# **1. Challenge Statement**

### Problem Understanding

The challenge requires developing a Generative AI solution that delivers hyper-personalized recommendations by analyzing diverse customer data points, including:

* Customer profiles
* Social media activity
* Purchase history
* Sentiment data
* Demographic details

The solution needs to generate personalized recommendations and provide actionable business insights.

# **2. Expectations from Participants**

Participants are expected to submit the following:

* **Functional Prototype:** An AI-driven hyper-personalization and recommendation system.
* **Detailed Report (Max 10 pages):** Explanation of approach, model selection, training methodology, hyperparameter tuning, ethical considerations, insights, and business recommendations based on AI-driven findings.
* **Demonstration Video:** Showcasing the system in action, generating personalized recommendations.
* **GitHub Repository:** Well-documented, modular code with a README detailing setup instructions.
* **Presentation (Max 15 slides):** Summary of key findings, challenges faced, evaluation results, business strategy recommendations, and future scope.
* **Benchmarking Comparison:** At least two alternative models to demonstrate effectiveness.

**Example Expected Outcomes:**

* **Adaptive Recommendation Engine:** Learns from real-time user interactions to provide dynamic suggestions based on behavioral changes.
* **AI-Generated Personalized Product/Service Suggestions:** Based on engagement history, purchase patterns, and sentiment analysis.
* **Sentiment-Driven Content Recommendations:** Tailored content suggestions based on sentiment scores.
* **Predictive Customer Insights & Business Strategies:** AI-driven insights to predict customer preferences, churn risks, and purchasing potential.
* **Multi-Modal Personalization:** Combining text, image, and voice inputs for immersive and relevant recommendations.
* **Hyper-Personalized Financial Product Recommendations:** Tailored credit card plans, loan options, or investment opportunities based on transaction history and risk profile.

# **3. Key Technical Considerations**

* **Generative AI Techniques:** Use of LLMs, transformers, fine-tuned models, retrieval-augmented generation, etc.
* **Multi-Modal Approach:** Incorporating text, images, and user sentiment analysis.
* **Data Privacy & Compliance:** Adhering to ethical AI principles and consent management.
* **Adaptability:** System should adjust recommendations dynamically based on real-time interaction.
* **Comprehensive Recommendations:** Provide insights for user engagement, product discovery, and service optimization.
* **Tools & Frameworks:** OpenAI APIs, Hugging Face models, open-source LLMs (like GPT-J, LLaMA), cloud-based NLP frameworks.
* **Advanced Techniques:** Prompt engineering and reinforcement learning from human feedback (RLHF).
* **Bias Detection & Fairness:** Prevent discriminatory recommendations, especially from biased financial data.
* **Automated Risk Assessment:** Identifying suspicious transactions or financial distress.