

**Project Proposal**

Group Names:

Delice Ishimwe

Lydia Amoakoaa  
 Sinam Ametewee  
Susanna Agyapong

CS415: Software Engineering  
Cohort: B  
Umut Tosun

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**Developing a Web Application: DataSphere**

# **Project Background**

Customer feedback is a vital component of business success, enabling companies to refine their services, address concerns, and maintain a competitive edge. However, African businesses struggle to effectively collect and utilize customer feedback due to fragmented and inefficient processes.

A comprehensive study by Hinson et al. (2020), highlights that modern African consumers are no longer passive recipients but active participants in the product and service experience. Despite this shift, most African businesses still rely on disconnected feedback collection methods such as manual surveys, scattered email communications, and informal feedback channels. Dr. Michélle Booysen’s (2025) analysis of African business processes further emphasizes that these outdated approaches create substantial data gaps, making it difficult for businesses to consolidate insights, detect critical trends, and implement timely improvements.

Without a streamlined system, companies waste valuable time piecing together feedback from multiple sources, leading to slow response times, inconsistent data collection, and inefficient resource allocation. These inefficiencies weaken customer satisfaction and limit the ability of African businesses to compete in an increasingly digital and customer-driven marketplace.

# **Problem Statement**

The fragmented nature of customer feedback management in African businesses leads to delayed response times, inconsistent data collection, and inefficient resource utilization. Companies struggle to consolidate feedback from various sources, making it difficult to identify critical insights, improve service quality, and meet customer expectations. This lack of an integrated feedback system ultimately reduces customer satisfaction and limits businesses' ability to adapt to evolving consumer needs.

# **Proposed Solution: DataSphere**

To address these challenges, we propose DataSphere, a web-based platform designed to streamline the collection, management, and analysis of customer feedback for African businesses. DataSphere provides an intuitive interface where customers can easily submit feedback, and companies can efficiently track, analyze, and visualize customer insights in real time.

By centralizing feedback collection, DataSphere eliminates inefficiencies caused by fragmented approaches such as manual surveys, emails, and informal feedback channels. The platform enhances decision-making by providing structured data analytics, helping businesses identify customer needs, respond faster, and improve service delivery.

With DataSphere, African businesses can transition from reactive to proactive customer engagement, fostering stronger relationships and improving overall competitiveness in the digital marketplace.

# **Project Objectives**

1. Develop a web-based platform that centralizes customer feedback collection and management for improved decision-making.
2. Design and implement customer and admin dashboards for tracking feedback submissions, responses, and engagement metrics.
3. Ensure secure user authentication and data handling to protect sensitive customer information.
4. Enable administrators to respond directly to feedback and manage customer interactions efficiently.
5. Integrate a notification system to keep users informed about feedback responses and updates.
6. Implement feedback analytics and visualization tools to help companies track trends and make data-driven decisions.
7. Optimize system performance and security to ensure scalability and reliability for long-term usage.

# **Team Roles:**

* **Project Manager and Database Manager (PM and DM):** Lydia Amoakoaa
* **System Architect (SA):** Delice Ishimwe
* **Frontend Developer (FE):** Sinam Ametewee
* **Backend Developer (BE):** Susanna Agyapong

# **1-Month Timeline Breakdown**

| Week | Project Manager (PM) | System Architect (SA) | Database Manager (DM) | Frontend Developer (FE) | Backend Developer (BE) |
| --- | --- | --- | --- | --- | --- |
| Week 1  (Planning and Design) | - Finalize project scope and roadmap  - Assign tasks and milestones  - Conduct kickoff meeting | - Create UML diagrams (Use Case, Class, Sequence)  - Define system architecture | - Design ERD and database schema  - Identify required data fields | - Create wireframes and UI mockups  - Review user journey | - Set up backend framework  - Define API structure |
| Week 2  (Prototyping and Setup) | - Collect feedback on prototype  - Ensure alignment with team | - Review UML models  - Adjust system architecture if needed | -Set up database and relationships  - Write database queries | - Develop interactive prototype (Frontend with dummy data) | - Implement authentication system  - Test initial API endpoints |
| Week 3  (Core Development) | - Monitor development progress  - Ensure documentation is updated | - Oversee security and scalability  - Validate backend architecture | - Optimize queries  - Integrate database with backend APIs | - Develop core UI components  - Connect frontend to APIs | - Develop core backend logic  - Implement API endpoints |
| Week 4  (Testing and Deployment) | - Conduct testing reviews  - Prepare final project report | -Optimize system performance  - Review any architectural issues | - Perform data integrity checks  - Finalize database documentation | - Fix UI/UX issues  - Ensure smooth frontend interactions | - Fix bugs in API  - Deploy backend |

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## **Sprint Board Setup:**

Using Jira, we created our Scrum board, organized the backlog, and assigned tasks to team members based on their roles.

