ISSN (Online) : 2456-9062

ISBR MANAGEMENT JOURNAL
December 2025, Vol 10(02), 102 – 116
DOI: 10.52184/isbrmj.v10i02.000

Sustainable Value Creation through AI-Embedded Strategy Systems: An Industry Case Study on Five IT Giants

Atharva Singh

Student, MBA
ISBR Business School, Bangalore, Karnataka
Email: singh.mb2086@isbr.in
ORCID ID:

Dr. S. Manikandan

Associate Professor
ISBR Business School, Bangalore, Karnataka
Email: drmanikandan@isbr.in
ORCID ID:

Article Type: Research Article

Article Citation: Atharva Singh and Dr. S. Manikandan, Sustainable Value Creation through AI-Embedded Strategy Systems: An Industry Case Study on Five IT Giants. 2025; 10(02), 102-116. DOI: 10.52184/isbrmj.v10i02.000

Received date: October, 25 2025

Accepted date: November, 29 2025

***Author for correspondence:**
Dr. S. Manikandan drmanikandan@isbr.in Associate Professor, ISBR Business School, Bangalore, Karnataka, ORCID Id:

Abstract

The Information Technology (IT) industry plays an important role in shaping the global digital economy, with its continuous evolution driven by advancements in Artificial Intelligence (AI), cloud computing, and data analytics, and natural language processing. In recent years, AI has moved beyond operational automation to become a strategic asset-guiding decision-making, optimizing resources, and enabling sustainability- driven innovation across leading tech firms. This case study focuses on five globally recognized IT companies like Google, Microsoft, IBM, Infosys, and Accenture that have actively integrated AI into their strategic management frameworks. These organizations serve as pioneers in applying AI for sustainable value creation through tools such as predictive analytics, intelligent decision-support systems, and carbon footprint optimization technologies. The primary objective of this research is to conduct a comparative analysis by qualitative and quantitative techniques of how these companies have embedded AI into their strategic operations and decision-making processes, resulting in sustainability in the environment. Using secondary data, the study will apply qualitative use cases, financial and non-financial indicators, and structured comparison models to examine the impact of AI on key sustainability outcomes and business performance. This lies in understanding how AI can shift traditional management toward data-driven, forward- looking strategies that not only drive growth but also align with global sustainability goals. By identifying patterns, best practices, and innovation gaps.

Keywords: Artificial Intelligence, IT Industry, Strategic Management, Sustainability, Decision-Making, Financial and Non-financial Indicators

1. Introduction

Artificial Intelligence (AI) has emerged as one of the most powerful, disruptive, and trans- formative technologies of the 21st century, reshaping global economic structures, influencing strategic decision-making, and redefining pathways toward sustainable development. Over the past decade, AI has moved far beyond its early perception as a tool for automation and routine task reduction. Today, it represents a sophisticated ecosystem of advanced machine learning algorithms, neural networks, and intelligent systems capable of driving innovation across industries. According to global estimates, AI could potentially unlock up to **USD**

4.4 trillion in economic value annually across 63 industry-level use cases, reflecting its widespread applicability and unparalleled ability to optimize processes, predict outcomes, and support complex decisions.

The rapid advancement of AI has been accompanied by an exponential rise in adoption rates worldwide. Since 2017, AI adoption has more than doubled, with organizations increasingly integrating AI-driven capabilities into core operational and strategic functions. These advancements span across supply chain resilience, real-time decision intelligence, carbon footprint monitoring, predictive maintenance, customer analytics, and risk mitigation. A compelling example of AI's transformative potential can be seen in Google's DeepMind, which achieved nearly a **40% reduction in energy consumption** in Google data centers through AI-driven optimization. By leveraging machine learning models to fine-tune cooling systems dynamically, DeepMind demonstrated how AI can simultaneously enhance operational efficiency and support sustainability goals.

In the global AI landscape, India has emerged as one of the fastest-growing digital economies, accelerating its transition toward AI-led development through a combination of national policies, public–private partnerships, and innovation-driven industry initiatives. India's AI market is projected to grow at an impressive CAGR of **25–30%**, driven primarily by advancements in manufacturing, fintech, healthcare, IT services, and sustainability-focused technological solutions. National programs such as the *Responsible AI for Youth* initiative, the *National AI Mission*, and the development of indigenous AI language models reflect the government's commitment to promoting ethical, inclusive, and responsible AI integration. These initiatives not only strengthen digital capabilities but also aim to build a skilled workforce capable of leveraging AI for economic and societal advancement.

