



Tribhuvan University
Institution of Science and Technology

A Final Year Report On
INTERNSHIP

Under the Supervision of
Er. Dhiraj Kumar Jha
Lecturer
Orchid International College



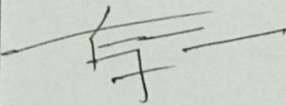
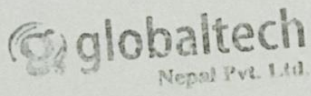










Submitted To:
DEPARTMENT OF COMPUTER SCIENCE AND INFORMATION
TECHNOLOGY
ORCHID INTERNATIONAL COLLEGE

In partial fulfillment for the Bachelor's Degree in Computer Science and Information
Technology

Submitted By:
Ankit Shrestha (23863/076)

June 2024

COMPLETION LETTER

 www.globaltech.com.np	Global Tech Nepal Pvt.Ltd. Teku, Kathmandu, Nepal Tel : +977-5329949 / 52 / 82 E-mail : info@globaltech.com.np	
Global-Tech Nepal Pvt. Ltd. Teku, Kathmandu Date: June 3rd, 2024		
To Whom It May Concern,		
<p>We are pleased to confirm that Ankit Shrestha has successfully completed his internship with Global-Tech Nepal Pvt. Ltd. The internship spanned from March 11th, 2024 to June 3rd, 2024, during which Ankit demonstrated commendable dedication and professionalism in his role.</p> <p>Throughout his tenure, Ankit exhibited a strong work ethic, excellent technical skills, and a proactive approach to problem-solving. He has been an asset to our team, contributing significantly to various projects and tasks assigned to him.</p> <p>Ankit's ability to quickly grasp new concepts and his enthusiasm for learning have been evident in his work. He has shown remarkable teamwork and communication skills, which have greatly contributed to the overall success of our projects.</p> <p>We appreciate Ankit's contributions to Global-Tech Nepal Pvt. Ltd. and wish him the best in his future endeavors. We are confident that he will continue to excel in his professional career.</p> <p>Sincerely,</p>		
 Sanjaya Rauniyar <i>Managing Director</i> Global Tech Nepal Pvt.Ltd		
<div></div>		



SUPERVISOR'S RECOMMENDATION

I hereby approve the report made under my supervision by Ankit Shrestha (TU Exam Roll No. 23863/076) entitled "**INTERNSHIP**" will be evaluated as part of the requirements for the degree of B.Sc. in Computer Science and Information Technology.

.....

Er. Dhiraj Kumar Jha

Full Time Faculty

Orchid International College

Bijyachowk, Gaushala



CERTIFICATE OF APPROVAL

This certifies that the "Internship" report, completed by Ankit Shrestha (TU Exam Roll No. 23863/076), partially fulfills the requirements for the degree of B.Sc. in Computer Science and Information Technology. We affirm its suitability as a project for the desired degree based on its scope and quality.

<p>.....</p> <p>Er. Dhiraj Kumar Jha Supervisor, Orchid International College Bijyachowk, Gaushala</p>	<p>.....</p> <p>External Examiner Central Department of Computer Science and IT, Tribhuvan University Kritipur, Nepal</p>
---	--

ACKNOWLEDGEMENT

I extend my heartfelt gratitude to all who have contributed to the completion of this internship report. Firstly, I would like to express my deepest appreciation to Er. Dhiraj Kumar Jha for their invaluable guidance, support, and encouragement throughout this internship journey. Their expertise and mentorship have been instrumental in shaping my learning experience and the successful completion of this report.

I also extend my sincere thanks to Trubhuvan University and Orchid International College for providing me with the opportunity to undertake this internship and gain practical insights into the field of ASP.NET (MVC). I am grateful for the knowledge and skills acquired during my time at the university and college, which have significantly enriched my understanding of software development.

Lastly, I express my gratitude to Global-Tech Nepal Pvt. Ltd. for providing a platform for experiential learning and facilitating this internship opportunity. This report is a culmination of the collective efforts and support from all those mentioned above, and I am truly grateful for their contributions.

ABSTRACT

This internship report details the experience gained at Global-Tech Nepal Pvt. Ltd., where the focus was on applying the ASP.NET MVC framework to develop enterprise web applications. The background emphasizes the company's leadership in software development and cloud computing, highlighting their commitment to innovation and client-centric solutions. The problem addressed is the need for practical, hands-on experience in web development, database management, and software engineering within a professional environment. Objectives included enhancing skills in frontend development (HTML, CSS, JavaScript, Bootstrap5), backend programming with C# ASP.NET MVC, and database management using SQL Server Management Studio (SSMS), along with understanding software engineering practices like user authentication, authorization, and RESTful API development. Methodology involved leveraging the Model-View-Controller (MVC) architecture to ensure separation of concerns and streamline development, evidenced through projects such as the Company Registration System, Payment and Loan Management System, and Web API development. The conclusion underscores the significance of practical learning in preparing for a career in software development.

Keywords: ASP.NET MVC, web development, database management, frontend development, backend development, SSMS, RESTful API

TABLE OF CONTENT

COMPLETION LETTER	i
SUPERVISOR'S RECOMMENDATION	ii
CERTIFICATE OF APPROVAL.....	iii
ACKNOWLEDGEMENT	iv
ABSTRACT	v
LIST OF ABBREVIATIONS	viii
LIST OF TABLES.....	ix
LIST OF FIGURES.....	x
CHAPTER 1-INTRODUCTION	1
1.1 Introduction	1
1.2 Problem Statement	1
1.3 Objectives	2
1.4 Scope and Limitation	2
1.5 Report Organization	3
CHAPTER 2-INTRODUCTION TO ORGANIZATION AND LITERATURE REVIEW	4
2.1 Organization Details.....	4
2.2 Organization Hierarchy.....	5
2.3 Work Domain of Organization.....	6
2.4 Description of Intern Department/Unit	7
2.5 Literature Review / Related Study	8
CHAPTER 3-INTERNSHIP ACTIVITIES.....	10
3.1 Roles and Responsibility	10
3.2 Weekly Log	10
3.3 Description of the Projects Involved During Internship.....	13
3.3.1 System Analysis	13
3.3.2 System Design	18
3.3.3 Tasks Completed	23
3.4 Tasks / Activities Performed.....	25

CHAPTER 4-CONCLUSION AND LEARNING OUTCOME	28
4.1 Conclusion	28
4.2 Learning Outcome	28
REFERENCES	29
APPENDIX	30

LIST OF ABBREVIATIONS

Some of the abbreviations used in are shown below:

ASP.NET MVC	Active Server Pages .NET Model-View-Controller
HTML	Hypertext Markup Language
CSS	Cascading Style Sheets
SSMS	SQL Server Management Studio
RESTful API	Representational State Transfer Application Programming Interface
C#	C Sharp (programming language)
SQL	Structured Query Language
ADO.NET	ActiveX Data Objects .NET
DTO	Data Transfer Object
API	Application Programming Interface
CRUD	Create, Read, Update, Delete
OMS	Organization Management Software
ERP	Enterprise Resource Planning
CMS	Content Management System
IaaS	Infrastructure as a Service
PaaS	Platform as a Service
SaaS	Software as a Service

LIST OF TABLES

Table 2.1: Contact Details of Organization	4
Table 3.1: Details of Weekly Log.....	10
Table 3. 2: Use Case for Registration.....	14
Table 3. 3: Use Case for Login.....	15
Table 3. 4: Use Case for Manage Company Information.....	15
Table 3. 5: Use Case for User Registration.....	16
Table 3. 6: Use Case for User Login.....	17
Table 3. 7: Use Case for Manage Loan Categories	17
Table 3. 8: Use Case for Manage Overdraft Table	17
Table 3. 9: Use Case for Manage Working Capital Table	18
Table 3. 10: Internship Duration	25
Table 3. 11: Tools Used.....	27

LIST OF FIGURES

Figure 2. 1: Organization Logo.....	5
Figure 2. 2: Organization Chart	5
Figure 3. 1: Use Case Diagram of Company Registration System	14
Figure 3. 2: Use Case Diagram of Loan Management System	16
Figure 3. 3: MVC	19
Figure 3. 4: ER Diagram of Company Registration System	20
Figure 3. 5: ER Diagram of Loan Management System	20
Figure 3. 6: Class Diagram of Company Registration System	21
Figure 3. 7: Class Diagram of Loan Management System.....	21
Figure 3. 8: Activity Diagram of Company Registration System.....	22
Figure 3. 9: Activity Diagram of Loan Management System	22
Figure 3. 10: Company Registration System.....	23
Figure 3. 11: Loan Management System	24

CHAPTER 1-INTRODUCTION

1.1 Introduction

The internship was conducted at Global-Tech Nepal Pvt. Ltd., a prominent technology firm in Teku, Kathmandu, from March 11th, 2024, to June 3rd, 2024. During this period, the intern worked as an ASP.NET (MVC) intern, gaining hands-on experience in web development and applying theoretical knowledge from academic studies. Global-Tech Nepal is renowned for its innovative technology solutions, focusing on high-quality software development, IT consulting, and system integration services, including cloud-based services. The company's commitment to excellence and advanced technology made it an ideal environment for learning and professional growth.

