Project Charter

A. General Information

Project Title:	LLM-Powered Digital Twin for Simulated Focus Groups		
Brief Project Description:	The project is about designing and implementing a digital-twin framework enabled by LLMs to simulate human-like personas in focus groups. Each digital twin represents a unique persona through specific demographic, behavioral, and psychological parameters and participates in a structured discussion of a product. The system employs prompt engineering, retrieval-augmented-generation (RAG), and lightweight multi-agent architectures to produce interactive and flexible simulations. It is a digital twin that captures realistic dialogue, surfaces insightful perspectives, and identifies latent needs to enrich the product research process using specific tasks, consequently reducing or eliminating the need for actual focus groups. This enables the option for scalable and cost-effective decisions to be rendered within a company.		
Prepared By:	Kanmani Vijayanand Ratan Sai Mandela Mallika Chand Poornima Piyush Bhattarai		
Date:	September 8, 2025	***Version:***	Version 1.0

B. Project Objective:

Explain the specific objectives of the project. For example: What value does this project add to the organization? How does this project align with the strategic priorities of the organization? What results are expected? What are the deliverables? What benefits will be realized? What problems will be resolved?

The goal of this project is to build an AI-powered digital twin that can act like a virtual focus group, bringing together different customer personas to share their views and experiences. Instead of spending weeks and resources setting up traditional focus groups, this system will allow the organization to gather meaningful insights quickly and cost-effectively. Having great conversations in uncovering a customer who sincerely values something, must face some challenges, and consider how they may react to new products or ideas. It aligns with the organization's approach to innovation and prioritizing customers, while also remaining practical, using persona templates, discussion transcripts, and precise text-based analysis. In the long run, it makes research faster, smarter, and more accessible—giving teams a stronger foundation for making decisions and staying ahead in the market.

C. Assumptions

List and describe the assumptions made in the decision to charter this project. Please note that all assumptions must be validated to ensure that the project stays on schedule and on budget.

The following assumptions are made for this project:

1) Relevant product information and persona details will be accessible to configure realistic digital twins.
2) Selected LLMs can simulate diverse personas, sustain context, and provide clear, usable outputs.
3) Required hardware and software resources will be available within budget limits.
4) Key users and teams will actively participate in validating personas and reviewing outputs.
5) Data used for simulation will be anonymized or synthetic to ensure ethical and privacy compliance.
6) The MVP can be scaled with future enhancements without requiring major redesigns.
7) Costs of running LLMs will remain within budget, with lightweight open-source models available if needed.
8) Project success will be measured through accuracy, quality of insights, and value to decision-makers.

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D. Project Scope

Describe the scope of the project. The project scope establishes the boundaries of the project. It identifies the limits of the project and defines the deliverables.

This project focuses on creating a prototype of a digital twin system powered by Large Language Models (LLMs) that can act like a virtual focus group. The aim is to show how different customer personas, defined by demographic and behavioral traits, can come together in a simulated discussion about a product and provide meaningful insights. The following scopes are included in this project:

1) Creating templates that define customer personas, including their demographics, behaviors, and preferences.
2) Building an LLM-powered workflow that enables these personas to participate in multi-turn focus group discussions.
3) Incorporating product information into prompts helps keep conversations relevant and grounded.
4) Capturing and storing the transcripts of these discussions for further review.
5) Analyzing the conversations to highlight sentiments, recurring themes, and key insights.
6) Providing clear documentation of the design, process, and suggestions for how the system can grow in the future.

List any requirements that are specifically excluded from the scope.

The following scopes are excluded from this project:

- Rolling out the system across the entire enterprise is not part of this phase.
- The project will not connect with live customer data or external tools like CRM or ERP systems.
- Building advanced analytics dashboards or production-ready visualization tools is outside the current scope.
- Developing brand-new LLM models is omitted, apart from simple fine-tuning or prompt adjustments.

E. Project Milestones

List the major milestones and deliverables of the project.