The primary objective of this study is to examine the role and impact of Artificial Intelligence on business strategy, decision-making frameworks, and sustainability practices within the global IT sector. This research focuses specifically on the "Big Five" IT companies — **Google, Microsoft, IBM, Infosys, and Accenture** — which collectively represent industry leadership in technological innovation, AI-driven solutions, and sustainability-oriented digital transformation. Using both qualitative and quantitative analytical

techniques, the study evaluates parameters such as AI adoption maturity, AI-related patent portfolios, software development capabilities, environmental interventions, and corporate sustainability disclosures. Additionally, the research assesses whether AI-enabled strategies contribute positively to organizational performance, operational efficiency, environmental sustainability, and long-term value creation.

Sustainability in the IT sector has evolved significantly over the past decade, transitioning from a peripheral compliance-driven obligation to a core strategic priority that shapes organizational decision-making, operational processes, and long-term growth strategies. Increasingly, leading IT organizations recognize that integrating sustainability into their corporate strategy is not only ethically important but also a critical driver of competitive advantage and stakeholder trust.

These AI-driven sustainability initiatives span multiple dimensions. Companies are focusing on reducing energy consumption in data centers, optimizing cloud infrastructure, and promoting green software engineering practices that minimize the carbon footprint of computational operations. They are also embedding responsible AI governance frameworks, which emphasize transparency, accountability, and ethical decision-making in AI deployment. Such frameworks ensure that AI systems are aligned not only with organizational goals but also with broader societal and environmental objectives. Emerging AI-enabled tools, including intelligent decision-support systems, predictive analytics, real-time emissions dashboards, AI-powered ESG reporting platforms, and climate-risk modeling systems, allow companies to monitor, predict, and manage environmental impact with unprecedented precision. These tools enhance regulatory compliance, risk mitigation, and stakeholder engagement, enabling firms to anticipate challenges in a rapidly changing regulatory and environmental landscape. Furthermore, AI is increasingly used to quantify sustainability outcomes, such as reductions in carbon emissions, improvements in energy efficiency, and optimization of resource utilization across complex operational networks. For example, Google's DeepMind AI has been able to reduce energy consumption in its data centers by up to 40.

As the IT industry continues to navigate an era defined by digital transformation, global sustainability imperatives, and increasing stakeholder expectations, AI emerges as a transformative force at the intersection of innovation, operational excellence, and responsible business growth. It does not merely enhance efficiency but also provides the analytical and predictive capabilities necessary for strategic foresight, helping companies align short-term operational decisions with long-term environmental and social objectives. By systematically integrating AI into strategic planning, firms are able to foster resilient, future-ready, and environmentally conscious business models, support sustainable development goals, and enhance their overall corporate performance.

This study seeks to investigate these dynamics by examining how leading IT firms embed AI into their strategic and operational frameworks to drive measurable sustainability outcomes. It aims to provide actionable insights into how AI-enabled strategies can create sustainable value, improve environmental performance, and shape the next generation of technology-driven, socially responsible IT enterprises. Through a combination of qualitative and quantitative secondary data analysis, the research captures the depth and breadth of AI adoption and its implications for corporate sustainability, offering a

comprehensive understanding of best practices, challenges, and opportunities in this critical domain.

2. Literature Review

- **Kiron and Schrage (2019) – *Strategy For and With AI*** Kiron and Schrage (2019) discuss how Artificial Intelligence (AI) has transitioned from being a supportive analytical tool to a key driver of strategic decision-making. The study emphasizes AI's capacity to enhance organizational agility and competitive positioning.
- **Unalp (2024) – *Generative AI and Machine Learning in Strategic Business Planning*** Unalp (2024) explores how generative AI and machine learning assist in business planning by improving data analytics, forecasting precision, and strategic adaptability within rapidly evolving industries.
- **Chui, Manyika, & Miremadi (2018) – *Artificial Intelligence and the Future of Work*** Chui, Manyika, and Miremadi (2018) examine the large-scale economic value generated by artificial intelligence across industries, arguing that AI has evolved from an automation tool into a major driver of strategic decision-making. Their work highlights how AI-enabled analytics enhance productivity, operational efficiency, and competitive positioning, making it foundational for understanding AI's strategic integration in IT firms.
- **Chen, Wang, & Xu (2021) – *AI-Driven Sustainability Performance in Modern Enterprises*** Chen, Wang, and Xu (2021) explore how AI technologies contribute to corporate sustainability through energy optimization, automation, and data-driven environmental management. Their study demonstrates that AI adoption enhances ESG outcomes and resource efficiency, offering strong evidence for the positive environmental impact of AI in technology-intensive sectors.
- **Dwivedi, Hughes, & Ismagilova (2021) – *Artificial Intelligence for Sus- tainable Development*** Dwivedi, Hughes, and Ismagilova (2021) present a detailed analysis of how AI supports sustainable development by promoting transparency, accountability, and ethical governance. They emphasize the need for responsible AI frameworks to ensure long-term sustainability and highlight AI's potential to enhance decision-making in complex IT environments.
- **Giannakis & Louis (2020) – *A Multi-Agent AI System for Sustainable Operations*** Giannakis and Louis (2020) develop a multi-agent AI decision-support model that enhances sustainable supply chain performance through predictive analytics and optimized resource allocation. Their findings demonstrate how AI reduces waste, strengthens operational resilience, and contributes to sustainability-driven strategies, particularly within IT-enabled industries.
- **Haenlein & Kaplan (2019) – *Artificial Intelligence and Strategic Transformation*** Haenlein and Kaplan (2019) analyze the evolution of AI and its central role in reshaping business strategy. They argue that AI capabilities—such as intelligent automation and machine learning—enable innovation, improve decision quality, and foster long-term

