

THE AI-AHP DECISION AGENT: GUIDING WHERE B2B INNOVATION SHOULD GO NEXT

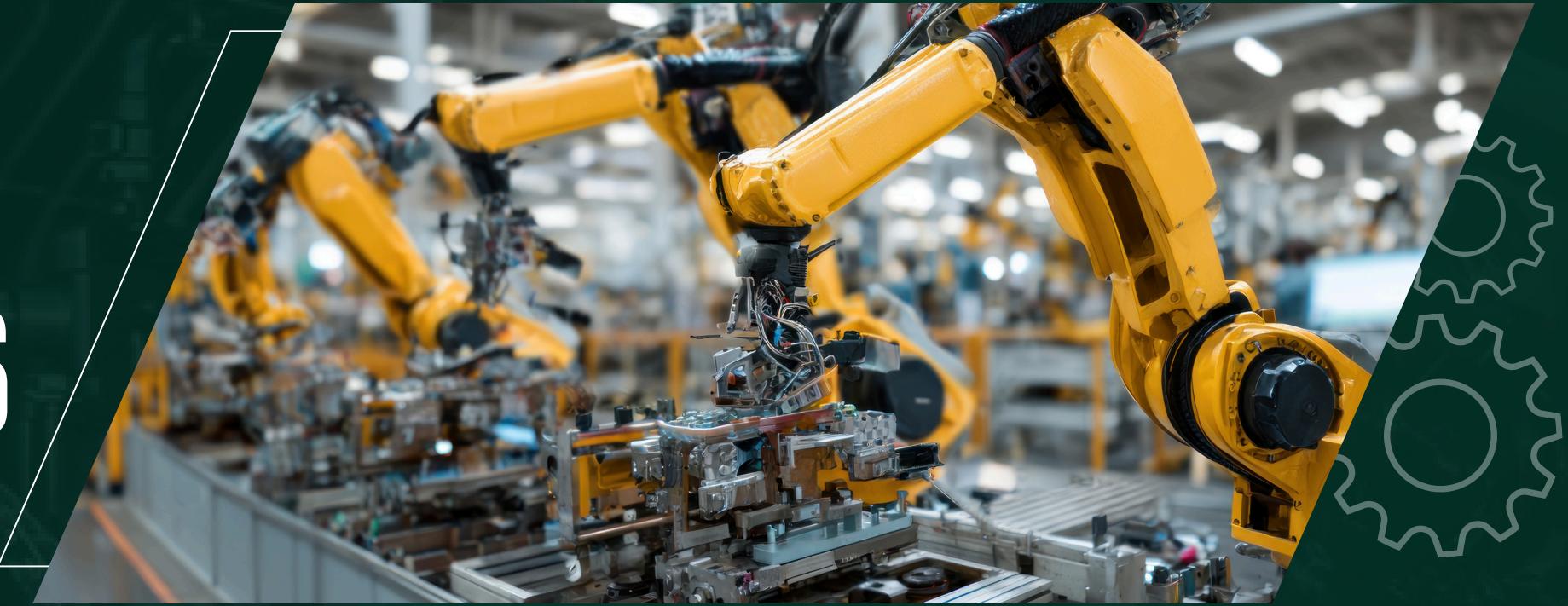
SCALING SMARTER MARKET ENTRY AND INVESTMENT DECISIONS ACROSS INDUSTRIES

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THE CHALLENGE FOR B2B COMPANIES

choosing the right market matters.



75% 40% 0%

product launches fail to
meet their revenue targets

revenue comes from new
products or markets

Without innovation, that
number becomes



WHO WE SERVE

01

WHO THEY ARE

Technology-driven B2B companies, from startups to mid-sized firms, actively exploring new markets and use-cases.

02

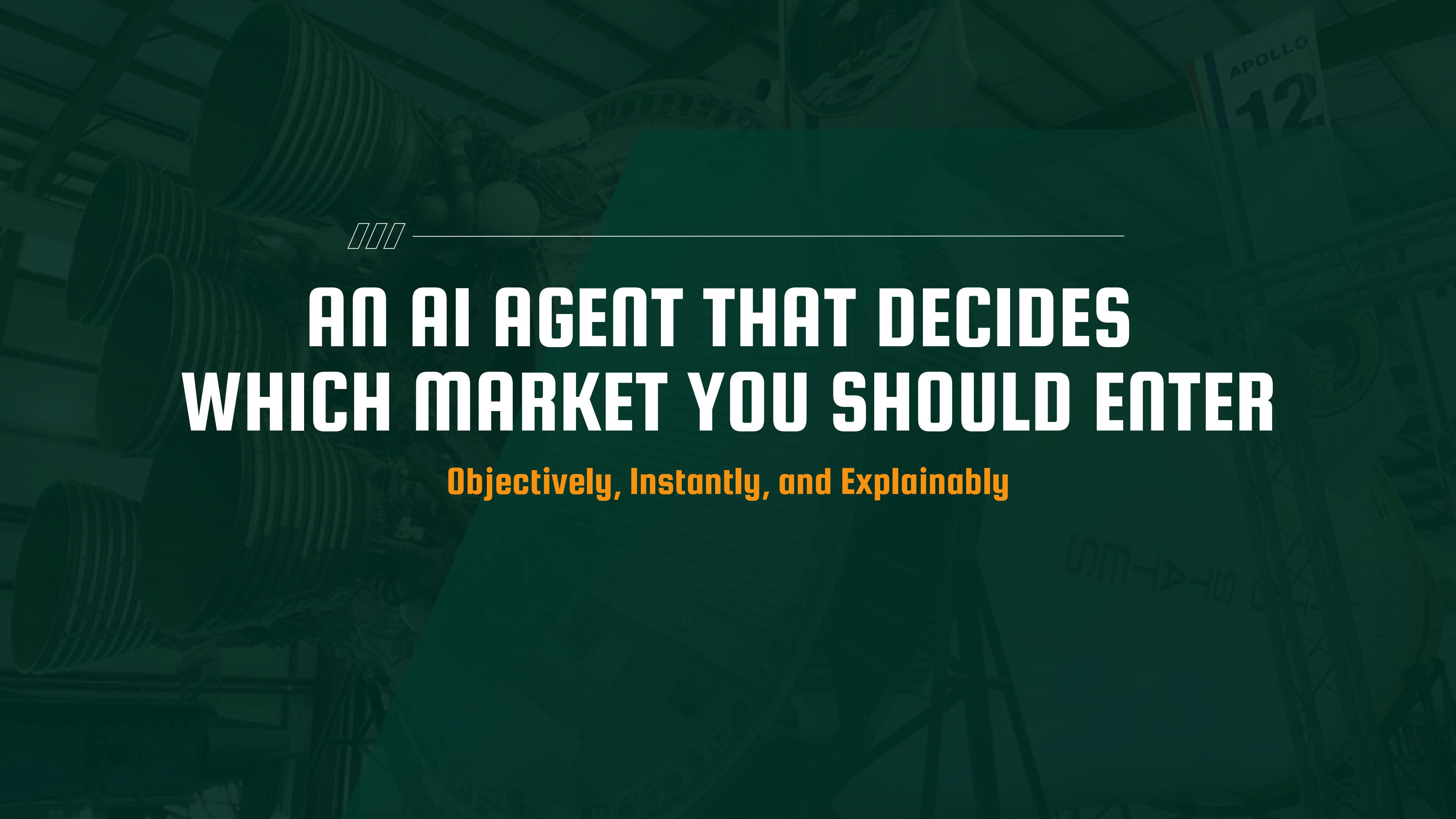
WHAT THEY WANT

Identifying which new markets offer the highest payoff with the lowest risk.

03

PAIN POINT

Months of market research often culminate in gut-feeling decisions or analysis paralysis when faced with multiple promising opportunities.

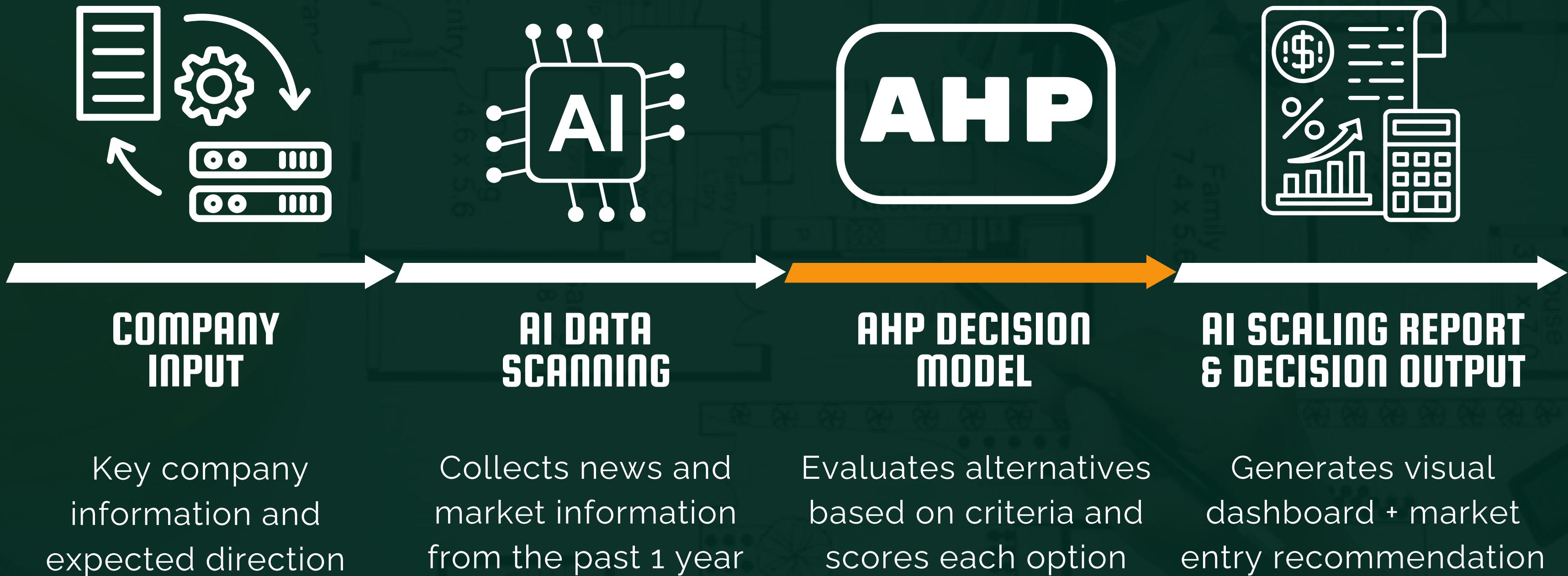


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AN AI AGENT THAT DECIDES WHICH MARKET YOU SHOULD ENTER

Objectively, Instantly, and Explainably

HOW IT WORKS



Enter Your Company Information

Help us understand your business needs

Who you are: industry, size, region

e.g., Healthcare, 500+ employees, North America

What you can do: core capabilities (AI, IoT, robotics, data)

e.g., AI-powered analytics, IoT sensor networks

Where you aim: expected direction & interest areas

e.g., Expanding into predictive maintenance, automation

Constraints: budget window, timeline, compliance limits

e.g., \$500K budget, 6-month timeline, HIPAA compliance required

SUBMIT INFORMATION

STEP I: COMPANY INPUT

These inputs let the system tailor its market research and recommend only the most relevant opportunities.