The intern was integrated into the web development team. Working with ASP.NET (MVC), the intern gained practical experience in web application development and honed skills in C#, HTML, CSS, Bootstrap 5, JavaScript, and SQL Server. The internship also facilitated the development of professional competencies such as effective communication, teamwork, and time management. Mentorship from senior developers and project managers helped the intern understand industry best practices and workflows. Overall, the internship was a transformative experience that bridged the gap between academic learning and real-world application, preparing the intern for a successful career in the technology sector.

1.2 Problem Statement

Despite Global Tech Nepal Pvt. Ltd.'s commitment to customer satisfaction and its array of quality cloud computing services, there exist challenges and opportunities for improvement within the organization. While the company boasts partnerships with leading IT companies and provides innovative cloud-based solutions, there is a need to streamline its customer-centric approach to better address client needs and preferences.

Additionally, as Nepal's first cloud-based accounting software company, there is a unique opportunity to enhance and expand its service offerings to meet the evolving demands of the market. The challenge lies in optimizing internal processes, enhancing service quality, and

leveraging technological advancements to consolidate Global Tech's position as a frontrunner in the field of cloud computing and IT solutions in Nepal.

1.3 Objectives

- To implement and enhance practical skills in ASP.NET (MVC) development by successfully completing assigned tasks in a professional setting.
- To implement effective software development lifecycle practices through coding, testing, and insightful code reviews.

1.4 Scope and Limitation

During the internship at Global-Tech Nepal Pvt. Ltd., the intern was immersed in a dynamic environment conducive to learning various dimensions of software development. This included frontend development, where proficiency was gained in crafting visually appealing and user-friendly interfaces using HTML, CSS, and JavaScript. Additionally, the intern delved into backend development utilizing C# with the ASP.NET MVC framework, contributing to the creation of robust server-side logic and functionality. Furthermore, valuable insights were obtained into database management, particularly with SQL Server Management Studio (SSMS), involving tasks such as database design and implementation.

Limitation:

Software Development Limitations:

- Direct SQL queries in ADO.NET can hinder code maintainability and readability over time.
- Debugging and troubleshooting SQL-related issues can be more complex compared to using ORM frameworks.

Technology Limitations:

- Scalability can be limited with direct SQL queries, especially under heavy load or with large datasets.

- Flexibility in adapting to changing business requirements may be constrained when relying solely on SQL stored procedures.

1.5 Report Organization

Chapter 1: Introduction

This section outlines the report's objectives and structure, offering insight into the internship's importance. It serves as a primer, setting the context for the subsequent chapters.

Chapter 2: Introduction to Organization

Here, Global-Tech Nepal Pvt. Ltd. is introduced, providing background information on its mission, values, and industry positioning. Readers gain a foundational understanding of the organization hosting the internship.

Chapter 3: Background Study and Literature Review

Exploring ASP.NET (MVC) development and related literature, this chapter lays the groundwork for understanding the theoretical underpinnings of the internship. It offers a scholarly perspective on the field of study.

Chapter 4: Internship Activities

This segment delves into the intern's hands-on experiences at Global-Tech Nepal Pvt. Ltd., detailing tasks, projects, and challenges encountered. It provides a practical narrative of the intern's contributions and learning journey within the organization.

Chapter 5: Conclusion and Learning

Wrapping up the report, this chapter reflects on the internship experience, summarizing key insights and lessons learned. It offers valuable recommendations for both future interns and the organization, closing the narrative with a sense of accomplishment and growth.

CHAPTER 2-INTRODUCTION TO ORGANIZATION AND LITERATURE REVIEW

2.1 Organization Details

Global-Tech Nepal Pvt. Ltd. is a prominent IT solutions provider based in Teku, Kathmandu. The company is dedicated to forging strategic alliances with renowned IT firms and cloud service providers worldwide to enhance its service portfolio and expand its global presence. The mission of Global-Tech Nepal is to deliver top-notch cloud computing solutions that meet and exceed industry standards, with a strong emphasis on data integrity and robust disaster recovery mechanisms.

Founded by a group of seasoned professionals with over 15 years of experience in various domains, including business development, ERP solutions, software development, and system and networking solutions, Global-Tech Nepal offers comprehensive solutions in software development, system integration, network management, and cloud computing. Among its core offerings are customized Organization Management Software (OMS) and ERP solutions tailored to meet the unique needs of each client, driving their business growth and operational efficiency. The company also takes pride in being Nepal's leading provider of cloud-based accounting software solutions, operating from a secure data center with strong disaster recovery capabilities.

Table 2.1: Contact Details of Organization

Location	Teku, Kathmandu
Organization	Global-Tech Nepal Pvt. Ltd.
Website	https://globaltech.com.np/
Email	info@globaltech.com.np
Phone	01-5329949



Figure 2. 1: Organization Logo

2.2 Organization Hierarchy

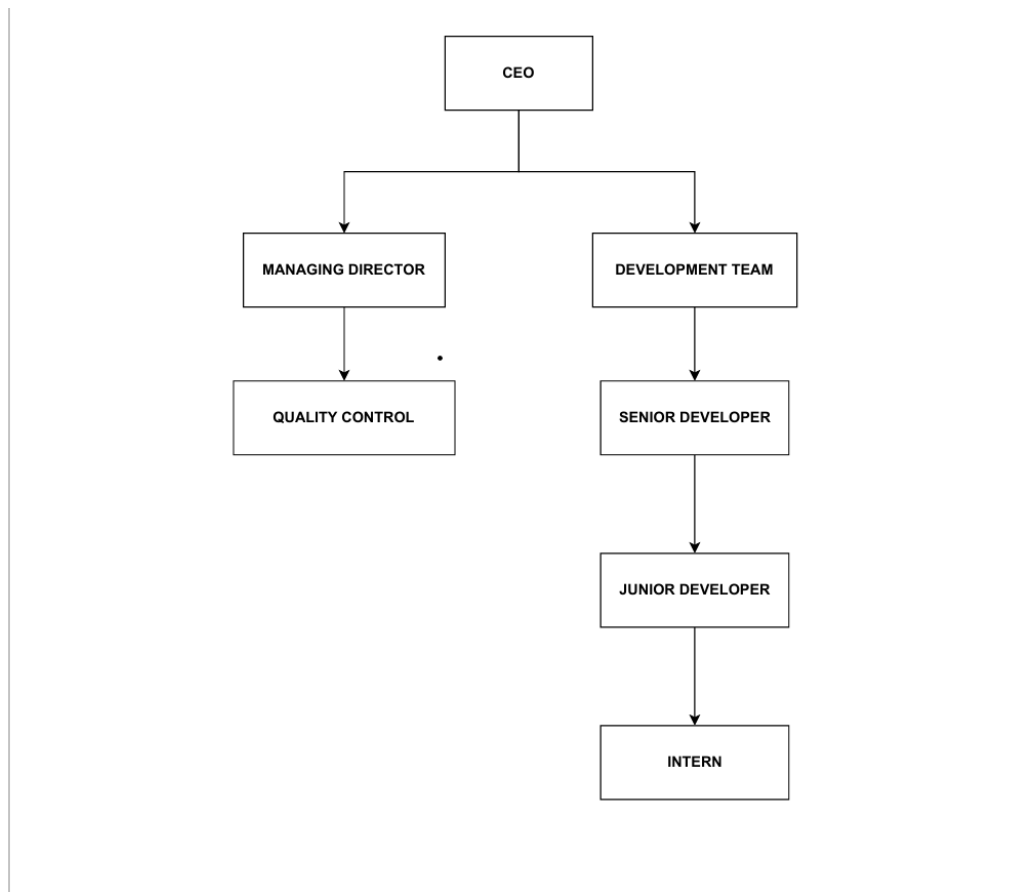


Figure 2. 2: Organization Chart

The organizational structure of Global-Tech Nepal Pvt. Ltd. is designed to ensure efficient management and seamless workflow across various departments. At the top of the hierarchy is the Chief Executive Officer (CEO), who is responsible for the overall strategic direction and management of the company. The CEO oversees all operations and ensures that the company's mission and vision are effectively implemented.

Reporting directly to the CEO is the Managing Director, who plays a crucial role in executing the company's strategic plans and policies. The Managing Director oversees the various departments, ensuring that they operate smoothly and align with the company's objectives. Under the Managing Director, the organization is divided into two main teams: Quality Control and the Development Team.

The development team is further divided into roles based on experience and expertise. Leading the development team is the senior developer, who is responsible for guiding the technical direction of projects and mentoring other team members. Reporting to the senior developer are the junior developers, who handle the more routine coding tasks and support the development of projects under the guidance of the senior team members. At the entry level are the interns, who assist the junior developers and gain hands-on experience in software development. Interns are provided with mentorship and training to help them develop their skills and contribute to the team's projects.

2.3 Work Domain of Organization

Global-Tech Nepal Pvt. Ltd. operates at the forefront of information technology and cloud computing services, offering a diverse range of specialized solutions. The company excels in software development, delivering tailored applications such as Organization Management Software (OMS) and Enterprise Resource Planning (ERP) systems designed to meet specific client needs. Renowned for its robust cloud computing services, Global-Tech Nepal ensures secure, scalable solutions with strong disaster recovery capabilities, encompassing Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS) offerings.