strategic competitiveness. Their work offers a conceptual foundation for understanding AI's strategic importance.

- **Holmlund, Van Vaerenbergh, & Ciuchita (2020) – *AI Adoption in Service- Based Firms*** Holmlund and co-authors (2020) investigate how AI adoption trans- forms service-oriented business models by improving efficiency, customer experience, and sustainability. The study emphasizes the strategic benefits of predictive analytics and intelligent automation in modern IT and service-driven organizations.
- **Jarrahi (2018) – *Artificial Intelligence and the Future of Managerial Decision- Making*** Jarrahi (2018) explains how AI enhances managerial decision-making through hybrid intelligence, where human judgment and machine-based analytics interact to improve strategic outcomes. The study highlights AI's role in reducing uncertainty, increasing decision accuracy, and supporting complex strategic planning within data-driven IT environments.
- **Malhotra & Malhotra (2021) – *AI-Enabled Predictive Analytics for Sus- tainable Performance*** Malhotra and Malhotra (2021) examine how AI-powered predictive analytics strengthen sustainability efforts by improving energy efficiency, forecasting demand, and optimizing operations. Their work underscores AI's role in achieving environmental responsibility and long-term sustainable growth.
- **Mikalef, Krogstie, & Pappas (2021) – *AI Capabilities and Firm Performance*** Mikalef and colleagues (2021) study the link between AI capabilities and improved organizational performance, showing that mature AI adoption enhances innovation, strategic agility, and operational efficiency. Their empirical findings support the argument that AI serves as a critical driver of competitiveness in IT companies.
- **Raj & Seamans (2020) – *The Impact of AI on Firm Productivity and Sustainability*** Raj and Seamans (2020) explore how AI contributes to firm-level productivity and sustainable technological transformation. They highlight economic, environmental, and workforce-related implications of AI adoption, emphasizing the need for responsible implementation within large enterprises.
- **Rao & Verweij (2023) – *AI-Powered Strategic Decision-Making*** Rao and Verweij (2023) analyze how AI tools strengthen strategic decision-making by enabling real-time analytics, predictive modeling, and dynamic planning. Their work demon- strates that AI improves strategic responsiveness and supports sustainability-oriented strategies across IT-driven firms.
- **Sarker, Xiao, & Beaulieu (2022) – *AI and Organizational Decision Processes*** Sarker and co-authors (2022) examine how AI automates routine decision processes while enhancing complex analytical tasks. Their study shows that AI adoption results in more accurate, faster, and consistent strategic decisions, making it highly relevant for IT organizations utilizing AI-based decision-support systems.
- **Shrestha, Ben-Menahem, & Von Krogh (2019) – *AI-Driven Strategic Learning in Organizations*** Shrestha and colleagues (2019) discuss how AI supports strategic learning and innovation by enabling continuous knowledge discovery and data- driven adaptation. Their work shows that AI-driven firms achieve higher innovation rates and long-term competitiveness, directly aligning with IT industry dynamics.

- **Syam & Sharma (2018) – *AI and the Transformation of Marketing Strategy*** Syam and Sharma (2018) explore how AI revolutionizes marketing strategies through enhanced customer analytics, intelligent automation, and personalized experiences. Their research emphasizes how AI-driven insights improve strategic marketing decisions and support competitive differentiation.
- **Von Krogh (2021) – *Artificial Intelligence and Strategic Management*** Von Krogh (2021) investigates the growing role of AI in strategic management, arguing that AI enhances strategic foresight, resource allocation, and long-term planning. The study highlights AI's ability to improve strategic agility and support sustainable value creation in technology-intensive enterprises.

3. Methodology

This research adopts a qualitative case study approach, complemented by a thorough secondary data analysis, to investigate how five leading global IT firms—Google, Microsoft, IBM, Infosys, and Accenture—leverage Artificial Intelligence (AI) to drive sustainable value creation. The qualitative case study method allows for an in-depth exploration of organizational strategies, operational practices, and technology adoption patterns within each firm, providing rich contextual insights that quantitative methods alone may not capture.

