



Bridging the Knowledge Gap: AI Powered Information Systems in Manufacturing

**Aaron Phipps, Patrick Byrne
MPI Systems, Annora.ai
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Introduction – MPI Systems



85
Employees

50+
Years of Equipment

Manufacturing high-quality equipment and custom solutions for the investment casting industry



Injection Casting Equipment



Automation Solutions



Information Spread Across Many Data Sources



Local Servers



Current ERP (Epicor)



Historical ERP



SharePoint



GembaDocs



Equipment Software



Trello & Teams



Other Systems



The Effect

Information Fragmentation

- Information scattered across many disconnected systems
- No unified search capability
- Knowledge trapped in departmental silos

Business Impact

- Difficulty hiring and onboarding
- Slower than desired quoting processes
- Delayed customer service resolutions



The Hidden Productivity Drain



■ Productive Work (12 hrs) ■ Information Search (10 hrs)

■ Interruptions (10 hrs) ■ Meetings (5 hrs) ■ Other (3 hrs)

FRAGMENTED SYSTEMS

8+ information systems
(ERP, MES, PLM, DMS)

INFORMATION SEARCH

1.8-2.5 hours daily
(22-31% of workday)

CONSTANT INTERRUPTIONS

8-25 mins per interruption
(up to 30% of workday)

Bridging the Knowledge Gap: Quantification



Let's quantify this for your business



You can also go to: [Aiactionplan.app](https://ai.actionplan.app)



Quantify the Problem with Your Numbers

1. How many employees are there at your company?

2. What is your fully loaded hourly rate per employee?

3. How many times do you interrupt someone daily to find information?

4. How many times do you get interrupted daily by someone seeking information?

5. How many key employees or managers have similar experiences to you?



The Manufacturing Knowledge Crisis

25%

of manufacturing workers
are **55+ years old**

10,000

baby boomers retire **daily**
through 2030

1.9M

unfilled manufacturing
jobs projected by **2033**

Critical knowledge walking out the door every day



Pillars of Solution

SPEED

Unified search across
all systems
simultaneously

ACCURACY

Vector semantic +
keyword matching

SECURITY

Private AI system
protects your IP



Solution

Centralize Knowledge

Unified database connected to key systems

Capture Expertise

Capture knowledge and problem resolutions

AI-Powered Search

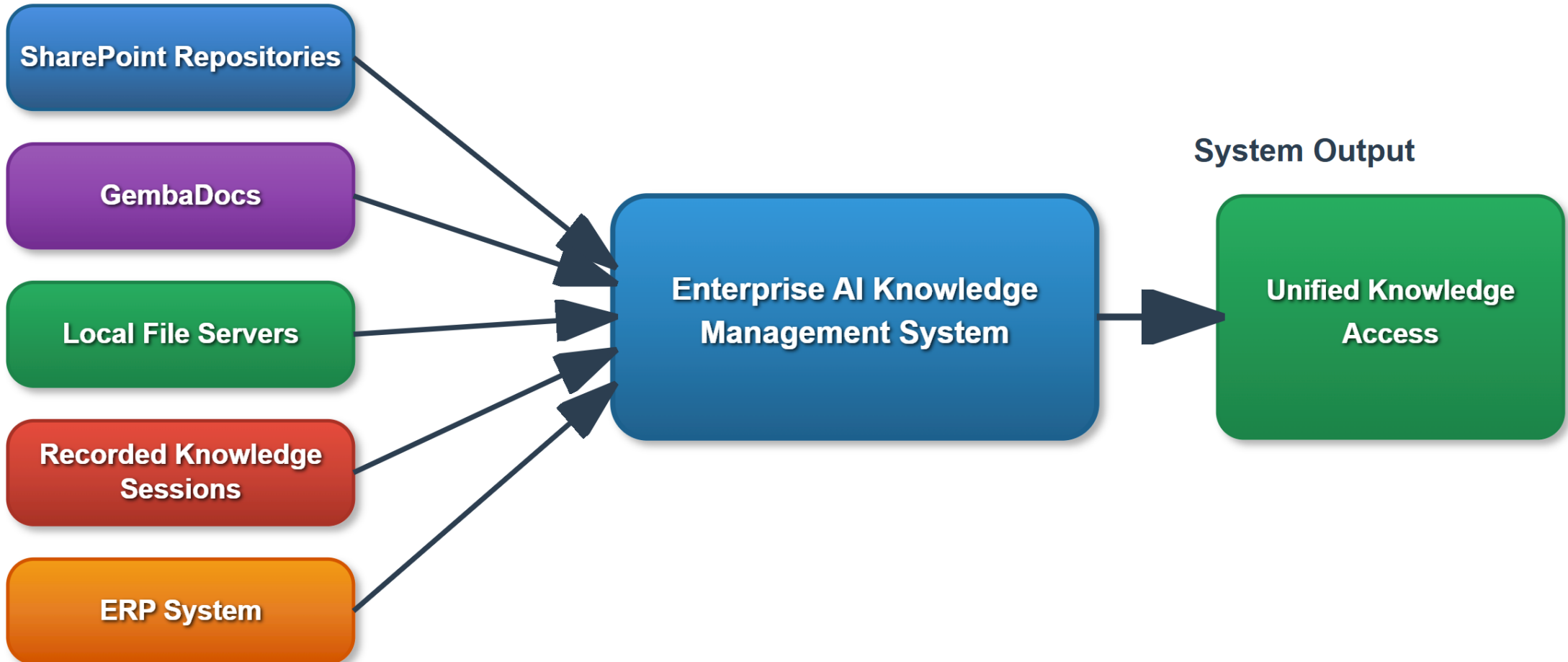
AI excels at searching for information (Keyword + Semantic)

