VIETNAM NATIONAL UNIVERSITY, HO CHI MINH CITY
HO CHI MINH UNIVERSITY OF TECHNOLOGY

COMPUTER SCIENCE & ENGINEERING DEPARTMENT

ASSIGMENT REPORT

Subject: Software Engineering

TASK 2: SYSTEM MODELLING

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1.1 Buy printing pages use-case

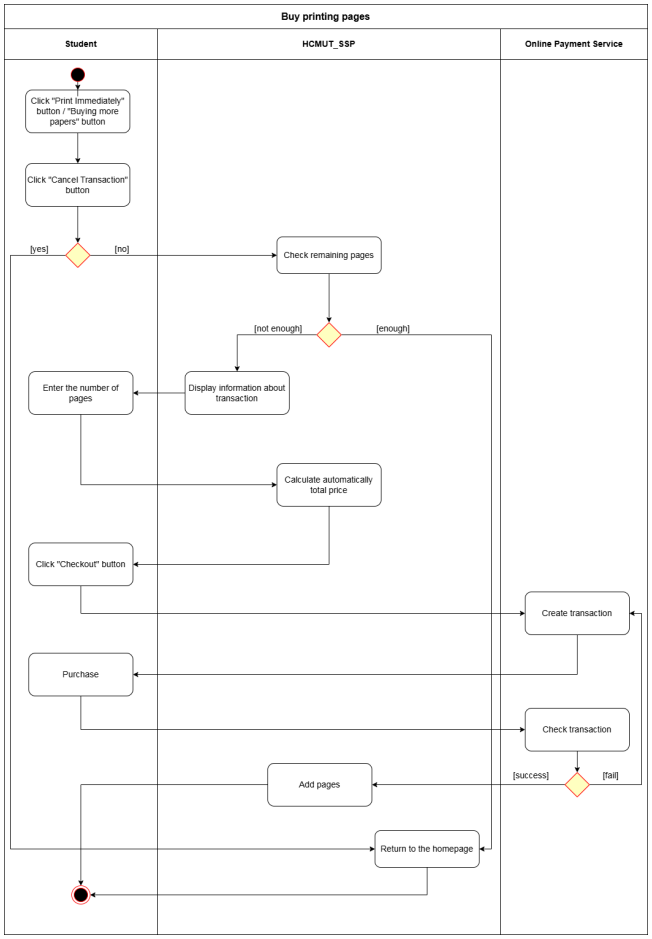

Figure 1.1: Activity diagram for Buy printing pages use-case

This diagram outlines the process by which a student purchases additional printing pages through an online system (HCMUT SSP) and an online payment service. The process starts when the student clicks either the "Print Immediately" or "Buy more papers" button. If the student chooses to cancel, the process ends; otherwise, the system checks whether the student has sufficient remaining pages. If pages are insufficient, the student is prompted to enter the required number, and the system calculates the total price. Upon proceeding, a transaction is created with the payment service, and if successful, the pages are added to the student's account, concluding the transaction.

