

AI Agent : Transforming with Intelligent Systems

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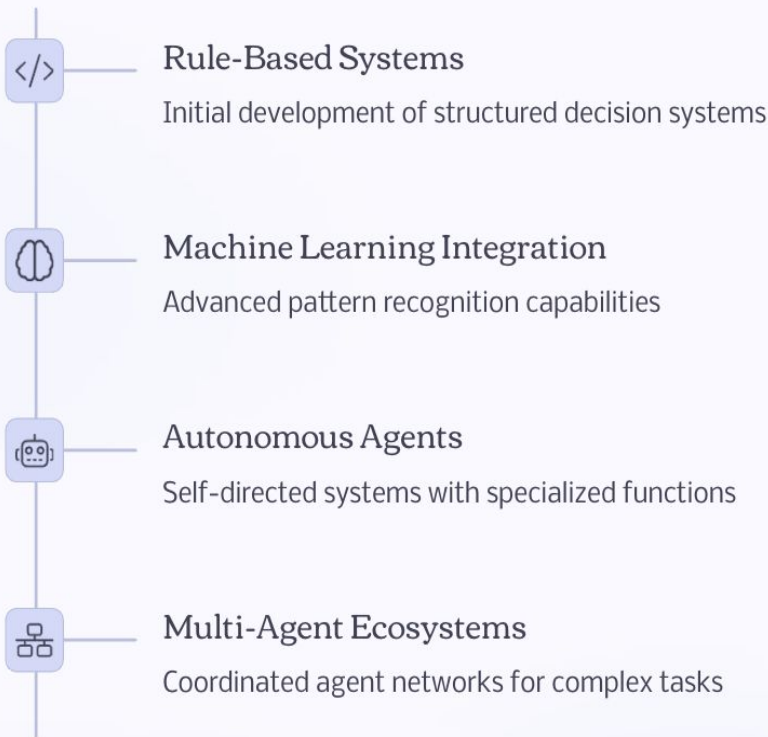
Background: AI Engineer with expertise in developing agent-based systems.

Experience: Specialized in pricing optimization ,adaptive learning, AI and ML systems.

Technical Skills:

- PyTorch, TensorFlow, Langchain, RAG
- LLM models (Llama3, OpenAI, Google Gemini Pro)
- Vector embeddings and data integration

AI Agent Development Experience



My journey in AI agent development has evolved from implementing basic rule-based systems to creating sophisticated autonomous agents. With technical foundations in machine learning, NLP, and data integration, I've successfully deployed AI solutions across multiple domains, with specialized expertise in pricing optimization and adaptive learning systems.

B2B Pricing System: AI Agent Implementation



Agent Architecture Design

Established hierarchical decision-making structure with defined communication protocols between specialized pricing agents



Data and Analysis Implementation

Built connector agents for 30+ data sources with adaptive scheduling, developed ensemble models for price elasticity prediction and competitive analysis



Orchestration and Communication

Created central orchestration agent with priority-based task scheduling, implemented message broker using Apache Kafka with standardized formats

