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**Chapter 6:** AI Artificial Intelligence, Sustainability and Strategic Leadership
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# Chapter 6 - AI Artificial Intelligence, Sustainability and Strategic Leadership

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Chapter Information

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## Abstract

Artificial Intelligence (AI) has grown drastically in recent years. Organization leadership teams are focusing on analyzing the data through Artificial Intelligence (AI) and deriving it to the constructive decisions. This chapter shall focus on the leadership strategies which are used to develop the business operations by simplifying the model of operations with the support of AI, minimizing the timelines, operation cost and enhancing the speed and accuracy of the results, also aligning the sustainable development goals, reducing carbon emission and footprint, which can be done by adapting the approaches like use of solar and wind (renewable) energy, water and waste management, sustainable agricultural developments, use of preserved biodiversity, respectively depending upon suitability in contributing to the different industries and sectors. This chapter will also focus on the use of generative AI, the positive and challenging impact of the same, also how it can be environmentally friendly, by using renewable energy and moderating emissions. Sustainable Business Practices is important but along with this, ethicality and transparency of data usage, code of conduct, proper documentations, managing and analyzing risk along with the responsible behavior is also significant. AI experts, policy makers, Government guidelines and business leaders need to align, plan and design the strategy which is supporting the concept of AI, sustainable development of the company and leadership teams leading the company's defined social and economic goals. The chapter will also shed light on scope and suggestions for future positive outcomes.

**Keywords:** *Artificial Intelligence, Strategic leadership, Ethicality, Transparency, Operations efficiency, Cost saving, Policy makers, Government guidelines, AI experts, Environment Sustainability, Social and Economic impacts, Renewable energy, Carbon emission;*

## 6.1. Introduction

### *6.1.1 Scope and Objectives*

The role of Artificial Intelligence (AI) in sustainability manner within business practices has gained meaningful power in new era. As organizations are facing immense to contribute to sustainable development by reducing environmental impact, AI has become an important tool for strategic leadership management. This chapter discovers how AI is being incorporated with sustainability programs and how it shapes an organization's strategies. By considering how AI technologies can contribute to improving sustainable efforts, organization management teams can well arrange their companies for future gaps and challenges such as climate change, resource depletion, and evolving social responsibilities. AI plays an important role particularly in the perspective of sustainability, where in its role is to minimize the environmental effects, preserving supplies, and refining operational effectiveness. The possibility of this chapter includes scrutinizing the role of AI role in reducing carbon emissions, energy consumption, and waste, at the same time aligning these strengths with stronger business strategies. This chapter will explore about the leadership teams in various sectors pertaining to leverage AI to drive sustainable practices, enhance the utilization of renewable energy, manage waste, and develop supply chain sustainability. The objectives of this chapter are to investigate how can AI drive business operations competences which can subsidize to sustainability objectives. Also to examine how strategic managers are integrating AI into their sustainability policies, simultaneously to explore how an ethical consideration of AI in business practices, predominantly in relation to environmental sustainability and social responsibility could be managed. Also to provide suggestions for incorporating AI into business operations to accomplish sustainability and strategic objectives.

### *6.1.2 Importance of the Chapter*

The rising concern and importance of sustainability, which is driven by the firmness of climate change, resource reduction, and social inequality, noises for solution which is innovative enough in every business. AI being one of the most transformative high-tech developments of the 21st era, has the probable to address these worldwide gaps and confronts by enhancing business operations, driving competences in energy use, reducing waste, and resource distribution. In the successful implementation of AI for sustainability, strategic leadership plays a crucial role, where in leaders who embrace AI are not only the one who gain a technological advantage but also safeguard their businesses are resilient to the interruptions caused by ecological and societal challenges. This chapter shall contribute to the present literature by incorporating AI's technological competences with management strategies that encourage environmental, economic, and social sustainability. By highlighting an ethical consideration, gaps and challenges in AI acceptance, this chapter purposes to offer realistic perceptions and future guidelines for businesses looking to influence AI for sustainable business practices.

## 6.2. Literature Review

### *6.2.1 Artificial Intelligence and Sustainability*

Ability of AI skill set, and knowledges are progressively getting increased, and it has also recognized for their probable to assist sustainable expansion works. One of the most important functions of AI in sustainability is in energy management. AI-powered systems can enhance the usage of energy and control it in real-time, by allowing for the more well-organized use of renewable energy resources like solar and wind power. Smart grids operated by AI can forecast energy need, adjust allocation, and incorporate renewable energy into the grid, decreasing dependency on fossil fuels (Rahman et al., 2022). Furthermore, use of AI in building constructions to control heating, ventilation, air conditioning (HVAC) systems, lighting, and appliances, leading to meaningful energy savings (Harrison et al., 2021).