1.2 Define printing properties use-case

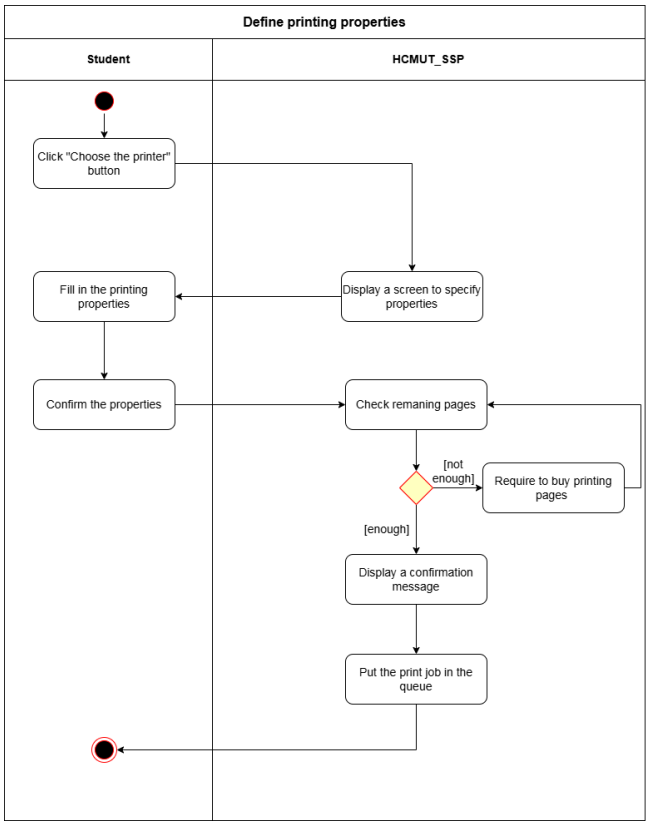

Figure 1.2: Activity diagram for Define printing properties use-case

This diagram describes the sequence a student follows to define printing properties for a document. After selecting a printer, the system checks if the required documents have been uploaded. If not, the user is prompted to upload them. If documents are available, the student specifies the printing properties and confirms them. The system checks if the student has

sufficient printing pages, and if so, it places the print job in the queue. If not enough pages are available, the system prompts the student to purchase more pages before continuing.

1.3 Print documents use-case

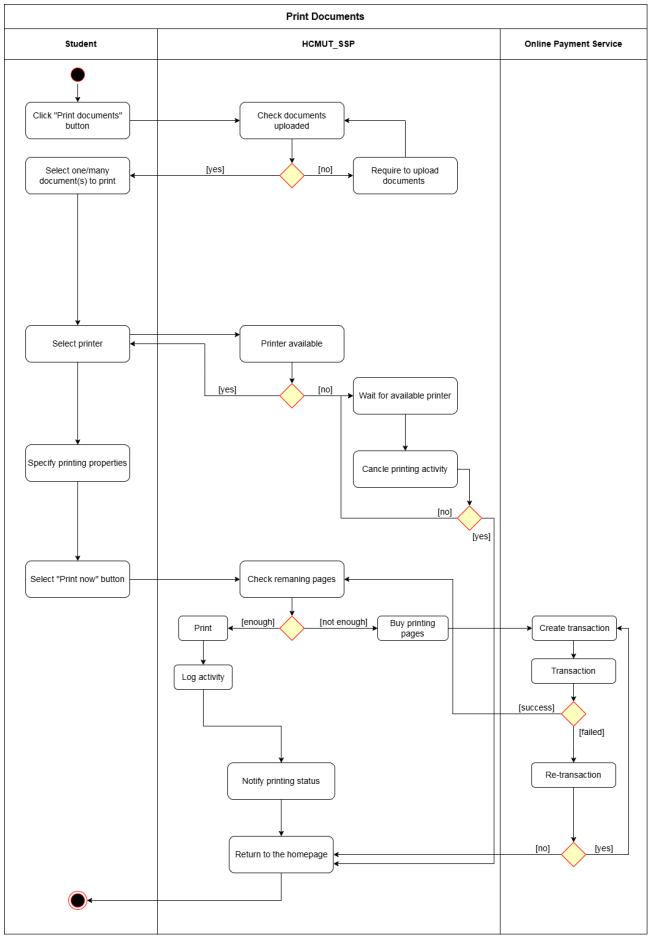

Figure 1.3: Activity diagram for Print documents use-case

This diagram outlines the process by which a student purchases additional printing pages through an online system (HCMUT SSP) and an online payment service. The process starts when the student clicks either the "Print Immediately" or "Buy more papers" button. If the student chooses to cancel, the process ends; otherwise, the system checks whether the student has sufficient remaining pages. If pages are insufficient, the student is prompted to enter the required number, and the system calculates the total price. Upon proceeding, a transaction is created with the payment service, and if successful, the pages are added to the student's account, concluding the transaction.

