

MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE

Sumy State University

Faculty of Electronics and Information Technologies

Department of Computer Sciences

«Approved for defense»

Acting Head of the Department

Igor SHELHOV

(signature)

June 2023

QUALIFICATION WORK

for the educational degree of Bachelor


in the specialty 122 – Computer Sciences,

educational-professional program «Informatics»

on the topic: «Infoware and Software for Client-Side of a Professional Blog Website»

by a student of the group IH-95AH George Sam Joel

The qualification work contains results of own research. The use of ideas, results and texts from other authors have references to the appropriate source.



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George SAM JOEL

Supervisor,
assistant of the Department of
Computer Sciences, candidate of
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Sumy – 2023

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TASK FOR QUALIFICATION WORK
for the educational degree of Bachelor

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by a student of the group IH-95аИ George Sam Joel

1. Topic of the work: «Infoware and Software for Client-Side of a Professional Blog Website» approved by order of SumDU dated "01" June 2023 No. 0475-VI _____
2. Deadline for the student to submit the qualification work is June 09, 2023 _____
3. Input data for the qualification work _____
4. Content of the explanatory note (list of questions to be developed) 1) Analysis of the problem of the subject area, setting and formulating research tasks. 2) Review of technologies used for currency rate prediction. 3) Development of a client side for website. 4) Analysis of results. _____
5. List of graphical material (with exact specification of mandatory drawings) _____
6. Consultants to the project (work), specifying the project sections they are responsible for

Section	Consultant	Signature, date	
		Task given	Task accepted

7. Date of task issuance « ____ » _____ 2023 p.

Task accepted for implementation _____ (signature) Supervisor _____ (signature)

SCHEDULE

№	Stages of the qualification work	Term of execution	Note
1	<i>Analysis of the problem of the subject area, setting and formulating research tasks</i>		
2	<i>Review of technologies used for developing websites</i>		
3	<i>Developing infoware and software for client-side of a professional blog website</i>		
4	<i>Analysis of obtained results</i>		
5	<i>Preparation of the explanatory note to the qualification work</i>		

Student _____ (signature) Supervisor _____ (signature)

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ANNOTATION

Work consists of: 38 p., 7 fig., 2 appendixes, 14 references.

Justification of the relevance of the work's theme – Considering the pervasive and progressive nature of internet-based technologies, the relevance of this study is increasingly underscored. Web development represents an integral component for a spectrum of entities, from expansive organizations to smaller enterprises across a plethora of sectors. Its pivotal role is evidenced in bolstering online visibility, enhancing operational streamlining, and catalyzing improved customer engagement.

Object of study – The study is primarily concerned with the process of web development. This includes an investigation of the varied tasks and techniques involved in designing, creating, and managing websites and online applications.

Objective of study – The aim of this research is to provide an in-depth understanding of the web development process, its role in various organizations, and its impact on operational efficiency and customer engagement. By examining the complexities and nuances of the field, the study seeks to enhance current methodologies and practices, ultimately fostering more effective and user-friendly web experiences.

Research Methods – literature review, case study analysis, technical analysis.

Results – a blog application was successfully developed. The ability to add new articles, delete, modify, and search existing articles was implemented. The program allows users to manage blog content conveniently and perform various actions with articles.

BLOG, WEBSITE, HTML, CSS, JavaScript, BOOTSTRAP

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INTRODUCTION

Web development, broadly defined, involves the creation of websites for the Internet or for an intranet, which is a private network. This area ranges in complexity from the generation of simple, static text pages to the development of intricate web applications, digital businesses, and social networking services. The scope of web development can encompass diverse tasks such as Web engineering, design, content development, client liaison, scripting for client-side/server-side, security configuration for Web servers and networks, and e-commerce development [1-3].

Often, web development is generally understood to encapsulate the primary non-design facets of website construction: namely, the creation of markup and coding. To simplify content alterations and make them accessible to those with fundamental technical abilities, content management systems (CMS) are often incorporated into web development.

Larger corporations may deploy extensive web development teams, potentially comprising hundreds of personnel. These teams typically adhere to standardized methodologies like Agile during website construction. In contrast, smaller entities may only need a single, permanent, or contracted developer, or they may assign web development tasks to individuals in related roles, such as graphic designers or information systems technicians. Web development can often involve collaborative efforts across departments, rather than being the sole responsibility of one department. Web developer specializations are typically categorized into three types: front-end developers who handle user interface behavior and visuals, back-end developers who manage server interactions, and full-stack developers who oversee both aspects [2-4].

Relevance. Given the omnipresence of web-based technologies and their ever-increasing growth, the importance of this study is accentuated. Web development is fundamental to a wide array of organizations and businesses, large and small, across diverse sectors. It plays a crucial role in enhancing online

presence, streamlining operations, and improving customer engagement.

Object of study. The study is primarily concerned with the process of web development. This includes an investigation of the varied tasks and techniques involved in designing, creating, and managing websites and online applications.

Subject of study. The main subject of this research pertains to the technical and non-design aspects of web development. These comprise markup writing, coding, and the use of content management systems.

Hypothesis. The hypothesis of this research suggests that a comprehensive understanding of the intricate processes and methodologies involved in web development can significantly improve the efficacy and efficiency of online platforms.

Novelty. The novelty of this study lies in its comprehensive approach to understanding web development. It combines the technical, aesthetic, and organizational aspects of web development to provide a holistic view of this complex field. This approach could potentially yield new insights into the optimization of web development practices and processes.

Structure. This work consists of an introduction, an analytical review, problem formulation, selection of a method for solving the defined problem, description of the software of the information system, conclusions, a list of used sources, and appendices.

1 ANALYTICAL REVIEW

1.1 Websites as a resource of information and services

Web development refers to the creation and maintenance of websites or web applications on the internet or an intranet. It involves a wide range of tasks, including coding or programming to ensure website functionality, designing the user interface and user experience, and managing the website structure and navigation.

Web development is generally divided into two main parts:

1. Front-end or client-side development: This involves creating the website's user-facing components, such as the visual design, layout, and interactive features. Front-end developers use languages like HTML, CSS, and JavaScript to implement responsive design, optimize user experience, and make the website look and function correctly in different browsers and on different devices.

2. Back-end or server-side development: This involves creating and managing the server-side components and databases that process and store the data needed for the website to function. Back-end developers use programming languages such as PHP, Python, Ruby, or Java, and work with databases like MySQL, PostgreSQL, or MongoDB.

A full-stack developer is skilled in both front-end and back-end development.

