

AI Capabilities

AI Kata Primer

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Overview



Today we'll explore:

- 3 Core AI Capabilities
 - Text Understanding
 - Information Retrieval
 - Recommendation Systems
- 3 Real-world Case Studies
 - Practical Applications
 - Tool Selection
 - Trade-offs

Part 1: Core AI Capabilities

What your applications could do

Text Understanding

Natural Language Processing & Comprehension

- **What it is:**

- Converting human language into structured, actionable data
- Understanding context, intent, and sentiment
- Generating human-like responses

- **Key Applications:**

- Content Analysis
- Chatbots & Virtual Assistants
- Document Processing
- Translation Services

Information Retrieval

Finding the needle in the digital haystack

- **What it is:**

- Searching through vast amounts of data
- Ranking results by relevance
- Understanding semantic relationships

- **Key Applications:**

- Search Engines
- Knowledge Bases
- Document Classification
- Question Answering Systems

Recommendation Systems

Personalized suggestions at scale

- **What it is:**

- Predicting user preferences
- Content/Product matching
- Behavioral pattern analysis

- **Key Applications:**

- E-commerce Product Suggestions
- Content Discovery
- Social Media Feeds
- Learning Platforms

Part 2: Case Studies

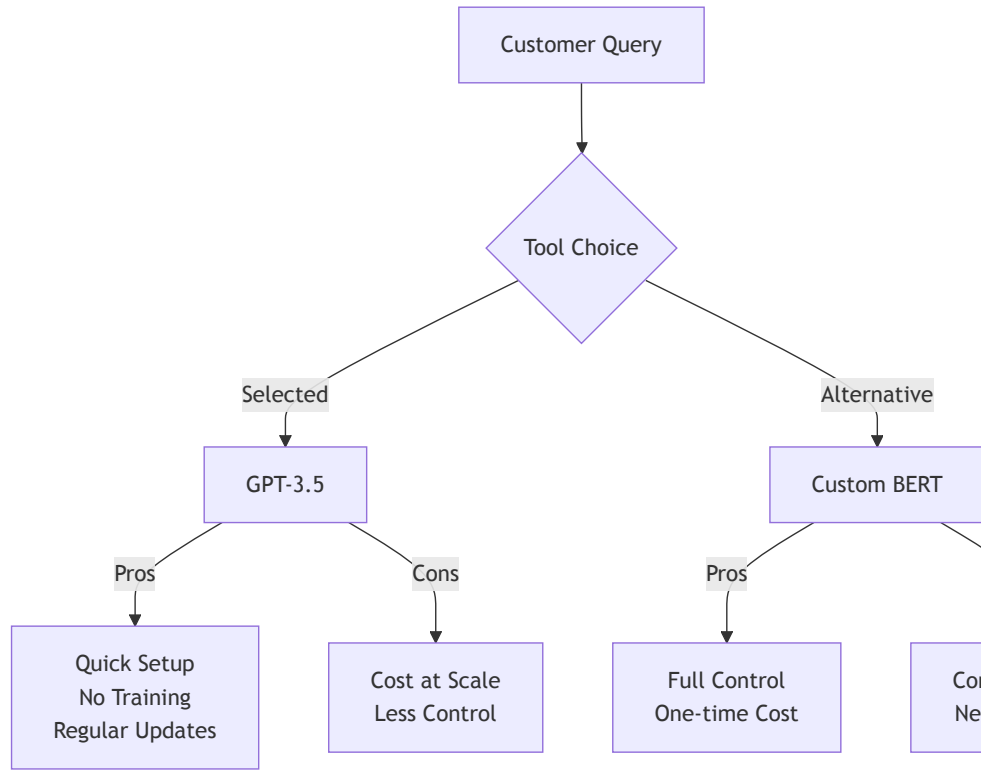
Real-world applications and tool selection

Case Study 1: Customer Support Bot

Challenge: High volume of repetitive customer queries

- **Capability Used:** Text Understanding
- **Selected Tool:** OpenAI GPT-3.5
- **Why This Tool:**
 - High accuracy in understanding context
 - Cost-effective for medium scale
 - Easy API integration
 - Quick deployment

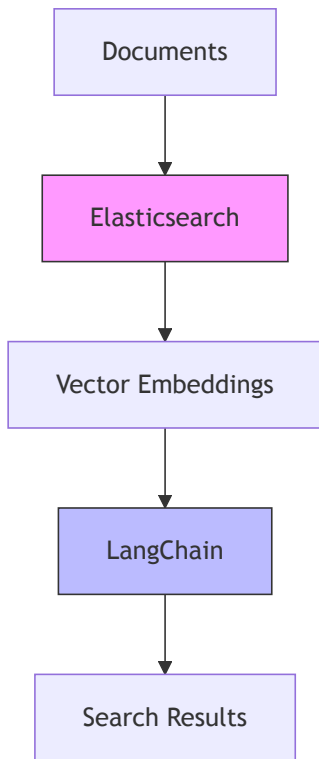
Alternative Considered:



Case Study 2: Enterprise Search

Challenge: Searching across multiple internal knowledge bases

- **Capability Used:** Information Retrieval
- **Selected Tool:** Elasticsearch + LangChain
- **Why This Stack:**
 - Scalable document indexing
 - Semantic search capabilities
 - Custom ranking control
 - Hybrid search approach



Case Study 3: Content Platform

Challenge: Personalized content recommendations for users

- **Capability Used:** Recommendation System
- **Selected Tool:** TensorFlow Recommenders
- **Why This Tool:**
 - Handles sparse data well
 - Scalable to millions of users
 - Custom feature engineering
 - Open-source with active community

```
# Example: Two-Tower Model
user_model = tf.keras.Sequential([
    tf.keras.layers.Dense(256, activation='relu'),
    # User features processing
    tf.keras.layers.Dropout(0.5),
])
# Content features processing
content_model = tf.keras.Sequential([...])
```

Making the Right Choice

Key Factors to Consider:

- **Scale Requirements**

- Data volume
- User base size
- Response time needs

- **Resource Constraints**

- Budget
- Development time
- Team expertise

- **Business Requirements**

- Customization needs
- Data privacy
- Regulatory compliance

- **Maintenance**

- Ongoing costs
- Update frequency
- Support availability

Thank You!

Questions?

Slides Repository