Chapter 2. THE SEQUENCE DIAGRAM FOR PRINT DOCUMENTS MODULE

2.1 Choose documents

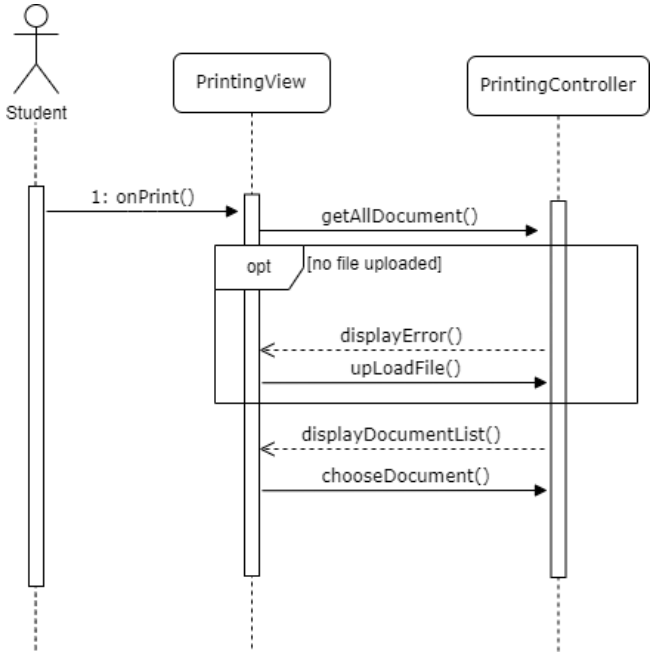

Figure 2.1: Sequence diagram for Choose document use-case

The sequence diagram you provided illustrates a simplified choice of documents initiated by a student, involving one primary actor: The student, and two key objects: the PrintingView, and the PrintingController. Initially, the Student begins the printing request by calling the **onPrint()** method on the PrintingView. Following this, the PrintingView calls the **getAllDocument()** method on the PrintingController to retrieve all available documents for printing. If no file has been uploaded, the system displays an error message to the student using the **displayError()** method, prompting the student to upload a file through the **upLoadFile()** method. If

documents are available, the PrintingController triggers the **displayDocumentList()** method on the PrintingView to present the list of documents to the student. The student can then choose a document to print by calling the **chooseDocument()** method. This diagram focuses on the early stages of the printing process, particularly document selection and handling cases where no document is initially available. Additional steps, such as selecting print properties, checking page balances, or handling payments, are beyond the scope of this diagram but are crucial for the complete printing process.

2.2 Define printing properties

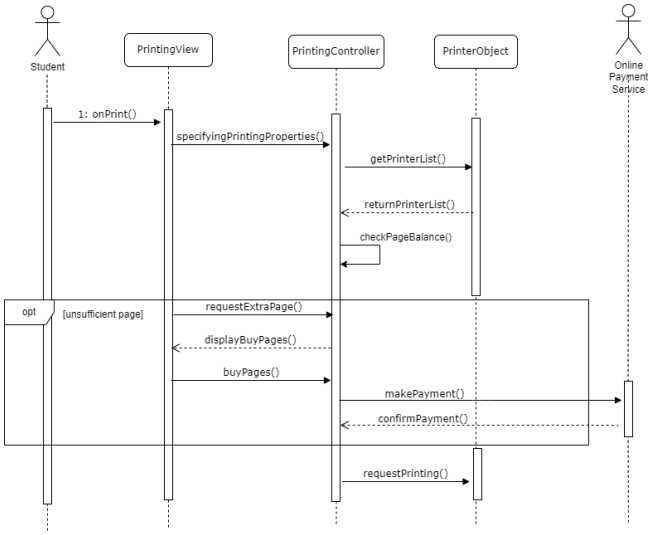

Figure 2.2: Sequence diagram for Define printing properties use-case

The depicted sequence diagram involves two primary actors: the Student and the Online Payment Service, along with four key objects: PrintingView, PrintingController, PrinterObject, and Online Payment Service. The process begins when the Student initiates a printing request by calling the **onPrint()** method on the PrintingView. This triggers the **specifyingPrintingProperties()** method, where the student specifies printing properties, such as the number of pages and other relevant details. The PrintingView then calls **getPrinterList()** on the PrintingController, which in turn requests available printers from the PrinterObject. The PrinterObject responds with the printer list through the **returnPrinterList()** method. Next, the PrintingController calls **checkPageBalance()** to verify if the student has sufficient pages to complete the print request. If the page balance is insufficient, an optional sequence occurs where the PrintingController calls **requestExtraPage()** on the PrintingView. The PrintingView displays a prompt to the student using **displayBuyPages()** to purchase more pages. The student initiates the purchase by calling **buyPages()**, which then triggers the

makePayment() method on the Online Payment Service. Once payment is confirmed through **confirmPayment()**, the PrintingController proceeds with the printing process by calling **requestPrinting()** on the PrinterObject to print the document.

