An Undergraduate Internship/Project on Topic "Stata IT (E-Commerce Project)"

By

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Dissertation submitted in partial fulfillment for the degree of Bachelor of Science in Computer Science

Department of Computer Science & Engineering

Independent University, Bangladesh

Attestation

I, Faiyaz Ahmed, attest that the web development project is the main topic of my report, which details my internship project at StataIT Limited. I completed this project partially to meet the criteria for my internship with Stata IT. I would like to express my appreciation to Mr.Ifaz Alam, my project manager, for all of his help and advice during my internship. His knowledge and help were crucial to the project's successful completion. Additionally, I certify that the work included in this report is original and that all references and acknowledgements to outside sources of information have been made correctly. My main priorities for the internship were front-end and back-end performance optimization and web development. The report's comprehensive project plan faithfully captures the goals and scope established for improving the website infrastructure. I took an active role in setting up and overseeing full-stack development, following strict design guidelines, and making sure that solutions were implemented successfully. An accurate picture of the project's development is given by the report's chronology, milestones, and resource allocation.

Signature Date

Faiyaz Ahmed

Acknowledgement

I would like to express my heartfelt gratitude to all those who played pivotal roles in making my internship at Stata IT Limited such a fulfilling and enriching experience. First and foremost, I am thankful to the divine for granting me this opportunity to embark on this internship journey. I extend sincere appreciation to my family, friends, and seniors for their unwavering support and encouragement throughout my academic journey and internship. Their belief in my capabilities has been a driving force, motivating me to overcome obstacles and strive for excellence. I am deeply thankful to the professionals and experts in the field of computer science and software development who generously shared their knowledge and resources, enriching my understanding and skills significantly. Special acknowledgement goes to my supervisor, Md. Asif Bin Khaled, Lecturer in Computer Science and Engineering at Independent University, Bangladesh, for his invaluable support and guidance during my internship and report preparation. I also recognize Independent University, Bangladesh, for providing me with a comprehensive education in computer science and engineering, laying a solid foundation for my professional journey. My profound gratitude goes to my industrial supervisor, Mr.Ifaz Alam from Stata IT Limited, for his kindness, support, and guidance during my internship. His mentorship has inspired me to surpass my expectations, and I feel fortunate to have had the opportunity to work under his supervision. I extend sincere appreciation to the entire team at Stata IT Limited for creating a conducive learning environment and offering valuable insights into the realm of IT solutions. In conclusion, I am grateful for the support and guidance I received during my internship at Stata IT Limited, and I am confident that this experience will have a lasting impact on my future pursuits in the field of computer science.

Letter of Transmittal

5th June 2024
Md.Asif Bin Khaled
Lecturer
Department of Computer Science and Engineering,
School of Engineering and Computer Science.
Subject: Submission of Internship Report for the completion of Graduation
Dear Sir,
I'm pleased to present my Internship Report, an essential element of the Bachelor Program in Computer Science and Engineering curriculum, for your review. It's been a privilege to work under your guidance and supervision during my internship period.
This report encapsulates my internship experiences at Stata IT Limited, where I had the opportunity to work on a web development project under the leadership of my project manager, Mr. Ifaz Alam. Over the course of three months, I gained valuable academic insights and practical exposure, providing me with a well-rounded understanding of the corporate environment. This report represents my efforts to document and communicate the knowledge and experiences gained during this period. I've diligently adhered to the prescribed guidelines and aimed to provide comprehensive details in all required areas.
I sincerely hope that this report fulfills the requirements of the internship program. Your feedback and evaluation are highly appreciated, and I'm thankful for your time and consideration of this submission. If you find this report informative and beneficial, it would bring me great satisfaction.
Thank you for your consistent support and guidance throughout my internship journey. Your mentorship has been pivotal in my learning and development. I eagerly look forward to receiving your feedback and comments on the report.
Warm regards,
Faiyaz Ahmed
1921860
Department of Computer Science and Engineering,
Independent University, Bangladesh

Evaluation Committee

Supervision Panel

.....	.....
Academic Supervisor	Industry Supervisor

Panel Members

.....	.....
Panel Member 1	Panel Member 2
.....	
Panel Member 3	

Office Use

.....	.....
Internship Coordinator	Head of the Department
.....	
Industry Coordinator of the Department	

