Crossroads 2026

MIT Work Analytics Lab | MIT Center for Transportation & Logistics

Beyond the Pilots:

The Executive Blueprint for AI-in-Operations

Yossi Sheffi x Pierre Bouquet

MIT Work Analytics Lab | MIT Center for Transportation & Logistics

Agenda

A. Historical Perspective | Technological Revolutions

B. The Impact of AI | Modeling Work

C. AI in Operations | The Executive Blueprint

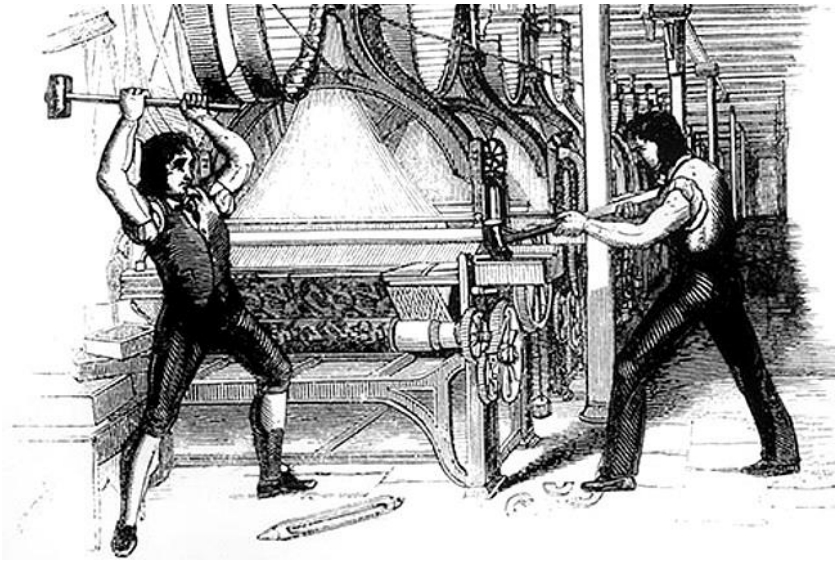
D. Case Study | A large manufacturing company

The Fear

- A tsunami is coming
- Big leaps in performance are getting faster
- AI is being used to create itself
- AI is a general substitute for cognitive work

The Industrial Revolutions

- 1st Industrial Revolution 1750-1850
  Manual production → machines



The Industrial Revolutions

- 1st Industrial Revolution 1750-1850
  Manual production → machines
- 2nd Industrial Revolution 1850-1950
  Assembly lines; telegraph; electricity


The Detroit Free Press

METROPOLITAN

4 DIE IN RIOT AT FORD PLANT

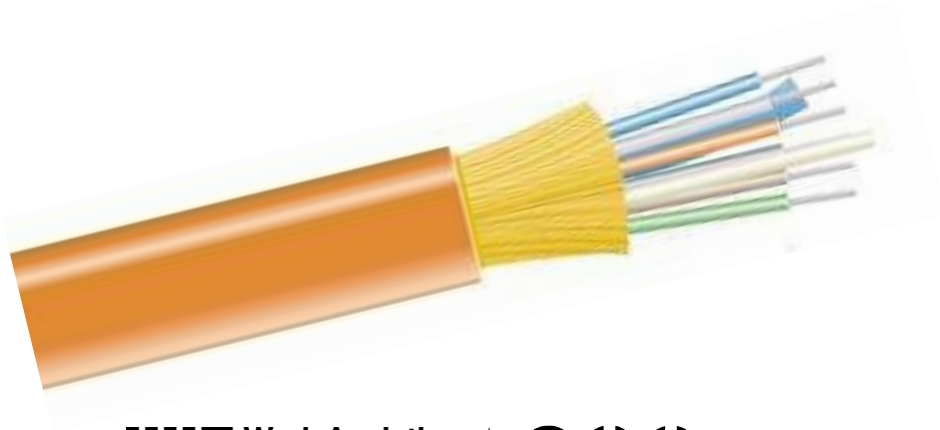
Baby's Kidnapers Send Two Notes to Lindbergh

MURDER CHARGES ASKED AFTER RED MOB FIGHTS POLICE

CHILD IS SAFE, NEW LETTERS TELL PARENTS

The Industrial Revolutions

- **1st Industrial Revolution 1750-1850**
  Manual production → machines
- **2nd Industrial Revolution 1850-1950**
  Assembly lines; telegraph; electricity
- **3rd Industrial Revolution 1950-2010**
  The digital revolution; containers



The Industrial Revolutions

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  The digital revolution; containers
- **4th Industrial Revolution 2010–2023**
  Widespread use of connected devices; IoT, AI, conversational computing…

The Industrial Revolutions

- **1st Industrial Revolution 1750-1850**
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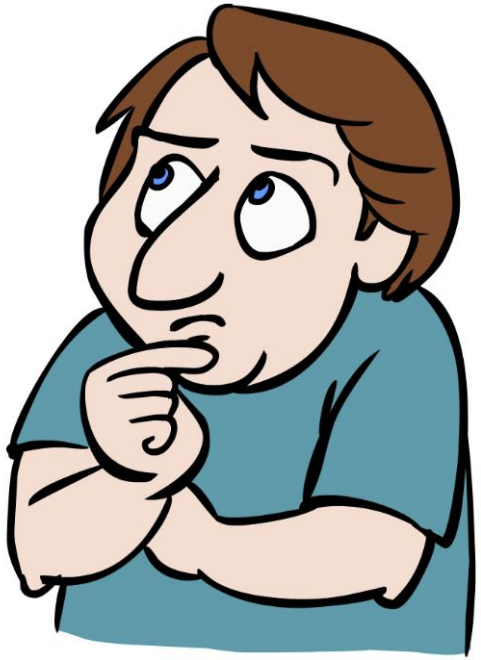
- **2nd Industrial Revolution 1850-1950**
  Assembly lines; telegraph; electricity
- **3rd Industrial Revolution 1950-2010**
  The digital revolution; containers
- **4th Industrial Revolution 2010–**
  Widespread use of connected devices; IoT, AI, conversational computing…
- **5th Industrial Revolution 2023–**
  Large language models, advanced AI-based models, integration of AI into business processes.

In the Past

After a short-term pain, **there was a massive gain.**

Example:

Ford's conveyor belt → emergence of the middle class, infrastructure, hospitality industry



Will the pattern continue with the new technology?

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D. Platform | Your company

Work Analytics Lab

Workforce Modeling

We use machine learning to model job profiles at the task level.

AI Exposure

We build new AI exposure metrics through news articles and natural language processing.

Organization Dynamics

We map private and public organizations using our models to find where AI initiatives can generate ROI.