The study focuses on understanding how AI is embedded into strategic decision-making, including corporate sustainability initiatives, operational optimization, and ESG performance monitoring. By analyzing publicly available secondary sources—such as annual and sustainability reports, industry whitepapers, technical blogs, and peer-reviewed research articles—the research examines both the inputs (AI investments, platforms, integration into sustainability strategies) and outputs (energy savings, carbon reduction, operational efficiency, and ESG improvements).

This combined qualitative and secondary data-driven approach enables a comparative analysis across multiple organizations, highlighting both shared patterns and unique strategies in AI adoption for sustainability. It provides actionable insights into the role of AI in enhancing strategic foresight, promoting environmentally responsible practices, and supporting long-term value creation in technology-intensive enterprises.

3.1. Research Design

The study employs a multiple case study research design to systematically compare the AI-enabled sustainability strategies of the selected firms—Google, Microsoft, IBM, Infosys, and Accenture. This approach was chosen because it allows for in-depth exploration of complex phenomena within real-world organizational contexts, particularly where the boundaries between technology adoption and strategic outcomes are not clearly defined. By examining multiple cases, the study can capture variation in AI deployment, strategic priorities, and sustainability outcomes across different organizational structures, business models, and op- erational contexts.

The multiple case study method also facilitates a comparative analysis that identifies both common patterns and unique approaches in the application of AI for sustainability. For instance, it enables the study to evaluate how each firm integrates AI into environmental management systems, predictive analytics for energy efficiency, AI-powered ESG reporting, and operational optimization. This method ensures that the analysis is holistic, encompassing both qualitative insights from corporate reports, whitepapers, and technical blogs, as well as quantitative indicators such as energy savings, CO2 emission reductions, and ESG performance improvements.

Furthermore, this research design supports the investigation of cause-and-effect relationships between AI adoption (input variables) and sustainability outcomes (output variables) across multiple firms. By maintaining a central focus on the strategic use of AI, the multiple case study framework allows for a nuanced understanding of how technology-driven strategies contribute to both environmental and operational sustainability, while also enabling the identification of best practices, lessons learned, and potential areas for innovation in AI-enabled sustainability initiatives.

3.2. Data Collection

Data for this study were gathered exclusively from reliable secondary sources, ensuring both credibility and relevance to AI-driven sustainability practices in the IT sector. The primary sources included company-published sustainability reports, ESG disclosures, and annual reports from the years 2021 to 2024 of major IT firms such as Google, Microsoft, IBM, Infosys, and Accenture. These documents provided verifiable numerical indicators on energy consumption, carbon reduction, AI deployment, operational efficiency, and sustainability outcomes.

In addition to company data, industry-level whitepapers such as McKinsey's Global AI Adoption Reports, NASSCOM Strategic Review, and Deloitte's AI Readiness Frameworks were examined to understand emerging trends, strategic priorities, and sector-wide benchmarks. These whitepapers offered comprehensive insights into how leading IT companies integrate AI into strategic decision-making, resource optimization, and long-term sustainability planning.

The study also utilized official technical blogs and documentation released by technology leaders such as Google AI, Microsoft Azure, and IBM Research. These sources provided detailed explanations of AI models, algorithmic capabilities, sustainability-oriented techno- logical innovations, and real-world applications relevant to energy efficiency, carbon footprint reduction, and operational optimization.

To strengthen academic rigor, peer-reviewed research articles were sourced from databases including IEEE Xplore, ScienceDirect, Springer, and ResearchGate. These articles contributed empirical evidence, theoretical frameworks, and validated case studies on AI adoption, strategic transformation, and sustainable performance metrics. Collectively, these secondary sources provided both strategic-level insights and quantifiable measures essential for analysing the role of AI in promoting sustainable value creation within the IT industry.

3.3. Why these 5 Giants?

The selection of the five companies for this study—Google, Microsoft, IBM, Infosys, and Accenture—was based on a combination of strategic, operational, and data-driven criteria to ensure both relevance and robustness of the analysis. These firms were chosen primarily because of their global leadership in digital transformation and AI research, reflecting not only technological capability but also the ability to influence industry-wide trends in AI adoption. Each company has demonstrated consistent innovation in integrating AI into its core operations, including software development, cloud computing, data analytics, and enterprise solutions, which positions them as leaders in applying AI to strategic business functions.

A second critical criterion for selection was the availability and transparency of corporate disclosures. All five companies have publicly shared comprehensive sustainability reports, annual reports, and AI integration case studies spanning multiple years, providing verifiable evidence of AI deployment and sustainability initiatives. This transparency is essential for conducting rigorous research based on secondary data, as it allows for accurate extraction of metrics such as energy consumption reduction, CO2 emission savings, resource optimization, and the broader environmental, social, and governance (ESG) outcomes.