AI is making improvements in encouraging ecological practices by relieving agriculturalists enhance resource usage in agricultural business at various places. From AI-driven technologies and tools it can be predicted that the crop is yield, schedules of irrigation and the need of pesticides and fertilizers, that when it is required and after what usage it is harmful to the environment. AI powered, accurate farming techniques allows farmers to use resources in a more proficient way, by improving crop yield and simultaneously while minimizing environmental impacts (Bera & O'Neill, 2020). Additionally, AI can be used to oversee soil well-being, biodiversity, and use of water, by providing farmers with data-driven perceptions that help sustainable agricultural practices.

AI plays a vital role in controlling waste management and its recycling. AI can predict the waste pattern by observing the waste management in a systematic way for stipulated time and can improve the process of re-cycling, which further can eventually assist in sorting the waste more efficiently. AI can help drastically by contributing to broadside saving practices by reducing landfill waste and growing recycling rates and confirming that resources are reused rather than disposed of (Cozzolino et al., 2020).

Despite many benefits as above, the study also highlights some gaps and challenges in the implementation of AI in sustainable business practices which leads to the win-win situation for business leaders. The execution of AI for sustainability needs substantial number of investments in infrastructure, technology, and human resources. Furthermore, concerns about data privacy, data biasness, and the environmental impact of AI systems themselves predominantly are those areas that require attention which involve vast computational resources (O'Neil, 2016). These experiments underline the need for ethical frameworks and strong leadership to safeguard usage of AI with responsibility.

### *6.2.2 Strategic Leadership in the Era of AI*

For successful adoption and implementation of AI, management strategic leadership is very important, particularly in the context of sustainability. Today's business leaders must focus on a clear vision which derives AI to meet sustainability goals and make the road map for their organizations which guides through the challenges of incorporating AI into present processes. This is particularly significant in businesses such as energy, agriculture, manufacturing, and logistics, where AI can show substantial enhancements in sustainability.

Transformational leadership, as labelled by Bass and Riggio (2006), is mainly

applicable in this study. Transformational leaders motivate and encourage their team members to hold change, containing the acceptance of AI tools. These leaders focus on operational improvements, also they highlight the broader visualization of sustainability and the long-term advantages of AI. By developing a culture of invention, these managers and business leaders can determine sustainable commercial practices while upholding growth of companies and increase in profitability. Furthermore, strategic leaders need to stabilize the short-term goals of operational effectiveness with the long-term goals of environmental sustainability. This necessitates the incorporation of AI into business strategies that highlights not only the decrease in cost and increase in productivity but also environmental stewardship, social accountability, and ethical business practices (Kiron et al., 2021).

The gap and challenge lie in positioning AI tools with sustainability goals without surrendering the organization's ethical values. Business leaders must ensure clarity, fairness, and inclusivity in AI arrangements, focusing concerns connected to data biasness and the probable shift of workers by robotics. As AI tools are evolving leadership and continuous adaption of AI ensures that functions are aligned with the company's mission, values, and sustainability aims.

### *6.2.3 AI Implementation in Business Operations*

The implementation of AI in business management operations widths an extensive variety of industries, respectively of which has the sole sustainability challenges and prospects. In manufacturing, AI-driven analytical systems help to optimize the equipment performance, reduce the timeline, and reduces the maintenance costs. These techniques can forecast breakdowns before they could happen, safeguarding that system functions at peak effectiveness, which in turn lowers energy depletion and material surplus (Harrison et al., 2021).

In logistics and supply chain management, use of AI is to optimize methods, reduce gasoline, power, energy consumption, and restructure an inventory management. AI-powered methods can forecast requirement, minimize extra inventory, and enhance delivery tracks, which leads to the decrease in greenhouse gas emission and cost of transportation (Binns, 2020). Furthermore, AI can aid in circular economy by refining product lifespan management and letting the companies to reduction of waste and promote the reuse of resources.

The healthcare industry is also adopting the use of AI, where it is being used to diminish waste in medicinal supply chains, improve resource distribution in hospitals, pharmacies and clinics, and forecast healthcare requirements created on population movements. By the better use of AI, healthcare procedures can manage more proficiently, by lessening energy utilization and surplus while enlightening the excellence in precaution (Cozzolino et al., 2020).

### *6.2.4 Identifying Gaps in Current Literature*

Although the existing literature in the articles, journal and other works delivers valuable perceptions into the function of AI in business sustainability, numerous gaps continue. Most study has determined on AI's functional competencies and its possible in cost reduction, with very restricted consideration to its wider strategic consequences for long-term sustainability. Furthermore, the studies are required to explore more AI's role in driving environmental sustainability by adopting sustainable business models that incorporate environmental goals of UN, social, and economic goals of the businesses.