The AI Effect

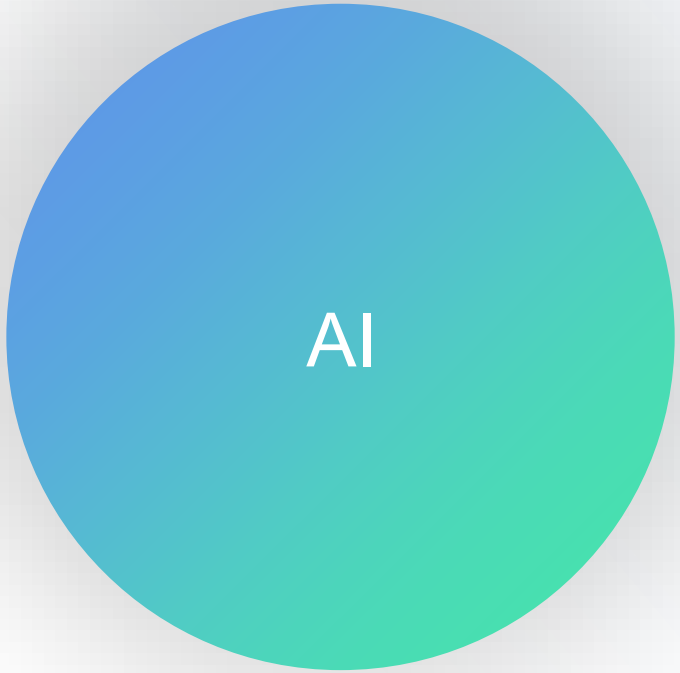
How A.I. Helped One Man (and His Brother) Build a $1.8 Billion Company

Who needs more than two employees when artificial intelligence can do so many corporate tasks? It's super efficient — and a little bit lonely.

April 2nd 20206

What is AI?

AI – An overview



A machine able to simulate a human decision.

Based on stochastic or deterministic rules.

Example:
- Newsvendor model
- Economic order model

Learns from the data it sees.

Example:
- Dynamic pricing @Uber
- Generate text based on a prompt @OpenAI

Deep learning

Reinforcement learning

Non-Exhaustive View

The Impact of AI

The effects of technology on jobs.

1. Automation

Requirement
Narrow and specialized tasks

Workforce
Deskilling

Outcome
Mass production, lower cost.

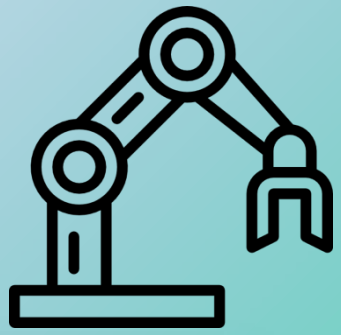
The Impact of AI

The effects of technology on jobs.

1. Automation

The Impact of AI

The effects of technology on jobs.



1. Automation

The Impact of AI

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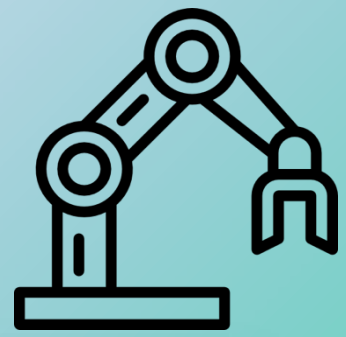


1. Automation

Substituting Humans

Driver: Taylorism and scientific management

1. Map a job into processes
2. Make specialized roles for each process
3. Automate processes iteratively

Workforce: Deskilling

Outcome: Mass production; economic boom; new industrial sectors.

The Impact of AI

The effects of technology on jobs.

1. Automation

Requirement
Narrow and specialized tasks

Workforce
Deskilling

Outcome
Mass production, lower cost.

2. Augmentation

Requirement
Tasks that can be accelerated.

Workforce
Upskilling

Outcome
Workers remain necessary
Increased efficiency

The Impact of AI

The effects of technology on jobs.

2. Augmentation
Complementing Humans

Driver: Digitalization and communication systems

Workforce: Upskilling

Outcome: Increased efficiency; workers remain central to the job.

Edge against automation: Adaptability, changing context; unstructured data.

The Impact of AI

AI Capabilities

Codified knowledge

Definition:
Well-defined tasks, systematic workflows.

New Ability:
Manages unstructured data and scale.

Workforce involved:
Entry-level workers

Tacit knowledge

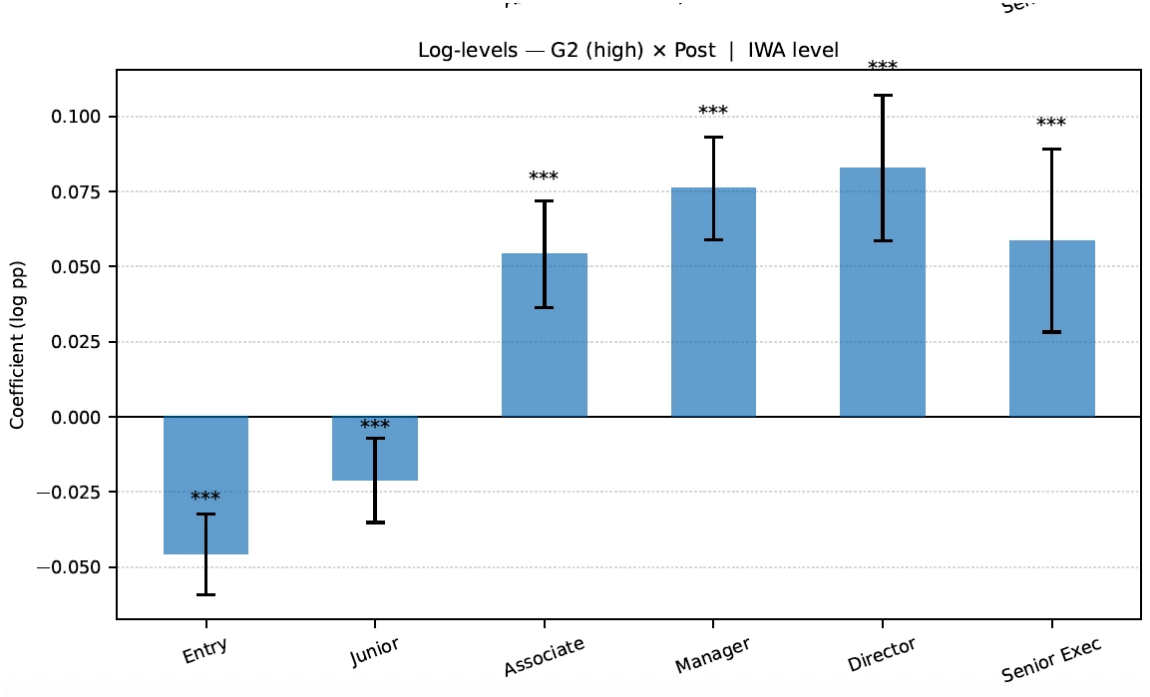
Definition:
Tacit, company-specific, interpersonal.

Limited Ability:
Unwritten rules, on-the-job heuristics.

Workforce involved:
Medium-level+ workers

The Impact of AI

Entry and junior level workers



Across the Atlantic: Early Labor Market Responses Following the Introduction of AI in the United States and the European Union

MIT Center for Transportation & Logistics Research Paper No. 2026/003

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Date Written: February 03, 2026

Abstract

We examine early labor market adjustments in the period associated with generative AI (Artificial Intelligence) introduction by comparing employment dynamics in the U.S. (United States) and the E.U. (European Union). Using large-scale workforce data linked to task-based AI exposure measures, we estimate within-firm employment reallocation by seniority and occupation while absorbing firm-level shocks. Across both regions, early-career employment contracts after 2022, with systematically larger relative declines in higher-exposure groups. Once firm-level shocks are controlled for, the magnitude of the declines is similar across the U.S. and E.U. Moving beyond exposure-quintile aggregation to an occupation-level framework reveals substantial heterogeneity that aggregate analyses obscure. Within the same occupation, employment responses vary across seniority levels. Correlation analyses show that exposure-linked contraction in Europe is more closely

The Impact of AI

Is AI the 5th Industrial Revolution?

The AI shift

Codified knowledge was not automatable; AI solves it.