In addition to its technological expertise, the company provides professional accounting training and consulting services, empowering businesses to optimize financial operations effectively. Their comprehensive web solutions portfolio includes portal development, web application development, content management systems (CMS), API integration, and e-commerce solutions, catering to varied client requirements.

Services Provided by Global-Tech Nepal Pvt. Ltd.:

- Software Development
- Cloud Computing (IaaS, PaaS, SaaS)
- Professional Accounting Training and Consulting
- Web Solutions: Portal Development, Web Applications, CMS
- API Integration and E-Commerce Solutions

Through its commitment to innovation, quality, and client satisfaction, Global-Tech Nepal Pvt. Ltd. continues to be a significant player in the IT industry, driving technological advancements and delivering cutting-edge solutions to its clients.

2.4 Description of Intern Department/Unit

The intern department at Global-Tech Nepal Pvt. Ltd. operates within the Development Team, a vital component responsible for crafting the company's software and web solutions. Led by the Senior Developer, this unit focuses on the design, development, and maintenance of various software products and services, ensuring they meet the company's quality and performance standards. Interns within this department collaborate closely with junior developers, engaging in diverse tasks spanning frontend and backend development, including coding, debugging, and testing software applications, as well as assisting in database management tasks such as SQL querying.

Each intern is assigned specific tasks and projects within the development team, accompanied by clear deadlines, fostering a culture of accountability and time management. This structured approach not only cultivates interns' technical skills but also instills professional discipline, preparing them for the demands of the industry. Through hands-on learning and mentorship,

interns gain a holistic understanding of the software development lifecycle, from requirements analysis to deployment, while experiencing the collaborative dynamics inherent in professional software development environments.

2.5 Literature Review / Related Study

Prameela, K. M., Rehka, D. S., Kusuma, M., Subramanyam, N. B., & Kumar, M. N. (2024). *Tourist guide system using ASP.NET*. Sri Vasavi Engineering College.

This paper introduces a tourist guide system developed using ASP.NET, which focuses on enhancing user experience by offering a personalized travel and tour management system. The platform provides comprehensive information on transportation, tourist attractions, and accommodations, enabling travelers to make informed decisions. This study highlights the capability of ASP.NET to create user-centric web applications with robust functionalities. It demonstrates how ASP.NET can be utilized to deliver customized solutions, making it relevant to projects involving dynamic web applications and user-focused designs.

Serbout, S., & Pautasso, C. (2024). *How are web APIs versioned in practice? A large-scale empirical study*. Software Institute (USI).

This study explores API versioning practices, a crucial aspect of maintaining compatibility and managing API evolution. By analyzing a large dataset of API specifications, the study examines various versioning strategies used by developers. This paper is highly relevant to projects on Web API development for data interaction, providing insights into best practices for API versioning and the importance of maintaining API compatibility and stability. The study's findings offer valuable guidance for developing and maintaining robust APIs in ASP.NET.

Rishikesh, P., Velavalapalli, S. V., Unnamatala, S., Ganesh, G. R. S. S. S., & Prasad, V. B. D. (2022). *Pro-Health Navigating System in healthcare organizations*. Sri Vasavi Engineering College.

This paper discusses the Pro-Health Navigating System, which improves efficiency and patient care in healthcare organizations through effective data management and automated processes. The system handles patient registration, detail storage, and computerized billing, showcasing the significance of robust database management and system integration. The paper emphasizes the importance of efficient CRUD operations and database management using SQL Server Management Studio (SSMS), highlighting best practices for system implementation in healthcare contexts.

CHAPTER 3-INTERNSHIP ACTIVITIES

3.1 Roles and Responsibility

In the intern department at Global-Tech Nepal Pvt. Ltd., each member, including interns, is assigned specific roles and responsibilities to contribute effectively to the team's objectives.

Intern Responsibilities:

- Assist in frontend and backend development tasks, including coding, debugging, and testing software applications.
- Collaborate with junior developers and other team members to complete assigned projects within specified timelines.
- Participate in requirements analysis, design discussions, and code reviews under the guidance of senior team members.
- Contribute to database management tasks, such as writing SQL queries and ensuring data integrity within applications.
- Communicate effectively with team members to provide progress updates, seek assistance when needed, and actively participate in team meetings and discussions.

3.2 Weekly Log

Table 3.1: Details of Weekly Log

Week	Tasks	Outcome
Week 1	<ul style="list-style-type: none">- Create a login page.- Add CSS and JavaScript for styling and client-side validation.- Render page as a view (C# ASP.NET MVC).- Validate user (server-side).	Successfully created and styled a login page, integrated client-side and server-side validation, and rendered the page as a view.
Week 2	<ul style="list-style-type: none">- Design an ER diagram, a class diagram, and an activity	Successfully Design an ER diagram, a class diagram, and an activity diagram for a company registration system.

	diagram for a Company Registration System.	
Week 3	<ul style="list-style-type: none"> - Create a table and stored procedure for create, update, and delete in SQL Server Management Studio. - Perform CRUD operations using ASP.NET MVC. 	Established a database table and stored procedures, and implemented CRUD operations via ASP.NET MVC.
Week 4	<ul style="list-style-type: none"> - Select a list of companies from the database and display in the view based on user-entered date. 	Successfully retrieved and displayed a list of companies based on the user-provided date.
Week 5	<ul style="list-style-type: none"> - Select a list of companies from the database and display in the view based on user-entered company name. - Create a dropdown for company entry and report. 	Successfully retrieved and displayed a list of companies based on the user-provided company name and implemented a dropdown for company entry and reporting.
Week 6	<ul style="list-style-type: none"> - Create login and registration pages, authenticate and authorize users. - Create a payment model, controller, and view; update the installation and renewal dates upon payment. 	Successfully created and validated login and registration pages, and implemented payment processing with corresponding updates to installation and renewal dates.
Week 7	<ul style="list-style-type: none"> - Create a Model, View, and Controller for a loan category (given field names). - Perform CRUD operations. - Authenticate and authorize users. 	Successfully created a loan category module with CRUD operations and user authentication and authorization.

Week 8	<ul style="list-style-type: none"> - Design an ER diagram, a class diagram, and an activity diagram for a Loan Management System. 	Successfully Design an ER diagram, a class diagram, and an activity diagram for a Loan Management System.
Week 9	<ul style="list-style-type: none"> - Create master tables for Overdraft and Working Capital - Create a loan category table and link it with master tables 	Successfully created master tables for Overdraft and Working Capital, and linked the loan category table with both master tables.
Week 10	<ul style="list-style-type: none"> - Create models for each table (Overdraft, Working Capital, Loan Category) - Create views for each table (Overdraft, Working Capital, Loan Category) - Create controllers for each table (Overdraft, Working Capital, Loan Category) 	Models, views, and controllers for Overdraft, Working Capital, and Loan Category tables were successfully created.
Week 11	<ul style="list-style-type: none"> - Perform CRUD operations for Overdraft, Working Capital, and Loan Category tables. - Create history tables for each operation (Overdraft, Working Capital, Loan Category) - Maintain operation history by logging CRUD actions into the corresponding history tables 	CRUD operations for Overdraft, Working Capital, and Loan Category tables were successfully implemented and tested, and history tables for logging each operation were successfully created.

Week 12	<ul style="list-style-type: none"> - Create a Web API for stock and comments to show relationships. - Use Web API with ASP.NET Core following design principles (Repository pattern with DTO). 	Successfully created a Web API demonstrating stock and comment relationships and integrated it with ASP.NET Core using the repository pattern and DTO.
---------	--	--

3.3 Description of the Projects Involved During Internship

During the internship at Global-Tech Nepal Pvt. Ltd., the intern was involved in various tasks and projects aimed at developing skills in web development, database management, and software development using ASP.NET MVC. Although not assigned to work on specific "projects" per se, the intern engaged in a series of tasks that collectively contributed to their learning experience and skill development.

3.3.1 System Analysis

System analysis, as used in software development, is the act of examining, comprehending, and recording the specifications, elements, and functionalities of a system. It entails disassembling a complicated system into smaller parts, analyzing the interactions between these parts, and determining the requirements that must be met for the system to achieve its goals.