[Link to the prototype](#)

PROMPT

“Given the following company profile:

Industry: {industry}

Size / Region: {size_region}

Core Capabilities: {capabilities}

Strategic Interests: {direction_interests}

Constraints: {constraints}

Search across data from the past 12 months (news, funding, patents, research, and case studies) to identify the Top 5–7 B2B industries or applications most relevant and achievable for this company.

For each candidate, evaluate and summarize the following criteria:

Market Demand (adoption trend, growth rate, pain point severity)

ROI Potential (productivity gain %, cost savings %, payback period)

Implementation Cost (investment range, complexity, HR needs)

Technical Feasibility (data availability, model maturity, infra readiness)

Scalability & Adoption (cross-industry fit, partnership ecosystem)

Output a structured table with candidate names, quantitative or proxy scores (0–5 scale) for each criterion, and short evidence summaries or references.”



STEP2: DATA SCANNING

The AI Agent tailors its market search to each company's profile — scanning **one year** of USA data to find the most promising and feasible opportunities based on that company's unique strengths and constraints.

STEP 3: AHP SETUP (DECISION HIERARCHY)

Goal

Select the Best Market or Application to Enter

Criteria

Market Demand

ROI Potential

Implementation Cost

Technical Feasibility

Scalability & Adoption

Sub-Criteria

Adoption trend (past 3–5 years)

Typical productivity gain

Investment range (USD)

Data availability

Cross-industry replicability

Growth rate or proxy signals

Defect/downtime reduction (%)

Integration complexity (ERP/MES)

Model reliability

Organizational readiness

Severity of customer pain points

Payback period (months)

HR/training demand

Infrastructure readiness

Partnership ecosystem

Alternatives

AI Quality Inspection (QI)

Predictive Maintenance

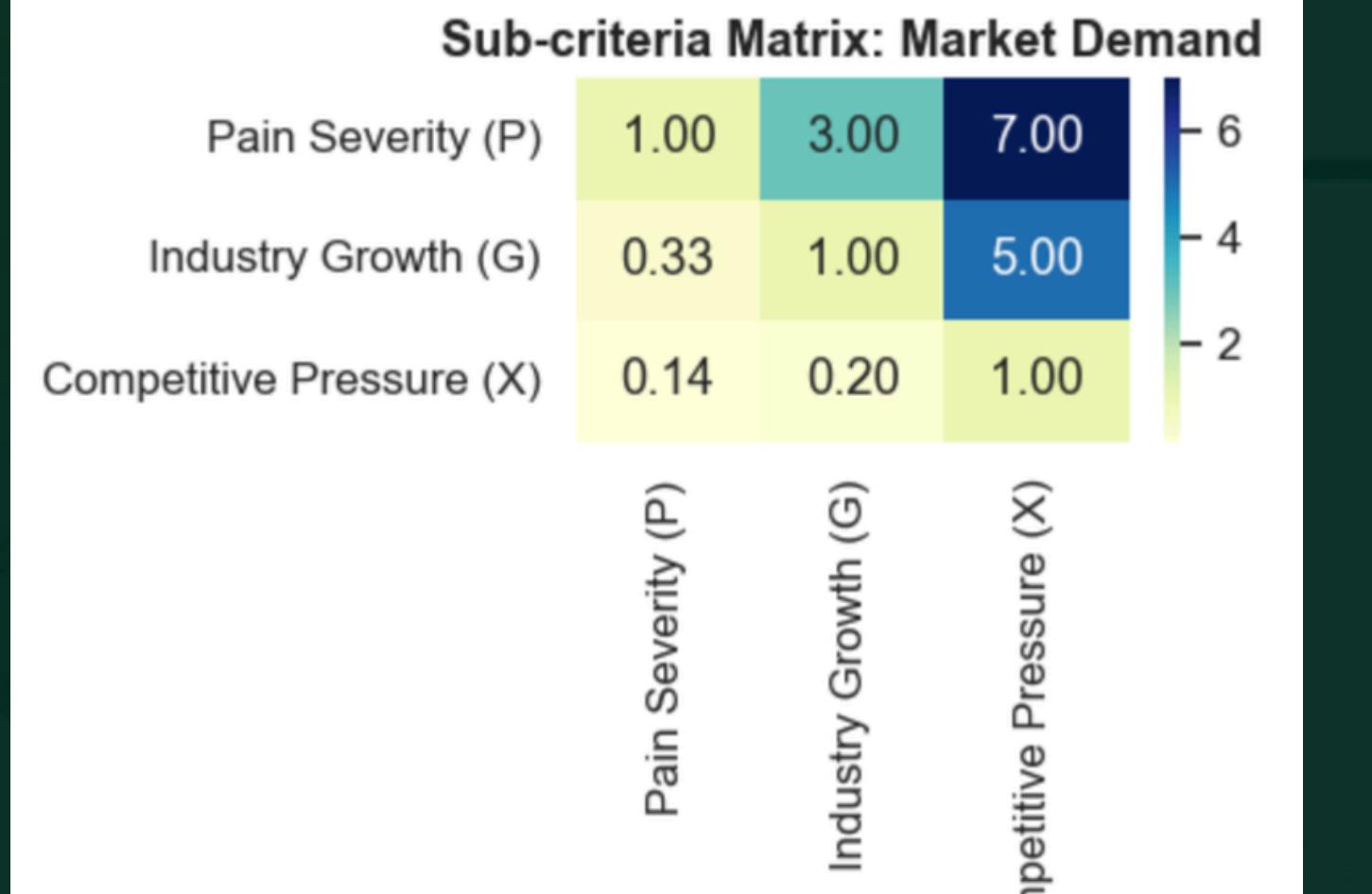
Energy Optimization (EO)

Adaptive Machining (AM)

Supply Chain Forecasting (SCF)

For the AI Agent case: The 5–7 industries or application identified by the Agent

Top-level Criteria Pairwise Matrix					
	Market Demand	ROI Potential	Implementation Cost	Technical Feasibility	Scalability & Adoption
Market Demand	1.00	0.33	3.00	1.00	2.00
ROI Potential	3.00	1.00	5.00	3.00	2.00
Implementation Cost	0.33	0.20	1.00	0.33	0.25
Technical Feasibility	1.00	0.33	3.00	1.00	2.00
Scalability & Adoption	0.50	0.50	4.00	0.50	1.00



STEP 3: AHP (PAIRWISE COMPARISON)

Top-level Criteria Weights

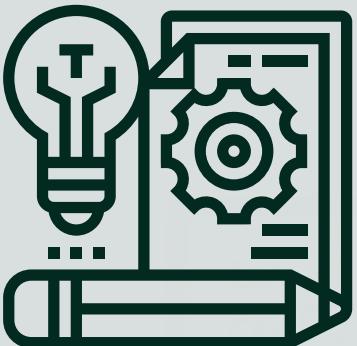
- ROI Potential = 0.41
- Technical Feasibility = 0.19
- Market Demand = 0.19
- Scalability & Adoption = 0.15
- Implementation Cost = 0.06
- Consistency Ratio = 0.048 (acceptable ≤ 0.10)

MODEL RESULTS (AHP GLOBAL RESULTS)

