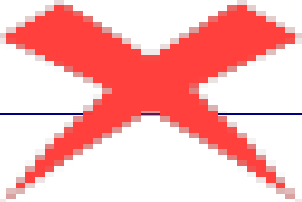








## ASSIGNMENT 1 FRONT SHEET

<b>Qualification</b>	<b>BTEC Level 5 HND Diploma in Business</b>		
<b>Unit number and title</b>	<b>Unit 30: Application Development</b>		
<b>Submission date</b>		<b>Date Received 1st submission</b>	
<b>Re-submission Date</b>		<b>Date Received 2nd submission</b>	
<b>Student Name</b>	Doan Tran Vinh Kha	<b>Student ID</b>	GCS190930
<b>Class</b>	GCD0901	<b>Assessor name</b>	Hoang Nhu Vinh
<b>Student declaration</b>  I certify that the assignment submission is entirely my own work and I fully understand the consequences of plagiarism. I understand that making a false declaration is a form of malpractice.			

Student's signature

### Grading grid

P1	P2	P3	M1	M2	D1
					

☐ Summative Feedback:

☐ Resubmission Feedback:

3.1

Grade:

Assessor Signature:

Date:

Internal Verifier's Comments:

Signature & Date:

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# Software Requirements Specification

## For FPT-Book Project Development

Version 1.0

Prepared by Doan Tran Vinh Kha

Group Name: Triple Clowns

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Instructor: Hoang Nhu Vinh

Course: Application Development

Date: July, 19<sup>th</sup> 2022

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## Revisions

Version	Primary Author(s)	Description of Version	Date Completed
Draft Type and Number	Doan Tran Vinh Kha	Information about the revision. This table does not need to be filled in whenever a document is touched, only when the version is being upgraded.	08/26/2022

## Introduction (P1)

### Document Purpose

The document aims to describe in detail about functional and non-functional requirements of the development of the FPT Books Website System, including the revision and author's information. The document's intended audience is the system administrator, the store owners, and the end-point users. Another audience that can be mentioned is our development team.

### Product Scope

The FPTBook will be a web-based software system designed to allow book store owners to manage book purchases and sales by streamlining and accelerating the selection, ordering, and purchasing of books online for customers and collecting the data of customers and products for book store owners. The project will be deployed in the stores, and the store owners and the customer can access the website. This website aims to contribute to the improvement of user experience and help to make the transaction process between customers and store owners more convenient and help the store owners to manage the stores easier.

### Intended Audience and Document Overview

The document is intended for the system administrator, end-point users, and store owners. To understand it deeply and clearly about the paper, we highly recommend you to read it from the top to the bottom part by part. Generally, this document includes six parts:

1. The **Contents** include the header title of each part of the document. It helps to summarize the document's layout for readers to have an overview of what content the document includes.
2. The **Revisions** provide information about the progress of the document. It shows the information about the order, the author's name, the description, and the date of the version. For example, *Firstdraft – Doan Tran Vinh Kha - Introduction finished – July 19th, 2022.*
3. The **Introduction** provides the audience with an overview of the document and the project, such as the objectives, the scope for which it is documented, acronyms and abbreviations, and references.
4. The **Overall Description** provides the audience an overview of the product that the SRS wrote about and its functionalities.
5. The **Specific Requirements** provide the functional requirements of the project and the technical illustration like the use case model and wire flow of the system.
6. The **Risk Assessment** lists the risks development teams may face during the development phase and analyzes those risks' impacts on the project's success.

To read and understand this SRS document, we recommend the audience scan the **Content** and **Revisions** sections first to identify the document's structure and version, then start with the **Introduction** to overview the project and understand the acronyms and abbreviations meanings. Then you can go down to **Overall Description** and **Specific Requirements** sections to discover how the system is designed. Finally, viewing the Risk **Assessment** lets you know what risks may happen during the project development process.

## Definitions, Acronyms and Abbreviations

The table below show the full form and meanings of all of the definitions, acronyms, and abbreviations in the document. To have a deeply understanding about the document, please review this section carefully before you read the rest.

Definitions, Acronyms and Abbreviations	Meanings
<b>ERD</b>	Entity Relationship Diagram
<b>FPT</b>	Name of the book store
<b>MVC</b>	Model View Controller
<b>SRS</b>	Software Requirements Specification
<b>WISA</b>	Windows Internet Information Services SQL Server ASP .NET Core

**Table 1: Definition, Acronyms and Abbreviations Table**

## Overall Description (P1)

### Product Overview

The FPT Book is a web-based e-commerce system that works independently and no interface with other systems. This product was born based on the FPT Book stores' demand to deploy an online web-based system, which helps them simplify and speed up the commercial trading between the store and the customers. The product will be implemented at all FPT Book chain stores and ensure to provide a safe and convenient environment for all users in the system to make online financial transactions and access and store the user's data.

Here is the diagram that describe generally about the product overview:

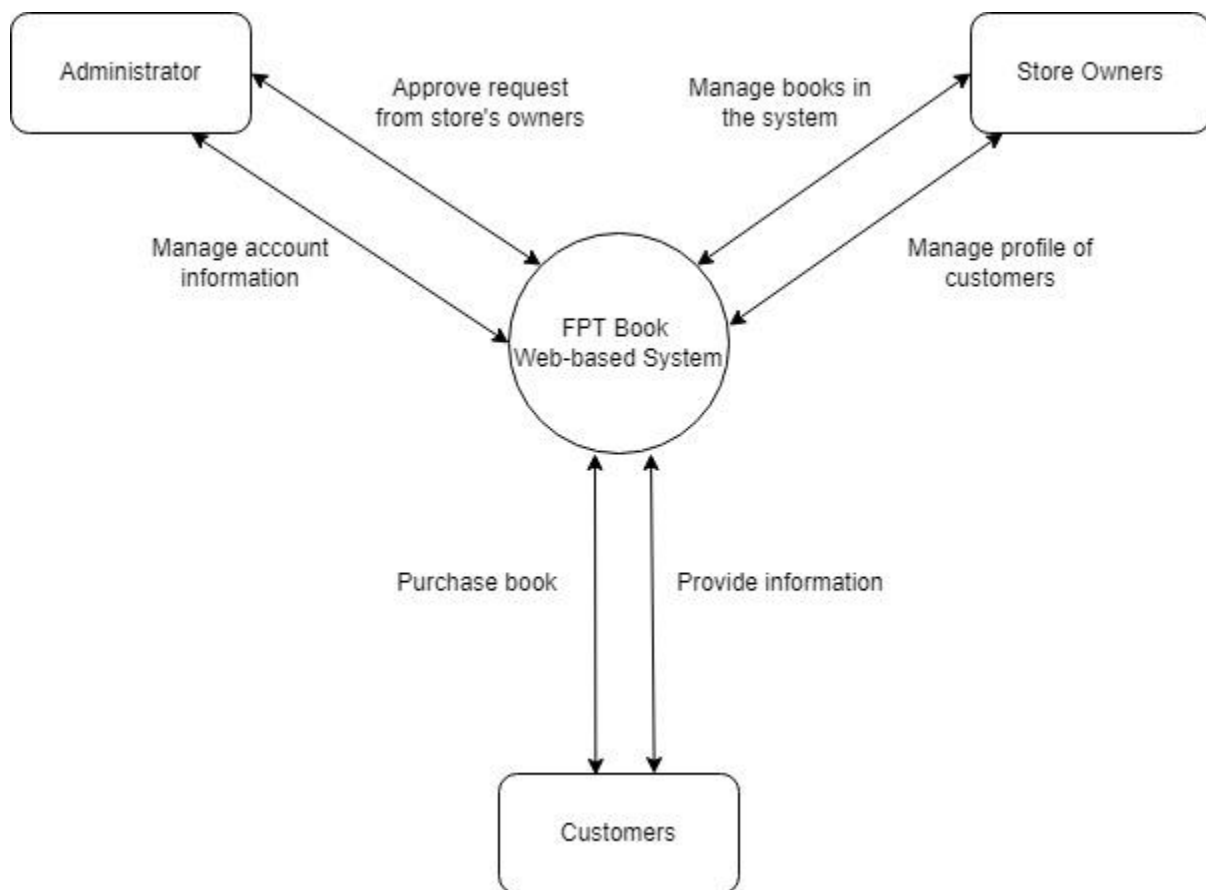


Figure 1: Major Functionalities Of The System

## Product Functionality

The FPT Book web-based system allows **administrator** to:

- Manage the customer accounts and edit the customer's password if it is necessary
- Manage the store's owners' accounts and edit the store owner's password if it is necessary
- Approve or reject the request from store owners about adding a new category to the list of categories

The FPT Book web-based system allows **store owners** to:

- Search for the information about customers by their email addresses
- Manage book with the specific category
- Send a request to the administrator about adding a new category to the book category list of the system, and receive a notification about the administrator's decision.

The FPT Book web-based system allows **customers** to:

- Sign up for a customer account full of their personal information
- Can view a list of books that they can buy
- View the detail of a specific book
- View the list of their order information, including the orders in the past
- View their profile
- View the transaction information in detail and make a payment
- View a list of solutions to the website's issues if they are any problem.
- Search for a book based on its name or category

## Functional Requirements (P1)

ID	AS A	I WANT TO	SO THAT I CAN
1	Administrator	Manage the account information of the system	Store and access the information of the system's user when essential
2	Administrator	Be able to change the password of the user's account	Help users take back their accounts in case they forget their passwords
3	Administrator	Approve the category request from store owner	Manage the list of categories in the store easily