2.3 Buy printing pages

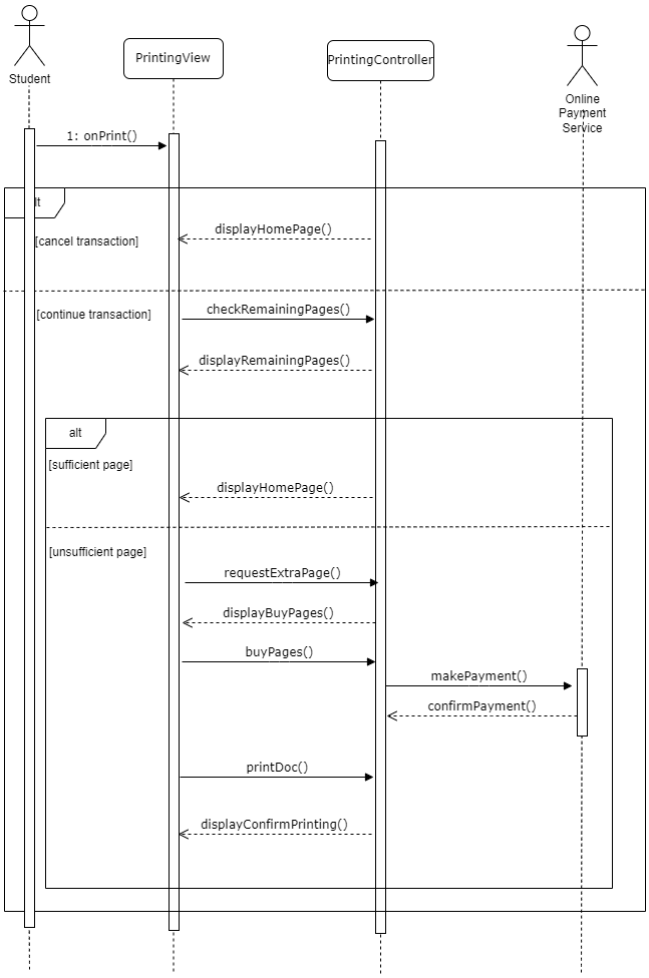

Figure 2.3: Sequence diagram for Buy printing pages use-case

The depicted sequence diagram involves two primary actors: the Student and the Online Payment Service, along with four key objects: PrintingView, PrintingController, StudentObject, and PrinterObject. The sequence begins with the Student initiating the printing process by calling **onPrint()** on the PrintingView. The student is then prompted to either cancel or continue the transaction.

If the transaction is continued, the PrintingController calls **checkRemainingPages()** to verify the page balance, and **displayRemainingPages()** provides this information to the student. Two outcomes are possible at this stage:

- Sufficient Pages: When there are enough pages, the PrintingView navigates back to the home page via **displayHomePage()**.
- Insufficient Pages: If there are insufficient pages, the PrintingController triggers **requestExtraPage()**, prompting the PrintingView to display a page purchase interface with **displayBuyPages()**. After the student confirms, **buyPages()** is called, leading to a payment process where the Online Payment Service handles the transaction through **makePayment()** and confirms it with **confirmPayment()**. Following a successful transaction, **printDoc()** is called to commence the printing, and **displayConfirmPrinting()** finalizes the process by notifying the student of the successful print.

This sequence highlights the process flow based on page sufficiency and integrates an optional payment procedure to purchase additional pages if required.