# **Technologies To Be Used**

* Frontend: Python
* Backend: Django/Node.js (Express.js): For handling backend logic, API development and deployment.
* Database: PostgreSQL / MySQL: A relational database for structured storage of customer feedback.
* Analytics: Scikit-learn / TensorFlow: For sentiment analysis and predictive analytics on customer feedback.
* Project Management: Jira

# **Functional Requirements**

### User Management

## The system must allow users to register and log in securely.

## The system must support role-based access control for customers and administrators.

## Customers should be able to update their profiles

## Administrators should be able to manage users (such as add new users, change their roles)

### Feedback Collection and Management

## Customers should be able to submit feedback through a structured form.

## The system must allow customers to rate services/products using a rating scale.

## Admins should be able to view, categorize, and respond to feedback.

## Feedback must be stored in a structured format in the database.

### AI-Powered Sentiment Analysis and Predictive Insights

## The system should analyze feedback using sentiment analysis such as positive, neutral, or negative.

## Predictive analytics should detect emerging trends or issues and alert administrators.

### Dashboards and Data Visualization

## Customers should have access to their own submitted feedback history.

## Admins should have an interactive dashboard displaying:

## Number of feedback submissions over time

## Sentiment trends (positive/negative/neutral)

## Product/service performance ratings

## Data should be visualized using graphs, charts, and statistical summaries.

### Notification System

## Customers must receive real-time notifications when their feedback is responded to.

## Admins should receive alerts for new feedback submissions.

### Security and Authentication

## The system must support secure authentication

## User data, including passwords, must be encrypted.

## The system should log user activities for security monitoring.

# **Non-Functional Requirements**

### Performance and Scalability

* The system must handle up to 2,000 concurrent users without degradation.
* Feedback submissions should be processed within 1 second.

### Security and Privacy

* The system must comply with GDPR and data protection regulations.
* Sensitive data such as user info, feedback should be encrypted in transit and at rest.
* Admins should have role-based permissions to prevent unauthorized data access.

### Usability and Accessibility

* The UI should be intuitive and user-friendly, ensuring ease of use.
* It should be responsive, working across desktop, tablet, and mobile devices.

### Reliability and Availability

* The platform should maintain 99.9% uptime.
* There should be a backup system to prevent data loss in case of failures.

### Maintainability and Extensibility

* The system should be modular, allowing easy updates and feature additions.
* The codebase should be well-documented for future developers.

# **Expected Outcomes**

* A fully functional web-based feedback management platform that allows users to submit, track, and manage feedback seamlessly.
* Improved customer satisfaction through faster response times.
* Enhanced decision-making through real-time analytics, sentiment analysis, and trend identification from feedback data.
* Reduced operational costs by automating feedback processing, categorization, and response prioritization, minimizing manual intervention.
* A scalable system designed to accommodate an increasing volume of feedback and support future integrations, such as AI-powered response suggestions.

# **Risk Management Strategies**

The DataSphere web app requires a proactive risk management approach to ensure long-term stability, security, and efficiency.

* We will follow an Agile development methodology, allowing us to iterate quickly, adapt to feedback, and continuously improve the platform.
* We will maintain comprehensive documentation to mitigate knowledge loss, ensuring that updates, and onboarding are seamless.
* We will design DataSphere with modular components, allowing isolated improvements and bug fixes without affecting the entire platform.
* Regular performance monitoring will be a priority, enabling us to detect inefficiencies, security vulnerabilities, or potential failures early and intervene before they impact operations.

Our risk management strategy ensures the DataSphere platform remains adaptable, reliable, and ready for future feature expansions and growth.

# **REFERENCES**

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