

A LITERATURE REVIEW FOR DEVELOPING A RESEARCH FRAMEWORK ON THE ANTECEDENTS INFLUENCING ENTREPRENEURIAL LEADERSHIP IN ENGINEERING BUSINESSES LISTED ON THE STOCK EXCHANGE OF THAILAND

Rathawit Na Lamphun¹, Tanapol kortana², Bundit Pungnirund³, Chompoo Saisama⁴, Mooktra Thongve⁵

¹*College of Innovation and Management, Suan Sunandha Rajabhat University, Bangkok, Thailand,
E-Mail: s65584945036@ssru.ac.th*

²*College of Innovation and Management, Suan Sunandha Rajabhat University, Bangkok, Thailand,
E-Mail: tanapol.ko@ssru.ac.th*

³*College of Innovation and Management, Suan Sunandha Rajabhat University, Bangkok, Thailand,
E-Mail: bundit.pu@ssru.ac.th*

⁴*College of Innovation and Management, Suan Sunandha Rajabhat University, Bangkok, Thailand
E-Mail: Chompoo.sa@ssru.ac.th*

⁵*College of Innovation and Management, Suan Sunandha Rajabhat University, Bangkok, Thailand
E-Mail: mooktra.th@ssru.ac.th*

ABSTRACT

This study explores the key antecedents influencing entrepreneurial leadership in engineering businesses listed on the Stock Exchange of Thailand. Through an extensive literature review, the research synthesizes various theoretical perspectives, including strategic, situational, and relational leadership theories, to construct a conceptual framework for effective leadership in the engineering sector. The findings identify six core leadership components: management skills, engineering expertise, flexibility and adaptability, ethics and social responsibility, business networking, and innovative thinking. These factors contribute to leadership effectiveness by enabling engineering entrepreneurs to navigate complex industrial challenges while fostering innovation and sustainability. The study highlights the crucial role of leadership in enhancing organizational performance, competitiveness, and long-term strategic success. The results provide a foundation for future empirical research aimed at testing hypotheses related to leadership dynamics in engineering businesses. This framework can support the development of training programs and policies to enhance leadership capabilities in the sector.

Keywords: Management Skill, Engineering Skill, Flexibility, Ethic, Networking, Innovative Thinking, Leadership

INTRODUCTION

The engineering industry is one of the fundamental pillars of national development, as it serves as a key mechanism driving the economy and technological innovation (Munir, 2022; Khalid, Chin & Atiqullah, 2013; Passow, 2007; Avigail & Emanuele, 2024). Engineering is not merely the science of designing and developing structures or mechanical systems; it also requires analytical skills, precise calculations, and specialized expertise to solve problems and control production processes efficiently (Aliasghar, 2023; Arkadiusz et al., 2024; Alkhawaldeh & Dabaghie, 2024). Engineering businesses encompass various fields, such as civil engineering, mechanical engineering, electrical engineering, environmental engineering, chemical engineering, and computer engineering, all of which are essential components of modern industry. Additionally, aerospace engineering, automotive engineering, and telecommunications engineering play crucial roles in technological advancements (Bowkett, 2023; Fehr, 2003). The engineering industry not only plays a significant role in manufacturing but also contributes to

infrastructure development and technologies that enhance a nation's competitive edge (Chen, Wu & Chang, 2022).

In the era of Industry 4.0, digital technology, automation, artificial intelligence (AI), and the Internet of Things (IoT) have become integral in transforming engineering production and business operations. The integration of these technologies enhances efficiency, reduces costs, and creates new business opportunities (Arkadiusz et al., 2024; Chen, Wu & Chang, 2022; Fehr, 2003). Investment in engineering businesses requires significant capital due to the need for advanced machinery, skilled personnel, and research and development (R&D) to foster innovation (Khalid, Chin & Atiqullah, 2013; Leever, 2023; Litchfield, Javernick-Will & Maul, 2015). High-investment industries, such as construction and infrastructure, energy, and aerospace, rely on capital from the stock market to ensure financial stability and the continuity of projects (Lin, Ting, Xiang & Xiaofeng, 2025; Munir, 2022; Nadeem et al., 2024).