Additionally, the ethical consequences of AI in sustainability energies are the capacities

that involves more consideration. How can AI tools can be proposed and executed in a manner that it encourages fairness, equality, and community responsibility? Study into these subjects will be serious as AI is becoming beyond universal in business tasks and sustainability strategies.

## 6.3. Research Methodology and Framework

### *6.3.1 Research Approach*

This chapter adopts a mixed methods where qualitative and quantitative research approach that synthesizes existing literature, case studies, survey in Likert scale method and industry reports. In survey method, respondent was from different industries with the role like managers, executive directors, consultants etc. This study is also based on observation method by understanding the existing occurrences of activities in my current organization named Abu Dhabi Precast LLC based in Abu Dhabi, UAE which falls under precast and composite manufacturing industry. Being precast manufacturing industry, automation plays an important role as many machineries and equipment are automated to achieve the labor cost reduction and increase the productivity strategically. However, at the same time environmental sustainability is the biggest concern for company like Abu Dhabi Precast LLC wherein concrete is the base of production. There to cover up the same, the production is shifted to GRC (glass reinforcement concrete products) which is more environmentally friendly. Moreover, the UAE govt is trying to promote more environmentally sustainable business therefore there are stipulated areas allotted for such manufacturing and any expansion of the business needs to have the plans which supports environment (Survey data, 2025). The comprehensive review of peer-reviewed articles and relevant reports from reliable sources such as business leaders, academic periodicals, and government publications are used. This methodology permits better understanding of the connection of AI, sustainability, and strategic leadership.

The emphasis is on examining how is the existing use of AI in current business to drive sustainability across different industries with strategical approach of growing business and reduce carbon emission along with improved business operations in terms of economic, well-being of employees and society and efficiency of business operations. With the assistance of real time case studies and real-world examples, this chapter delivers a thorough inspection of the applied function of AI in driving sustainability aims. Furthermore, the ethical opinions of AI recognition and the function of management in managerial AI incorporation are discovered.

Survey was conducted via emails and LinkedIn to get the understanding from professionals, the response was received from the geographical region of Europe, Middle East, Asia, from the countries like India, Qatar, United Arab Emirates, Switzerland. There were 30 respondents, from the industries Real Estate, Consulting, Education, Manufacturing, Construction. The positions of the respondent were managers, supervisors, executive directors, consultants and analysts.

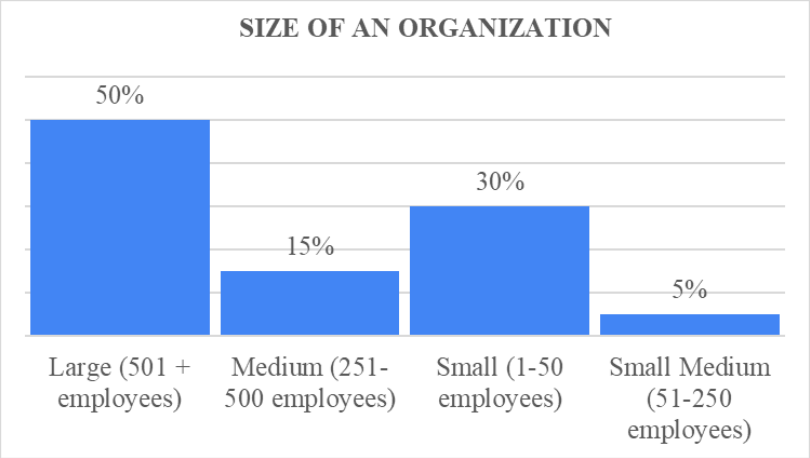


Figure 1


Figure 2

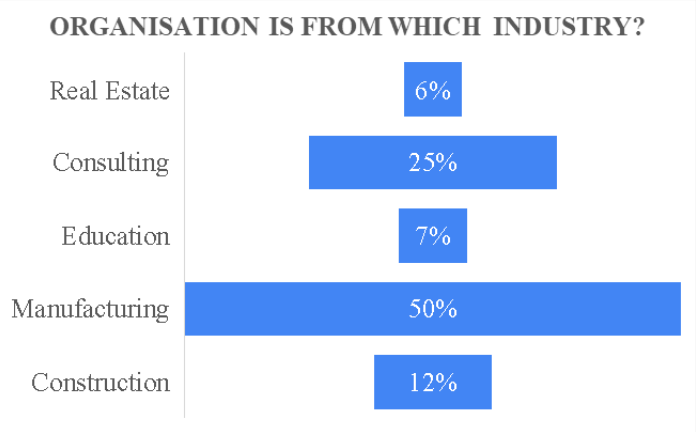


Figure 3

*Note.* The respondents of this survey are from different sizes of the organization as stated in the figure 1, and the percentage of the roles holding respondents are shown in the figure 2. Whereas maximum respondents are from manufacturing industry as shown in the figure 3