It is important to distinguish between a website and a web system, as they have distinct characteristics. A website is a collection of multiple web pages which are rendered to the user in a browser using a specific markup language. There is no restriction on the number of pages a website can contain. Even a single webpage constitutes a website. Despite being just one page, a website can convey extensive information, which can be used for diverse purposes. Thus, in this era of rapid technological advancement, there is a vast array of website types, and their numbers are increasing rapidly. To understand the concept of a websites more

clearly, it is necessary to become acquainted with certain types of which serve as information and service resources:

1. Information portal websites provide information on a specific profile and are currently one of the most common sources of information. They cover many types of work sectors, thus attracting a large target audience. Their primary functions typically include search features, forums, a messaging system, and a comprehensive knowledge base with an abundance of materials.

2. Brand image websites: These are usually developed by companies or organizations with an abundance of resources and diverse focus areas, aiming to cater to different consumer groups.

3. E-commerce websites have come a long way over the past decade. The launch of an online store was once quite expensive, but now, with platforms like Shopify, selling online has become nearly as straightforward as creating a website. All it requires is a solid business idea, and you can start selling. Any website where purchases can be made using a bank card falls into this category.

4. Entertainment websites are primarily designed to entertain their visitors. They typically feature entertaining information, images, and interactive online services. This can range from humor sites, entertainment news sites, or simply sites with amusing or interesting content. The revenue generated from such sites is largely dependent on the advertising displayed on the page. If you aim to launch an entertainment site, the content should be engaging, with new, topical, and unconventional information to attract as many visitors as possible.

5. Portfolio websites are utilized for showcasing work samples and are beneficial to any author who wishes to establish their presence, as well as those seeking clients or customers. This type of website is most common among creative professionals (photographers, designers, artists), as it can be used to present work to potential employers, acquire new clients via search engines and advertising, or build a personal brand on a specific social network.

6. News websites (or media sites) gather news or other reports. While they share some similarities with entertainment websites, media sites tend to offer more

serious content.

7. Websites of specific educational institutions and online courses primarily aim to provide educational materials to visitors or information about the educational institution. Like entertainment and media sites, some educational websites may also feature advertising. Some even facilitate the sale of educational products.

1.2 The Process of Website Development

The successful creation of a website relies on a sequence of clearly elaborated stages. At a superficial glance, the process might appear simple: conceive a design, construct the layout, and populate it with some content. However, each step of the website development entails meticulous work, with every team member bearing responsibility[5-8].

Website development encompasses not only the design and coding but also a detailed project analysis, collaboration with the client, and the pursuit of solutions to meet the project's set goals.

The website development process can be divided into key stages:

1. Goal setting. It is paramount first to have a clear concept of the product and define the target audience for which the product is created. A specific analysis of competitors and analogues is conducted, and the features and unique aspects of the website that may attract users' attention are determined.

2. Creation of a clear technical task. The technical task is the foundation upon which every specialist involved in the development relies. It is determined and edited until the client gives consent. Only then does the project move to the creation stage. During the formation and discussion of the technical task, the website's structure, its navigation, the number of categories and subcategories, their sequence of placement, etc., are also developed.

3. Creation of the website design mockup. Design development is one of the main stages of the process. After all, the design is the first thing the user sees,

evaluates, and based on it, decides whether to stay on the page or close the browser tab. The design is based on the technical task, with buttons, banners, and other graphic elements being drawn. In other words, the prototype created at the first stage of website development gets an aesthetic exterior, stylized in the colors chosen during the creation of the technical task. If the company has a corporate style, the design is developed accordingly. Alternatively, a corporate style may be developed first, and then the design based on it. Web designers seek a convenient platform for their creations, one of which is Figma.

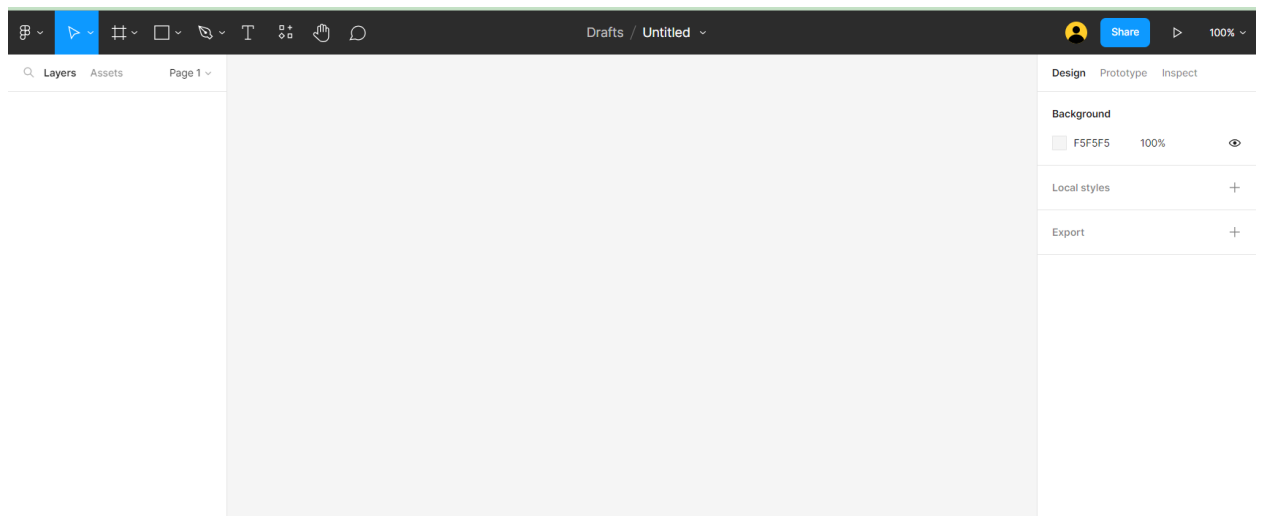


Figure 1.1 – Figma design creation program

4. **Development:** This is the actual building of the website. It often starts with developing the home page, followed by a "shell" for the interior pages. The shell serves as a template for the content pages of your site, as it contains the main navigational structure for the website. Then, the content (text, images, videos) will be distributed throughout the site in the appropriate areas. This phase also involves coding the functionalities of the website (such as contact forms, eCommerce shopping carts)[5-8].

5. **Testing and Quality Assurance:** After the site is built, it's time to test. This includes checking the site on multiple browsers and devices to ensure it's responsive, checking all features to ensure they work correctly, and checking all

the links and content for errors. SEO checks should also be done to ensure the site is optimized for search engines.

6. **Launch:** Once everything has been tested and you are happy with the site, it's time to launch. This involves moving it from a local development environment to live servers. Once the site is live, it's important to run through everything again to make sure that it functions properly.

