Design and Analysis of A Web Based AI

Yanping Liu

School of Computer and Software, Jincheng College, Sichuan University, Chengdu 611731, China

Abstract: *In order to address the shortcomings of traditional food information carriers such as books, magazines, newspapers, etc. that are not suitable in the current digital age of information, a web-based food website has been developed. This food website is designed based on user needs, considering multiple aspects and referencing many food websites; Based on web front-end development technology and developed using the Vue.js framework, it is a website that can meet the needs of users of different regions and ages for food sharing, recipe information browsing, interactive rules compliance, aesthetics, and simplicity. In this food website, users can perform account management, like and post updates, click to view details, switch between different content page sections, and other operations.*

Keywords: Web; Vue.js; Food website.

1. REQUIREMENT ANALYSIS

Users of different age groups and regions need to receive food recommendations anytime and anywhere, and perform dynamic food sharing, recipe viewing, and other operations. With the digitization of information, the drawbacks of traditional paper printed food recipes and food sharing books, such as high cost, long publishing cycle, and inconvenient portability, have gradually emerged. Users need to receive the latest food information simply and conveniently. Affected by the increasing popularity of social media, users' demand for dynamic social interaction has increased in addition to receiving food information and viewing recipes. In addition, users also have a great demand for their own information security and account management. They can log in to the website based on their username and password, and log out to log out of browsing the website, ensuring the security of their account and user information. In computer vision, Yan et al. [1] proposed a convolutional neural network (CNN)-based mechanism for image super-resolution reconstruction, demonstrating improved reconstruction accuracy in high-performance computing environments. Similarly, Wu [7] optimized image classification models for cloud infrastructure by integrating elastic scaling, addressing computational resource allocation challenges. For medical applications, Huang et al. [4] developed a federated learning-based system for multi-institutional medical image analysis, ensuring data privacy while maintaining diagnostic accuracy. Further enhancing healthcare AI, Diao et al. [9] optimized Bi-LSTM networks to achieve higher lung cancer detection accuracy. In urban and logistics optimization, Zheng et al. [2] combined the Triz method with a GWO-SARIMA-LSTM hybrid model for urban building energy forecasting, while Wang and Li [5] utilized LSTM networks to dynamically optimize transportation logistics networks. Zhou et al. [19] improved automated garbage recognition models using ResNet-50 and weakly supervised CNNs, contributing to sustainable urban development. Economic and market analyses have also benefited from AI integration: Tang et al. [6] employed big data to qualitatively assess regional housing supply-demand imbalances in the US, and Chen et al. [13] explored the green innovation effects driven by the digital economy. Cloud computing and real-time processing advancements include Deng et al. [16], who designed a transformer-based framework for cloud-optimized financial fraud detection, and Xie et al. [20], who introduced an ultra-fast GPU-accelerated Top-K selection method for neural network acceleration. In natural language processing, Zheng et al. [23] conducted a comparative study of pre-trained models for named entity recognition, highlighting performance variations across architectures. Cross-disciplinary innovations are exemplified by Ren et al. [17], who integrated IoT and 3D pose estimation for athlete motion optimization, and Xu et al. [21], who developed AI-enhanced tools for cross-cultural game design.

2. USER ANALYSIS

2.1 Interface and Content

According to color psychology research, orange is beneficial for stimulating people's appetite, and a simple and beautiful page can enhance people's browsing desire. So this food website mainly uses orange as the main color tone, with a simple and clear layout design.

The target audience of this food website is widely distributed, mainly consisting of internet users aged 18-55, who are distributed throughout the country. People from different regions have different dietary characteristics, and

people of different ages have different preferences. So in order to cater to users of different age groups and regions, the website's food recipes, recommendations, sharing, and other content should have broad coverage and be classified differently.

2.2 Operability

The operation of a webpage by a user is the process of interaction between the user and the webpage. Analyze the purpose and needs of users who operate this website. These users operate the website to obtain food information, recipe information, etc., which can be classified as ordinary browsing. Therefore, this type of website needs to be simple and concise in operation, without the need for cumbersome or complex steps. Therefore, the operation design of this food website ensures that it meets the needs of users while being simple and clear.