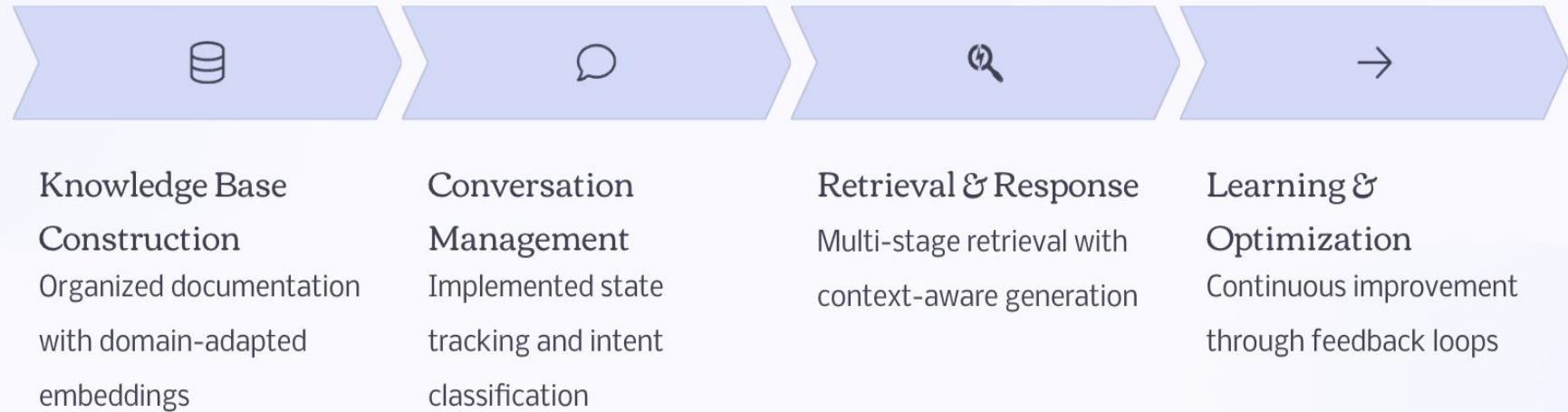


Business Impact

Delivered remarkable business impact: 32% increase in deal profitability, 47% reduction in pricing decision time, 28% decrease in pricing exceptions, and \$4.2M annual cost savings.

The system demonstrates how well designed agent networks can transform business operations.

Intelligent Customer Service: RAG-Enhanced Agent Network



This RAG-enhanced agent network transformed customer service operations by implementing sophisticated conversation management, intelligent retrieval, and continuous learning mechanisms. The business impact was substantial: 30% improvement in query resolution time, 25% increase in response accuracy, and 20% uplift in forecasting accuracy.

Financial Data Analysis: Adaptive Learning Agents

Data Collection

Specialized agents for each financial data source with adaptive scheduling based on market volatility



