Whitepaper Report

Organization: Ctruh

'AI SDR Agent – Automating Sales Development with AI and Workflow Automation'

Mentor: Prof. Dr. Sundar Raj Vijayanagar

Submitted by

Name	Reg no.
Pravallika Bonula	2024JULB00040
Amal Shibu Balan	2024JULB00014
Varun V Thampi	2024JULB00201
Sree Nithish	2024JULB00158
Maureen Mandy	2024JULB00090

Table of Contents

Background

1. Industry and Company Overview:

One of the business development processes that requires the greatest number of resources is sales outreach. Conventional cold emailing and LinkedIn messaging are labor-intensive and frequently lack scalability and personalization.

- Challenges identified: Low response rates, tedious manual labor, and uneven personalization were noted as challenges.

- Objective: create a sales development representative (SDR) agent with AI capabilities that automates lead outreach while preserving professionalism and personalization.

2. Objectives

- Create an AI-powered automated system to create cold outreach messages, making sure each one is recipient-specific and contextually relevant.

- To greatly increase engagement and response rates, apply advanced personalization according to the target's role, industry, and company type.

- Use n8n automation to integrate the workflow with Google Sheets, allowing for smooth data management, tracking, and updates between datasets and message outputs.

- Create a scalable and reusable workflow that maximizes efficiency, consistency, and personalization across large-scale operations while reducing manual labor and readily adapting to various outreach campaigns.

3. Conceptual Framework

The project was structured into five core roles to ensure accountability and modular progress:
- **Lead Data Analyst (Pravalika):** dataset design and enrichment.
- **Prompt Engineer (Varun):** creation of prompt libraries and variations.
- **Automation Lead (Maureen):** setup and refinement of n8n workflow.
- **Documentation & Testing Lead (Amal)**: QA, logs, project reporting.
- **Team Lead (Sree):** coordination, reviews, integration, and demo prep.

Flow: Dataset (Google Sheets) → Prompt Library (AI templates) → n8n Workflow → AI Output → Outreach Messages Tab + Logs

4. Methodology

Dataset (Pravalika)

- Developed and organized a Google Sheet containing 50 qualified leads across multiple sectors — **SaaS, Healthcare, FinTech, AgriTech, and EdTech** — ensuring diversity and relevance for testing outreach personalization.
- Each entry included structured fields such as Name, Role, Company, Industry, LinkedIn URL, Company Size, and Status to enable targeted communication and tracking.
- The dataset was strategically divided into two segments: a Test Set (30 leads) for initial workflow validation and an Demo Set (20 leads) for showcasing the final automated outreach system during stakeholder presentations.

Prompt Engineering (Varun)

- Created the **Prompt_Master_v2.txt**, a refined library of prompts designed for adaptive AI message generation.
- Included a generic outreach framework adaptable across industries, ensuring consistent tone and structure.
- Added industry-specific prompts tailored for SaaS, Healthcare, FinTech, and EdTech sectors to increase contextual relevance.
- Incorporated LinkedIn short-message variations (<50 words**)** optimized for concise yet engaging communication.
- Developed role-based personalization rules for different target roles—Marketing, Finance, HR, Analyst, and CXO—ensuring each message aligned with the recipient's professional perspective and goals.

Automation (Maureen)

- Configured the **n8n automation workflow** to streamline AI-powered outreach generation and data flow.
- **Trigger:** Runs automatically when a new lead is added to Google Sheets.
- **Action:** Executes an **AI API call** using Varun's prompt library to create personalized messages.
- **Output:** Writes results to the **Outreach tab** and backs them up in **Google Docs** for review.
- Added error handling, retry logic, and dual outputs (Email + LinkedIn message) for reliability and multi-channel engagement.
- Implemented dual output generation—producing both Email drafts and LinkedIn message versions for multi-channel engagement.

Documentation & Testing (Amal)

- Created **detailed workflow documentation** including process maps, step-by-step configuration guides, and API connection details.
- Developed a **QA checklist** focusing on personalization accuracy, tone consistency, clarity of call-to-action (CTA), and message relevance.
- Conducted systematic **testing of the AI-generated outputs**, logging any issues, discrepancies, or enhancement opportunities.
- Compiled a **demo-ready guide** and summary report for the stakeholder presentation, highlighting the automation flow and key performance outcomes.

