FINAL PROJECT PROPOSAL

Global Bites: Exploring Food Through Culture and History

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PREPARED FOR

COMS 3190 - Construction of User Interfaces

Iowa State University Computer Science Department

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1. Introduction

We, Alex Stoner and Batuhan Sonmez, are from team IP5. We're both juniors; Alex is a Cybersecurity Engineering major, and Batuhan is a Computer Science major. We are in the process of learning demanding web development skills like HTML, CSS, Javascript, React, and other important technologies. Alex and Batuhan both have front-end development experience through this course, including the international restaurant website they made for the midterm. Additionally, Alex is in the Web Development Club, and Batuhan has a portfolio website that he created before this class. Neither has extensive experience using backend technologies or development until this class. When deciding on our midterm project, we initially expanded on our Assignment 1 catalog of products, focusing on the food section. We created an interactive website for a restaurant, and now we plan to expand on that by adding interactive features for the user.

2. Purpose of the Proposal

Our website will function as a restaurant website that showcases the menu items, pricing, and cultural insights into international cuisines for our business. Food is a universal connection between people, and every culture has unique dishes shaped by history, climate, and tradition. Therefore, we have created a restaurant that focuses on international cuisine, allowing us to showcase foods from all over the world. Our restaurant aims to bring global cuisine to one place, enabling customers to explore various foods and their significance. Our website will provide insight into different cuisines while allowing customers to view the food we offer. Users will be able to order food on the website by selecting food items from the website and time that they can pick it up. It will not only display our offerings but also enhance the user experience through a visually engaging layout and informative descriptions.

3. Goals and Objectives

Here are our project goals and objectives for our project:

- Update current website to React.
- Create pages for users to purchase food on the website and set times to pick it up.
- Create log-in and sign-up functionality.
- Improve upon skills using React, Node.js, and other technologies for the front end and back end.
- Update the menu page to allow users to add items to the cart while on the menu.
- Add a restaurant reviews and comments section
- Deliver an engaging and interactive experience that fosters curiosity and appreciation for diverse cuisines while guiding users to understand other cultures better.
- Maintain a consistent schedule to work on the project each week.
- Spend time to plan properly for starting the project to be able to work efficiently.

4. Project Description

The website has 4 pages that are already created, including a home page, a menu page, an interactive map page, and a page that provides additional information about each culture. The home page, interactive map page, and additional information page are all frontend only using React. The user can interact with these pages, including navigating to the other pages using the navigation pages and buttons, but it will not require a backend to store data. The home page introduces the user to the brand and message of the website. The interactive map allows the user to navigate through the website by interacting with the map that has buttons at locations around the world. The buttons will bring the user to the menu page. The additional information page has information specific to each culture to learn more about the food.

The menu will utilize frontend and backend (React and Node.js). The front end will allow us to display different items with the details of each. We will be able to utilize the backend by allowing users to add to their cart. In doing so, they are updating the data for the number of each item they want, and they can also read the data by seeing how many items they have already selected before they order. We will add a reviews and ratings page as well. It will utilize React and Node.js. We will need to add a database for all of this information. We will want to allow users to select a rating and leave a comment about the restaurant. The user will create a new entry into the database and can read all previous reviews recorded. Additionally, the log-in and sign-up pages will be an important addition to the website. The users will navigate to that page to access all their personal information, such as their order history. The login feature will check the database against the login credentials. Additionally, when a user signs in, they will be able to create a new account for themself in the database, and if they wanted to change their password, they would be able to update their information as well. When a user is logged in, it allows them to view things like order history. Finally, there are the pages that are involved with the checkout process. The process will take the user's items that they selected and move them through several pages that will ensure their information is correct, then allow the purchase to occur.

