



# Dialogix – Conversational Gateway

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### Introduction

Dialogix is an AI-powered conversation training platform designed to help individuals build confidence and competence in high-stakes workplace communication.

Modern professionals frequently struggle with difficult conversations, such as performance feedback, conflict resolution, negotiation, and leadership dialogue. Tet few receive structured practice in a safe environment.

### Methodology

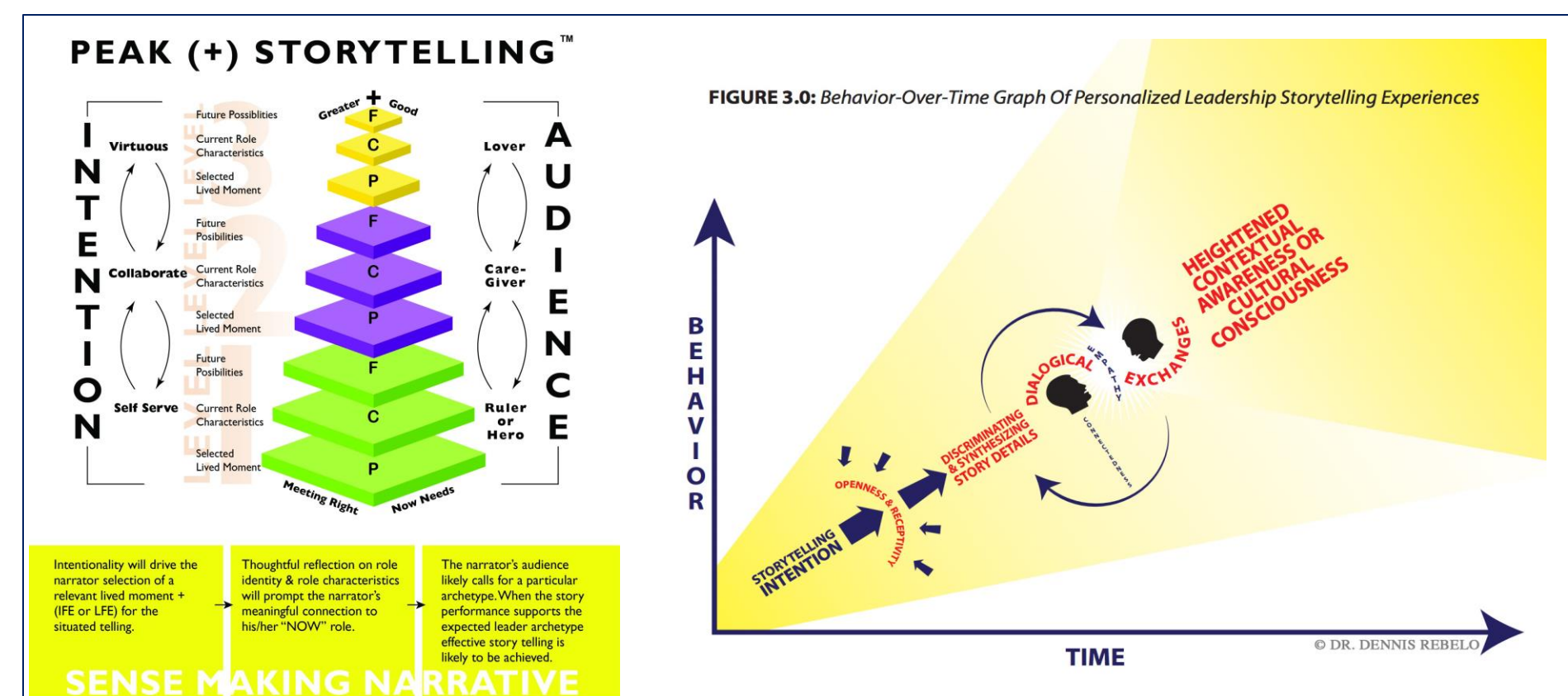
MArchitecture: React Native mobile app + Express.js backend + MongoDB + OpenAI GPT-4o-mini