The Stock Exchange of Thailand (SET) includes engineering-related companies in four main sectors: the resources sector (energy and renewable energy), the technology sector (information technology and telecommunications), the industrial sector (machinery and logistics), and the real estate and construction sector (infrastructure and mass transit systems) (The Stock Exchange of Thailand, 2025; Leever, 2023; Alkhaldeh & Dabaghie, 2024). This research aims to study the leadership of engineering business entrepreneurs listed on the Stock Exchange of Thailand by utilizing concepts of engineering management and various leadership styles to analyze factors influencing business success (Leiden et al., 2018; Nguyen, 1998; Litchfield et al., 2015). This study will contribute to understanding the relationships between various factors expected to influence strategies for enhancing leadership capabilities to cope with industrial changes, develop organizational strategies, and promote effective and sustainable management (Aboramadan et al., 2020; Blanchard, 2019; Bass, 2020; Northouse, 2019). These insights will serve as a foundation for further academic research and development in the field.

METHODOLOGY

The researcher defines the population for this study as research articles, theses, documents, and literature related to factors and variables that are expected to influence or have an impact on the leadership of engineering business entrepreneurs listed on the Stock Exchange of Thailand. These sources consist of complete documents, literature, or articles published between 2020 and 2024, all of which are secondary sources. The researcher applies evaluation criteria based on authenticity, credibility, representativeness, and meaning, as recommended by Scott (1990). Additionally, all selected sources must be verifiable through recognized academic journal databases.

RESULTS

The Confirmatory Component Synthesis of Entrepreneurial Leadership in Engineering Businesses Listed on the Stock Exchange of Thailand.

The literature review on topics related to the research subject, including engineering businesses in the Stock Exchange of Thailand, engineering management, leadership concepts, strategic leadership theory, situational leadership theory, and relational leadership theory, along with an analysis of the business context of engineering firms in the Stock Exchange of Thailand, enables the researcher to synthesize the definition of entrepreneurial leadership in engineering businesses listed on the Stock Exchange of Thailand.

This concept refers to the ability of executives in publicly listed engineering businesses to set direction, provide guidance, and motivate personnel to work towards organizational policies and objectives efficiently. This leadership is demonstrated through management skills that encompass expertise in engineering, adaptability and flexibility, ethical responsibility and social accountability,

effective business networking, and innovative thinking that align with business needs and environmental changes., Show as table 1

Table 1
The Synthesis of Entrepreneurial Leadership Components in Engineering Businesses Listed on the Stock Exchange of Thailand

Articles	Management skills	Engineering Skill	Flexibility and Adaptability	Ethics and Social Responsibility	Business Networking	Innovative Thinking
Engineering Management						
Aboramadan, Dahleez and Hamad (2020)	☐	☐	☐		☐	☐
Arkadiusz, Lucas, Joeri, Dennis and Hans (2024)			☐	☐	☐	☐
Bass (2020)	☐	☐		☐		☐
Bragger, Alonso, Ambrosio and Williams (2021)			☐	☐	☐	☐
Chamnaphuttiphon and Nuthongkaew (2023)	☐		☐	☐		☐
Fano (2024)	☐	☐	☐		☐	☐
Fitzgerald (2022)		☐		☐	☐	☐
Jansiri (2018)	☐		☐	☐	☐	☐
Leiden, Posselt, Bhakar, Singh, Sangwan and Herrmann (2018)		☐	☐		☐	
Lin, Ting, Xiang and Xiaofeng (2025)	☐		☐		☐	☐
Siricharnsook (2022)	☐			☐	☐	
Strategic Leadership						
Chan (2018)	☐		☐	☐	☐	☐
Daily, McDougall, Covin and Dalton (2002)		☐		☐	☐	☐
Davies (2003)	☐	☐		☐	☐	
Ferrada-Videla, Dubois and Pepin (2021)	☐	☐	☐		☐	☐
Iszatt-White (2010)	☐		☐	☐	☐	☐
Jarrett and Vince (2024)		☐	☐	☐	☐	
Pang and Pisapia (2012)		☐	☐	☐		☐
Zhou, Hiller, Zaccaro, Campbell, McCauley, Parris and Klimoski (2024)	☐	☐		☐	☐	☐
Situational Leadership						
Blanchard (2019)	☐		☐	☐	☐	☐
Bosse, Duell, Memon, Treur and Wal (2017)		☐	☐		☐	☐
Cote (2017)		☐	☐	☐	☐	☐
Drea and Peyton (2017)	☐	☐		☐	☐	☐
Egan (2024)	☐		☐	☐	☐	☐
Fairhurst, Jackson, Foldy & Ospina, 2020	☐		☐	☐		☐