Processing

Real-time cleaning, anomaly detection, and feature generation



Decision Support

Personalized recommendations with explanation generation



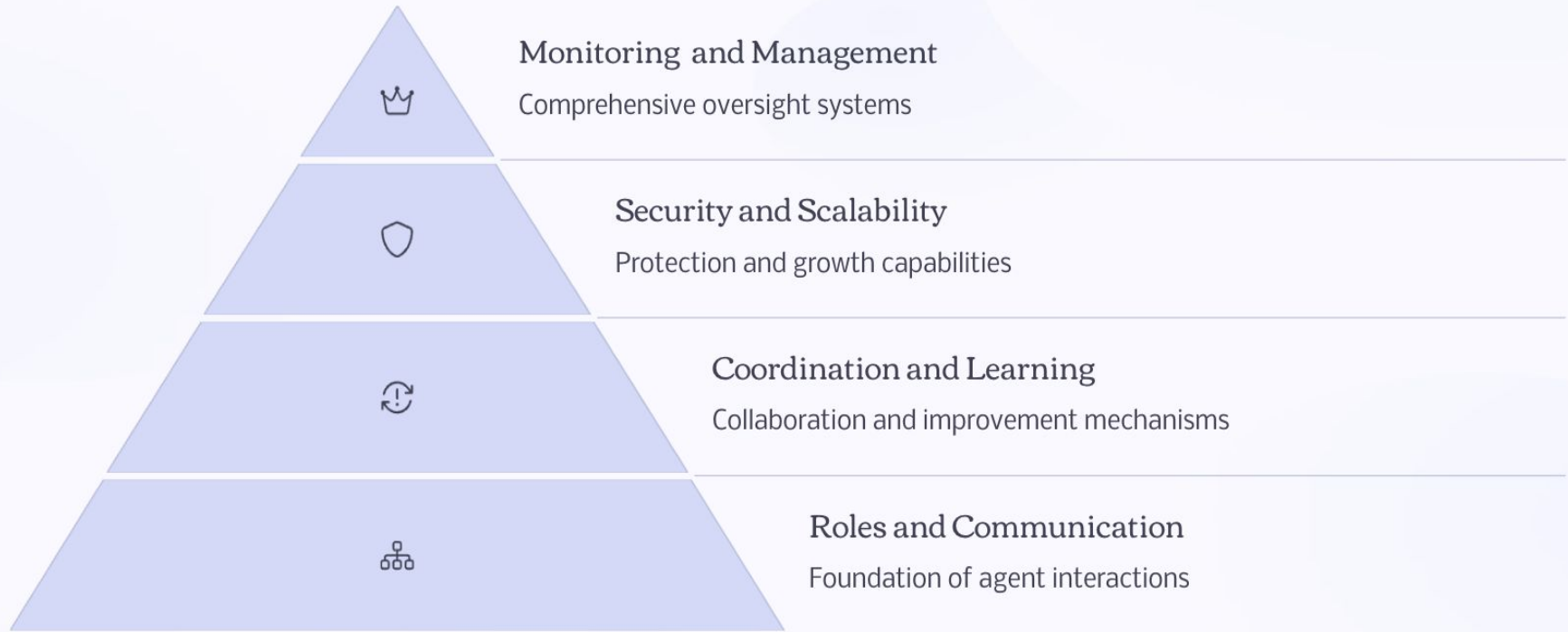
Analysis

Specialized models with uncertainty quantification and causality analysis



The financial data analysis ecosystem leveraged machine learning and dynamic data pipelines. This implementation delivered impressive results: 50% reduction in data retrieval time, 30% increase in processing efficiency, and 20% reduction in analysis time through sophisticated agent coordination.

Multi-Agent System Implementation Guide



Successful multi-agent systems require careful design across multiple dimensions. Starting with clearly defined agent roles and standardized communication protocols, these systems must implement sophisticated coordination mechanisms, continuous learning capabilities, robust security measures, and comprehensive monitoring tools to ensure optimal performance and scalability.

Designing Autonomous AI Systems

Methodologies for healthcare and bioscience applications

Methodology for Designing Autonomous Systems

- 1. Capability Assessment and Scoping
- 2. Layered Architecture Design
- 3. Human-AI Collaboration Framework
- 4. Progressive Autonomy Implementation
- 5. Continuous Evaluation and Adaptation

Balancing Autonomy with Human Oversight

Decision Consequence Threshold

Low Consequence

Routine data processing, quality control checks, preliminary analyses

Fully Autonomous

Medium Consequence

Treatment suggestions, biomarker interpretations, diagnostic support

Human Verification

High Consequence

Novel treatment protocols, unexpected findings, life-critical decisions

Human Leadership

AI Guardrails and Evaluation Framework

Essential Safety

Mechanisms

- Content safety guardrails
- Hallucination prevention
- Regulatory compliance
- PII protection

Performance Evaluation

- Task effectiveness metrics
- Operational efficiency
- Benchmark testing
- Human evaluation

Optimization Strategies

- Model architecture refinement
- Data quality enhancement
- Computational efficiency
- Continuous improvement systems

Implementing robust guardrails is essential for healthcare AI applications. These safety mechanisms ensure content safety, prevent hallucinations, maintain regulatory compliance, and protect sensitive information. Paired with comprehensive evaluation frameworks and optimization strategies, they create AI systems that are both powerful and trustworthy.

Performance Metrics Framework

Clinical Efficacy

- Diagnostic accuracy measures
- Treatment recommendation quality
- Longitudinal outcome tracking

Operational Performance

- Efficiency indicators
- Integration effectiveness
- Scalability measures

Trust and Usability

- Explainability measures
- User experience indicators
- Trust development tracking

Ethical and Compliance

- Fairness indicators
- Privacy protection measures
- Regulatory alignment

Continuous Learning Framework

1 Systematic Performance Monitoring

Real-time dashboards, automated alerting, periodic reviews, user feedback collection

2 Root Cause Analysis

Error pattern identification, contributing factor mapping, counterfactual testing

3 Targeted Enhancement

Prioritization framework, modular updates, A/B testing, incremental rollout

4 Knowledge Integration

Literature monitoring, expert insight capture, cross-institutional learning

5 Model Refresh Governance

Trigger criteria, version control, backward compatibility, transition management

Vision for Ayass Bioscience



AI agent systems offer transformative potential for Ayass Bioscience. By enhancing the MoNet Scoring System, optimizing laboratory workflows, and extending the Transcriptome AI Platform with agent capabilities, we can establish market leadership in AI-enhanced precision medicine. The implementation roadmap spans 10-15 months from assessment to full-scale deployment, with significant improvements in analysis time, biomarker identification, and treatment recommendation specificity.

Alignment with Mission

The AI agent presented directly aligns with Ayass Bioscience' mission and existing AI initiatives. By enhancing the current systems with advanced agent-based approaches, we can further your goals of:

- Early disease detection through AI-enhanced analysis
- Disease monitoring systems powered by intelligent agents
- Achieving better patient outcomes through personalized approaches
- Accelerating research and development through AI-driven insights
- Integrating generative and agentic AI for complex data analysis workflow

Thank You