5. Project Path Selection

We are going to continue our Midterm project. We are passionate about the importance of sharing new cuisines and understanding the cultures around you. There are several features that we plan to add to our current website. Per the requirements of the assignment, the log-in and sign-up pages will be added to our page to save purchases and information about a user. We will add the order processing pages so that users can order directly from the website. The edit view will also be added. We will need to adjust all of our current pages so that they will work with React. The menu page will need to be updated to include the ability to add items to the cart so that users can purchase directly from the menu page. We use DOM manipulation throughout our Midterm project, but we will need to adjust because React uses a virtual DOM. All the static HTML will need to be adjusted because React is dynamic. Additionally, the entire backend will need to be established since the current website has no backend. Additional features of the page include the user feedback page so that people can leave reviews and ratings for the restaurant.

6. Feature Ownership & Responsibility

- Login and Sign Up: Batuhan (Frontend and Backend)
    - The user will be able to log in and save their information. It will allow them to see their previous sales.
- Updating the Home page and interactive map: Batuhan (Frontend)
    - The pages need to be updated to work with React.
- Updating the menu page and additional information page: Alex (Frontend and Backend)
    - The pages need to be updated to work with React. Additionally, the menu needs to work with the backend to save the items the user added to the cart.
- Reviews page: Alex (Frontend and Backend)
    - Create a page that allows users to create ratings/reviews for the restaurant, including a star system and comments. The page should also allow the user to see the previous ratings that were left.
- Edit View: Batuhan (Frontend and Backend)
    - The admin should have the ability to edit the data entries. It will require pulling from the backend and utilizing the frontend to show it.
- Confirmation Page: Batuhan (Frontend)
    - The page that confirms that the user's purchase was successful.
- Process Flow, Cart, and Order History: Batuhan (Frontend and Backend)
    - Allow the user to change the items in their cart and view the items that they have selected. The process flow is the page that will allow the user to put in their information for the purchase to go through. The order history will be pulled from the database of all the orders purchased by a user.

7. Resources and Tools

7.1 Frontend Tools & Libraries

- React.js: Core framework for building dynamic user interfaces.
- React Router: Handles routing between different pages/views.
- Axios: Facilitates API communication between the frontend and backend.
- Bootstrap & CSS: Used for consistent styling and responsive layout.
- Leaflet.js: Enables the creation of an interactive cultural world map in the application.

7.2 Backend & Database

- Node.js with Express: Backend server environment and route handler.
- MongoDB Atlas: Cloud-hosted NoSQL database to store user data, orders, reviews, and menu items.
- Mongoose: ODM is used to define schemas and communicate with MongoDB.

7.3 External APIs / Libraries

- Leaflet.js: Integrated for map functionality.
- Extra: We may explore APIs related to world cuisines or food databases to further enhance the cultural storytelling element of the project.

7.4 Design & Wireframing

- Excalidraw: For wireframes and user journey sketches.
- Figma (Extra): For planning UI layouts and collaborative visual design.

7.5 Development Tools & Collaboration

- GitLab/GitHub: Version control, issue tracking, and collaborative development.
- GitLab Issues/GitHub Projects: For task management and agile sprint planning.
- Visual Studio Code: Shared code editor for both frontend and backend work.
- Discord and In-Person Meetings: Weekly sync-ups and quick communication.

7.6 Time Commitment & Role Distribution

Each team member is expected to dedicate approximately 5–7 hours per week, divided between feature development, testing, and planning. Responsibilities are assigned based on complete feature ownership, ensuring accountability and workload balance. Both members will collaborate on overall UI design, deployment preparation, and bug fixing. Weekly task progress will be tracked via Git-based issue boards.