Chapter 3. CLASS DIAGRAM FOR PRINT DOCUMENTS MODULE

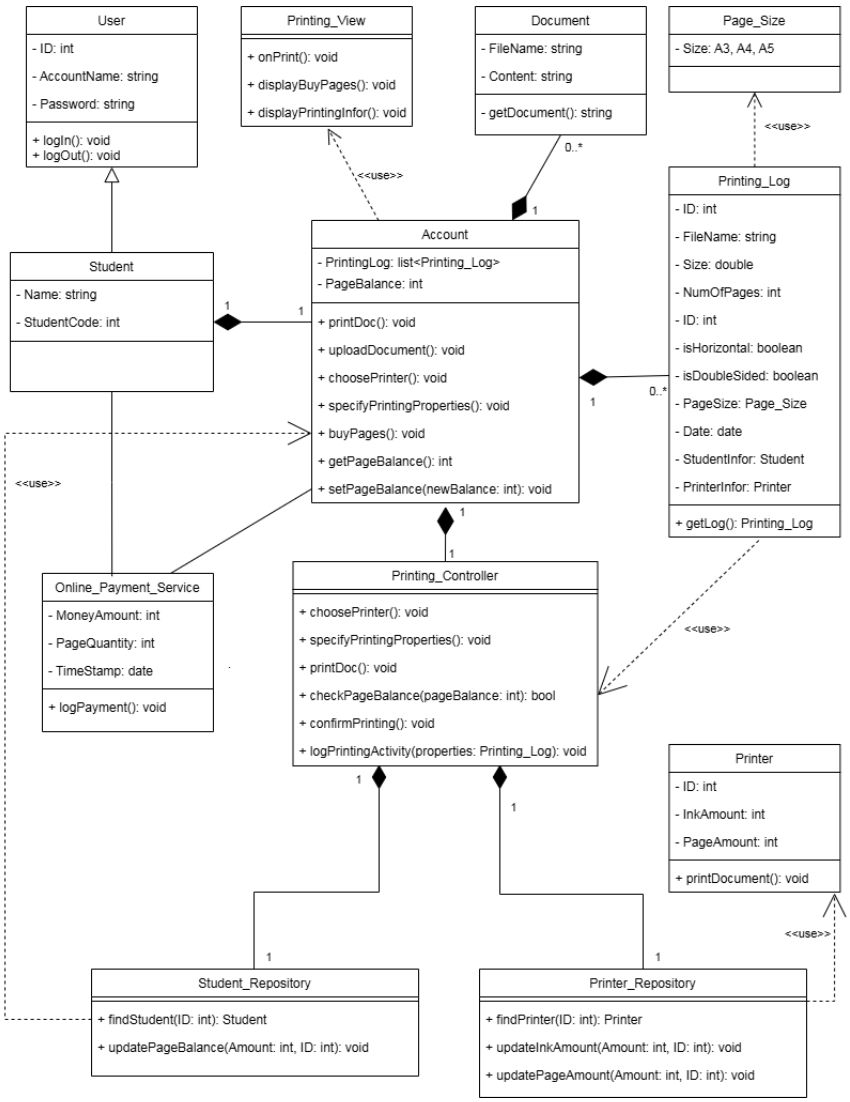

Figure 3.1: Class diagram for Print documents module

Chapter 4. MVP FOR PRINT DOCUMENTS MODULE

4.1 The screens in the module

1. **Menu screen**: Menu screen contains the navigation bar with three options: Printing history, Print documents, and Buy printing pages. Each button navigates to a corresponding window.
    - Printing history: Printing history window.
    - Print documents: Start the printing job with a window for choosing documents.
    - Buy printing pages: Navigate to the buying window.

Figure 4.1: Menu screen

2. **Printing history screen**: The screen shows the jobs that used to be completed as well as provides sorting options for users.