7. **Maintenance & Updating:** Post-launch, websites require regular maintenance and updates to keep the content fresh, fix bugs, improve performance, and enhance security. This can also include monitoring website analytics, optimizing for SEO, and making tweaks to improve user experience.

8. **Website Marketing:** This phase is about making your website visible to your target audience. It includes activities like SEO, email marketing, social media marketing, content marketing, and pay-per-click advertising[5-8].

1.3 What is blog

A blog is a type of website where the content is presented in reverse chronological order (newer content appear first). Blog content is often referred to as entries or «blog posts». Blogs are typically run by an individual or a small group to present information in a conversational style. However, now there are plenty of corporate blogs that produce a lot of content on a regular basis.

Blogs have gained popularity over the years because they allow individuals to express their thoughts, share their experiences, and discuss their passions. They can focus on one subject, such as food, travel, fashion, or can vary greatly, with posts on many different topics.

The process of blog development, akin to website development, involves several stages:

1. **Planning:** This stage requires the definition of the blog's purpose and identification of the target audience. The decision about the blog's focus or

niche is also made during this phase.

2. **Selection of a Blogging Platform:** Numerous blogging platforms, such as WordPress, Blogger, and Tumblr, are available. The choice depends on budget, necessary features, and technical proficiency.

3. **Domain Name and Hosting:** Selection of a fitting domain name that aptly represents the blog's content is essential. Hosting services are diverse, or an all-inclusive platform such as WordPress.com can be utilized.

4. **Design and Structure:** At this stage, the blog is designed to align with the intended aesthetic and user experience. This process includes theme selection, layout planning, and the creation of pages and categories.

5. **Content Creation:** This critical phase involves the generation of valuable, unique content that caters to reader interests. High-quality content is instrumental in attracting and retaining readership.

6. **Publication:** Blog posts are published with careful attention to compelling headlines, clarity of content, and appropriate tagging or categorization.

7. **Promotion:** The blog is promoted using SEO techniques and social media, fostering increased reader traffic.

8. **Maintenance and Updating:** Regular content updates and technical upkeep are necessary to ensure smooth running of the blog.

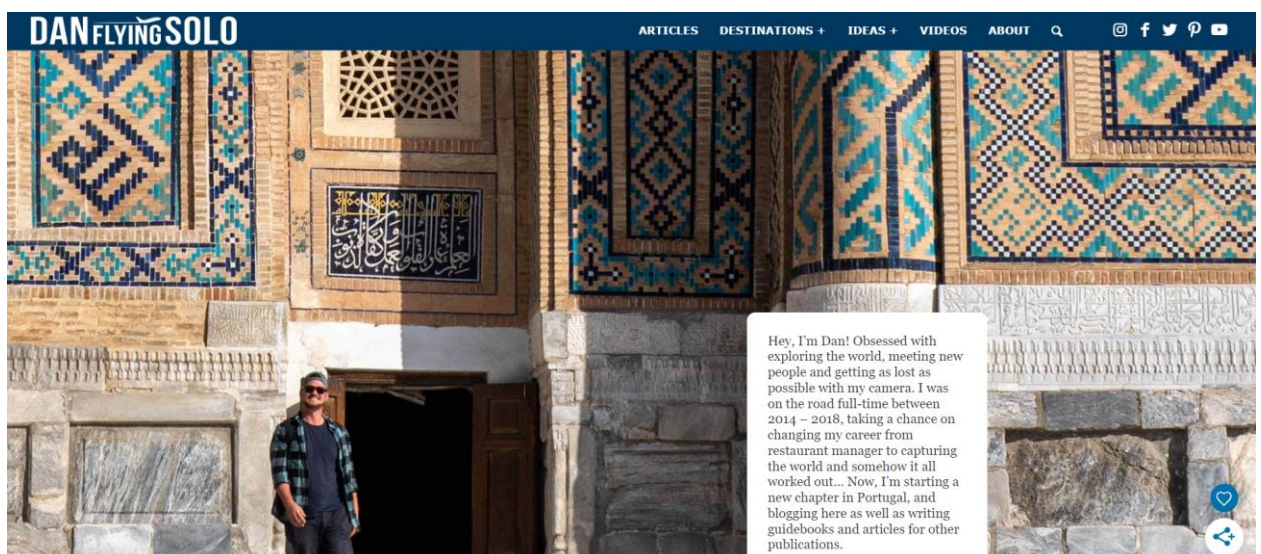


Figure 1.2 – An example of blog page

1.4 Task definition

For developing the client-side of a blog website, it is important to focus on the user interface and provide the best possible user experience. Here are some tasks in this process:

1. **Developing intuitive navigation:** Ensure easy access to the main sections of the blog and current publications.
2. **Optimizing design for different devices:** Designing a responsive layout that provides an optimal user experience on all types of devices, including desktop computers, laptops, tablets, and smartphones.
3. **Integrating social media:** Adding quick access buttons for content sharing on social media platforms, which can help attract more readers.
4. **Implementing a search system:** Integrating an efficient search system to assist visitors in finding specific content.
5. **Optimizing loading speed:** Implementing techniques to reduce page loading time, including image optimization, CSS and JavaScript minimization.
6. **Organizing content structure:** Developing a categorization and tagging system that allows users to navigate the blog content easily.
7. **Ensuring accessibility:** Designing the client-side with consideration for accessibility standards (WCAG), including color contrast, keyboard navigation, and the use of alternative text for images.

2 CHOOSING THE APPROACH TO PROBLEM SOLUTION

2.1 Usage of IntelliJ IDEA: Advantages and Disadvantages

IntelliJ IDEA is one of the most popular Integrated Development Environments (IDEs) for software development in various programming languages, including Java, Kotlin, JavaScript, Python, and many others. It offers advanced features and tools that facilitate the development process and ensure high developer productivity. Here are some advantages and disadvantages of using IntelliJ IDEA:

Advantages of IntelliJ IDEA:

Powerful Tools: IntelliJ IDEA provides a wide range of powerful tools, such as code autocompletion, refactoring, code analysis, debugging support, version control integration, and more. These tools help developers write, test, and debug code more efficiently.

Multi-language Support: IntelliJ IDEA supports multiple programming languages, providing enhanced support for each language, including built-in code autocompletion, suggestions, syntax checking, and more.

Integration with Other Tools: IntelliJ IDEA seamlessly integrates with other development tools, such as version control systems (e.g., Git), build tools (e.g., Maven or Gradle), and automation tools (e.g., Jenkins). This allows developers to work conveniently with these tools directly from IntelliJ IDEA.