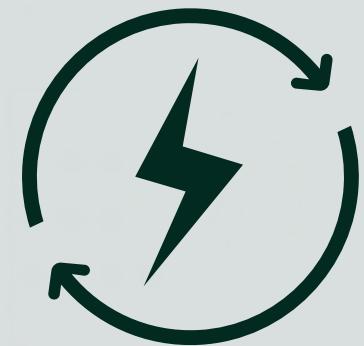
Supply Chain
Forecasting
0.1466



Adaptive
Machining
0.1782



Energy
Optimization
0.1923

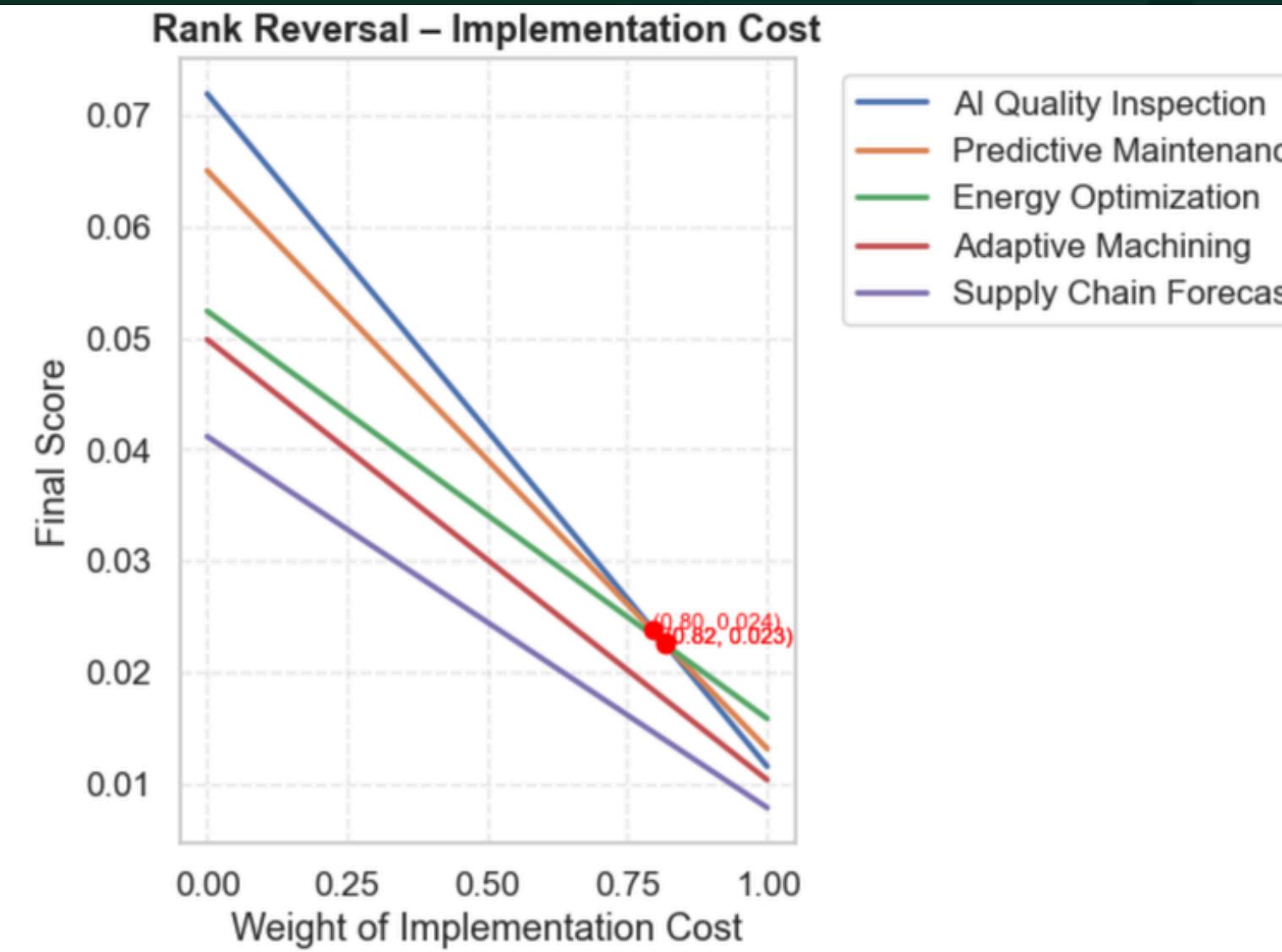
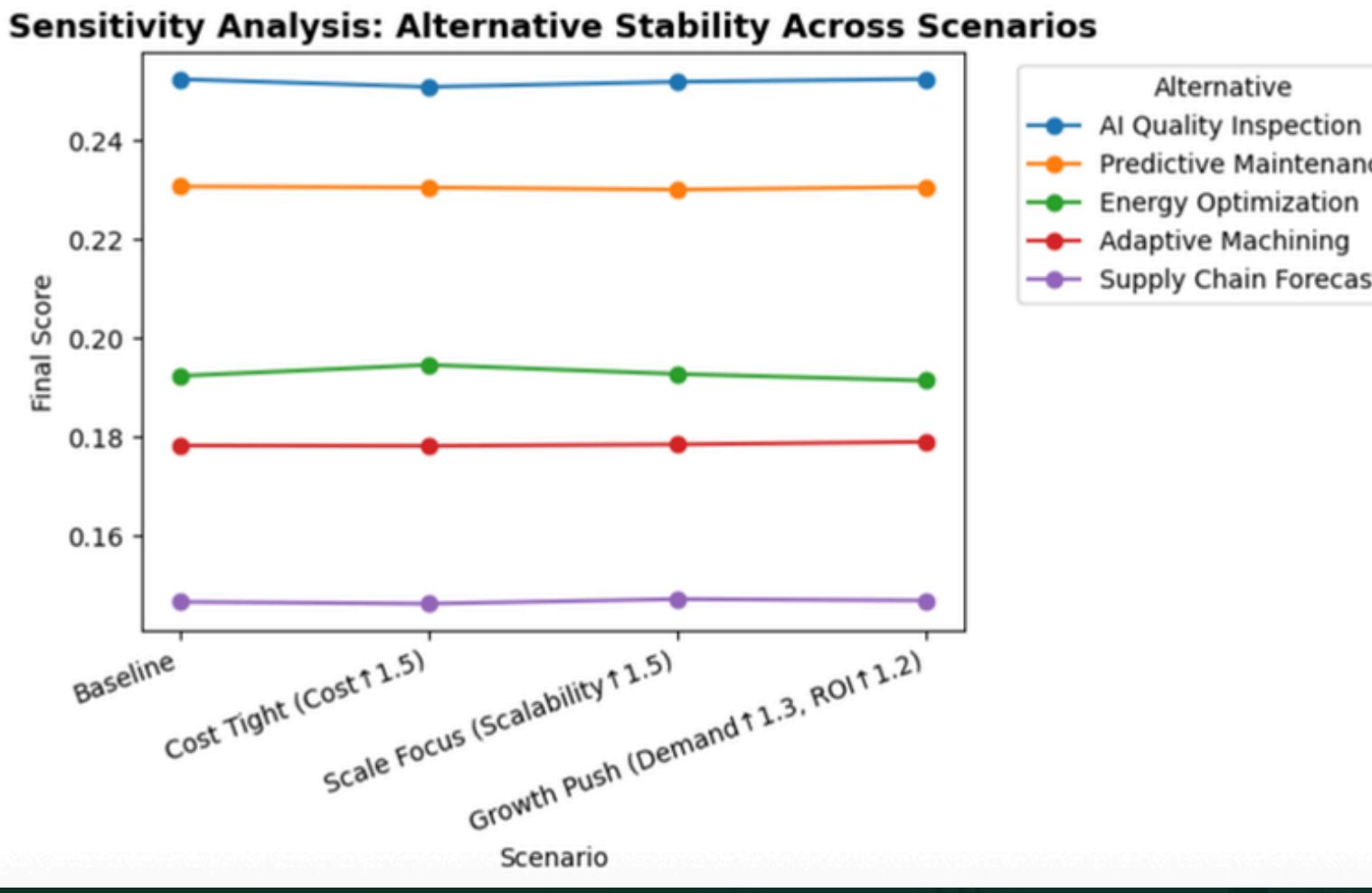


Predictive
Maintenance
0.2306



AI Quality
Inspection
0.2523





STEP 3: AHP (SENSITIVITY VALIDATION)

Scenario-based Sensitivity

- Tested three what-if scenarios:
 - Cost Tight → Implementation Cost ×1.5
 - Scale Focus → Scalability ×1.5
 - Growth Push → Demand ×1.3, ROI ×1.2
- Across all scenarios, AI Quality Inspection remained #1
- Ranking stability = 100% consistent order
- Max Score Shift < 0.01 ($\approx \pm 3\%$) → Results remain consistent under scenario changes

Monte Carlo (5000 simulations): AI Quality Inspection wins 4 592 times (> 95%)

AI-AHP Decision Engine Report

Market Entry Recommendation — Comprehensive Analysis

Generated on November 2, 2025

Top Recommendation: Computer Vision for Quality Inspection

AHP Global Score: 0.289 (Rank #1 of 5) | Stability: 87% winner retention

87%
CONFIDENCE LEVEL

10-13
MONTHS PAYBACK

28-35%
EXPECTED IRR

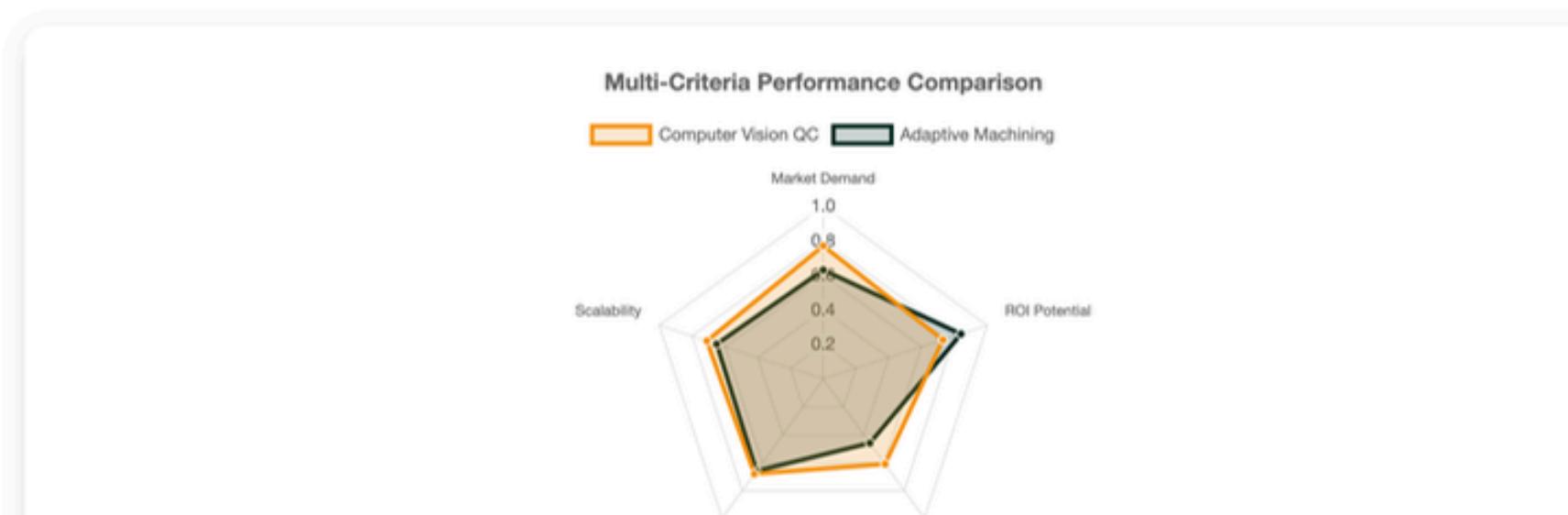
25%
PRODUCTIVITY LIFT

1) AI Data Scanning Results

Search Scope: 12-month analysis of news, funding, patents, partnerships, and enterprise case studies

Rank	Application	Adoption	ROI	Evidence	Score
1	Computer Vision QC	High Growth	High	58	0.289
2	Adaptive Machining	Moderate	Very High	27	0.256
3	Predictive Maintenance	Stable	Medium-High	42	0.224
4	Digital Twin	Moderate	Medium	33	0.137
5	Energy Optimization	Moderate	Low-Medium	22	0.094

3) Multi-Criteria Comparison



STEP 4: AI SCALING REPORT & DECISION OUTPUT

Process:

After AHP ranking, the AI Agent uses APIs to collect latest market data and auto-builds reports for top alternatives.

Output:

- Top recommendation
- AHP scores with stability & rationale
- Financial snapshot & ROI model
- Pilot plan, readiness, and risk mitigation
- Geographic & next-step roadmap



STRATEGIC IMPACT

AI

- Collected real-time industry data
- Extracted key metrics
- Built automated research reports

AHP

- Structured decision logic into 5 weighted criteria
- Compared 5–7 AI use cases objectively
- Ensured model consistency ($CR < 0.1$)

SCALING

- Enables repeatable decision-making
- Adapts to any B2B or manufacturing context
- Achieves industry-scale decisions in one click