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Milestones	Deliverables	Date
Project Initiation & Architecture Outline	Project charter, finalized scope, and assumptions.	Week 1
Persona Modeling (Config File–Based)	Persona configuration templates (demographic, behavioral, psychographic profiles)	Week 2 & 3
Multi-Tier Prompt Conditioning	LLM-based workflow for multi-turn focus group simulation.	Week 4 & 5
Product Context Integration	Prompts enriched with product information.	Week 6 & 7
Transcript Generation & Storage	Collection and storage of conversation transcripts.	Week 8 & 9
Analysis & Insight Extraction	Analytical reports (sentiment trends, themes, key insights).	Week 10 & 11
Documentation & Recommendations	Final documentation, scaling guidelines, and recommendations.	Week 11 & 12
MVP Prototype Completion & Presentation	Functional MVP demo and project presentation.	Week 13 & 14

F. Impact Statement

List the impact this project may have on existing systems or units.

Potential Impact	Systems / Units Impacted
Compute & hosting needs for local LLMs and multi-agent runs.	IT/Infrastructure, DevOps/MLOps.

New data stores have been implemented for persona files, product context, transcripts, and logs.	Data Engineering/Platform, Storage & Backup, IT Operations.
Privacy, anonymization, and de-identification controls for all artifacts.	Legal/Privacy, Compliance/Risk, Security.
LLM serving stack adoption (Ollama / vLLM / HF-TGI).	Platform Engineering, MLOps, DevOps
Research workflow shift to use simulated insights.	UX Research/Insights, Product Management, Research Ops

G. Roles and Responsibilities

Describe the roles and responsibilities of project team members followed by the names and contact information for those filling the roles. The table below gives some generic descriptions. Modify, overwrite, and add to these examples to accurately describe the roles and responsibilities for this project.

Sponsor: Provides overall direction on the project. Responsibilities include: approve the project charter and plan; secure resources for the project; confirm the project's goals and objectives; keep abreast of major project activities; make decisions on escalated issues; and assist in the resolution of roadblocks.	
Name	**Email / Phone**
Dr. Srikanth Mudigonda	srikanth.mudigonda@slu.edu
Project Lead: Leads in the planning and development of the project; manages the project to scope. Responsibilities include: develop the project plan; identify project deliverables; identify risks and develop risk management plan; direct the project resources (team members); scope control and change management; oversee quality assurance of the project management process; maintain all documentation including the project plan; report and forecast project status; resolve conflicts within the project or between cross-functional teams; ensure that the project's product meets the business objectives; and communicate project status to stakeholders.	
Name	**Email / Phone**
Kanmani Vijayanand	Kanmani.vijayanand@slu.edu
Piyush Bhattarai	piyush.bhattarai@slu.edu
Team Member: Works toward the deliverables of the project. Responsibilities include: understand the work to be completed; complete research, data gathering, analysis, and documentation as outlined in the project plan; inform the project manager of issues, scope changes, and risk and quality concerns; proactively communicate status; and manage expectations.	
Name	**Email / Phone**
Ratan Sai Mandela	ratansai.mandela@slu.edu
Mallika Chand	mallika.chand@slu.edu
Poornima	poornima.anamanenisayeeswaran@slu.edu
Customer: The person or department requesting the deliverable. Responsibilities include: partner with the sponsor or project manager to create the Project Charter; partner with the project manager to manage the project including the timeline, work plan, testing, resources, training, and documentation of procedures; work with the project team to identify the technical approach to be used and the deliverables to be furnished at the completion of the project; provide a clear definition of the business objective; sign-off on project deliverables; take ownership of the developed process and software.	
Name	**Email / Phone**
Product & UX Research Team	digitaltwin-focusgroup@slu.edu
Subject Matter Expert: Provides expertise on a specific subject. Responsibilities include: maintain up-to-date experience and knowledge on the subject matter; and provide advice on what is critical to the performance of a project task and what is nice-to-know.	
Name	**Email / Phone**
Dr. Srikanth Mudigonda	srikanth.mudigonda@slu.edu

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H. Resources

Identify the initial funding, personnel, and other resources committed to this project by the project sponsor.

