Business Requirements Document (BRD)

Project: ADDIE-Based Prompt Management & Retrieval System
Platform: Google Cloud + Vertex AI Agent Builder / Agentspace
Prepared for: Internal AI/ML Enablement & Learning Design Teams

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1. Executive Summary

As Generative AI adoption accelerates across learning design, instructional engineering, and content development, organizations face growing challenges in **prompt reuse, consistency, quality control, and lifecycle management**. Teams frequently recreate similar prompts, introduce subtle variations without governance, and lack a trusted, queryable repository aligned to instructional design frameworks such as **ADDIE (Analyze, Design, Develop, Implement, Evaluate)**.

This initiative introduces a **phased Prompt Management System** that enables:

- Structured capture of prompts aligned to ADDIE
- Human and automated vetting for quality and similarity
- A **Vertex AI Agent** that allows users to *ask for prompts by ADDIE phase*
- Progressive automation from pilot to full production

The system begins with lightweight tooling (Google Forms, Sheets, human review) and evolves into a **fully automated, agent-driven, BigQuery-backed platform** with semantic similarity, versioning, and governance.

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2. Problem Statement

Current Challenges

- Prompts are created ad hoc and stored inconsistently (docs, chats, notebooks).
- High duplication of “similar sounding” prompts with no visibility.
- No standardized framework alignment (e.g., ADDIE).
- No quality gate or testing before reuse.
- No agent-friendly, authoritative data source for prompt retrieval.

Business Impact

- Reduced productivity due to prompt re-creation.
- Inconsistent outputs across teams and courses.
- Increased risk of low-quality or misaligned prompts being reused.
- Lack of trust in AI-assisted workflows.

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3. Business Objectives

1. **Standardize prompt creation** using the ADDIE framework.
2. **Reduce duplication** through similarity detection.
3. **Improve quality and consistency** via review and testing.
4. **Enable natural-language prompt retrieval** via a Vertex AI Agent.
5. **Progressively automate** with minimal disruption to users.

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4. Scope Overview

In Scope

- Prompt capture, review, storage, and retrieval
- ADDIE-aligned metadata
- Agent-based prompt discovery
- Pilot → Production automation roadmap

Out of Scope (Initial Phases)

- Multi-language prompt translation
- External (non-Google) tooling
- Public-facing prompt marketplace

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5. User Personas

Prompt Author

- Instructional designers, curriculum developers, AI practitioners
- Goal: submit reusable, high-quality prompts

Reviewer / SME

- Senior designers, architects, or leads
- Goal: vet prompts for quality, duplication, and alignment

Prompt Consumer (End User)

- Uses a Vertex AI Agent
- Goal: “Give me a prompt for the **Design** phase”

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6. Functional Requirements (High Level)

ID	Requirement
FR-1	Capture prompts with ADDIE phase metadata
FR-2	Support human review and approval
FR-3	Store approved prompts in an agent-consumable format
FR-4	Allow agent queries by ADDIE phase
FR-5	Detect similar or duplicate prompts (Phase 2)
FR-6	Automate lifecycle gates (Phase 2)

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7. Non-Functional Requirements

- **Security:** Internal-only access
- **Auditability:** Traceable prompt lineage
- **Explainability:** Agent explains why a prompt was selected
- **Scalability:** From ~50 prompts to thousands
- **Google-native:** Use Google Cloud services end-to-end

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8. Architectural Overview – Pilot Phase (Phase 1)

Phase 1 Goal

Validate the **end-to-end value** of structured prompt capture and agent-based retrieval with **human-in-the-loop controls**.

Phase 1 Architecture (Conceptual)

Prompt Capture

- Google Forms used to submit:
    - Prompt text
    - ADDIE phase
    - Intended use
    - Tags
    - Author

Intermediate Review

- Responses stored in **Google Sheets**
- Human reviewer:
    - Checks similarity manually
    - Reviews quality and alignment
    - Approves or rejects

Approved Prompt Storage

- Approved prompts exported to **Google Cloud Storage (GCS)**
- Each prompt stored as a structured JSON or Markdown file

Agent Consumption

- Vertex AI Agent Builder configured with:
    - **Cloud Storage as a data source**
- Agent answers:
  "Give me a Design-phase prompt for learning objectives"

Key Characteristics

- Manual similarity detection
- Manual approval
- Simple governance
- Fast to deploy and iterate

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9. Architectural Overview – Full Production Phase (Phase 2)

Phase 2 Goal

Achieve **near-perfect automation** while preserving quality, governance, and trust.

Phase 2 Architecture (Conceptual)

Prompt Capture

- UI or Agent-assisted submission
- Prompts stored directly in **BigQuery (Prompt Backlog)**

Automated Similarity Detection

- Prompt embeddings generated using Vertex AI
- Similarity search performed against existing prompts
- Threshold-based duplicate detection

Testing & Vetting

- Automated prompt tests (rubrics, format checks)
- Results stored in BigQuery

Lifecycle Management

- Versioning
- Status transitions (Draft → Testing → Approved → Published)

Authoritative Data Source

- **BigQuery Prompt Registry**
- Only approved, active prompts exposed

Agent Consumption

- Vertex AI Agent:
    - Uses **Prompt Registry** (BigQuery or exported index)
    - Retrieves prompts by:
        - ADDIE phase
        - Intent
        - Tags
    - Explains selection rationale

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10. Data Sources by Phase

Phase	Data Source	Purpose

Pilot	Google Sheets	Capture + review
Pilot	Google Cloud Storage	Agent data source
Production	BigQuery (Backlog)	Draft & review
Production	BigQuery (Registry)	Published prompts
Production	Vertex Embeddings	Similarity search

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11. Vertex AI Agent Responsibilities

Agent Capabilities

- Interpret user intent
- Enforce ADDIE phase filtering
- Retrieve only approved prompts
- Explain why a prompt was selected
- Ask clarifying questions if needed

Example Agent Interaction

> User: “I need a Design-phase prompt to create learning objectives.”

Agent:

- Filters prompts where `ADDIE = Design`
- Ranks by semantic relevance
- Returns top prompt + explanation

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12. Success Metrics

Pilot Phase

- % of prompts reused
- Reviewer satisfaction
- Time to find a prompt

Production Phase

- Reduction in duplicate prompts
- Test pass rates
- Agent retrieval precision
- User satisfaction with agent responses

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13. Risks & Mitigations

Risk	Mitigation
Low-quality prompts	Human review (Phase 1)
Over-automation too early	Phased rollout
Agent hallucination	Authoritative registry only
User trust	Explainable retrieval

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14. Roadmap Summary

Phase	Description
Phase 1	Google Forms → Sheets → Human Review → GCS → Agent
Phase 2	BigQuery → Similarity → Testing → Registry → Agent

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15. Conclusion

This phased approach balances **speed, trust, and scalability**, allowing teams to immediately benefit from structured prompt reuse while building toward a **fully automated, agent-driven prompt platform** aligned to the ADDIE framework and Google Cloud best practices.