- **Driver:** AI can manage unstructured data, flexibility, and scale.
- **Workforce:** Upskilling or deskilling.
- **Paradox:** Tasks are getting automated, but jobs are not modular.

Outcome: Jobs are being redefined.

The Impact of AI

Redefined Jobs

Centaur workers

AI capabilities

AI agents
- Perform the codified work.
- Pre-analysis and data structuring.

Core capabilities:
- Scale
- Speed

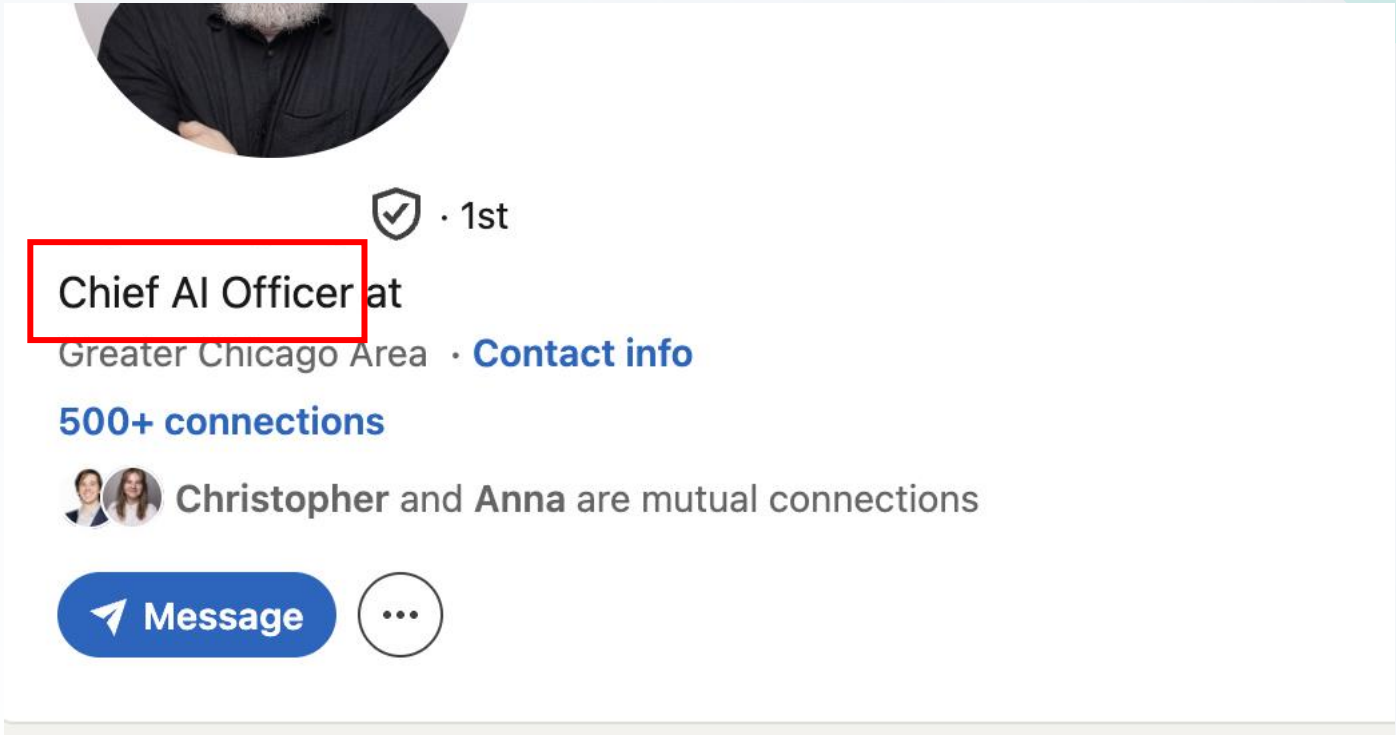
Human capabilities

Manage and adapt:
- Manage agents.
- Disseminate results.

Core capabilities:
- Intuition
- Relationships
- Tacit knowledge

The Impact of AI

New jobs



The Organizational Challenge

AI Impact

- Current jobs are evolving.
- New roles are appearing.

As jobs evolve, how should my organization evolve?

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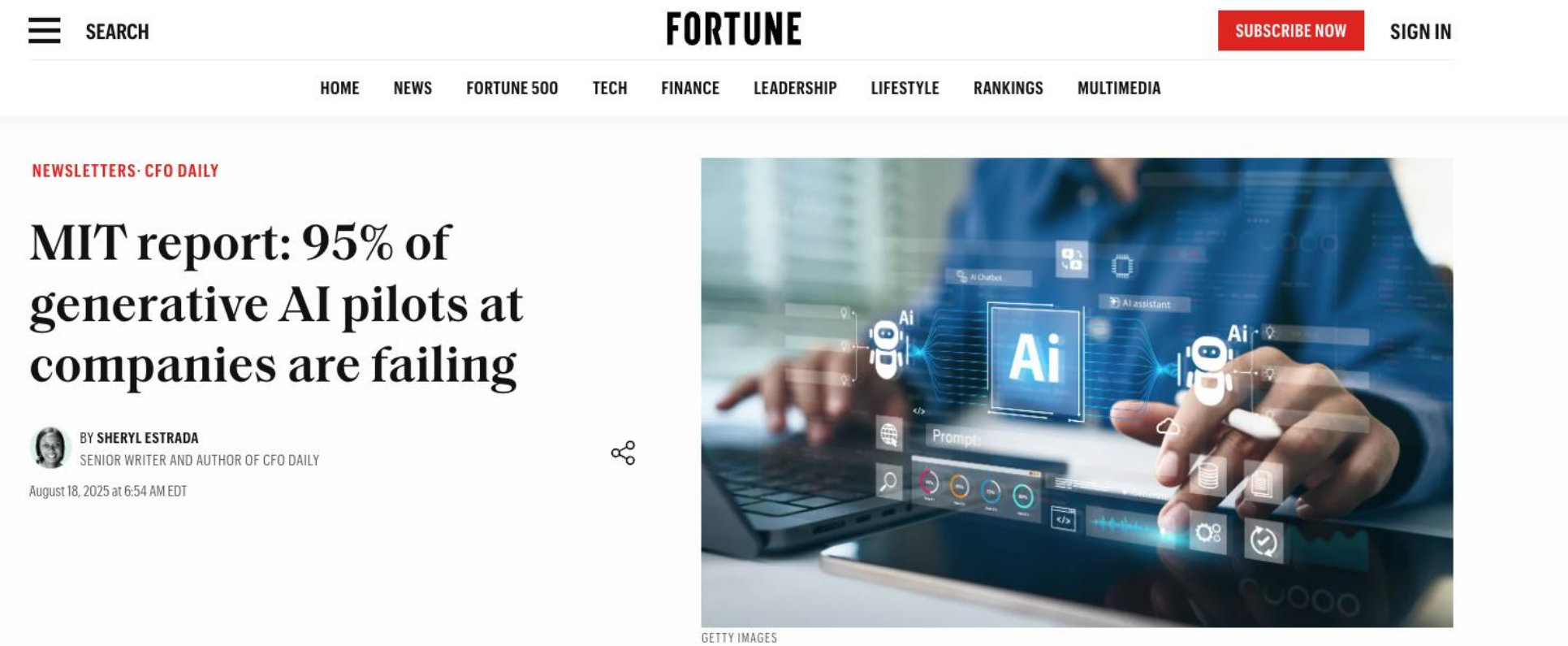
The GenAI Divide



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NEWSLETTERS · CFO DAILY

MIT report: 95% of generative AI pilots at companies are failing

BY SHERYL ESTRADA
SENIOR WRITER AND AUTHOR OF CFO DAILY

August 18, 2025 at 6:54 AM EDT

GETTY IMAGES

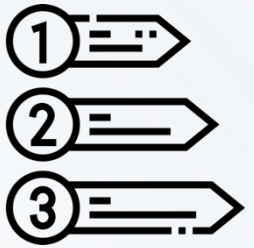
Framework – AI in Operations

Identify workflows and cost

Step 1
Map

Find ROI and AI opportunities

Step 2
Identify



Define strategy and goals

Step 3
Prioritize

Continuous improvement

Step 4
Deploy

Case Study - Context

Case study: “Acme Inc.” a large public sector organization

60
Locations.

Locations of Acme.