Abstract

Within my internship at Stata IT, I'm responsible for advancing an e-commerce platform using a technology stack consisting of Dot Net, C, HTML, Bootstrap, and CSS. The objective is to construct a robust and intuitive online shopping destination, employing modern technologies and adhering to industry web development standards.
Leveraging my technical proficiency, I will actively contribute to designing and implementing different elements, including backend functionality using Dot Net and C sharp, and frontend presentation using HTML, Bootstrap, and CSS. The focus lies on crafting a user-friendly interface for a seamless shopping journey. Moreover, the project entails integrating secure authentication methods and optimizing performance to handle high traffic efficiently. Advanced features such as tailored recommendations, search capabilities, and responsive design will enrich the user experience. Agile methodologies will guide the development process, ensuring continuous feedback and iterative enhancements.
Comprehensive testing, encompassing unit, integration, and user acceptance testing, will ensure the reliability and functionality of the e-commerce platform. The final presentation will demonstrate the successful development and deployment, showcasing the harmonious integration of technologies and meticulous design and implementation processes.

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Chapter 1

Introduction

1.1 Overview/Background of the Work

This section provides an overview of the project, highlighting the challenges and goals associated with building an e-commerce site. It emphasizes the importance of creating a user-friendly platform equipped with secure and efficient features to cater to the needs of online shoppers.

1.2 Objectives

The primary objective is to develop a secure and feature-rich e-commerce website using Dot Net, C sharp, HTML, Bootstrap, and CSS. Specific objectives include:

1. Designing a user-friendly interface with responsive capabilities.
2. Integrating secure payment gateways and robust authentication systems.
3. Enhancing website performance to ensure scalability and efficiency.
4. Implementing advanced features to enhance user personalization.

Chapter 2

Literature Review

2.1 Relationship with Undergraduate Studies

2.1.a E-Commerce Website Development This segment examines existing literature concerning networking infrastructure within educational environments, underscoring the significance of dependable connectivity and efficient data transfer. It delves into successful case studies of similar projects and their impact on overall institutional functionality.
2.1.b Technology Stack Overview An exploration of the selected technology stack, encompassing Dot Net, C sharp, HTML, Bootstrap, and CSS. The literature review elucidates the strengths and benefits of these technologies within the realm of e-commerce website construction.
2.1.c Relationship with Undergraduate Studies In the development of the Stata IT e-commerce initiative, the integration of diverse technologies resonates with the fundamental principles acquired during undergraduate studies in Computer Science and Engineering (CSE). The project establishes links with several pivotal aspects of undergraduate education:
Programming Languages and Tools (Bootstrap, jQuery, etc.): The selection of technologies such as Bootstrap for CSS, jQuery for client-side scripting, and ASP.NET Core MVC for server-side development reflects the application of commonly taught programming languages and tools in CSE programs. The familiarity with these technologies acquired during undergraduate studies has facilitated their effective use in constructing the user interface and ensuring a responsive and dynamic web application.

Database Management (Entity Framework Core, MS SQL Server): The project utilizes Entity Framework Core for data access and MS SQL Server for database management. Concepts learned in database management courses, including data modeling, normalization, and querying, directly contribute to the efficient management of product data, user information, and transactions within Stata IT.

Software Development Methodology (Agile): The adoption of Agile Methodology in the project mirrors the emphasis on various software development methodologies introduced in undergraduate courses. The iterative and collaborative nature of Agile aligns with the real-world development approach employed in Stata IT, allowing for continuous improvement and adaptation to evolving requirements.

System Architecture (ASP.NET Core MVC): The use of ASP.NET Core MVC for system architecture aligns with the principles of modular design and separation of concerns emphasized in undergraduate system architecture courses. This decision enables the creation of a scalable and maintainable application structure.

2.2 Related works

Examining related works offers valuable insights into existing projects and applications that share similarities with Stata IT. The e-commerce domain and service delivery apps have seen significant contributions, with notable examples including:

1. Amazon: Amazon, a global e-commerce leader, serves as a model for Stata IT. Its focus on user experience, product variety, and secure transactions sets a standard for e-commerce applications.
2. eBay: eBay's online marketplace, known for its auction-style listings, introduces innovative approaches to product discovery and user interaction, providing inspiration for Stata IT's dynamic platform.
3. Shopify: Shopify's success in providing an accessible and customizable e-commerce platform offers insights for Stata IT. Its focus on empowering businesses to establish their online presence aligns with the project's objectives.
4. Instacart: Instacart's on-demand grocery delivery approach parallels the service aspect of Stata IT. Analyzing Instacart's user interface, real-time tracking features, and delivery optimization can inform improvements to Stata IT's delivery experience.