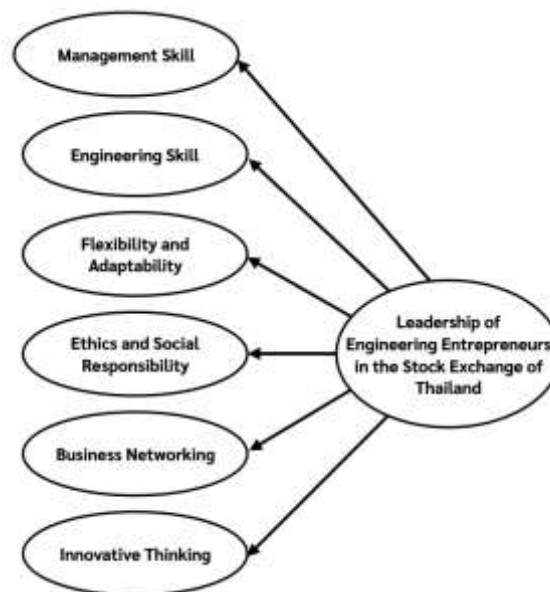
Articles	Management skills	Engineering Skill	Flexibility and Adaptability	Ethics and Social Responsibility	Business Networking	Innovative Thinking
Thompson and Glasø (2018)	☐		☐		☐	☐
Walls (2019)	☐	☐	☐	☐		
Wang, Liu, Peng, Li, Liang, Liao and Liu (2024)		☐	☐	☐	☐	☐
Relational Leadership						
Andersen and Chen, 2002)	☐		☐	☐	☐	☐
Anderson, Potocnik and Zhou (2014)		☐	☐		☐	☐
Carifio (2010)	☐	☐		☐	☐	☐
Epitropaki, Martin and Thomas (2018)	☐		☐	☐	☐	☐
Maritsa, Goula, Psychogios and Pierrakos (2022)		☐	☐	☐	☐	
Northouse (2019)	☐		☐	☐		☐
Rayner (2020)	☐	☐	☐		☐	☐
Uhl-Bien and Ospina (2012)	☐		☐	☐	☐	
Wang, Su and Sun (2022)	☐		☐	☐		☐

The researcher has conducted a synthesis of the components of entrepreneurial leadership in engineering businesses listed on the Stock Exchange of Thailand, emphasizing the context of engineering entrepreneurship in the stock market. This study focuses on the development of large-scale engineering projects, including real estate and construction, resources and energy, public utilities, technology, and industrial products, with key considerations on quality standards, sustainability, and risk management to ensure financial stability and investor confidence. The research integrates leadership theories with engineering management principles, combining engineering knowledge and business administration to effectively plan, control, and execute projects while ensuring optimal management of resources, technology, and personnel to achieve project goals within the allocated budget and timeline.