3.3.1.1 Use Case Diagram

1. Company Registration System

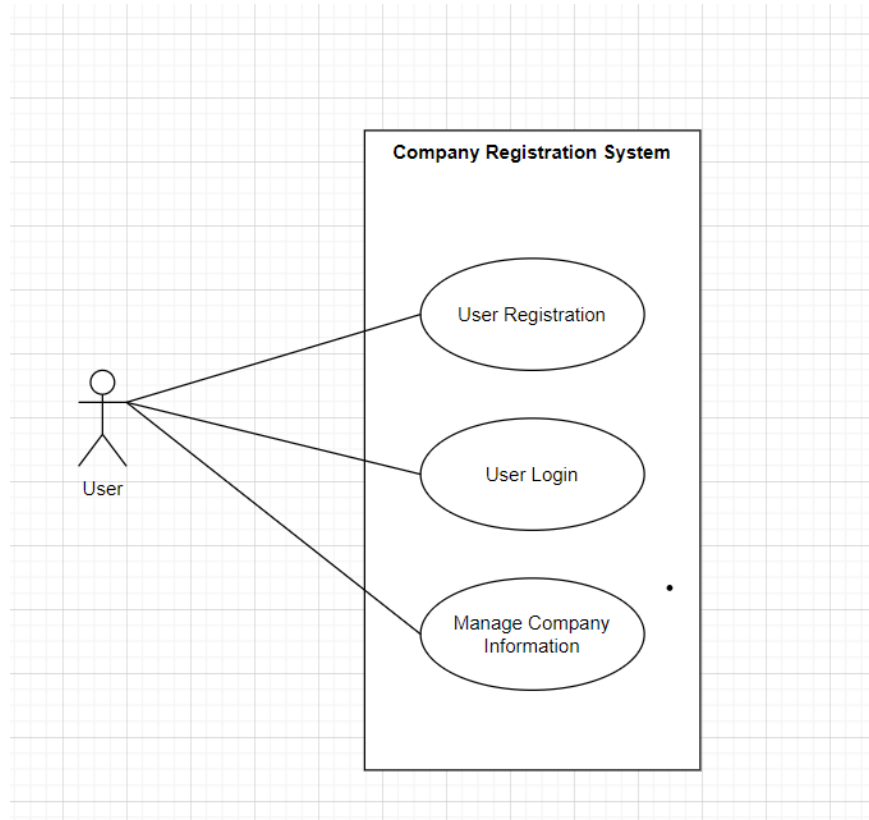


Figure 3. 1: Use Case Diagram of Company Registration System

Use Case Description

Table 3. 2: Use Case for Registration

Use Case Identifier	UC-01
Primary Actor	User
Secondary Actor	None
Description	User registers a new account.
Pre-Condition	User is on the registration page.
Success Scenario	User submits the form with valid data and receives a confirmation message.

Failure Scenario	User submits the form with invalid data and receives an error message.
-------------------------	--

Table 3. 3: Use Case for Login

Use Case Identifier	UC-02
Primary Actor	User
Secondary Actor	None
Description	User logs into the system.
Pre-Condition	User has a registered account.
Success Scenario	User submits valid credentials and accesses the system.
Failure Scenario	User submits invalid credentials and receives an error message.

Table 3. 4: Use Case for Manage Company Information

Use Case Identifier	UC-03
Primary Actor	Admin
Secondary Actor	None
Description	Admin creates, reads, updates, or deletes loan categories.
Pre-Condition	Admin is logged in.
Success Scenario	Admin successfully performs CRUD operations on loan categories.
Failure Scenario	Admin encounters an error during CRUD operations.

2. Loan Management System

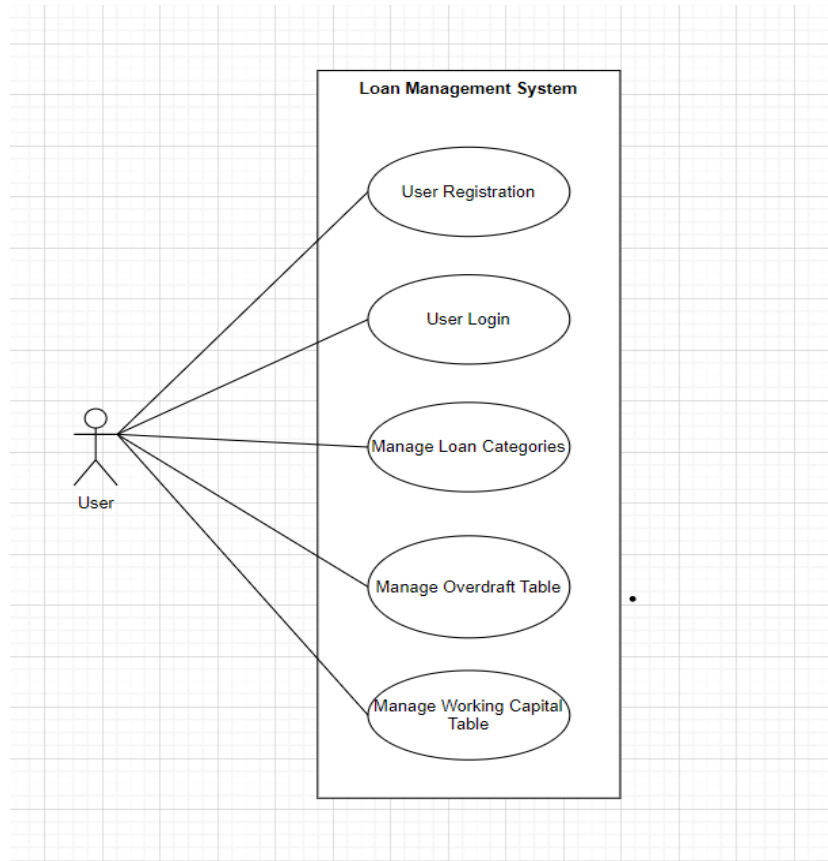


Figure 3. 2: Use Case Diagram of Loan Management System

Use Case Description

Table 3. 5: Use Case for User Registration

Use Case Identifier	UC-01
Primary Actor	User
Secondary Actor	None
Description	User registers a new account.
Pre-Condition	User is on the registration page.
Success Scenario	User submits the form with valid data and receives a confirmation message.
Failure Scenario	User submits the form with invalid data and receives an error message.

Table 3. 6: Use Case for User Login

Use Case Identifier	UC-02
Primary Actor	User
Secondary Actor	None
Description	User logs into the system.
Pre-Condition	User has a registered account.
Success Scenario	User submits valid credentials and accesses the system.
Failure Scenario	User submits invalid credentials and receives an error message.

Table 3. 7: Use Case for Manage Loan Categories

Use Case Identifier	UC-03
Primary Actor	Admin
Secondary Actor	None
Description	Admin creates, reads, updates, or deletes Loan Categories.
Pre-Condition	Admin is logged in.
Success Scenario	Admin successfully performs CRUD operations on Loan Categories.
Failure Scenario	Admin encounters an error during CRUD operations.

Table 3. 8: Use Case for Manage Overdraft Table

Use Case Identifier	UC-04
Primary Actor	Admin
Secondary Actor	None
Description	Admin creates, reads, updates, or deletes overdraft records.
Pre-Condition	Admin is logged in.
Success Scenario	Admin successfully performs CRUD operations on overdraft records.
Failure Scenario	Admin encounters an error during CRUD operations.

Table 3. 9: Use Case for Manage Working Capital Table

Use Case Identifier	UC-05
Primary Actor	Admin
Secondary Actor	None
Description	Admin creates, reads, updates, or deletes working capital records.
Pre-Condition	Admin is logged in.
Success Scenario	Admin successfully performs CRUD operations on working capital records.
Failure Scenario	Admin encounters an error during CRUD operations.

3.3.2 System Design

The design of the system unfolds as a crucial stage where an object-oriented approach is employed to intricately weave analysis insights into a meticulously structured system architecture. This process entails the crafting of detailed class diagrams, the refinement of dynamic modeling concepts into clear state and sequence diagrams, and the seamless transition of process modeling into intuitive activity diagrams. The overarching objective is to architect a robust and scalable system, ensuring each design element resonates seamlessly with the project's requirements. This phase serves as a foundational stepping stone, setting the emotional groundwork for subsequent implementation and testing phases.

3.3.2.1 MVC Methodology in ASP.NET

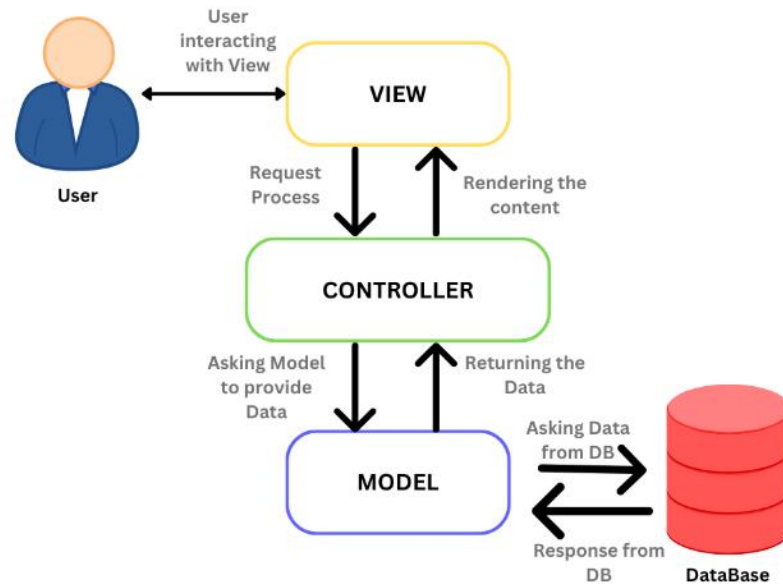


Figure 3. 3: MVC

The Model-View-Controller (MVC) architecture, central to ASP.NET MVC framework, divides web applications into three interconnected components to improve code organization and maintainability. The Model represents the application's data structure and business logic, handling data access, validations, and business rules. Views, on the other hand, manage the presentation layer, rendering UI elements using Razor syntax to generate dynamic HTML based on data from the Model. Controllers act as intermediaries between Models and Views, handling user input, processing requests, and deciding which View to display. This separation of concerns ensures that business logic (Model), presentation logic (View), and user interaction (Controller) remain distinct, facilitating easier code maintenance, testing, and scalability. ASP.NET MVC provides tools like routing, model binding, and action filters to streamline development while adhering to MVC principles, making it a robust framework for building modern web applications.