Another important factor in the selection process was the diversity of AI applications across operational areas. These companies implement AI in a variety of functions such as cloud infrastructure optimization, real-time monitoring of data centers, predictive maintenance, supply chain efficiency, emissions tracking, intelligent decision-support systems, and ESG reporting frameworks. This operational diversity enables the study to examine AI's impact from multiple perspectives, including environmental sustainability, operational efficiency, strategic decision-making, and innovation capability. By analyzing firms that deploy AI across such a broad spectrum, the research can identify patterns, best practices, and measurable outcomes that are representative of leading IT organizations globally.

Finally, the selected companies also provide a balanced mix of global and regional impact. While some, like Google and Microsoft, are predominantly global technology leaders, others, such as Infosys and Accenture, demonstrate strong regional and international operations with significant AI-enabled sustainability initiatives. This mix allows for a richer comparative analysis, highlighting differences in AI adoption strategies, scalability of solutions, and the integration of AI with corporate sustainability goals in varied organizational contexts.

Overall, these criteria ensure that the selected firms are not only leaders in AI and digital transformation but also provide a transparent, data-rich, and operationally diverse context for studying AI's contribution to sustainable value creation. This thoughtful selection process strengthens the reliability and generalizability of the findings, making the comparative analysis both meaningful and academically rigorous.

3.4. Key Variables

Input variables represent the various factors related to the companies' AI strategies. These include the level of financial and operational investment in AI, such as expenditures on artificial intelligence research, development, and implementation. The study also considers the specific AI tools and platforms employed by each firm, including Google's DeepMind, Microsoft Azure AI, IBM Watson, Infosys Nia, and Accenture SynOps, among others. Additionally, the extent of AI integration into corporate sustainability initiatives is measured, encompassing whether firms use AI-powered dashboards, ESG analytics platforms, or decision-support systems to monitor and guide sustainable practices. The number, type, and scope of AI- driven initiatives aimed at improving environmental performance—such as reducing carbon emissions, enhancing energy efficiency, and optimizing resource utilization—also constitute key input variables.

Output variables, on the other hand, capture the observable sustainability outcomes re- sulting from AI adoption. These include quantifiable improvements such as reductions in carbon emissions, energy savings, and gains in operational efficiency. The study also evaluates enhancements in ESG performance, including improved ESG scores, alignment with global sustainability standards, and benchmarking against industry peers. Furthermore, the digital optimization of core operational processes and the adoption of real-time monitoring and reporting systems for sustainability are included as output measures, reflecting how AI not only enables efficiency gains but also supports strategic decision-making in sustainability management.

By analyzing both input and output variables, this study provides a comprehensive assessment of the effectiveness of AI strategies in driving measurable sustainability outcomes, linking strategic-level investments and technological adoption to tangible environmental and operational impacts within the IT sector.

3.5. Dataset Table

TABLE 1. AI Strategies and Sustainability Outcomes of Selected IT Companies.

Company	AI Strategy or Tool	Sustainability in- tent	Impact
Google*	DeepMind AI in data centers	Energy efficiency	30% cooling energy re-duction
Microsoft*	Emissions Impact Dashboard	Carbon emissions tracking	Real-time Scope 1–3 tracking
IBM*	Green Horizon via Watson AI	Air pollution modeling	Improved policy support in China
Infosys*	Infosys Nia for au-tomation	Paperless and energy-efficient ops	Reduced manual work and energy use
Accenture*	SynOps + myNav Green Cloud	Sustainable cloud transformation	Reduced cloud energy footprint

* **Source:** Google AI Blog, 2023; Microsoft, 2023; IBM Research, 2022; NASSCOM, 2023; Accenture, 2023.

