AAGI-AU-RD-GIA Grains Industry Analytics Roadmap Generator

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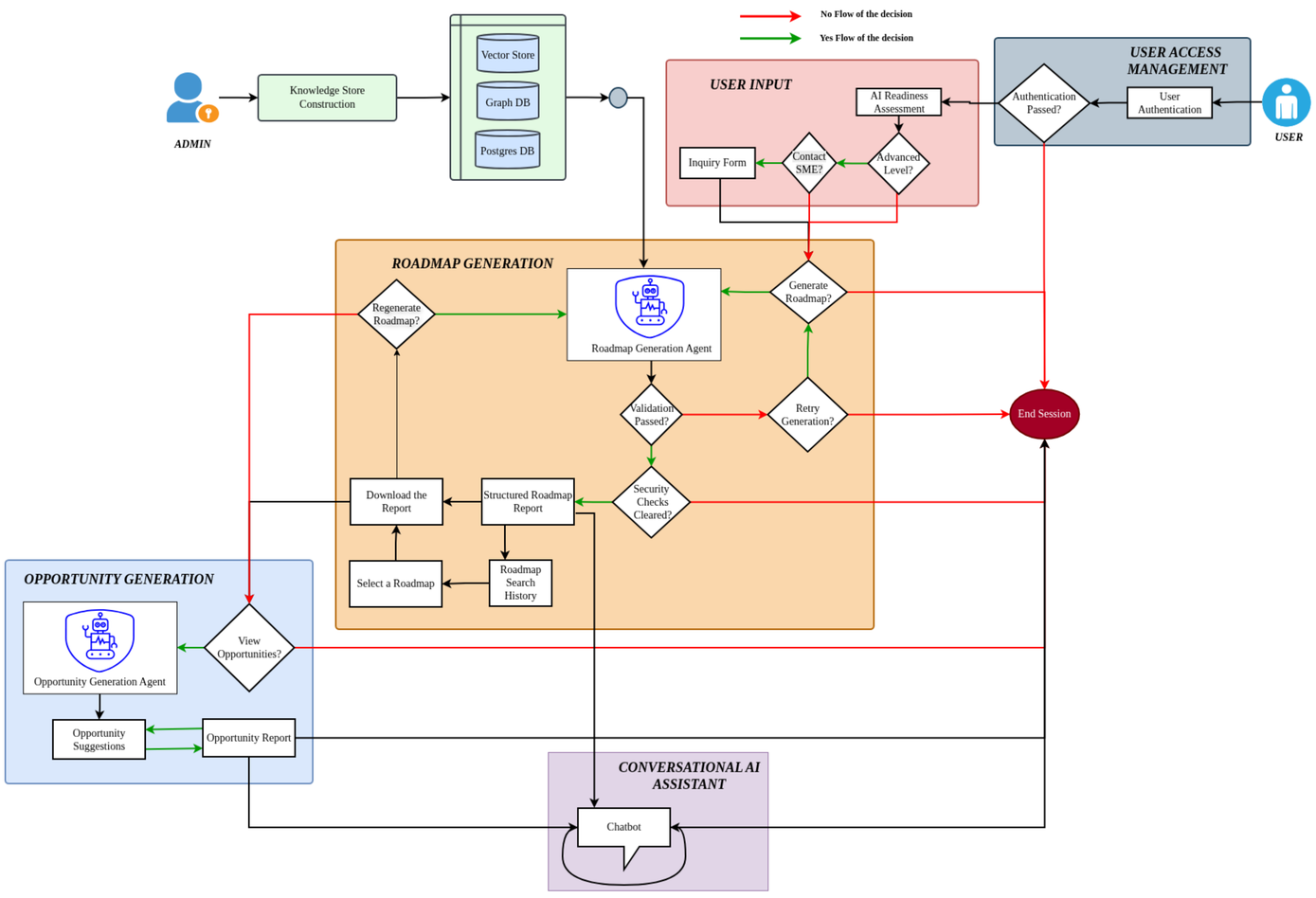
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MOTIVATION

Grains researchers, advisers and growers lack structured guidance for comparative trial design, data quality assessment, and judging whether AI/ML is suitable, producing inconsistent experimental rigour and inefficient use of RD&E investment.

The aim is to develop an evidence-grounded platform to guide experimental design, assess data and AI/ML readiness, generate research roadmaps, identify additional AI opportunities, and provide interactive chatbot support for informed RD&E decision-making.