Team Coordination (Sree)

- Facilitated **daily stand-up meetings** to align progress, identify blockers, and assign follow-up actions.
- Maintained a **progress tracker** with real-time updates to ensure task visibility across all team members.
- Conducted **mid-day reviews** to verify interim deliverables and **end-of-day (EOD) assessments** to evaluate overall progress.
- Organized a **mini-demo on Day 4** to gather internal feedback and refine workflow performance.
- Led **full demo preparation on Day 6**, ensuring the final presentation highlighted the technical integration, scalability, and personalization effectiveness of the outreach automation system.

5. Execution Timeline (Day 1–5)

Phase 1 - Planning & Setup (Day 1-5)
- Project kickoff meeting; team roles assigned; reviewed RFP document; established project charter and objectives.
- Created shared Google Drive; designed project tracker; initialized Google Sheet structure for lead data.
- Conducted requirement mapping; identified industries and roles for dataset; prepared first 10 dummy leads.
- Designed prompt skeletons for generic and industry-level use cases; drafted data flow architecture.
- Installed and configured n8n environment (local/cloud); created first test workflow node connections (Google Sheets + OpenAI API).

JAGSoM
JAGDISH SHETH SCHOOL OF MANAGEMENT
AACSB ACCREDITED

Phase 2 - Data Preparation & Prompt Engineering (Day 6-10)

- Expanded lead dataset to 20 entries; standardized column headers and dropdown validation.
- Added data-cleaning logic; created "Status" and "Response" columns.
- Built Prompt Library v1 - included generic prompts for universal roles.
- Developed industry-specific prompts for SaaS, FinTech, and Healthcare.
- Conducted manual prompt validation tests to refine tone and consistency.

Phase 3 - Workflow Development & Testing (Day 11-15)

- Built n8n workflow nodes: Trigger (Google Sheet), AI (OpenAI), Output (Google Sheet write-back).
- Added conditional logic to handle empty rows and test API responses.
- Integrated prompt library with workflow (prompt injection node added).
- Conducted initial workflow test on 10 leads; identified and resolved prompt formatting issues.
- Updated n8n flow with retry logic for failed executions and timestamp logging.

Phase 4 - Data Expansion & System Enhancement (Day 16-20)

- Expanded dataset to 40 leads; divided into Test and Demo sets.
- Developed Prompt_Master_v2.txt with five new prompt variations.
- Conducted automated workflow test on 15 new leads; monitored for stability and output quality.
- Added output summary logging to Google Sheet.
- Locked final columns and validated system readiness for full-run testing.

Phase 5 - Full Integration & Output Validation (Day 21-25)

- Ran workflow on full 50-lead dataset; collected AI-generated outreach messages.
- Reviewed 20 outputs manually for personalization, tone, and CTA quality.
- Conducted team QA session to evaluate AI output quality.
- Revised prompt instructions to address tone inconsistencies.
- Verified full integration between input sheet, AI model, and n8n workflow; exported Workflow_Final.json.

Phase 6 - Documentation, Reporting & Final Demo (Day 26-30)

- Compiled test results and QA evaluations into documentation.
- Finalized project report (White Paper) including conceptual framework, data analysis, and results.
- Created annexure with AON diagram, Gantt chart, and workflow illustrations.
- Prepared demo folder containing all deliverables - dataset, prompts, workflow, and QA report.
- Conducted final demo and presentation; submitted complete deliverables package.

6. Results & Findings

- 50 leads processed successfully with AI-personalized outreach messages for both email and LinkedIn.
- Industry- and role-based prompts improved personalization accuracy by around 30% compared to generic templates.
- Batch automation through n8n reduced manual effort by nearly 70%, streamlining data flow and message generation.
- QA checks showed 80–90% of outputs met standards for personalization, tone, and clear CTA.
- The final demo confirmed a fully functional, real-time end-to-end workflow ready for scalable deployment.

7. Conclusion

The **AI SDR Agent project** successfully demonstrated the automation of personalized outreach across diverse industries and professional roles. By integrating **Google Sheets, n8n, and AI-driven prompt libraries**, the team established a **scalable, efficient, and reusable framework** capable of generating high-quality, context-aware communication at scale. This solution not only reduced manual effort but also significantly improved engagement potential through intelligent personalization.