- The wage bill of the largest location – Boston - is $86M, with 1207 FTEs.

1,100
Departments.

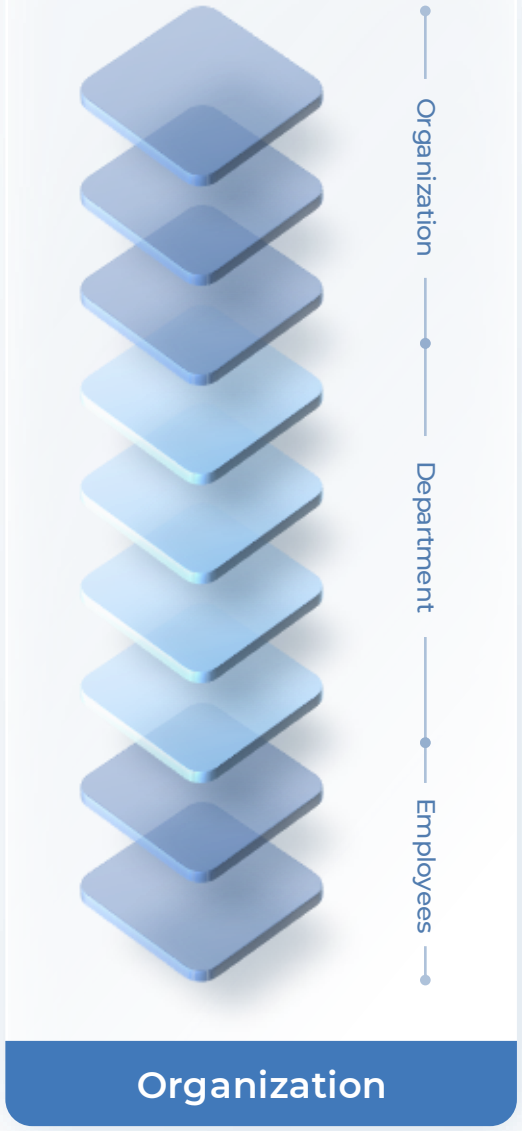
Departments at Acme.

- The wage bill of the largest department – Boston’s ferry office - is just under $9M, with 144 FTEs.

13,500
Number of workers at Acme.

Acme’s Employees

- In 2025, Acme employed approximately 14,600 persons, spanning from maintenance workers to high-level management.



Organization

Case Study - Data

Framework – AI in Operations

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Find ROI and AI opportunities

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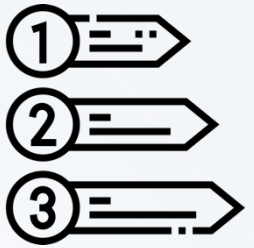

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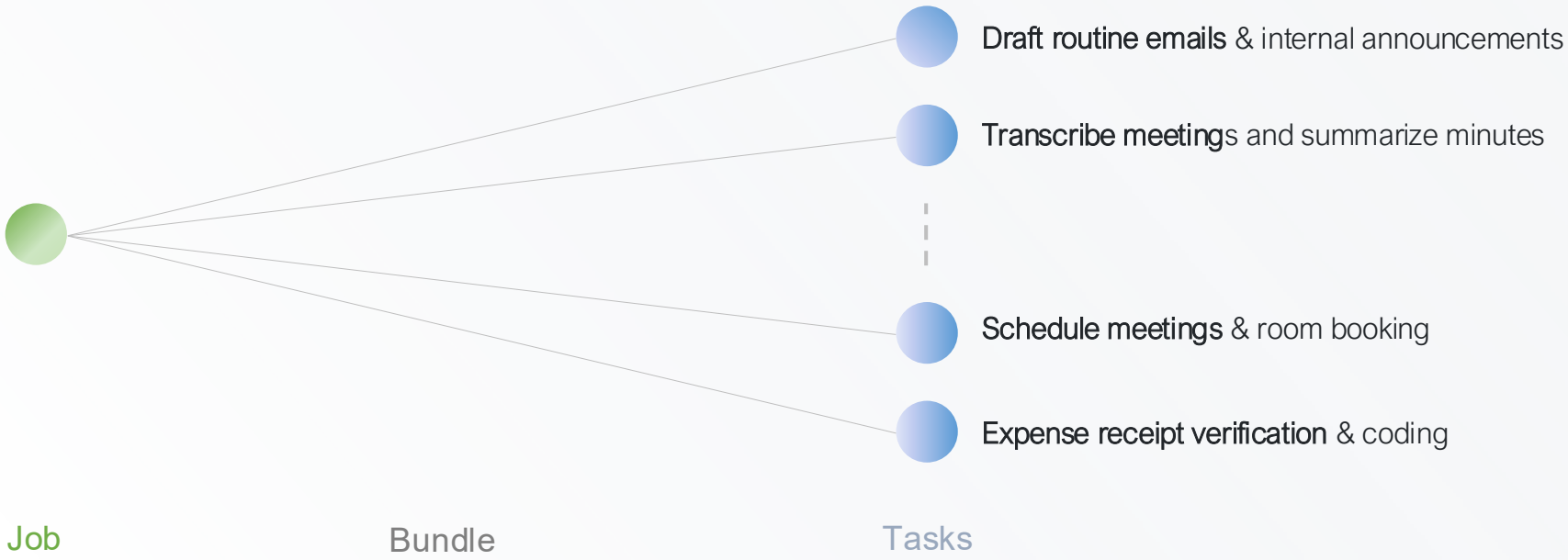
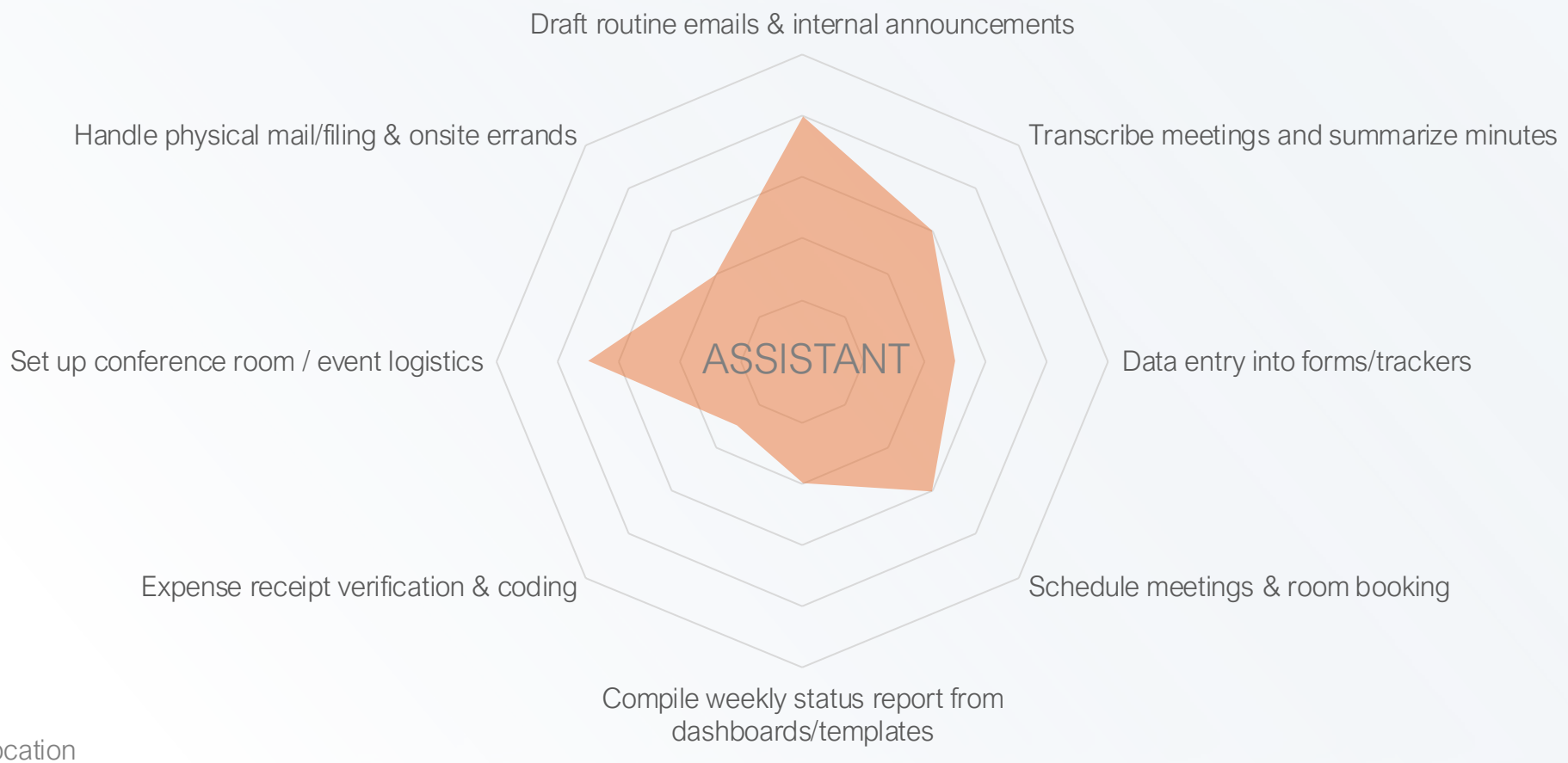
Step 1 – Mapping Tasks