The theoretical framework includes Strategic Leadership Theory, which emphasizes vision formulation, strategy development, and proactive decision-making to create a competitive advantage, requiring leaders to inspire, guide, and efficiently allocate resources for long-term sustainability. Situational Leadership Theory highlights the need for leaders to adapt their leadership style based on followers' readiness and capabilities in different situations, using directive, supportive, delegative, or participative approaches to maximize efficiency and teamwork effectiveness. Relational Leadership Theory focuses on fostering leader-follower relationships built on trust, open communication, and collaboration, enhancing team cohesion, engagement, and collective goal achievement.

Based on these perspectives, the researcher has made a theoretical decision to explore the key components of entrepreneurial leadership in engineering businesses listed on the Stock Exchange of Thailand, identifying six core components: management skills, engineering skills, flexibility and adaptability, ethics and social responsibility, business networking, and innovative thinking, which together form the foundation for effective leadership in the engineering sector., Figure 1

Figure 1
Key Components of Entrepreneurial Leadership in Engineering Businesses Listed on the Stock Exchange of Thailand



CONCLUSION AND FUTURE WORK

The study on entrepreneurial leadership in engineering businesses listed on the Stock Exchange of Thailand provides a comprehensive analysis of the fundamental components that influence leadership effectiveness in this specific industrial sector. The research synthesizes various theoretical frameworks, including strategic leadership, situational leadership, and relational leadership, to construct a model that encapsulates the essential attributes of engineering entrepreneurs. Given the critical role of engineering businesses in national economic development, particularly in infrastructure, technology, and industrial projects, leadership within this sector must possess a dynamic set of skills to navigate an increasingly competitive and technologically advanced environment. One of the central findings of this study is the multifaceted nature of entrepreneurial leadership in engineering businesses. Unlike leadership in traditional corporate settings, engineering entrepreneurs must blend technical expertise with managerial acumen to drive innovation and operational efficiency. The research identifies six core components of effective leadership in this sector: management skills, engineering skills, flexibility and adaptability, ethics and social responsibility, business networking, and innovative thinking. These components collectively contribute to the ability of engineering leaders to set strategic directions, motivate personnel, and ensure organizational sustainability. Management skills are highlighted as a critical component in engineering leadership, as they encompass the ability to plan, organize, and control resources efficiently. Effective engineering entrepreneurs must balance technical decision-making with financial and human resource management to optimize business performance. Engineering skills are equally essential, as they provide the technical foundation for decision-making and problem-solving in complex industrial projects. A leader's ability to understand technical processes enables informed decision-making, particularly in high-investment projects requiring precision and risk mitigation. Flexibility and adaptability emerge as

indispensable traits in entrepreneurial leadership, particularly in response to rapid technological advancements and market fluctuations. Engineering businesses must continuously innovate to maintain a competitive edge, and leaders who exhibit adaptability are better positioned to integrate new technologies and navigate industry disruptions. This adaptability extends to management practices, where leaders must be agile in responding to regulatory changes, environmental concerns, and economic uncertainties. Ethics and social responsibility are emphasized as fundamental attributes that define sustainable leadership in engineering enterprises. Given the industry's impact on infrastructure, energy, and public utilities, engineering entrepreneurs bear a significant responsibility to uphold ethical standards and corporate social responsibility (CSR) principles. Ethical leadership fosters trust among stakeholders, enhances corporate reputation, and ensures compliance with industry regulations. Moreover, socially responsible engineering businesses contribute to sustainable development by prioritizing environmental conservation, workplace safety, and community engagement. Business networking is identified as another key component, reflecting the importance of building strategic alliances and partnerships within the engineering sector. Successful engineering entrepreneurs leverage their networks to access investment opportunities, secure contracts, and collaborate on large-scale projects. Networking also facilitates knowledge exchange and fosters innovation through industry collaborations and academic partnerships. Leaders who actively engage with stakeholders, including government agencies, investors, and research institutions, enhance their organization's competitive positioning in the market. Innovative thinking is underscored as a driving force behind entrepreneurial success in engineering businesses. The ability to conceptualize and implement novel solutions distinguishes leading firms from their competitors. Engineering leaders who foster a culture of innovation encourage creative problem-solving, invest in research and development (R&D), and embrace emerging technologies such as artificial intelligence (AI), automation, and the Internet of Things (IoT). The study highlights that innovation is not limited to technological advancements but also extends to business models, operational processes, and customer engagement strategies. The integration of leadership theories into the study reinforces the dynamic and contextual nature of entrepreneurial leadership in engineering businesses. Strategic leadership theory emphasizes vision-setting, long-term planning, and proactive decision-making. Engineering entrepreneurs must articulate a clear vision, define strategic objectives, and implement robust strategies to achieve sustainable growth. Situational leadership theory highlights the importance of adapting leadership styles based on the readiness and competence of team members. Engineering businesses operate in diverse and complex environments, necessitating leaders who can adjust their approach to suit varying levels of employee expertise and organizational maturity. Relational leadership theory underscores the significance of interpersonal relationships in fostering a collaborative and high-performance work culture. Effective communication, trust-building, and employee empowerment are critical in engineering enterprises, where teamwork and cross-functional collaboration drive project success.