NEXT STEPS

1

Finalize Data Pipeline
Integrate real-time feeds for each criterion

2

Pilot Test Run AHP engine with live inputs

3

Validation & Feedback
Compare AI vs human judgments

4

Rollout Deploy as web tool for B2B strategy teams





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THANK YOU

TEAM II



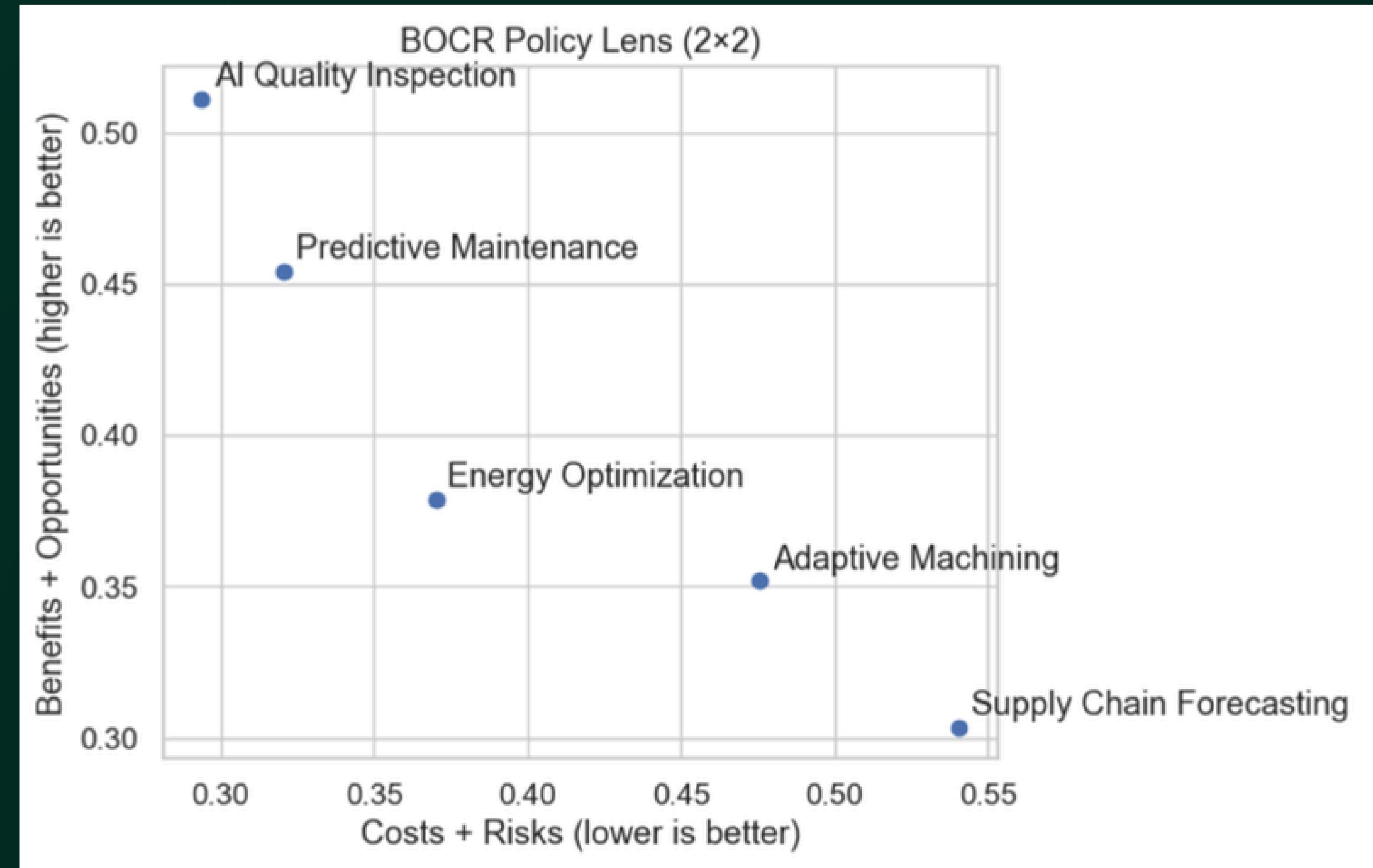
APPENDIX

	Alternative	B	O	C	R
0	AI Quality Inspection	0.266064	0.245429	0.203482	0.089929
1	Predictive Maintenance	0.233214	0.221028	0.183089	0.137532
2	Energy Optimization	0.182298	0.196626	0.148259	0.221687
3	Adaptive Machining	0.173814	0.178035	0.217920	0.257513
4	Supply Chain Forecasting	0.144610	0.158882	0.247250	0.293339

BOCR Weighted Scores by Alternative



APPENDIX



BORC Policy Lens (2x2)



APPENDIX

	Market Demand	ROI Potential	Implementation Cost	Technical Feasibility	Scalability & Adoption	Total
AI Quality Inspection	0.0468	0.1058	0.0115	0.0516	0.0366	0.2523
Predictive Maintenance	0.0428	0.0958	0.0131	0.0458	0.0331	0.2306
Energy Optimization	0.0345	0.0768	0.0158	0.0355	0.0296	0.1923
Adaptive Machining	0.0370	0.0728	0.0103	0.0310	0.0271	0.1782
Supply Chain Forecasting	0.0291	0.0601	0.0078	0.0264	0.0231	0.1466

Scenarios

```
cost_tight = rerank_with_scalars({"Implementation Cost":1.5})
scale_push = rerank_with_scalars({"Scalability & Adoption":1.5})
sales_push = rerank_with_scalars({"Market Demand":1.3, "ROI Potential":1.2})
```

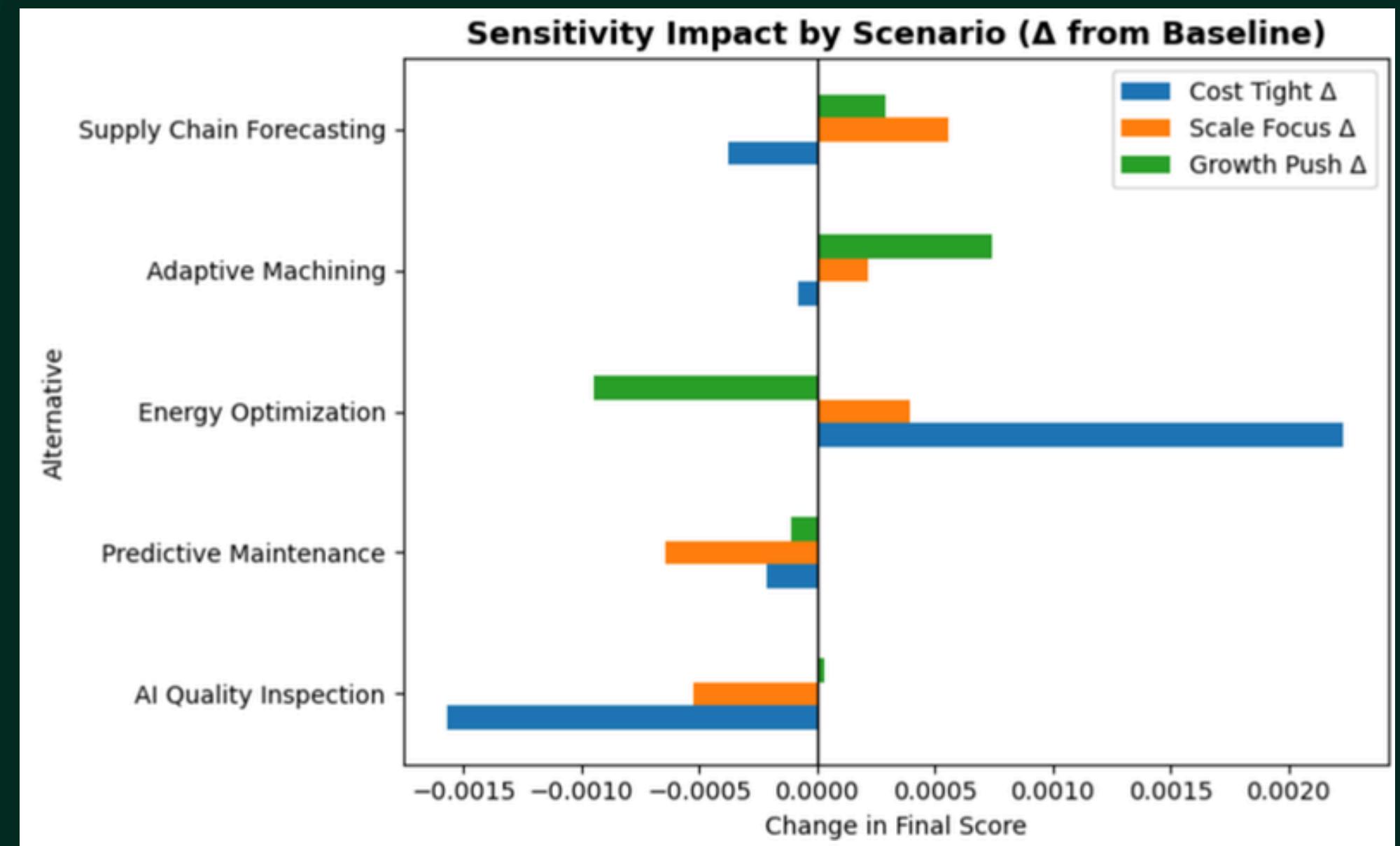
cost_tight, scale_push, sales_push

```
(      Alternative   Score
  0    AI Quality Inspection  0.250745
  1    Predictive Maintenance 0.230397
  2    Energy Optimization  0.194518
  3    Adaptive Machining  0.178128
  4    Supply Chain Forecasting 0.146212,
                           Alternative   Score
  0    AI Quality Inspection  0.251787
  1    Predictive Maintenance 0.229967
  2    Energy Optimization  0.192679
  3    Adaptive Machining  0.178426
  4    Supply Chain Forecasting 0.147141,
                           Alternative   Score
  0    AI Quality Inspection  0.252343
  1    Predictive Maintenance 0.230500
  2    Energy Optimization  0.191334
  3    Adaptive Machining  0.178950
  4    Supply Chain Forecasting 0.146874)
```

Global Scores of Alternative (Under different scenario)



