5th CoNeScINTech
Conference on Business, Social Sciences and Technology

Volume 5 No 1 (2025)

Received : May 06, 2025
Accepted : June 17, 2025
Published : August 18, 2025

Conference on Business, Social Sciences and Technology
https://journal.uib.ac.id/index.php/conescintech

Strategic Analysis of Business Decisions PT. Flextronics Techology Indonesia by Utilizing Generative Artificial Intelligence (GenAI) in the Electronics Manufacturing

Syaeful Anas Aklani[1], Halizah Binti Basiron[2], Nur Zareen Binti Zulkarnain[3]
p032320011@student.utem.edu.my, halizah@utem.edu.my, zareen@utem.edu.my
[1,2,3]Fakulti Teknologi Maklumat dan Komunikasi, Universiti Teknikal Melaka Malaysia
Melaka, Malaysia

Abstract

New technologies in manufacturing companies continue to develop and innovate, companies face increasing challenges related to operational efficiency, supply chain complexity, and the need for continuous innovation. PT. Flextronics Technology Indonesia, as one of the large-scale industries in the Batam city, is trying to overcome this challenge by integrating Generative Artificial Intelligence (GenAI) into its strategic decision making. GenAI, a transformative part of artificial intelligence, offers unmatched capabilities in generating insights, optimizing processes, and driving innovation. This research carries out a comprehensive strategic analysis of PT Flextronics Technology Indonesia's decision by evaluating the potential impact of using GenAI in all main operational domains such as management, engineering and quality. Using a mixed-methods approach, this research combines qualitative insights from stakeholder interviews and surveys with quantitative analysis of pilot projects to assess the feasibility and benefits of Gen AI integration. The findings highlight that GenAI significantly improves decision-making accuracy, reduces operational costs, and drives innovation in product design and production processes. However, successful implementation requires addressing challenges such as workforce readiness, data security, and initial investment costs. The study also emphasizes the importance of aligning GenAI initiatives with organizational goals and encouraging stakeholder engagement to ensure continued adoption. This research provides actionable insights and a roadmap for PT. Flextronics Technology Indonesia utilizes GenAI as a strategic tool, strengthening its position as a leader in the electronics manufacturing sector while setting a benchmark for future AI-based industrial transformation.

Keywords:

Generative AI, Business Decisions, Business Strategy, Manufacturing, Artificial Intelligence

Introduction

The new era of business openness and global competition between businesses, how to create creative ideas and innovation with increasingly sophisticated technological advances, the business world, especially manufacturing companies, how to create creative innovation ideas to gain competitive advantage.

PT. Flextronics Technology Indonesia is one of the manufacturing companies in the city of Batam. how to create efficiency, modernize technology and practices, strategic decision making is very important and sustainability in business.

This study explores strategic analysis of business decisions at PT. Flextronics Technology Indonesia through the integration of Generative Artificial Intelligence (GenAI). GenAI, a cutting-edge innovation in artificial intelligence, offers transformative capabilities that go beyond automation. This allows the birth of new ideas, process optimization and improved problem solving that is tailored to the unique challenges of the electronics manufacturing industry in Batam City in particular.

By utilizing Gen AI, how PT. Flextronics Technology Indonesia can improve operational efficiency, encourage innovation in product development in the manufacturing sector, and improve supply chain management. This study investigates how GenAI can function as a catalyst for strategic decision making, one of which is conducting training on the use of Generative AI such as ChatGPT and DALL-E, empowering companies to adapt to market trends, anticipate customer needs, and maintain a leadership position in existing industries in the Batam city.

Through a combination of theoretical analysis and practical case studies, this research highlights the potential for using GenAI to redefine business strategies and make it easier for employees to help with their work, thereby offering a roadmap for PT. Flextronics Technology Indonesia to navigate the complexity of the electronics manufacturing landscape in the digital era in the Batam city in particular.