The findings of this research contribute to the broader discourse on entrepreneurial leadership by offering insights tailored to the unique challenges and opportunities within the engineering sector. Unlike general entrepreneurial studies, which often focus on startup ventures and small businesses, this study provides a nuanced perspective on leadership within large-scale, capital-intensive industries. The emphasis on technical expertise, ethical considerations, and strategic networking differentiates engineering entrepreneurship from other business domains. The study also has practical implications for engineering professionals aspiring to leadership roles. By understanding the core components of effective leadership, aspiring engineering entrepreneurs can develop the necessary competencies to navigate the complexities of the industry. Educational institutions and professional training programs can incorporate these findings into curricula to equip future leaders with a balanced skill set that combines technical proficiency with managerial capabilities. Policymakers and industry regulators can also leverage these insights to design frameworks that support leadership development, innovation, and sustainable business practices within the engineering sector. Despite its contributions, the study acknowledges certain limitations that warrant further exploration. The reliance on secondary sources and literature reviews,

while comprehensive, may not fully capture the evolving nature of engineering leadership in real-world scenarios. Future research could incorporate empirical studies, case analyses, and interviews with industry leaders to validate and expand upon the conceptual framework presented in this study. Additionally, the study primarily focuses on engineering businesses in Thailand, and comparative analyses with other countries could provide a more global perspective on entrepreneurial leadership in engineering. In conclusion, the study presents a robust synthesis of entrepreneurial leadership in engineering businesses listed on the Stock Exchange of Thailand. By identifying key leadership components and integrating relevant theoretical perspectives, it provides a comprehensive framework for understanding and enhancing leadership effectiveness in the engineering sector. The research underscores the importance of a multidimensional leadership approach that blends technical expertise, strategic foresight, ethical responsibility, and innovative thinking. As the engineering industry continues to evolve in response to technological advancements and market demands, effective leadership will remain a cornerstone of organizational success and industrial progress. In future research, the results of this component analysis can be used to develop a research framework for testing hypotheses.

