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COMPLETED THE PROJECT

NAMED AS : PHASE 2 TECHNOLOGY

PROJECT NAME : FEEDBACK COLLECTION SYSTEM

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1. Tech Stack Selection

The project will use a **modern MERN-style stack (MongoDB, Express, Node.js)** but in a simplified form for Phase 2.

- **Frontend (User Interface):**
    - A lightweight HTML, CSS, and JavaScript-based feedback form for Phase 2.
    - Users can enter their **name, email, and feedback message**.
    - Responsive design ensures it works on both desktop and mobile devices.
    - Future enhancement: A React-based frontend to provide an admin dashboard with real-time updates.
- **Backend (API Layer):**
    - **Node.js** as the runtime environment for fast, non-blocking I/O.
    - **Express.js** as the web framework to define routes, middleware, and handle requests/responses efficiently.
    - RESTful API design ensures scalability and interoperability with future systems (e.g., mobile app).
- **Database (Data Storage):**
    - **MongoDB** chosen for its flexibility and JSON-like document structure.
    - Feedback entries often vary in length and content, making NoSQL a better fit compared to relational databases.
    - MongoDB provides indexing, filtering, and efficient querying for admin analytics.
- **Enhancements & Supporting Tools:**

- **Mongoose**: Schema validation, middleware hooks, and easier data modeling.
- **Nodemailer**: To notify admins via email when new feedback is received.
- **Sentiment Analysis Library** (like sentiment or natural in Node.js): To categorize user feedback as positive, neutral, or negative.
- **Postman**: For API testing and documentation.

Why this stack?
It is lightweight, scalable, easy to extend in future phases, and widely used in real-world feedback systems.

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2. UI Structure / API Schema Design

This section defines how **users interact with the system (UI)** and how data is exchanged between **frontend and backend (API schema)**.

- **UI Structure:**
  - **User Interface (Feedback Form):**
    - Fields: *Name*, *Email*, *Message*.
    - Simple validation (non-empty, email format).
    - On submit, the form sends a JSON payload to the backend.
    - Displays confirmation to the user once feedback is saved.
  - **Admin Interface (Phase 2 – minimal):**
    - Admin uses an API endpoint with filters (via Postman or browser).
    - Response includes a structured list of feedback, sorted by date.
    - Future: Interactive dashboard with charts and filters.
- **API Schema Design:**
  - **POST /api/feedback**

Request body:

```
{
  "name": "Alice",
  "email": "alice@example.com",
  "message": "Loved the service!"
}
```

Response body:

```
{
```

```
 "success": true,
 "data": {

  "name": "Alice",
  "email": "alice@example.com",
  "message": "Loved the service!",
  "sentiment": "positive",
  "createdAt": "2025-09-26T09:30:00Z"
 }
}
```


- **GET /api/admin?sentiment=positive&email=alice@example.com**

Request parameters: Sentiment, Email, Date (optional).

Response body:


```
{
 "success": true,
 "data": [
  {
   "name": "Alice",
   "email": "alice@example.com",
   "message": "Loved the service!",
   "sentiment": "positive",
   "createdAt": "2025-09-26T09:30:00Z"
  }
 ]
}
```


- **Validation Rules:**
  - Name: Minimum 2 characters.
  - Email: Must match email regex.
  - Message: Minimum 5 characters.
  - Sentiment: Auto-generated based on message.

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3. Data Handling Approach

The system ensures **reliable, secure, and structured data handling** for both users and admins.

- **For Users (Feedback Submission):**
    - The form captures input → Sends JSON payload via POST → API validates and sanitizes → Data stored in MongoDB.
    - Automatic **sentiment analysis** categorizes the message.
    - Timestamp is added using server time to maintain consistency.
    - Optional: Admin notified via email.
- **For Admins (Feedback Viewing):**
    - Admin queries the system using GET /api/admin.
    - The API checks for filters (e.g., sentiment=negative).
    - MongoDB retrieves matching records and sorts them by newest first.
    - Data is returned as JSON for easy consumption.
- **Error & Exception Handling:**
    - Invalid input → Returns 400 Bad Request.
    - Database errors → Returns 500 Internal Server Error.
    - Custom error messages ensure better debugging.
- **Security Considerations:**
    - Input sanitization to prevent **NoSQL injection**.
    - Email addresses validated with regex.
    - Future enhancement: **Authentication middleware** for admin routes.
- **Scalability & Future Proofing:**
    - Feedback collection scales horizontally with MongoDB's sharding.
    - APIs are stateless, so they can be containerized with Docker for deployment.