Literature Review

The integration of artificial intelligence (AI) into business decision-making has been a focal point of recent research, particularly within the manufacturing sector. Generative Artificial Intelligence (GenAI), as a subset of AI, offers a transformative approach by synthesizing novel solutions, optimizing workflows, and enhancing strategic decision-making capabilities. This literature review examines existing studies on Gen AI in manufacturing, strategic business decision-making, and its applicability to PT. Flextronics Technology Indonesia's operations.

1. Generative AI in Manufacturing

Recent advancements in AI have highlighted GenAI potential to revolutionize manufacturing by addressing key challenges such as design optimization, production efficiency, and quality assurance.[1] indicate that Gen AI can generate innovative product designs, streamline production schedules, and predict maintenance needs through machine learning algorithms trained on historical data. Similarly, an analysis in [2] demonstrates that GenAI's predictive capabilities can significantly enhance supply chain resilience by identifying and mitigating risks in real-time.

2. Strategic Decision-Making and AI

AI's role in strategic decision-making has been widely studied, emphasizing its ability to process large datasets and provide actionable insights. According [3], organizations that integrate AI into decision-making frameworks experience improved accuracy and reduced cognitive biases. GenAI, in particular, extends these benefits by generating creative solutions to complex problems, as demonstrated [4], who explored AI's use in scenario planning and market trend analysis within manufacturing firms.

3. Challenges and Opportunities in Implementing GenAI

While the benefits of GenAI are well-documented, its implementation poses challenges, including data quality, model interpretability, and workforce readiness. A study by [5] emphasizes the importance of aligning AI strategies with organizational goals and ensuring transparency in decision-making processes. Furthermore, workforce training and change management are critical for successful adoption, as highlighted [6] report on AI transformation in manufacturing industries.

4. Relevance to Electronics Manufacturing

The electronics manufacturing sector, characterized by rapid innovation and global supply chain complexity, presents unique opportunities for Gen AI application. Research in [8] explores how AI-driven solutions enhance product lifecycle management and reduce time-to-market in electronics production. For companies like PT. Flextronics Technology Indonesia, leveraging GenAI can provide a competitive advantage by improving customization capabilities, optimizing resource allocation, and addressing environmental sustainability concerns.

5. Application to PT. Flextronics Technology Indonesia

Existing literature underscores the relevance of GenAI for strategic decision-making in electronics manufacturing, yet specific case studies on its implementation at PT. Flextronics Technology Indonesia remain limited [7]. Insights from related industries suggest that a targeted approach, incorporating Gen AI into key operational areas such as supply chain management, product innovation, and risk analysis, can significantly enhance the company's strategic outcomes

Impelementation

Before conducting research, the author has also conducted training for employees so that they can understand the maximum use of Generative AI in the company. This training is shown to all employees at engineering, staff, quality and other levels. The following is one of the photos documenting the training carried out by the author

Figure 1. Documentation Training GenAI

PT. Flextronics has also purchased OpenAI license so that it can be used by employees and can maintain all information about the company for data security.

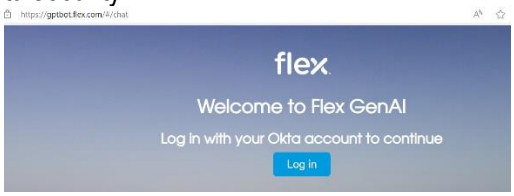

Figure 2. License Flex GenAI

This research aims to analyze how GenAI is used in the company and get input from employees regarding what parts need to be improved. This questionnaire was given to a total sample of 100 employees at engineering level and above and 62 who have filled in, in order to maximize the use of GenAI in the company and help the company achieve its goals and KPIs.

