

EXPERT KNOWLEDGE REQUIREMENTS

AI systems built with AMESA succeed because they incorporate expert operator and engineering knowledge. AI system designers interview experts to learn expertise in six key areas.

1 Sensors and Actions

- The **data** used for AI training and system control
- **Sensors** provide dynamic data about the state of the system
- **Actions** are variables the operator adjusts to control the system

2 Benchmarks

- The top-level **KPI** that the system will optimize
- The **benchmark** performance level that the system will attempt to beat
- The **ROI** for a 1% improvement in the KPI

3 Scenarios

- Different **situations** that require different control strategies
- Process **phases**, different products, or **changing conditions**
- **Edge and corner cases** that may be uncommon but critical

4 Strategies

- Different **approaches** and skills that expert operators use in different scenarios
- “When X happens, do Y”
- AI performs better when it **learns strategies separately**

5 Orchestration

- **Relationships** between scenarios and strategies
- Follow common **orchestration patterns** such as sequences, hierarchies, or parallel execution

6 Guidance

- **Goals:** sensor variables to maximize, minimize, or maintain at set levels
- **Constraints:** variable values that the AI system learns to avoid
- **Success criteria:** variable values that the system learns to pursue