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4. Component / Module Diagram

Breaking the system into smaller modules ensures **separation of concerns** and maintainability.

- **Frontend Modules:**
    - **Feedback Form Module:** Collects user input and sends data to backend.
    - **Admin Interface Module (basic):** Displays feedback results (currently via API response).
- **Backend Modules:**

- **Feedback Controller:**
  - Handles new submissions.
  - Validates and sanitizes input.
  - Calls sentiment analyzer.
  - Saves entry into MongoDB.
- **Admin Controller:**
  - Fetches data from MongoDB.
  - Applies filters (sentiment, email, date).
  - Returns results as JSON.
- **Utility Modules:**
  - sentiment.js: Performs sentiment classification.
  - emailService.js: Sends notifications to admin when new feedback arrives.

- **Database Layer:**
  - **MongoDB Feedback Collection** with schema: name, email, message, sentiment, createdAt.

High-level Module Flow:

[User Form] → [API Routes] → [Feedback Controller] → [MongoDB]

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[Sentiment Utility]

[Email Notification]

[Admin API] → [Admin Controller] → [MongoDB] → [Filtered Results]

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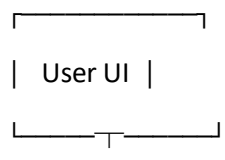
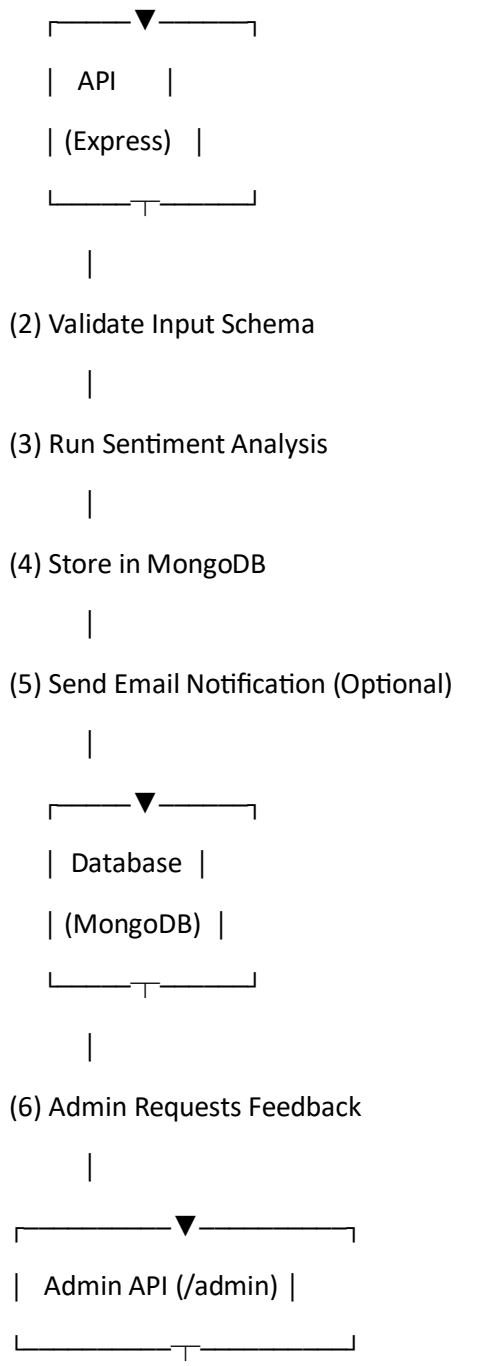
5. Basic Flow Diagram

This represents **end-to-end system flow** for both user and admin.



(1) Submit Feedback Form


API
(Express)
(2) Validate Input Schema
(3) Run Sentiment Analysis
(4) Store in MongoDB
(5) Send Email Notification (Optional)
Database
(MongoDB)
(6) Admin Requests Feedback
Admin API (/admin)
(7) Apply Filters (Sentiment, Date, Email)
(8) Return JSON Results to Admin