Nosedive



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# Design specification

## **5.1 Project Recap**

**Short Summary of Project Idea:**

**Nosedive is a social media web application that allows users to** users to rank each other using a 5-star grading system. The core concept revolves around integrating social validation, hierarchy, community building, and competitive aspects into a social media platform. My application aims to provide users with a novel way to gauge the personality and social credibility of others in the online community.

**Aims and Objectives:**

* **Create a User-Rating Feature: Implement a 5-star rating system for users to evaluate each other, enhancing the depth of social interactions online.**
* **Create a Responsible Online Community: I will use university credentials for user authentication to promote accountability and prevent misuse.**
* **Apply Agile Development Methods: I will create Kanban and Test-Driven Development (TDD) for flexible and iterative software creation.**
* **Prioritize Usability and Accessibility: I will design an intuitive interface adhering to web accessibility standards to cater to a wide user base.**
* **Create Fair Rating Algorithms: Integrate algorithms like Weighted Moving Average and Elo Rating or** Bayesian Average **system for a fair rating process.**
* **Ensure Privacy and Security: Focus on data protection and user privacy and especially the handling of sensitive login information.**

## **5.2 Software requirements**

### 5.2.1 User Requirements

* Intuitive Interface: My app should be straightforward and easy for users to navigate.
* Secure Login: Incorporation of university credentials for secure and reliable user login.
* Interactive Rating Feature: A system enabling users to assign ratings to their peers, using a 5-star scale.
* Review Functionality: Allowing users to provide feedback accompanying their ratings.
* Discover and Explore: Tools for users to find and connect with new profiles.
* Profile Customization and Viewing: Enabling users to modify their profiles and view their interaction history, including received ratings and feedback.
* Control over Privacy: Users should have the ability to manage the visibility of their personal ratings and feedback.
* User Contact Feature: A section for users to seek support or assistance.

### 5.2.2 Requirements Specification

* User-Friendly Design: An accessible and straightforward design for all user interfaces.
* Storage and Handling of Data: Employing NoSQL databases to manage user profiles, interactions, and associated data.
* Adaptability and Growth: Ensuring the system can accommodate an increasing user base.
* Data Protection: Stringent security protocols to safeguard user information.
* Universal Compatibility: I will ensure consistent functionality across diverse devices and web browsers.
* Dynamic Rating Updates: System designed to show rating changes in real time.
* Legal Compliance: My application will adhere to prevailing data protection and privacy regulations.

### 5.2.3 Functional Specification

* **Login Module:**
  + Implementation of secure login using university credentials.
  + Authentication process to verify the identity of users.
* **Rating and Review Module:**
  + Users can rate others on a scale of 1 to 5 stars.
  + Mandatory feedback section for any rating given.
  + Algorithm to calculate and display average user ratings.
* **User Profile Module:**
  + Personalized user profiles showing ratings, feedback, and basic information.
  + Options to edit profile details and privacy settings.
* **Search and Discovery Feature:**
  + Search bar to find users.
  + Suggested users feature based on user interactions and interests.
* **Homepage and Dashboard:**
  + Dynamic homepage displaying top rated users and recent activity.
  + Personalized dashboard for users to view their ratings and feedback.
* **Contact Page:**
  + Contact form linked to email and telephone support.

## 5.3 System Design

### 5.3.1 Use case Diagrams

Use case diagram showcases the rating of other users on the web application[1].

Figure

A diagram of a customer review

Description automatically generated

Use case diagram showcases the user using the search and discover page to find user ratings.

Figure

A diagram of a user

Description automatically generated

### 5.3.2 UML diagram

object-oriented class diagrams / UML[2]:

Figure

A diagram of a program

Description automatically generated with medium confidence

### 5.3.3 Pseudocode

Pseudocode for Bayesian Average algorithm which is used to avoid extreme ratings when there's insufficient data:

Figure

A screenshot of a computer program

Description automatically generated

### 5.3.4 Flow chart

Flow chart below shows the rating system in the web application[3]:

Figure

A diagram of a process

Description automatically generated

## 5.4 Experimental design

### 5.4.1 Description of Experimental Process

**Experiment:**

* I will have university students from various courses join. This will ensure a diverse test group.
* I will conduct a session to familiarize users with NOSEDIVE's features and the purpose of the study.
* I will allow participants to use NOSEDIVE for a set period, encouraging them to explore all features.
* I will monitor the user interactions within the app, focusing on how they engage with the 5-star rating system and other functionalities in the app.
* At the end of the usage period, I will collect user feedback through surveys, interviews, or focus groups.