In the section the author divides them into 8 among others,

Section 1: Respondent Information – 3 questions
Section 2: Awareness and Understanding of GenAI
Section 3: Implementation of GenAI
Section 4: Impact of GenAI on Business Decisions
Section 5: Future Outlook
Section 6: GenAI Integration and Usage
Section 7: Perception and Attitudes – 3 questions
Section 8: Future Development and Training – 3 questions

The employees were asked which department they work in, and most of employees are from Engineering department. From the results of the questionnaire, almost all departments use GenAI.

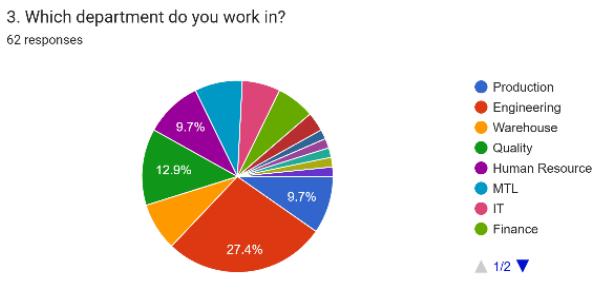

Figure 3. Questionnaire from department

In question 9. What type of GenAI tools or platforms are used in your department? Most answers use ChatGPT.

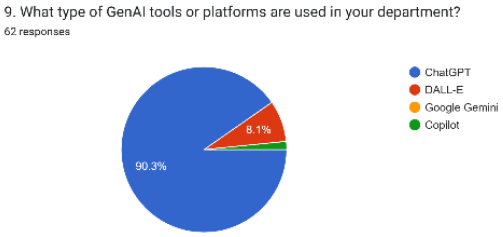

Figure 4. Tools GenAI

Following are the results of the question 12: How would you assess the overall impact of GenAI (ChatGPT/Dall-E) on your work processes? 29% employees feel very positive and 66.1% employees feel positive, while the other ones neutral.

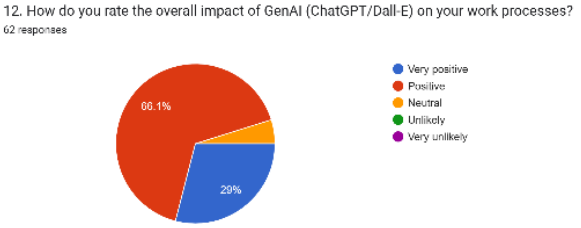

Figure 5. Impact of GenAI

The use of GenAI in the workplace received a positive response from employees, research was Very Positive 29%, Positive 66.1% while Neutral 7.6%, so it has a good response from employees.

From the question What are the main reasons for using GenAI (ChatGPT) in your department?

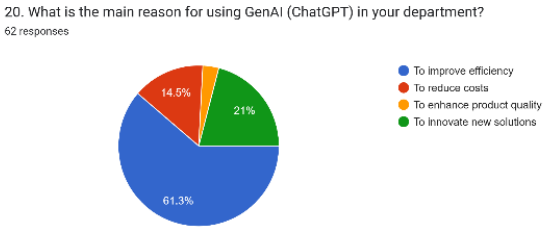

Figure 6. Reason GenAI in Department

There is 61.3% use of GenAI in companies to innovate new solutions. This is how employees are required to innovate and solve existing problems appropriately and quickly.

This below answers for the next question, what type of training do you think is most necessary for effective GenAI (ChatGPT) implementation? The most chosen answer is Strategic Thinking that need to be implemented with 40.3% from overall response.

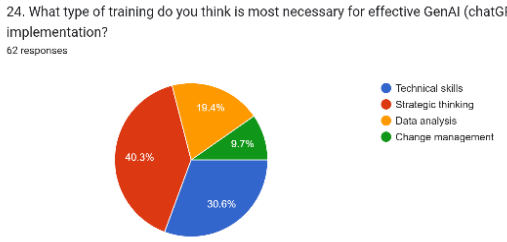

Figure 7. Effective GenAI

Almost all employees want training that can support skill updates for using GenAI to make work easier and create innovative and creative ideas.

