System Design Document

MCDA 5510(Software Development in Business Environment)

M.Sc. in Computing and Data Analytics

**Saint Mary’s University**

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INTRODUCTION

As the year winds down to the holiday season, people usually decorate their houses with colorful lights and bright ornaments, bring out hot chocolate, the warm fuzzy blankets, and watch Christmas movies with their families while their pets doze. Winters in Canada are usually quite harsh, so people rarely venture out unless necessary.

While Christmas shopping is wonderful, we often realize that we’ve missed out on buying an item till the very last moment, at which point, the weather or other factors could prevent us from visiting a physical store. It is not always possible to find that one unique product on Amazon, but it can be found in local stores in times like these.

Here, “Dashing through the Snow” comes in handy as an online store which meets your festive needs, delivering local products from around the city to your doorsteps within 24 hours.

## **Purpose**

The purpose of this document is to describe the system design for the project “dashing through the Snow”. This document will explain the scope, architecture, characteristics, and the components of the application. The SD document is intended for the team members working on the application and the faculty who are the stakeholders of the project.

## **Definitions, Acronyms and Abbreviations**

|  |  |
| --- | --- |
| **Abbreviation** | **Description** |
| FR | Functional Requirement |
| NFR | Non-Functional Requirement |
| IR | Interface Requirement |
| DB | Database |
| Frontend | Client-side User Interface |
| SD | System Design |
| Backend | Server |
| SQL | Structured Query Language |

Table 1- Abbreviation

## **Scope**

### **In Scope**

1. Landing Homepage
   1. Carousels
2. About Us
   1. Brief Overview
   2. Journey
   3. Contact Information
3. Shop
   1. Categories
   2. Search
   3. Filters
   4. Card view of Items
   5. Add items to the cart
4. Cart
   1. View items in cart
   2. Remove items from cart
   3. Checkout
5. Profile
   1. Edit profile
   2. Add/Remove addresses
   3. Order History
6. Login / Register
   1. Login
   2. Log in with Google or Facebook
   3. Register
   4. Register with Google or Facebook
7. Payment Gateway
   1. Card Payment
   2. Wallet Payment

### **Out of Scope**

1. Vendor Screen
2. Customer Support

## **References**

1. [Angular with .NET](https://learn.microsoft.com/en-us/visualstudio/javascript/tutorial-asp-net-core-with-angular?view=vs-2022)
2. [Payment Using Stripe](1.%09https:/www.positronx.io/how-to-integrate-stripe-card-checkout-payment-gateway-in-angular/)
3. [Web applications Azure architecture design](https://learn.microsoft.com/en-us/azure/architecture/guide/web/web-start-here)
4. [Hosting Web Application on Azure](https://jasonwatmore.com/post/2020/01/08/angular-net-core-sql-on-azure-how-to-deploy-a-full-stack-app-to-microsoft-azure)

## **Overview**

# SYSTEM OVERVIEW

## **System Characteristics**

The web application is expected to be available round-the-clock from anywhere in Halifax, and usable from any device for any screen size. Security is a must for end users’ data and should be flexible, and scalable to meet reasonable demand occasionally. Additionally, it should have rich user experiences built on the client.

### **Availability**

“Dashing Through the Snow” is planned to be hosted on Azure and will be available only in the city of Halifax.

### **Performance**

The delay in loading the web application should be less than 1 second.

### **Scalability**

The application is scaled to handle 20 users in real-time.

### **Security**

Security is a very important factor, and the application follows industry standards and guidelines.

* Password encryptions, namely SSL encryption is to be used.
* Azure Web Application Firewall is to be enabled.

### **Functional**

The website is designed to address selling local festive goods and items such as lights, decorations, cakes, candles, dresses and many more.

### **Ease of use**

The website is designed to be easy to use with friendly and quick navigation to move around different pages on the site.

### **Content**

Website content is relevant, informative and user-centric.

### **Optimization**

The website and its content are to be optimized for different devices, browsers, data speed, search engines, and users.

### **Responsive**

“Dashing Through the Snow” will be a responsive website. It should change its layout and options to fit the device and browser size.

## **System Architecture**

Diagram

Description automatically generated

Figure 1 - System Architecture

## **Infrastructure Services**

Application infrastructure consists of the components that are necessary for its function. The following components are implemented to support the application features and service delivery.

### **Azure App Service**

It will be used to deploy the application for any platform or device and deploy them on a scalable cloud infrastructure.

### **Azure Web Application Firewall**

Azure Web Application Firewall is a cloud-native service that will be used to protect the application from common web-hacking techniques such as SQL injection and security vulnerabilities such as cross-site scripting.

### **Azure Monitor**

Azure Monitor will be used for end-to-end observability of the application, infrastructure, and network.

### **SQL Server**

The application uses SQL Server as a backend to fulfill user requests, display product catalogues, and store user history (such as orders, addresses etc.).

## **System Context**

Diagram, PowerPoint

Description automatically generated

Figure 2 - Context Diagram

## **Standards and conventions**

## **Software development tools**

|  |  |  |
| --- | --- | --- |
| **Software** | **Version** | **Purpose** |
| Node js | 16.17.0 | Server-side programming, websites and back-end API services |
| Angular | 15.0.0 | Building client applications using HTML and TypeScript |
| .NET | 6.0.0 | Build internet-connected application |
| MS SQL SERVER | 2019 Preview 3 | Manage data and store information |
| Microsoft Visual Studio | 17.3.6 | Edit, debug, and build code, and then publish an application |
| Visual Studio Code | 1.73.1 | Streamlined code editor with support for development operations like debugging, task running, and version control |
| Dbeaver Community | 22.3.0 | Integrated environment for managing any SQL infrastructure |

Table 2- Development Tools

## **Outstanding Issues**

# COMPONENT DESCRIPTION

## **Component Identifier**

# APPENDIX

## **Record of Changes**

| Version | Date | Author | Description of Change |
| --- | --- | --- | --- |
| 1.0 | 26/11/2022 | Piyush Priyam  A00464893 | The document review was done by the team members and all the comments are incorporated. |

Table 3- Record of Changes

## **Approvals**

The undersigned acknowledge that they have reviewed the SD and agree with the information presented within this document. Changes to this SD will be coordinated with and approved by the undersigned, or their designated representatives.

|  |  |
| --- | --- |
| **Approved By** | **Date Approved** |
| Rashad (A#) |  |
| Shiney Prabhakar (A#) |  |

Table 4- Approvals