Table 1: Team Project Responsibilities

Team Member	Primary Feature Ownership
Batuhan	Login/Signup system, Edit View (admin controls), Cart functionality, Order History, Checkout process, Confirmation page, Wireframing, Proposal documentation
Alex	Menu and Additional Info pages, Review and Rating system, Backend integration for menu and reviews, React update for static pages

8. File Structure and Project Organization

8.1 Frontend Structure (/frontend)

Contains all React-related code, including component logic, styling, and routing.

```
/frontend
  /src
      /assets      → Images, icons, and static data files
      /components   → Reusable React components (e.g., Navbar, Footer,
FoodCard)
      /pages       → Page-level components (e.g., HomePage, MenuPage, LoginPage)
```

```
  /styles      → Custom CSS or SCSS modules
  App.jsx      → Main component defining routes and layout
  index.js     → Entry point for the React app
```

We will use React Router for page navigation and Axios to communicate with backend APIs. The frontend will call RESTful endpoints to retrieve and update data such as menu items, user authentication, and order history.

8.2 Backend Structure (/backend)

Contains all server-side logic using Node.js and Express.js, including routes, models, and database configuration.

```
/backend
  /routes          → API endpoints for users, menu, orders, etc.
  /models          → Mongoose schemas for MongoDB collections
  server.js        → Main server file initializing Express and API routes
```

The backend exposes RESTful APIs that handle all CRUD operations (Create, Read, Update, Delete) related to user data, menu items, reviews, and order processing.

8.3 Database & Seeding

```
/database
  seedData.json   → Initial seed data for testing the MongoDB collections
```

This file will be used during development to populate the database with sample users, menu items, and order history.

8.4 Planning & Documentation (/documents)

```
/documents
  proposal.pdf           → Final project proposal document
  user-flow.excalidraw   → User journey and interaction diagram
  wireframes.fig         → (Extra)Visual mockups and UI layout sketches
  final-report.docx      → To be added for final submission
  demo-video.mp4         → To be recorded during the final demo
```

All planning materials, design references, and final deliverables will be stored in this directory for easy access during reviews and presentations.

8.5 Frontend–Backend Communication

The frontend and backend will communicate via RESTful API calls. Using Axios, the frontend will send requests (e.g., GET, POST, PUT, DELETE) to specific Express endpoints (e.g., /api/menu, /api/users/login) hosted by the backend server. The server will interact with MongoDB Atlas to fetch or update the required data and respond in JSON format.

9. Data Sources and Management

9.1 Data Sources

Our application will primarily rely on user-generated input and seed data stored in a MongoDB Atlas database. Core data categories include:

- User Accounts (sign-ups, login credentials, profile info)
- Menu Items (food name, region, ingredients, pricing, etc.)
- Orders (cart selections, delivery preferences, order history)
- Reviews (user feedback and ratings for individual dishes)

Although the majority of our data will be user-driven, we may use a seedData.json file during development to populate the menu and simulate user activity for testing.

9.2 Sample Data Format

Below is an example of the JSON structure used to store food items in the database:

```
{
 "id": "TR-001",
 "name": "Manti",
 "region": "Turkey",
 "price": 12.99,
 "ingredients": ["Dough", "Meat", "Yogurt"],
 "reviews": [
        {
        "user": "john123",
        "rating": 5,
        "comment": "Amazing!"
        }
 ]
}
```

This structure allows us to dynamically render menu items, handle user reviews, and link regional dishes to the interactive map.

9.3 CRUD Implementation

The backend will expose RESTful API endpoints using Express.js to allow full CRUD operations across key data models. These will be consumed by the frontend using Axios for asynchronous communication.

Table 2: CRUD Implementation Examples

Operation	Example Use Case	Route (Sample)	Method
Create	User places an order	/api/orders	POST
Read	View menu or reviews	/api/menu, /api/reviews	GET
Update	User edits profile	/api/users/:id	PUT

Delete	Cancel order	/api/orders/:id	DELETE

Each of these endpoints will interact with the MongoDB collections using Mongoose models and return a structured JSON response.

9.4 Data Flow Summary

1. Frontend triggers action (e.g., placing an order or submitting a review).
2. A corresponding Axios request is sent to the backend Express API.
3. The backend validates and processes the request.
4. The MongoDB Atlas database is queried or updated.
5. The response is returned as JSON, which the frontend uses to update the UI.

