Microsoft

Navigating the Stages of AI Value Creation for **Manufacturing**

Executive summary

AI has come a long way since 1956, when John McCarthy first coined the term at a conference he organized at Dartmouth College.[1] The unprecedented pace of innovation, along with the accessibility of ChatGPT and other generative AI tools, has galvanized virtually every organization.

Given the number of AI technologies, the possible uses, and the range of opportunities, it can be challenging to know where to start.

To better understand key drivers of AI readiness and their impact on AI readiness, Microsoft commissioned IPSOS to conduct a research study using qualitative data from experts and quantitative data from more than 1,300 information technology and business leaders across a range of industries and regions.[2]

IPSOS then used the survey data to build a predictive model to help identify the stage of AI readiness—from exploring to realizing.

This book provides our research findings for manufacturing, focusing on how industry leaders can realize the value of AI.

Industry summary

Manufacturing

The manufacturing sector is already gaining significant value by integrating AI into manufacturing processes, outperforming other industries in ROI from AI adoption. Additionally, manufacturers are building AI into their organizations and cultures, with 28% of companies appointing a chief AI officer.

Create more opportunities with AI using our manufacturing-specific insights and use cases. Based on a study commissioned by Microsoft and conducted by IPSOS, this guide identifies the key stages of AI readiness and drivers of AI and offers best practices and next steps for realizing value with AI in manufacturing.

171

Manufacturing decision-makers participated in this research

Research, methodology, and modeling

Market	Total	IT decision-makers	Business decision-makers
United States	n=500	251	249
India	n=200	100	100
United Kingdom	n=200	100	100
Germany	n=207	103	104
Japan	n=206	105	101

The research behind this e-book included multiple phases conducted by IPSOS on behalf of Microsoft. In August of 2023, IPSOS conducted an expert workshop with representatives from business and academia. They then conducted a quantitative survey of enterprise business and IT decision-makers (BDMs and ITDMs) on the topic of AI readiness and success from September to October of 2023.

These decision-makers had a budget responsibility, covered a mix of business factors and departments, and represented enterprise or higher mid-market organizations (500+ employees for U.S organizations, 300+ employees for global markets). They also covered 4 core industries, financial services (212 individuals), healthcare (153 individuals), manufacturing (171 individuals), and retail (89 individuals). We obtained input from more than 1,300 decision-makers in multiple markets, including the United States, India, United Kingdom, Germany, and Japan.

The survey included more than 40 questions related to each of the five drivers of AI success: business strategy, technology and data strategy, AI strategy and experience, organization and culture, and AI governance. The analyses and models described in this paper were created using multinominal logit analysis to protect the AI readiness level of each driver using the items in the survey for each and then the overall AI readiness from the predicted assessment of the five drivers.

For each stage of AI readiness, the study identified typical values to represent the stage's characteristics and opportunities. For example, in the initial "exploring" stage, the responses to all the scale questions were at a value of 1. Similarly, for the "planning" stage, questions were set at a value of 2. The values serve as standard examples for each stage. However, the specific recommendations for an industry might differ, depending on the organization's unique situation and opportunities.

Manufacturing AI readiness summary

Manufacturers encounter a variety of industry challenges, from global competition to supply-chain disruptions. However, they can overcome some of these obstacles and transform operations by embracing the latest AI technologies. This AI adoption has the power to boost efficiency, automate manual tasks, and enable the creation of customer-tailored products.

Among manufacturing organizations:

54%

Prioritize **security and compliance** when selecting AI tools and solutions

Cross-industry average: 53%

66%

Seek to increase **operational efficiency** through AI investments

Cross-industry average: 59%

24%

Of **supply-chain departments** are currently using AI

Cross-industry average: 14%

17%

Have piloted **AI applications** or **AI-assisted solutions**

Cross-industry average: 22%

25%

Believe **significant value** is achieved from AI implementation across multiple departments

