

<HealthBite/HB>

Requirements analysis and idea formulation

Digital Media and Design course

Version 0.0.1

Date	Version	Description	Author
2024.15.10	0.0.1	We finished writing problem research and analysis and possible project limitations	Ksenija and Anna
2024.12.11	0.0.2	We added Software specification	Anna and Ksenija
2024.10.12	0.0.3	Added developmental plan	Anna and Ksenija
2025.20.05	0.0.4	Added written reports, testing report, updated the references, formatted the document	Ksenija and Anna

All authors: Anna and Ksenija

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Problem research and analysis

At first, Anna and I mostly focused on what kind of project we should create based on our personal interests. Anna enjoys cooking, while I am interested in tracking progress at the gym and maintaining a healthy diet. After some discussions and exploration of various idea ranges in other fields such as chemistry and physics we came up with an idea that would combine both of our interests: a nutrition-based recipe generator. This idea allowed us to blend Anna's love for culinary arts with my focus on fitness and nutrition, making it a practical and engaging project for both of us.

We wanted to make a project that would not only fulfil our interests, but also provide something useful and valuable to users who care about both fitness and diet. From my experience I've noticed that many people struggle with maintaining a healthy diet particularly when it comes to balancing nutritional requirements with taste for better progress at the gym. On the other hand, Anna expressed that while cooking can be enjoyable, it often becomes a challenge to come up with recipes that align with specific criteria, especially when considering dietary restrictions and the available ingredients. By merging these two aspects, we realised we could create a tool that would allow people to meet their fitness goals through personalised meal planning, without having to sacrifice the joy of cooking or eating delicious food.

After settling on the concept, we started discussing the main functionalities of the recipe generator. Our primary intention is to design a user-friendly platform where users can input specific dietary goals, such as calorie intake, macronutrient ratios, ingredient preferences and restrictions and ingredient availability. One of the key elements of our project is to incorporate filter algorithms into the recipe generator to help users find meals that fit their specific needs. Users will be able to filter recipes based on dietary restrictions they follow. Additionally, users can input specific nutrition goals—like calorie limits and macronutrient targets (protein, carbs, fat)—so that the system can recommend recipes that align with their personal fitness objectives. The system would also feature an algorithm to find the top meals from a list of websites that we will choose.

Another important feature will be the account creation process, where users provide their basic information, including weight, height, age, gender, and their weight or fitness goals. This data will help us create more tailored nutritional plans. A personalised account would allow the user to track their progress over time and adjust their nutritional goals as needed. The platform would offer users the ability to add all their criteria—from dietary restrictions and nutritional goals to ingredients they have at home—before finding the best recipes.

We also plan to include a notifications feature. Users will receive notifications with recommended meals based on their past selections, progress, and goals. This will make the platform more dynamic and engaging, ensuring that users receive updates and meal suggestions that keep them on track with their diet plans.

Software specification

1.1 Epic definition

Epic value statement

For gym goers and cooks

who care about both fitness and diet

the HealthBite.com

is a website with recipe generator

that finds recipes based on requirements for calorie intake, macronutrient ratios, ingredient preferences and restrictions and ingredient availability

unlike Nutrition.gov

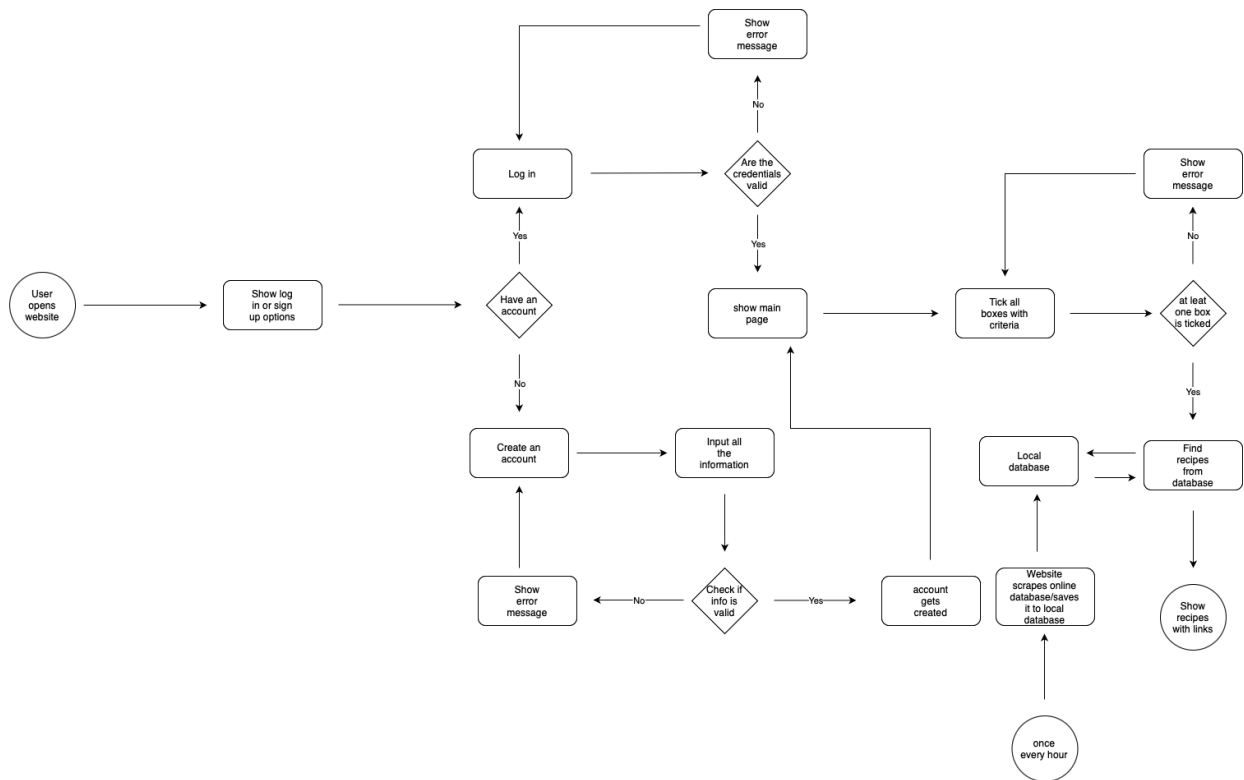
our solution is also focused on micronutrients and products that you already have at home

