

Here is a **detailed study guide** for **Task Statement 1.2** of the **AWS Certified AI Practitioner (AIF-C01)** exam.

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## ✔ Task Statement 1.2: Identify Practical Use Cases for AI

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### ◆ 1. Recognize Applications Where AI/ML Can Provide Value

AI/ML provides value in situations where:

- **Patterns in large datasets** can be learned and used to make predictions or automate tasks.
- **Scalability** is needed beyond human capability (e.g., analyzing millions of emails or images).
- **Decision support** is required (e.g., risk scoring, recommendation engines).
- **Automation** of repetitive or manual tasks is desirable (e.g., chatbots, document classification).

Use Case	AI/ML Value
Customer churn prediction	Assist human decision making (identify at-risk customers)
Image classification	Automate visual tasks
Chatbots	Scale customer support without additional staff
Fraud detection	Continuously learn and flag suspicious behavior

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### ◆ 2. Determine When AI/ML Solutions Are Not Appropriate

AI/ML may not be suitable when:

- **Deterministic logic is sufficient** (e.g., rule-based validation like ZIP code formatting).
- **A specific or guaranteed outcome is needed** rather than a probabilistic prediction (e.g., legal decisions, critical medical diagnosis without oversight).
- **Training data is insufficient or of poor quality**, leading to unreliable results.
- **Costs outweigh the benefits**, especially if simpler automation is available.

Consideration	Why AI/ML May Not Be Ideal
Clear rules exist	Easier and cheaper to implement with standard programming
No training data	ML cannot learn without data
High risk of bias	AI may inherit or amplify bias from training data
Limited budget	AI/ML can be expensive to develop and maintain

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### ◆ 3. Select the Appropriate ML Techniques for Specific Use Cases

ML Technique	Use Case	Description
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ML Technique	Use Case	Description
Regression	Predicting housing prices, sales forecasting	Predicts a continuous numerical value
Classification	Email spam detection, disease diagnosis	Predicts a category or class label
Clustering	Customer segmentation, product grouping	Finds groups in data without labels
Time-series forecasting	Stock prices, energy demand	Predicts future values over time
Recommendation Systems	Netflix, Amazon suggestions	Suggests items based on user behavior
Anomaly Detection	Fraud detection, equipment failure	Identifies unusual patterns

◆ 4. Identify Examples of Real-World AI Applications

Domain	AI Application	Tech Used
Retail	Product recommendation	Collaborative filtering
Healthcare	Medical image diagnosis	Computer vision
Finance	Fraud detection	Anomaly detection
Customer Service	Chatbots	NLP (Natural Language Processing)
Marketing	Sentiment analysis on reviews	NLP
Manufacturing	Predictive maintenance	Time-series analysis
Entertainment	Content personalization	Recommendation systems
Voice Assistants	Speech-to-text and text-to-speech	Speech recognition & synthesis

◆ 5. Explain the Capabilities of AWS Managed AI/ML Services

These services allow developers to implement AI/ML without deep data science knowledge.

Service	Category	Functionality
Amazon SageMaker	ML Platform	Build, train, and deploy ML models at scale. Offers built-in algorithms, notebooks, and model hosting.
Amazon Transcribe	Speech Recognition	Converts speech into text (e.g., call center transcripts, voice apps).
Amazon Translate	Machine Translation	Translates text between languages in real time.

Service	Category	Functionality
Amazon Comprehend	Natural Language Processing	Extracts insights (sentiment, key phrases, entities) from text.
Amazon Lex	Conversational Interfaces	Builds chatbots and voice assistants with automatic speech recognition and NLP.
Amazon Polly	Text-to-Speech	Converts text into realistic speech in various languages.

☑ **AWS AI services** are **fully managed**, meaning AWS handles infrastructure, scaling, and most of the model complexity, enabling faster deployment and easier integration.

### Study Tips

- **Use Cases Drill:** Go through different industries and brainstorm how AI might help (e.g., AI in logistics = route optimization).
- **Service Matching:** Match AWS services to real-world needs (e.g., Amazon Comprehend = understanding customer feedback).
- **Practice Questions:** Focus on scenario-based questions that ask you to choose when AI is or isn't a good solution.
- **Hands-On (Optional but Valuable):** Use the AWS free tier to explore SageMaker Studio Lab, Polly, or Comprehend.