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Potable Water Monitoring

Plant Analyzer to Managers Agent

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WHY DO WE NEED TO FOCUS ON POTABLE WATER QUALITY

Community , worker health & safety

Productivity and operational continuity

Legal and regulatory compliance

Reputation, and investor requirements

Socio-environmental impact

- Acid mine drainage in South African goldfields exposed **10,000+ residents to contaminated groundwater**
- Copperbelt mining discharge in Zambia caused mass community illness and emergency **potable-water supply intervention**
- **A sewage pump failure contaminated** the community's water plant in Ontario as a result 44 people tested positive for cryptosporidium, **a diarrhea-causing parasite**

Economic impacts & license to operate

- **Suspension** of production and economic loss
- **Potential negative impact on stock value**
- **Lost trust** by communities, workforce, host country, regulators, institutional shareholders, private investors, and banks

Sustainability

- Helps meet reporting requirement to **Department of health** (Australian Drinking Water guidelines).
- **Continuous water monitoring** prevents outbreaks, protects citizens, and shields the institution, organizations from legal, financial, and reputational damage

SYSTEM MATURITY ASSESSMENT – Level of Automation & technology adoption

- Existing Water Monitoring and dosing equipment
- Level of Automation and Control
- Infrastructure and Networks
- SCADA Systems and Alarming
- Reporting and Data Analytics

SYSTEM MATURITY ASSESSMENT - Typical Outcomes

- Infrastructure Challenges
- Water Quality Risks
- Response & Operations
- Monitoring & Data Gaps
- Compliance & Reporting

Legacy Analyzers and dosing systems

- Legacy systems with low accuracy , no data interface, therefore insufficient granular data to benefit from AI

Real time water monitoring

- Monitoring will be enabled by automated data collection via. integrated real-time water quality analyzers with LTE communication integrated with existing plant PLC and SCADA.

Legacy Monitoring SCADA/Historian

- Legacy systems with insufficient data and bandwidth to leverage AI

Monitoring Dashboard

- Centralized dashboard displays location-wise CCP Points (chlorine etc.) with status indicators showing whether each CCP is within limits or crossed the required threshold