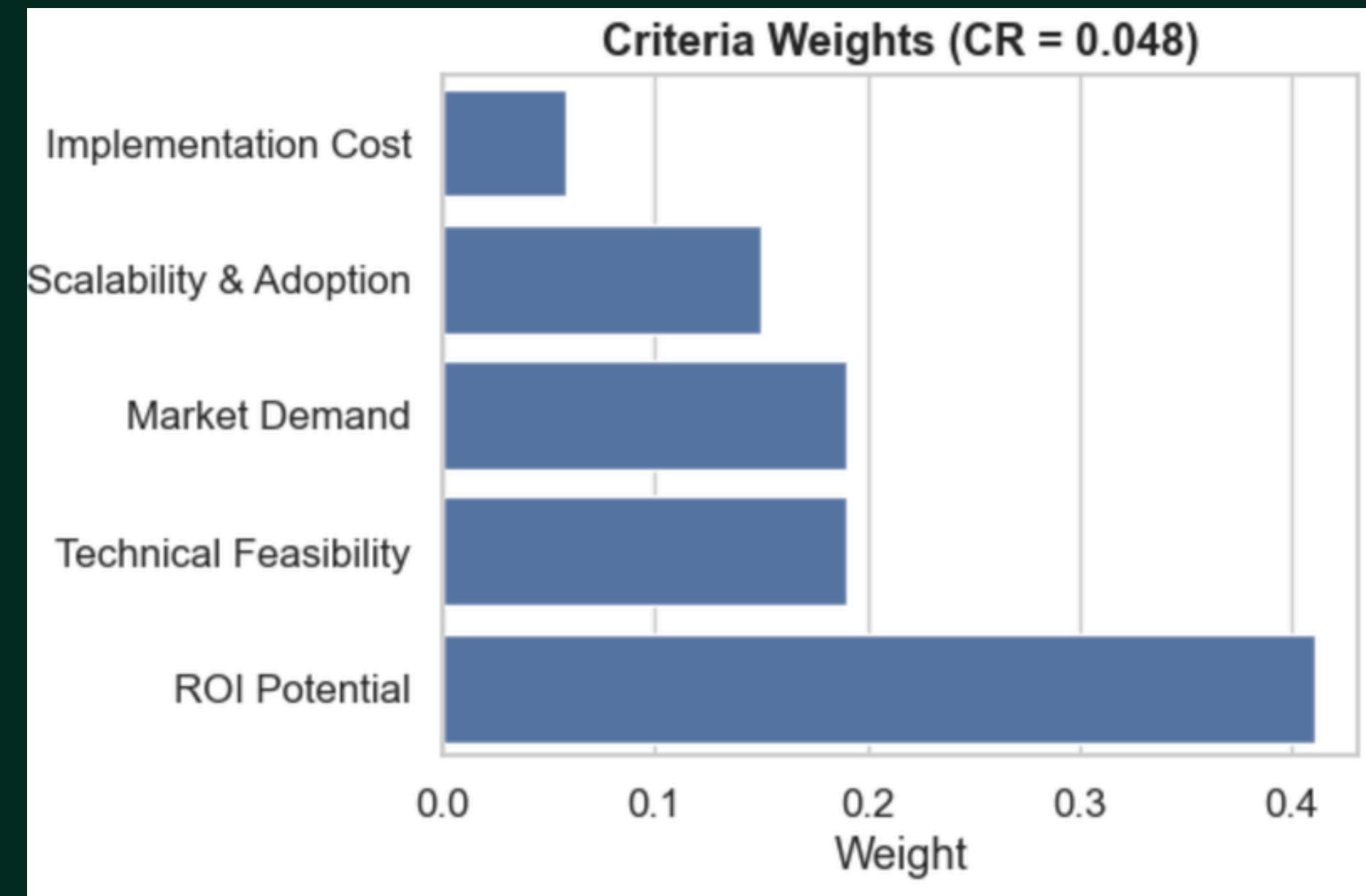
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Sensitivity Impact by Scenario



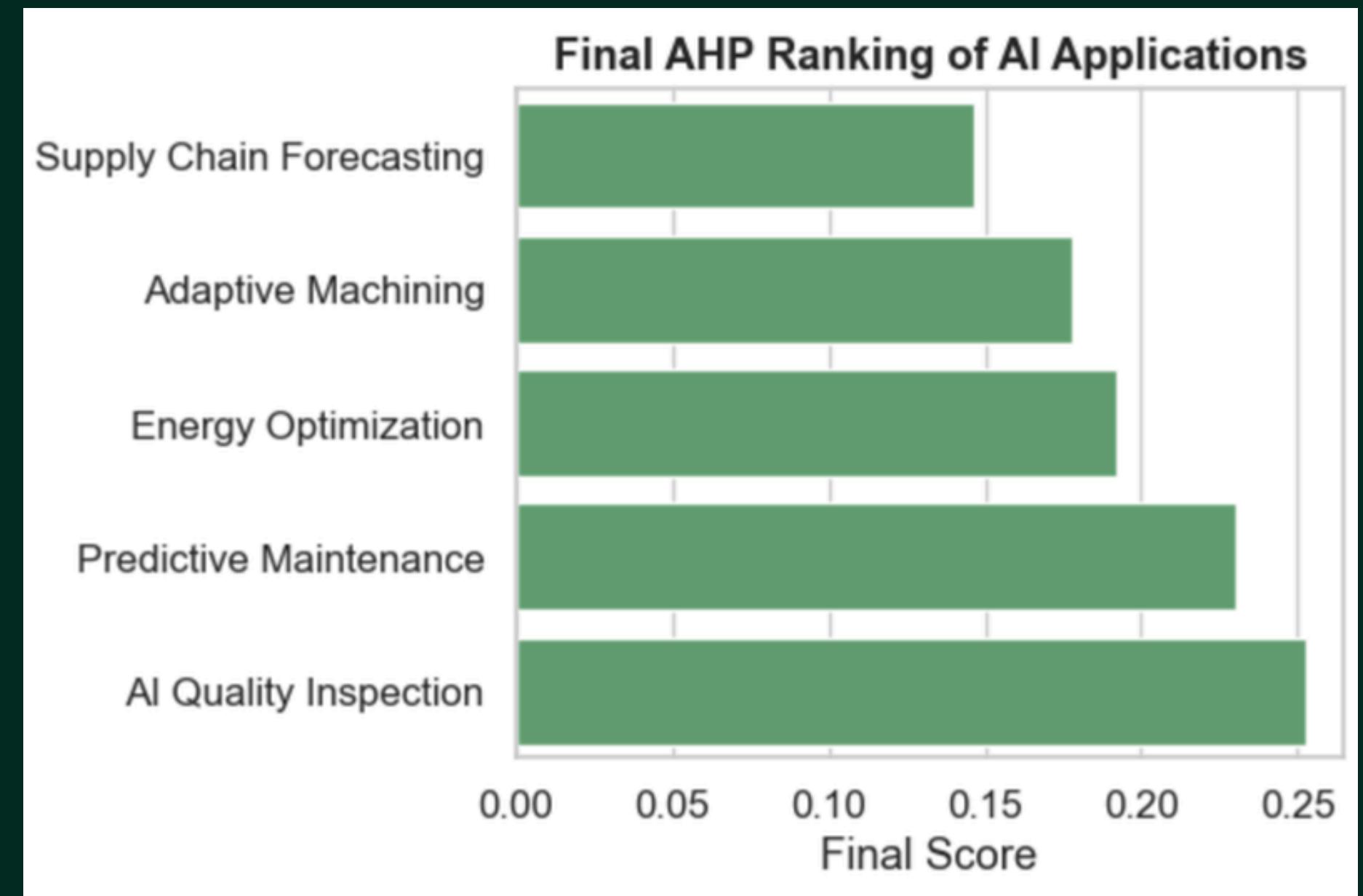
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Criteria Weights (Bar Charts)



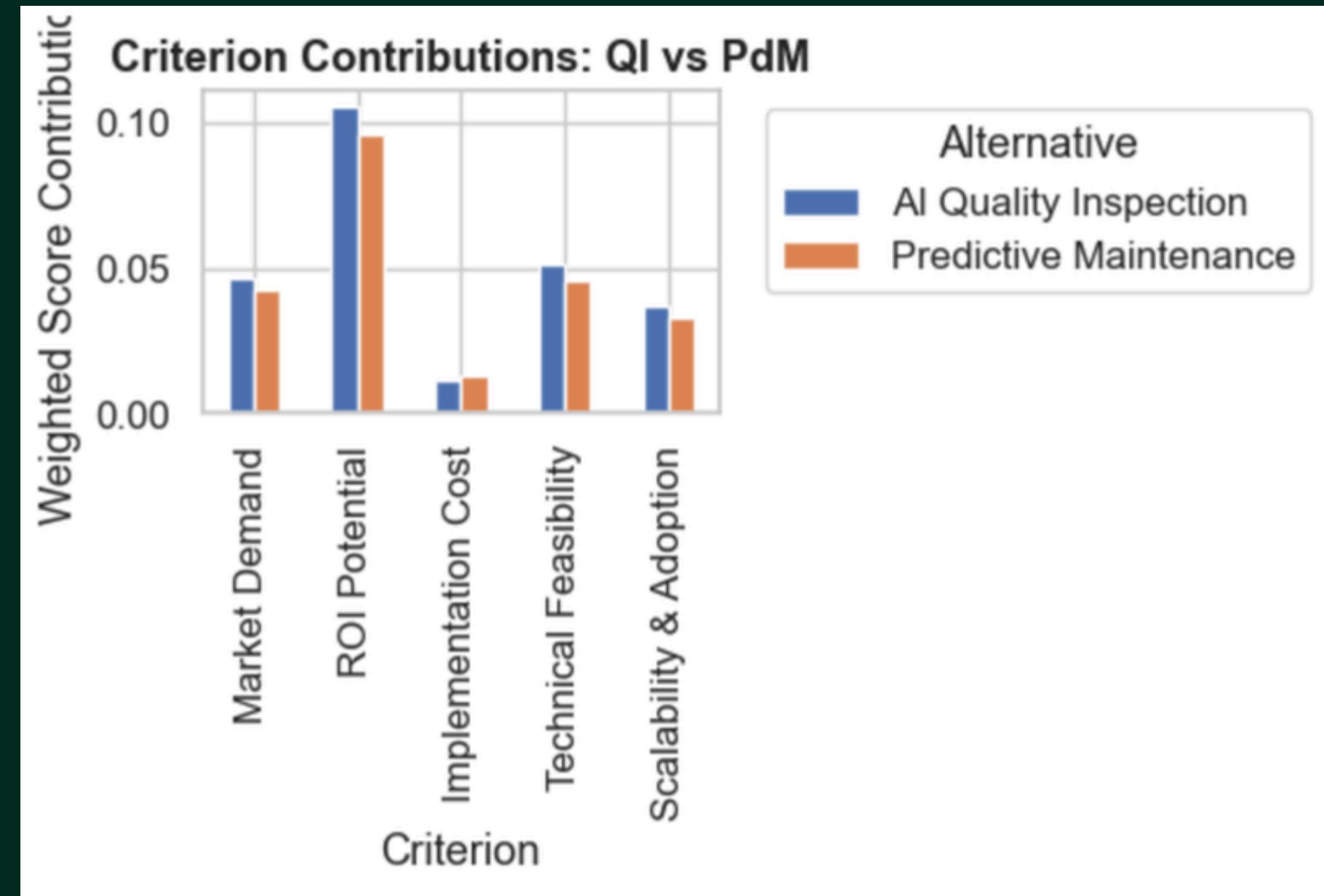
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Final AHP Ranking of AI Applications



