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A Centre of Excellence in Science and Technology by the Catholic Archdiocese of Trichur

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

APPLICATION FOR ALLOTMENT OF THE PROJECT TOPIC

Sub: - CSD 334 MINI PROJECT

GROUP NO:16

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2. Write up about Area of Specialization: **Agentic AI, Web Development**

3. Topic Selected: **AI Sales & Lead Outreach Agent**

4. Abstract of Topic : **1) AI Sales & Lead Outreach Agent**

2) AI-Based Medical & Cosmetic Product Analyzer Using Gemini

3) Smart Scan Queue & Slot Allocation System for Hospitals

5. Dated signature of the students :

ALLOTMENT MADE [To be filled by the Guide]

1) Topic allotted :

2) Date of allotment :

3) Name of Guide :

4) Signature of Guide :

Project Coordinator

H.O.D



ABSTRACT

1) AI Sales & Lead Outreach Agent

The **AI Sales & Lead Outreach Agent** is an intelligent, multilingual voice-automation system developed to enhance and scale lead engagement for businesses across diverse linguistic and demographic markets. Leveraging the Gemini API's advanced speech recognition, natural language understanding, and real-time reasoning capabilities, the agent autonomously conducts follow-up calls, nurtures leads, and delivers personalized information with human-like clarity and empathy. The system is specifically optimized for India's multilingual ecosystem, supporting regional languages, dialect variations, informal speech patterns, and code-mixed communication styles commonly used by customers.

At the core of the agent's interaction model is the **PESO framework**—Pain, Emotion, Solution, and Offer—which guides the generation of persuasive, context-aware responses. This enables the system to not only understand user intent but also identify subtle emotional cues such as hesitation, interest, frustration, or confusion. By dynamically adjusting its conversational tone and strategy, the agent improves user trust, reduces resistance, and increases the chances of conversion compared to conventional automated systems.

The solution integrates robust **ASR (Automatic Speech Recognition)** for accurate real-time transcription, **sentiment and emotion detection** for deeper behavioral insights, and **adaptive response generation** to handle incomplete, unexpected, or off-topic replies. Its reasoning engine allows the system to detect conversation mismatches and automatically recover through fallback prompts, clarifications, or redirections—ensuring smooth, uninterrupted dialogue flow without manual intervention.

By automating repetitive follow-ups and lead-qualification tasks, the **AI Sales & Lead Outreach Agent** significantly reduces operational dependency on large telecalling teams. Businesses can scale outreach to thousands of leads simultaneously, maintain consistent messaging, and provide emotionally aware support even in rural and regional markets where traditional communication barriers exist. This leads to improved customer satisfaction, higher conversion rates, reduced operational costs, and a more efficient, data-driven sales pipeline.

Overall, the proposed solution represents a transformative approach to modern sales communication—combining language intelligence, emotional understanding, and automated persuasion to deliver a scalable, reliable, and deeply personalized sales outreach experience.



2.AI-Based Medical & Cosmetic Product Analyzer Using Gemini

The widespread use of medical and cosmetic products has raised concerns regarding harmful chemicals, allergens, and toxic compounds that may impact human health. Most consumers lack the expertise to interpret complex ingredient lists, while manual verification is slow, inconsistent, and often inaccurate. To overcome these challenges, this project introduces an **AI-Based Medical & Cosmetic Product Analyzer** powered by **Gemini's NLP and reasoning capabilities**, designed to automatically assess product safety and generate an accurate toxicity score.

The system extracts product ingredients using **barcode scanning, OCR-based label reading, or direct text input**, and cross-references them with a curated toxicity database containing details on **carcinogens, allergens, hormone disruptors, banned substances**, and medically regulated chemicals. Gemini analyzes each ingredient's risk severity, concentration relevance, and global regulatory acceptance (FDA, EU, WHO) and computes a **Safety Score (0–10)** using a weighted risk model.

The system provides users with:

1. A Safety Score indicating overall product risk
2. Identification of toxic ingredients with severity ratings
3. Health impact explanations (e.g., irritation, endocrine disruption)
4. Safer alternative recommendations
5. Instant alerts for globally banned or high-risk chemicals

The analyzer can be deployed as a mobile app or web platform with features like product history tracking, cloud-based toxicity insights, and real-time AI analysis. This solution empowers consumers with accessible safety intelligence, promotes healthier choices, and contributes to public health by raising awareness of hidden chemical hazards.



3. Smart Scan Queue & Slot Allocation System for Hospitals

Hospitals frequently experience long queues for diagnostic scans such as MRI, CT, and X-ray, resulting in overcrowded hallways, patient discomfort, inefficient workflows, and delays. Traditional physical queueing forces patients to wait near scanning rooms, causing stress and unnecessary congestion. To solve this, the project proposes a **Smart Scan Queue & Slot Allocation System** that virtualizes the entire waiting process and automates slot management using **n8n workflows**.

Doctors assign patients a priority level (1–5) based on urgency and link them to the relevant scanning department. The system automatically places each patient into a **digital queue**, checks machine availability, and allocates the next optimal time slot. Patients receive instant notifications through **WhatsApp, SMS, Telegram, web chat widget, or hospital kiosk chatbot**.

Patients can interact with the bot to request:

- Current queue status
- Estimated waiting time
- Next available slot
- Rescheduling assistance

All daily operational data—including patient ID, scan type, assigned time, status, and communication logs—are securely stored in an Excel sheet, allowing hospitals to adopt the system without complex databases or technical overhead.

This solution **reduces crowding**, improves patient experience, increases operational efficiency, and minimizes staff workload. By offering accurate time predictions and virtual queueing, it creates a more peaceful and organized diagnostic workflow within healthcare facilities.