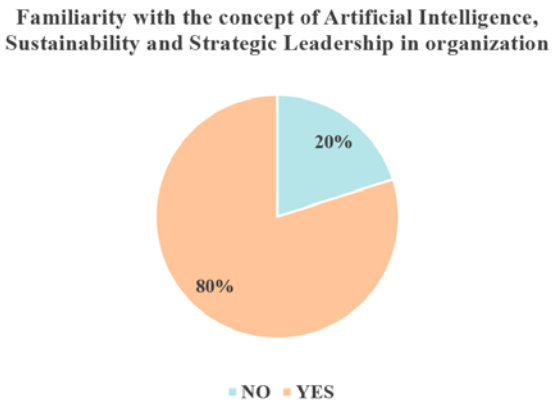


Figure 4

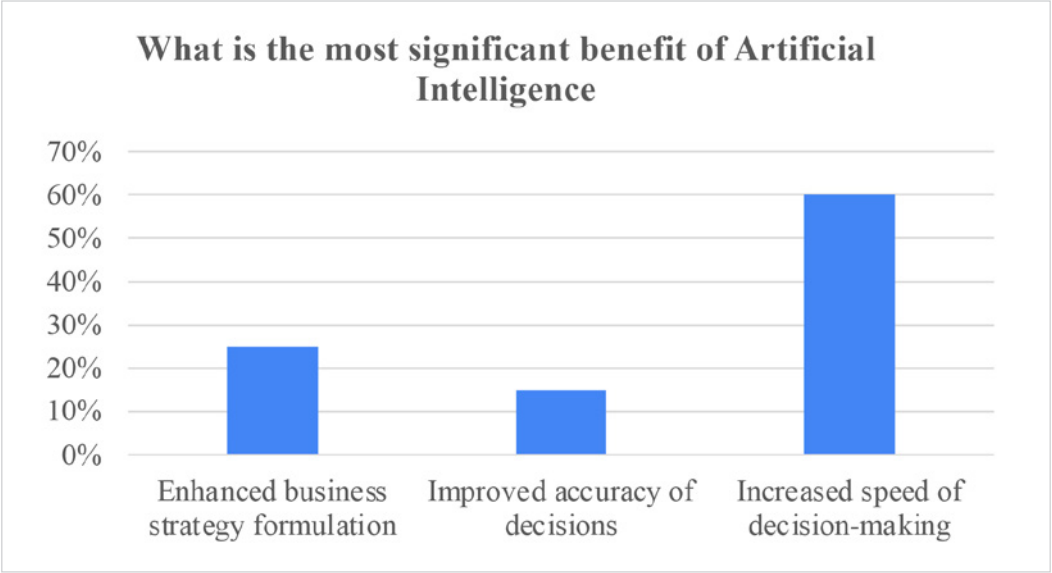


Figure 5

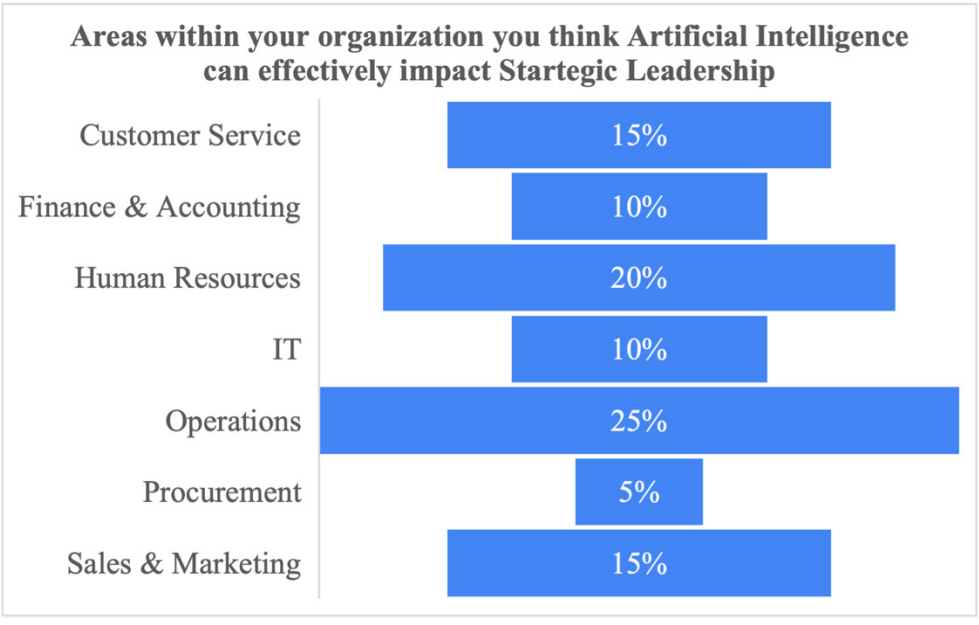


Figure 6

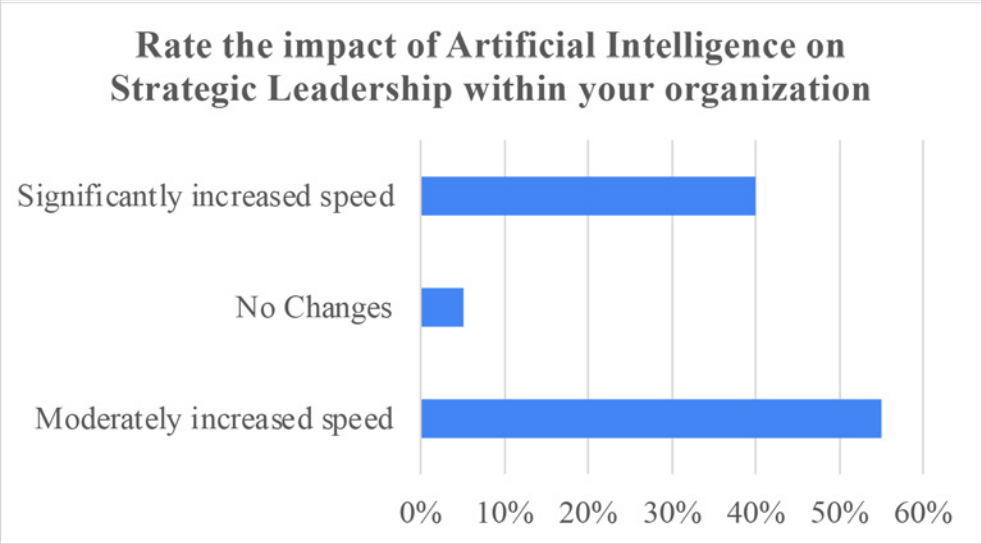


Figure 7

*Note.* Figure 6 states that an artificial intelligences tools are used in many functions like Operations, Human Resources, Sales and Marketing etc. Whereas in figure 8, it reflects that the impact of AI in strategic leadership is increasing.