Example: Executive Assistant

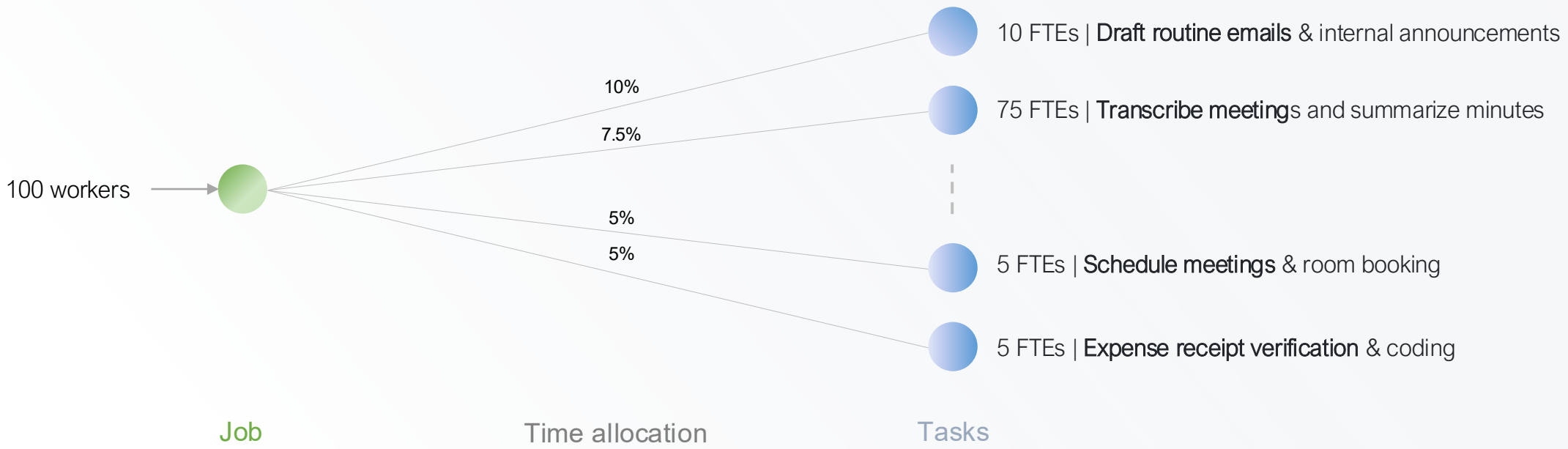


Step 1 – Job Profiles



Step 1 – Job Profiles

Example: Executive Assistant



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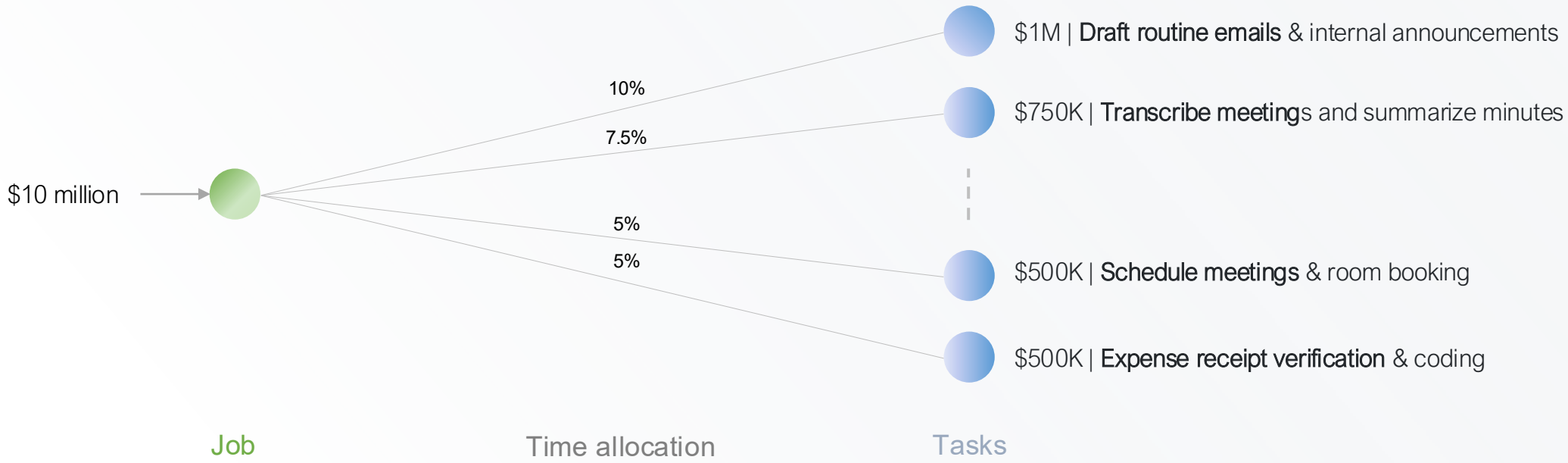
Step 1 – Job Profiles

