High-Level Software Design (HLD) – KisanConnect

This HLD includes component and data views, plus sequence diagrams with context for implementation.

# Component Architecture

\*\*Purpose:\*\* Show the main runtime components, their responsibilities, and key data stores.

\*\*Assumptions:\*\* Stateless services; API gateway at edge; cloud-managed data stores; optional serverless for read-heavy endpoints.

\*\*Notes:\*\* Microservices are grouped logically; not every internal helper is shown (e.g., cache warmers).

Component\_Architecture

A screenshot of a computer

AI-generated content may be incorrect.

# Core Entity-Relationship Diagram (ERD)

\*\*Purpose:\*\* Define core entities and relations for persistence schemas used by multiple services.

\*\*Assumptions:\*\* PostgreSQL with JSONB for flexible attributes; TimescaleDB for high-volume IoT readings.

\*\*Notes:\*\* Not all columns/constraints shown; see LLD for full schema and migrations.

Core\_ERD

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AI-generated content may be incorrect.

# Advisory Flow

\*\*Preconditions:\*\* Service health green; identities authenticated where required.

\*\*Postconditions:\*\* State transitions committed; audit logs written; notifications dispatched if applicable.

\*\*Edge Cases:\*\* Network drops; provider timeouts; retries with idempotency keys; human-in-the-loop for moderation.

Seq\_Advisory\_Flow

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# Offline Sync

\*\*Preconditions:\*\* Service health green; identities authenticated where required.

\*\*Postconditions:\*\* State transitions committed; audit logs written; notifications dispatched if applicable.

\*\*Edge Cases:\*\* Network drops; provider timeouts; retries with idempotency keys; human-in-the-loop for moderation.

Seq\_Offline\_Sync

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# IoT Reading & Irrigation Advice

\*\*Preconditions:\*\* Service health green; identities authenticated where required.

\*\*Postconditions:\*\* State transitions committed; audit logs written; notifications dispatched if applicable.

\*\*Edge Cases:\*\* Network drops; provider timeouts; retries with idempotency keys; human-in-the-loop for moderation.

Seq\_IoT\_Irrigation

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# Authentication & Identity Flow

\*\*Preconditions:\*\* Service health green; identities authenticated where required.

\*\*Postconditions:\*\* State transitions committed; audit logs written; notifications dispatched if applicable.

\*\*Edge Cases:\*\* Network drops; provider timeouts; retries with idempotency keys; human-in-the-loop for moderation.

Seq\_Auth\_Identity

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# Forum Moderation Pipeline

\*\*Preconditions:\*\* Service health green; identities authenticated where required.

\*\*Postconditions:\*\* State transitions committed; audit logs written; notifications dispatched if applicable.

\*\*Edge Cases:\*\* Network drops; provider timeouts; retries with idempotency keys; human-in-the-loop for moderation.

Seq\_Forum\_Moderation

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# Blockchain Anchoring Sequence

\*\*Preconditions:\*\* Service health green; identities authenticated where required.

\*\*Postconditions:\*\* State transitions committed; audit logs written; notifications dispatched if applicable.

\*\*Edge Cases:\*\* Network drops; provider timeouts; retries with idempotency keys; human-in-the-loop for moderation.

Seq\_Blockchain\_Anchoring.

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