3. SYSTEM ARCHITECTURE DESIGN

According to its functions, this food website is divided into five modules: security management module, article module, recipe module, and topic module. According to the page, this food website is divided into login/registration page, homepage, recipe page, selection page, health page, and topic page. Users can log in and register their accounts, switch between sections according to the navigation on the homepage, and perform functions such as browsing and reading articles, clicking on recipes, liking and posting topics. The specific website architecture diagram is shown in Figure 1.
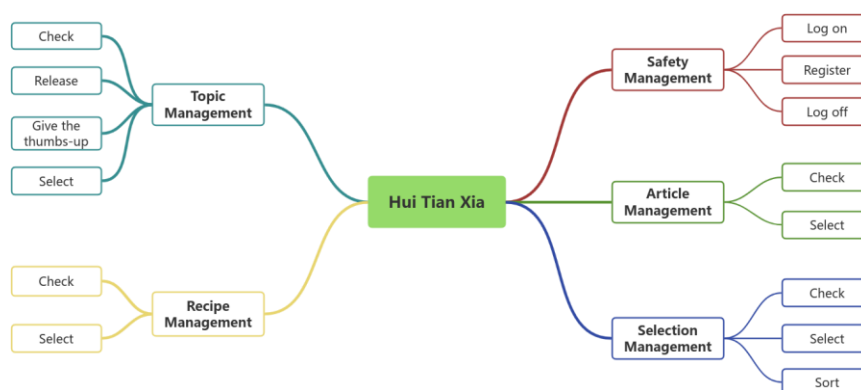

Figure 1: Website Architecture Diagram

4. CONCLUSION

4.1 Web front-end development technology

The technology of web front-end development and design has gradually become the key content of website production, which is indispensable. The relevant technical personnel of Internet website development and design can use these technologies to ensure that the website becomes dynamic [1]. Web front-end development utilizes JavaScript, CSS+HTML technology to develop responsive interactive websites. This food website adopts web front-end development technology, which has relatively low development costs and is easy to maintain in the later stage. In addition to high development efficiency, its user experience is also very user-friendly, friendly to major browsers, and has good rendering effects on web pages.

4.2 Data Driven Web Pages

Data driven web pages drive pages through data streams, replacing the method of driving pages by manipulating dome elements. Nowadays, almost many shopping websites, data information systems and other information websites or systems adopt data-driven web pages, which not only reduces the amount of code, but also makes it easier to maintain and update data in the later stage, laying a good foundation for the expansion of the website to a certain extent.

4.3 Vue.js Framework

Vue.js, as a framework for building user progressive interfaces, can be used for component development. This food website mainly uses Element UI components, which can also perform bidirectional data binding, making it very flexible, modular, and fast to run. Using Vue.js can eliminate tedious DOM operations by only focusing on the source of the data, without worrying about binding changes after DOM element changes [2]. In addition, the page is partially refreshed, and all data is not refreshed when the page is redirected, providing a good user experience.

5. FUNCTIONAL DESIGN

5.1 Login and Registration Function Design

Users can enter the website by entering the correct username and password on the login page, or register their account on the registration page.

The user enters their username and password in the input box on the login page.
Check if the username and password are empty, display a prompt message if they are empty;

If the username and password are not empty, compare them with the username and password stored in the backend data. If the password is incorrect, a prompt message will be displayed.

If the username exists and the password is correct, it will redirect to the website homepage. If the username does not exist, display a prompt message.

Users can enter the registration page by clicking on the registration link on the login page.

The user enters their username and password in the input box on the registration page.

Check if the username and password are empty. If they are empty, display a prompt message.

If the username and password are not empty, traverse the username stored in the backend data. If the username already exists, display a prompt message.

If the username does not exist, the password will be evaluated. If it does not meet the requirements, a prompt message will be displayed. If it meets the requirements, the user will be redirected to the login page.

5.2 Thumbs and Post Function Design

Users can click the like button below or dynamically post their favorite posts. When a user posts a dynamic page, use the Element UI component to input the edited topic and images smaller than 500 jpg / png into the topic area.

5.3 Function Design for Clicking to Display Details

In order to enhance the readability and aesthetics of web pages, the layout is mainly arranged with food images, article summaries, etc. Therefore, clicking on images or text can provide detailed views of recipes, food, and articles. This feature is implemented by using the < router link > tag for page redirection.

5.4 Functional design using recipe pages as an example

5.4.1 Design of Dynamic Picture Rotation Effect

Dynamic image rotation not only makes the page more beautiful, but also recommends hot information to users.

Create stopmove () and move () methods by concatenating < ul > by setting its style to style={'left ': calleft + 'px'}.

Create a timer in the move () method to control the startmove () method and change the calllet. By changing the value of calleft, the position of the image can be changed to achieve the effect of image rotation.

When the mouse hovers, trigger the stopmove () function to clear the timer, and the image stops moving. When the mouse moves out, trigger the startmove () method again, and the image continues to move.