Extensibility: IntelliJ IDEA offers extensibility through plugins, allowing developers to customize their working environment according to their needs. There is a wide range of plugins available for various development tasks, significantly expanding the functionality of IntelliJ IDEA.

Disadvantages of IntelliJ IDEA:

Resource Requirements: IntelliJ IDEA has certain resource requirements, such as CPU, memory, and disk space. On less powerful computers or when working with large projects, this can impact the performance of the IDE.

Learning Curve: IntelliJ IDEA has a rich set of features and settings, which can make it somewhat complex for beginners. Developers who are unfamiliar with IntelliJ IDEA may require some time to fully grasp all its capabilities and become proficient in using the IDE.

Cost: IntelliJ IDEA is available in two versions: Community Edition (free) and Ultimate Edition (paid). The Ultimate Edition offers additional features and extended support but requires a subscription fee for commercial use. This cost factor may influence the consideration of IntelliJ IDEA for certain projects or development teams.

2.2 Technologies for developing websites

HTML, CSS, and JavaScript are the core technologies used for developing websites, including blogs. Here's some information about their usage in web development:

HTML is the standard markup language used for creating the structure and content of web pages. It defines the elements and their semantic meaning, allowing developers to organize and present information on a website. With HTML, you can create headings, paragraphs, lists, images, links, forms, tables, and more. It provides the foundation for structuring the content of a blog and plays a crucial role in creating a well-formed and accessible website.

CSS is a stylesheet language that is used to define the presentation and layout of web pages. It allows developers to style the HTML elements by specifying properties such as colors, fonts, margins, padding, and positioning. CSS provides the flexibility to control the visual appearance of a blog, including its typography, colors, spacing, and overall design. It enables the separation of content and presentation, making it easier to maintain and update the styling of a website.

JavaScript is a programming language that adds interactivity and dynamic functionality to web pages. It allows developers to create interactive elements, handle user interactions, manipulate the content of a page in real-time, and communicate with servers to fetch and update data. JavaScript is essential for building features like navigation menus, forms validation, sliders, carousels, pop-

ups, and other interactive components in a blog. It enhances the user experience and enables dynamic content updates without the need to reload the entire page.

In combination, HTML, CSS, and JavaScript form the core building blocks of a website. HTML provides the structure and content, CSS handles the presentation and styling, and JavaScript adds interactivity and behavior. Together, they empower developers to create visually appealing, responsive, and interactive blogs that engage users and deliver a rich user experience.

It's worth noting that there are also various frameworks and libraries available for web development, such as Bootstrap, React, Angular, and Vue.js, which leverage HTML, CSS, and JavaScript to provide additional functionality and simplify the development process.

Bootstrap is a popular front-end framework for building responsive and mobile-first websites. It provides a collection of CSS styles, JavaScript components, and pre-designed templates that help developers create consistent, visually appealing, and user-friendly web interfaces.

Here are some key features and benefits of using Bootstrap:

1. **Responsive Design:** Bootstrap is built with a responsive grid system that automatically adjusts the layout and sizing of elements based on the screen size. This ensures that websites built with Bootstrap look great on various devices and screen resolutions, including desktops, tablets, and smartphones.

2. **Ready-to-Use Components:** Bootstrap offers a wide range of reusable UI components, such as navigation bars, buttons, forms, modals, carousels, and more. These components are designed with a consistent style and behavior, making it easier to create consistent and professional-looking web pages without starting from scratch.

3. **Customizable Styling:** Bootstrap provides an extensive set of CSS classes that allow developers to customize the look and feel of components. It offers options for colors, typography, spacing, and responsive breakpoints, giving developers the flexibility to adapt the framework to match their desired design.

4. **JavaScript Plugins:** Bootstrap includes a collection of JavaScript plugins

that add interactivity and enhanced functionality to components. These plugins handle features like dropdown menus, modals, tooltips, carousels, and form validation. By utilizing these plugins, developers can save time and effort in implementing common interactive elements.

5. **Community and Documentation:** Bootstrap has a large and active community of developers, which means there are plenty of resources, tutorials, and examples available for learning and troubleshooting. The official Bootstrap documentation is comprehensive and well-maintained, providing detailed explanations and code samples for each component and feature.

6. **Time Efficiency:** By using Bootstrap, developers can leverage the ready-made components and styling, reducing the amount of time spent on designing and coding common elements. This accelerates the development process and allows developers to focus more on the unique aspects of their project.

7. **Cross-Browser Compatibility:** Bootstrap is designed to be compatible with major web browsers, ensuring consistent rendering and functionality across different platforms. This helps to minimize the need for browser-specific CSS hacks and fixes.

Overall, Bootstrap simplifies the development of responsive and visually appealing websites by providing a comprehensive set of tools, components, and styles. It is suitable for both beginner and experienced developers and is widely adopted in the web development community.

3 SOFTWARE IMPLEMENTATION OF A BLOG WEBSITE

3.1 Program realization by HTML

The provided code is an HTML page that contains various elements and functionalities for a blog. Code listing in Appendix A.

The code includes a link to Google Fonts in the HTML head section. Google Fonts is a library of free and open-source fonts that can be easily incorporated into web pages. By including the Google Fonts link, the code is requesting the browser to load the specified font family called "Poppins" for use in the blog application.

The "Poppins" font family includes various font weights and styles, as indicated by the multiple URL parameters in the link. These parameters specify which font weights and styles should be loaded for the "Poppins" font.

For example:

```
<link href="https://fonts.googleapis.com/css2?family=Poppins:ital,wght@0,100;0,200;0,300;0,400;0,500;0,600;0,700;0,800;0,900;1,100;1,200;1,300;1,400;1,500;1,600;1,700;1,800;1,900&display=swap" rel="stylesheet">;
```

Font Awesome icons:

```
<link rel="stylesheet" href="https://use.fontawesome.com/releases/v5.15.3/css/all.css" integrity="sha384-SZXxX4whJ79/gErwcOYf+zWLeJdY/qpuqC4cAa9rOGUstPomtqpuNWT9wdPEN2fk" crossorigin="anonymous">;
```