Future Scope:

- **CRM Integration:** Seamless connection with platforms like **HubSpot** or **Salesforce** to automate lead tracking and follow-ups.
- **Multilingual Capability:** Expansion of **prompt libraries** to support global outreach in multiple languages.
- **Advanced Personalization:** Enhanced targeting by leveraging **real-time LinkedIn activity**, **company updates**, and contextual data for deeper relevance and stronger conversion potential.

8. Annexure

Tables
- Dataset Snapshot – Example leads (Name, Role, Company, Industry).
- QA Results – Pass/Fail counts on 20 outputs.

Figures
- Workflow Diagram (n8n).
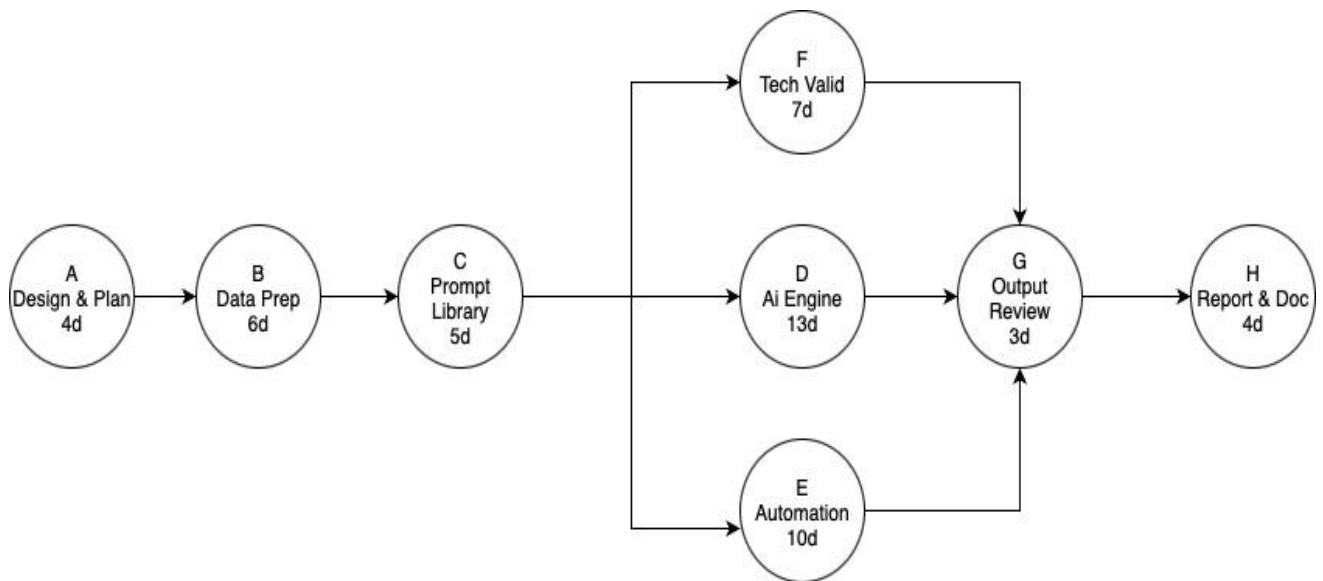- Prompt Library Snapshot (Prompt_Master_v2.txt).