Overall Opportunities for Improvement:

1. Standardize GenAI integration across departments to maximize its utility.
2. Enhance employee skills and strategic thinking through targeted training.
3. Invest in infrastructure and Training to support advanced GenAI applications.
4. Leverage GenAI for customer-facing solutions to improve satisfaction and loyalty.
5. Regularly evaluate the impact of GenAI implementations to refine strategies.

This summary highlights the positive perception of GenAI among employees and outlines the strategic steps PT. Flextronics Technology Indonesia can take to harness its full potential.

Conclusions

The implementation of GenAI at PT. Flextronics Technology Indonesia represents a significant step forward in addressing the complexities of the electronics manufacturing industry. This study underscores the strategic value of GenAI in improving operational efficiency, driving innovation, and improving decision-making processes. By integrating GenAI into critical business areas such as supply chain management, product design, and quality assurance, companies are well positioned to strengthen their market competitiveness.

By utilizing GenAI's predictive analytics, creative problem solving and process automation capabilities, PT. Flextronics Technology Indonesia can achieve significant improvements in customer satisfaction and operational agility. This strategic integration not only positions the company as a leader in the electronics manufacturing sector, but also provides a benchmark for other organizations looking to harness the potential of GenAI.

Going forward, ongoing evaluation and adaptation of GenAI strategies will be critical to sustaining these benefits and addressing future industry challenges. With a commitment to innovation and stakeholder involvement, PT. Flextronics Technology Indonesia is ready to lead the transformation of electronics manufacturing through artificial intelligence.

Acknowledgment

The author would like to express his deepest gratitude to all individuals and organizations who have contributed to the successful completion of this research, Strategic Analysis of Business Decisions PT. Flextronics Technology Indonesia by Utilizing Generative Artificial Intelligence (GenAI) in Electronic Manufacturing.

First of all, the author expresses his deepest appreciation to the management and staff of PT. Flextronics Technology Indonesia for their invaluable insight, cooperation and support during this research. Your openness and willingness to share data and experiences was instrumental in shaping this research.

The authors also thank our questionnaire respondents for their thoughtful and detailed input. Your perspective provides important input that enriches the analysis and helps identify practical opportunities and challenges in GenAI integration.

This work would not be possible without the collective efforts and collaboration of all parties involved. We hope this research contributes to advancing the integration of Generative AI in the manufacturing industry and inspires further exploration in this exciting field.

References

[1] Davenport, T., & Kirby, J. (2021). Artificial Intelligence and Business Strategy: A Guide for Leaders. Harvard Business Review Press.
[2] Zhang, Y., Li, X., & Wang, T. (2023). "The Role of Generative AI in Enhancing Manufacturing Efficiency and Design Innovation." International Journal of Manufacturing Technology, 58(3), 112–125.
[3] Lee, J., & Park, S. (2022). "Generative AI in Manufacturing: Challenges and Opportunities." Journal of Advanced AI Applications, 34(2), 198–214.
[4] Siau, K., & Wang, W. (2023). "Addressing the Challenges of Implementing AI in Manufacturing." AI and Society, 38(1), 45–59.
[5] Li, J., & Chen, Q. (2022). "AI-Driven Solutions in Electronics Manufacturing: A Strategic Perspective." Journal of Electronics Manufacturing and Design, 47(4), 230–245.
[6] Fei-Yue Wang, F. I. (2023). Chat with ChatGPT on Industry 5.0: Learning and Decision-Making for Intelligent Industries. IEEE/CAA JOURNAL OF AUTOMATICA SINICA, 831-834.
[7] Flex. (2023, March). Optimizing electronics manufacturing with artificial intelligence and machine learning . Retrieved from Flex.com: https://flex.com/resources/optimizing-electronics-manufacturing-with-artificial-intelligence-and-machine-learningA
[8] Mlađan Jovanović, M. C. (2022). Generative Artificial Intelligence: Trends and Prospects. IT INNOVATION IEEE, 107-112.