### 5.4.2 independent / dependent variables

* **Independent Variables:**
* Features within the app (e.g., the 5-star rating system).
* User authentication method (the university credentials vs. standard methods).
* **Dependent Variables:**
* User engagement (measured by time spent, frequency of use, interactions).
* User feedback and perceptions (I will gather from post-use surveys or interviews).

### 5.4.3 Experimental Confounds

* **User Preferences:** Individual preferences for certain types of social media interactions.
* **Technical Variability:** Differences in user experience due to device type or internet connection.
* **External Social Influences:** Any current social media trends or events that might influence user behaviour.

### 5.4.4Evaluation of Output

* Interaction Data Review: I will analyse how users interact with the app, focusing on engagement with the rating system.
* User Feedback Analysis: I will assess feedback for insights into user satisfaction, perceptions, and suggested improvements.
* Comparative Review: I will examine differences in user behavior and feedback based on the independent variables.
* Technical Assessment: Assess any reported technical issues or challenges faced by users during the testing period.

### 5.4.5 Development process/ methodology

For the development of Nosedive, I will be using Node.js[4] for its efficiency in back-end processing, crucial for real-time user interactions. The front-end will be powered by JavaScript, ensuring a seamless and responsive user experience. I will employ a NoSQL [5] database like MongoDB for its flexibility with diverse data types which is needed for managing user profiles, ratings, and reviews.

For me to refine the user rating system, algorithms such as Weighted Moving Average and Elo Rating System will be used, providing a dynamic and fair representation of user profiles. The development approach will be guided by Test-Driven Development (TDD) [6], ensuring high-quality and efficient code.

I will use GitHub as a version control system, facilitating smooth collaboration and rapid iterations. The user authentication will be integrated with university credentials to ensure security and credibility.

In post-development, the app will undergo rigorous testing, including personal testing, user testing sessions, and surveys to gather broad user insights. This will be complemented by integration testing to ensure seamless functionality. This comprehensive approach aims to deliver a unique and engaging social media experience through Nosedive.

# Prototype documentation

GitHub Link: https://github.com/Goldsmiths-Computing-Project/Computing-Project

## 5.5 Minium viable products

In developing the prototype for "Nosedive," I will follow a structured approach, starting with low-fidelity wireframes and progressing to high-fidelity prototypes. This prototype will encompass the core functionalities vital for the MVP:

* **User Profile Page**: Displays user information, ratings received, and reviews. This is where users can view and manage their own ratings and feedback.
* **Rating System**: This feature allows users to rate others using the 5-star system. This is the central element of the app, reflecting the core concept of social validation and hierarchy.
* **Review Mechanism**: It lets users leave feedback or comments on others, providing context to the ratings.
* **Search and Discover**: This enables users to find and interact with other profiles. This includes features like User Directory and Suggested Profiles.

## 5.6 Core Technologies Used:

* **Node.js**: For building the back-end functionality, handling user interactions, and data processing.
* **JavaScript**: To create dynamic and responsive front-end elements.
* **NoSQL Database (like MongoDB)**: I will be storing and managing user data, including profiles, ratings, and reviews.
* **GitHub**: I will use for version control and collaborative development.
* **Agile Development Practices**: For employing methodologies like Test-Driven Development (TDD) and regular user testing sessions.

## **5.7 Low fidelity wireframes**

The Low fidelity wireframe acts as my initial concept of the website. This will allow me to visualize my concepts and ideas in early stage and to see if we have any improvements or innovations. Also, it helps me to focus on the functionality of the website instead of the look of it.