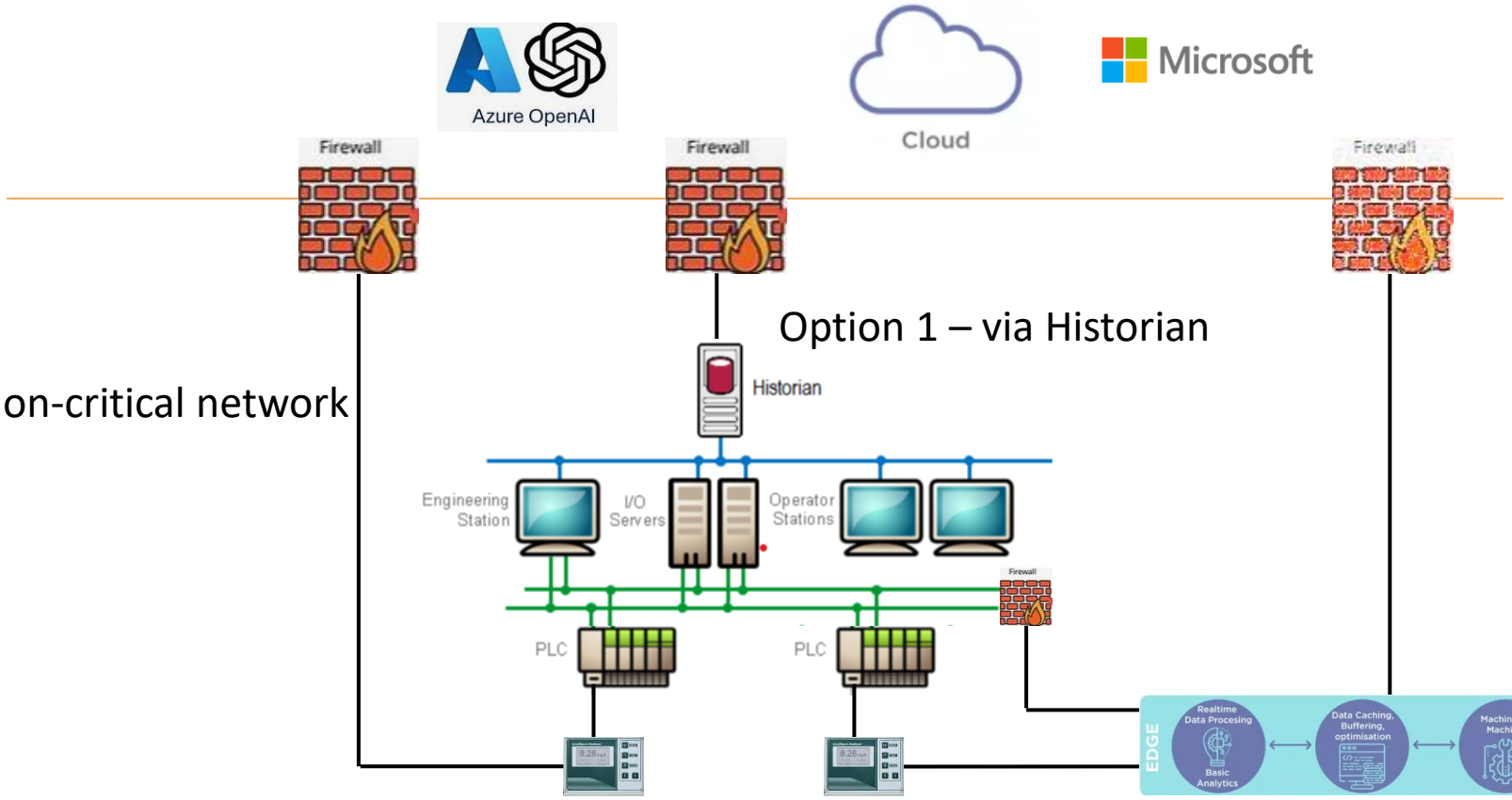
Compliance Reporting

- Compliance parameters or percentage - calculated manually.
- Reports for the regulatory authority are prepared manually.

Automated Reporting

- Compliance metrics will be auto-calculated in real time through an integrated digital platform
- Regulatory reports will be auto-generated with single click

Architecture Considerations and Options



Option 1 – via Historian

Option 2 – via non-critical network

Option 3 – Edge processing

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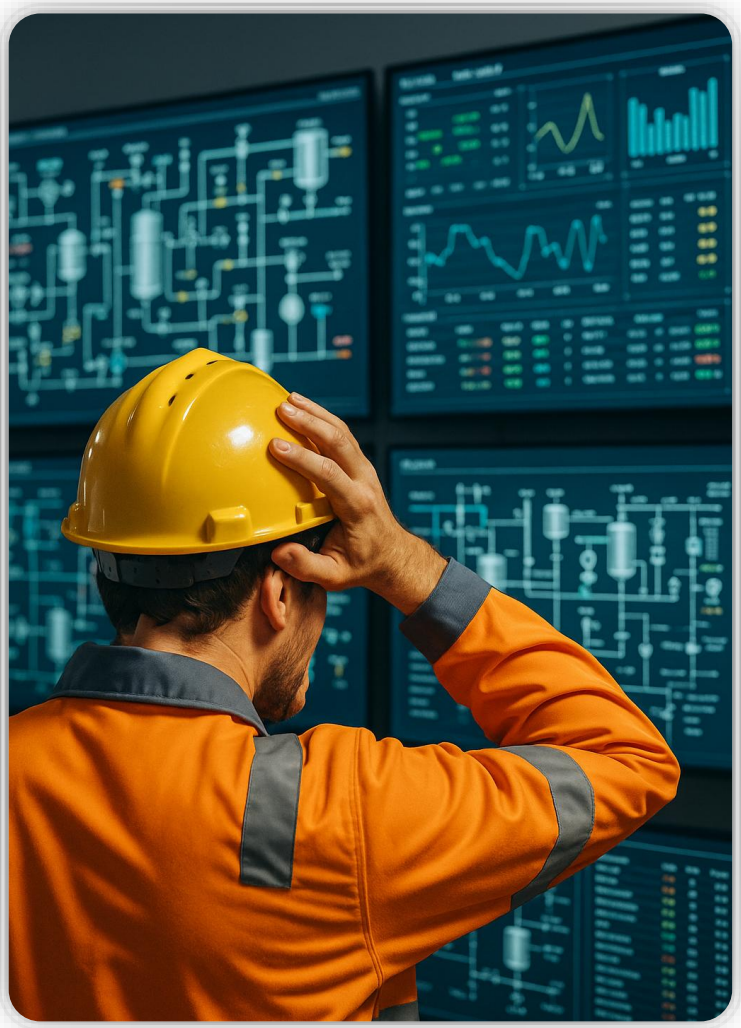
Why do we care about them?