1.2. Business process model

1. User opens the online recipe generator website.
2. If it's a registered user show the login page
 - 2.1 Check in database if user with these credentials is present
 - 2.2 If yes proceed with login
 - 2.3 If not go to create an account
3. Create an account with all their info. (height, weight, age, gender)
 - 3.1 Website checks if all the info is valid
 - 3.2 If its valid create an account
 - 3.3 If not valid show an error message
4. Tick all the boxes with the criteria for the recipes
 - 4.1 Website checks if at least one box is ticked
 - 4.2 If ticked show the recipes
 - 4.3 If not show error message
5. Website finds recipes from its database
 - 5.1 Once an hour the website scrapes the online database for information and saves it to local database

6. Website shows all the recipe options with links

1.3. Process diagram



1.4. Defining requirements

Functional requirements:

1. The system shall allow users to create an account by providing personal information, including height, weight, age, and gender.
2. The system shall validate user credentials during the login process against stored database records.
3. The system shall display relevant error messages when login credentials are invalid or if the account creation fails due to invalid information.
4. The system shall maintain user session states, allowing logged-in users to remain authenticated during their session.
5. The system shall provide checkboxes for users to select dietary criteria and preferences for recipe generation.
6. The system shall ensure that at least one dietary criteria checkbox is selected before proceeding to display recipes.
7. The system shall show recipes based on the selected criteria.
8. The system shall display all available recipe options with clickable links for users to view detailed recipes.
9. The system shall allow users to view and edit their personal information and preferences from their profile.
10. The system shall provide a password recovery mechanism for users who forget their passwords.
11. The system shall allow users to delete their accounts if they choose to no longer use the service.
12. The system shall ensure that the website is responsive across different devices (e.g., desktop, tablet, mobile).
13. Users should be able to log and track their dietary habits and nutritional intake over time.

Non-functional requirements:

1. The system shall respond to user login requests within 10 seconds under normal operating conditions.
2. The system shall be available 99.9% of the time, excluding scheduled maintenance windows.
3. The system shall use encryption to protect user data during transmission, and passwords shall be hashed in the database.
4. The system shall ensure that all user data is accurate and consistent throughout the account creation and recipe generation processes.
5. The user interface shall have a clean and intuitive design that allows users to easily navigate through the login, registration, and recipe selection processes.

6. The system shall be designed to allow for easy updates and scaling, with a modular architecture to facilitate maintenance and feature enhancements.
7. The system shall be compatible with the latest versions of major web browsers and responsive across multiple devices.
8. The system shall comply with relevant legal requirements, such as data protection laws.
9. The system shall ensure that the website is accessible across different devices (e.g., desktop, tablet, mobile).
10. The system shall present the generated recipe options to users within 10 seconds after criteria selection.
11. The system shall connect to a centralized database to store user information.

To build the **HealthBite** platform, we selected a combination of widely-used programming languages and frameworks that support both back-end and front-end web development:

Python

- Used for back-end logic and server-side processing.
- Chosen due to its simplicity, readability, and extensive libraries (e.g., Flask, BeautifulSoup).
- Ideal for building lightweight APIs and handling tasks like recipe scraping and nutritional data processing.

JavaScript

- Used for front-end interactivity and client-side scripting.
- Enables dynamic content updates, user input validation, and improved user experience.

HTML

- Provides the structural foundation of all web pages in the application.
- Ensures semantic structure and compatibility across devices and browsers.

Bootstrap (CSS Framework)

- Used for responsive design and fast UI development.

- Allows the site to adapt to different screen sizes and ensures a consistent, mobile-friendly layout.