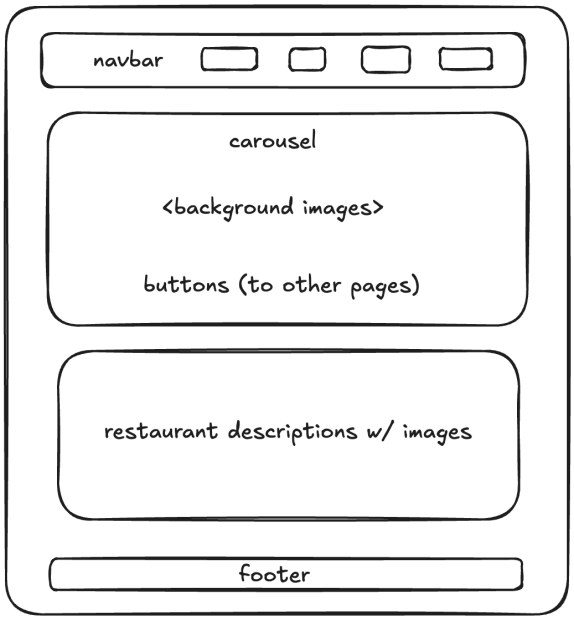
This clear flow ensures that the application remains modular, maintainable, and responsive to user interactions.

10. User Experience Views

We designed the following wireframes in Excalidraw to represent all major pages of the application. Each screen supports a core feature and provides a clean, responsive layout.

10.1 Home Page

Image 1: Home Page



What the user sees:

A welcoming screen featuring a header with navigation links, a cultural showcase banner, and a brief introduction to the website's purpose.

User actions:

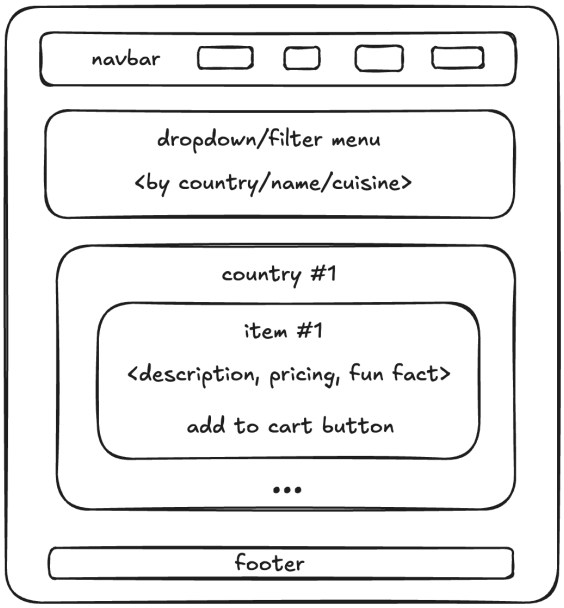
- Click navigation links to go to other pages
- Click “Explore” or “Start” to be taken to the Menu or Map

Purpose in flow:

Acts as the landing page and sets the thematic tone of the site.

10.2 Menu Page

Image 2: Menu Page



What the user sees:

A list or grid of food items categorized by region or type. Each item displays a name, image, price, and description.

User actions:

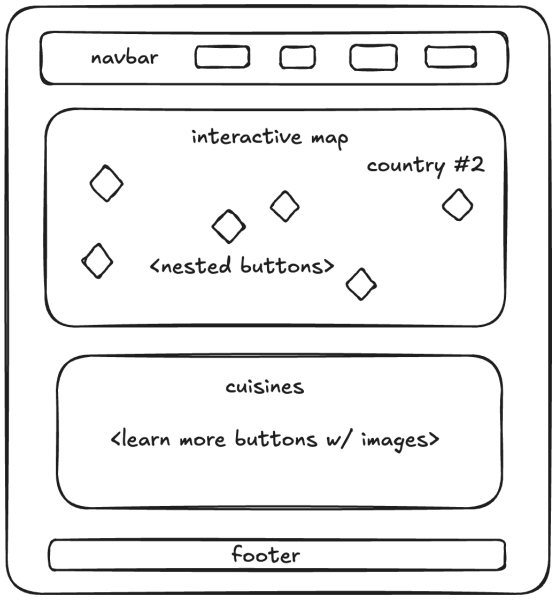
- Filter or sort the menu using dropdowns
- Add items to the cart
- Click food items for more information (optional modal or hover)

Purpose in flow:

Core shopping page where users browse and select food.