Key Features of Monitoring Systems

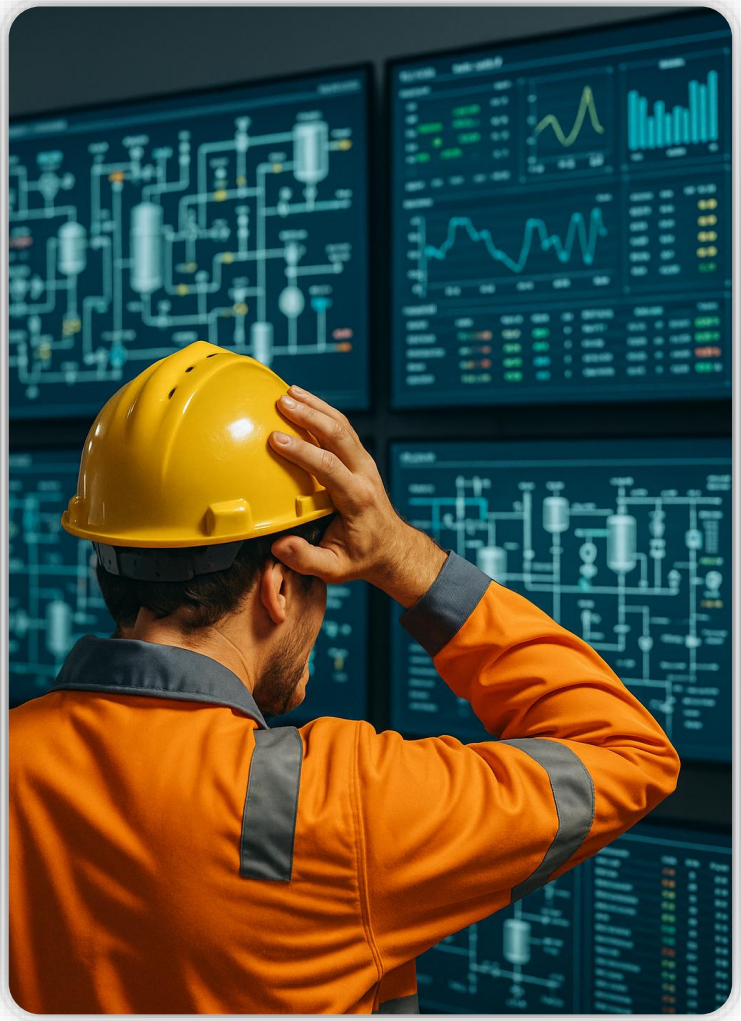
- **Real-time visibility**: Provides live insights into equipment status
- **Alarm management**: Notifies operators of potential issues
- **Preventive and reactive maintenance**: event-triggered checks
- **Performance tracking**: Supports analysis to improve operational efficiency
- **Safety assurance**: Ensures compliance with safety regulations
- **Basic reporting and visualization**: operational summaries
- **Human-in-the-loop decision-making**: Relies operator expertise for decisions