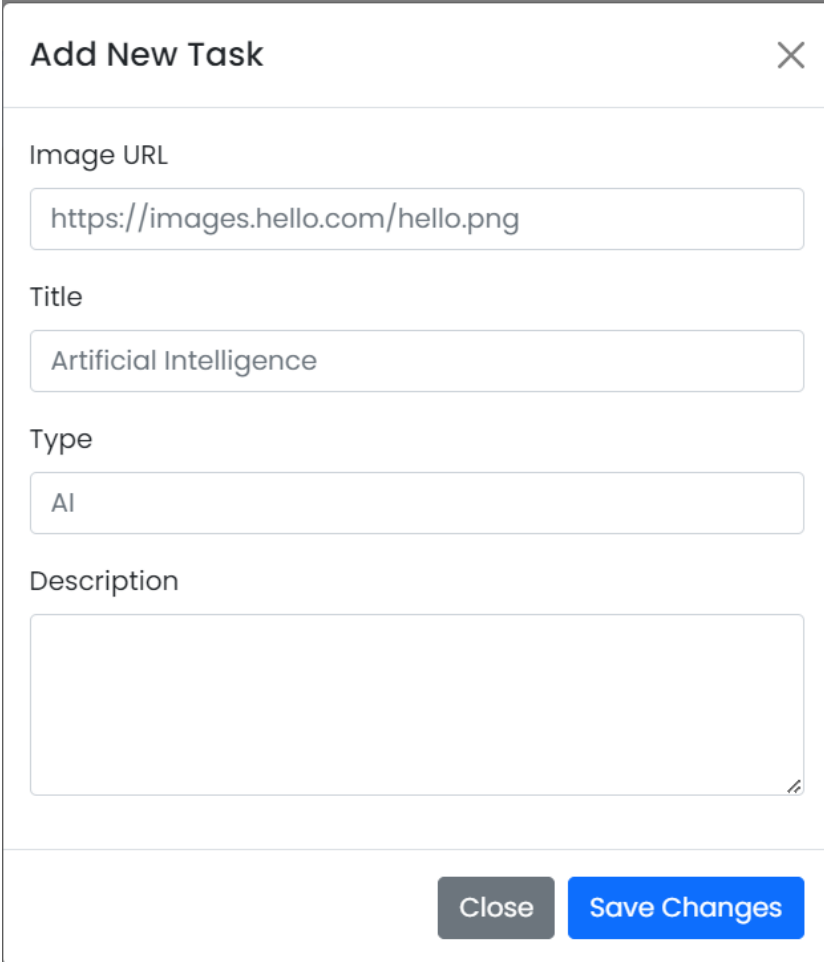
Bootstrap styles:

```
<link href="https://cdn.jsdelivr.net/npm/bootstrap@5.0.1/dist/css/bootstrap.min.css" rel="stylesheet">;
```

Custom Stylesheet: own custom stylesheet named Blog.css, and it is linked using the `<link rel="stylesheet" href="Blog.css">` tag.

Script Tags: In this section, various JavaScript files are included, such as Blog.js, Bootstrap scripts, and Popper.js.

Modal Windows “Add New” (see fig.3.1): This code includes two modal windows - `staticBackdrop` and `showblog`. Modal windows are pop-up windows that appear on top of the main content to display additional information or interact with the user.



Add New Task ✕

Image URL

Title

Type

Description

Figure 3.1 – Modal window



The image shows a screenshot of a web browser displaying a blog article. At the top right, there are two icons: a green pencil icon and a red trash can icon. Below these icons is a large image of the Java logo, which consists of a stylized coffee cup with steam rising from it, and the word "Java" written in a bold, sans-serif font below the cup. Underneath the logo, the word "Java" is written in a smaller, bold font. Below the title, there is a paragraph of text: "The latest version of Java is Java 20 or JDK 20 released on March, 21st 2023 (follow this article to check Java version on your computer). JDK 20 is a regular update release, and JDK 17 is the most recent Long Term Support (LTS) release of Java SE platform (about 8 years of support from Oracle)." Below the text, there is a blue button with the text "Program language". At the bottom right, there is a blue button with the text "Open Blog".

Figure 3.2 – An article with information



Figure 3.3 – Changing an article

Navigation Bar (navbar): This code includes a navigation bar that contains the "SOCIO - Blog" logo, an active "Home" page link, and various buttons, including a search form and a button to add new posts. There is also a social-media-buttons block that contains links to social media pages.

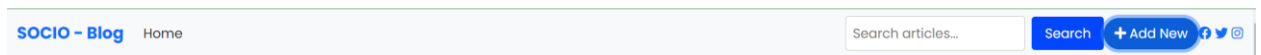


Figure 3.4 – Navigation Bar

Blog Content Container: This code includes a container that serves as the main container for the blog content. It is within this container that blocks with articles or other blog content will be placed.

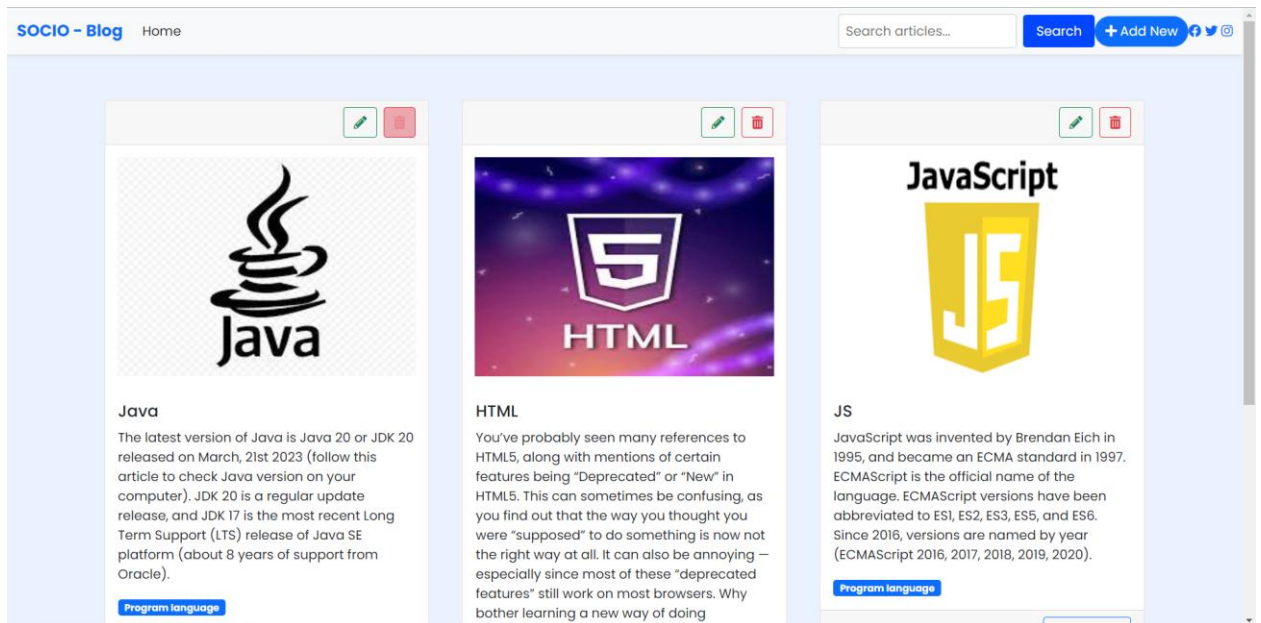


Figure 3.5 – Blog Content Container

Script Tags and Closing Tags: At the end of the code, the remaining scripts, such as Bootstrap and Popper.js, are included, and your JavaScript file Blog.js is also included. Finally, there are closing `</body>` and `</html>` tags.