## Use Case Model (P1)

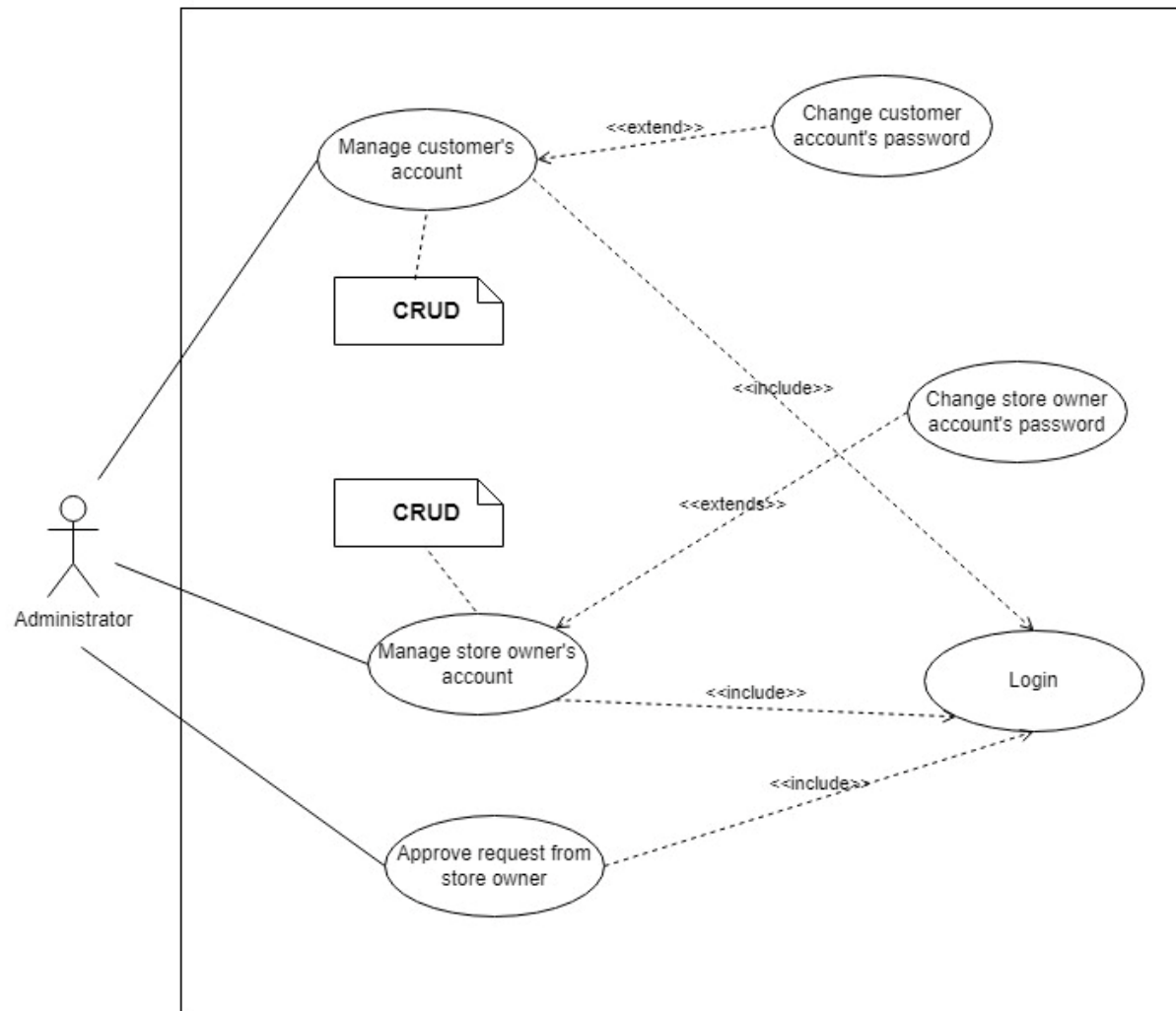


Figure 2: Use case diagram of Administrator

## Wireflow (P1)

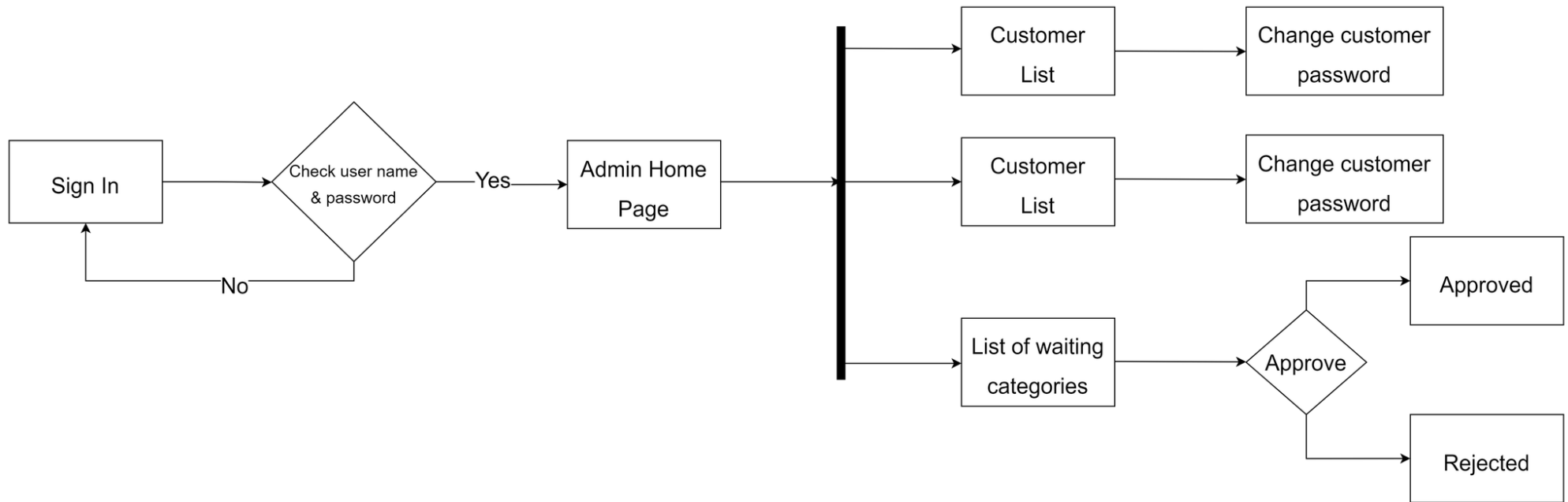


Figure 3: Wireflow of the administrator role

# Technical Design (M1)

## Entity Relationship Diagram (ERD) (M1)

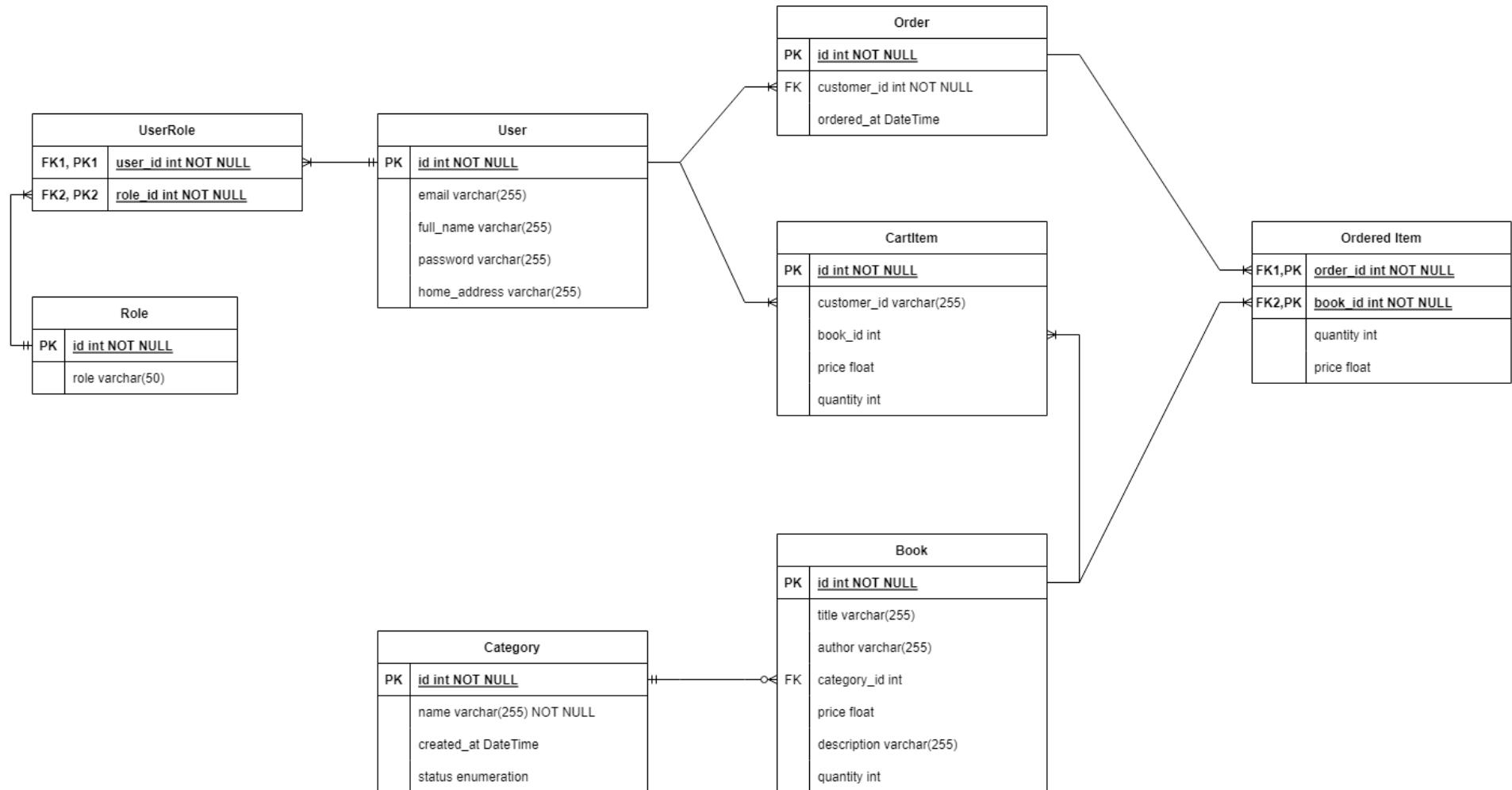


Figure 4: ERD diagram



## Class Diagram (M1)

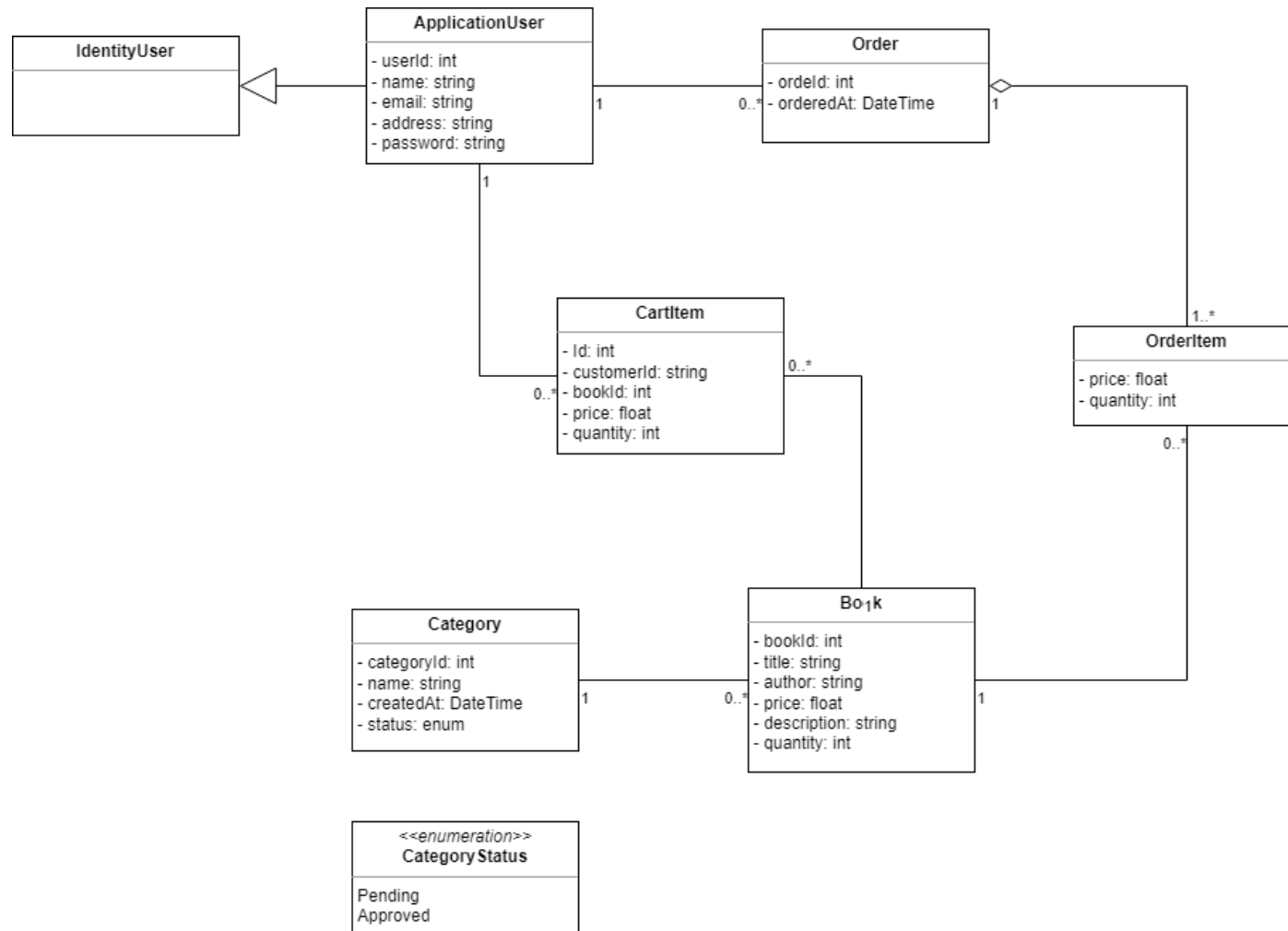


Figure 5: Class Diagram

## Activity Diagram (M1)

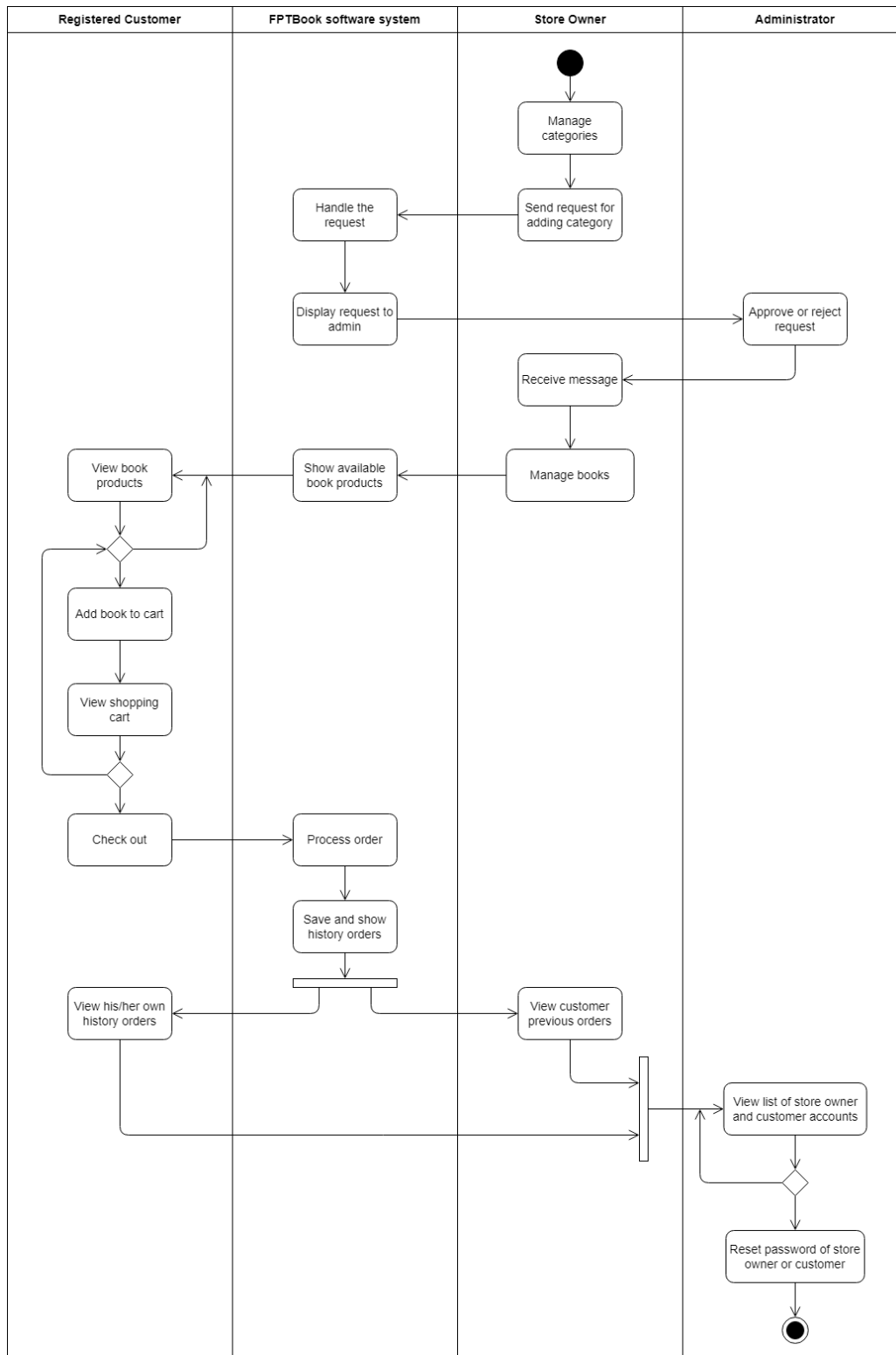


Figure 6: Activity Diagram

## Gantt Chart (M1)

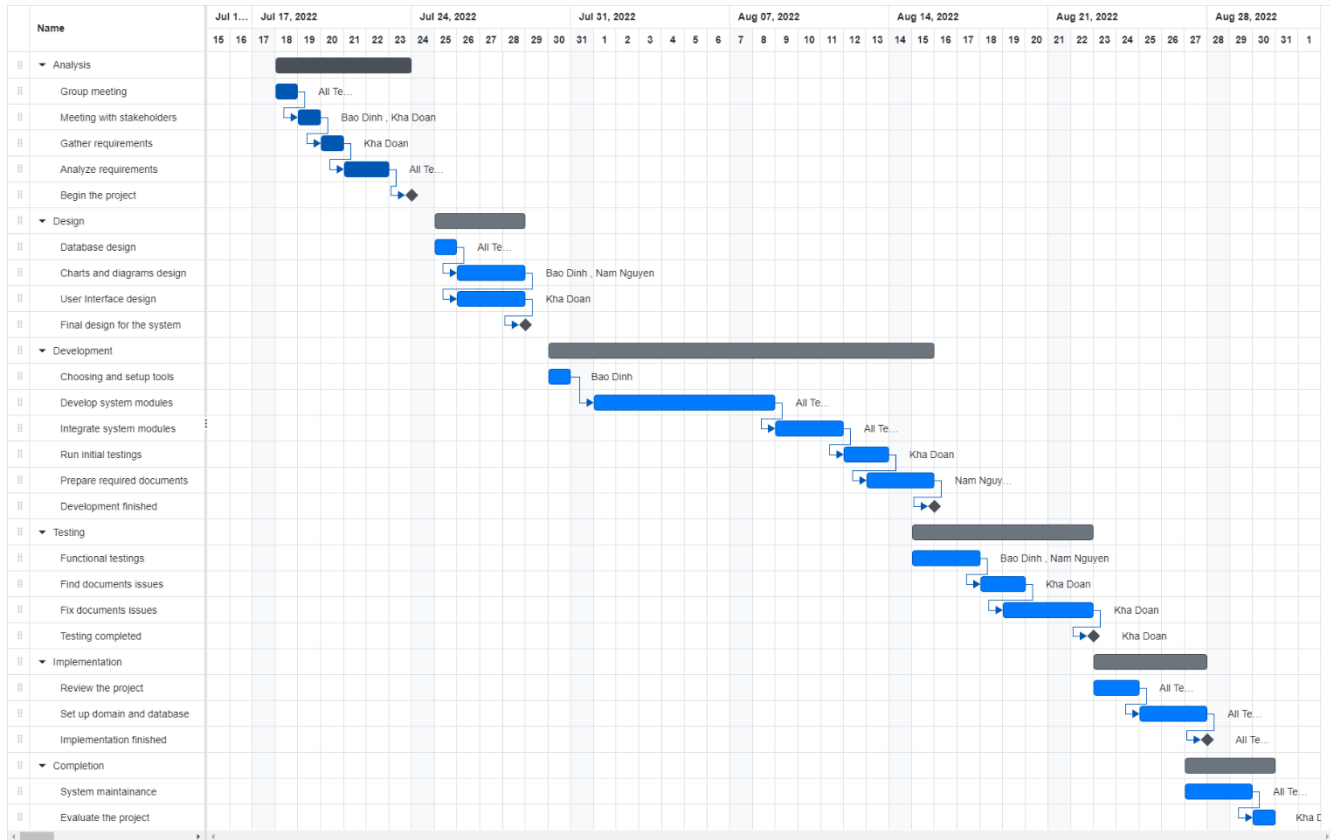


Figure 6: Gantt Chart

## Risk Assessment (P2)

### Risk Assessment

Identify and list Hazards		List Current Risk Controls	Risk Rating	List Additional Controls (if any - where current controls are not adequately managing the level of risk)
1	Unclear project agenda and schedule	Assess estimates, threats, and hypotheses with built-in and recurring project management tasks. Planning risk management based on regular updates and suggestions for modifying the project plan.	High	
2	Do not deeply understand the programming tool (ASP.NET framework)	Due to the short period of the project duration, each team members have to spend a few hours per day reading more about framework documents, watch a tutorial on Youtube, or taking a look at IT forum like StackOverflow to find the solutions	Medium	Ask the professor for helping to solve the problem
3	Team member missed the deadline	Gradually create weekly meetings to share the project progress with other team members.	High	Divide the project into small and clear stages which helps every member of the development team to track down easily the progress  Apply the SDLC methods such as SCRUM into the development phase of the project to help the whole team to manage the project progress better
4	Team member has the unexpected problems or accidents that lead to his/her absence	During the weekly meeting, each team member must share their ideas and work progress with another member in case he/ she faces an unexpected problem, and other team members can keep up with his/ her work.	High	

Identify and list Hazards		List Current Risk Controls	Risk Rating	List Additional Controls (if any - where current controls are not adequately managing the level of risk)
5	Budget issues	Frequently work and update the project status with the investor by technical documents to give them an overview of how the project is going on.	LOW	

# Chapter 1 – Design Tools (P3 - M2)

## I. Tools To Design UML

The abbreviation UML stands for Unified Modeling Language, a modern software modeling and documentation method and one of the most prominent methodologies for modeling business processes. It utilizes graphical representations of program components. Visual representations allow us better to comprehend software or business process defects or problems. Here are some online tools which is very useful and convenient in helping user to create an UML diagram with no required installation.