SYSTEM ARCHITECTURE



PLANNED EVALUATION

RAGAS: Assess chatbot faithfulness and response relevance.

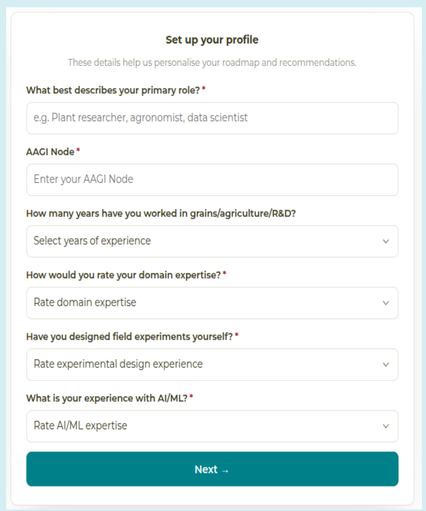
LLM-as-a-Judge: Evaluate roadmap and opportunity relevance, completeness, feasibility and actionability.

Expert Assessment: Validate technical accuracy and practical suitability using selected test cases.

User Acceptance Testing (UAT): Assess platform usability, clarity and usefulness with representative end users.

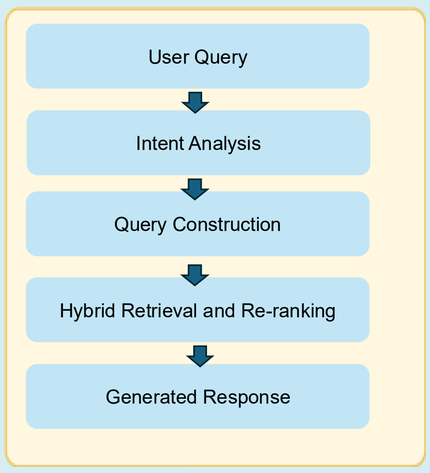
TECHNICAL DESIGN

User input



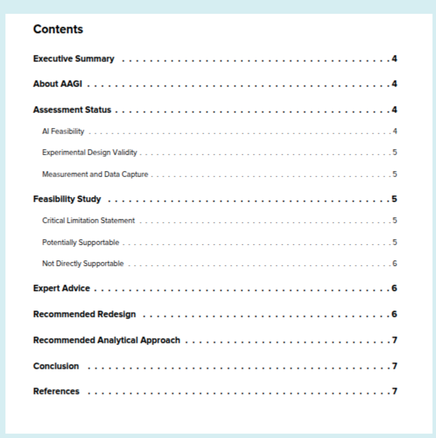
- User profile.
- Research objective, proposed plan and data sources.
- Detailed idea-based workflow.

Generation Pipeline



- Transforms user responses into retrieval queries.
- Retrieves and re-ranks relevant grains-domain evidence.
- Builds grounded context for report generation.

Roadmap



- Combines assessment results, retrieved evidence and report schema.
- LLM generates a structured roadmap report.
- Validates and stores the final output for downstream use.

Opportunities

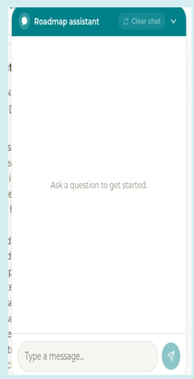
Alternative analytical approaches

New data capture opportunities

Parallel or follow-on AI use cases

- Combines roadmap findings, capability gaps and available data.
- Identifies additional AI and data-driven opportunities.
- Suggests follow-on use cases for further investigation or expert support.

Chatbot



How is chat grounded?

Uses the generated roadmap report as primary context

Can reference retrieved evidence and specific report sections

Supports explanation, clarification and exploration of next steps

Users can ask

- What other opportunities exist?
- What data gaps limit feasibility?
- What should happen next?
- Why was this approach recommended?

AAGI-AU CONTRIBUTION

A purpose-built grains analytics and AI roadmap platform: grains-specific workflows, system prompts and templates for experimental design, data readiness and analytics suitability.

A retrieval-augmented document store that grounds advice in AAGI/GRDC literature rather than model memory, built on foundational components shared with AAGI-AU-RD-RAG.

INDUSTRY IMPACT

Gives growers, advisers, agronomists and researchers contextualised methodological guidance on demand, reducing reliance on scarce expert bandwidth.

Grounding advice in grains literature improves reliability and traceability, strengthening trial design and data quality before research investment is committed.

The support of the Grains Research and Development Corporation (GRDC) provided through the Analytics for the Australian Grains Industry (AAGI) project is acknowledged.