Chapter 3

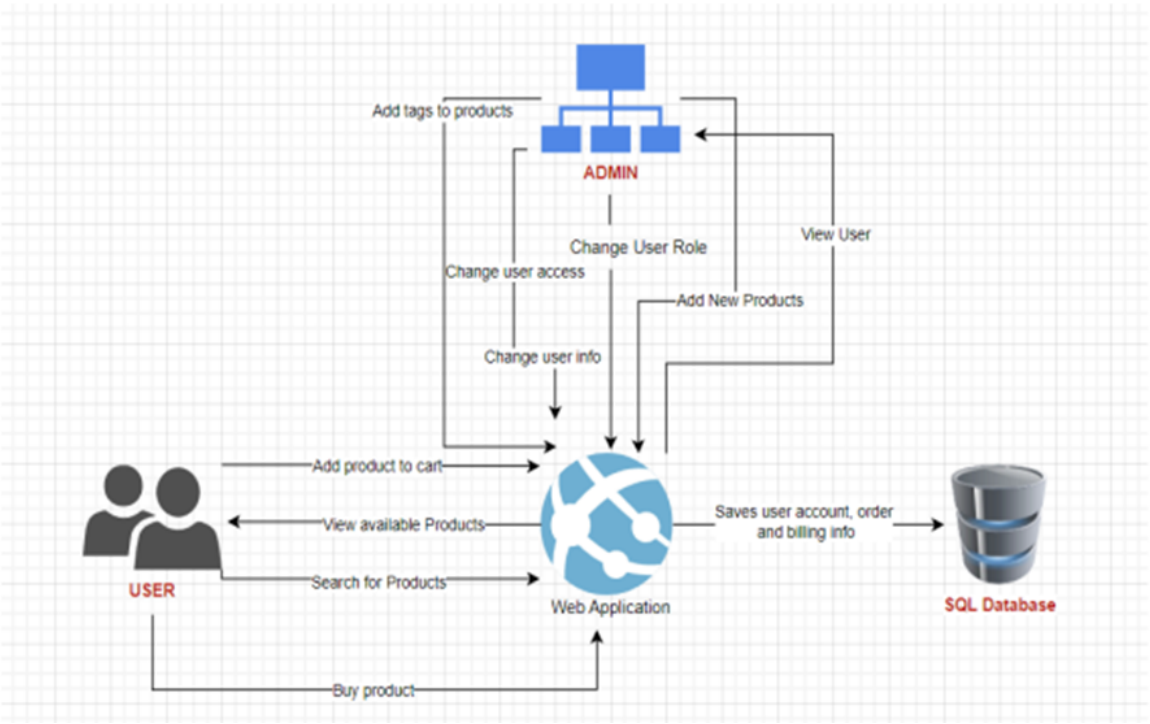
Project Management & Financing

3.1 Work Breakdown Structure

A work breakdown structure (WBS) arranges a project's tasks hierarchically, aiding in the organization of complex projects into more manageable activities or processes. This project management technique divides the e-appointment system into various stages, including concept, design, development, maintenance, and closure, each further broken down into smaller tasks and subtasks. Alongside comprehensive planning elements like sitemaps, timelines, risk analyses, and cost estimations, requirement analysis stands as a crucial subtask. The design phase comprises two main tasks: development-oriented system and model design. For the development-oriented model, responsibilities entail creating class diagrams, use case diagrams, and UML designs. System design tasks include producing rich images, flow charts, and defining system architecture. The project's development processes encompass both frontend and backend tasks. Following development, there are four tasks related to user acceptance, customer feedback, system evaluation, bug reporting, and rectification. Finally, reviewing documentation and deploying the product are integral to project closure, with tasks focusing on deploying the final product and making any necessary adjustments. This WBS aims to efficiently manage the scaling up of a significant project.