Theoretical Framework — Three storytelling models drive the AI:

Peak Storytelling — Maps responses to 9 leadership archetypes (Caregiver, Hero, Sage, etc.) across Past, Current, and Future layers

Storytelling Flow Process — Assesses narrative clarity from initial consciousness through adaptive adjustment

### Data



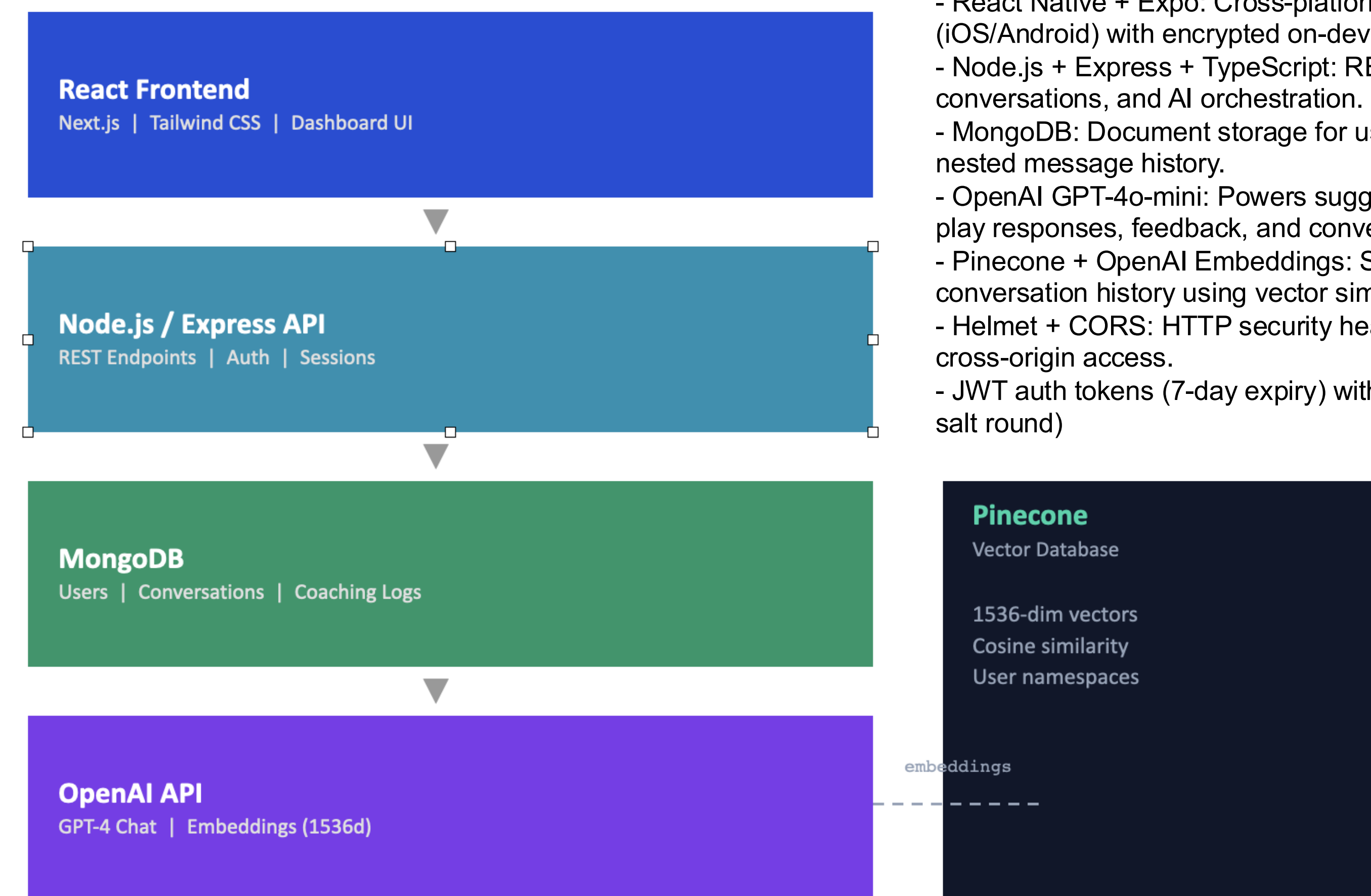
Three leadership storytelling models (Dr. Dennis Rebeo) drive the AI coaching prompts:

- Peak Storytelling : 9 leadership archetypes across Past, Current, and Future layers
- Storytelling Flow: Narrative clarity from awareness through adaptive adjustment
- Behavior-Over-Time: 5 developmental stages from intention to cultural consciousness

Each conversation produces a 1–10 score, developmental stage placement, and growth recommendations.

### Design

#### System Architecture



- Tools
- React Native + Expo: Cross-platform mobile app (iOS/Android) with encrypted on-device token storage.
  - Node.js + Express + TypeScript: REST API handling auth, conversations, and AI orchestration.
  - MongoDB: Document storage for users, conversations, and nested message history.
  - OpenAI GPT-4o-mini: Powers suggestion generation, role-play responses, feedback, and conversation analysis.
  - Pinecone + OpenAI Embeddings: Semantic search across conversation history using vector similarity.
  - Helmet + CORS: HTTP security headers and restricted cross-origin access.
  - JWT auth tokens (7-day expiry) with hashed passwords (10 salt round)

Fig. 1: System architecture showing full-stack data flow from user interface through AI services to vector storage.

#### RAG (Retrieval-Augmented Generation) Pipeline

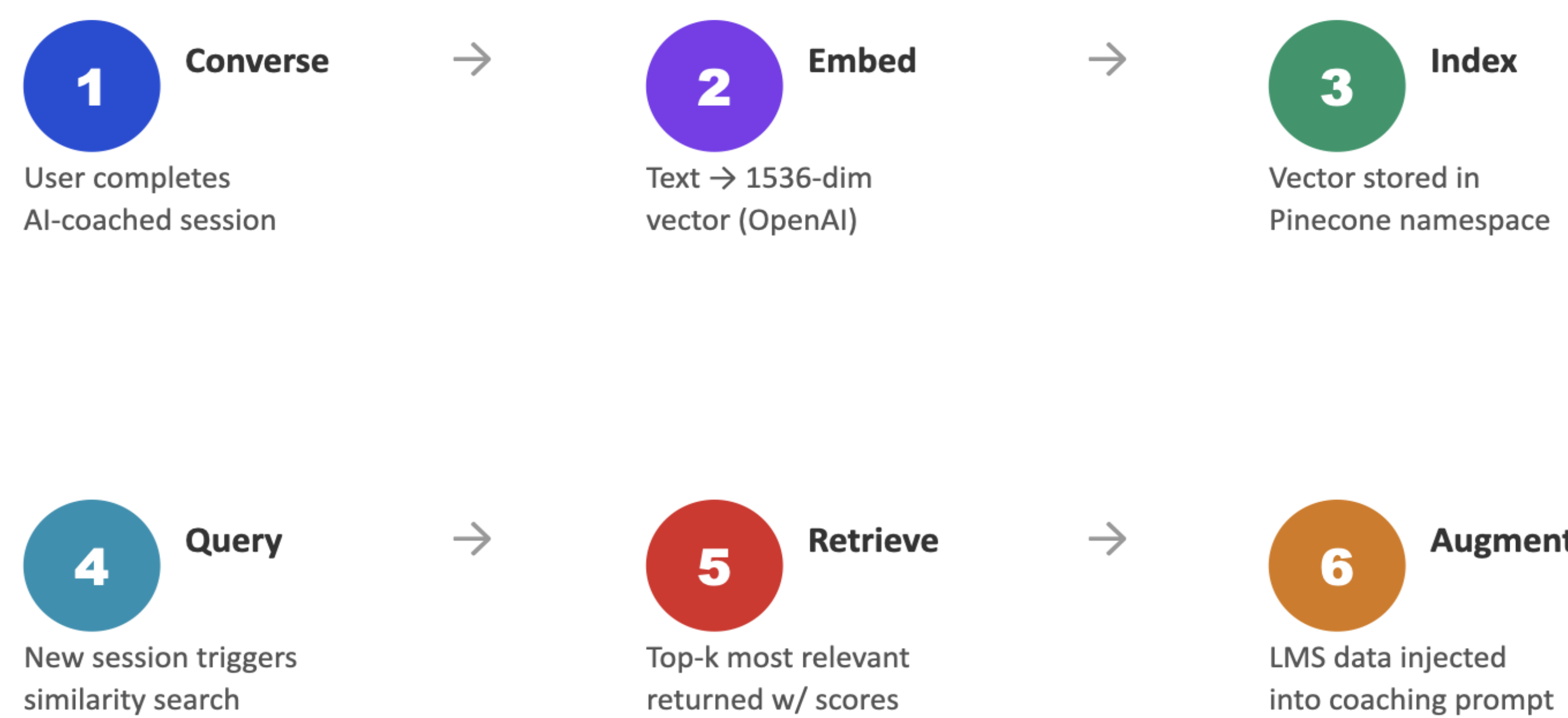


Fig. 2: RAG pipeline — conversations are embedded, indexed, and retrieved to augment AI coaching with personal history and LMS data.

#### Semantic Similarity Search - Example

Query: "negotiate salary raise with manager"

Past Conversation	Score	Context
Asking for a promotion	0.94	Manager 1:1
Workplace conflict resolution	0.87	Team meeting
Negotiating project deadline	0.82	Client call
Giving critical feedback	0.76	Perf. review

Fig. 3: Cosine similarity scores (0–1) show the system retrieves relevant conversations by meaning, not keywords.