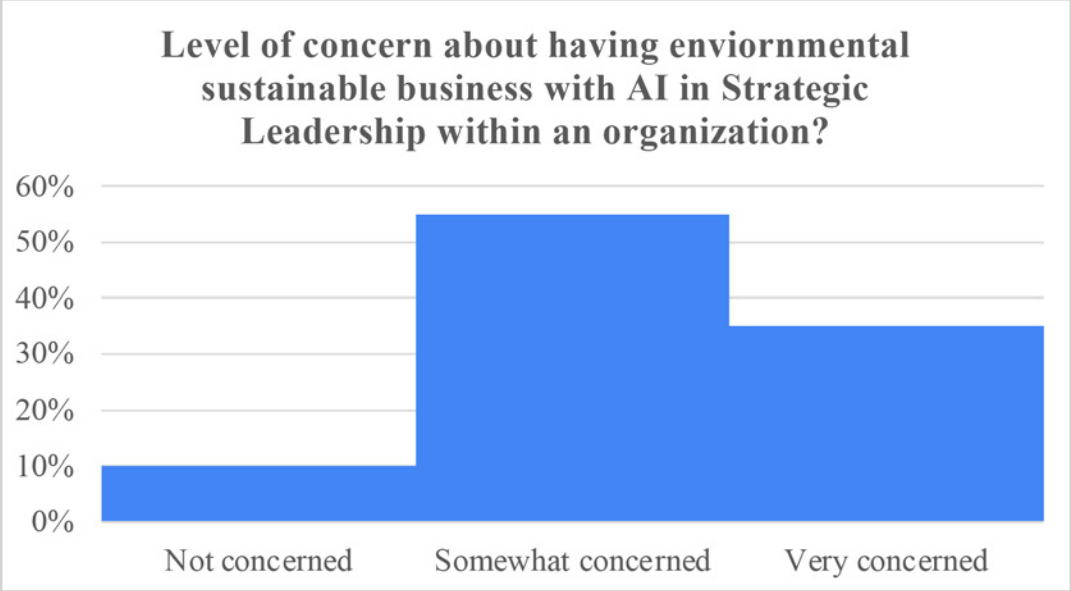


Figure 8

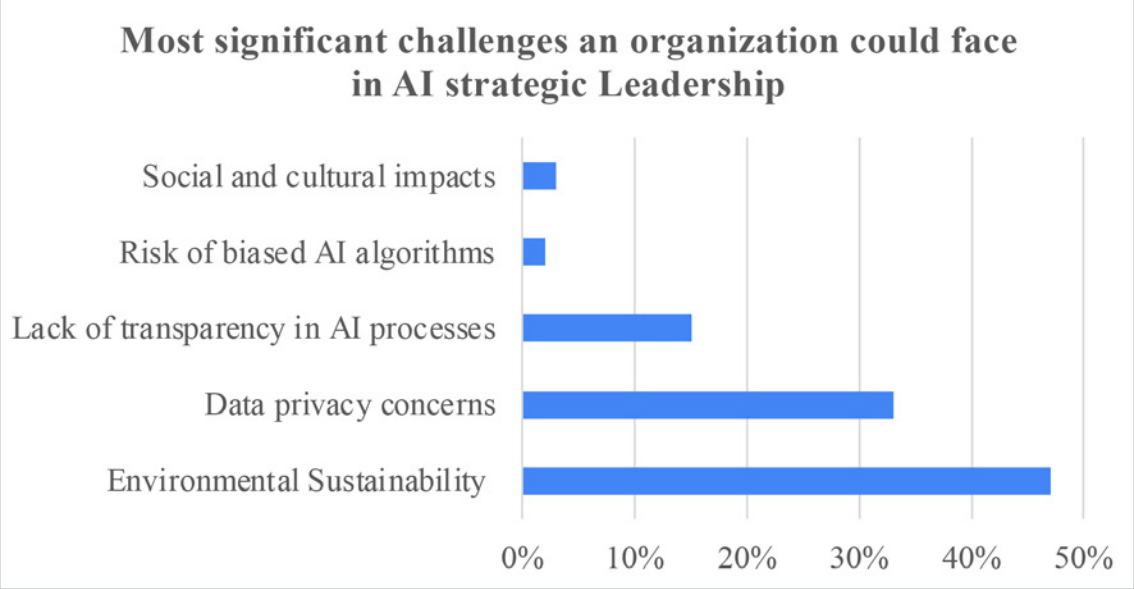


Figure 9

*Note.* In figure 8 and 9 it states that the concern of environmental sustainability is high and it's the most challenging aspects in AI strategic leadership