### **Lucidchart**

This is a program chosen by many programmers to develop the UML diagram. Lucidchart, offers a set of simple functions. The HTML5-based code of Lucidchart enables it to function in real-time on various platforms. From intricate system diagrams to mind maps, Lucidchart handles it all. Due to its intuitive drag-and-drop user interface, Lucidchart do not require users to have much technical skills

### **Gleek.io**

Gleek.io generates several UML diagrams, including sequence diagrams, class diagrams, and object diagrams. Additionally, teams utilize Gleek.io to construct org charts, flowcharts, mind maps, and numerous other diagrams. As experienced users and developers know, the keyboard is far faster than the mouse. Due to Gleek.io's reliance on keyboard commands, developers can work faster than with drag-and-drop diagramming software.

## Draw.io

Draw.io is a proprietary software designed by Seibert Media for creating diagrams and charts. Users can use an automatic layout option or design a bespoke layout using the software. They offer a vast array of shapes and hundreds of visual features to customize their diagram or chart. The drag-and-drop tool simplifies the creation of aesthetically pleasing diagrams and charts. Depending on users' needs, Draw.io can save saved charts in the cloud, on a server, or in network storage at a data center.

## II. Tools To Design User Interface

### Sketch

An application for creating vector graphics is called Sketch. It is a tool for product design that web designers frequently utilize to produce concept pages, icons, and various other parts of websites. It is also very well known among designers of user interfaces and user experiences (UI and UX).

### Figma

Figma is a graphical editing and user interface design application that runs in the web browser. Users may use it to accomplish graphic design work, including wireframing websites, building mobile app interfaces, prototyping designs, creating social media posts, etc. Figma is not like any other graphics editing application users used before. The primary reason is that it operates directly within the user's browser. Because of this, users will be able to access the projects and begin the design process from any computer or platform, and they will not be required to purchase numerous licenses or install the software.

## Wireflow.co

Wireflow is an online, open-source, and free-flow tool. Using this tool, users may quickly construct prototypes of user flows. Wireflow was developed to eliminate the need for expensive and time-consuming software such as Adobe Photoshop and Illustrator, making it possible to streamline the process of user flow planning at an earlier stage in the product development life cycle. It was the motivation behind the software's creation.

### III. Conclude Which Tools Will Be Used To Design The Application

The sections above are the list of useful and popular tools that I have found for designing the project. In this section, I will make a comparison between these tools and represent the reason why I decide to choose which ones for doing my project.

#### 1. Tool To Design UML

To design the UML for the project, me and my team decided to choose the **Draw.io**.

Pros	Cons
➤ It can help to create a high-quality diagram.	➤ It only displays 2D objects and shapes, not support 3D ones.



<ul style="list-style-type: none"> <li>➤ It contains a large number of preconfigured shapes that can be used to fulfill a variety of diagramming requirements.</li> <li>➤ It enables the grouping of various shapes</li> <li>➤ Smartly connect to multiple platforms.</li> <li>➤ It can export to a vast number of formats conveniently.</li> <li>➤ It allows for the development of diagrams to be done in collaboration.</li> </ul>	<ul style="list-style-type: none"> <li>➤ The quality of drawings, diagrams, and charts is lower users export the diagram as an image file.</li> <li>➤ There are no graph options.</li> </ul>
---	--

## 2. Tool To Design User Interface

To design the user interface of the project, me and my team decided to choose the **Wireflow.co**

Pros	Cons
<ul style="list-style-type: none"> <li>➤ It can help to create a visual wireflow</li> <li>➤ It contains a variety of graphics/ cards that helps users to build a clear wireflow easily</li> <li>➤ It response back to user's manipulation in real time quickly</li> <li>➤ The interface is easy to approach</li> <li>➤ It does not require professional skills to use effectively</li> </ul>	<ul style="list-style-type: none"> <li>➤ In spite of the huge number of graphics/ cards, it is still lack of some essential ones</li> <li>➤ The website does not work smoothly so that sometimes, the website response is delayed</li> </ul>

➤ Real – chat functions helps	
-------------------------------	--

In conclusion, based on the above comparisons, my team and I chose **Draw.io** and **Wireflow.co** to design our project because these tools are free to use and meet our project's needs. Due to the scale of our project, we do not need to pay for professional instruments. Therefore, my team and I think these tools are the best option.

# Chapter 2 - Front End Technology Stack (P3 - M2)

## I. Front End Programming Language

### JavaScript

JavaScript is a popular programming language for web development. Netscape created it to incorporate dynamic and interactive components into websites. While Java influences JavaScript's name, the syntax is more likely to be C and is derived from ECMAScript, a scripting language developed by Sun Microsystems. JavaScript is a client-side scripting language, meaning that the client's web browser interprets the source code as opposed to the web server.

### TypeScript

TypeScript is an extension of JavaScript that was developed to scale web applications. ECMAScript is its open standard, and a large community of developers is working with it. Microsoft created the object-oriented programming language known as TypeScript in the year 2012. It extends the capabilities of JavaScript and may function as both a language and a toolkit at the same time. It offers optional static typing, which can assist in catching problems as they emerge, making it suited for big projects

## II. HTML and Style Language

### HTML

HTML is the standard markup language for text display in a web browser. It can be aided by Cascading Style Sheets (CSS) and other programming languages such as JavaScript. Web browsers accept HTML files from a web server or local storage and convert them into multimedia web pages. HTML explains the semantic structure of a web page and originally contained hints for the document's appearance. The newest version of HTML is HTML5

### CSS

Cascading Style Sheets, or CSS for short, is a style sheet language that may describe how a document created in a markup language like HTML or XML will appear on the screen. Cascading style sheets (CSS) and HTML and JavaScript are crucial parts of the World Wide Web. To differentiate between the presentation and the content, including the layout, colors, and fonts, a CSS file will be inserted into the HTML page to help programmers to customize every single element in the HTML file. The relevant CSS is specified in a separate file with the CSS file extend, which reduces complexity and repetition in the structural content and allows the file to be cached to improve the page load speed between pages that share the file and its formatting. The newest version of CSS is CSS3

## III. JavaScript & CSS Library / Framework

### ReactJS

The JavaScript package known as ReactJS is used to construct reusable user interface components. It is a library for designing user interfaces that are composable and is called React. It fosters the construction of UI components that can be reused and convey data subject to change over time. Many users substitute React for the "View" in MVC. Because it abstracts the DOM for users, React offers a more straightforward programming model and improved speed. It is also possible for React to render on the server by utilizing Node JS.

### Angular

Angular is an open-source framework and was created in TypeScript using JavaScript. It is kept up to date by Google, and developing single-page applications is its primary objective. Using Angular as a framework comes with several obvious benefits, including providing a consistent framework for developers to work inside. It allows customers to construct big applications in a way that is yet maintainable.

### Bootstrap

Bootstrap is a free and open-source front-end framework that makes it possible to create mobile-first websites that load more quickly, are easier to manage, and are responsive. Because of its interoperability with all modern browsers, Bootstrap has become the most popular framework. Because Bootstrap comes with pre-defined classes, it makes the work of developers much simpler. Using Bootstrap allows users can create designs that are responsive and adaptable to a variety of devices. It includes a variety of HTML and

CSS-based design templates, with an emphasis on typography, buttons, tables, forms, models, navigation, and picture carousels, in addition to a selection of optional JavaScript plugins.

## IV. Conclude Which Technologies Will Be Used To Design The Application's Front End

Based on the above list, me and my team has listed out several front-end programming languages as well as the frameworks can be applied to design the website interface. After discussed carefully, my team has concluded that we will choose **HTML**, **CSS**, **JavaScript**, and **Bootstrap** to design the website's interface.

About **HTML**, it is the language most commonly acknowledged for website development, and its application is widely on the internet. Most web browsers understand HTML and need HTML files to render a website for users. HTML is a language that is incredibly streamlined and easy to understand.

About **CSS**, If HTML represents the components of a car's engine, then CSS would represent the vehicle's body style and paint job. A website's front end will be vivid and colorful when CSS is used, and users will have a far more positive experience. Without CSS, websites would have a substantially lower aesthetic appeal and be significantly more challenging to navigate. In addition to the format and layout, CSS is responsible for the color of the fonts and other things.

About **JavaScript**, the implementation of JavaScript is relatively straightforward. Including the user's code in the HTML content and informing the browser that it is JavaScript, and then the browser will automatically implement it. JavaScript is functional on the computers of web users even when such users are not connected to the internet. Website developers can design highly responsive interfaces using JavaScript,

which improves the user experience and gives dynamic functionality without waiting for the server to react and present another page.

About **Bootstrap**, it is easy to set up and use in the project. It contains several pre-defined components, a solid grid system, a style for many HTML elements ranging from typography to buttons, and support for JavaScript plugins, making it even more flexible. Additionally, it has a good grid system. Because its responsive CSS is meant to conform to various devices, Bootstrap is an excellent tool for creating layouts. It can assure uniformity, eliminate difficulties when using different browsers, and so forth.