This HTML code creates the basic structure and layout of the blog page, includes necessary resources and settings for proper functioning.

3.2 Program realization by JavaScript

The provided code includes JavaScript functions and event handlers for a blog application. Code listing in Appendix B. Let's go through each section:

Selecting Elements: The code selects the necessary elements from the HTML using `document.querySelector()` and assigns them to variables. The

`blogContainer` variable represents the container for the blog posts, and the `blogModal` variable represents the modal body for displaying individual blog posts.

Global Variables: The code initializes a global variable `globalStore` as an empty array. This variable will store the blog post data.

Creating a New Card: The `newCard()` function takes an object containing blog post data as input and returns the HTML markup for a new blog post card. The function uses template literals to dynamically generate the card's HTML structure based on the provided data.

Loading Data: The `loadData()` function retrieves data from the local storage (assuming it was previously saved) and populates the `blogContainer` with the saved blog posts. It converts the stringified data back into an object and uses the `newCard()` function to generate HTML for each blog post.

Updating Local Storage: The `updateLocalStorage()` function stores the current state of the `globalStore` array in the local storage. It uses `localStorage.setItem()` to save the data as a stringified object.

Save Changes: The `saveChanges()` function is triggered when the user clicks the "Save Changes" button in the modal. It retrieves the input values from the form fields, creates a new `blogData` object, generates the HTML for the new blog post using the `newCard()` function, appends the HTML to the `blogContainer`, and adds the new `blogData` object to the `globalStore` array. Finally, it calls `updateLocalStorage()` to update the local storage.

Delete Card: The `deleteCard()` function handles the deletion of a blog post card. It identifies the clicked card by extracting the target ID from the event object and removes the corresponding `blogData` object from the `globalStore` array. Then, it updates the local storage and removes the card from the DOM.

Edit Card: The `editCard()` function enables the user to edit the content of a blog post card. It extracts the relevant elements within the card using DOM traversal and modifies their attributes to enable content editing. It also changes the "Save Changes" button's functionality and appearance to allow for saving edits.

Save Edit Changes: The `saveEditChanges()` function is triggered when the user clicks the "Save Changes" button after editing a card. It updates the content of the card based on the edited data, updates the `globalStore` array, updates the local storage, and restores the button's original functionality and appearance.

HTML Modal Content: The `htmlModalContent()` function generates the HTML markup for displaying an individual blog post in the modal. It takes an object containing blog post data as input and returns the corresponding HTML structure.

Open Blog: The `openBlog()` function is triggered when the user clicks the "Open Blog" button. It extracts the blog post ID from the event object, retrieves the corresponding `blogData` object from the `globalStore`, and generates the HTML for displaying the blog post in the modal.

Search Functionality: The code includes event listeners and functions for handling the search functionality. When the user submits the search form, the `searchArticles()` function is called. It retrieves all the articles from the DOM and checks if the search term matches the article's title, category, or tags. Based on the match, it either shows or hides the article.

Event Listeners: The code attaches an event listener to the search form's submit event, which triggers the `searchArticles()` function.

This JavaScript code provides functionality for adding, editing, deleting, and searching blog posts. It uses the `globalStore` array to store the data and interacts with the DOM to display the blog posts and handle user actions.

3.3 Testing web-site

The test results of the blog application are as follows:

1. Adding new articles:

- After filling out the new article form and clicking the "Save Changes" button, the new article is successfully added to the blog.

- Correctly filled fields in the form, such as Image URL, Title, Type, and Description, are displayed in the respective sections of the new article.

- Information about the new article is also stored in the local storage to preserve the data between sessions.

2. Deleting articles:

- When clicking the delete button on an article card, the corresponding article is successfully deleted from the blog.

- The respective article is also removed from the local storage to maintain updated data.

3. Editing articles:

- When clicking the edit button on an article card, the corresponding fields of the article become editable.

- After making changes and clicking the "Save Changes" button, the modifications are reflected in the article.

- The made changes are also saved in the local storage to preserve the updated data.

4. Searching articles:

- When entering text in the search field and clicking the "Search" button, the articles that match the entered text in the title, category, or tags are displayed, while the rest of the articles are hidden.

- The search is performed in real-time as text is entered in the search field.

These results indicate the successful implementation of the functionality to add, delete, edit, and search articles in the blog. The application allows users to interact with the content, save changes, and find articles using the search feature.

CONCLUSIONS

During the execution of the bachelor's qualification work, a blog application was successfully developed. The ability to add new articles, delete, modify, and search existing articles was implemented. The program allows users to manage blog content conveniently and perform various actions with articles.

As a result of testing, it was found that the functionality of adding new articles works correctly. Users can fill out the article submission form, and after clicking the "Save Changes" button, a new article is added to the blog. The corresponding fields of the article, such as image URL, title, type, and description, are displayed in their respective sections of the new article. Article information is also stored in the local storage to preserve data between sessions.

Testing confirmed that the functionality of deleting articles works correctly. When the delete button on an article card is clicked, the corresponding article is successfully removed from the blog. The respective article is also deleted from the local storage to maintain updated data.

Furthermore, during testing, it was confirmed that the functionality of editing articles works correctly. When the edit button on an article card is clicked, the corresponding article fields become editable. After making changes and clicking the "Save Changes" button, the modifications are reflected in the article. The changes made are also saved in the local storage to maintain updated data.

Testing also confirmed that the functionality of searching articles works correctly. When text is entered in the search input and the "Search" button is clicked, articles that match the entered text in the title, category, or tags are displayed, while the rest of the articles are hidden. The search is performed in real-time as text is entered in the search input.

Therefore, the test results indicate the successful implementation of the functionality to add, delete, modify, and search articles in the blog. The application allows users to interact with content, save changes, and find articles using the search feature.