3.3.2.2 ER Diagram

1. Company Registration System

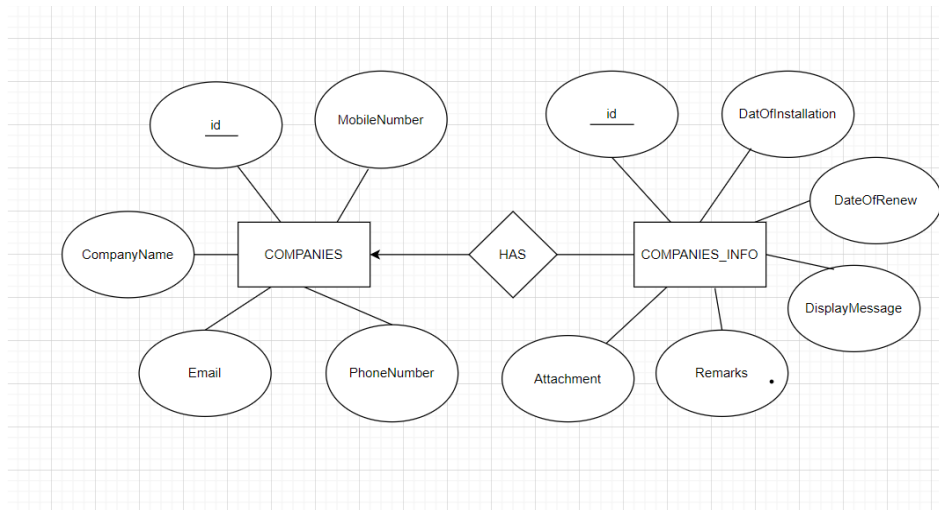


Figure 3. 4: ER Diagram of Company Registration System

2. Loan Management System

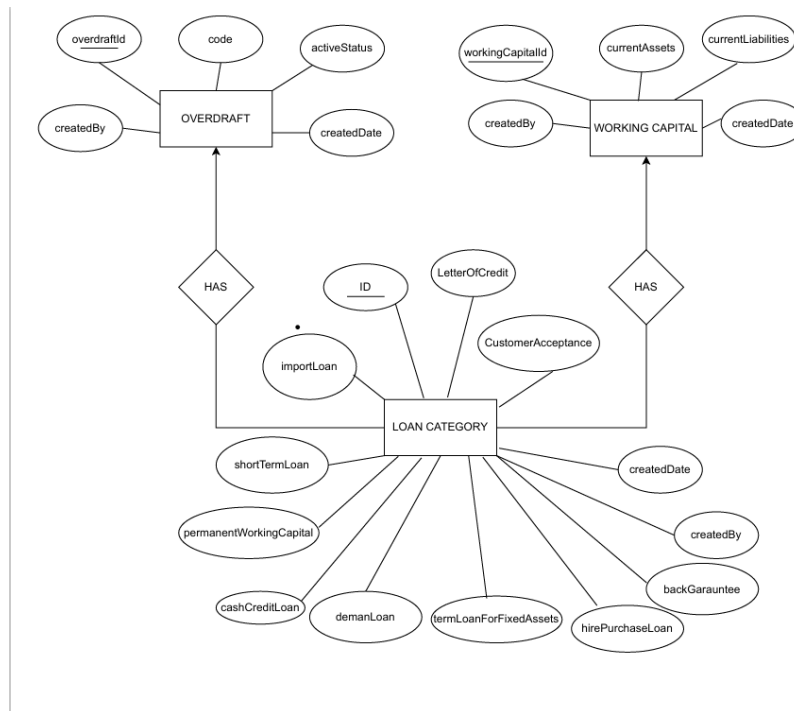


Figure 3. 5: ER Diagram of Loan Management System

3.3.2.3 Class Diagram

1. Company Registration System

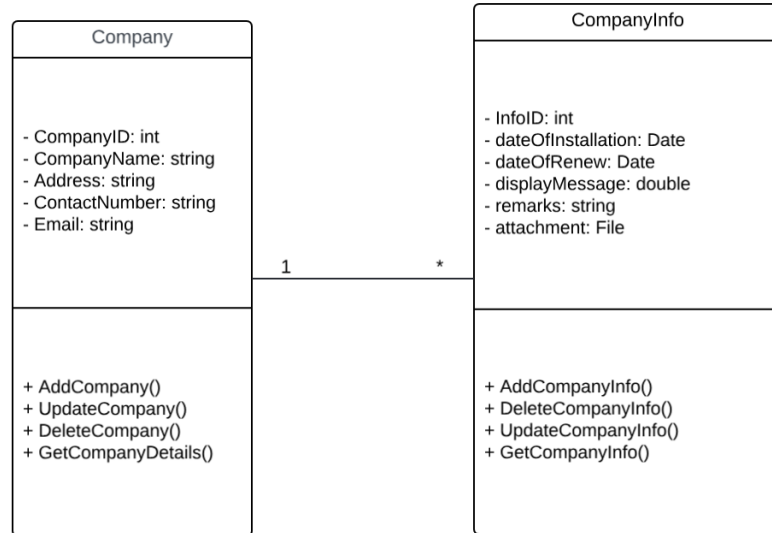


Figure 3. 6: Class Diagram of Company Registration System

2. Loan Management System

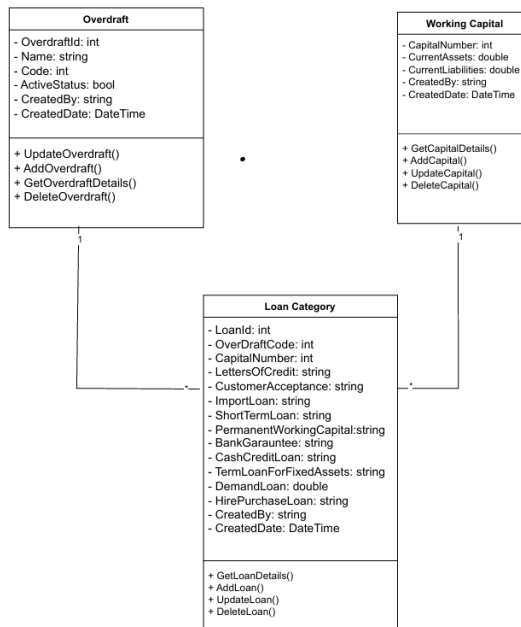


Figure 3. 7: Class Diagram of Loan Management System

3.3.2.4 Activity Diagram

1. Company Registration System

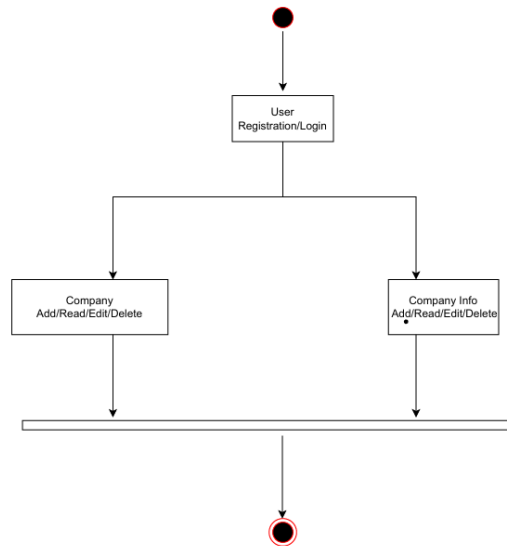


Figure 3. 8: Activity Diagram of Company Registration System

2. Loan Management System

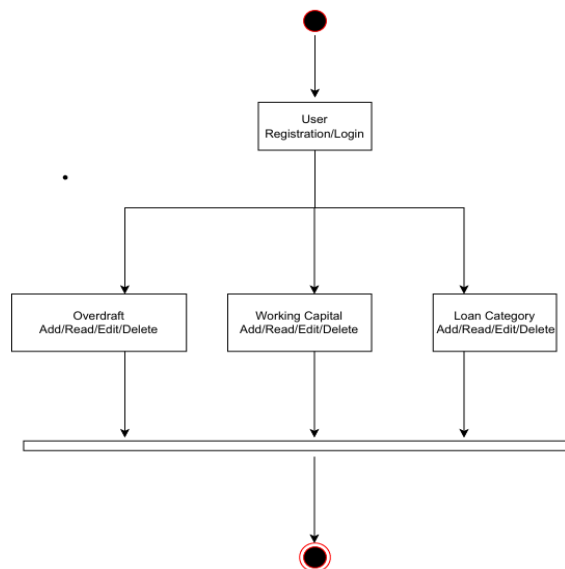


Figure 3. 9: Activity Diagram of Loan Management System

3.3.3 Tasks Completed

1. Company Registration System Development:

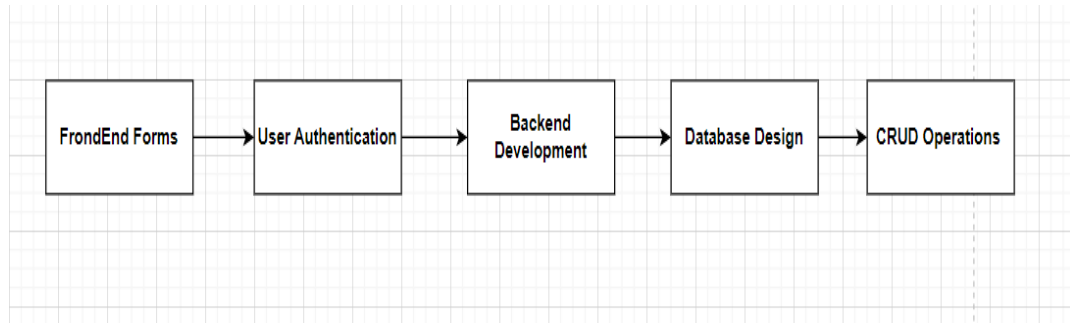


Figure 3. 10: Company Registration System

- Created login and registration pages for user authentication.
- Implemented frontend forms using CSS and JavaScript to improve styling and enable client-side validation.
- Utilized C# ASP.NET MVC to render pages as views and integrated server-side validation mechanisms.
- Designed a database system comprising two interconnected tables: company and company_info.
- Implemented database tables and stored procedures in SQL Server Management Studio to support CRUD operations.
- Integrated ASP.NET MVC to ensure efficient execution of CRUD operations and seamless database interactions.
- Employed ADO.NET to enhance data access capabilities, improving the application's interaction with the database.

2. Loan Management System Development:

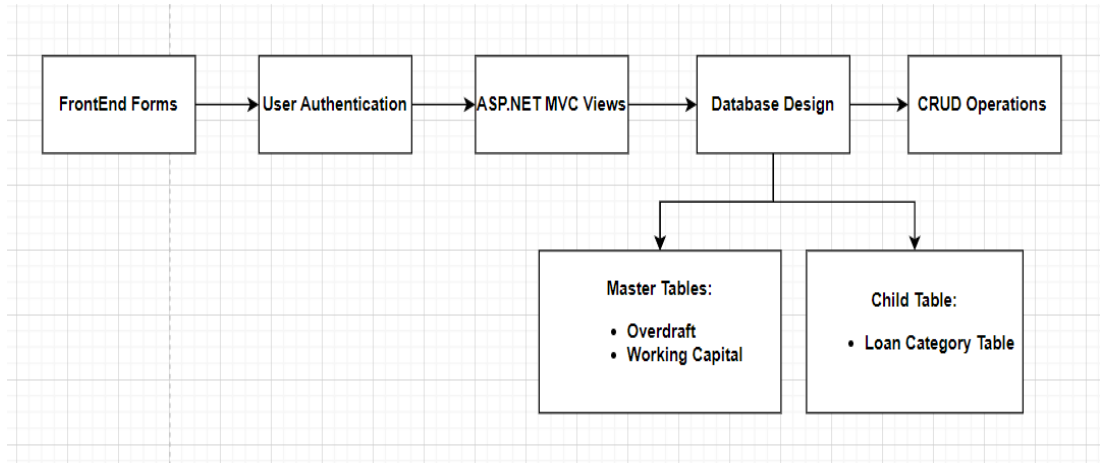


Figure 3. 11: Loan Management System

- Designed and implemented login and registration pages for user authentication and system access control.
- Utilized C# ASP.NET MVC to render pages as views and integrated server-side validation mechanisms.
- The system comprises two master tables: Overdraft and Working Capital, along with one child table, Loan Category Table.
- Established a parent-to-child relationship between the tables, enabling one-to-many associations.
- Implemented CRUD operations for the Loan Category Table, restricted to active Overdraft models.
- Designed and implemented database tables and stored procedures in SQL Server Management Studio to support CRUD operations.
- Integrated ASP.NET MVC for efficient execution of CRUD operations, ensuring seamless database interactions.
- Leveraged ADO.NET to enhance data access capabilities, optimizing the application's interaction with the database.

3. Web API Development for Data Interaction:

- Created a Web API to demonstrate relationships between stock and comments.
- Developed the API using ASP.NET Core, following best practices such as the repository pattern with DTO.
- Integrated the Web API into the web application, improving data interaction and adhering to design principles.

Table 3. 10: Internship Duration

Time Period	March 11 th , 2024 – June 3 rd , 2024
Days per week	6 days
Hours per day	7 Hours (11:00 am – 6:00 pm)
Holiday	Saturday
Internship Period	2 months and 24 days
Mentor	Anish Kaju Shrestha

Working Environment

Frontend: HTML, CSS, JavaScript, Bootstrap5

Backend: C# (ASP.NET MVC)

Communication: IP Messenger

3.4 Tasks / Activities Performed