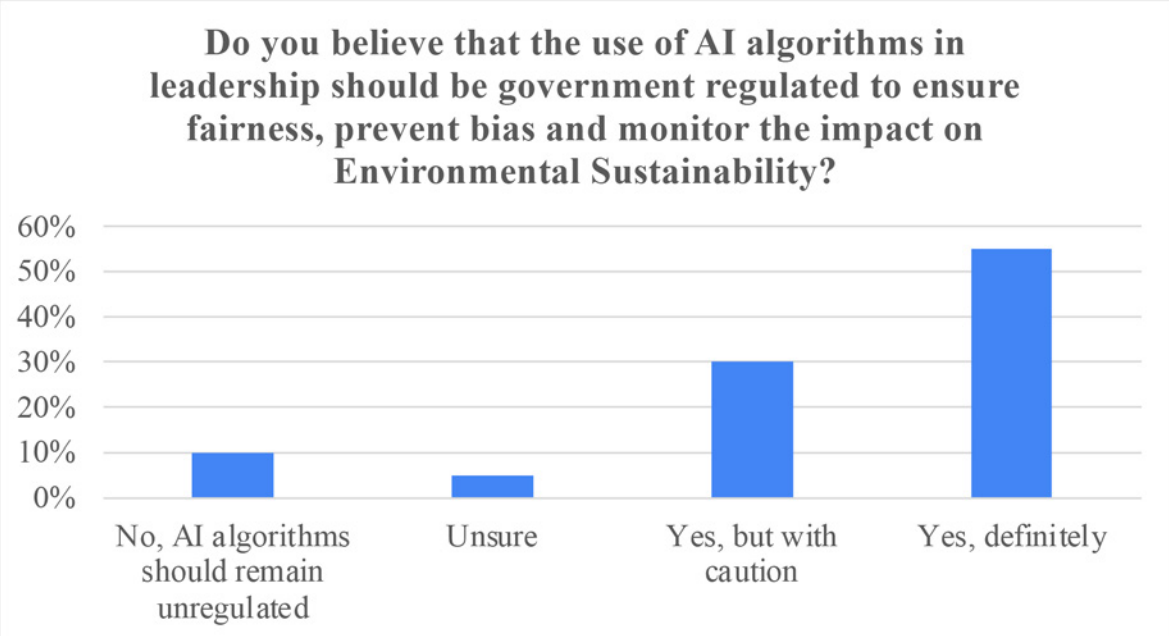


Figure 10


Figure 11

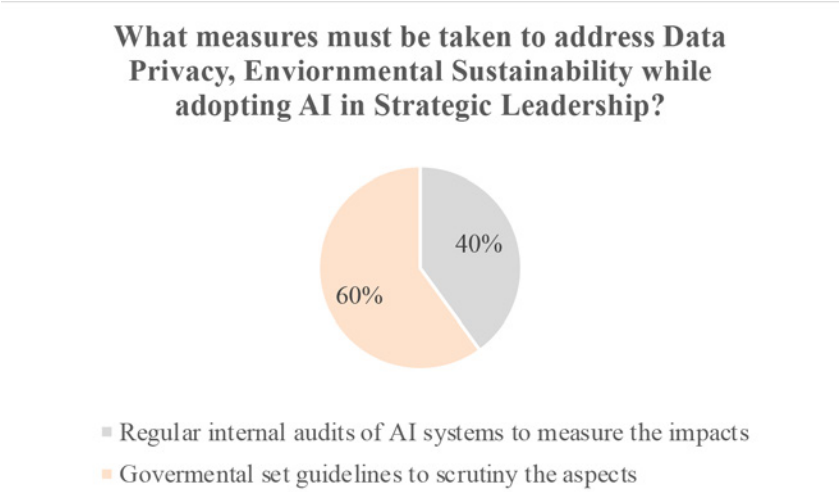


Figure 12

*Note.* In figure 12, 60% of the respondent thinks that government needs to evaluate in the use of AI in strategic leadership to safeguard, monitor and reduce environmental impact

### *6.3.2 Academic Framework*

The analysis of the Academic framework is established in numerous recognized concepts in strategic leadership and sustainability, including Transformational Leadership Theory (Bass & Riggio, 2006) which is a vital to understand that how business leaders can stimulate and encourage their organizations to grip AI tools while practicing sustainable goals. Another theory is Resource-Based View (RBV) (Barney, 1991), which highlights leveraging businesses capital and resources by involving technological proficiencies, to benefit an economical gain. In this perspective, AI is an appreciated means that can improve sustainability practices and push functional effectiveness. The third one is Triple Bottom Line (TBL) (Elkington, 1997), which is framework that estimates the companies, centered on three pillars: economic, environmental, and social presentation. AI tools can provide to all three scopes by improving business operational effectiveness, diminishing environmental effects, and indorsing social

responsibility. The fourth theory is Dynamic Capabilities Theory (Teece et al., 1997) which hypothesizes that organization can benefit a competitive advantage by emerging adaptable strategies that alter to promptly shifting circumstances. AI allows companies to adjust quickly to marketplace modifications, technological progressions, and sustainability confronts. By using these academic frameworks, the chapter investigates on how strategic leadership can influence organizations to use AI to meet sustainability aims and form long-term significance.