### Results/Implementation and Testing

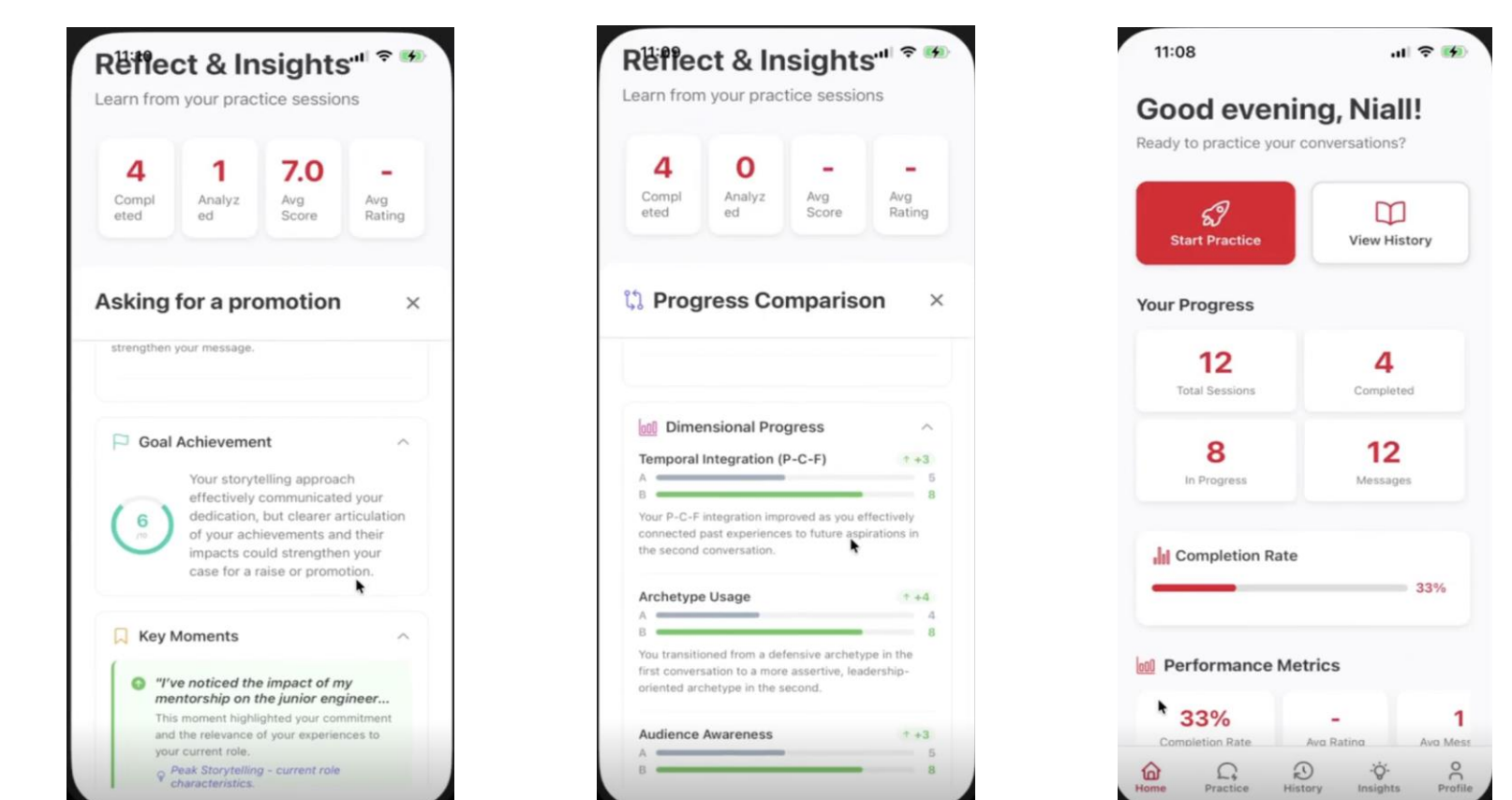
- Testing
- Auth tests: signup, login, token verification, protected route access.
  - API tests: conversation lifecycle (draft → active → completed), message handling, analysis generation.
  - Data isolation: verified user-scoped queries prevent cross-user access.
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- AI Capabilities
1. Suggestion generation: 4 archetype-based response options per turn (Caregiver, Sage, Hero, etc.).
  2. Role-play responses: realistic, context-aware counterparty dialogue.
  3. Custom message feedback: coaching and improved alternatives for user-written responses.
  4. Conversation analysis: post-session review with scores, developmental stage, communication patterns, and growth recommendations.
- System Scale
- Conversation comparison for tracking progress across sessions.
  - 3-tier architecture: mobile app → REST API → MongoDB / OpenAI / Pinecone.
  - 15+ API endpoints covering auth, conversation lifecycle, metrics, and search.
  - Multi-turn dialogue with AI suggestions and responses at each step.

- Security
- 6-layer model: HTTPS, hashing, JWT tokens, encrypted device storage, CORS, and user-scoped DB queries.

- Metrics & Analytics
- Tracks completion rate, average rating, weekly/monthly activity trends, rating distribution, and developmental stage progression.
  - Semantic search lets users find similar past conversations

### Conclusions

- Evaluation
- Our app delivers a fully functional AI-powered conversation practice platform meeting all core success criteria: guided dialogue, framework-based coaching, and measurable skill tracking.
  - Users can practice unlimited workplace scenarios with real-time AI suggestions grounded in the Leadership Storytelling Framework.
  - Built-in analytics provide concrete metrics (scores, ratings, developmental stage) to demonstrate communication growth over time.
- Impact
- Provides a safe, private space for professionals to practice difficult conversations before they happen.
  - Bridges the gap between communication theory (Peak Storytelling, Behavior-Over-Time) and hands-on practice.



### Acknowledgements

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