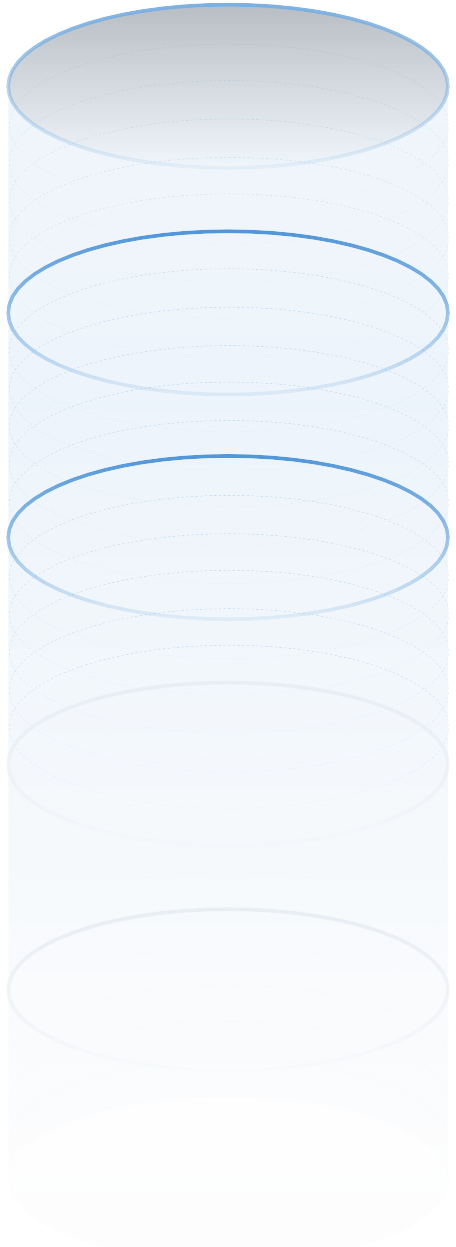
Example: Executive Assistant



Case Study – Mapping Tasks

Process mappings at Acme

Task	FTEs	Wage bill
Determine geographic coordinates.	104	$305k
Transcribe information.	358	$85k
Edit documents.	531	$2.7M
Read material to determine needed actions.	245	$844k
Prepare documents for legal proceedings.	35	$22k



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Step 2
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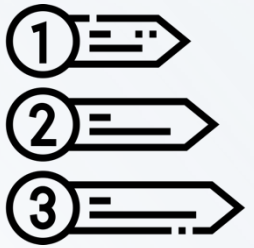

Define strategy and goals

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Prioritize

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Step 2 – AI Exposure

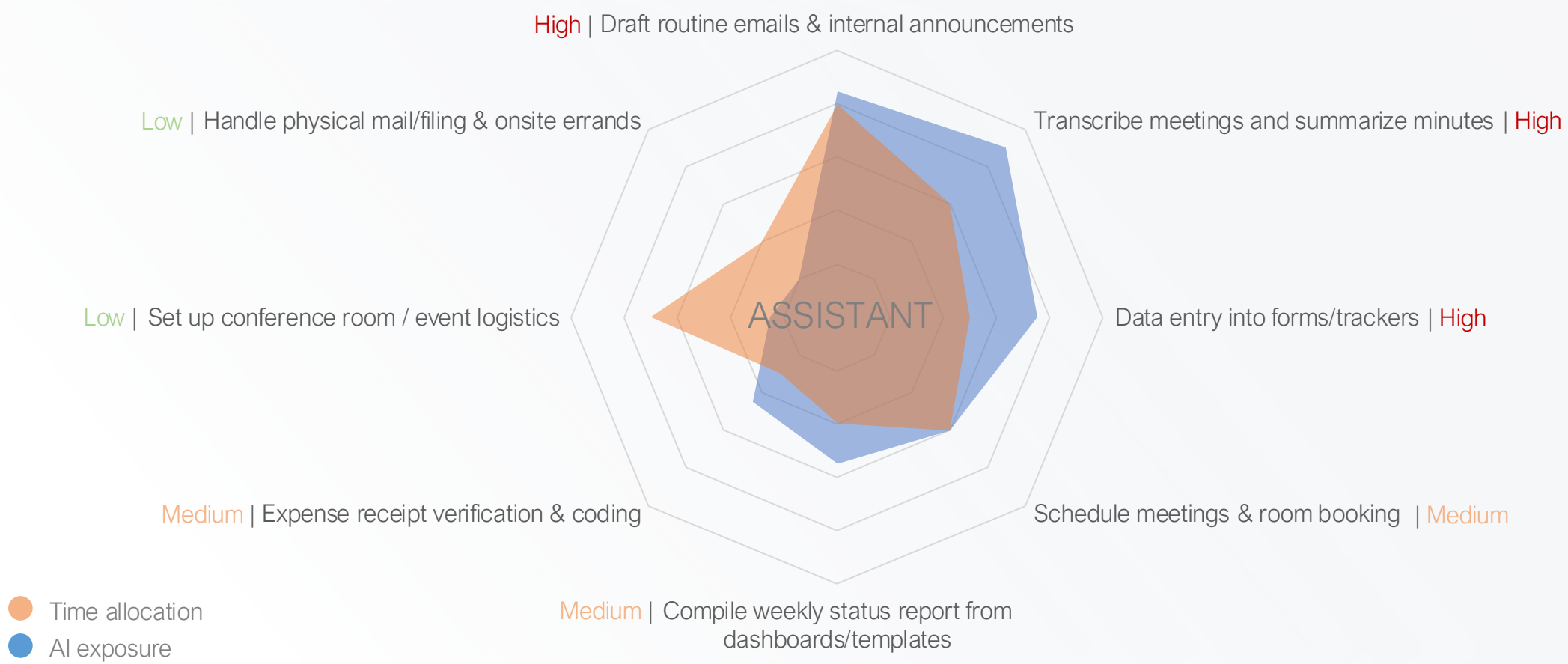
Job Profiles

News

AI Analysis

AI/Task Score

Step 2 – AI Exposure



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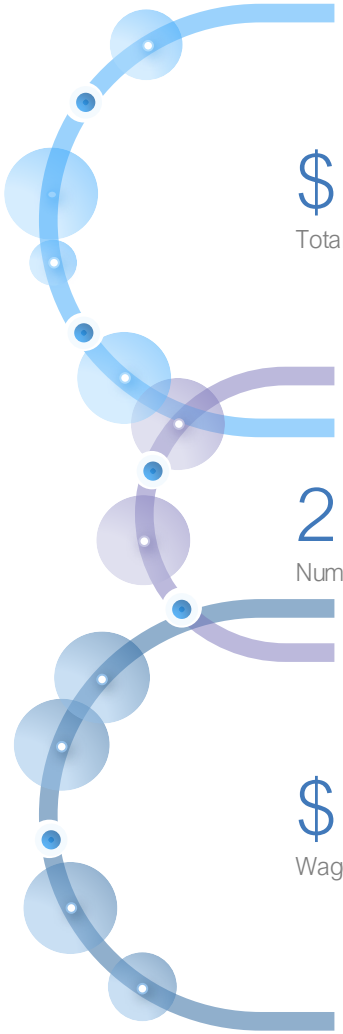
Step 2 – Acme Overview



$1 Billion

Total Wage Bill at Acme.