Cross-industry average: 22%

56%

Are currently using **internet of things** in production

Cross-industry average: 39%

52%

Allocate **budget and resources** for AI projects

Cross-industry average: 51%

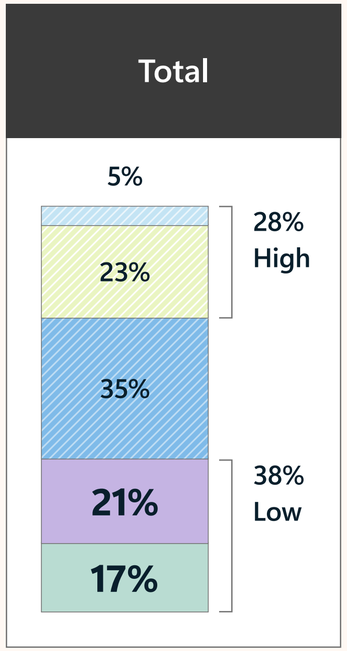
28%

Have a **chief AI officer**

Cross-industry average: 20%

Manufacturing AI readiness insights

Manufacturing stages of AI readiness



Overall AI readiness in manufacturing

The manufacturing industry exhibits a range of AI readiness, with 38% of organizations still in the **"exploring" and "planning" stages**. These early stages of AI readiness include learning about AI, experimenting with it in different areas of the organization, and actively assessing, defining, and planning an AI strategy organization wide. Compared to other industries, manufacturers are more actively deploying AI in Operations, R&D, and Supply Chain departments, driven by the significant impact these areas have on addressing business challenges.

Given that manufacturing is more likely to appoint AI leadership, it is no surprise that the industry excels in **organization and culture** with more organizations in the "realizing" and "scaling" stages. This driver emphasizes the operational and human factors that support value creation with AI.

Drivers of manufacturing AI readiness

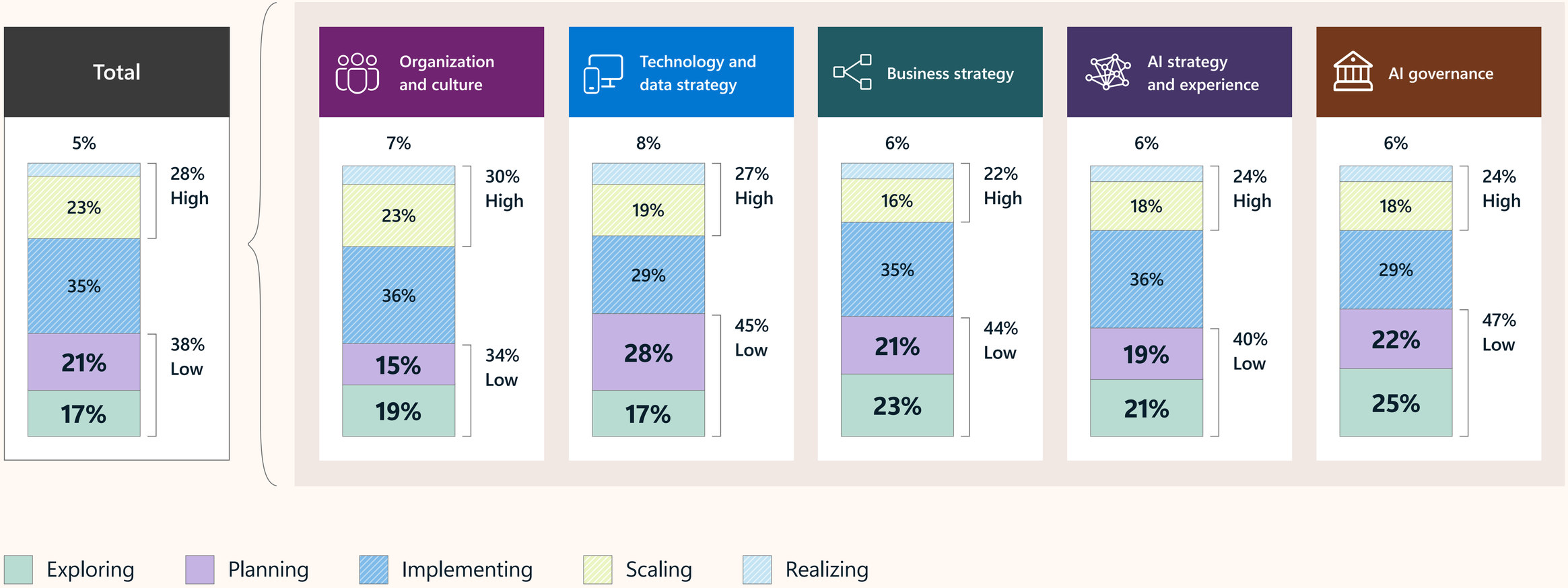
The research also highlights that manufacturing is the most progressive in **technology and data strategy**, which encompasses the data and infrastructure needed to deploy AI at scale. While data may be the fuel for AI, cloud infrastructure is the engine. Although manufacturing organizations are less likely to have started on the cloud, 9 out of 10 organizations are in the cloud or currently migrating to the cloud. Given the shift required to build AI-ready cloud and data foundations, manufacturers tend to require more investment with 23% of manufacturing organizations spending $100k to less than $500k on cloud per month, exceeding the 20% industry average.