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APPENDIX A

```
<!DOCTYPE html>
<html lang="en">

<head>
  <meta charset="UTF-8">
  <meta http-equiv="X-UA-Compatible" content="IE=edge">
  <meta name="viewport" content="width=device-width, initial-scale=1.0">
  <!-- google fonts -->
  <link rel="preconnect" href="https://fonts.gstatic.com" />
  <link href="https://fonts.googleapis.com/css2?family=Poppins:ital,wght@0,100;0,200;0,300;0,400;0,500;0,600;0,700;0,800;0,900;1,100;1,200;1,300;1,400;1,500;1,600;1,700;1,800;1,900&display=swap" rel="stylesheet" />
  <!-- icons -->
  <link rel="stylesheet" href="https://use.fontawesome.com/releases/v5.15.3/css/all.css"
    integrity="sha384-SZXX4whJ79/gErwc0Yf+zWLeJdY/gpuqC4cAa9r0GUSTPomtqpuNWT9wdPEn2fk" crossorigin="anonymous" />
  <!-- bootstrap cdn -->
  <link href="https://cdn.jsdelivr.net/npm/bootstrap@5.0.1/dist/css/bootstrap.min.css" rel="stylesheet"
    integrity="sha384-+0n0xVW2eSR50omGNYDnhzAbDs0XxcvSN1TPprVMTNDbiYZCxYbOO17+AMvyTG2x" crossorigin="anonymous" />
  <!-- our stylesheet -->
  <link rel="stylesheet" href="Blog.css">
  <script type="Blog.js"></script>
  <title>Blog App</title>
</head>
```

```

<body onload="LoadData()">

<div class="modal fade" id="staticBackdrop" data-bs-backdrop="static" data-bs-keyboard="false"
  tabindex="-1" aria-labelledby="staticBackdropLabel" aria-hidden="true">
  <div class="modal-dialog">
    <div class="modal-content">
      <div class="modal-header">
        <h5 class="modal-title" id="staticBackdropLabel">Add New Task</h5>
        <button type="button" class="btn-close" data-bs-dismiss="modal" aria-label="Close"></button>
      </div>
      <div class="modal-body">
        <form>
          <div class="mb-3">
            <label for="imageurl" class="form-label">Image URL</label>
            <input type="url" class="form-control" id="imageurl" aria-describedby="emailHelp"
              placeholder="https://images.hello.com/hello.png">
          </div>
          <div class="mb-3">
            <label for="title" class="form-label">Title</label>
            <input type="text" class="form-control" id="title" placeholder="Artificial Intelligence">
          </div>
          <div class="mb-3">
            <label for="type" class="form-label">Type</label>
            <input type="text" class="form-control" id="type" placeholder="AI">
          </div>
          <div class="mb-3">
            <label for="description" class="form-label">Description</label>
            <textarea rows="4" class="form-control" id="description"></textarea>
          </div>
        </form>
      </div>
      <div class="modal-footer">
        <button type="button" class="btn btn-secondary" data-bs-dismiss="modal">Close</button>
        <button type="button" class="btn btn-primary" data-bs-dismiss="modal"
          onclick="saveChanges()">Save Changes</button>
      </div>
    </div>
  </div>
</div>

<!-- card modal -->
<div class="modal fade" id="showblog" tabindex="-1" aria-labelledby="showTaskLabel" aria-hidden="true">
  <div class="modal-dialog modal-lg">
    <div class="modal-content">
      <div class="modal-body blog__modal__body"></div>
      <div class="modal-footer">
        <button type="button" class="btn btn-secondary" data-bs-dismiss="modal">Close</button>
      </div>
    </div>
  </div>
</div>

```



```

<!-- navbar -->
<nav class="navbar navbar-expand-md navbar-light bg-light shadow-sm">
  <div class="container-fluid"> <a class="navbar-brand fw-bold text-primary" href="#">SOCIO - Blog</a>
    <button class="navbar-toggler" type="button" data-bs-toggle="collapse"
      data-bs-target="#navbarSupportedContent" aria-controls="navbarSupportedContent"
      aria-expanded="false" aria-label="Toggle navigation"> <span class="navbar-toggler-icon"></span>
    </button>
    <div class="collapse navbar-collapse" id="navbarSupportedContent">
      <ul class="navbar-nav me-auto mb-2 mb-lg-0">
        <li class="nav-item"> <a class="nav-link active" aria-current="page" href="#">Home</a>
        </li>
      </ul>
      <form id="search-form">
        <input type="text" id="search-input" placeholder="Search articles...">
        <button type="submit">Search</button>
      </form>
      <button type="button" class="btn btn-primary rounded-pill" data-bs-toggle="modal"
        data-bs-target="#staticBackdrop"><i class="fas fa-plus"></i> Add New</button>
      <div class="social-media-buttons">
        <a href="https://www.facebook.com/your-page" target="_blank"><i class="fab fa-facebook"></i></a>
        <a href="https://twitter.com/your-page" target="_blank"><i class="fab fa-twitter"></i></a>
        <a href="https://www.instagram.com/your-page" target="_blank"><i class="fab fa-instagram"></i></a>
      </div>
    </div>
  </div>
</nav>
<div class="container">
  <section>
    <div class="row blog__container mt-5 mb-3 ">
      </div>
    </section>
  </div>
<script src="https://cdn.jsdelivr.net/npm/@popperjs/core@2.9.2/dist/umd/popper.min.js"
  integrity="sha384-IQsoLXl5PILFhosVNubq5LC7Qb9DXgDA9i+tQ8Zj3iwWAwPtgFTxbJ8NT4GN1R8p"
  crossorigin="anonymous"></script>
<script src="https://cdn.jsdelivr.net/npm/bootstrap@5.0.1/dist/js/bootstrap.min.js"
  integrity="sha384-Atwg2Pkwv9vp0ygtn1JAoJH0nYbwNjLPhwyoVbhoPwBhjQPR5VtM2+xf0Uwh9KtT"
  crossorigin="anonymous"></script>
<script src="Blog.js"></script>
</body>
</html>

