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Industries' Generative AI Adoption: A Functional and Comparative Analysis

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Abstract

This research analyzes the adoption of Gen AI in industries and business functions based on secondary data from McKinsey Global Survey on AI (2024). The research works towards achieving three fundamental goals: (1) comparing industry patterns of AI use, (2) assessing if adoption rates of AI vary significantly between business functions, and (3) identifying functions with highest and lowest adoption rates. Eight industry segments and eleven business activities were examined using a mix of correlation analysis, one-way ANOVA, and visualization (heatmap, donut chart). The heatmap of correlations showed strong similarity in AI adoption behavior across digitally high-end industries like Technology & Media and Telecom (r = 0.91) and Technology & Financial Services (r = 0.90), and maximum divergence was exhibited by Media and Telecom & Consumer Goods and Retail (r = 0.61). One-way ANOVA outcomes showed statistically significant differences in mean AI adoption rates across business functions (F = 19.31, p < 0.001), rejecting the null hypothesis of equal adoption. Marketing and Sales was the top function (20.9%), followed by Product/Service Development (13.9%), while Supply Chain/Inventory Management (3.5%) and Manufacturing (2.5%) had the lowest adoption. Findings point out that Gen AI adoption is not balanced over both industry and function lines, with implications for AI investment, workforce planning, and industry-specific digital transformation strategies. This study offers a cross-sectional baseline for policymakers, executives, and academics to grasp existing adoption trends and guide focused AI implementation strategies.

Keywords: Generative AI adoption, business functions, industry comparison, ANOVA, correlation analysis.

Introduction

Artificial intelligence is employed as a means to augment a human work force in refining operations and streamlining business activities. Such efficiencies are achieved in several different manners, such as by applying AI in the automation of redundant

tasks, creating information based on machine learning sets, processing large quantities of data sets rapidly and yielding meaningful conclusions, and forecasting future results through data analysis. AI technology drives a number of forms of business automation, such as enterprise automation and process automation, to minimize human mistakes and allow human workforces to focus on upper-level work. Usage of artificial intelligence in business processes has doubled since 2017, reports McKinsey & Company.1 This is primarily because AI technology can be tailored to suit an organization's specific requirements. 63% of McKinsey's respondents foresee their investment in AI technologies to rise in the next three years.2 In order to employ AI as part of an effective business strategy, an organization needs to have a good knowledge of its business functions, an understanding of how AI functions and which parts of the business can be enhanced using AI implementation. The adoption of gen AI in particular is growing fast. As new technologies come to the market, and old ones are refined, the potential uses of artificial intelligence in business increase in number. The advantages of AI are diverse and need the combination of technologies and human labor forces to enhance efficiency in business operations and spur business value.

Statement of the Problem

In spite of increased focus on Generative AI (Gen AI), its usage in industries and business functions is still uneven. Technology and media seem to be early adopters in some sectors, while manufacturing and healthcare lags behind. Similarly, some functions such as marketing and sales are being quickly reshaped by Gen AI, while others such as legal compliance or HR are slow to integrate. This disjointed adoption creates valid questions: Which sectors are leading or trailing in Gen AI adoption? Which business processes are more likely to embrace Gen AI? Do any patterns or similarities in how industries are using Gen AI exist across their business processes?

Answering these questions is very important for business executives, policymakers, and academic scholars who seek to know the strategic environment of AI adoption in business and create more inclusive AI strategies.

Scope of the Study

The scope of this research is to explore the adoption of Generative Artificial Intelligence (Gen AI) in sample industries and business functions based on the McKinsey Global Survey on AI data (2024). The study analyzes eight key industry sectors namely technology, financial services, healthcare, and manufacturing and eleven key business functions such as marketing, product development, HR, legal compliance, and IT. The research will determine which sectors and roles have more adoption levels of Gen AI, order industries by overall usage, and examine trends or consistencies between applications of Gen AI across industries. Being a secondary data-informed, quantitative research, it does not assess specific companies, local practices, or the actual AI applications applied. Instead, it offers a comparative, cross-section view of Gen AI adoption at the functional and industry level. Results are meant to provide insight for researchers, policymakers, and business executives who need to know about adoption patterns and benchmark AI maturity across industries.

Objectives of the Study

- To compare patterns of AI usage between industries.
- To determine whether AI adoption rates differ significantly across business functions
- To know the business functions with the highest and lowest AI adoption rates.