Total Wage Bill at Acme

- The wage bill is calculated by summing each employee's salary.

2,400 (20%)

Number of Acme employees exposed to AI.

Employees at Acme that are highly exposed to AI

- 2,358 of 13,000 jobs have at least 25% of their tasks highly exposed to AI.

$180 Million

Wage Bill of Acme's tasks exposed to AI.

Total Task Wage Bill exposed to AI at Acme

- While exposure rates vary, and the feasibility of implementing AI solutions must be taken on a per case basis, the potential for successful AI augmentation projects is high.

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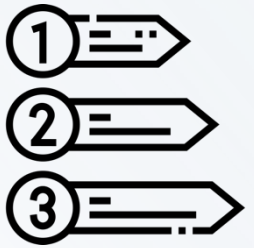

Define strategy and goals

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Prioritize

Continuous improvement

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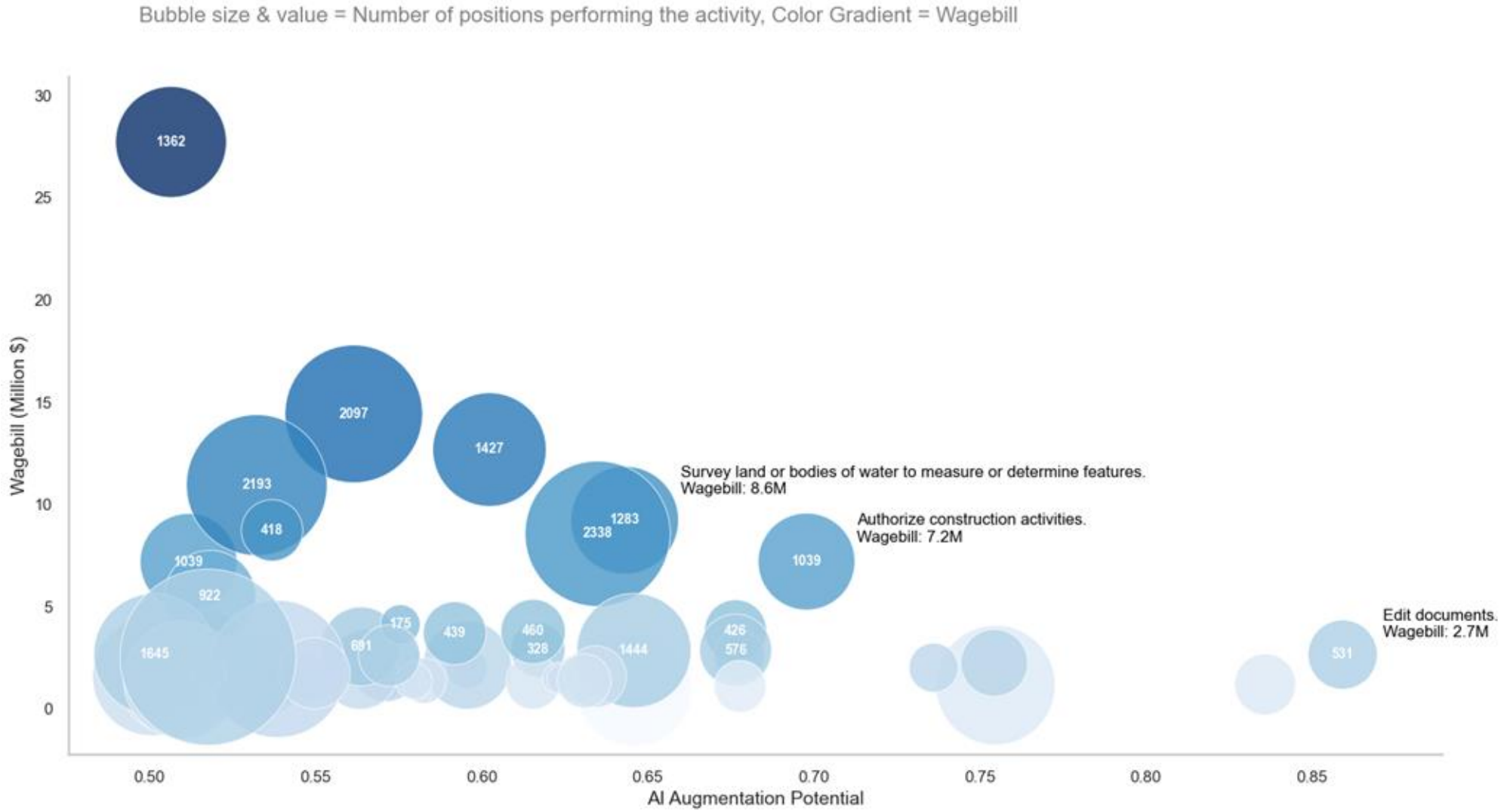
Step 3 – Prioritize



Step 3 – Prioritize

5 most exposed tasks with wage bill over $1M

Number of tasks	Scenario 15%	Scenario 25%	Scenario 35%
5	$1.4M	$2.3M	$3.3M

10 most exposed tasks with wage bill over $1M

Number of tasks	Scenario 15%	Scenario 25%	Scenario 35%
10	$4.0M	$6.7M	$9.4M

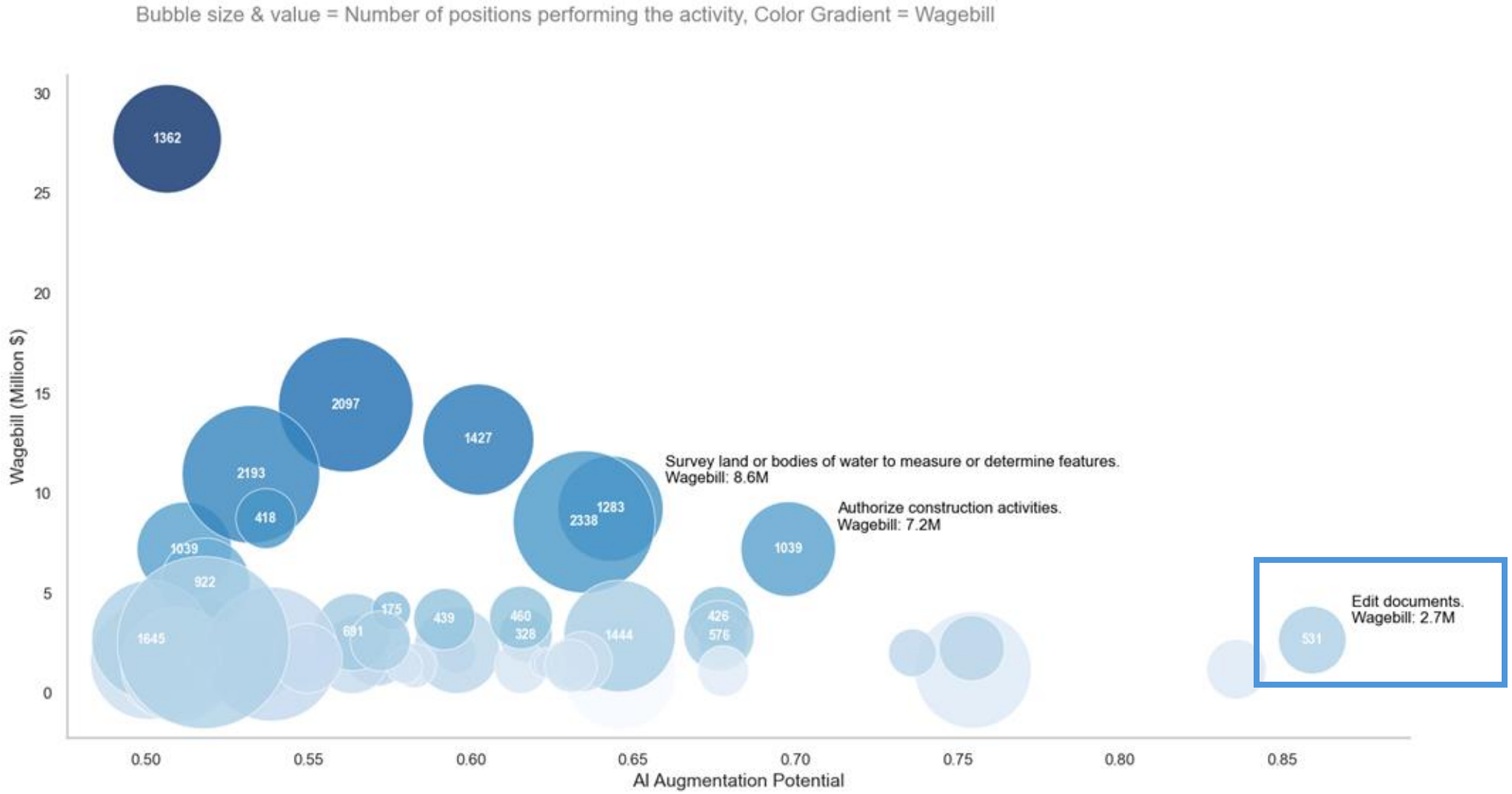
20 most exposed tasks with wage bill over $1M