During the internship at Global-Tech Nepal Pvt. Ltd., a variety of technical tasks and activities were undertaken, contributing to skill development and practical knowledge in software development. Below are the key tasks and activities performed:

1. Frontend Development:

- Implemented user interface components using HTML, CSS, JavaScript, and Bootstrap5.
- Ensured responsiveness and compatibility across different devices and browsers.

2. Backend Development:

- Developed server-side logic and functionality using C# with ASP.NET MVC framework.
- Integrated frontend and backend components to create dynamic web applications.

3. Database Management:

- Designed and implemented database schemas using SQL Server Management Studio.
- Implemented CRUD operations to interact with the database and manage data effectively.

4. User Authentication and Authorization:

- Developed user authentication and authorization systems to secure web applications.
- Implemented login and registration functionalities with appropriate validation and error handling.

5. Web API Development:

- Created RESTful APIs using ASP.NET Core to enable data interaction between frontend and backend components.
- Implemented endpoints for data retrieval, manipulation, and validation.

6. Testing and Debugging:

- Conducted unit testing and debugging of code to ensure functionality and performance.
- Identified and resolved software defects and issues in a timely manner.

7. Collaboration and Communication:

- Collaborated with team members to discuss project requirements, tasks, and timelines.
- Communicated effectively through tools such as IP Messenger to coordinate activities and share updates.

8. Continuous Learning and Improvement:

- Engaged in self-learning and exploration of new technologies and best practices in software development.
- Actively participated in training sessions, workshops, and knowledge sharing sessions within the organization.

Overall, the tasks and activities performed during the internship provided valuable hands-on experience and contributed to the development of technical skills, problem-solving abilities, and collaboration skills in a professional software development environment.

Table 3. 11: Tools Used

Category	Tools
Frontend Development	HTML, CSS, JavaScript, Bootstrap5
Backend Development	C# (ASP.NET MVC), ASP.NET Core
Database Management	SQL Server Management Studio
Web Browser	Microsoft Edge, Chrome
Version Control	Git, GitHub
Communication	IP Messenger
Integrated Development Environment (IDE)	Visual Studio

CHAPTER 4-CONCLUSION AND LEARNING OUTCOME

4.1 Conclusion

The internship at Global-Tech Nepal Pvt. Ltd. offered a rich learning experience in software development using ASP.NET MVC, enhancing practical skills through projects like the Company Registration System, Payment and Loan Management System, and a Web API for data interaction. The intern developed secure user authentication and authorization, managed databases with SQL Server and ADO.NET, and improved user experience with dynamic data displays and reporting. Despite challenges with direct SQL queries and resource constraints, the internship provided invaluable insights into full-stack development, fostering a strong foundation for future professional growth in the IT industry

4.2 Learning Outcome

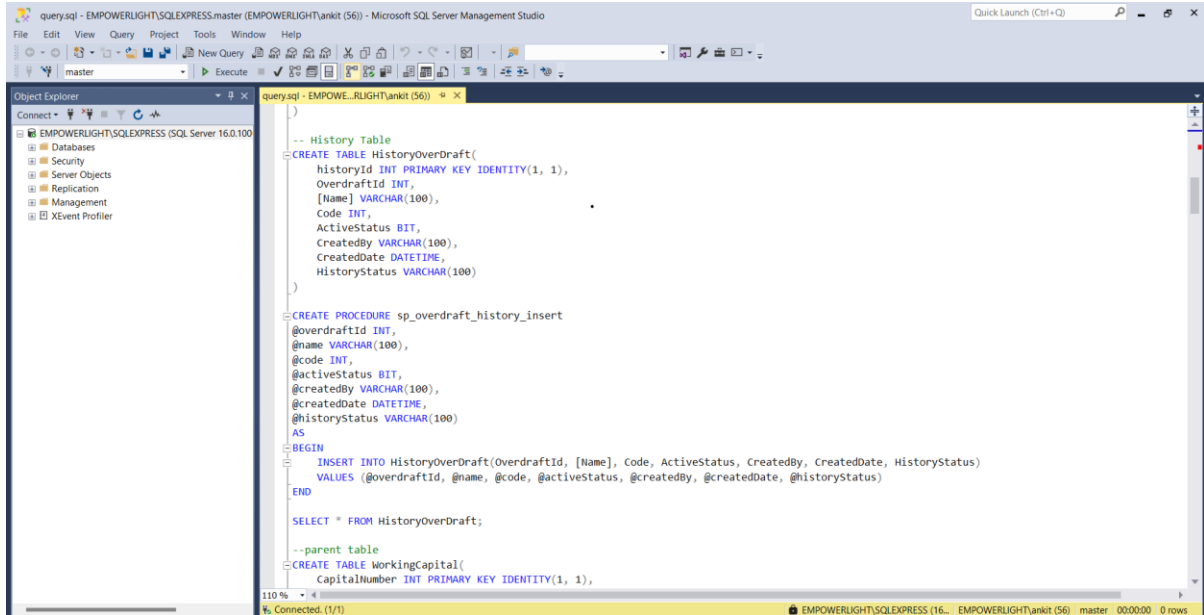
During the internship at Global-Tech Nepal Pvt. Ltd., the intern achieved significant learning outcomes that will enhance their professional growth in software development:

- Proficiency in frontend technologies: HTML, CSS, JavaScript, and Bootstrap5.
- Backend programming skills with C# and ASP.NET MVC.
- Database management expertise including design, CRUD operations, and SQL Server Management Studio.
- Understanding of stored procedures and their advantages in performance, security, and maintenance.
- Knowledge of software engineering practices: user authentication, authorization, and RESTful API development.
- Improved collaboration and communication skills through teamwork and use of tools like IP Messenger.
- Commitment to continuous learning and adaptability, exploring new technologies.
- Hands-on experience in projects like Company Registration System, Payment and Loan Management System, and Web API development.

REFERENCES

- Prameela, K. M., Rehka, D. S., Kusuma, M., Subramanyam, N. B., & Kumar, M. N. (2024). *Tourist guide system using ASP.NET*. Sri Vasavi Engineering College.
- Serbout, S., & Pautasso, C. (2024). How are web APIs versioned in practice? A large-scale empirical study. *Software Institute (USI)*.
- Rishikesh, P., Velavalapalli, S. V., Unnamatala, S., Ganesh, G. R. S. S. S., & Prasad, V. B. D. (2022). *Pro-Health navigating system in healthcare organizations*. Sri Vasavi Engineering College.

APPENDIX



The screenshot shows the Microsoft SQL Server Enterprise Manager interface. The left pane displays the 'Object Explorer' with the 'EMPPOWERLIGHT\SQLEXPRESS (SQL Server 16.0.100)' server selected. The right pane shows a query window titled 'query.sql - EMPPOWERLIGHT\SQLEXPRESS (SQL Server 16.0.100)' containing the following SQL code:

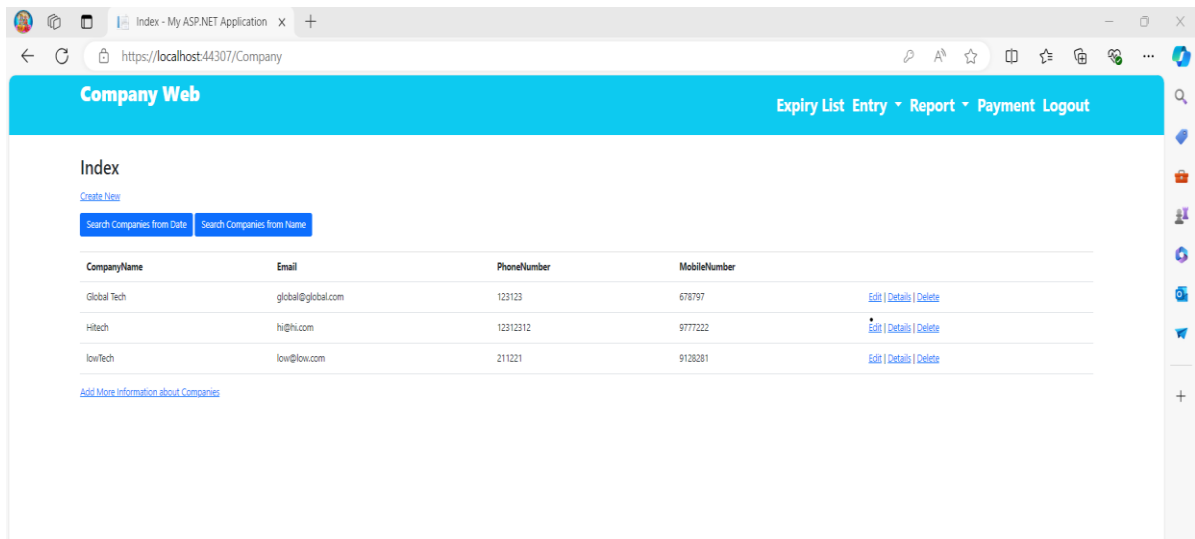
```
-- History Table
CREATE TABLE HistoryOverDraft(
    historyId INT PRIMARY KEY IDENTITY(1, 1),
    OverdraftId INT,
    [Name] VARCHAR(100),
    Code INT,
    ActiveStatus BIT,
    CreatedBy VARCHAR(100),
    CreatedDate DATETIME,
    HistoryStatus VARCHAR(100)
)

CREATE PROCEDURE sp_overdraft_history_insert
    @overdraftId INT,
    @name VARCHAR(100),
    @code INT,
    @activeStatus BIT,
    @createdBy VARCHAR(100),
    @createdDate DATETIME,
    @historyStatus VARCHAR(100)
AS
BEGIN
    INSERT INTO HistoryOverDraft(OverdraftId, [Name], Code, ActiveStatus, CreatedBy, CreatedDate, HistoryStatus)
    VALUES (@overdraftId, @name, @code, @activeStatus, @createdBy, @createdDate, @historyStatus)
END

SELECT * FROM HistoryOverDraft;

--parent table
CREATE TABLE WorkingCapital(
    CapitalNumber INT PRIMARY KEY IDENTITY(1, 1),
```

SQL Query



Company List View

Create - My ASP.NET Application x +

https://localhost:44307/Company/Create

Company Web Expiry List Entry Report Payment Logout

Create
CompanyModel

CompanyName

Email

PhoneNumber

MobileNumber

Create

[Back to List](#)

Create Company View

CompaniesInfoIndex - My ASP.NET Application x +

https://localhost:44307/Company/CompaniesInfoIndex

Company Web Expiry List Entry Report Payment Logout

CompaniesInfoIndex

[Create New](#)

DateOfInstallation	DateOfRenew	DisplayMessage	Remarks	Attachment	
4/29/2025 2:30:00 PM	4/29/2024 2:30:00 PM	Perfect	Perfect	E:\CompanyWeb\CompanyWebApp\Attachments\ab3.pdf	Edit Details Delete
5/29/2024 3:34:00 PM	4/17/2024 3:35:00 PM	Perfect	Perfect	E:\CompanyWeb\CompanyWebApp\Attachments\UbuntuUser.pem	Edit Details Delete
4/17/2024 3:35:00 PM	4/12/2024 3:35:00 PM	Perfect	Perfect	E:\CompanyWeb\CompanyWebApp\Attachments\UbuntuUser.pem	Edit Details Delete

[Back to List](#)

Company Info List View

Company Web Expiry List Entry Report Payment Logout

CreateCompanyInfo
CompanyInfoModel

DateOfInstallation

DateOfRenew

DisplayMessage

Remarks

Attachment No file chosen

[Back to List](#)

Create Company Info View

Company Web Expiry List Entry Report Payment Logout

Search Compant From Name

Enter Name

Result

Id	Company Name	Email	Phone Number	Mobile Number	Date of Installation	Date of Renew	Display Message	Remarks	Attachments
1	Global Tech	global@global.com	123123	678797	4/28/2023 2:30:00 PM	4/28/2024 2:30:00 PM	Perfect	Perfect	E:\CompanyWeb\CompanyWebApp\Attachments\lab3.pdf

[Back to List](#)

Search Company from Name View

Id	Company Name	Email	Phone Number	Mobile Number	Date of Installation	Date of Renew	Display Message	Remarks	Attachments
2	Hitech	hi@hi.com	12312312	9777222	5/29/2024 3:34:00 PM	4/17/2024 3:35:00 PM	Perfect	Perfect	E:\CompanyWeb\CompanyWebApp\Attachments\UbuntuUser.pem
2	Hitech	hi@hi.com	12312312	9777222	4/17/2024 3:35:00 PM	4/12/2024 3:35:00 PM	Perfect	Perfect	E:\CompanyWeb\CompanyWebApp\Attachments\UbuntuUser.pem

[Back to List](#)

Company Expiry List View

Create Account

Email

Password

ContactNumber

[Register](#)

[Back to Login Page](#)

Registration View

LoanCategory Register Login

Login Account

Email

Password

[Login](#)

[Don't Have Account? Register Here](#)

LogIn View

LoanCategory Overdraft Working Capital Loan Category Logout

Overdraft List

[Create New Overdraft](#)

S.No.	Name	Code	ActiveStatus	Created By	Created Date	
1	Global Tech	101	Active	Global	2024-05-08	Edit Details Delete
2	Hitect	102	Active	HiTechs	2024-05-08	Edit Details Delete
3	Low Tech	103	Active	lowTechs	2024-05-14	Edit Details Delete