## 6.4. Discussion and Findings

### *6.4.1 AI in Driving Sustainability Agendas*

As per the (Survey data, 2025), it is understood that respondents believes that the potential use of AI needs to be monitored. AI has been used by many companies at large, medium and small scales, ability of AI to run the sustainability is huge, and companies are willing to use the AI tools and technologies to increase productivity and support the environment as well along with the improvement in efficiency. For instance, in an Energy, the use of AI tools and technology drives the optimum utilization of renewal energy by reducing the dependency on non-renewable energy resources. (Rahman et al., 2022). AI-expert energy management techniques assist companies and business to reduce energy utilization and rise the usage of clean energy, which directly contributes to decrease of carbon emissions.

Furthermore, the use of AI techniques in agricultural businesses are transforming the way the food has been manufactured, reducing the environmental footprint of agricultural practices. AI-driven exactness cultivation techniques grant agriculturalists to boost water use, diminish pesticide function, and increase soil health, which ultimately leads to more sustainable agricultural practices (Bera & O'Neill, 2020). These developments support the worldwide driven supportable food manufacturing methods and gives a roadmap to attend food security confronts in an environmentally sensible approach.

### *6.4.2 AI in Strategic Leadership in Contemporary Organizations*

Strategic leadership is critical role in any organization, management needs to be assured that not only the implementation of AI but also the use of AI is being done in an organization to ensure and get the best return out of investment. Leaders in an organization needs to ensure that AI is used to enhance the sustainability along with the business decisions of making revenue. Management must use the AI initiatives to align with the organization's mission, values, goals and long-term aims. By concentrating on sustainability aims, managers can push revolution and increase in operational effectiveness, by creating strong organizations which are better armed to route ecological and social gaps and challenges.