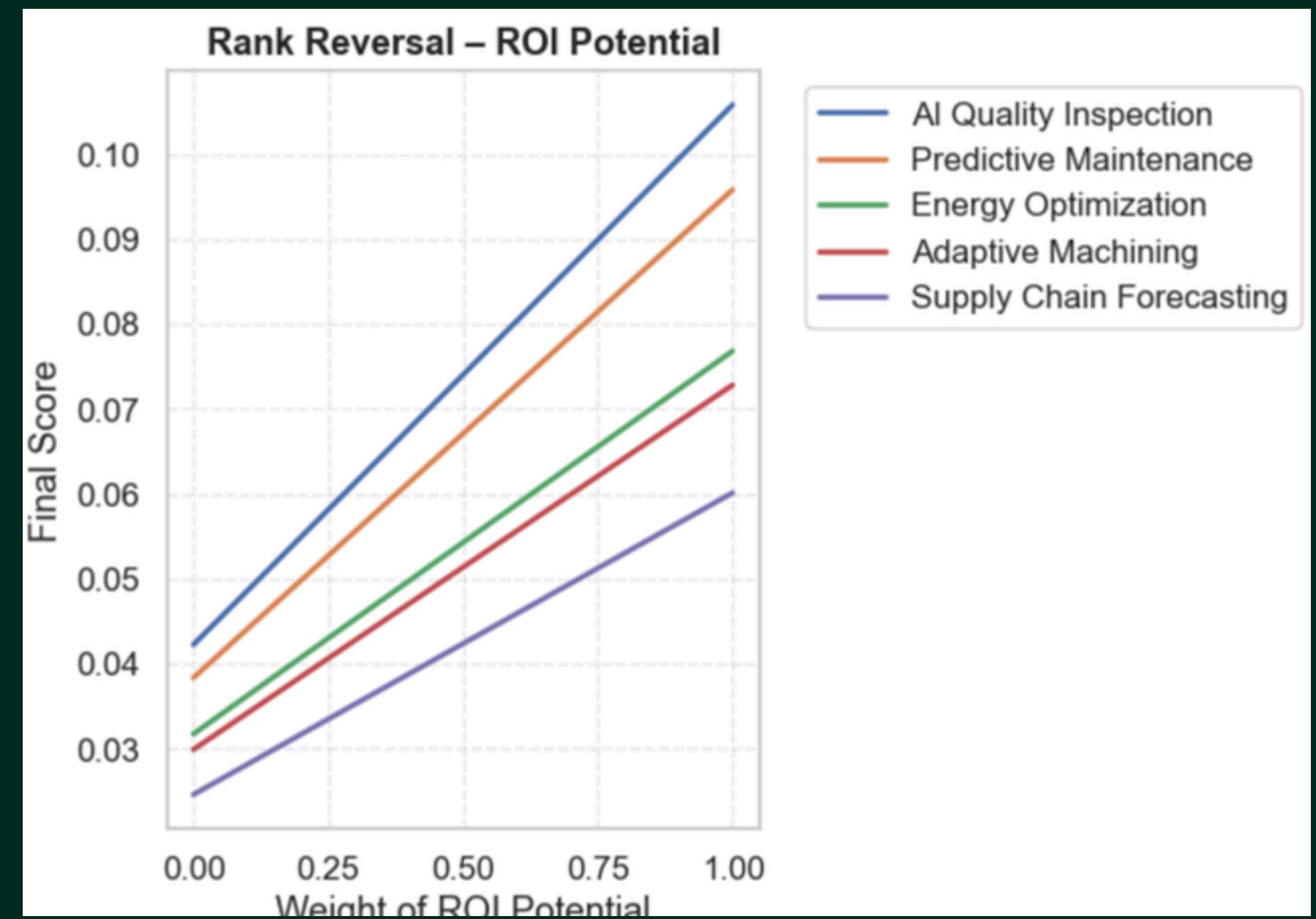
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Criterion Contributions: QI vs PdM



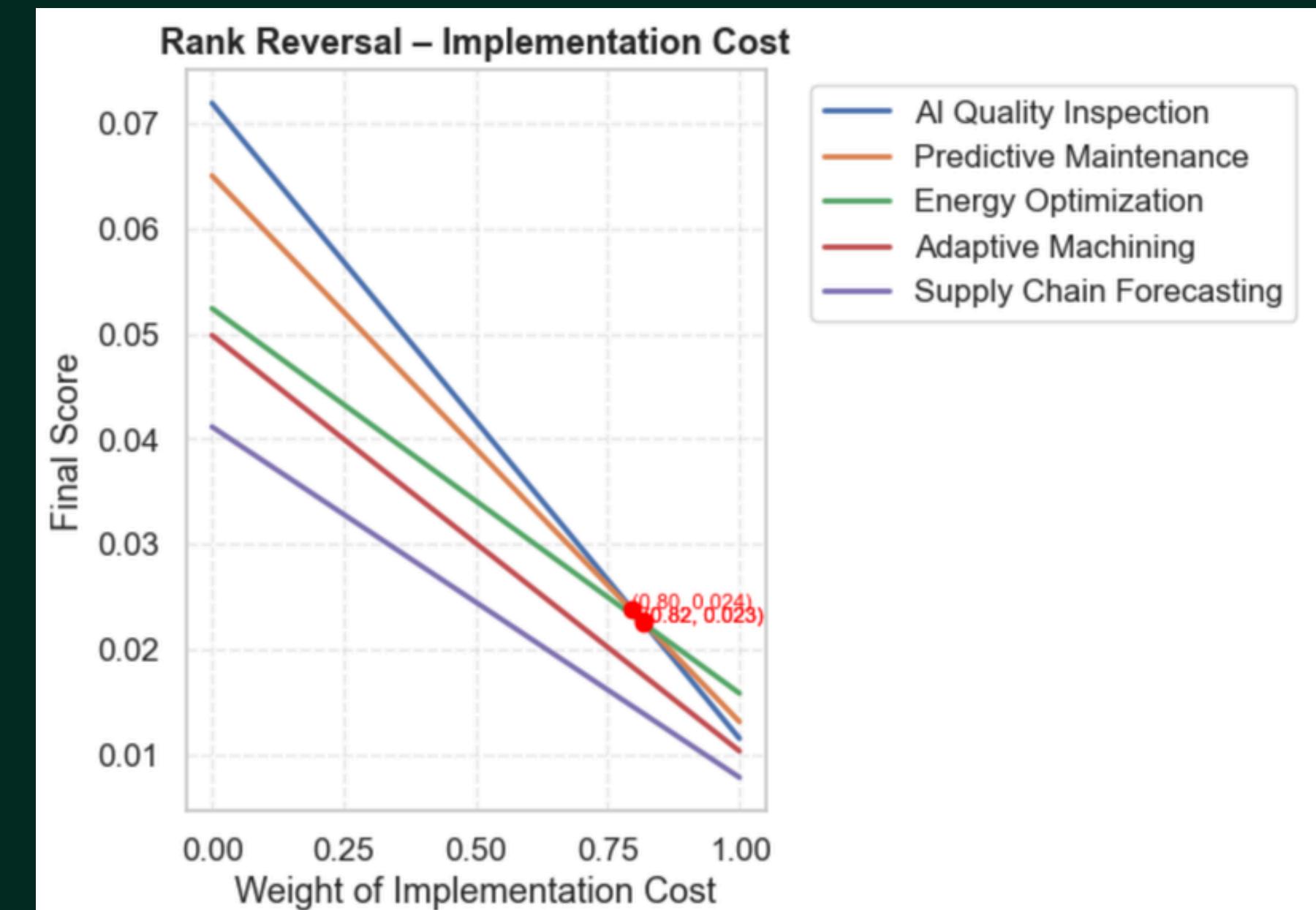
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Rank Reversal - ROI Potential (Line Chart)



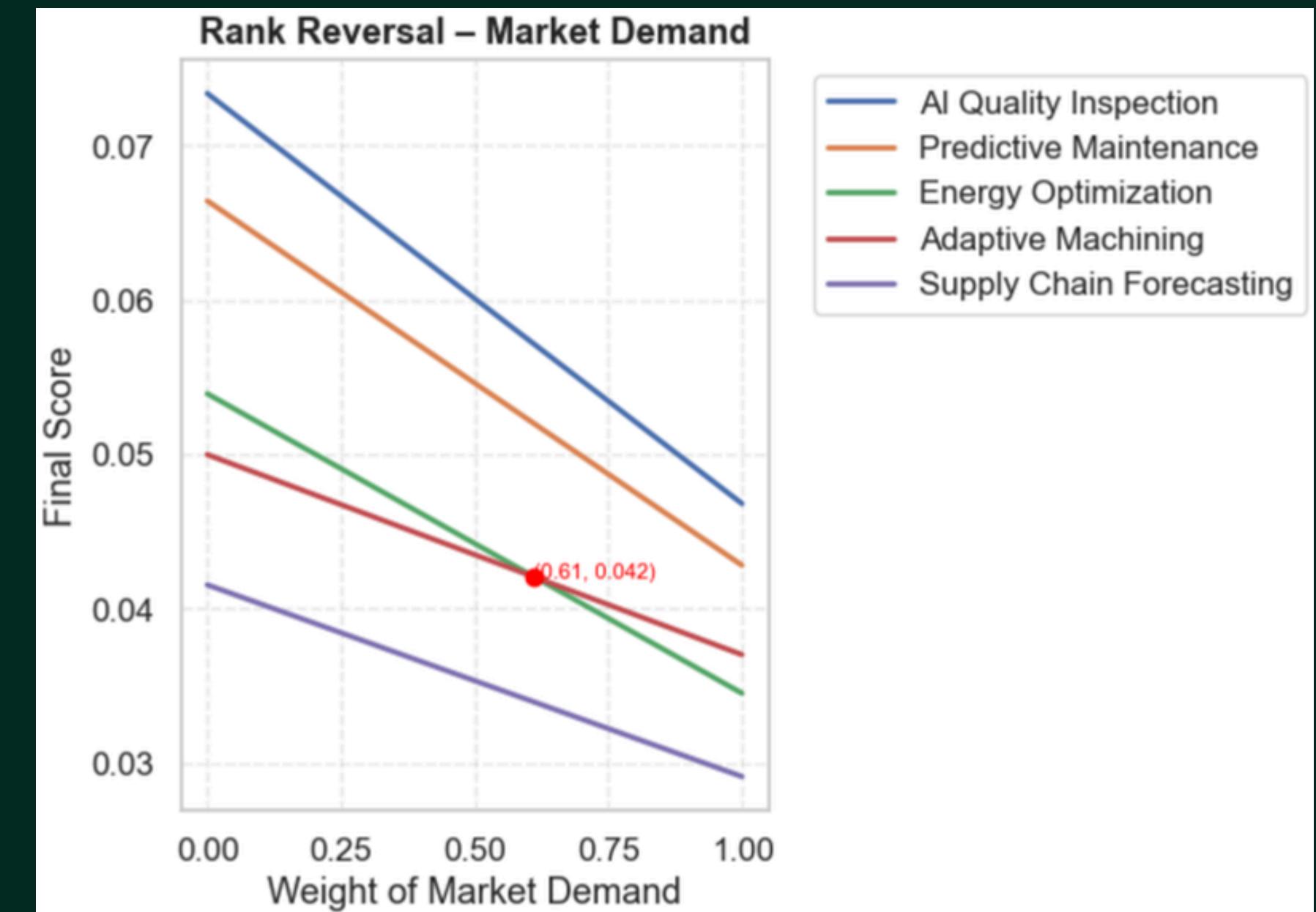
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Rank Rversal - Implementation Cost (Line Chart)