Home Page:

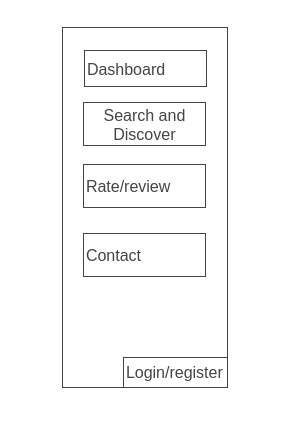
Figure

A screenshot of a browser window

Description automatically generated

Menu bar:

Figure



User profile page:

Figure

A screenshot of a computer

Description automatically generated

## 5.8 Mid/HIGH-FIDELITY wireframes

Home Page:

Figure

A screenshot of a web page

Description automatically generated

Login:

Figure

A screen shot of a sign up form

Description automatically generated

Figure

A screen shot of a computer code

Description automatically generated

Figure 11 shows the Bayesian Average function, a method to estimate an average rating by combining individual item ratings with a global average. The function accepts three parameters: an array of rating objects (ratings), a predetermined global average rating (globalAverage), and a confidence value (confidence). Each rating object in the ratings array contains a rating value and a count indicating the number of times that rating was given.

## 5.8 Prototype Testing

My prototype of the "Nosedive" web application underwent rigorous testing to validate its functionality and ensure adherence to the defined MVP features. The testing process incorporates both automated and manual methods and creating the core technologies outlined in the project plan, such as Node.js, JavaScript, and NoSQL databases.

1. **Automated Testing:**
   * Automated tests were developed using Node.js frameworks, which facilitated unit and integration testing of the application's back-end functionalities.
   * Key features like user authentication via university credentials, user profile management and the rating and review system were automated tested. These tests validated the correct functioning of the algorithms and database interaction. Especially the implementation of algorithms like the Weighted Moving Average and Bayesian Average.
   * I tested NoSQL database to ensure accurate data handling, storage, and retrieval, focusing on user profiles, ratings, and reviews.
2. **Manual Testing:**
   * I tested the web application in various web browsers and on multiple devices to assess its front-end functionality and responsiveness. This included JavaScript-driven interactions and UI elements.
   * Manual testing involved creating user profiles, using the rating and review system, and navigating through the search and discovery features.
   * I gave special attention to the application’s usability and user interface, ensuring that the design heuristics, such as simplicity, feedback, affordances, consistency, and error prevention, were effectively implemented.
3. **User Experience Evaluation:**
   * I evaluated the application for user experience on different screen sizes and devices to identify any issues in responsiveness and accessibility.
   * I created feedback systems to test to ensure that users could easily understand and use the rating system, manage their profiles, and interact with other features like search and discovery.

## 5.9 Progress report and updated plan

**Current Status:**

**Prototype Development:**

* The core functionalities of 'Nosedive,' including user authentication via university credentials, profile management, and the 5-star rating system have been created using Node.js and JavaScript.
* The NoSQL database has been created for handling, storing user data, rating and reviews.

**Challenges:**

* The integration of certain advanced features like the Bayesian Average and Weighted Moving Average algorithms faced initial problems but has been fixed.
* I made some minor deviations from the initial proposal were made based on preliminary testing feedback and practical considerations.

**Testing and User Feedback:**

* I did manual testing on various browsers and devices has provided valuable insights into the front-end user experience and interface design.
* The user feedback particularly regarding the usability and interface design has led to iterative improvements in the application.

**Risk Management:**

* I identified risks that include potential technical glitches and data security concerns. We have implemented robust security measures in our Node.js backend and will continue to monitor and address any vulnerabilities.
* I have contingency plans to tackle unexpected technical challenges and data breaches.

**Updated Plan:**

Figure

**A screenshot of a project

Description automatically generated**

## 6 Ethical considerations

**Involvement of Human Participants:**

* Since my application allows users to rate each other using a 5-star grading system then it directly involves human participants. This introduces ethical concerns related to social impact, privacy, and potential emotional or psychological effects on users.
* Ethical concerns may arise from the way users perceive and react to ratings. High or low ratings could impact a user's self-esteem or social standing within the community.
* To address this issue, I need to make guidelines and rules to prohibit abusive conduct on my web application.

**Handling of Personal Data (GDPR Compliance):**

* My application requires users to log in using university credentials which means handling sensitive personal data. Under GDPR [7], I am obligated to ensure the security and privacy of this data.
* I should include clear consent forms explaining how user data will be used and ensuring users are aware of their rights under GDPR. This includes the right to access their data, the right to be forgotten, and the right to data portability.
* I need to ensure transparent communication[8] with users about how their data is used, stored, and protected. I will include clear and understandable privacy policies and terms of service.

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