As a professional in the manufacturing industry, focus on advancing from the "planning" stage by continuing to prioritize developing a solid AI business strategy tied to your business objectives. That foundation lets you go from proof of concept to implementation successfully.

Exploring Planning Implementing Scaling Realizing

Manufacturing AI readiness drivers

Manufacturing drivers and stages of AI readiness



Manufacturing dominant AI readiness stages: Exploring and planning

Most manufacturing companies are in the **exploring and planning stages** with the opportunity to use **business strategy** to advance towards realizing AI value.

Top drivers for exploring and planning stages

Business strategy

Rank #1

Manufacturers are increasingly integrating AI to meet growing customer demand for personalized, sustainable, and efficiently delivered products and services. This involves adopting unified data solutions to bridge operational and information technology, enhancing operational efficiency through root-cause analysis, knowledge discovery, and agile decision-making. This integration supports business strategy by laying a foundation for broader and more resilient innovation.

Top trend

- Personalized products that are sustainable and delivered efficiently

Top opportunities

- Prioritized, approved, and socialized use cases for AI
- AI used for real-time decision-making

Accelerate industrial transformation with Microsoft AI solutions.

Technology and data strategy

Rank #2 (tie)

Prioritizing AI-assisted solutions can help manufacturers streamline operations, enhance compliance with sustainability regulations, and manage supply-chain disruptions. Building a robust data strategy that supports system improvements and aligns with AI capabilities can lead to harmonious integration, driving immediate benefits and ongoing innovation.

Top trend

- Modernizing infrastructure and architecture

Top opportunities

- Access to complete and relevant data for AI modeling purposes
- Dedicated cloud infrastructure

Discover Azure IoT's Industrial Transformation Strategy at Hannover Messe 2024.

Organization and culture

Rank #2 (tie)

Embracing structural flexibility allows manufacturers to use AI as a catalyst for workforce transformation, enhancing the skills of engineers and non-IT staff. This strategic use of AI fosters a culture of innovation and adaptability, ensuring the workforce is equipped to meet the evolving demands of the industry.

Top trend

- Recruiting, upskilling, and retaining workforce

Top opportunities

- Leadership has clearly communicated vision and importance of AI
- Availability of experts to contribute to AI projects

Introducing Copilot in Microsoft Dynamics 365 Guides, bringing generative AI in mixed reality to frontline workers.

Modernize and transform operations with AI

The manufacturing industry displays varying levels of AI readiness, with most organizations currently situated in the “exploring” and “planning” stages.

To accelerate progress in AI readiness within the manufacturing sector, prioritize crafting a comprehensive business strategy.

There are opportunities for improvement in technology and data strategy, such as using AI to modernize infrastructure and architecture. Emphasizing organization and culture, such as recruiting, upskilling, and retaining workforces, will also push manufacturing organizations closer to the “implementing” stage. This unlocks the full potential of AI for integration, maximizing its transformative impact on the manufacturing industry.

Get the full e-book to learn how to develop an AI strategy roadmap for success and explore more valuable industry insights.

Discover more at **Microsoft Cloud for Manufacturing**.

Endnotes

1. Grace Solomonoff, “The Meeting of the Minds that Launched AI,” May 6, 2023, accessed February 29, 2024, The Meeting of the Minds That Launched AI - IEEE Spectrum.

2. Please see the “Research, methodology, and modeling” overview for more detail on the research and analytical approaches that support this study.