Use Case Scenario: A Day in the Life of an Asset Manager: The Information Maze

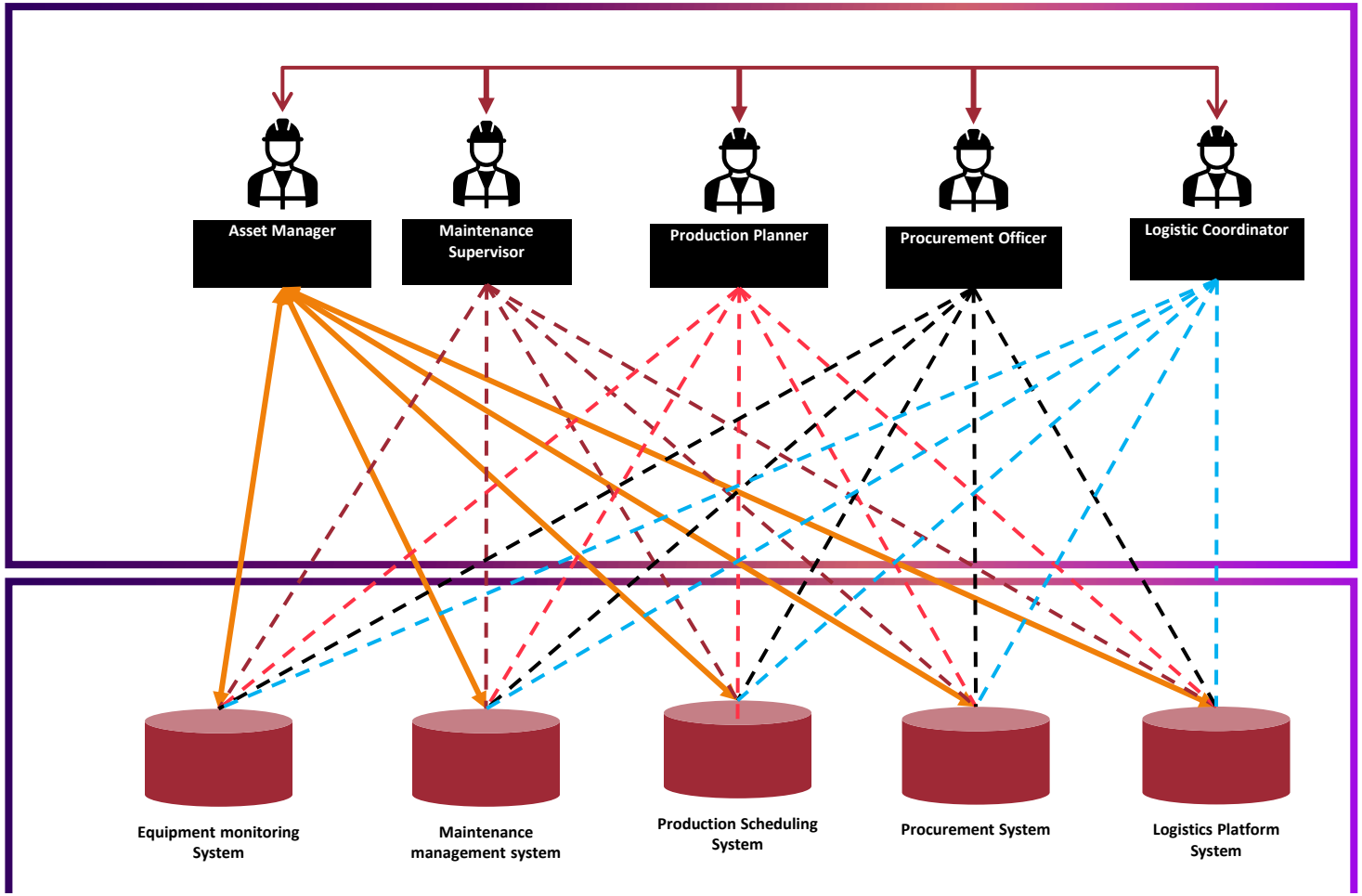
Lisa, an Asset Manager at a Mining Corporation, starts her day tackling a critical excavator efficiency issue, only to find out:

- Crucial data is **scattered**
- **Spends hours** gathering incomplete maintenance logs, production schedules, and cost analyses
- Coordinates with **multiple departments** to piece together a solution.
- Fragmented data and **siloed workflows** slow down decision-making
- A repair-or-replace decision turns into an all-day challenge.



THE MAZE – WHAT AGENTS HAVE TO DO WITH THIS?