Developmental plan

Deadline	Expected results	Comments
14.01.2025	Users can create an account	
30.01.2025	System provides checkboxes for users to select criteria	
05.02.2025	System checks if at least one dietary criteria checkbox is selected	
10.03.2025	System shows personalized recipes based on the selected criteria and provides links to the source	
15.03.2025	Create a database	
17.03.2025	Add input validation for the sign-up form	
23.03.2025	Add a password reset mechanism	
04.05.2025	Add a BMI and calorie calculator to the platform	
15.03.2025	Add a set amount of recipes for the checkboxes	

Testing report

https://docs.google.com/document/d/1jJIZX_XAIrkT6VNhe-Mt_ERNnztnrTzT08okLb_FMCeE/edit?usp=sharing

References

1. Bootstrap. (n.d.). *Introduction*. Retrieved from <https://getbootstrap.com/docs/5.3/getting-started/introduction/Bootstrap+6>
2. OpenAI. (2025). *ChatGPT (May 2025 version)* [Large language model]. <https://chat.openai.com/>
3. Our github repo. <https://github.com/ksuyrash/HealthBite>

Written report

Anna:

This project aimed to create an end-to-end web-based system that enables users to track their food preferences, see personalized recipes, and track their nutritional trends. The system was written with functional and non-functional requirements so as to enable usability, security, and performance. Throughout the development process, teamwork was essential, but, ultimately, the project did not end up as well as we initially hoped.

The primary objective was to develop an easy-to-use site where users would be free to create accounts by submitting their individual details such as height, weight, age, and gender. Users could login, reset passwords, update their profiles, and delete accounts, promoting user autonomy and data privacy. To enhance customization, the system featured diet option checkboxes to restore potential recipes along with BMI and calorie counters to allow users to monitor their health. The site was rendered fully responsive on all devices. Fast response times and high system availability were also part of the project's requirements, as usual with non-functional requirements.

We collaborated as a team throughout the development process, covering tasks such as design, coding, testing, and deployment. Coordination of the team was mostly efficient although it was characterized by poor planning and regular

communication. Better planning would have helped workflows, clarified responsibilities, and prevented some misunderstandings during implementation.

Some of the challenges involved making sure that health calculators were smoothly integrated into the user interface and making sure the responsive design worked well across devices. Through these challenges, continued testing and peer review ensured that aspects of the system improved as development continued.

The initial plan envisioned a feature-rich system with features such as web scraping external websites for dynamic recipe retrieval, personal meal planning, and detailed nutritional analysis. For reasons of time and scope, we focused on essential features: user registration, authentication, profile handling, choosing dietary options, displaying a certain list of recipes, and health calculators.

So, while the site has login, registration, password reset, dietary needs checkboxes, and a static number of recipes, it lacks more advanced features like dynamic recipe updating via data scraping from outside or recommendation based on user history. The project succeeded in the basic goals but was not able to reach its original vision of a highly dynamic meal planner.

Looking back, the project was not as successful as we had hoped. The site is functional, secure, and responsive, satisfying most of the basic requirements, but not as comprehensive or advanced as originally envisioned. Planning and scope limitations kept the full potential of the system from being developed.

In spite of these drawbacks, we learned a lot about project management, team work, and technical growth. In the future, finer planning, improved communication, and well-defined goal-setting are necessary to bring more successful projects. On the whole, the project managed to reach a functional prototype without a broader extent.

Ksenija:

This project aimed to build a full-stack web-based system that enables users to manage their food preferences, receive personalized recipe suggestions, and monitor nutritional data such as BMI and calorie intake. We emphasized both functional and non-functional requirements to ensure a smooth, secure, and user-friendly experience. The system is fully responsive, maintains performance standards, and meets key usability goals.

I was responsible for implementing nearly all core components of the system — including user registration, login, password reset, health calculators, and system responsiveness. The only feature I did not handle was the dietary checkboxes used for filtering recipes based on user preferences. Everything else, from frontend design to backend logic and database integration, was developed and maintained by me.

A major technical challenge I encountered was ensuring that password changes were successfully stored in the database. While the reset process on the interface seemed straightforward, ensuring that the new password was correctly encrypted,

validated, and persisted in the database took multiple iterations. Debugging this issue involved careful handling of password hashing, database update queries, and user session consistency. This was by far the most difficult part of the project.

The initial vision included more advanced features like recipe scraping from external sources and personalized meal planning based on user history. Due to time and resource constraints, the final system focused on the essentials: secure authentication, health tracking, and recipe presentation based on preset data.

Overall, the system meets the most important functional and non-functional requirements. It is stable, secure, and responsive across devices, though the scope is narrower than we initially imagined. Looking back, the project could have benefited from better planning and earlier feature prioritization, especially as I was handling most of the workload.

Despite the setbacks, I gained valuable experience in full-stack development, project structuring, and database security. This project pushed me to solve real-world problems and deepen my understanding of web systems. Going forward, I will prioritize more detailed planning and earlier testing to avoid bottlenecks late in development. Still, I'm satisfied with the outcome, especially considering the amount of work completed individually.