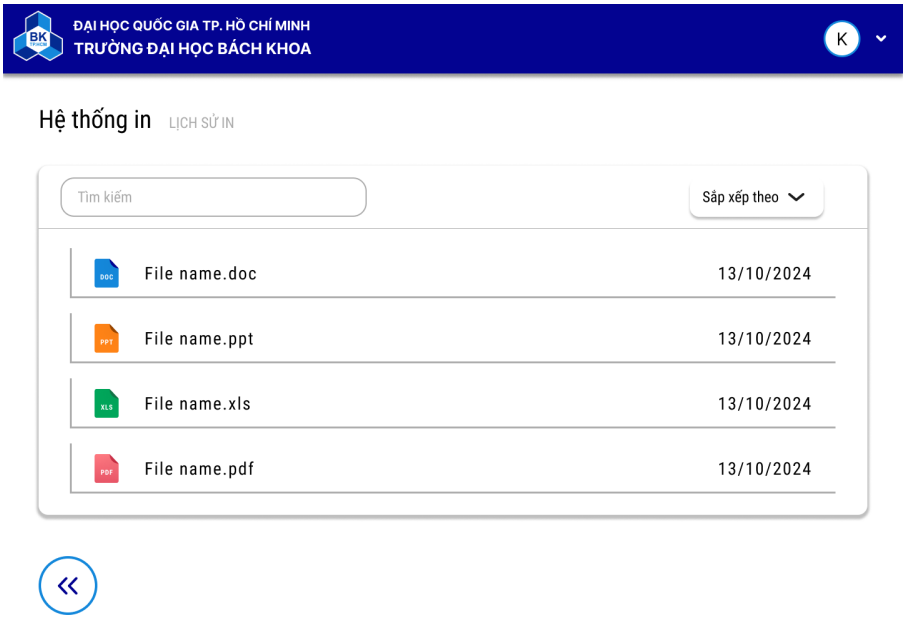

Figure 4.2: Printing history screen

3. **Choosing documents screen**: This screen provides the users with a list of available documents and a button to upload new documents if they need to. Sorting criteria are also included so that users can use this function more conveniently.

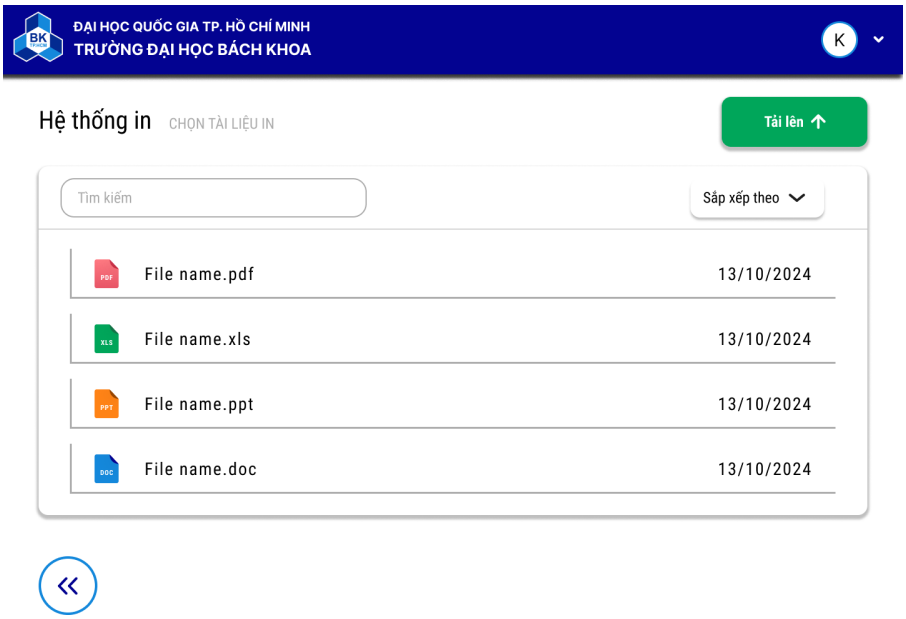

Figure 4.3: Choosing documents screen

4. **Choosing printer screen**: A list of available printers is presented in this screen attended with a sub-window with sorting criteria.

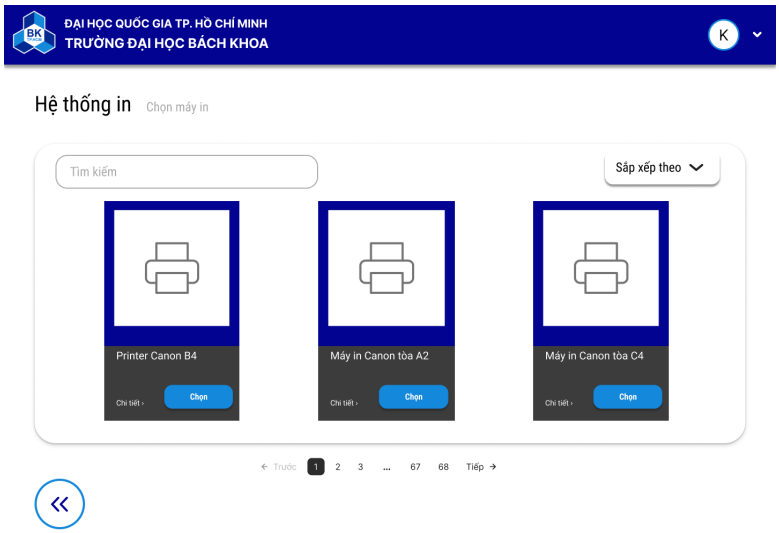

Figure 4.4: Choosing printers screen

5. **Defining printing properties screen**: Users can specify the form of the document that is going to be printed through this screen. Some options that can be set are the type of page, page orientation, etc.