Personas involved



Current Issues

- **Fragmented Data Sources**
- **Delayed Communication**
- **Lack of Real-Time Updates**
- **Manual Data Consolidation**
- **Disjointed decision process**
- **Inefficient document follow up**
- **…**

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Intelligent Asset Management Interaction

Lisa: *"What's the status of the excavator?"*

Chat Interface: *"The excavator is operating at 85% efficiency due to a hydraulic issue detected yesterday. Would you like details on the diagnostics?"*

Lisa: *"Yes, and what are my options for repair or replacement?"*

Chat Interface: *"Repair will cost $15,000 and take 2 days. Replacement will cost $250,000 but could take 30 days for delivery. Repair is recommended to avoid immediate downtime. Would you like to proceed?"*

Lisa: *"Schedule the repair and notify the maintenance team."*
Chat Interface: *"Repair scheduled for tomorrow. The Maintenance Supervisor has been notified. Anything else?"*

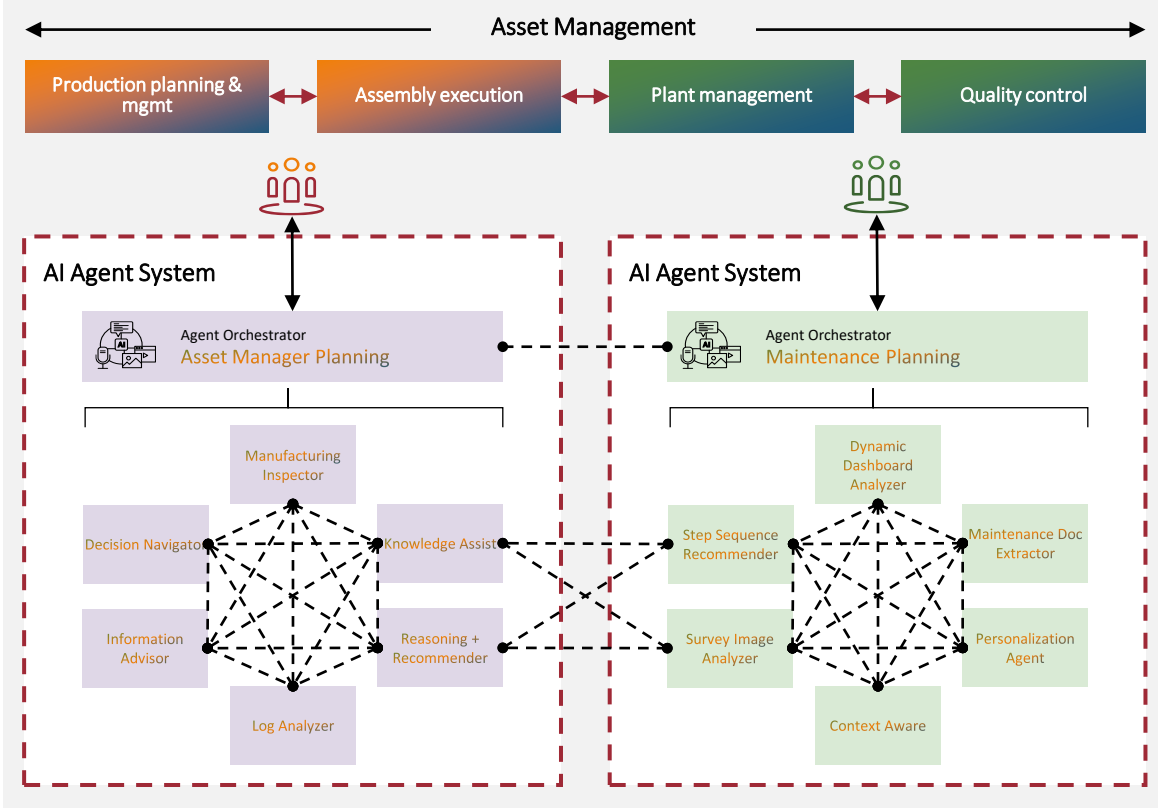
Asset management evolution to scalable Multi-Agent Systems

Current state: Use Case Specific Chatbots

Individual use case pilots are often isolated, fragmented, difficult to maintain, hard to scale and grow adoption

Future State: Multi-Agent Systems

Focusing on evolving **processes**, **people,** and the **value chain**, we combine use cases to realise improvements at scale



Diverse teams are not a nice-to-have.

They are a technical requirement.