Resource	Constraints
Project Budget	$0 – This is an academic project; no external funding is allocated. Costs are limited to free/open-source tools, as well as university-provided resources.
Team Members	Kanmani & Piyush (Project Lead) lead scope, schedule, stakeholder coordination, and quality/ethics across the project. Ratan Sai Mandela (LLM/Orchestration) builds the simulation workflow and prompts to generate grounded multi-turn conversations; Poornima (Persona Modeling) designs the persona schema/profiles, sets voice guidelines, and validates realism with bias checks. Mallika Chand (Data/ML Insights) turns transcripts into sentiment/themes and actionable recommendations. At the same time, she will set up the (DevOps/Platform) runtime, storage/logging, and reproducible pipelines to deliver a stable MVP demo.
Technical Tools	Python 3.10+; Git; Jupyter/VS Code; LLM runtime (Ollama / vLLM / HF-TGI); Small open models (e.g., Phi-3, Llama-3-8B quantized) for local tests; JSON/YAML for personas; CSV/Parquet for transcripts; Basic storage (filesystem/Drive); Optional: Power BI/Sheets for quick charts.
Data Resources	Persona files (JSON/YAML), product briefs/specs**,** focus-group questions**,** conversation transcripts/logs (synthetic/anon). Optional: small knowledge snippets to ground prompts.
Timeframe	8 weeks (Week 1 charter → Week 8 MVP demo), aligned with your milestones: persona modeling → prompt conditioning → product grounding → simulation → analysis → docs/demo.

I. Project Risks

Identify the high-level project risks and the strategies to mitigate them.

Risk	Mitigation Strategy
Ungrounded or “hallucinated” answers	Inject product facts into prompts (grounding checklist); add light RAG later if needed; spot-check sessions for factual references.
Personas feel same-y or unrealistic	Use a structured persona schema + voice/style rules; run dry-tests and iterate until each persona is clearly distinct; get stakeholder sign-off.
Privacy/PII exposure	Use only synthetic/anonymized data; de-identify any examples; include a simple data-handling note in the repo.
Compute/memory limits.	Choose small/quantized models; serialize persona runs; keep prompts/context windows lean; cap conversation turns.
Scope creep beyond MVP	Lock scope and acceptance criteria early; hold brief weekly reviews; park advanced features (RAG, dashboards, agent debates) as “Future Work.”

J. Success Measurements

Identify metric and target you are trying to achieve as a result of this project. For example, overall cost savings of $50K or reduce processing time by 25 percent.

We will measure success by delivering first insights within 48 hours from a defined question set, with persona realism ≥4.0/5**,** persona distinctiveness ≥4.0/5 (or average embedding distance ≥0.25), and validity ≥85% of answers referencing provided product facts. Conversations should be ≥80% coherent**,** each concept yielding ≥3 actionable insights plus one objection and one recommendation, with 100% transcript capture (timestamps/metadata) and ≥90% reproducibility of key themes on repeat runs. We will maintain zero PII incidents (all synthetic/anonymized inputs), achieve stakeholder satisfaction ≥4.0/5 post-demo, and keep runtime to ≤30 minutes for simulating five personas × five questions on a lab machine.

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K. Signatures

The signatures of the people below document approval of the formal Project Charter. The project manager is empowered by this charter to proceed with the project as outlined in the charter.

Customer:		
Name	**Signature**	**Date**
Product & UX Research Team	N/A – Internal Stakeholder	N/A
Project Sponsors:		
Name	**Signature**	**Date**
Dr. Srikanth Mudigonda	Dr. Srikanth Mudigonda	9/9/2025
Project Lead:		
Name	**Signature**	**Date**
Kanmani Vijayanand	Kanmani V	9/9/2025
Piyush Bhattarai	Piyush Bhattarai	9/9/2025