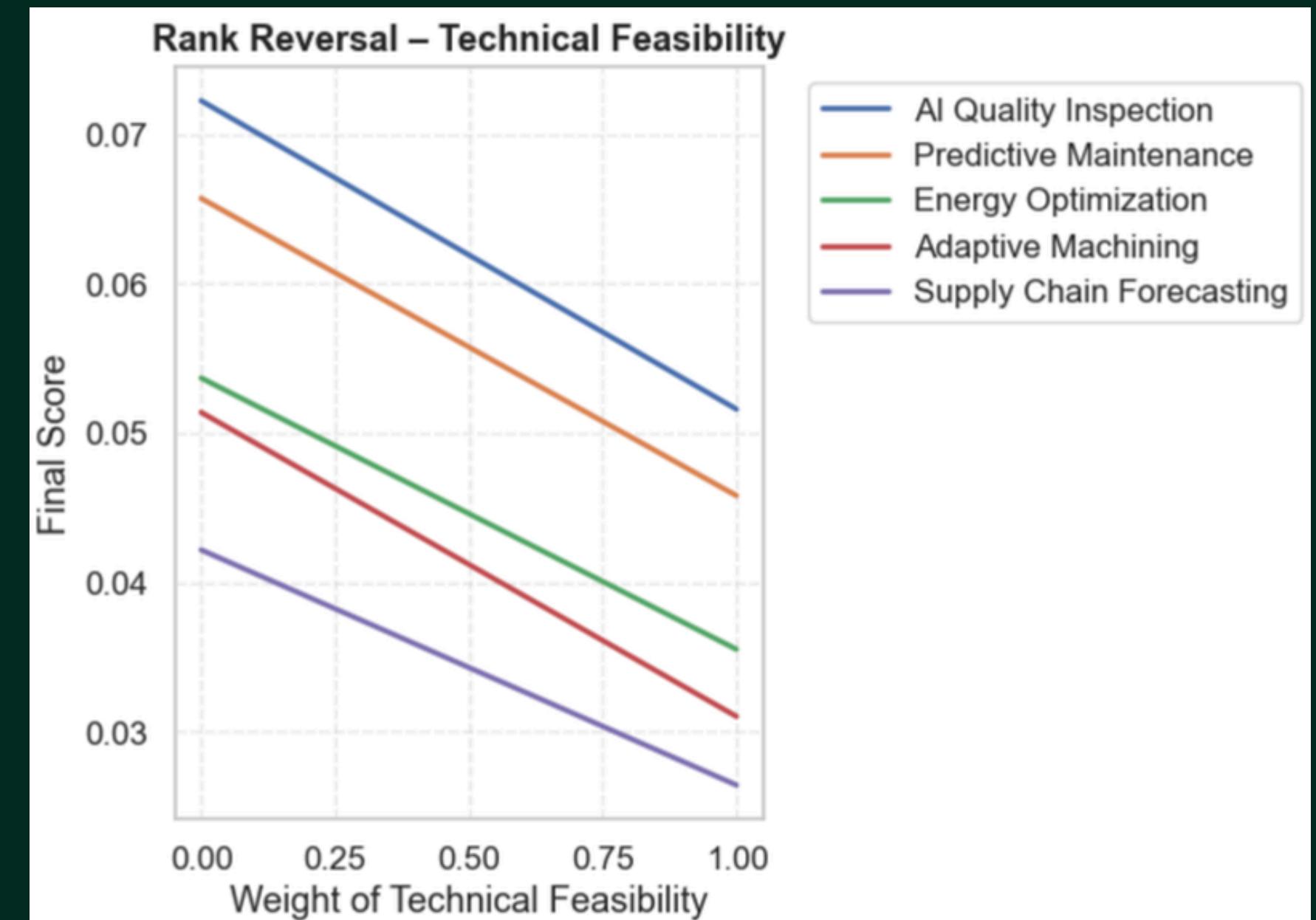
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Rank Reversal - Market Demand (Line Chart)



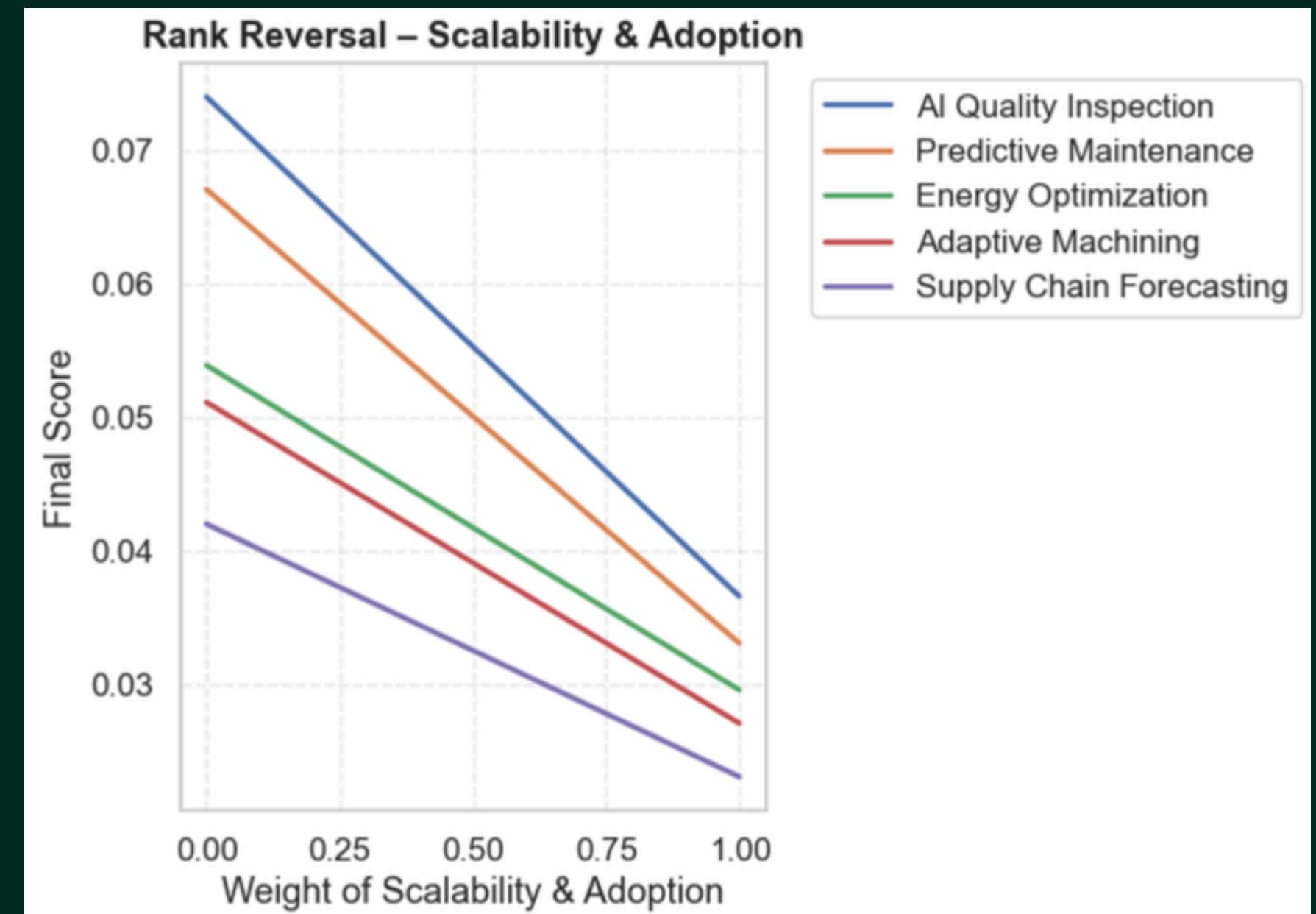
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Rank Reversal - Technical Feasibility (Line Chart)



APPENDIX



Rank Reversal - Scalability & Adoption (Line Chart)