Number of tasks	Scenario 15%	Scenario 25%	Scenario 35%
20	$8.9M	$14.8M	$20.7M

50 most exposed tasks with wage bill over $1M

Number of tasks	Scenario 15%	Scenario 25%	Scenario 35%
50	$24.3M	$40.5M	$56.7M

Step 3 – Prioritize



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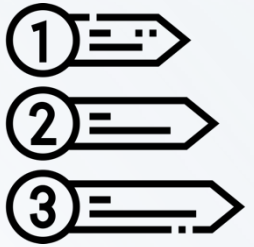


Define strategy and goals

Step 3
Prioritize

Continuous improvement

Step 4
Deploy

Step 4 – Deploy

Process

Use-case
Clearly define a use-case with the user

Task
Within the use case, workflow, and where AI integrates.

Metrics
Define clear metrics to follow the progression of the adoption and implementation,

Technology

Safety
Data confidentiality, brand reputation, relationships

Scale
Depending on the workflows, the expected scale of the AI system should be clearly pre-defined.

Integration
The AI systems should fit into the existing workflows.

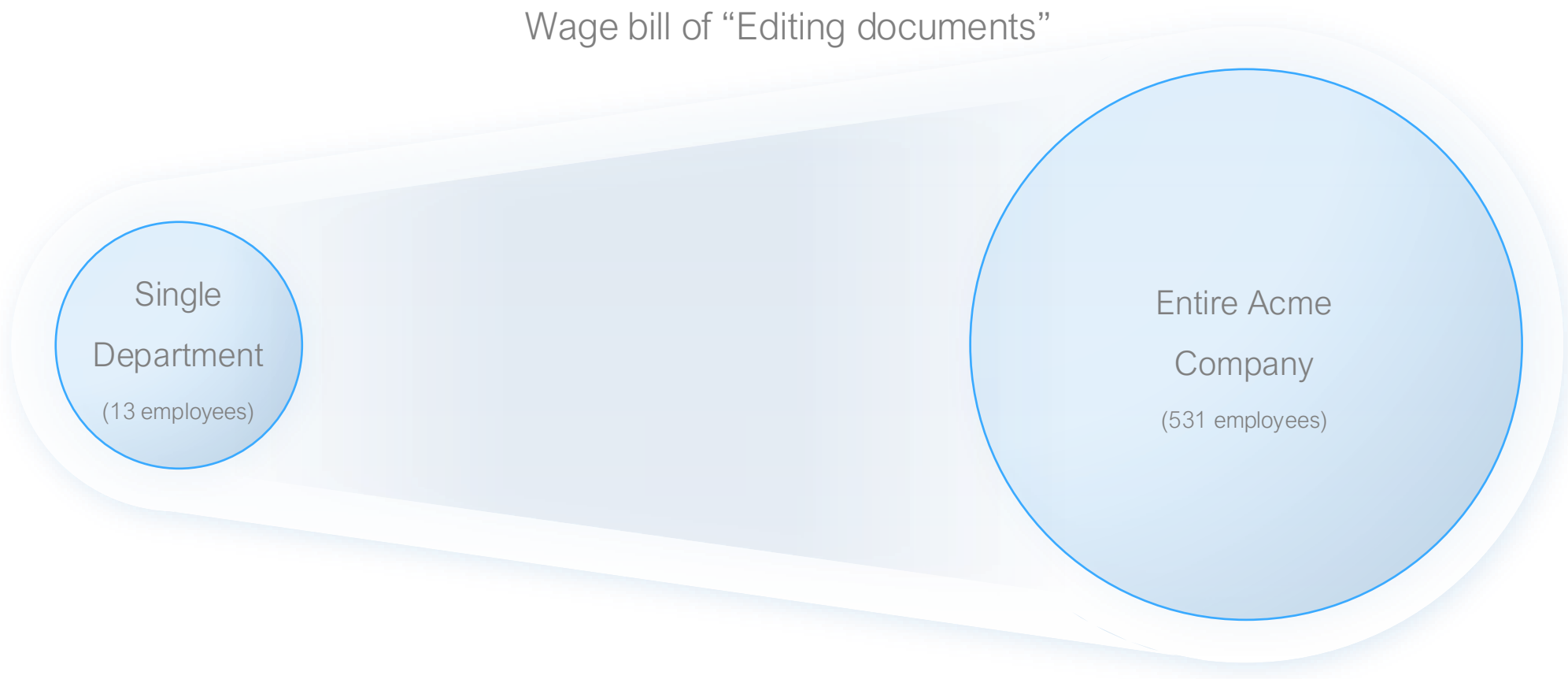
People

Decision maker
Clearly define a use-case with the user

Champion
Within the use case, workflow, and where AI integrates.

User
Define clear metrics to follow the progression of the adoption and implementation,

Step 4 – Results



Step 4 – Results

A. Pilot

$15,000

25% savings on “editing documents” in single department, $58,000 wage bill

-$5,000

Based on a 30$/month license

$10,000

Value generated from AI deployment

B. Full Deployment

$700k

25% savings on “editing Documents”, $2.7M wage bill

-$200k

Based on a 30$/month license

$500k

Value generated from AI deployment

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Platform

WORKFORCE COST

TOTAL

$380 billion

Platform

WORKFORCE COST

TOTAL

$380 billion

PROCESSES MONITORED

15,700 across 1.2 million employees

AVAILABLE AUTOMATION SAVINGS

$6.8 billion

Disclaimer:

- **Workforce data:** based on public information collected by Revelio.
- **Job profiles:** based on the Bureau of Labor Statistics.

Platform

Demo

Connect

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PhD candidate

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