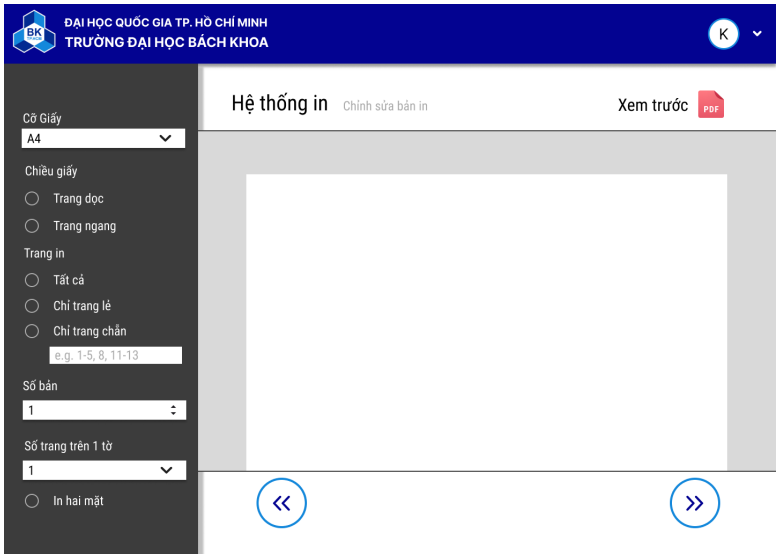

Figure 4.5: Defining printing pages screen

6. **Buying printing pages screen**: Students can buy more printing pages, they have to supply the information such as type of page, and quantity. After that, the system will

calculate the final price after taxes. They can add the transaction to the shopping cart to pay after.

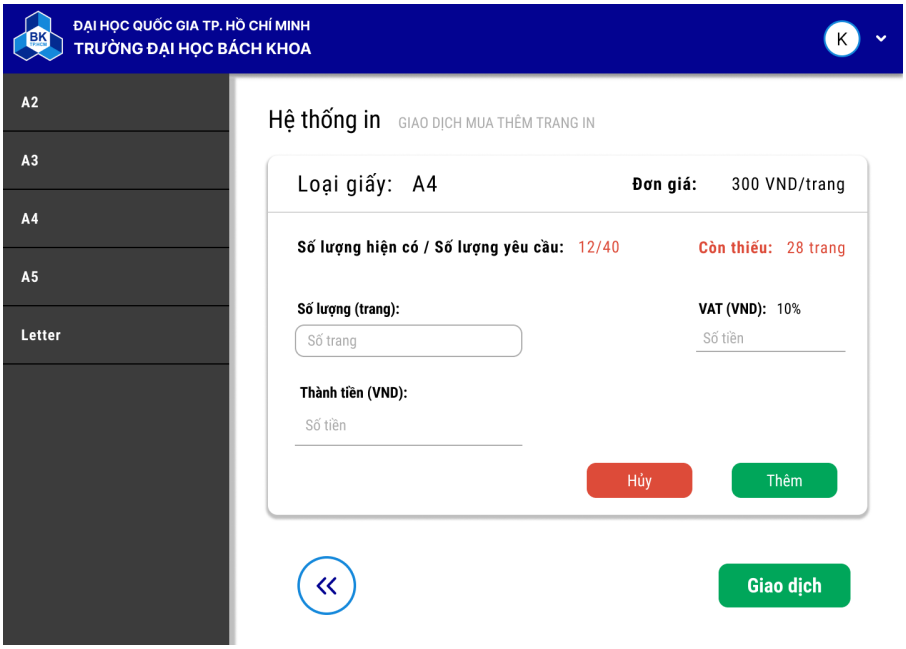

Figure 4.6: Buying printing pages screen

4.2 Figma links

1. **The link of Figma design**: Print documents documents module
2. **Guildline**: Press the **Present** button on the top left corner to see how this application works.