As it is known that AI helps management leaders to enhance the decision-making skills as the analysis are quick and well reported in quick manner, this guides them to be ready with new strategic initiatives. For instances, AI techniques can forecast market trends, customer and client behavior, and potential interruptions in the supply chain, permitting leaders to articulate practical strategies that boost organizational strength (Kiron et al., 2021). In the agricultural sector, AI techniques enable farmers to rapidly react to fluctuating climatic circumstances by adjusting crop management exercises and modifying planting agendas based on climate predictions and soil data (Bera & O'Neill, 2020).

### *6.4.3 Accepting to Change: AI as an Initiator of Business Compliance*

One of the important advantages of implementation of AI is its capability to assist companies adapting the fast dynamics of the market, technology, and environmental circumstances. In industries like manufacturing, AI-driven projections continue to safeguard that assembly practices remain constant, even at the time of external interruptions (Harrison et al., 2021). The employees of the company are required to adapt the changes in working style for which the proper training is required to be given in the company. Employees are the asset to the company, in many cases the main cause of the failure and success are the employees and their working style, basically company environment and culture plays an important role in the growth of the company itself. AI allows companies to be more flexible, dynamic and fast forward in decision making, as it offers the tools to respond to all the challenges related to environmental, social and economic. This adaptability is essential for long-term sustainability.

### *6.4.4 Moral Concerns in AI for Sustainability*

Although AI embraces important in strategic leadership related to environmental, economic and social sustainability, it also raises important ethical concerns. Disputes such as data confidentiality, algorithmic unfairness, and the ecological impact within the use of Artificial Intelligence tools must be focused to safeguard that AI is used sensibly (O'Neil, 2016). Management leaders must embrace moral frameworks that highlight transparency, impartiality, and inclusivity in the planning and accomplishment of AI tools.

## 6.5. Conclusion

### *6.5.1 Summary of Findings*

This chapter focusses on the important role of AI in fostering sustainability throughout all the industries, emphasizing on manufacturing and agriculture. Certainly, AI has the prospective to enhance the usage of energy, reduction in waste by doing proper waste management, and enhancing business operational competence, all with supporting the concept of sustainability with wider goals. Nevertheless, the fruitful execution of AI evolves strategic leadership that incorporates AI tools with the organization's sustainability goals. Management leaders must direct companies through the complications of AI embracing, attending moral concerns and safeguarding that AI plans support with ecological, social, and economic sustainability targets.

### *6.5.2 Future Scope of Research*

Future scope of work can emphasis more on ethical issues and concerns of implementation of AI in sustainable business strategies. Which can be done by discovering on how organizations can identify and reduce the fears connected to data privacy, algorithmic fairness, and social discriminations. Furthermore, the studies are required to analyze the long-term influence of Artificial intelligence on employees working in the company, an environment of an organization, its impact on the culture, employee relations and enhancement of employee's skills to name a few. Government, Policymakers, Auditors, AI implementors,

and business leaders should collaborate to build standards that confirm the trustworthy use of AI in succeeding sustainability targets.

## 6.6 References


Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of Management, 17*(1), 99–120. https://doi.org/10.1177/014920639101700108

Bass, B. M., & Riggio, R. E. (2006). *Transformational leadership* (2nd ed.). Lawrence Erlbaum Associates.

Bera, A., & O'Neill, R. (2020). Artificial intelligence in agriculture: Applications and challenges. *Agricultural Systems, 178*, 102721. https://doi.org/10.1016/j.agsy.2019.102721

Binns, A. (2020). The role of artificial intelligence in driving sustainability. *Harvard Business Review*. https://hbr.org/2020/09/the-role-of-artificial-intelligence-in-driving-sustainability

Cozzolino, A., et al. (2020). Sustainability-driven innovation in the era of artificial intelligence. *Sustainability, 12*(1), 167. https://doi.org/10.3390/su12010167

Elkington, J. (1997). *Cannibals with forks: The triple bottom line of 21st-century business*. Capstone.

Harrison, J., et al. (2021). Leveraging AI for sustainable development: Case studies in energy, agriculture, and manufacturing. *Journal of Strategic Sustainability, 10*(2), 45–62.

Kiron, D., et al. (2021). The role of artificial intelligence in strategic decision-making. *MIT Sloan Management Review, 62*(3), 22–29.

O'Neil, C. (2016). *Weapons of math destruction: How big data increases inequality and threatens democracy*. Crown Publishing Group.

Rahman, M. M., Rahman, M. S., & Hossain, G. (2022). Applications of artificial intelligence in energy systems: A comprehensive review. *Energy Reports, 8*, 739-756. https://doi.org/10.1016/j.egyr.2022.01.014

Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic Management Journal, 18*(7), 509–533. https://doi.org/10.1002/(SICI)1097-0266(199708)18:7<509::AID-SMJ882>3.0.CO;2-Z