```

APPENDIX B

```

const blogContainer = document.querySelector( selectors: '.blog__container');
const blogModal = document.querySelector( selectors: ".blog__modal__body");
// global
let globalStore = [];

// -----
// a function for creating a new card
const newCard = ({
  id,
  imageUrl,
  blogTitle,
  blogType,
  blogDescription
}) => `
```

```
const loadData = () => {  
  
  // access localStorage  
  // localStorage.getItem("blog") === localStorage.blog  
  const getInitialData = localStorage.blog; // if null, then  
  if (!getInitialData) return;  
  
  // convert stringified-object to object  
  const {  
    |   cards  
  } = JSON.parse(getInitialData);  
  
  // map around the array to generate HTML card and inject it to DOM  
  cards.map(blogObject) => {  
    |   const createNewBlog = newCard(blogObject);  
    |   blogContainer.insertAdjacentHTML( position: "beforeend", createNewBlog);  
    |   globalStore.push(blogObject);  
  });  
};  
  
const updateLocalStorage = () => {  
  |   localStorage.setItem("blog", JSON.stringify( value: {  
  |     |   cards: globalStore  
  |   })))  
};
```

```

// create a function which will triggered on clicking on save changes in the modal
const saveChanges = () => {
  const blogData = {
    id: `${Date.now()}`, // generating a unique id for each card
    imageUrl: document.getElementById( elementId: 'imageurl').value,
    blogTitle: document.getElementById( elementId: 'title').value,
    blogType: document.getElementById( elementId: 'type').value,
    blogDescription: document.getElementById( elementId: 'description').value
  };

  const createNewBlog = newCard(blogData);
  blogContainer.insertAdjacentHTML( position: "beforeend", createNewBlog);

  globalStore.push(blogData);

  // API -> add to localStorage
  updateLocalStorage()
  // provide some unique identification, i.e key, here key is "blog",

};

// function for deleting a card -----

const deleteCard = (event) => {
  // id
  event = window.event;
  const targetID = event.target.id;
  const tagname = event.target.tagName; // BUTTON OR I

  // assign the same id of card to button also

  // search the globalStore, remove the object which matches with the id
  globalStore = globalStore.filter((blogObject) => blogObject.id !== targetID);

  updateLocalStorage();

  // access DOM to remove them

  if (tagname === "BUTTON") {
    // task__container
    return blogContainer.removeChild(
      | event.target.parentNode.parentNode.parentNode // col-lg-4
    );
  }

  // else
  // blog__container
  return blogContainer.removeChild(
    | event.target.parentNode.parentNode.parentNode.parentNode // col-lg-4
  );
};

```

```

// function for editing
const editCard = (event) => {

  event = window.event;
  const targetID = event.target.id;
  const tagname = event.target.tagName;

  let parentElement;
  if (tagname === "BUTTON") {
    parentElement = event.target.parentNode.parentNode;
  } else {
    parentElement = event.target.parentNode.parentNode.parentNode;
  }

  let blogTitle = parentElement.childNodes[5].childNodes[1];
  let blogDescription = parentElement.childNodes[5].childNodes[3];
  let blogType = parentElement.childNodes[5].childNodes[5];
  let submitBtn = parentElement.childNodes[7].childNodes[1];
  // console.log(taskTitle, taskDescription, taskType);

  // setAttributes
  blogTitle.setAttribute(qualifiedName: "contenteditable", value: "true");

  blogDescription.setAttribute(qualifiedName: "contenteditable", value: "true");
  blogType.setAttribute(qualifiedName: "contenteditable", value: "true");
  submitBtn.setAttribute(
    qualifiedName: "onclick",
    value: "saveEditChanges.apply(this, arguments)"
  );
  submitBtn.innerHTML = "Save Changes";

  // modal removed
  submitBtn.removeAttribute(qualifiedName: "data-bs-toggle");
  submitBtn.removeAttribute(qualifiedName: "data-bs-target");
}

```

```

const saveEditChanges = (event) => {

  event = window.event;
  const targetID = event.target.id;
  const tagname = event.target.tagName;

  let parentElement;
  if (tagname === "BUTTON") {
    parentElement = event.target.parentNode.parentNode;
  } else {
    parentElement = event.target.parentNode.parentNode.parentNode;
  }

  let blogTitle = parentElement.childNodes[5].childNodes[1];
  let blogDescription = parentElement.childNodes[5].childNodes[3];
  let blogType = parentElement.childNodes[5].childNodes[5];
  let submitBtn = parentElement.childNodes[7].childNodes[1];

  const updatedData = {

    blogTitle: blogTitle.innerHTML,
    blogDescription: blogDescription.innerHTML,
    blogType: blogType.innerHTML,
  }

  // console.log(updatedData);
  globalStore = globalStore.map((blog) => {
    if (blog.id === targetID) {
      return {
        id: blog.id,
        imageUrl: blog.imageUrl,
        blogTitle: updatedData.blogTitle,
        blogType: updatedData.blogType,
        blogDescription: updatedData.blogDescription,
      };
    }
    return blog; // important statement
  });

  updateLocalStorage();

  blogTitle.setAttribute(qualifiedName: "contenteditable", value: "false");

  blogDescription.setAttribute(qualifiedName: "contenteditable", value: "false");
  blogType.setAttribute(qualifiedName: "contenteditable", value: "false");

  // modal added
  submitBtn.setAttribute(qualifiedName: "onClick", value: "openBlog.apply(this, arguments)");
  submitBtn.setAttribute(qualifiedName: "data-bs-toggle", value: "modal");
  submitBtn.setAttribute(qualifiedName: "data-bs-target", value: "#showblog");

  submitBtn.innerHTML = "Open Blog";
}

```

```

const htmlModalContent = ({
  id,
  blogTitle,
  blogDescription,
  imageUrl,
  blogType
}) => {
  const date = new Date(parseInt(id));
  return ` <div id=${id}>
    <img
      src=${imageUrl}
      alt="bg image"
      class="img-fluid place__holder__image mb-3 p-4"
    />
    <div class="text-sm text-muted ">Created on ${date.toDateString()}</div>
    <h2 class="my-5 mt-5" style="display:inline;">${blogTitle}</h2>
    <span class="badge bg-primary">${blogType}</span>
    <p class="lead mt-2">
      ${blogDescription}
    </p></div>`;
};

const openBlog = (event) => {

  event = window.event;
  const targetID = event.target.id;

  const getBlog = globalStore.filter(({
    id
  }) => id === targetID);
  // console.log(getBlog[0]);
  blogModal.innerHTML = htmlModalContent(getBlog[0]);
};

const searchForm = document.getElementById('search-form');
const searchInput = document.getElementById('search-input');

searchForm.addEventListener('submit', function (event) {
  event.preventDefault();

  const searchTerm = searchInput.value.toLowerCase();
  searchArticles(searchTerm);
});

// Search articles
function searchArticles(searchTerm) {

  const articles = document.querySelectorAll('.article');

  articles.forEach(function (article) {
    const articleTitle = article.querySelector('.article-
title').textContent.toLowerCase();
    const articleCategory = article.querySelector('.article-
category').textContent.toLowerCase();
    const articleTags = article.querySelector('.article-
tags').textContent.toLowerCase();

    if (
      articleTitle.includes(searchTerm) ||
      articleCategory.includes(searchTerm) ||
      articleTags.includes(searchTerm)
    )
  }
}

```

```
    ) {  
      article.style.display = 'block';  
    } else {  
      article.style.display = 'none';  
    }  
  });  
}
```