Overdraft List View

CreateOverDraft - My ASP.NET Application

https://localhost:44307/Overdraft/CreateOverDraft?Length=0

LoanCategory Overdraft Working Capital Loan Category Logout

Create Overdraft

Name

Code

☐ ActiveStatus

Created By

Create Back to List

Create Overdraft View

Index - My ASP.NET Application

https://localhost:44307/WorkingCapital

LoanCategory Overdraft Working Capital Loan Category Logout

Working Capital List

Create New Working Capital

S.NO.	Current Assets	Current Liabilities	Created By	Created Date	
1	12.4	12.1	Global	2024-05-08	Edit Details Delete
2	22.1	20.1	HiTechs	2024-05-08	Edit Details Delete
3	22.1	20.1	Global	2024-05-09	Edit Details Delete
4	500	200	Globals	2024-05-15	Edit Details Delete

Working Capital List View

Create New Working Capital

Current Assets

Current Liabilities

Created By

[Create](#) [Back to List](#)

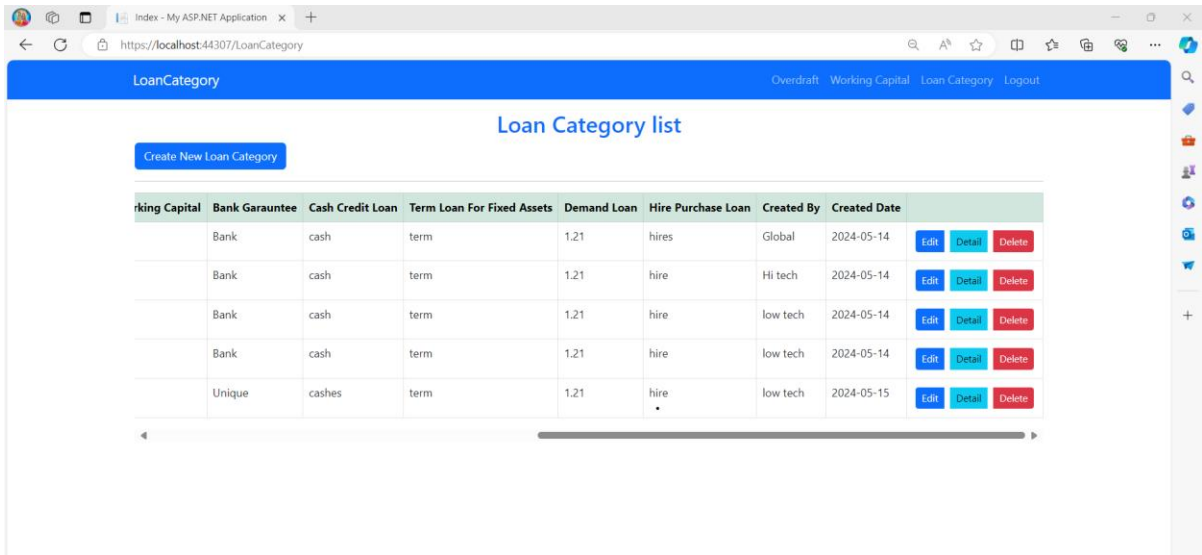
Create Working Capital View

Loan Category list

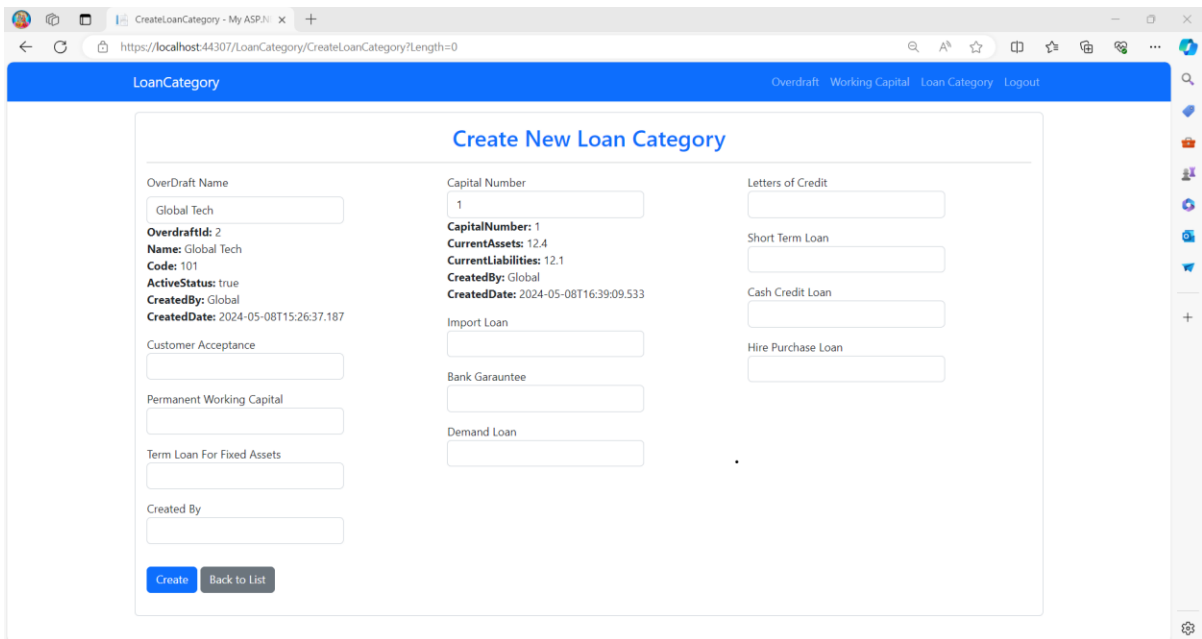
[Create New Loan Category](#)

S.No.	Overdraft Code	Capital Number	Letters of Credit	Customer Acceptance	Import Loan	Short Term Loan	Permanent Working Capital	Bank Guarantee	Cash
1	101	1	letter	customer	import	short	permanent	Bank	casl
2	102	1	letter	customer	import	short	permanent	Bank	casl
3	101	1	letter	customer	import	short	permanent	Bank	casl
4	101	3	letter	customer	import	short	permanent	Bank	casl
5	101	4	letter	customer	import	short	permanent	Unique	casl

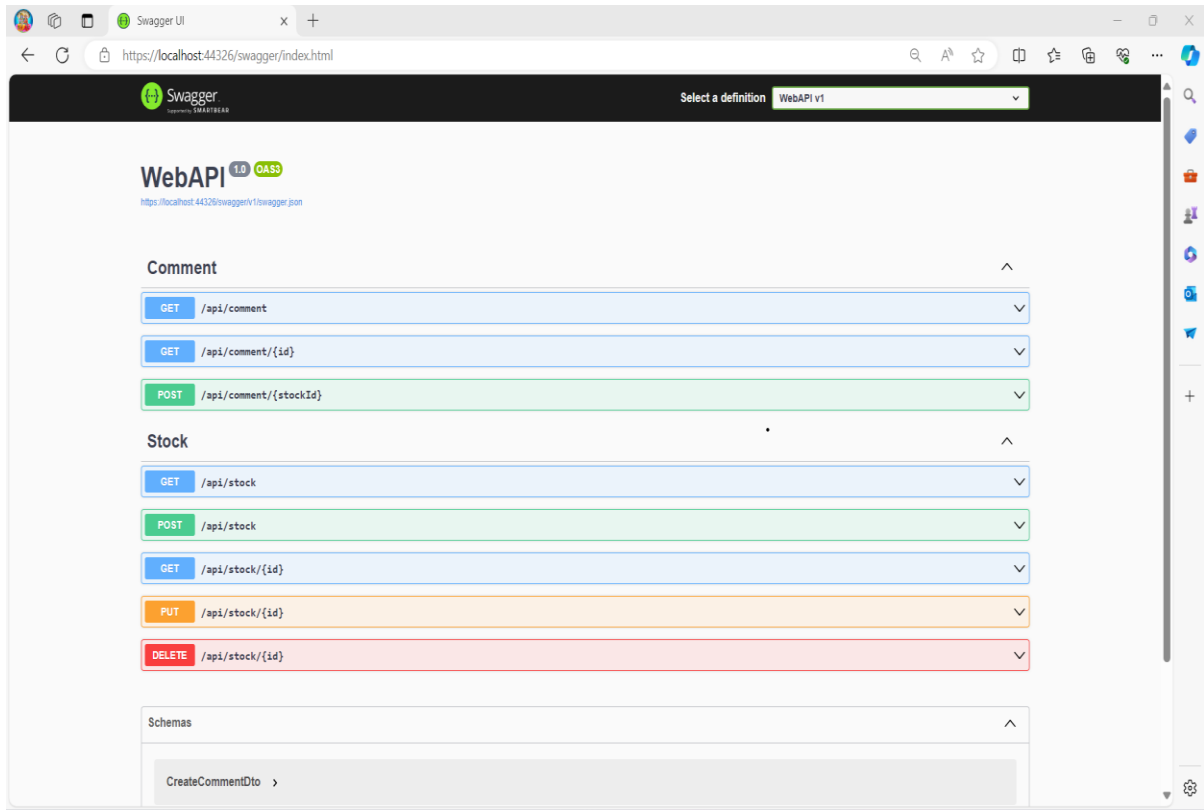
Loan Category List View



Loan Category List View



Create Loan Category List View



Web API