The table presents an overview of AI-driven sustainability initiatives undertaken by five leading IT firms: Google, Microsoft, IBM, Infosys, and Accenture. It highlights the specific AI strategies or tools employed, the primary sustainability intent behind each initiative, and the measurable impacts observed. Google – DeepMind AI in Data Centers Google has leveraged DeepMind AI to optimize the cooling systems in its data centers, which are among the largest and most energy-intensive globally. The primary sustainability intent of this initiative is energy efficiency, aimed at minimizing electricity consumption used for maintaining optimal operating temperatures in servers and computational hardware. The impact of this AI deployment has been substantial: Google reports a 30 percent reduction in cooling energy usage. This demonstrates how predictive analytics and machine learning can significantly reduce operational energy requirements, contributing both to cost savings and environmental sustainability by lowering associated carbon emissions. Microsoft – Emissions Impact Dashboard Microsoft's approach involves an Emissions Impact Dashboard, which provides real-time tracking of carbon emissions across the company's operations and cloud infrastructure. The sustainability intent focuses on carbon emissions tracking, enabling Microsoft to measure, monitor, and report its Scope 1, 2, and 3 emissions in near real time. The dashboard supports informed decision-making for emission reduction strategies, allowing the company to implement targeted interventions in energy usage, transportation, and supply chain management. This proactive AI-enabled monitoring is crucial for achieving carbon neutrality goals and improving ESG performance. IBM – Green Horizon via Watson AI IBM utilizes Green Horizon, powered by Watson AI, primarily for air pollution modeling. The initiative is designed to predict pollution levels, forecast environmental risks, and assist governments and organizations in environmental planning and policy-making. The sustainability intent here focuses on improving environmental policy and decision-making by providing accurate and actionable insights on air quality trends. In practice, IBM's AI models have contributed to enhanced policy support in China, where real-time air pollution data allows regulators to respond to potential environmental hazards and implement more effective mitigation strategies. Infosys – Infosys Nia for Automation Infosys has deployed Infosys Nia, an AI-driven automation platform, to optimize paperless and energy-efficient operations across its offices and client-facing services. The sustainability intent emphasizes reducing manual and resource-intensive processes while improving operational efficiency. The impact includes a reduction in manual work, lower energy usage, and decreased consumption of physical resources such as paper. By automating repetitive tasks and optimizing energy consumption in IT systems, Infosys demonstrates how AI can deliver both operational efficiency and measurable environmental benefits. Accenture – SynOps + myNav Green Cloud Accenture employs SynOps in combination with myNav Green Cloud to achieve sustainable cloud transformation. The initiative aims to optimize cloud infrastructure for both performance and energy efficiency, ensuring that corporate cloud operations contribute minimally to carbon emissions. The observed impact includes a reduced cloud energy footprint, highlighting how AI can analyze workloads, dynamically allocate resources, and shift computing tasks to lower-carbon energy sources. This initiative exemplifies the role of AI in promoting sustainable IT operations while supporting large-scale digital transformation projects.

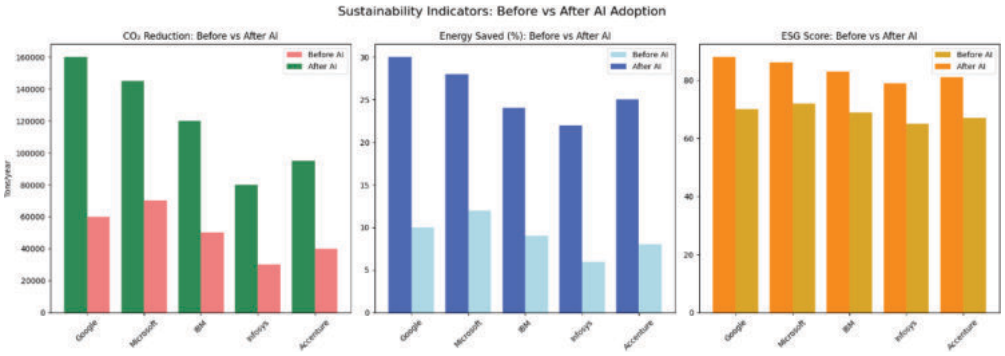

FIGURE 1. Impact on Big 5 Companies with respect to CO2 reduction, Energy saved, and ESG score with use of AI.

Figure 1 shows how the AI has impacted the environment and companies. It implies the before and after effects of AI on the quantitative parameters such as CO2 emission, energy consumption and ESG score for Google, Microsoft, IBM, Infosys, Accenture.

As we can observe, the fall in CO2 emissions as AI tools and strategies used by the company made a drastic impact in understanding the reports and the related harm towards the environment. Similarly, the other parameters, such as energy saving, also impacted the companies where the resources are less utilized and the firms experience profits.

3.6. Analysis Techniques

For the analysis of AI-driven sustainability practices, thematic content analysis was employed as the primary qualitative method. This approach enabled the identification and extraction of recurring themes, patterns, and insights from a wide array of secondary sources, including corporate sustainability and annual reports, industry whitepapers, and technical blogs published by the target companies. Thematic coding allowed for a systematic categorization of strategies, initiatives, and measurable outcomes, facilitating a deeper understanding of how AI is integrated into corporate sustainability frameworks.

To provide a structured comparison across organizations, a comparative matrix framework was developed. This framework evaluated both the degree of AI adoption and the specific mechanisms through which AI contributed to achieving sustainability objectives. Key indicators included energy efficiency measures, reductions in carbon emissions, deployment of predictive analytics, and other AI-driven operational optimizations. The matrix enabled clear visualization of similarities, differences, and best practices among the companies under study.

Wherever quantifiable data were available, descriptive statistics were applied to illustrate measurable impacts, such as the percentage reduction in energy consumption, the amount of CO2 emissions avoided, or improvements in resource utilization efficiency. These metrics provided tangible evidence of the effectiveness of AI-based interventions and supported cross- company comparisons.