3.2 Process/Activity wise Time Distribution

The Use-Case Points (UCP) method, a software estimation technique, is employed to gauge the software's size based on its use cases. UCP shares similarities with Function Points (FPs) in its underlying concept. The project's UCP count is determined by factors such as the quantity and complexity of use cases, the size and complexity of system actors, and various non-functional criteria like portability, performance, and maintain-



ability. Additionally, the project's context, including the programming language used and the team's motivation level, also influences the estimation process. To ensure accurate estimation with UCPs, all use cases must be meticulously crafted with clear objectives and detailed content. Use cases should be developed with consistent levels of detail and purpose before estimation. Typically, each use case is completed in a single session, with users moving on to other tasks once objectives are achieved.

3.3 Gantt Chart

For effective project timeline management and adherence to strict deadlines, a Gantt chart will be utilized. Gantt charts are widely regarded as one of the most practical tools in project management, illustrating activities or tasks against a timeline. The chart displays a list of activities on the left side, with a corresponding time scale at the top. Each activity is represented by a bar, where the start, duration, and end dates of the activity are depicted. Gantt charts facilitate project progress tracking and provide a visual overview of the project's timeline.

Chapter 4

Methodology

4.a FRONTEND Methodology
1. Alertify JS: Alertify JS is a JavaScript library designed to create stylish and responsive alert dialogs, confirm dialogs, and notifications. It's utilized to manage user notifications and alerts in an appealing and user-centric manner.

2. Bootstrap CSS: Bootstrap, an open-source CSS framework, offers a collection of pre-designed components, styles, and utilities. It simplifies and expedites the process of structuring and styling the user interface, ensuring a responsive and visually appealing design with a range of ready-made components.

3. jQuery: jQuery, a lightweight JavaScript library, streamlines HTML document traversal and manipulation, event handling, and animation. Its inclusion in this application facilitates various UI interactions, such as implementing date pickers through jQuery UI.

4. DataTables: DataTables, a jQuery plugin, enhances HTML tables with advanced interaction controls. It enriches user experience by enabling features like sorting, searching, and data export, contributing to the creation of interactive and feature-rich tables in the application.

4.b BACK END Methodology 1. ASP.NET Core MVC: ASP.NET Core MVC is a cross-platform, high-performance, and open-source framework tailored for building modern, cloud-based, and internet-connected applications. Following the Model-View-Controller (MVC) architectural pattern, it's ideal for developing robust web applications.

2. Entity Framework Core: Entity Framework Core, an Object-Relational Mapping (ORM) framework for .NET, simplifies database operations by enabling developers to interact with database entities in a more intuitive and object-oriented manner.

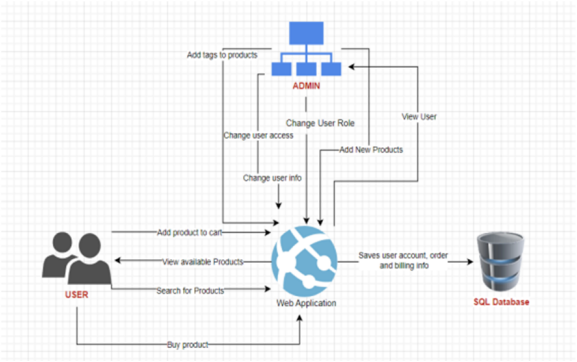


Figure 4.1: Agile Methodology

3. ASP.NET Core Identity: ASP.NET Core Identity is a membership system enhancing ASP.NET Core applications with login functionality. It facilitates user authentication, authorization, and account management.

4. MS SQL Server: Microsoft SQL Server, a relational database management system (RDBMS), is widely adopted for storing and managing data. Renowned for its security, scalability, and reliability, it's suitable for applications handling sensitive data like health records.

4.c Project Management Methodology: Agile Methodology Agile methodology serves as a project management framework that breaks projects into dynamic phases called sprints, fostering an iterative approach. After each sprint, teams reflect to identify areas for improvement, enabling strategic adjustments in subsequent sprints.

In our project, we embraced the SCRUM Agile framework, tailored for small teams. This approach entails organized sprints led by a Scrum master, responsible for removing obstacles hindering day-to-day work. Daily Scrum meetings facilitate discussions on ongoing tasks, challenges, and factors affecting development. Sprint planning initiates each sprint, outlining deliverables and strategies for the upcoming iteration. Additionally, sprint retrospectives, recurring meetings, serve as reviews to iterate on lessons learned, enhancing efficiency and refining future sprints.

