Final Year Project Proposal & Software Requirements Specification

# Project Title

AutoMarketer – An Autonomous Multi-Agent AI System for Marketing Campaigns

# 1. Introduction

## 1.1 Problem Statement

Small and medium businesses struggle to afford full-scale marketing teams. Traditional digital marketing requires manual work in market research, strategy development, content creation, and campaign optimization. This is time-consuming, costly, and inefficient.

## 1.2 Proposed Solution

We propose AutoMarketer, a multi-agent AI system that automates the entire marketing lifecycle — from research and strategy to content generation and campaign execution — using intelligent agents powered by AI models.

# 2. Objectives

* Automate end-to-end marketing campaigns.
* Use multi-agent collaboration to simulate a human marketing team.
* Provide real-time strategy recommendations and performance feedback.
* Enable non-technical users to run professional marketing campaigns.

# 3. Core Functional Modules

* **Market Research Agent –** Collects market data from sources like Google Trends, Twitter, and LinkedIn. Performs competitor analysis and customer segmentation.
* **Strategy Agent** – Analyzes research data to build targeted marketing strategies. Suggests optimal channels, content types, and scheduling.
* **Content Generation Agent** – Generates platform-specific content: Blogs, captions, product descriptions (via LLMs). Posters, social media graphics (via DALL·E / Stable Diffusion). Voiceover scripts and short videos (via Bark AI / FFmpeg).
* **Ad Optimization Agent** – Sets up and runs ad campaigns using APIs (e.g., Facebook, Google Ads). Continuously improves campaign performance using ML models.
* **Engagement Agent** – Manages email campaigns and chatbots for user interaction. Handles FAQs and customer responses autonomously.

# 4. Unique & Value-Added Features

• AI Trend Detection: Predicts emerging trends using NLP and time-series models.

• Autonomous Ad Budgeting: Allocates ad budget based on ROI and predicted performance.

• Voice-Driven Assistant: Allows business owners to speak directly to the system for insights.

• Real-Time Monitoring Dashboard: Visual dashboard to track KPIs (CTR, CPC, engagement rate, etc.).

• Feedback Loop: Learns from past campaign data to improve future strategies.

# 5. System Architecture Overview

[Market Research Agent] → [Strategy Agent] → [Content Agent] → [Ad Agent] → [Engagement Agent] ↺ (Feedback + Optimization)

# 6. Technology Stack

## AI & ML

• LLMs/NLP: Gemini, GPT-4, Claude, LLaMA  
• CV Models: Stable Diffusion, DALL·E  
• Speech Models: Bark AI, OpenAI TTS  
• ML Frameworks: Scikit-learn, PyTorch, TensorFlow

## Backend & Agent Coordination

• LangChain / AutoGen  
• FastAPI / Flask  
• Vector DBs: ChromaDB / Pinecone

## Frontend ( Flexible)

• Streamlit  
• React.js / Next.js

## Data Collection & Visualization

• BeautifulSoup / Scrapy  
• APIs: Google Trends, Twitter API, LinkedIn API  
• Matplotlib, Seaborn, Plotly

## Content Automation

• Figma API / Canva API  
• FFmpeg / Premiere Automation  
• Facebook Ads API, Google Ads API

# 7. Feasibility & Implementation Plan

* Phase 1: Research (Week 1–2): Dataset gathering, model exploration
* Phase 2: Core Agents (Week 3–6): Develop market research, strategy, and content agents
* Phase 3: Ad & Engage (Week 7–9): Integrate ads APIs and chatbot/email systems
* Phase 4: Dashboard (Week 10–11): Build UI with real-time analytics
* Phase 5: Testing (Week 12): Final integration and user testing

# 8. Expected Outcomes

* A functioning autonomous marketing system.
* Clear reduction in manual effort for businesses.
* Reusable AI-powered modules for future marketing automation products.

# 9. Tools & Platforms

* VS Code / Jupyter Notebooks – Development
* GitHub – Version control
* Kaggle / Google Colab – Model training (if needed)
* Render / Vercel / Streamlit Cloud – Deployment

# 10. Team & Roles

Your Name – Full-stack + AI Developer

# 11. References

• OpenAI, Google Generative AI, Meta AI (LLaMA)  
• LangChain, AutoGen documentation  
• APIs: Facebook Ads, Google Ads, Canva, Twitter, etc.