In order to facilitate user browsing, two buttons have been added on the left and right sides of the carousel. Users can manually click the right (left) button to switch between the left and right sides of the carousel. Its function is achieved through:

If the value of calleft reaches a certain set value in the positive (negative) direction, it means that the last image has been reached, and the user will no longer be able to switch the image in the positive (negative) direction by clicking.

If the value of calleft does not reach the set value of positive (negative), the image will move to the corresponding position in the positive (negative) direction, thus achieving the dynamic effect of switching left and right in the carousel image.

5.4.2 V-show displays and hides sections
Users can click and categorize "Recipe Home", "Hot Dishes", "Cold Dishes", "Soup", "Main Dishes", and "Recommendations" in the secondary navigation bar of the recipe page. This function is mainly implemented using the v-show instruction, which achieves the effect of content transformation by displaying hidden content. The implementation steps are as follows:

First, create 6 < button > tags and 6 < div > tags, and add the click event @ click = change (num) (num = 0, 1, 2, 3, 4, 5) to the < button > tags.

Bind the button and the content to be displayed by using the < button > tag with class = "{new Style: num=number}" and the < div > tag with v-show ="num = number". The initial number is 0, so that every time the user enters the website, the content of the "recipe homepage" will be displayed.

When the user clicks on different buttons, the corresponding content bound to the button will be displayed, and other content will be hidden.

5.4.3 V-for List Rendering

On the recipe page, it is necessary to classify and display food recipe images. If the < li > tags are passed in one by one, it will not only increase the amount of code, but also be inconvenient for later maintenance and data updates. So, the v-for instruction was used in a < li > tag to pass in images and text through data (). This is also combined with the v-show command, allowing users to click on food recipes to display cooking methods and hide other content, thus achieving the operation effect of clicking to view details.

5.4.4 Top function design

In order to facilitate users to quickly return to the top of the page at the bottom of the page and proceed to the next step, a top function has been designed in the bottom right corner of the page. This feature is implemented through: Create a listener, where the top marker is hidden. When the listener hears that the scrolling distance of the page is greater than a certain value in pixels, the top marker in the lower right corner will be displayed.

When the user clicks the top button, the function is triggered, and the page scrolls up to the position of the parent level where the top tag is located, and the top flag is hidden.

In order to make the topping process smoother and more continuous, a timer was also created to control the speed of upward sliding, making this operation more aesthetically pleasing. When the page is heard sliding to a certain pixel distance from the parent level, the timer is cleared, the topping operation stops, and the topping flag is hidden.

5.4.5 Use of Element UI Components

The recommendation and classification of food dishes at the bottom of the page use the Element Ui component - Tabs tab. The usage method is to copy the code from the Element UI library to the code page and make appropriate adjustments. At this time, it is necessary to reset the theme color of the Element UI library and download the new

theme color file to replace the default file in the Vue framework. This operation greatly reduces the amount of code and enriches the functionality of the webpage.

5.4.6 Overall Layout View

The overall layout of the recipe page is T-shaped, with clear structure and prominent themes, providing users with a concise and beautiful experience. The switching between different sections is flexible. Users can categorize and view food recipes by clicking on the secondary menu, or by clicking on the tab below to select and categorize the recommended dishes on the website. Users can view detailed cooking methods by clicking on food recipe images or dish names. The homepage interface diagram of its recipe is shown in Figure 2.

Figure 2: Menu homepage interface diagram

6. CONCLUSION

This website is developed and researched using Vue.js framework based on web front-end development technology, which makes up for the shortcomings of traditional food recipe books and publications that have gradually become unsuitable with the development of information digitization, and meets the needs of users of different regions and age groups. The interface design of this food website is beautiful and simple, runs smoothly, and the functional design is relatively complete, which can meet the simple needs of users. However, this food website still needs to be further improved in some aspects. Next, we will improve the search function, third-party login function, and other functions to provide users with a better user experience.