AI Overlay Solution - No System Replacement Required

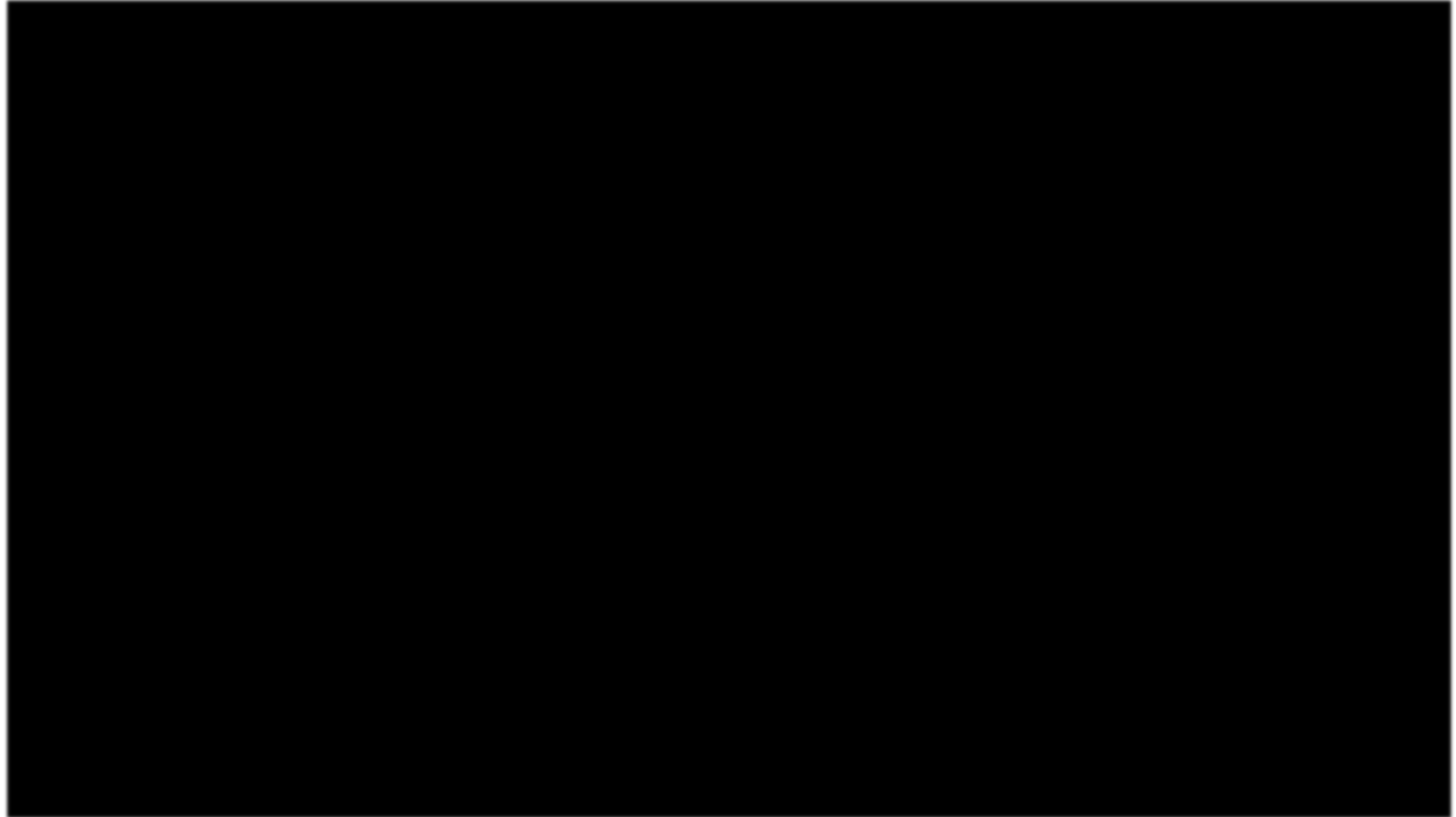
Bridging the Knowledge Gap: Solution



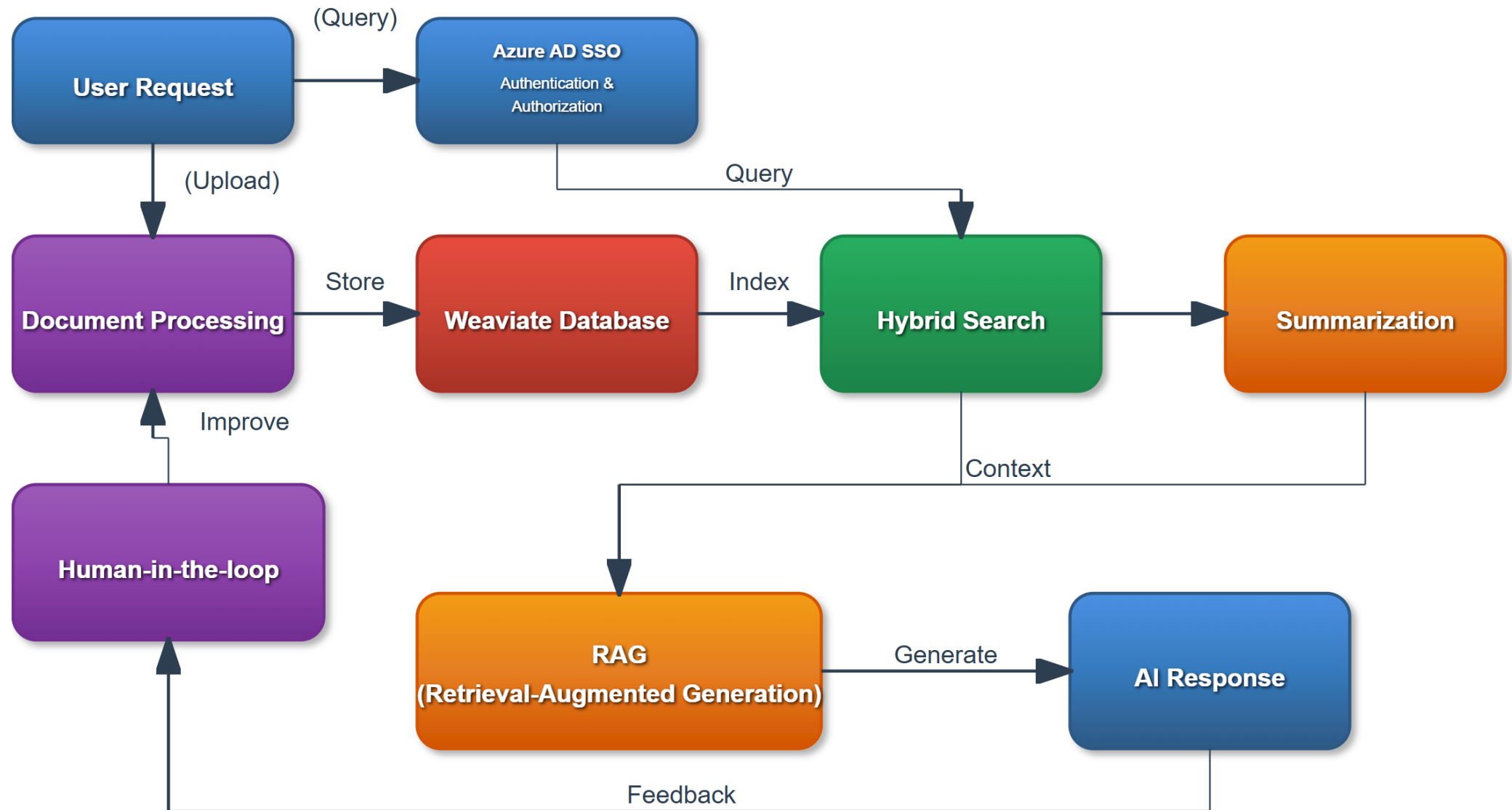
Enterprise Data Sources



Bridging the Knowledge Gap: Solution

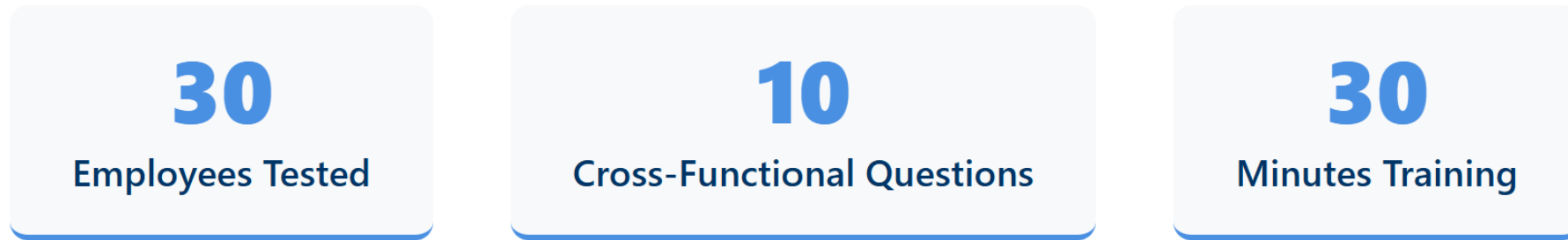


Bridging the Knowledge Gap: Architecture





Measuring Impact



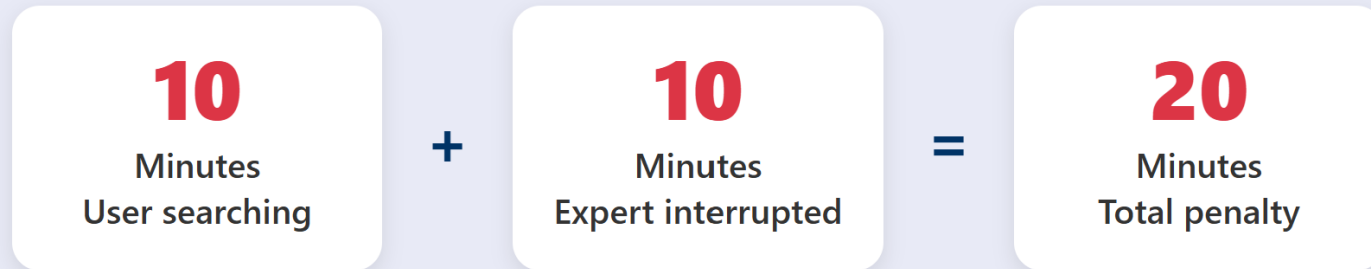
Controlled Experiment Process





Measurement Framework

Conservative Time Penalty for Incorrect Answers



Research-Based Assumptions

1.8-2.5 hours/day

Knowledge workers daily search

8-25 minutes

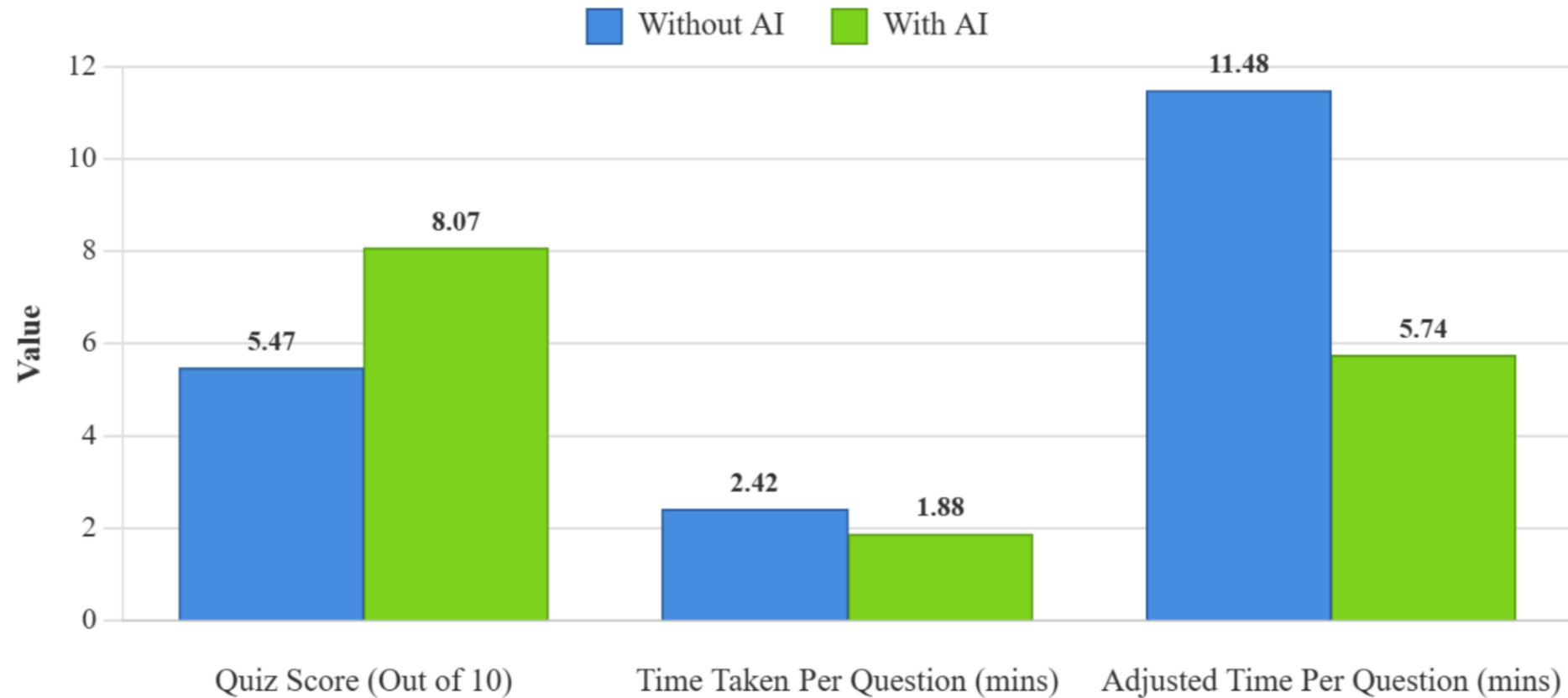
Recovery time after each interruption

Bridging the Knowledge Gap: Results



Performance Comparison: Quiz Without AI vs Quiz With AI

Impact of AI Assistance on Quiz Performance Metrics





Quantitative Results