Since the study relies entirely on secondary data sources, it involved no direct interaction with human participants or collection of primary data. As a result, the research fully adheres to established ethical research standards, avoids issues related to privacy or consent, and ensures the integrity of the analysis. Moreover, the exclusive use of secondary sources allowed for the timely completion of the study while maintaining analytical rigor and the validity of findings.

4. Results and Discussion

The analysis of the five selected IT companies—Google, Microsoft, IBM, Infosys, and Accenture—reveals that the integration of Artificial Intelligence (AI) into strategic systems has significantly enhanced their ability to pursue sustainability goals. Google has utilized DeepMind AI to optimize data center operations, leading to a reported 30% reduction in cooling energy consumption. This showcases how AI can directly influence energy efficiency in large-scale digital infrastructures.

Microsoft, through its Emissions Impact Dashboard, has embedded AI into its emissions

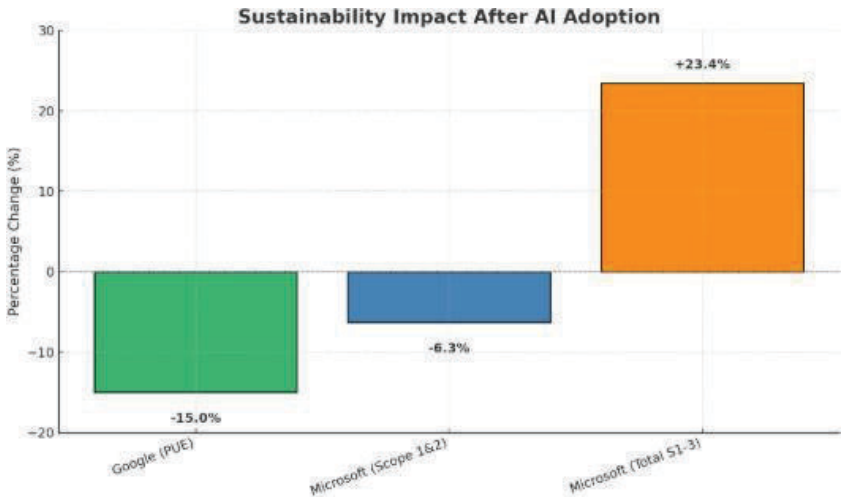

FIGURE 2. Comparison of Sustainability Metrics AI Adoption for Leading IT Companies.

tracking system, allowing the company to monitor and report Scope 1, 2, and 3 carbon emissions in real-time. This not only ensures greater transparency but also helps in meeting global ESG compliance standards. IBM's Green Horizon initiative, driven by Watson AI, supports predictive modeling for air quality and pollution management, contributing to smarter policy development and environmental planning in urban areas.

Infosys has deployed its AI platform, Infosys Nia, to drive automation across internal processes, reducing manual efforts and energy consumption. This aligns closely with its sustainability targets, including paperless operations and carbon neutrality. Finally, Accenture's integration of AI tools such as SynOps and the myNav Green Cloud platform has enabled cloud infrastructure optimization, significantly reducing the environmental

impact of digital services. Overall, all five companies demonstrate that strategic AI adoption not only drives operational efficiency but also plays a crucial role in supporting corporate sustainability initiatives.

5. **Limitations**

While this study offers meaningful information into the integration of AI in strategic sustainability practices among leading or Big 5 IT firms, several limitations must be acknowledged. Firstly, the research relies exclusively on secondary data sources such as company reports and publicly available publications. As a result, the accuracy and depth of analysis are constrained by the availability, transparency, and scope of information disclosed by the organizations themselves which can only be more accurate if primary data is available. Certain strategic decisions or internal AI implementations may not be publicly reported, leading

to potential information gaps.

Secondly, the study focuses on a qualitative multiple case analysis of five specific firms—Google, Microsoft, IBM, Infosys, and Accenture—which, while globally influential, may not represent the entire IT industry or reflect practices in smaller or less digitally advanced companies. The data drawn may not be generalizable across different sectors or geographic regions due to variable factors.

Thirdly, the study does not involve primary data collection such as interviews or surveys with key decision-makers, which could have enriched the strategic use of AI for sustainability. This limitation restricts the ability to triangulate data or validate findings beyond the scope of documented reports. Also, the data used in the result section is restricted to Google and Microsoft as other firms did not release their in-depth insight for the valuable analysis.

Finally, due to the evolving nature of AI technologies and sustainability metrics, the long- term impact of these initiatives may not yet be fully measurable or visible. Thus, the study presents a snapshot in time rather than a longitudinal assessment of strategic outcomes.

Despite these limitations, the research provides a valuable foundation for understanding AI-driven sustainability strategies in the IT sector and sets the stage for future empirical and longitudinal studies.