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REFERENCES

- Aboramadan, M., Albashiti, B., Alharazin, H., & Zaidoune, S. (2020). Organizational culture, innovation and performance: a study from a non-western context. *Journal of Management Development*, 39(4), 437-451.
- Al-Aghbar, L., Elshurafa, O., & Lowrey, J. S. (2019). Book Review: Northouse & Lee (2019) *Leadership Case Studies in Education*. *Canadian Journal of Educational Administration and Policy*, (189).
- Aliasghar, O., & Rose, E. L. (2023). Adjustment strategies for firms affected by international sanctions. *Multinational Business Review*, 31(4), 586-601.
- Alkhawaldeh, K. A., & Dabaghie, Y. M. (2024). Developing an “entrepreneurial engineer mindset” to expand future career opportunities for engineering graduates in Jordanian universities. *Industry and Higher Education*, 38(5), 445-456.
- Arkadiusz, B., Grzegorz, R., Andrzej, T., Adam, R., Marcin, D., & Anna, K. (2024). Uterine perforation during hysteroscopy and dilation and curettage and its management. *European Journal of Obstetrics and Gynecology and Reproductive Biology*, 293, 88-89.
- Bass, L. R. (2020). Black male leaders care too: An introduction to Black masculine caring in educational leadership. *Educational Administration Quarterly*, 56(3), 353-395.
- Blanchard, O. (2019). Public debt and low interest rates. *American Economic Review*, 109(4), 1197-1229.
- Bowkett, S., & Hitchman, T. (2023). *Understanding the World Through Narrative: 160+ Classroom Activities in Fiction, Mythology, Science, History, and the Media: StoryWise for 9–15 year-olds*. Routledge
- Fehr, E., & Fischbacher, U. (2003). The nature of human altruism. *Nature*, 425(6960), 785-791.
- Khalid, A., Chin, C. A., Atiqullah, M. M., Sweigart, J. F., Stutzmann, B., & Zhou, W. (2013, June). Building a better engineer: The importance of humanities in engineering curriculum. In *2013 ASEE Annual Conference & Exposition* (pp. 23-256).
- Khalid, A., Chin, C. A., Atiqullah, M. M., Sweigart, J. F., Stutzmann, B., & Zhou, W. (2013, June). Building a better engineer: The importance of humanities in engineering curriculum. In *2013 ASEE Annual Conference & Exposition* (pp. 23-256).
- Leevers, H. (2023, December). A new strategy for securing the future of the engineering profession.

- In *Proceedings of the Institution of Civil Engineers-Civil Engineering* (Vol. 177, No. 1, pp. 8-9). Emerald Publishing Limited.
- Litchfield, K., Javernick-Will, A., & Maul, A. (2016). Technical and professional skills of engineers involved and not involved in engineering service. *Journal of Engineering Education*, 105(1), 70-92.
- Litchfield, N. J., Villamor, P., Dissen, R. J. V., Nicol, A., Barnes, P. M., A. Barrell, D. J., ... & Zinke, R. (2018). Surface rupture of multiple crustal faults in the 2016 M w 7.8 Kaikōura, New Zealand, Earthquake. *Bulletin of the Seismological Society of America*, 108(3B), 1496-1520.
- Munir, N., Hanif, M., Abideen, Z., Sohail, M., El-Keblawy, A., Radicetti, E., ... & Haider, G. (2022). Mechanisms and strategies of plant microbiome interactions to mitigate abiotic stresses. *Agronomy*, 12(9), 2069.
- Mao, K., Huang, Y., Liu, Z., Sui, W., Liu, C., Li, Y., ... & Lou, B. (2025). Oxidative stress mediates retinal damage after corneal alkali burn through the activation of the cGAS/STING pathway. *Experimental Eye Research*, 251, 110228.
- Scheibner, M., Schmidt, T., Worschech, L., Forchel, A., Bacher, G., Passow, T., & Hommel, D. (2007). Superradiance of quantum dots. *Nature Physics*, 3(2), 106-110.
- Ullah, N., Lu, D., & Nadeem, S. (2024). Enhancing thermal performance in enclosures filled with nanofluids subjected to sinusoidal heating: a numerical study. *Engineering Applications of Computational Fluid Mechanics*, 18(1), 2338522.
- Wang, T. D., Chiang, C. E., Chao, T. H., Cheng, H. M., Wu, Y. W., Wu, Y. J., ... & Lin, T. H. (2022). Guidelines of the Taiwan Society of Cardiology and the Taiwan Hypertension Society for the management of hypertension. *Acta Cardiologica Sinica*, 38(3), 225.
- Ullah, N., Lu, D., & Nadeem, S. (2024). Enhancing thermal performance in enclosures filled with nanofluids subjected to sinusoidal heating: a numerical study. *Engineering Applications of Computational Fluid Mechanics*, 18(1), 2338522.