

# Software Requirements Specification

for

**Project**

**Version 1.0 approved**

Prepared by:

1. Tran Anh Khoa – 2252362
2. Tran Dinh Long – 2252450
3. Tran Duy Duc Huy – 2252263
4. Tran Gia linh – 2252434
5. Tran Le Tien Dat – 2252149

Department of Software Engineering  
Faculty of Computer Science and Engineering  
Ho Chi Minh City University of Technology –  
VNU-HCM

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## Contents

<b>1 Task 1.1: Requirement elicitation (1.1, 1.2)</b>	<b>3</b>
1.1 Domain Context . . . . .	3
1.2 Stakeholders and Needs . . . . .	3
1.2.1 Students . . . . .	3
1.2.2 Student Printing Service Officer (SPSO) . . . . .	3
1.2.3 IT department . . . . .	4
1.2.4 HCMUT (Ho Chi Minh City University of Technology) . . . . .	4
1.2.5 Online Payment Systems . . . . .	4
1.3 Benefits of the System . . . . .	4
1.3.1 Students . . . . .	4
1.3.2 Student Printing Service Officer (SPSO) . . . . .	4
1.3.3 IT department . . . . .	5
1.3.4 HCMUT (Ho Chi Minh City University of Technology) . . . . .	5
1.3.5 Online Payment Systems . . . . .	5
1.4 Functional requirements: . . . . .	5
1.5 Non-functional requirements: . . . . .	7

## Revision History

Name	Date	Reason for Changes	Version

## 1 Task 1.1: Requirement elicitation (1.1, 1.2)

### 1.1 Domain Context

HCMUT is a multi-disciplinary and multi-major university with emphasis on technology. It has several campuses and more than 20,000 students, including undergraduates and graduates. The university is intended to implement a smart printing system to provide printing service to its students.

The system leverages a network of printers distributed in different campus locations, allowing students to print documents by uploading files, choosing preferred printers, and specifying printing properties. The key functionalities include secure student authentication through HCMUT's SSO, logging of all printing actions, management of printer resources by the Student Printing Service Officer (SPSO), and the ability for students to monitor and manage their printing activities.

Every student receives a default number of A4-sized pages per semester, which they can use for printing, with the option to buy additional pages if needed. The system enforces printing limits based on the student's remaining page balance, and it supports online payments via university systems such as BK-Pay. Students can upload documents to the system and customize their printing options, including selection of paper size, page ranges and more.

For administration, the SPSO can configure and manage the entire printing network, including enabling/disabling printers, setting default page allocations, and defining permitted file types. Additionally, detailed printing logs and usage reports are available, ensuring transparency for both students and SPSO. The service operates through both a web app and a mobile app, offering convenience and accessibility to all users across campus.

This system is designed to streamline the document printing process, enhance accessibility, and efficiently manage printing resources for the university community.

### 1.2 Stakeholders and Needs

#### 1.2.1 Students

- **Description:** Students are the main users of the system's printing service. They create print requests, upload documents, select printers, and make payments.
- **Needs:** Students need convenient and affordable access to print documents. They also required secure and convenient online payments, along with the ability to view print and page purchase history when needed.

#### 1.2.2 Student Printing Service Officer (SPSO)

- **Description:** SPSO is responsible for managing and supervising student printing activities in the system, as well as the resources used within this

system. They ensure that everything runs smoothly and efficiently.

- **Needs:** SPSOs require useful management tools implemented in the system.

### 1.2.3 IT department

- **Description:** IT department is responsible for developing and supplying software and related technologies for digital printing and print management.
- **Needs:** To build and develop the smart printing service system for the university.

### 1.2.4 HCMUT (Ho Chi Minh City University of Technology)

- **Description:** HCMUT is the investor, implementing the system to serve students.
- **Needs:** To provide a printing service for students, making document printing easier and offering a better management system for student printing.

### 1.2.5 Online Payment Systems

- **Description:** The electronic payment system supports students in purchasing additional print pages easily.
- **Needs:** To integrate the payment system into the smart printing service.

## 1.3 Benefits of the System

### 1.3.1 Students

- **Benefits:** Students save time and effort using the service and can easily manage their printing requests and expenses related to printing.

### 1.3.2 Student Printing Service Officer (SPSO)

- **Benefits:** The SPSO benefits from streamlined resource management, allowing for easy oversight and control of printers, configurations, and printing policies, ensuring efficient operation of the service across all campuses.

### 1.3.3 IT department

- **Benefits:** The service generates economic advantages for the IT department, while also boosting its visibility and reputation within the university. By managing and supporting the smart printing system, IT staff gain valuable experience and enhance their technical expertise, contributing to their overall professional growth.

### 1.3.4 HCMUT (Ho Chi Minh City University of Technology)

- **Benefits:** Implementing a modern, efficient printing service strengthens HCMUT's reputation as a tech-savvy institution, attracting students and external partnerships. Additionally, the system generates revenue through paid services like extra printing pages, contributing to the university's financial sustainability.

### 1.3.5 Online Payment Systems

- **Benefits:** By integrating with the printing service, BKPay gains a consistent flow of transactions from students purchasing additional printing pages, boosting its usage and visibility.

## 1.4 Functional requirements:

### Students:

- Students are able to upload multiple permitted document files to the system for printing.
- Students can select a printer, paper size, and configure printing properties.
- Students can view their own printing history and balance for each semester.
- Students can buy additional pages using an online payment system. .
- The system shall allow students to view printing log for a time period.
- Students can view summary of number of printed pages for each page size.
- The system shall prevent students from printing more pages than their available page balance.
- System rejects printing requests when chosen printer is overloaded and notify user about fail requests.

### SPSO (Student Printing Service Officer)

- The system allows SPSO to view the printing history of all students or a student for a time period and for all or some printers.
- SPSO can permit and configure file types.

- SPSO can add, enable, or disable printers in the system.
- The system shall allow the SPSO to manage configurations, such as changing the default number of pages, change reset date, change permitted file types.
- The system allows the SPSO to view the reports of the using of the printing system generated yearly and monthly by the system.

**IT department**

- The system should log printing actions, including student ID, printer ID, and file name.
- The system must generate monthly and yearly reports on printing activities.
- IT department must ensure system integration with online payment systems.
- IT department creates an interface where users can report technical issues related to printer integration and system errors with the detailed error description.
- IT department can keep track of issue report time, priority, whether it has been resolved.
- IT department can inform the users about scheduled maintenance/ downtime through notifications.

**HCMUT (Ho Chi Minh University of Technology)**

- HCMUT oversees the system's integration with the campus's authentication (SSO) and payment systems (BKPay).
- HCMUT can review monthly and yearly reports on printing activities.
- HCMUT can view the feedbacks and request IT department to fix errors for users.
- HCMUT provides students with a certain number of print pages each semester.
- HCMUT manages the allocation of resources such as printers and paper supply for the service.

**Online Payment Systems**

- The system allows students to buy additional pages using an online payment system.
- Online payment systems must provide secure transaction methods for students.

- Payment systems must integrate with student account balances.
- Payment systems must support refunds or corrections for failed transactions.
- The system must generate reports on payment transactions for both users and the university.

### **1.5 Non-functional requirements:**

- The system must be available as both a web-based app and a mobile app.
- The system must handle up to 1000 concurrent users.
- The system should ensure privacy and data security for all users.
- The system should maintain uptime and provide reliable access to printing services.
- The system has an integrated timer.