

Slide 7: System Architects - AI Architecture & Design

Objective: Define architectural skills needed to design scalable, secure, and maintainable AI-enhanced systems.

Layout Composition:

The slide is a flex-col with a header sized to its content, a main body that grows, and a footer sized to its content. The main body is a grid with two columns (1fr 1fr) and two rows (auto auto). Top row for architectural patterns, bottom row split between design considerations (left) and cloud architecture (right).

Content Breakdown:

- Block 1:
- Block Type: Text
- Placement: Header section
- Component Schema: "Role Header"
- Content:
 - Role_Title: "System Architects"
 - Role_Icon: "Network"
 - Subtitle: "AI Architecture, Design & Integration Patterns"
 - Persona_Badge: "Primary: AI Worker"
- Creative Brief: Title text-6xl with purple accent color (architecture role). Icon inline with title. Persona badge as small chip/pill. White text.
- Block 2:
- Block Type: Text
- Placement: Top row, spanning both columns
- Component Schema: "Architectural Patterns Card"
- Content:
 - Section_Title: "AI System Architecture Patterns"
 - Icon: "Layers"
 - Patterns: {
 - "Model Serving Patterns": [
 - "Real-time inference vs batch prediction",
 - "Edge deployment vs cloud-based serving",
 - "Model versioning and A/B testing strategies",
 - "Caching and response optimization"
 - "Integration Patterns": [
 - "Microservices with AI capabilities",
 - "Event-driven AI workflows",
 - "API gateway patterns for AI services",
 - "Hybrid human-AI processing pipelines"
 - "Data Architecture": [
 - "Feature stores and data versioning",
 - "Training/inference data separation",
 - "Data lineage and provenance tracking",

"Real-time vs batch data pipelines"

```
]
}
```

- Creative Brief: Wide card with slate-800 background spanning both columns. Three pattern categories arranged horizontally or in a grid. Each category has bold title (text-xl, purple accent), icon, and bullet list (text-lg). Clear column/section separation.

- Block 3:

- Block Type: Text

- Placement: Bottom-left cell

- Component Schema: "Design Considerations Card"

- Content:

Section_Title: "Key Design Considerations"

Icon: "CheckCircle"

Considerations: {

"Scalability": [

"Auto-scaling for variable AI workloads",

"Cost optimization for GPU/TPU resources",

"Multi-region deployment strategies"

],

"Reliability": [

"Fallback mechanisms for model failures",

"Circuit breakers for AI service dependencies",

"Model performance monitoring and alerting"

],

"Security": [

"Model access control and authentication",

"Data encryption in transit and at rest",

"Secure model deployment pipelines",

"Audit logging for AI decisions"

]

}

- Creative Brief: Card with slate-700 background. Three consideration categories stacked vertically. Bold category headers (text-xl, purple) with icon indicators. Bullets in text-base. Ensure visual hierarchy is clear.

- Block 4:

- Block Type: Text

- Placement: Bottom-right cell

- Component Schema: "Cloud Architecture Reference"

- Content:

Section_Title: "Cloud AI Architecture Components"

Icon: "Cloud"

AWS_Stack: {

"Compute": "SageMaker, Lambda, EC2 (GPU)",

"Storage": "S3, FSx",

"Data": "Glue, Athena, Kinesis",

"MLOps": "SageMaker Pipelines, CodePipeline"

```

}
Azure_Stack: {
  "Compute": "Azure ML, Functions, GPU VMs",
  "Storage": "Blob Storage, Data Lake",
  "Data": "Synapse, Data Factory, Event Hubs",
  "MLOps": "Azure ML Pipelines, DevOps"
}
GCP_Stack: {
  "Compute": "Vertex AI, Cloud Functions, GPU VMs",
  "Storage": "Cloud Storage, Filestore",
  "Data": "BigQuery, Dataflow, Pub/Sub",
  "MLOps": "Vertex AI Pipelines, Cloud Build"
}

```

- Creative Brief: Compact card with slate-700 background. Three cloud providers stacked with clear labels. Each provider has 4 component categories in a mini-grid or table format. Text-base, very scannable. Use cloud provider brand colors subtly for headers (orange for AWS, blue for Azure, multi-color for GCP).
- Block 5:
- Block Type: Text
- Placement: Footer
- Component Schema: "Simple Footer"
- Content:

Footer_Text: "Training estimate: 60-80 hours | Focus on cloud architecture certifications"
- Creative Brief: Centered, text-base, opacity-70.