Engineers

build the system

miss operational edge cases

Domain Experts

know what should happen

can't code it alone

Ethicists

spot bias & consequences

engineers miss these

Systems Thinkers

catch cascading failures

across silos

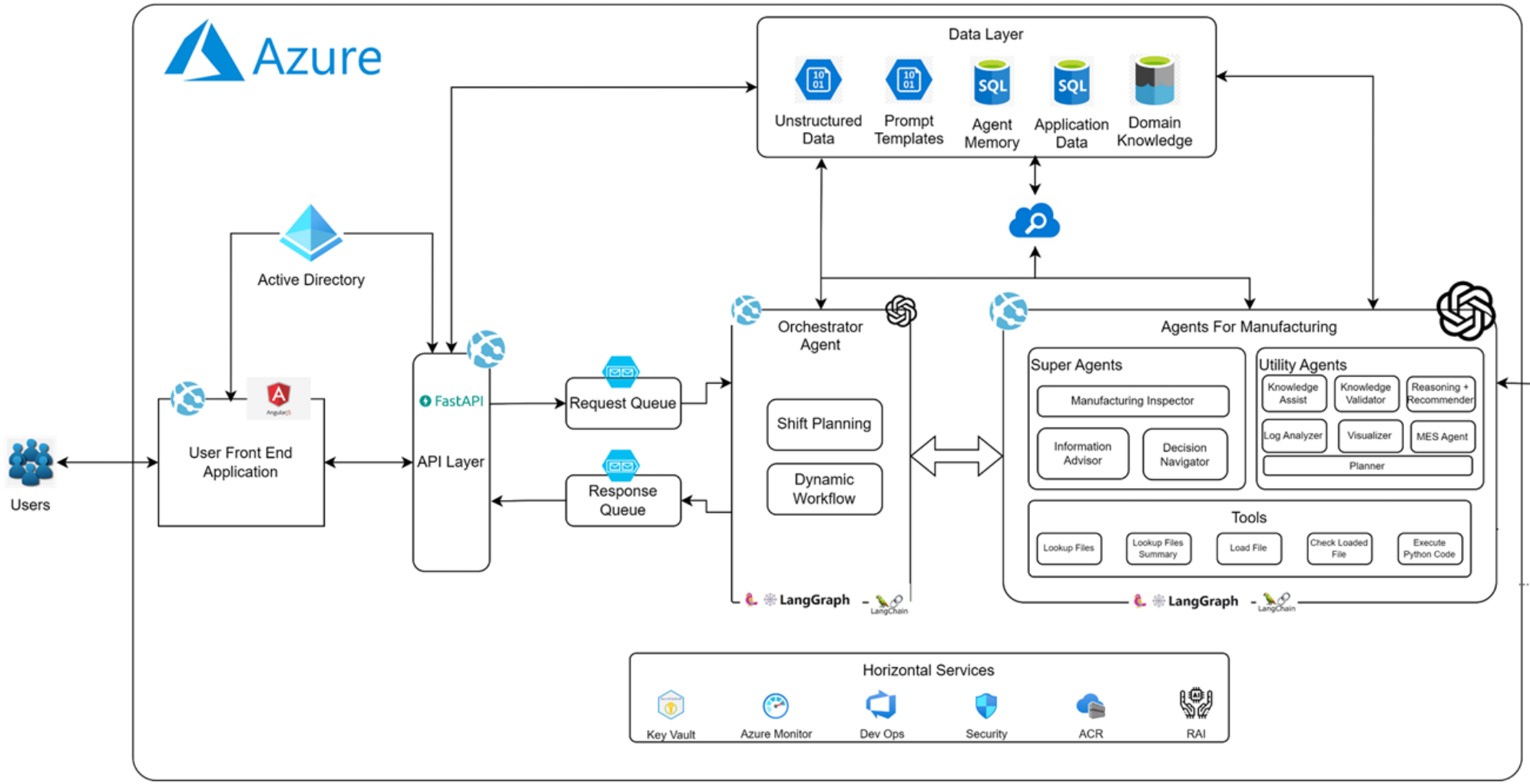
Communicators

make it trusted & usable

by real people

If any of these voices is missing, the system breaks in ways **you won't see until it's in production.**

Architecture Considerations and Options



Integrated Engineering Approach & Considerations

Configuration and testing - Hardware , Software and AI Agents

Design, procurement and manufacture ** Data and AI design

Install , Commission and handover

Discovery phase and maturity assessment

Deployment of AI Agents to support Maintenance teams and provide insights.

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Thank you