REFERENCES

[1] Yan, H., Wang, Z., Xu, Z., Wang, Z., Wu, Z., & Lyu, R. (2024, July). Research on image super-resolution reconstruction mechanism based on convolutional neural network. In Proceedings of the 2024 4th International Conference on Artificial Intelligence, Automation and High Performance Computing (pp. 142-146).
[2] Zheng, S., Liu, S., Zhang, Z., Gu, D., Xia, C., Pang, H., & Ampaw, E. M. (2024). Triz method for urban building energy optimization: Gwo-sarima-lstm forecasting model. arXiv preprint arXiv:2410.15283.
[3] Li, T. (2025). Optimization of Clinical Trial Strategies for Anti-HER2 Drugs Based on Bayesian Optimization and Deep Learning.
[4] Huang, S., Diao, S., Wan, Y., & Song, C. (2024, August). Research on multi-agency collaboration medical images analysis and classification system based on federated learning. In Proceedings of the 2024 International Conference on Biomedicine and Intelligent Technology (pp. 40-44).
[5] Wang, J., & Li, X. (2024). Dynamic Optimization of Transportation Networks in Logistics Using Long Short-Term Memory Neural Networks.
[6] Tang, Y., Zhao, S., & Yanjun, C. (2024). Regional Housing Supply and Demand Imbalance Qualitative Analysis in US based on Big Data.
[7] Wu, W. (2025). Optimizing Image Classification Models for Cloud Infrastructure with Elastic Scaling.
[8] Ge, J. (2022). The Failure of International Diplomacy and Economic Sanctions in Response to Japan's Aggression in East Asia, 1931-1937. Available at SSRN 4817444.

[9] Diao, S., Wan, Y., Huang, D., Huang, S., Sadiq, T., Khan, M. S., ... & Mazhar, T. (2025). Optimizing Bi-LSTM networks for improved lung cancer detection accuracy. PLOS ONE, 20(2), e0316136.

[10] Yao, T. (2024, August). Research on the Local Head Loss Coefficient in Short-Tube Hydraulic Testing. In 2024 3rd International Conference on Applied Mechanics and Engineering Structures (AMES 2024) (pp. 89-97). Atlantis Press.

[11] Xiangyu, G., Yao, T., Gao, F., Chen, Y., Jian, X., & Ma, H. (2024). A new granule extrusion-based for 3D printing of POE: studying the effect of printing parameters on mechanical properties with "response surface methodology". Iranian Polymer Journal, 1-12.

[12] Zhao, S., Lu, Y., Gong, C., & Xu, Q. (2025). Research on Labour Market Efficiency Evaluation Under Impact of Media News Based on Machine Learning and DMP Model.

[13] Chen, K., Zhao, S., Jiang, G., He, Y., & Li, H. (2025). The Green Innovation Effect of the Digital Economy. International Review of Economics & Finance, 103970.

[14] Meng, Q., Wang, J., He, J., & Zhao, S. (2025). Research on Green Warehousing Logistics Site Selection Optimization and Path Planning based on Deep Learning.

[15] Chen, Y., Yao, R., Hassanieh, H., & Mittal, R. (2023). {Channel-Aware} 5g {RAN} slicing with customizable schedulers. In 20th USENIX Symposium on Networked Systems Design and Implementation (NSDI 23) (pp. 1767-1782).

[16] Deng, T., Bi, S., & Xiao, J. (2025). Transformer-Based Financial Fraud Detection with Cloud-Optimized Real-Time Streaming. arXiv preprint arXiv:2501.19267.

[17] Ren, F., Ren, C., & Lyu, T. (2025). Iot-based 3d pose estimation and motion optimization for athletes: Application of c3d and openpose. Alexandria Engineering Journal, 115, 210-221.

[18] Zhou, Y., Wang, Z., Zheng, S., Zhou, L., Dai, L., Luo, H., ... & Sui, M. (2024). Optimization of automated garbage recognition model based on resnet-50 and weakly supervised cnn for sustainable urban development. Alexandria Engineering Journal, 108, 415-427.

[19] Xie, X., Luo, Y., Peng, H., & Ding, C. RTop-K: Ultra-Fast Row-Wise Top-K Selection for Neural Network Acceleration on GPUs. In The Thirteenth International Conference on Learning Representations.

[20] Xu, Y., Shan, X., Lin, Y. S., & Wang, J. (2025). AI-Enhanced Tools for Cross-Cultural Game Design: Supporting Online Character Conceptualization and Collaborative Sketching. In International Conference on Human-Computer Interaction (pp. 429-446). Springer, Cham.

[21] Yang, Y., Li, I., Sang, N., Liu, L., Tang, X., & Tian, Q. (2024, September). Research on Large Scene Adaptive Feature Extraction Based on Deep Learning. In Proceedings of the 2024 7th International Conference on Computer Information Science and Artificial Intelligence (pp. 678-683).

[22] Zheng, Z., Cang, Y., Yang, W., Tian, Q., & Sun, D. (2024). Named entity recognition: A comparative study of advanced pre-trained model. Journal of Computer Technology and Software, 3(5).