Methodology of the Study

The present study uses the secondary sources of data from McKinsey & Company, the global survey on the state of AI. The web survey was in the field from 16th July to 31st July, 2024

and collected responses from 1,491 participants in 101 countries covering the entire spectrum of regions, industries, company sizes, functional specialties, and tenures. Forty-two percent of those responding indicate they work for organizations with greater than $500 million in revenues annually. To account for varying response rates, the data are weighted by each respondent's nation's contribution to global GDP.

Correlation Heatmap is used to calculate similarity of patterns between industries according to the extent of AI adoption. ANOVA is used to determine the significant difference between AI adoption rates and business functions. Donut Chart visualises the AI adoption rates across various business functions.

Literature Review

Kusetogullari et al. (2025) methodically peer-reviewed 83 articles to extract thematic clusters like strategic AI impact, business models, and sustainable innovation. Kumar & Davenport (2024) provided a framework for organizing the use of generative AI in marketing applications, highlighting how companies select between custom versus general AI inputs and the resulting differences for output quality, human augmentation, and ethics risk. Schneider et al. (2024) discussed organizational gen-AI governance with a more nuanced model specific to corporate environments. It extended the macro-analysis by proposing why certain functions (e.g., compliance, HR) continue as slow adopters because of governance sophistication. Singh et al. (2024) used a Neo-Schumpeterian perspective to analyse how gen-AI reconfigures business models through innovation and operational effectiveness, as well as creating ethical and regulatory issues. Sarioguz, Miser, Olasehinde, & Mandel (2024) explained how generative AI transforms business models, enhances operating efficiency, and strengthens competitive edge. They also concluded function-based adoption disparities: product or service development (with more defined innovation logic) adopts ahead of operations or logistics, in which data integration and risks abound. Przegalińska & Jemielniak (2023) evaluated how gen-AI is embedded within current offerings and services, fueling incremental innovation across sectors. They also described the timing of innovation and business model implications that are sources of competitive entry barriers.

The above studies focused on some conceptual aspects of gen-AI. The present study concentrates on the adoption of gen-AI between industries and to know the business functions with the highest and lowest AI adoption rates.

Results and Discussions

Organizations are beginning to implement organizational changes intended to create future value from gen AI, and big companies are at the forefront. The most recent McKinsey Global Survey of AI discovers that organizations are starting to execute actions that create bottom-line results, like recasting processes as they implement gen AI and assigning top leaders to key positions, like AI governance. The results also indicate that organizations are actively addressing an increasing number of gen-AI-related risks and are recruiting for new AI-related positions while retraining staff to engage in AI deployment. Firms with a minimum of $500 million in annual revenues are transforming faster than small entities. All in all, the application of AI—that is, gen AI as well as analytical AI—is gaining further traction: Over three-quarters of respondents now indicate that their organizations apply AI in at least one business area.

AI usage Pattern Across Industries

The heatmap of correlation calculates similarity of patterns between industries according to the extent of AI adoption across various business functions.

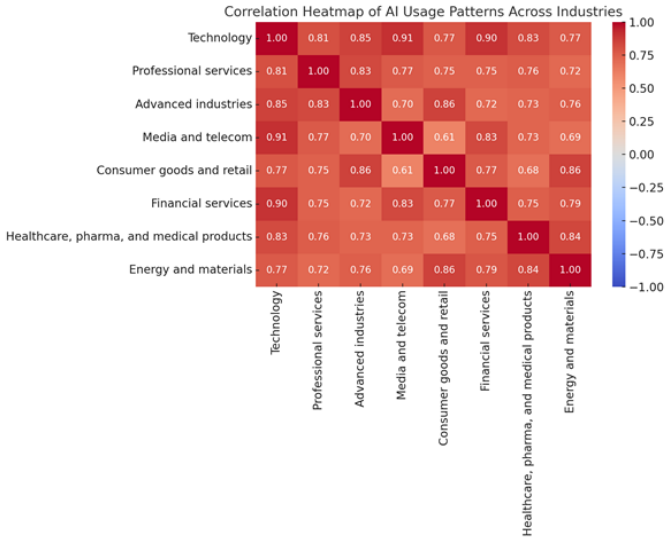

Chart 1.1
Source: McKinsey & Company

A. High-similarity pairs (correlation ≥ 0.85)

Technology & Media and telecom (0.91) and Technology & Financial services (0.90). These industries implement AI across business functions in highly similar ways.

Plausible reasons: High digital intensity, heavy data volumes, customer-facing processes, and strong personalization & automation incentives.

Consumer goods and retail & Advanced industries (0.86), and Consumer goods and retail & Energy and materials (0.86) — While these sectors are operationally different, their adoption trends of AI are similar, perhaps because they share similar operational issues (supply chain management, demand prediction).

