Cost-Benefit Analysis: Approach 1 Vs Approach 2

Approach 1: Complete Gemini Model

Costs:

- Average tokens per invoice: **1000**
- Input prompt tokens: **1000**
- Output tokens: **2000**
- Total tokens per invoice: **4000**

Assuming Gemini Pro pricing ($0.00025 per 1K input tokens, $0.0005 per 1K output tokens):

Cost per invoice: (2000 * $0.00025/1000) + (2000 * $0.0005/1000) = **$0.0015**

Benefits:

Average trust score: (99.8% + 98.7% + 97.9% + 99.5% + 99.4%) / 5 = **99.06%**

Approach 2: Hybrid (PDFPlumber + Gemini)

Costs:

Assuming 70% of PDFs are extractable (using PDFPlumber) and 30% require Gemini:

For 30% non-extractable PDFs:

- Total tokens per invoice: **4000**
- Cost per non-extractable invoice: **$0.0015**

Average cost per invoice: $0.0015 * 0.30 **= $0.00045**

Benefits:

Average trust score: (97.6% + 96.6% + 96.2% + 97.9% + 98.3%) / 5 **= 97.32%**

Analysis:

- The hybrid approach costs 30% of the complete Gemini model approach, resulting in a 70% cost reduction.
- The hybrid approach has a slightly lower trust score, with a difference of 1.74 percentage points (99.06% - 97.32%).
- Cost-Benefit Ratio:
  a. Complete Gemini: 99.06% accuracy / $0.0015 = 66,040 accuracy points per dollar
  b. Hybrid: 97.32% accuracy / $0.00045 = 216,266 accuracy points per dollar

The hybrid approach provides 3.27 times more accuracy per dollar spent.

Based on this analysis, **the hybrid approach appears to be more cost-effective**. It offers substantial cost savings (70%) with only a minor decrease in accuracy (1.74 percentage points). The significantly better cost-benefit ratio suggests that the hybrid approach is the more efficient use of resources.