Time to Find Information

Before
11.5
min/question

→

After
5.7
min/question

50% Faster

Answer Accuracy

Before
55%

→

After
81%

47% Improvement

79%

Improvement for New Employees

Bridging the Knowledge Gap: Analysis Framework



Top-Down Analysis

Daily search time	1.8 hours
Time savings measured	× 50%
Daily active users	× 35
Working days/year	× 240

Annual Hours Saved

7,560

3.94 FTE Equivalent



Bottom-Up Analysis

User Segmentation:

10

Power Users
15 searches/day

20

Regular
5 searches/day

30

Infrequent
1 search/day

Total searches/day × Minutes saved/search ×
Working days/year

Annual Hours Saved

6,430

3.35 FTE Equivalent



Organizational Impact at Full Adoption

3.9-4.6%

Efficiency Gain

(From 85 Employees)

Faster Onboarding

Senior Staff Focus

Better Decisions

Competitive Edge

First Year ROI: **250%+**

Bridging the Knowledge Gap: Impact



Lets look at the results from earlier:

<https://www.aiactionplan.app/admin>





Key Observations

Low Barrier to Entry

Only **30 minutes** of training

Data Quality Matters

Revealed inconsistencies needing cleanup

Culture is Critical

Engagement in continuous improvement

Double Benefit

Faster search, fewer interruptions



Strategic Value

Addressing Today's Challenges While Building Tomorrow's Capabilities



Better Customer Outcomes

Higher win rates & CSAT



Knowledge Preservation

Capture expertise before it retires



Immediate Productivity

3.9-4.6% gain across organization

Creating Organizational Resilience Against Workforce Transitions



Future Directions

- 1 Automate knowledge capture from problem resolutions
- 2 Automatically detect conflicting knowledge
- 3 Apply to specific pain points: quoting & service requests

The future of manufacturing is intelligent information systems that empower every employee



Start with Strategy

- 1 Define Company Goals**
Align AI projects with business objectives that move the needle
- 2 Define Trackable KPIs**
Choose metrics you can measure and improve
Examples: Time to Quote, Win Rate, First Call Resolution
- 3 Quantify Project Benefits**
Calculate expected ROI before implementation
- 4 Estimate Complexity**
Assess technical requirements and organizational readiness
- 5 Start with Quick Wins**
Build momentum with high-impact, low-complexity projects first

Bridging the Knowledge Gap: Thank You



- Aaron Phipps
- MPI Systems
- aphipps@mpi-systems.com
- (845) 505-0100



- Patrick Byrne
- Annora AI
- patrick@annora.ai
- +353 85 1094981



THANK YOU