

THESIS STATEMENT AND ANNOTATED BIBLIOGRAPHY

Corporate Applications of Artificial Intelligence (AI) to Promote Sustainability

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Academic Writing

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**Declaration**

By completing this cover sheet and declaration, I confirm that this assignment is my own work, is not copied from the work (published or unpublished) of any other person, and has not previously been submitted for assessment either at Aalto University, or another educational establishment. Any direct or indirect uses of material (e.g.: text, visuals, ideas…) from other sources have been fully acknowledged and cited according to the conventions of the Harvard Referencing System.

Thesis Statement: Amidst global environmental challenges, Artificial Intelligence (AI) has emerged as a pivotal tool in fostering sustainable business practices, highlighting AI´s major role in revolutionizing energy optimization, waste reduction, and agricultural efficiency, shedding light on its potential to drive corporate sustainability.

1. Farzaneh, H., Malehmirchegini, L., Bejan, A., Afolabi, T., Mulumba, A. and Daka, P.P. (2021) ‘Artificial Intelligence Evolution in Smart Buildings for Energy Efficiency.’ *Applied Sciences* [Online]. 11 (2): 763. Available from: <https://www.mdpi.com/2076-3417/11/2/763> [Accessed on 4 November 2023].

This study explores the application of AI in the context of smart buildings, with a specific focus on enhancing energy efficiency. The study also delves into various forms of machine learning, a subset of AI widely employed in energy management due to its capacity to quickly learn human behavior patterns. Despite seeming unrelated to the business realm, the topics explained in this study hold relevance for businesses, as they also operate within buildings. An area that distinguishes this study from other sources is its consideration of the ethical dimensions of AI. It stresses the importance of AI systems being ethically robust and designed to serve the greater good. This source is a valuable addition to the academic report, not only for its ethical discourse but also for introducing a new dimension, the concept of smart buildings, which are beneficial for businesses aiming to bolster their sustainability efforts.

1. Kelechi, A.H., Alsharif, M.H., Bameyi, O.J., Ezra, P.J., Joseph, I.K., Atayero, A.-A., Geem, Z.W. and Hong, J. (2020) ‘Artificial Intelligence: An Energy Efficiency Tool for Enhanced High Performance Computing’. *Symmetry* [Online]. 12 (6): 1029. Available from: <https://www.mdpi.com/2073-8994/12/6/1029> [Accessed on 4 November 2023].‌

The article provides a thorough analysis of the incorporation of AI into data center operations, focusing on optimizing resource allocation and energy management to limit their environmental impact, therefore promoting sustainability. Notably, this source examines and evaluates Google's utilization of AI algorithms within their data centers. This case study not only strengthens the academic report but also offers a real-world example, showcasing the efficacy of employing AI to enhance energy efficiency and sustainability in data centers.

1. Liu, J., Qian, Y., Yang, Y. and Yang, Z. (2022) ‘Can Artificial Intelligence Improve the Energy Efficiency of Manufacturing Companies? Evidence from China.’ *International Journal of Environmental Research and Public Health*; 19 (4): 2091. Retrieved from: NCBI Database [Accessed on 4 November 2023].

This study investigates the ability of AI to promote sustainability within manufacturing companies, focusing on firms in Guangdong, China. The authors present unique approaches, not widely explored by other researchers, concerning AI's potential in advancing energy efficiency. Through statistical analyses, the study establishes a positive correlation between the use of AI and energy efficiency in the manufacturing sector. Like the previous source, the authors address the limitations of their experiment and critically evaluate the tests that contradicted their initial hypothesis, thus establishing the article's credibility and impartiality. This article will certainly introduce a novel dimension to the report by presenting innovative insights and statistical data, thereby enriching its breadth of analysis.

1. Yan, B., Hao, F. and Meng, X. (2020) ‘When Artificial Intelligence Meets Building Energy Efficiency, a Review Focusing on Zero Energy Building.’ *Artificial Intelligence Review*; 54 (3): 2193 - 2220. Retrieved from: Springer Link Database [Accessed on 4 November 2023].

The article provides a comprehensive review of how AI is employed to enhance energy efficiency in buildings, specifically focusing on zero-energy buildings. This study covers various AI applications within this context, including adaptive control mechanisms, highlighting their crucial role in achieving zero energy goals by minimizing energy consumption. The author offers a balanced argument, highlighting both the benefits of using AI in thermal regulation to reduce energy consumption and discussing potential drawbacks. This makes the source more reliable as it does not develop a one-sided argument in favor of AI. For the academic report, this source is immensely pertinent as it offers a thorough understanding of the specific applications of AI in the context of energy efficiency. Also, the article’s detailed insights into AI's role in optimizing energy consumption will significantly contribute to discussions on utilizing AI to promote sustainability from an energy efficiency aspect.