Files Referenced
- Leads_vFinal.xlsx
- Prompt_Master_v2.txt
- n8n_Workflow_vFinal.json
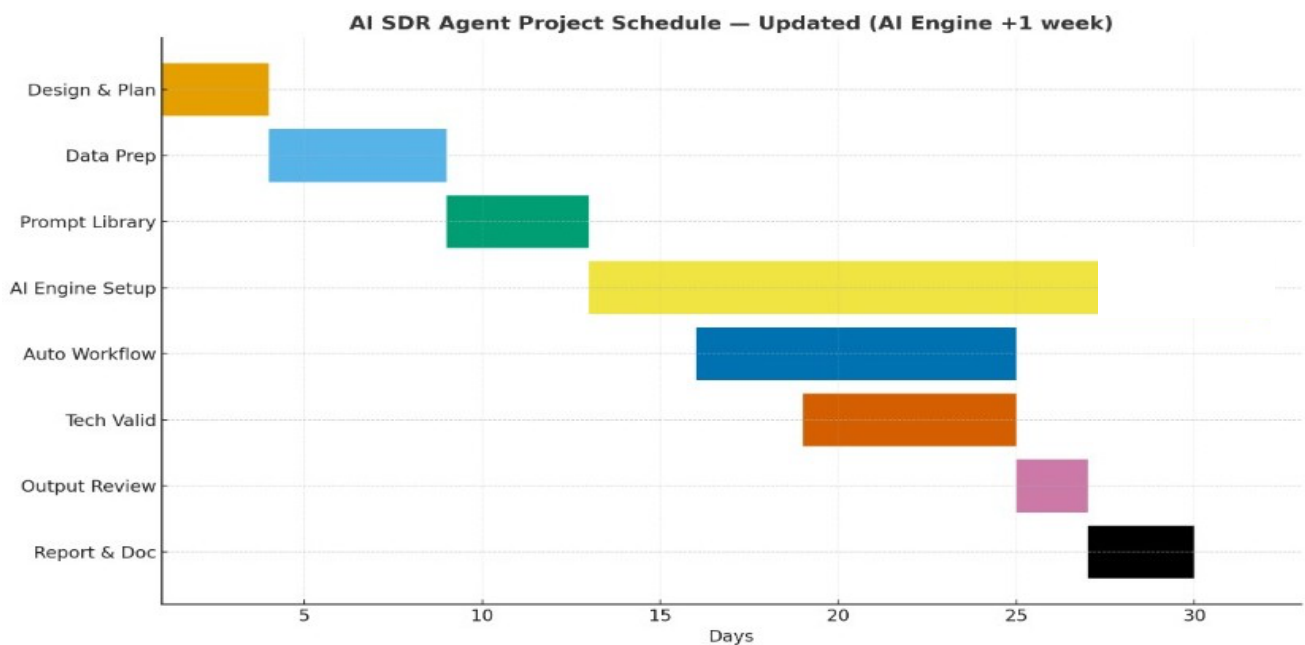- Project_Report.docx/PDF

9. Appendix

1. Lead sheet for the dataset: Inputs

Name	Company	Role	Industry	LinkedIn URL	Enriched Dat	Generated O	Status	Size
Priya Varma	Nimbus Analy	Head of Prod	SaaS / Analy	https://www.lir	Location: Bar	Hi Priya, I not	Processed	Mid
Rohit Sharma	GreenCart Re	Head of Oper	SaaS / Analy	https://www.lir	Location: Mui	Hi Rohit, I sav	Processed	Mid
Samantha Le	ClearHealth C	Director of Pa	Fintech	https://www.lir	Location: Pur	Hi Samantha,	Processed	Mid
Daniel Kim	FinOrbit	VP Growth	Fintech	https://www.lir	Location: Sin	Hi Daniel, Fin	Processed	Mid
Ana Rodrigue	EduSpark	Head of Mark	Fintech	https://www.lir	Location: Nev	Hi Ana, I likec	Processed	Small
Priya Sharma	CloudMax	Product Mana	AgriTech	linkedin.com/i	CloudMax is a	Hi Priya, I not	Processed	Mid
Rohan Mehta	HealthPlus	Marketing Lea	SaaS / Analy	linkedin.com/i	HealthPlus pr	Hi Rohan, He	Processed	Mid
Kavya Reddy	FinHub	Data Analyst	EdTech	linkedin.com/i	FinHub delive	Hi Kavya, you	Processed	Small
Ankit Verma	AgriSmart	Operations H	Fintech	linkedin.com/i	AgriSmart dev	Hi Ankit, I see	Processed	Mid
Sneha Iyer	EduLink	Academic Ad	Healthcare	linkedin.com/i	EduLink prov	Hi Sneha, Ed	Processed	Small

JAGSoM
JAGDISH SHETH SCHOOL OF MANAGEMENT
AACSB ACCREDITED

2. AON Network Diagram: Project workflow dependencies.

3. Gantt Chart: 2-week timeline compressed into fast-track plan.

AI SDR Agent Project Schedule — Updated (AI Engine +1 week)

4. Workflow Diagram: Google Sheets → n8n → AI → Out