B. Moderate similarity pairs (0.70–0.84) Most industry pairs fit here — having some functional-level adoption similarity, yet also differences that indicate industry-specific requirements.

Healthcare, pharma, and medical products closely correlates with Energy and materials (0.84), probably because these have an emphasis on operations, compliance, and specialized product development.

C. Most dissimilar pair (~0.61)

Media and telecom & Consumer goods and retail (0.61) — This is the most evident divergence.

Media/telecom places great emphasis on customer interaction, content customization, and IT, whereas retail might emphasize supply chain, sales maximization, and demand forecasting.

Difference between AI adoption rates and Business functions

To determine whether AI adoption rates differ significantly across business functions, ANOVA is applied and the interpretations are made thereon:

Null Hypothesis (H_0):

AI adoption rates does not differ across business functions

Alternative Hypothesis (H_1)

AI adoption rates differ significantly across business functions

One Way Anova

ONE WAY ANOVA						
Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	9803.590909	10	980.3590909	19.30630435	0	1.956024002
Within Groups	3910	77	50.77922078			
Total	13713.59091	87				

Source: McKinsey & Company

The one-way ANOVA tested if AI adoption rates are significantly different across the 11 business functions. F-value is 19.31, which is very high compared to the F-critical value of 1.96, showing that the variation between business function means is much higher than the variation within every function. The p-value is 0.000 ($p < 0.05$), indicating the result is highly statistically significant.

We thus reject the null hypothesis and conclude there are significant differences in mean AI adoption rates by business functions.

AI adoption is not equal across company functions — some are adopting AI significantly more than others. This distinction is statistically significant, rather than simply a random difference.

Business Functions with the highest and lowest AI adoption rates

The donut chart presents the distribution of AI adoption rates across various business functions. From the data, several important trends emerge:

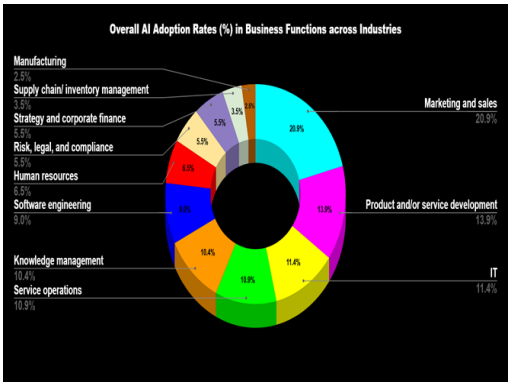

Chart 1.2

Source: McKinsey & Company

A. Leading Functions in AI Adoption

Marketing and Sales show the highest adoption rate at 20.9%.

This indicates that industries are leveraging AI primarily for customer analytics, targeted marketing, personalized recommendations, and sales forecasting.

Product and/or Service Development follows with 13.9%, suggesting AI's significant role in product innovation, prototyping, and service enhancements.

B. Mid-tier Adoption Functions

IT (11.4%) and Service Operations (10.9%) exhibit substantial adoption.

AI in IT is being applied for infrastructure automation, cybersecurity, and system optimization.

Service operations use AI for process automation, chatbots, and operational analytics.

Knowledge Management (10.4%) and Software Engineering (9.0%) also demonstrate considerable uptake, indicating AI's role in managing corporate knowledge bases and supporting coding/QA tasks.

C. Lower Adoption Functions

Human Resources (6.5%) and Risk, Legal, and Compliance (5.5%) exhibit relatively low adoption, which means AI in these functions is still in its nascent stages—largely in recruitment automation, compliance monitoring, and fraud detection.

Strategy and Corporate Finance (5.5%) also lie on the lower end, reflecting risk-averse AI adoption for senior strategic-level decision-making.

D. Least Adopted Functions

Supply Chain/Inventory Management (3.5%) and Manufacturing (2.5%) exhibit the lowest levels of adoption.

This can be because of increased cost of implementation, integration complexity, and the necessity for domain-specific AI solutions.

Conclusion

This research presents a thorough analysis of Generative AI adoption by industry and business function, highlighting differences in adoption. The research shows that industries such as Technology & Media and Telecom, and Technology & Financial Services have similar AI adoption behaviors, while industries such as Healthcare and Manufacturing fall behind. The study also indicates that business operations such as Marketing and Sales, Product or Service Development, and IT have greater AI adoption while Supply Chain, Inventory Management and Manufacturing experience lower AI adoption. Insights from the study can guide policymakers, executives, and scholars in creating AI implementation strategies, investing in digitalization, and resolving industry-specific issues. By learning about the current adoption trends and patterns, organizations will have the ability to realize growth opportunities, maximize AI investments, and accelerate business excellence.

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Weblinks

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