10.3 Interactive Map Page

Image 3: Map Page



What the user sees:

A map with labeled, clickable regions that represent different cuisines.

User actions:

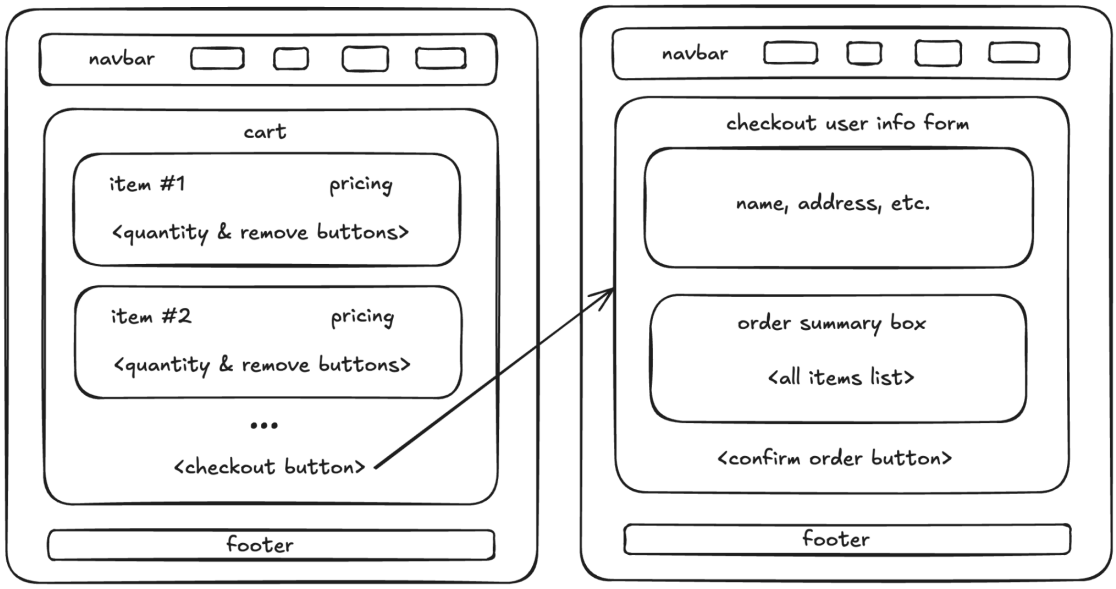
- Hover or click on a country/region to view menu items from that area
- Navigate back to the homepage or menu using the navbar

Purpose in flow:

Engages users visually and connects food to its cultural origin.

10.4 Cart & Checkout Pages

Image 4: Cart & Checkout Page



What the user sees:

Cart: a list of selected food items with quantities and total cost.
Checkout: a form to enter personal and delivery info.

User actions:

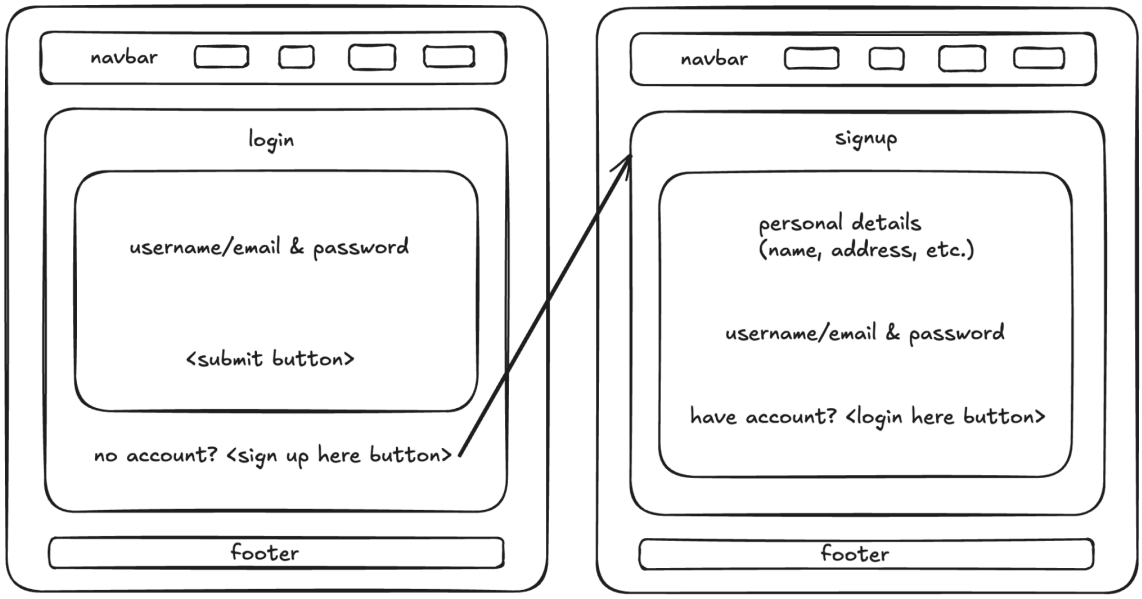
- Review/edit cart items
- Submit delivery info and place the order

Purpose in flow:

Handles the purchase and confirmation process.

10.5 Login / Sign-Up Page

Image 5: Login & Signup Page



What the user sees:

A form with fields for login or sign-up, with validation messages for incorrect entries.

User actions:

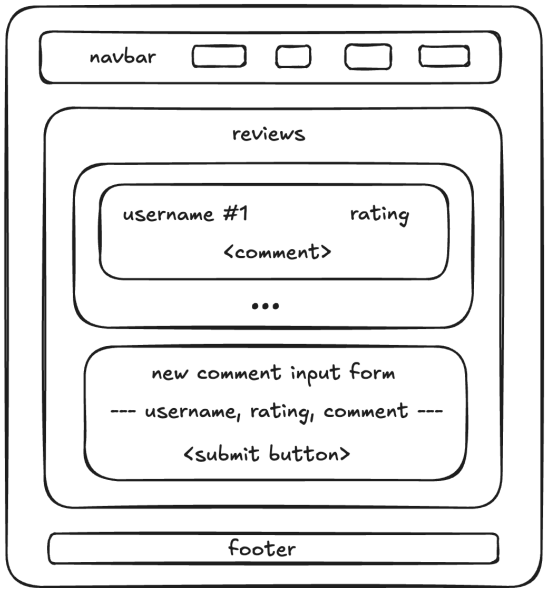
- Enter username/email & password
- Switch between login and registration
- Submit to gain access to user-specific features

Purpose in flow:

Enables account-based features such as order history and reviews.

10.6 Reviews Page

Image 6: Reviews Page



What the user sees:

A scrollable list of user-submitted reviews with ratings and comments. At the top a form to submit new reviews.

User actions:

- Read reviews
- Submit a rating and comment

Purpose in flow:

Allows users to engage with the restaurant and each other through feedback.

11. Final Comments

We are proud to present Global Bites and share amazing food from around the world. We're aiming to create an engaging, interactive platform where users can explore food through a cultural lens. We hope to gain practical experience using full-stack technologies like React, Node.js, and MongoDB while improving our collaboration and time management skills. Our goal is to create a product that showcases great food options and lets people learn along the way. Thank you for your consideration!

You can contact us with any questions or concerns at:
astoner@iastate.edu or bsonmez@iastate.edu