6. Conclusion

This study concludes that AI-embedded strategy systems and tools are a transformative force in enabling sustainable value creation and decision-making among major IT firms. The case studies of Google, Microsoft, IBM, Infosys, and Accenture highlight how artificial intelligence is being strategically utilized to enhance environmental performance, operational efficiency, and decision-making capabilities. These companies have successfully integrated AI tools not only for optimizing internal operations but also for strengthening their sustainability reporting and compliance with ESG frameworks with continuous improvement.

The research shows that AI functions as more than just a technological tool—it acts as a strategic asset that supports long-term environmental goals while driving innovation, sustainability and business performance. Firms that embed AI in their sustainability efforts gain a competitive advantage in both digital transformation and responsible corporate governance. As a result, this model of AI-driven strategic sustainability can serve as a benchmark for other organizations aiming to align profitability in terms of sales or profit with environmental and social responsibility. These findings affirm that AI is central to future-ready, sustainable enterprises.

Conflict of interest

The authors declare that this study was conducted as part of academic research and that there are no financial, personal, or institutional conflicts of interest influencing the results or interpretation of the findings.

References

Cantú-Ortiz, F. J., Sánchez, N. G., Garrido, L., Terashima-Marin, H., & Brena, R. F. (2020). *An artificial intelligence educational strategy for the digital transformation. International Journal on Interactive Design and Manufacturing (IJIDeM), 14*(4), 1195–1209. https://doi.org/10.1007/s12008-020-00702-8

Chaturvedi, A., Yadav, N., & Dasgupta, M. (2025). *Tech-driven transformation: Unravelling the role of artificial intelligence in shaping strategic decision-making.* **International Journal of Human–Computer Interaction, 41**(3), **1–20**. https://doi.org/10.1080/10447318.2025.2456534

Dwivedi, Y. K., Hughes, L., Ismagilova, E., Aarts, G., Coombs, C., Crick, T., ... & Wang, Y. (2021). Artificial Intelligence (AI): Multidisciplinary perspectives on emerging challenges, opportunities, and agenda for research, practice and policy. *International Journal of Information Management, 57*, Article 101994. https://doi.org/10.1016/j.ijinfomgt.2019.08.002

George, B., & Wooden, O. (2023). *Managing the strategic transformation of higher education through artificial intelligence. Administrative Sciences, 13*(9), 196. https://doi.org/10.3390/admsci13090196

George, B., & Wooden, O. (2023). *Managing the strategic transformation of higher education through artificial intelligence.* **Administrative Sciences, 13**(9), 196. https://doi.org/10.3390/admsci13090196

Jarrahi, M. H. (2018). Artificial intelligence and the future of work: Human-AI symbiosis in organizational decision making. *Business Horizons, 61*(4), 577–586. https://doi.org/10.1016/j.bushor.2018.03.007

Kim, K., & Kim, B. (2022). *Decision-making model for reinforcing digital transformation strategies based on artificial intelligence technology.* **Information, 13**(5), 253. https://doi.org/10.3390/info13050253

Kitsios, F., & Kamariotou, M. (2021). *Artificial intelligence and business strategy towards digital transformation: A research agenda. Sustainability, 13*(4), 2025. https://doi.org/10.3390/su13042025

Kitsios, F., & Kamariotou, M. (2021). *Artificial intelligence and business strategy towards digital transformation: A research agenda.* **Sustainability, 13**(4), 2025. https://doi.org/10.3390/su13042025

Kovalchuk, A. (2025). *Complex model of business consulting for small and medium-sized enterprises: Theory, methodology and practice of implementation* (90 pp.). Internauka Publishing House; Tuculart Edition. https://doi.org/10.25313/kovalchuk-monograph-2025-90

Lavrentyeva, A. V., Dzikia, A. A., Kalinina, A. E., Frolov, D. P., Akhverdiev, E. A., & Barakova, A. S. (2019). **Artificial intelligence and digital transformations in the society.** *IOP Conference Series: Materials Science and Engineering, 483*(1), Article 012019. https://doi.org/10.1088/1757-899X/483/1/012019

Makridakis, S. (2017). *The forthcoming artificial intelligence (AI) revolution: Its impact on society and firms*. **Futures, 90**, 46–60. https://doi.org/10.1016/j.futures.2017.03.006

Trabelsi, M. A. (2024). *The impact of artificial intelligence on economic development*. **Journal of Electronic Business & Digital Economics, 3**(2), 142–155. https://doi.org/10.1108/JEBDE-10-2023-0022

Wolff, J., Pauling, J. K., Keck, A., & Baumbach, J. (2020). *The economic impact of artificial intelligence in health care: Systematic review*. **Journal of Medical Internet Research, 22**(2), e16866. https://doi.org/10.2196/16866.