



Basic Details of the Team and Problem Statement

PS Code: *PS03(4)*

Problem Statement Title: *Bulk email & SMS service*

Team Name: *PIXEL PIONEERS*

Team Leader Name: *SURAJIT ROY*

Institute Code (AISHE): *C-148*

Institute Name: *FUTURE INSTITUTE OF ENGINEERING AND
MANAGEMENT*

Theme Name: *SMART EDUCATION*



Idea/Approach Details

We are looking forward for a solution by creating an android /web based-application, that will serve as a platform for individuals to send large volumes of emails and text messages to a list of contacts simultaneously. These services are commonly used for marketing campaigns, announcements, reminders, and notifications . The prototype as follows:

➤ Mass MAIL & SMS Campaigns:

Ability to send emails in bulk to thousands of recipients, through customized emails with recipient names and other dynamic content , using **GPT-4** or similar language models for generating personalized email and SMS content.

➤ Tracking :

Anomaly Detection using AI to identify suspicious activities and potential security threats . Behavioral Analysis to detect and prevent fraudulent activities based on user behavior patterns. **OAuth 2.0** for secure user authentication and authorization . **HTTPS** and **TLS** for encrypted communication.

➤ Monitoring and Analytics:

Prometheus and **Grafana** are used for real-time monitoring and alerting . Google Analytics or Mix panel are used for tracking user engagement and performance metrics.

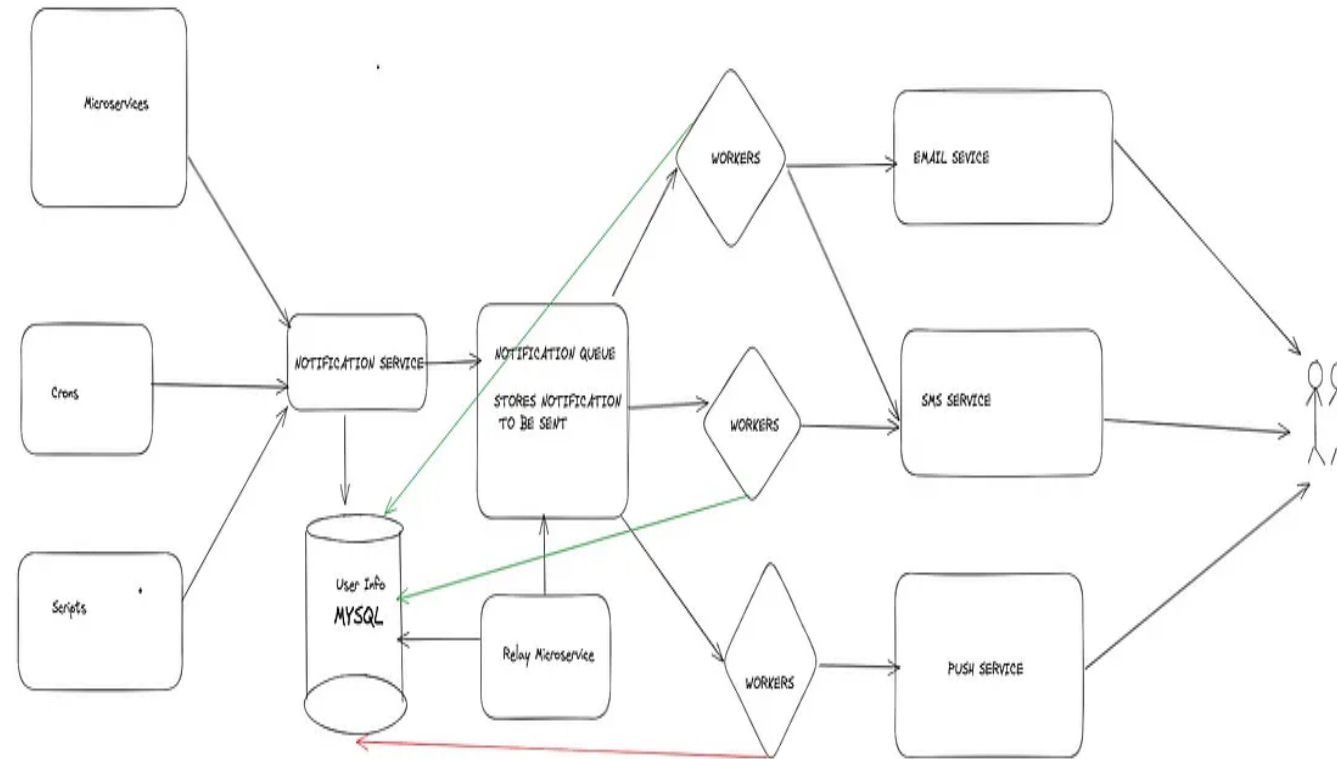
➤ Messaging Queues:

RabbitMQ or **Apache Kafka** are used for managing and processing large volumes of messages asynchronously . **AWS SQS** or **Google Cloud Pub/Sub** for scalable message queuing.

➤ Email/SMS Delivery Optimization:

Spam Filter Avoidance using **ML** models to analyze email content and structure to improve delivery rates . Dynamic Content Optimization to adapt messages in real-time based on user interactions and feedback.

PROCESS FLOWCHART :



TECHNOLOGY STACK:



Idea/Approach Details

Describe your Use Cases here

☐ Cloud Infrastructure:

AWS (Amazon Web Services), Google Cloud Platform (GCP), or Microsoft Azure are used for scalable and reliable cloud infrastructure. Serverless Computing using **AWS Lambda, Google Cloud Functions, or Azure Functions** to handle email/SMS processing without managing servers.

☐ Database Technologies:

NoSQL Databases like **MongoDB or DynamoDB** for handling large volumes of user data efficiently. Relational Databases like **PostgreSQL or MySQL** for structured data and complex queries.

☐ Machine Learning Algorithms:

Predictive Analytics are targeted to forecast user engagement and optimize sending times. Clustering Algorithms to segment users based on behavior and preferences for targeted campaigns.

☐ SMS Services:

Twilio, Nexmo (Vonage), or Plivo incorporates reliable SMS delivery and handling. **AWS SNS (Simple Notification Service)** used for scalable SMS notifications.

☐ Email Services:

SendGrid, Mailgun, or Amazon SES (Simple Email Service) allow reliable and scalable email delivery. **SMTP (Simple Mail Transfer Protocol)** helps custom email sending configurations.

Describe your Dependencies / Show stopper here

☐ Personalization and Customization:

User Profiling using **AI** is administered to create detailed user profiles for personalized content. Behavioral Targeting are aimed to send messages based on real-time user actions and preferences.

☐ Customer Support and Interaction:

Efficiency and effectivity enhances with the availability of 24/7 hotline Chatbots powered by AI for automated customer support and interaction through email and SMS. Voice Assistants for handling voice-based interactions and queries are also available.

☐ A/B Testing and Campaign Optimization:

A/B Testing using **AI** is automated to run multiple campaign variations and select the most effective ones. Adaptive Campaigns that learn and improve over time based on user interactions and feedback.

☐ Automated Workflow and Integration:

Robotic Process Automation (RPA) is devised to automate repetitive tasks and integrate with other systems. **AI-driven APIs** are automated for seamless integration with other AI and data services.

☐ TECHNOLOGY STACK:

React.js or Vue.js serves the frontend part, build dynamic and responsive user interfaces. **Bootstrap or Tailwind CSS** make quick and efficient UI designs.

Node.js with **Express.js** or **Python** with **Django/Flask** builds scalable backend services. **restful APIs or GraphQL** for efficient communication between **frontend** and **backend**.

Team Member Details

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