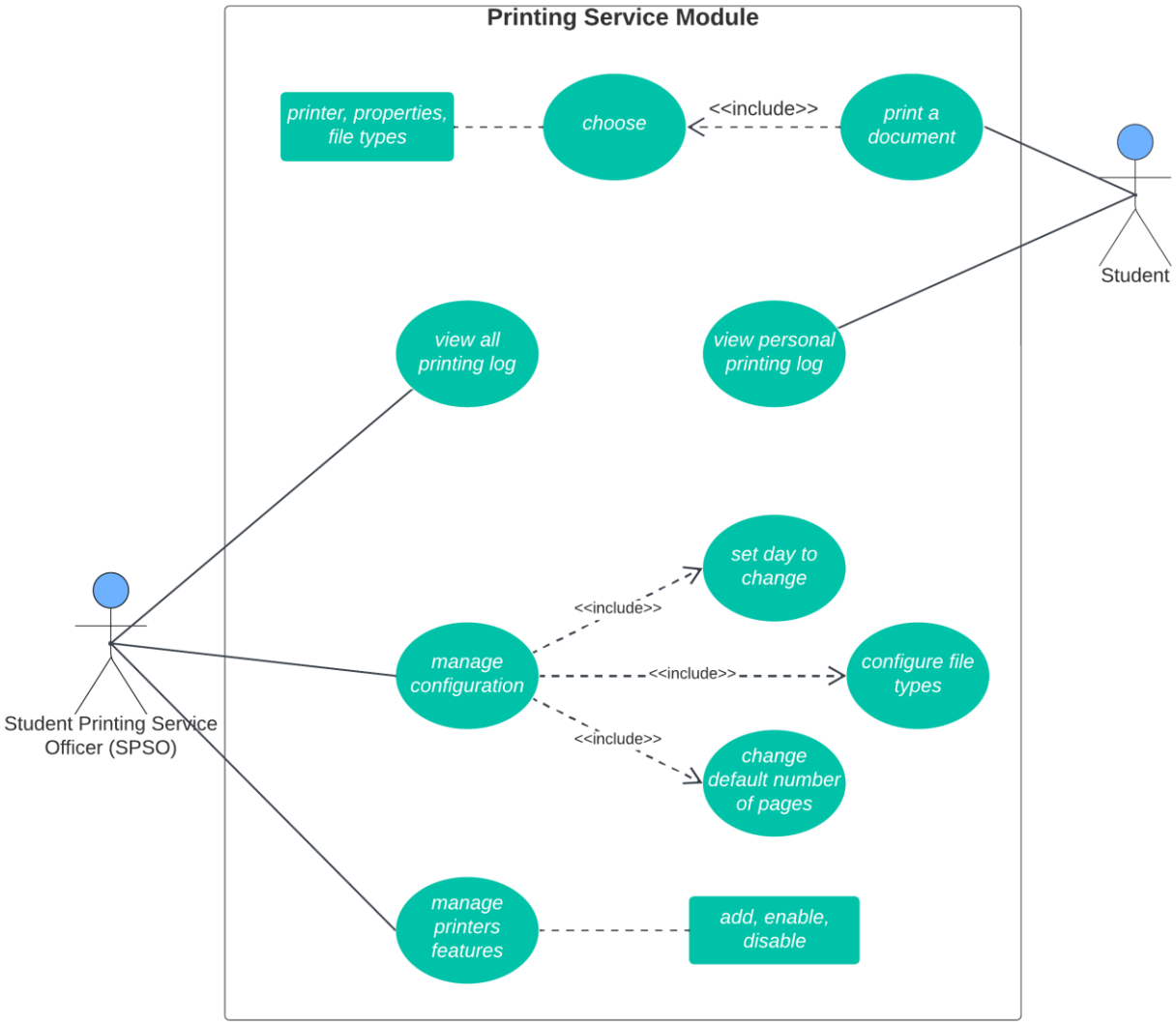
-The system shall incorporate a map feature to make it easier for students to locate printer locations.

1.2.3 General use case diagram



1.3 Printing service use case diagram and table descriptions

1.3.1 Use case diagram



1.3.2 Table descriptions

Use case name	Print documents
Use case overview	The system allows to print a document
Actors	Students
Preconditions	1. The system is running 2. The database is connected to printers informations 3. Internet connection is available
Trigger	Users click the “Print documents” button
Steps	1. Retrieve all printers information from the database 2. Display a list containing available printers 3. Overview the printers which the users click and ask if they are chosen 4. Display a button for users uploading documents to the system

	5. Display a box of printing properties and the button "Print" after users choose all compulsory properties 6. Print documents at the chosen printer and display location on screen 7. Log the printing actions
Post conditions	Update printing log and database
Exception flow	If the file types are unsupported, display a box of notifications on the screen and offer users to choose again

Use case name	View printing log
Use case overview	View personal printing history for each student and view all printing history for SPSO
Actors	SPSO and Students
Preconditions	1. The system is running 2. The database is connected to printing logs 3. Internet connection is available
Trigger	Users click the "View printing log" button
Steps	1. Retrieve all printing logs information from the database 2. Overview the printers which the users click and ask if they are chosen 3. Display a personal printing log / a list of all printing logs
Post conditions	Update access time and database
Exception flow	If there are no information about printing logs, display a box "no information"

Use case name	Manage configuration
Use case overview	Allow to change configuration of each printer
Actors	SPSO
Preconditions	1. The system is running 2. The database is connected to printers informations 3. Internet connection is available
Trigger	Users click the "Change configuration" button
Steps	1. Retrieve all printers information from the database 2. Display a list of changeable configuration 3. Display a box of configuration properties 4. Display a box of time setting 5. Send notification to the chosen printers and display it on screen as a note 6. Display notification "complete" on screen
Post conditions	Update printers informations and database
Exception flow	If the system cannot change configuration of printers because of some problems, display notification "Please try later" on screen

Use case name	Manage printers features
Use case overview	Allow to change features of printers
Actors	SPSO

Preconditions	1The system is running 2The database is connected to printing logs 3Internet connection is available
Trigger	Users click the “Change features” button
Steps	1. Retrieve all printers information from the database 2. Display a box of features (add, enable, disable) 3. If user click “Add”, display the box of printer properties for input. Else display the list of all printer, overview the printers which the users click and ask if they are chosen 4. Ask users if they are sure and the button “yes” “no” 5. Display notification “complete” on screen
Post conditions	Update printers informations and database
Exception flow	If the system cannot change features of printers because of some problems, display notification “Please try later” on screen