Initially, my responsibility was to create design mockups for the e-commerce project. Drawing inspiration from various websites, I crafted initial designs, which were then reviewed by my supervisor. We engaged in multiple iterations, incorporating feedback until the supervisor was satisfied. Following the completion of front-end development, we proceeded to deploy the website.

Subsequently, I transitioned to back-end tasks. Leveraging the approval of my front-

end design by the supervisor, I undertook the design of the back-end admin panel and managed data visualization, including the creation of various product and data tables. I began by outlining the system design and then segmented the work into distinct parts.

As we transitioned into the project development phase, I simultaneously tackled both front-end and back-end coding. Throughout this phase, I conducted test cases in tandem to ensure the project's functionality. This approach was aimed at delivering a thoroughly tested and seamlessly integrated product ready for deployment.

Chapter 5

Body of the Project

5.1 Work Description

During my internship, I collaborated closely with my supervisor, engaging in iterative discussions to refine the design language. These discussions extended to client interactions, enabling us to finalize the design. Following approval, I transformed the agreed-upon design into a fully functional front-end using Alertfy.js and BootstrapCSS.
Upon completing the front-end development, I spearheaded the formulation of the system design for the entire project. This collaborative effort underwent multiple iterations to ensure a comprehensive and efficient system. With the system design finalized, my responsibilities expanded to include designing the back-end admin dashboard and implementing data visualization. Leveraging positive client feedback on my front-end work, I also took charge of designing elements like graphs and data tables for the admin dashboard.
Meanwhile, other project teams focused on various back-end aspects such as account management and billing. Collaboratively, we divided the project into distinct parts, with each team accountable for specific components. Transitioning from the design phase, I progressed to project development, where I handled both front-end and back-end coding. Throughout this phase, I implemented thorough test cases for completed components to ensure the application's functionality and integrity.

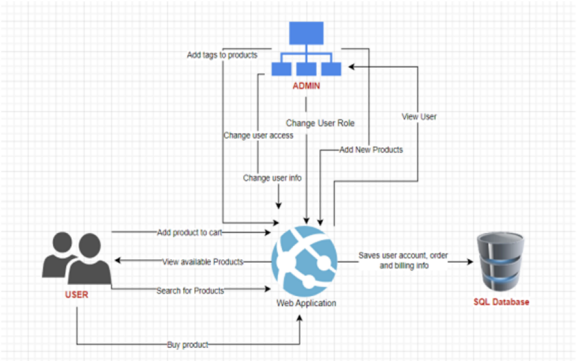


Figure 5.1: Rich Picture

5.2 Requirement Analysis

Functional and Non-Functional Requirements

5.3 System Analysis

5.3.1 Six Element Analysis

5.3.2 Feasibility Analysis

5.3.3 Problem Solution Analysis

5.3.4 Effect and Constraints Analysis

5.4 System Design

UML Diagrams

Architecture

5.5 Implementation

5.6 Testing

Input

Output

Designing Test Cases

Test Results

*** You can add more if needed ***

*** Add more sections according to your project/work. ***

Chapter 6

Results & Analysis

*** write about all your results according to your project/work and analyze them. You may add more sections.***

Chapter 7

Project as Engineering Problem Analysis

7.1 Sustainability of the Project/Work

*** Explain the sustainability of the project/work ***

7.2 Social and Environmental Effects and Analysis

*** Explain the social and environmental effects of your project/work and analyze them ***

7.3 Addressing Ethics and Ethical Issues

*** Explain ethical aspects/issues of your projects and suggest how to solve them ***

Chapter 8

Lesson Learned

8.1 Problems Faced During this Period

*** Please narrate the problem faced during the internship period ***

8.2 Solution of those Problems

*** Please narrate how individually or in group you have solved the problem ***

Chapter 9

Future Work & Conclusion

9.1 Future Works

*** Write about the future works of your work/project ***

9.2 Conclusion

*** Write the conclusion. ***

Bibliography

An Undergraduate Internship/Project on Topic

By

Your Name

Student ID: **ID**

Semester, Year

The student modified the internship final report as per the recommendation made by his or her academic supervisor and/or panel members during final viva, and the department can use this version for achieving.

Signature of the Supervisor

Name of the Supervisor

Supervisor's Designation

Department of Computer Science & Engineering

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