# Chapter 3 - Back End Technology Stack (P3 - M2)

## I. Back End Programming Language

### C#

C# is a high-level object-oriented programming language that quickly adapts to run on many different kinds of systems. This strong language is used by programmers in conjunction with frameworks such as .NET to design the underlying structure of webpages and to connect client interactions with server interactions to create a program capable of its full range of functionality. C# and the associated frameworks are excellent web and software development options because of their adaptability and consistency.

### Golang

Golang, commonly reduced to Go, is a static programming language. It implies that it detects problems before running the program, making it simple to zero in on specific flaws in the code before testing the application. Users can write code for the back end of their project quickly and efficiently with its simple and practical syntax, and users can also scale their file up or down depending on the requirements.

### PHP

PHP is a scripting language, meaning the code written in this language must be compiled by an interpreter so that it can be read directly by the computer rather than going through a compiler, which would translate it into code that the computer could understand. PHP is an acronym for hypertext preprocessor.



PHP is most useful for server-side functionality and makes it much simpler to distribute user's code by providing various tools and capabilities that simplify the process of submitting and validating it.

## II. Operating System

### Windows

Microsoft Windows is the brand name for a family of operating systems (OS) developed and marketed by Microsoft Corporation for use on personal computers. It is commonly referred to simply as Windows (PCs). Users can observe and interact with the operating system through cursors, drop-down menus, graphical icons, and moveable windows representing folders and drives, thanks to the Graphical User Interface (GUI) included in Windows (a Command line is also available). Windows has been the most widely used operating system over the last few decades because it is simple to operate and has an intuitive user interface. In addition, it comes with a vast selection of programs that can be effortlessly installed. However, the Windows operating system is pricey and requires a significant amount of hardware and software resources. Additionally, its security is average, which many software developers consider a considerable concern.

### Ubuntu

Ubuntu Desktop is a Linux distribution that Canonical developed. As a result of its user-friendliness, Ubuntu Desktop is currently one of the most widely used distributions. The server edition, which will not be the focus of this discussion, is also running on most servers connected to the internet. The desktop edition of Ubuntu is compatible with all the typical programs found on Windows, including Firefox, Chrome, VLC, and many others. The fact that it is a free operating system that is supported by a sizable open-source community is the best aspect of it.

## MAC OS

macOS is the name of the operating system (OS) that is installed on desktop computers and laptops manufactured by Apple. It is an exclusive graphical operating system that every Mac uses. Operating systems communicate with the hardware of a computer and distribute the resources required for it to carry out the duties assigned to it, such as running an application. Operating systems are responsible for allocating resources such as memory, processing power, and file storage. As a result of the operating system being tailored to the particular hardware, macOS offers an often brisk and snappy performance.

## III. Web Server

### IIS (Internet Information Services)

Hosting websites, services, and applications in a reliable manner is made possible by Windows Server 2012's Web Server (IIS) role. This role provides a secure, simple-to-maintain, modular, and extendable platform. Users can share information on the Internet, intranet, or extranet when using IIS 8. IIS 8 is a single online platform that unifies previous versions of Microsoft Internet Information Services (IIS) and ASP.NET, FTP services, PHP, and Windows Communication Foundation (WCF).

### Apache Web Server

Apache is a Web server that is free to use and was developed by an American software developer named Robert McCool. In its capacity as a Web server, Apache is responsible for handling requests for directories sent in via the HTTP protocol from users of the Internet and delivering the requested information to those users in the form of files and Web pages. Most software and code that powers the Web is created

with Apache's features and functionality in mind. Most of the time, programmers working on Web applications utilize a home version of Apache to preview and test the code. Users can place files into the root directory of their Apache software and then share those files with other users, thanks to Apache's safe and secure file-sharing capability. The one-of-a-kind license that the software from the Apache Software Foundation is released under helps to explain, at least in part, why the Apache server has had such a significant impact on the open-source software community.

## IV. Database

### MySQL

MySQL is a relational database management system (RDBMS) that uses structured query language as its foundation. MySQL was developed by Oracle (SQL). A database is a well-organized collection of several types of data. It might be anything from a brief shopping list to a picture gallery or even a location in a business network to store the copious amounts of information that are present there. A relational database, in particular, is a digital storage that collects data and organizes it according to the relational paradigm. Tables in this paradigm are rows and columns, and the relationships between the various data pieces adhere to a logical framework. A Relational Database Management System (RDBMS) is nothing more than a collection of software tools that are used to create, administer, and query such a database.

### SQL Server

SQL Server is a software application designed to handle databases; it stores and retrieves data as other hosted-applications-1 applications request it to do so. When writing new business applications that store information in a database, software developers will frequently use the functionality offered by SQL

Server to manage the databases. It makes developing database applications more straightforward and faster (and hence less expensive) and makes those programs more dependable, scalable, and secure. A "Relational Database Management System" like SQL Server is called a "Relational Database." Tables function very similarly to the rows and columns of a spreadsheet when it comes to data storage.

## PostgreSQL

Relational database software is what PostgreSQL is. It organizes the data points into rows and uses the columns to record the various data properties. A table can store many rows that are connected. The relational database is the sort of database that is used the most frequently today. Because it is compatible with a wide variety of other technologies and adheres to several different database standards, it may easily be expanded upon. PostgreSQL is an enterprise-class database with advanced features such as Multi-Version Concurrency Control (MVCC), point-in-time recovery, tablespaces, asynchronous replication, nested transactions, online/hot backups, a sophisticated query planner/optimizer, and write-ahead logging for fault tolerance. These features are all designed to make PostgreSQL highly reliable. PostgreSQL is compatible with the most widely used operating systems, including Windows, Mac OS X, and virtually every distribution of Linux and Unix. Because it is open source, it is simple to upgrade or extend. Without recompiling the database, PostgreSQL users can define their data types, create custom functions, and even write code in a different programming language, such as Python. In addition to this, PostgreSQL is offered at no cost.

# V. Hosting

## Azure

Web hosting on Azure is a vital tool that, when utilized by the production unit, makes it possible to manage cloud computing and storage accounts using a straightforward method that has never been implemented before. Users can manage many databases, virtual machines in multiple locations, and subscriptions. The platform marks meek as capable of handling all available resources and developing appealing dashboards and templates to streamline and organize the work. Web hosting provided by Azure allows users to scale independently run websites while still managing them under a single subscription. As a result, the user is provided with the ability to construct the sites that he desires, and this can be accomplished without wasting any expense.

## Heroku

Heroku is a cloud service provider and software development platform that enables the development, launching, and scaling of web applications in a time-efficient and effective manner. It has 140 pre-installed add-ons, such as monitoring, caching, mailing, and networking add-ons. These pre-installed add-ons can be used for various purposes, including alarms, analytic tools, and security services. The cloud computing model of Heroku is Container-as-a-Service, a cloud platform that employs (PaaS). Heroku is a platform as a service that has earned many people's trusts, enabling developers to launch, manage, and grow modern apps using Heroku. Building, testing, deploying, and managing apps can all be accomplished using Heroku's collection of development tools and application-specific services, all housed under a single, unified platform. Heroku is a

comprehensive application development platform for the cloud constructed from several separate elements that collaborate.

## Google Cloud

Google Cloud, also known as Google Cloud Platform or GCP, is a provider of computing resources that may be utilized for creating, deploying, and operating applications hosted on the World Wide Web. GCP is primarily a service for building and maintaining original applications, which may then be published via the Web from its hyper-scale data center facilities. Although its cloud infrastructure does serve as the host for applications such as Google Workplace (formerly G Suite, and before that, Google Apps), GCP is primarily a service for building and maintaining original applications.

# VI. Framework

## Laravel

Laravel is a PHP framework that is open-source and free to use. It offers a collection of tools and resources that can be used to construct modern PHP applications. Laravel has enjoyed a meteoric rise in popularity over the past few years. As a result, many developers prefer to use it as their preferred framework to streamline the development process. The Object Relational Mapper (ORM), dubbed Eloquent, is one of the robust database tools that Laravel provides. Developers can bootstrap new models, controllers, and other application components using the command-line tool Artisan, which helps speed up the application development process

## Node.JS

Node.js is a runtime environment that is open source and cross-platform. It is used for the development of server-side applications and networking programs. Using JavaScript as a foundation to develop, Node.js applications and the Node.js runtime environment can be installed on OS X, Microsoft Windows, and Linux. It provides an event-driven, non-blocking (asynchronous) I/O and cross-platform runtime environment for constructing highly scalable server-side applications with JavaScript. Many kinds of apps may be built with Node.js, including command line programs, web applications, real-time chat applications, REST API servers, etc. On the other hand, its primary application is developing network programs like web servers, like PHP, Java, or ASP.NET.

## .Net

ASP.NET is a C#-based web development framework that offers a programming model, a comprehensive software infrastructure, and various services necessary to construct powerful web applications for personal computers and mobile devices. These are the essential components of a web development environment. ASP.NET is built on top of the HTTP protocol and uses its commands and policies to establish browser-to-server communication and cooperation. Applications developed in ASP.NET are code that has been compiled and written utilizing the extendable and reusable components or objects that are provided in the the.Net framework. These scripts can utilize the entirety of the class hierarchy that is available in the .Net framework. ASP .NET is a technology that runs on the.Net framework and incorporates all of the features and capabilities related to the web. A hierarchical structure of object-oriented components makes up the.Net framework. Pages are the building blocks of an ASP.NET online application; when a user requests

an ASP.NET page, the Internet Information Services (IIS) hands over control of the page's processing to the ASP.NET runtime system.

## VII. Conclude Which Back End Technologies Will Be Used For The Development

The sections above are the list of back-end technologies that me and my team has done the research about. In this section, I will represent which technology will be chosen for developing my project and give the explanation.

### Back-end Programming Language

About choosing the back-end programming language, me and my team decided to choose **C#** because of the following reasons:

- C# contains several characteristics that, when combined, make it possible for developers to write code at a faster rate than is possible with other languages.
- Because C# applications are based on static code, every one of its products is a dependable service open to easy customization and modification. That means developers may change any C# applications to enhance the program's functionality and support more users
- C# is a computer language that has fully embraced object-oriented programming. As a result, it stands a good chance of becoming the language that most effectively and exceedingly adaptable utilizes the MVC programming model.
- C# is a high-level language that is relatively simple to learn and comprehend, despite its advanced complexity.