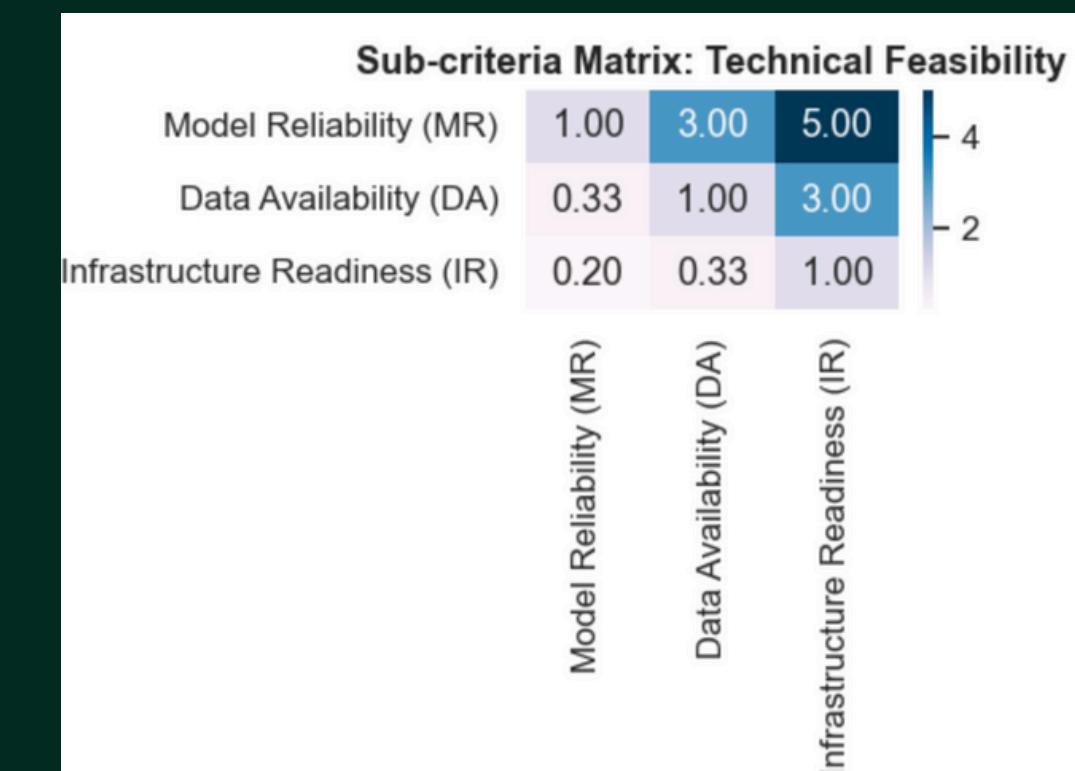
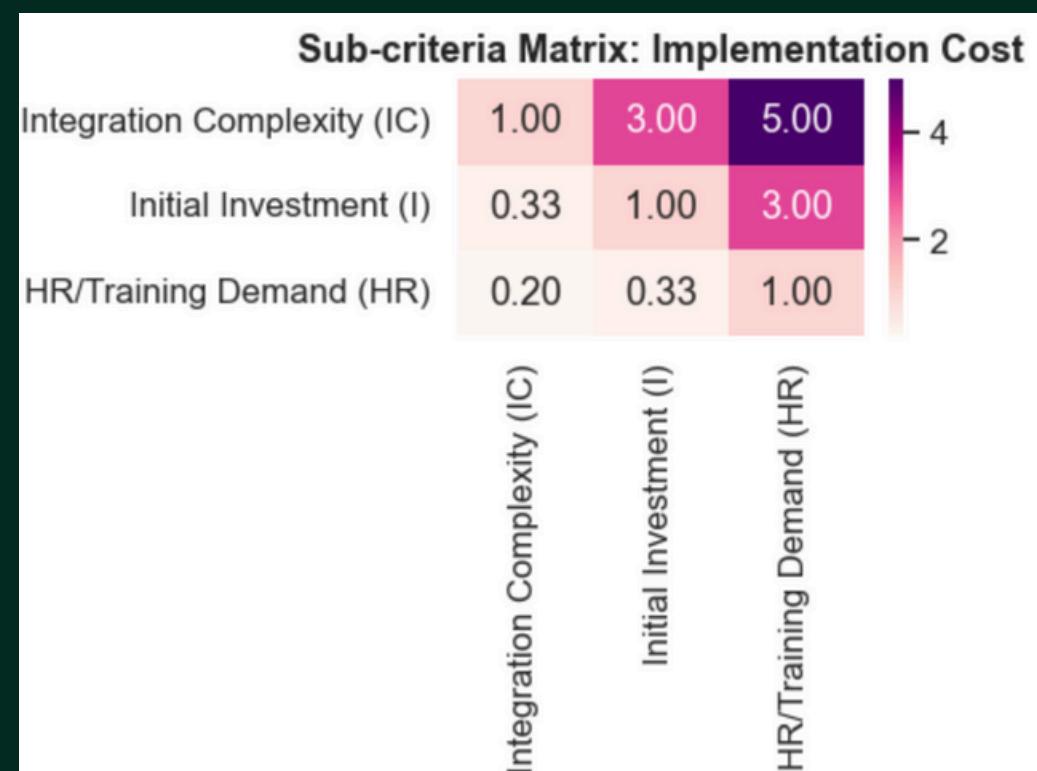
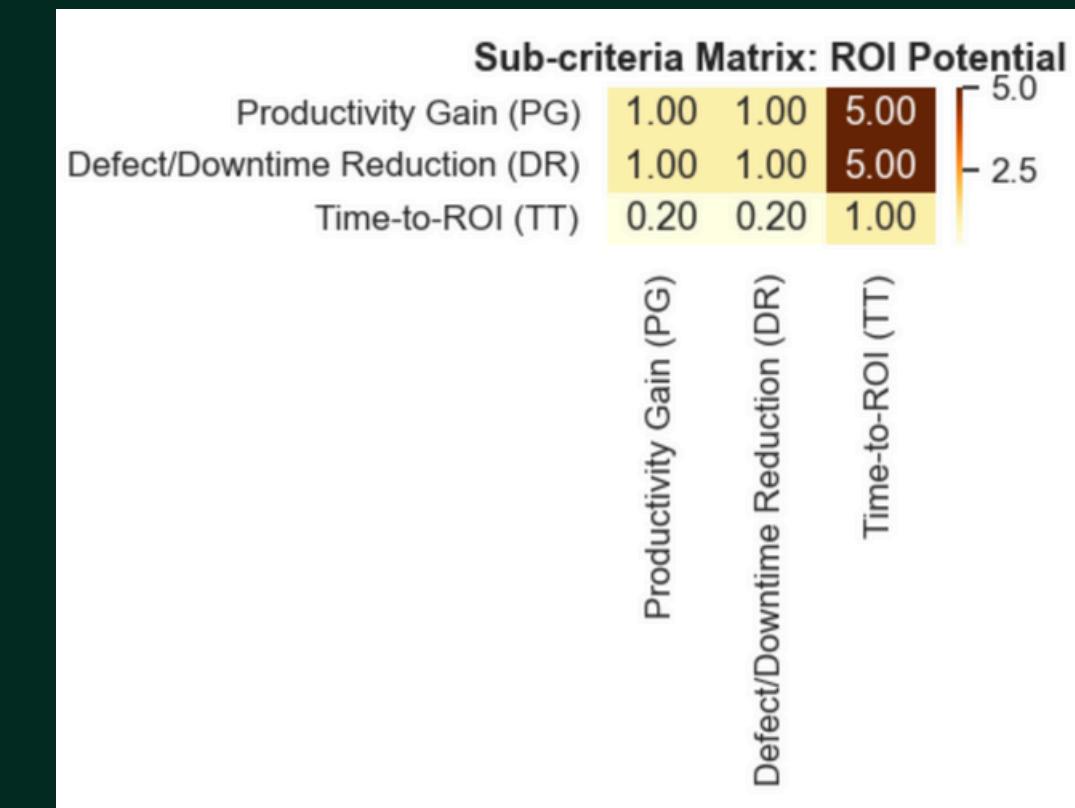
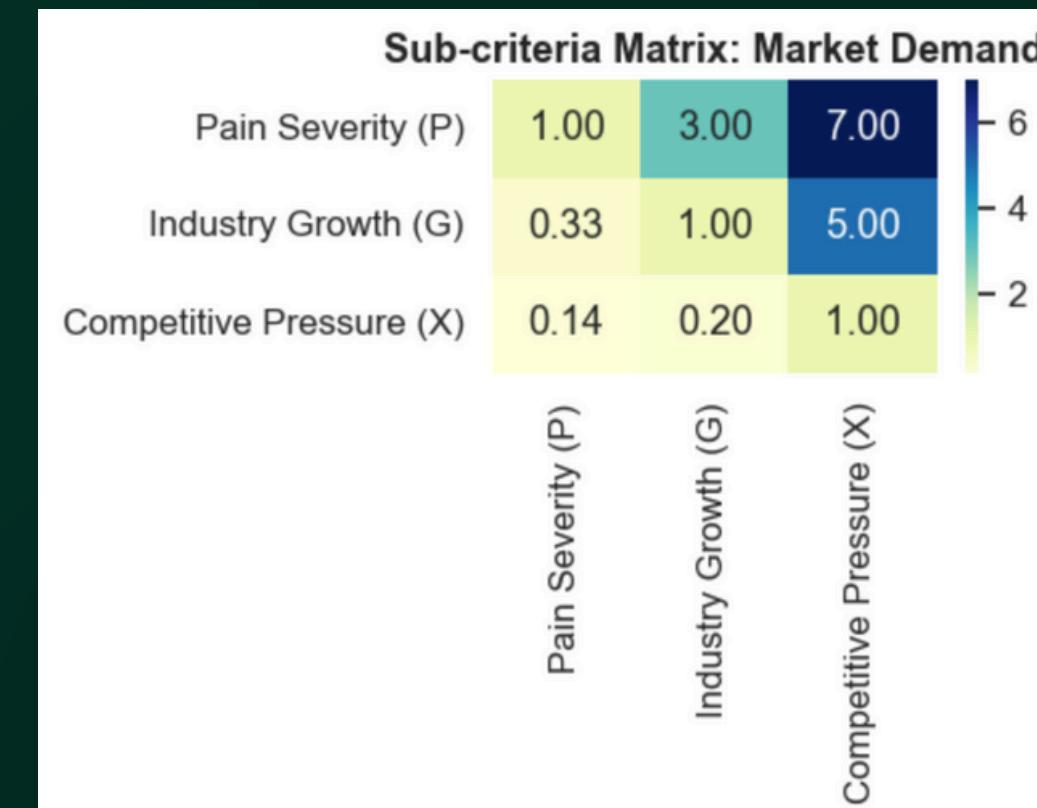
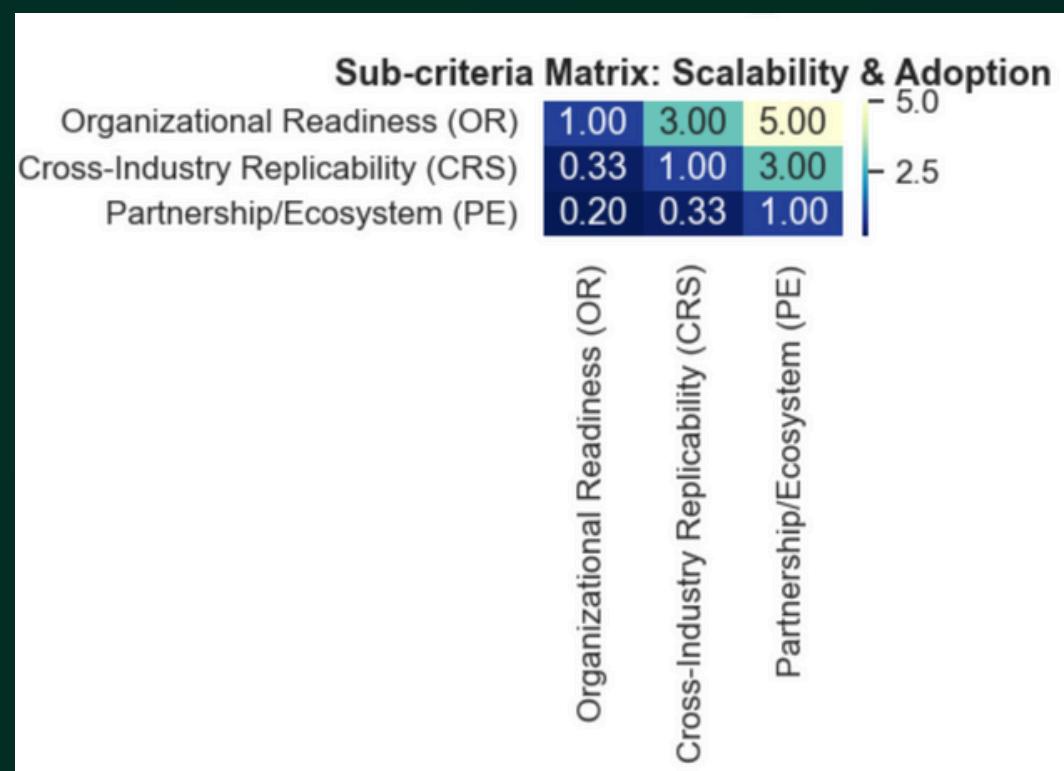
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	Market Demand	1.00	0.33	3.00	1.00	2.00
	ROI Potential	3.00	1.00	5.00	3.00	2.00
	Implementation Cost	0.33	0.20	1.00	0.33	0.25
	Technical Feasibility	1.00	0.33	3.00	1.00	2.00
	Scalability & Adoption	0.50	0.50	4.00	0.50	1.00
		Market Demand	ROI Potential	Implementation Cost	Technical Feasibility	Scalability & Adoption

Top-Level Criteria Pairwise Matrix



APPENDIX



Sub-Criteria Matrix



APPENDIX

OTHER USE OF AI AGENT

Industry/Application Research

Explore specific industries or applications

Industry or Application to Research

e.g., Smart Manufacturing, Healthcare AI, Autonomous Vehicles

Specific Focus Areas

e.g., Market trends, technology adoption, competitive landscape

Priority Metrics

Market Demand

5

ROI Potential

7

Implementation Cost

3

Technical Feasibility

5

Scalability & Adoption

6



AI-Assisted Default Weights