## Operating System

About operating system, me and my team decided to use **Windows** OS due to the following reasons:

- It is the most popular operating system installed on the user's laptops and desktops and, it is easy to use. Thus, we do not need time to get familiar with it.
- It is the most popular operating system installed on users' laptops and desktops and is easy to use. Thus, we do not need time to get familiar with it.
- Due to our back-end programming language being C#, a windows-only programming language, we cannot choose the other operating system in case of unexpected errors.
- Applications designed for Microsoft Windows typically offer a higher quality feature set when compared to applications designed for other platforms. It does not imply that Windows is the only platform that produces high-quality software. A few programs were developed for other platforms that are well made. Compared to their contemporaries, apps that run on Microsoft Windows emerge as clear front-runners in our tests.
- Last but not least, the Windows operating system is often integrated with our devices when we purchase them so that we do not have to pay for a new one.

## Web Server

About the web server, we prefer to use the **IIS (Internet Information Services)** for our project due to the following reasons:

- Protect the server by minimizing the area that an attacker can penetrate. One of the most powerful techniques to safeguard a server system is to reduce the amount of exposed surface area. Users can

achieve the smallest feasible surface area for their application by using IIS to eliminate any unnecessary server functions.

- Enhance performance while simultaneously lowering the memory footprint. Users can enhance performance by minimizing the amount of feature code executed on every request to their application if they remove unwanted server features and minimize the amount of memory the server needs.
- Create servers that are unique to users' needs or requirements. Users can design custom servers that perform a specific function inside their application topology by selecting a particular set of server characteristics and creating a custom server configuration.

## Database

About choosing the database for our project, we decided to choose the **Microsoft SQL Server** because of the following reasons:

- MS SQL is easy to set up, and its installation interface is user-friendly, unlike other database servers requiring complex command-line configurations.
- Because of its intricate encryption algorithms, Microsoft SQL Server is widely regarded as one of the most secure database servers available. These algorithms make it extremely difficult, if not impossible, to penetrate the security levels that the user imposes.
- Microsoft SQL Server has many advanced features that make it possible to recover and restore data even after it has been corrupted or deleted.

- The essential component of MS SQL, known as the SQL Server Database Engine, is responsible for controlling the data storage. The server is responsible for the processing and storing of data in addition to data security. Both demands and queries can be carried out via the Database Engine.

## Hosting

About the hosting for our project, me and my team decided to choose the **Azure** because of the following reasons:

- Microsoft Azure is the only cloud service with a more significant number of distribution points and data centers than any other provider. Because of this, Azure can provide its users with the best possible experience and transfer content more quickly. Azure provides a location for storing data that is both quick and dependable. Additionally, we can share content between various virtual machines.
- Microsoft Azure is a cloud computing service that allows you to pay for what you use and adapts rapidly to your organization's specific requirements while also letting you spend on a pay-per-use basis. Because of this, it presents itself as a viable option for us.
- Azure is exceptionally flexible and can use at whatever degree of capability we deem necessary. Conveniently, it is compatible with the same technologies that many software developers and IT professionals already employ. We can make changes and deploy web apps to Azure rapidly, and there will be minimal downtime.

## Framework

Finally, for the last section of back-end technologies, I will represent about our reasons to choose the framework ASP .NET for our project

- Since Asp.Net is an entirely server-based solution, all code processing takes place on the Windows server before it is sent to the client's web browser for display. Because of this, applications written in ASP.net run far faster than interpreted scripts.
- The data types are defined by the Common Language Specification in their entirety.
- Full support for XML, Cascading Style Sheets (CSS), and ASP.NET provides various emerging and long-standing web standards.
- Asp.Net is simple to deploy due to the built-in configuration information provided. Because the information necessary to configure the component is already built-in, there is no need to register the part.
- Last but not least, we choose .Net to develop our project because it supports and works efficiently with the programming language C#, web server IIS, and the database Microsoft SQL. All of these components are integrated and supported in the Visual Studio IDE.

# Chapter 4 - Tools For Source Control Management (P3 - M2)

## I. List Of Tools

### Git

Git is a tool for development and operations teams that manages source code. It is a free and open-source version control system that can efficiently manage projects ranging in scale from very small to very large. Git is a tool that keeps track of the changes made to the source code. It makes it possible for numerous engineers to collaborate on non-linear development.

## GitHub

GitHub is a for-profit firm that provides a hosting service for Git repositories hosted in the cloud. In essence, it makes it much simpler for individuals and teams to utilize Git for version control and for collaborating on projects. Git is accessible to even inexperienced programmers thanks to GitHub's intuitive and straightforward user interface. Without GitHub, utilizing Git typically demands a higher level of technical expertise and familiarity with the command line. However, because GitHub is so simple, some individuals even use it to manage programming-related projects, such as writing novels. Because any user can create an account and host a public code repository without paying a fee, GitHub is particularly well-liked among open-source software development endeavors. GitLab

## GitLab

is a platform for collaborative software development and a repository for open-source code. It is geared toward large-scale development and security operations and is free to use. GitLab is a platform that offers a location for online storing code and tools for monitoring bugs and doing continuous integration and deployment. The repository hosts many development chains and versions, enabling users to examine previous code and refer back to it if unforeseen complications arise. GitLab is an alternative to the well-known code repository known as GitHub, which is responsible for hosting, amongst many other projects, the work done by Linus Torvalds on the Linux kernel. GitLab was developed by a company called Atlassian. Regarding managing source code, GitLab is astonishingly comparable to Git in terms of performance. It is because GitLab was built using the same Git foundation as version control.

## II. Conclude Which Tools Will Be Used

To choose a tool for managing project's source code, me and my team decided to use Git and GitHub due to the following reasons:

### About **Git**:

- Compared to other version control systems, Git operates exceptionally well and has a high degree of dependability. Changes to the code can be committed without much work, different version branches can be compared and merged without much effort, and the code can also be modified to run more efficiently.
- Git was developed specifically to ensure that the source code does not become corrupted. An algorithm known as SHA1 is used to provide cryptographic protection for the contents of files, as well as the relationship between files and directories, tags, commits, and versions, among other things. It safeguards the code and changes history from accidental and intentional damage.
- Git was designed with several primary design goals in mind, the most important of which is its flexibility to enable several different nonlinear development workflows, its efficacy in managing both small and large-scale projects, and protocols.

### About **GitHub**:

- Within the context of the GitHub workflow, build, test, and deploy Continuous Integration (CI) and Continuous Deployment (CD) automation, also known as CI/CD, are typically the most straightforward concepts for users to use GitHub effectively

- GitHub allows users to create a pull request, add a new contributor to the user's repository, or merge a pull request from a web hook from a third-party application integrated with particular storage.
- Maintainers frequently utilize GitHub Actions to create organization rules, such as allocating developer access and notifying reviewers of new pull requests, among other things. It makes user management simple and scalable.
- Maintain an eye on users' projects with the help of GitHub Actions, which integrate with various third-party applications and allow users to monitor application builds, assess performance, keep tabs on issues, and more.

# Chapter 5 - Software Development Models (P3 - M2 – D1)

## I. Agile Model

The Agile Software Development Life Cycle (SDLC) model is a combination of iterative and incremental process models with a focus on the adaptability of the process and customer satisfaction through the rapid delivery of working software products. The product is divided into a series of small, incremental builds using agile methods. The suitable time for each small stage is often between one and three weeks. In Agile, the jobs are broken down into time boxes, which are short periods, for team members to track particular features for a phase. The time spent on each iteration typically ranges between one to three weeks. In each iteration, cross-functional teams work at the same time on the following areas: Planning, Requirements Analysis, Design, Coding, Unit Testing and Acceptance Testing.

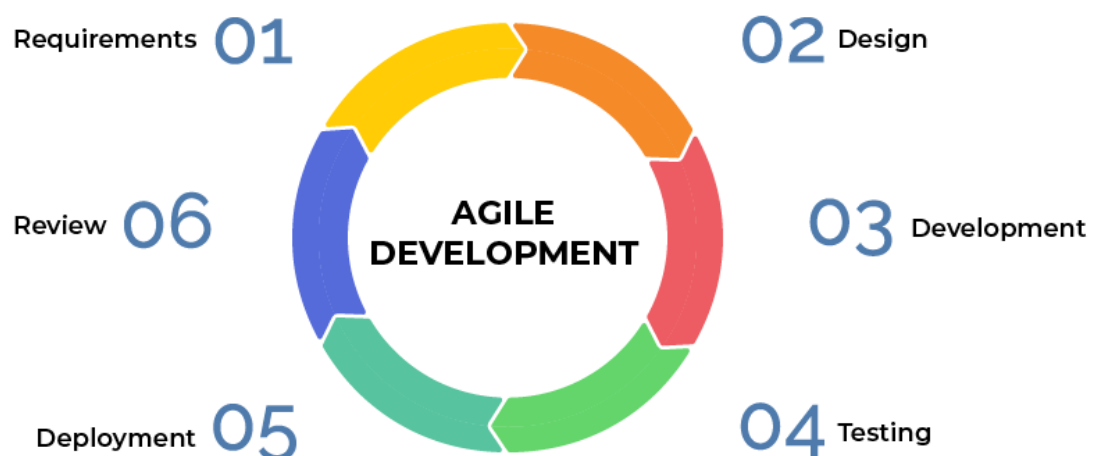


Figure 7: Agile Model



## II. Waterfall Model

The waterfall model can be understood as a linear-sequential life cycle model, another name for this paradigm. There is no room for overlap in the phases of a waterfall model because each phase needs to be completed before moving to the next phase. The initial iteration of the software development life cycle (SDLC) methodology that utilized the waterfall concept was the waterfall approach. The software development process is depicted as a linear sequential flow in the Waterfall Model. It indicates that the beginning of any phase of the development process is contingent on the completion of the phase that came before it. In the model of a waterfall, the stages do not overlap with one another. The Waterfall Method was the initial SDLC Model utilized extensively in Software Engineering. Its purpose was to guarantee the successful completion of a project. The entire software development procedure is broken down into parts using a methodology called "The Waterfall." In a typical implementation of this Waterfall model, the output of one phase serves as the input for the following phase in the model's sequential progression.

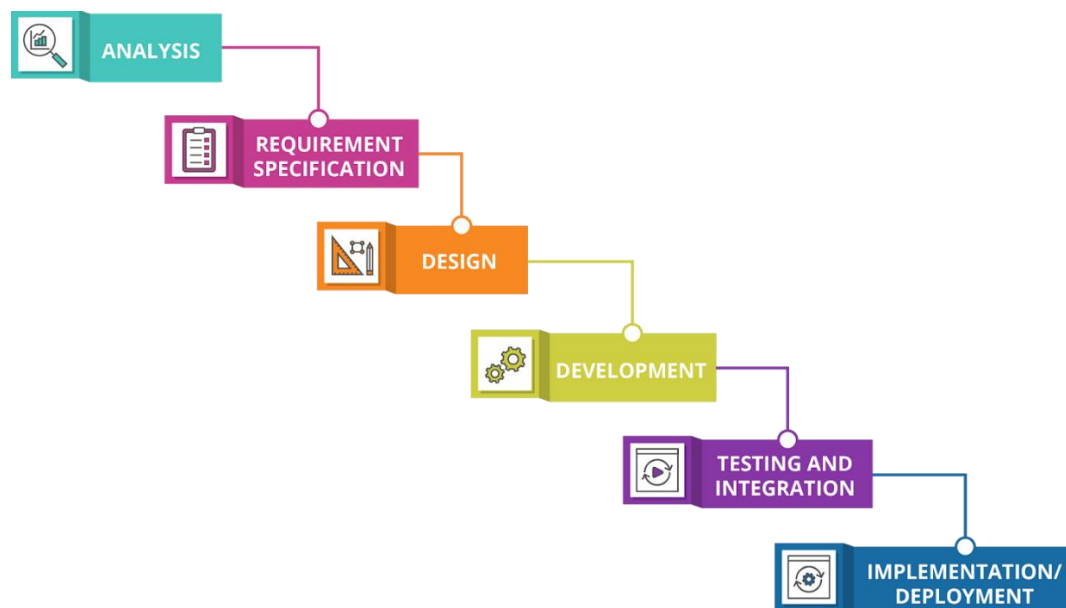


Figure 8: Waterfall model

### III. V-model

V-model is a model of SDLC that organizes the carrying out of procedures sequentially, in the form of a V-shape. Another name for this model is the Verification and Validation model. The V-Model is a waterfall model extension based on assigning a testing phase to each appropriate development step. The waterfall model was the inspiration for the V-Model. It indicates a directly related testing phase for every element of the development cycle. It is a very structured model, and developers will not go on to the next phase until the one before it has been finished. Because both the V-Model and the Waterfall Model are sequential, both applications are nearly identical. Before developers start to work on any project, the requirements must be detailed due to the expensive cost of restoring the project to repair. Because of the high discipline, software developers often apply this model to developing application projects to make sure that the released products must have the best quality

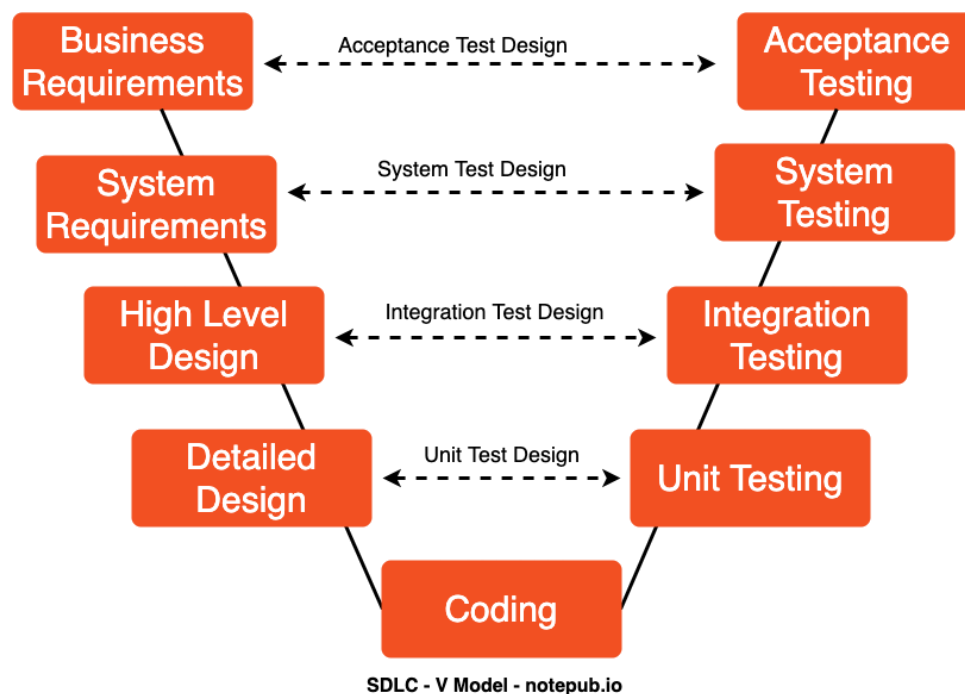


Figure 9: : V - model

## IV. Conclude Which SDLC Model Will Be Used For The Development

The success of a project is initially based on how this project is managed and which management method is applied to this project. Project management is an integral part of the software development life cycle. The Agile model is the most suitable lifecycle model for developing the FPT Book website project. By dividing the whole process into minor phases and collaborating with the project's stakeholders, the Agile model helps us improve the quality stage by stage. The **Agile** model focus on the endpoint user's experience. The developers should develop the project by following the user's demands and feedback. It will help to improve the user's experience mistakes. By repeating the development process, the Agile model can optimize the development speed of the project and reduce the financial resource consumption by a surprising number.

Here is the following reasons why we decided to choose the Agile model

- ❖ Agile teams keep stakeholders informed and demonstrate that my team respects their feedback by incorporating them into the development process. Stakeholders want to be involved throughout the project's life cycle so that they may provide feedback and ensure that the end product meets their needs.
- ❖ Agile techniques employ an iterative approach to project management, which means that processes are improved with each repetition of an interval. This continual focus on improvement and quality control is one of Agile's basic concepts and contributes to creating outstanding products.

- ❖ Agile's fundamental premise is adaptability. Agile teams are adaptable to change, even at the last minute, and can respond to it quickly. Being adaptive means that teams can deliver consistently and successfully handle clients' shifting requirements.
- ❖ It helps my team leader monitor progress during sprints, giving us improved visibility into the project and the ability to rapidly identify possible roadblocks to plan suitable solutions

## V. Justify The Chosen Tools And Techniques (D1)

A website constructed entirely from scratch with no dependence on any available templates is meant by the term "custom build website." There is no pre-made format that will restrict the requirements of the user. Custom websites are adaptable because they are simple to update, and users have a limitless number of design alternatives from which to pick. I have made my selections for the tools of my custom-built website FPT Book. Those tools are:

Sections	Tools	Tool Features	Why I choose the tool
Front-end	Bootstrap 4	<p>Bootstrap helps users easily develop website interfaces quickly by using predefined classes. Users only need to insert the CDN link into the HTML file and use the appropriate classes. In addition, the components supported by bootstrap are compatible with browsers and mobile devices.</p> <p>Bootstrap's value lies in its vast community and exhaustive references. Bootstrap versions are regularly improved and updated on Bootstrap's website. Moreover, the extensive support community with much documentation is an advantage that makes many people choose to use Bootstrap.</p> <p>Bootstrap also offers a customizer function, which allows users to adjust practically all of its properties to suit their's applications better. It will enable Bootstrap to apply to a wide variety of website</p>	<p>Due to time and resource constraints, we could not do much research on a professional web interface development tool like ReactJS or VueJS. Therefore, we prioritize using tools that help us build websites quickly and conveniently, like Bootstrap.</p> <p>Moreover, according to the customer's request, our website does not have to have a beautiful and professional look. Last but not least, the tool I chose for coding the back-end section of the website also integrates and supports Bootstrap</p>

		<p>kinds. If these modifications do not fulfill all of their requirements, they have the option to modify the bootstrap source code in its entirety directly.</p> <p>Another of the advantages of bootstrap is that it is compatible with most browser versions, except for some versions like Internet Explorer 8. It will make it easier for developers to develop on multiple web browser websites and satisfy users' demands on various web browsers like Opera, Firefox, Chrome, Microsoft Edge, etc.</p>	
<b>Back-end</b>	<b>ASP .Net Core</b>	<p>ASP .NET Core is a new framework for building cloud-based applications, such as web apps, IoT, and mobile backends. This Framework is open source and works across several platforms.</p> <p>Applications written in ASP.NET Core can be configured to run either on .NET Core or a full version of the .NET Framework. It is intended to provide and optimize the development framework for applications either executed in the cloud or on-premises, and its</p>	<p>Currently, there are many tools to support programming back-end processing for websites. However, I decided to choose ASP .NET Core because of the following reasons:</p> <p>ASP .NET Core is developed by Microsoft, the same company that created and developed the Windows operating system. As mentioned above,</p>

		<p>design reflects this intention. As a result of the inclusion of modular components, which reduce the number of resources and development expenses required, users maintain the freedom to construct their solutions. Windows, Mac OS X, and Linux are all supported environments for developing and executing cross-platform applications written in ASP.NET Core.</p> <p>The ASP.NET Core framework was built from the ground up with performance in mind from the beginning. The Kestrel web server, used by default, has been the primary focus of the ASP.NET team's efforts to improve performance. The ASP.NET Core application runs on the .NET 5.0 platform, which is cross-platform. In contrast to the older ASP.NET framework, it is not dependent on the Windows operating system. Linux and Mac computers are both capable of running and developing production-ready ASP.NET Core applications. ASP.NET Core is a free, open-source software</p>	<p>my team and I chose to use Windows operating system in this project because of its popularity and convenience. That is why I choose ASP .NET Core, partly because it works best on Windows operating system</p> <p>ASP .NET Core is an open-source framework developed by Microsoft - one of the world's largest enterprises in information technology. Therefore, this framework ensures stability and limits unintended errors during the development of our projects. Moreover, with a vast support community and detailed technical documentation, we will easily find solutions to problems that arise during project development. Finally, because it is open source, it is free, which helps us deal with customers and limit financial waste.</p>
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		framework actively developed on GitHub by Microsoft and hundreds of other developers worldwide.	Asp .NET Core provides a list of security methods like authentication, authorization, data protection, and attack avoidance set of simple techniques. Regarding authentication, ASP.NET Core Identity allows our application to be integrated with all essential third-party suppliers. Facebook, Google, WS-Federation, Windows, or two-factor authentication might be valid requirements in real-life scenarios, and without the proper framework, it can be tough to implement. Thus, the usage of ASP .NET Core may help us to save much time on designing the security layer for our website
<b>Web Server</b>	<b>Microsoft IIS</b>	IIS 10.0 has a new request-processing architecture and application isolation environment, enabling individual Web applications to operate inside an isolated process. This environment stops one program or website from halting another and also decreases the	We chose to use Microsoft IIS Server because it is a web server developed by Microsoft, and it primarily works well with our back-end development tool - ASP .NET Core. Moreover,



		<p>time system administrators need to spend restarting services to fix problems caused by applications.</p> <p>IIS 10.0 includes a new kernel-mode driver for Hypertext Transfer Protocol/ 2 (HTTP/ 2) parsing and caching. This driver has been fine-tuned to improve Web server throughput and the scalability of computers with multiple processors. As a result, connections can be reused effectively, and there is a reduction in latency.</p> <p>Moreover, using the Microsoft IIS Server</p>	<p>Microsoft IIS Server is built into the Windows operating system, so we will not have to pay any other fees to run it. It will result in financial savings for our customers. In addition, IIS supports several authentication types such as Basic access authentication, Digest access authentication, Windows Authentication, and Certificate authentication;...; Other security features include SSL/TLS support, Server Name Indication (SNI), security settings for FTP servers, etc. With a modular design, opening, disabling and installing some features to meet the needs of users as well as optimize the performance and security of the webserver to be met</p>
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<b>Database</b>	<b>Microsoft SQL Server</b>	<p>Microsoft SQL server, often known as MS SQL server, is a relational database server that Microsoft Corporation built. It is also known more generally as SQL server. In the case of the Microsoft SQL server, the language used to obtain and store data is called SQL (Structured Query Language). A database server is a program that stores data and other software applications retrieve and store data using this language. SQL Server is typically employed for tasks involving the storage of data. In addition, it provides many working features geared toward assisting users in working more constructively, as follows. It helps users in preserving a sustainable storage environment and gives them the ability to establish additional databases and ability to examine data with SSAS. It also offers a very high level of protection.</p>	<p>As mentioned above, our team mainly chooses tools developed by Microsoft like ASP .NET Core or Microsoft IIS Server. Therefore, it is no exception that we choose Microsoft SQL as the database for our website. It works well with the ASP .NET Core framework and Windows operating system. Furthermore, SQL is a non-procedural language that does not require how the database should be accessed. All SQL messages are easy to use and error-free. Finally, Microsoft SQL Server has a community of exchanges and support by talented programmers and experts and is available worldwide in a rich language. Therefore, finding help, troubleshooting, documentation, and knowledge is not complex.</p>
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<b>Integrated Development Environment</b>	<b>Visual Studio</b>	<p>Visual Studio is one of the most famous web development tools produced directly by Microsoft, and it is written in two languages, C# and VB+. These two programming languages help users program the system easily and quickly through Visual Studio.</p> <p>Visual Studio supports programming on many different language platforms from C/C++, C#, to HTML, CSS, JavaScript, and frameworks produced by Microsoft such as ASP .NET Core. Visual Studio also helps to support efficient and easy debugging by running each statement and monitoring the change of the program's state through the value of variables and the code's behavior. It also has a user-friendly interface that is easy to use for beginners.</p>	<p>We chose to use the Visual Studio IDE because it is a part of the Microsoft ecosystem. It means that it will work seamlessly with other tools like ASP .NET Core, Microsoft SQL Server, or Microsoft IIS. Moreover, Visual Studio also supports linking with Git Hub - an essential version control tool for every programmer in the application development process. Moreover, one of the most important features of Visual Studio is the Debug feature. Application Debugging occurs when the programmers find and fix bugs (fixing) in the program. Debugging often takes longer than writing the program because logic-related errors are often difficult to detect. Therefore, the Debug tool in Visual Studio helps programmers run the</p>
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			program step by step, finding out which code is faulty during execution.
<b>Version Control</b>	<b>GitHub</b>	<p>Git is a piece of open-source software for maintaining version control and keeping track of changes made to individual files. It is possible to use it with any file, although tracking code files is its most common application. Since Git is the version control system that has seen the most adoption in the world of software development, GitHub got its name from the fact that it uses this technology to power its service. Free remote cloud repository hosting for software developers and engineers is a feature offered by GitHub. The public can access these repositories. After users have created a repository on GitHub, they can "pull" a copy of it to your device, make changes and additions to files locally, and then "push" those changes back to the repository, where they will be visible to the general public.</p>	<p>We chose GitHub to manage the project's source code during development because it is a large project that requires us to collaborate with other team members. Therefore, each source code version can affect the entire project's success. Therefore, we must use GitHub to host fully functional versions of the website's source code before we proceed with other functions in case the source code breaks. Moreover, GitHub is a version control tool integrated into the Visual Studio IDE, making it convenient for us to manipulate the project's source code versions. Finally, we use GitHub's tracking feature to understand and keep</p>

			track of team members' changes to the project's source code, giving appropriate development directions.
<b>Operating System</b>	<b>Windows OS</b>	Microsoft Windows is a graphical operating system developed and distributed by Microsoft. This operating system is commonly referred to as Windows or Win. It allows users to store files, run applications, play games, watch videos, and connect to the internet in one convenient package. On November 10, 1983, the first version of Microsoft Windows, version 1.0, was released to the public. Compared to other operating systems, the Windows Operating System's Graphical User Interface (GUI) makes its functions far easier. It is not necessary to have extensive knowledge of computers to use this operating system. Even anyone with only a fundamental understanding of computers can use this.	We chose Windows as the operating system to develop our website because Windows is a popular and widely used system. Moreover, Windows is a free operating system built into our electronics, so we can save a ton when we use Windows. Finally, Microsoft developed the Windows operating system, which will be compatible with the tools we choose to develop our applications like ASP .NET Core or IIS web server.

# Chapter 6 – The Illustrated Overview About The System Workflow (P3 - M2)

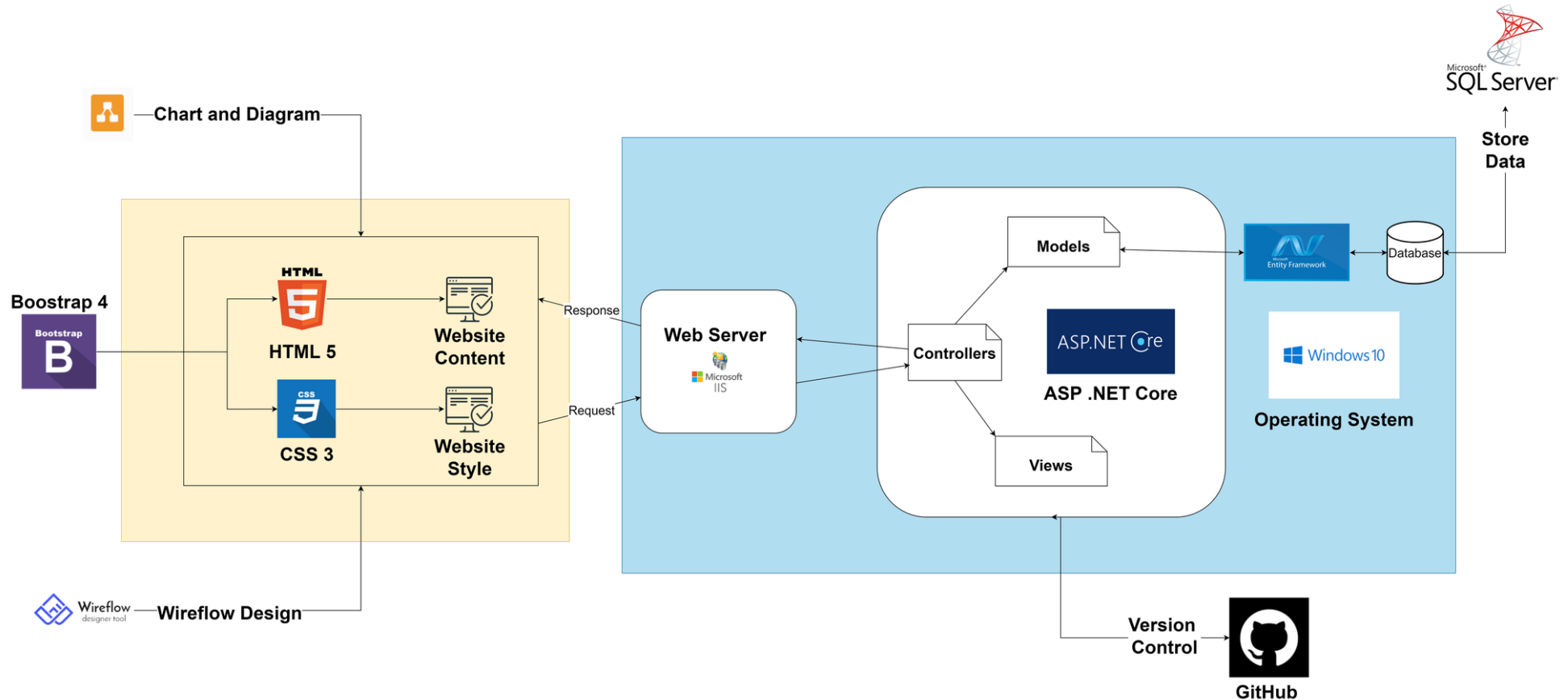


Figure 10: Overview Of The System

The image above illustrates the workflow process of our project. The application will be divided into two segments: Front-end & Back-end, and those parts communicate via a web server. Users will interact with the application by sending requests on the website's front-end components, and the front-end will help to transfer the request to a web server; then, the web server will transfer the request to the back-end components. After the requests are processed, the back-end segments will send the response to the web server, and it helps to transfer the answers to the front-end for displaying to users

To create the front-end segments, first of all, we used draw.io and wireflow to design the layout of the application. Then we used HTML 5 to create the website content of the website such as lable, input, etc... then use Boostrap 4 & CSS 3 to edit the style of HTML elements to make them vividly and visually for better user experience & interface.

Next, we used the Microsoft IIS web server integrated into the Windows operating system to create a server that plays the intermediary role between the front-end and back-end for transferring requests and responses.

On the back-end side, we chose the Microsoft SQL Server to create the user's database and store the user's data for our website. Next, we used ASP .Net Core to make the data processing side with the Model-View-Controller model. However, we applied the Entity framework to let the data processing part communicate with the database. Last but not least, to avoid losing progress and recovery in case of any errors during the working process, we used Git Hub to control our source code. After we finished a function, we stored this version on Git Hub's project before continuing our work. This step ensures that we can recover the previous version of our source code in case of any problems.

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# Index of comments

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- 3.1 P1  
You develop a very good overall about the system with good details of each role  
Functional and non-functional requirements are very clear.
- You have used correctly Use case diagram describe system in overall.
- Your Wireflows are quite clear to express users' behaviors
- P2  
The risk matrix contains realistic items and suitable mitigation plan.
- P3  
You have researched tools and technologies needed for the project included: design tools, front end technologies, back end technologies, database technologies and SDLC model
- M1  
Very good documentation for Class Diagram, Entity Relational Diagram and Activity Diagram to illustrate system's behavior and design.
- A Gantt is well included to justify the project progress
- M2  
You explain each stack very good and choose the solution stack wisely
- D1  
The justification is very clear with good evidence and arguments