



Human-centered strategies for sustainable firm growth through competitive advantage in the gypsum board industry in Indonesia

Author Name(s): Sutanto Sutanto, Sri Widyastuti, Mombang Sihite

Publication details, including author guidelines

URL: <https://jurnal.konselingindonesia.com/index.php/jkp/about/submissions#authorGuidelines>

Editor: Refnadi

Article History

Received: 6 Jul 2025

Revised: 17 Sept 2025

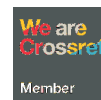
Accepted: 11 Nov 2025

How to cite this article (APA)

Sutanto, S., Widyastuti, S., & Sihite, M. (2025). Human-centered strategies for sustainable firm growth through competitive advantage in the gypsum board industry in Indonesia. *Jurnal Konseling dan Pendidikan*. 13(3), 286-316. <https://doi.org/10.29210/1161400>

The readers can link to article via <https://doi.org/10.29210/1161400>

SCROLL DOWN TO READ THIS ARTICLE



Indonesian Institute for Counseling, Education and Therapy (as publisher) makes every effort to ensure the accuracy of all the information (the "Content") contained in the publications. However, we make no representations or warranties whatsoever as to the accuracy, completeness, or suitability for any purpose of the Content. Any opinions and views expressed in this publication are the opinions and views of the authors and are not the views of or endorsed by Indonesian Institute for Counseling, Education and Therapy. The accuracy of the Content should not be relied upon and should be independently verified with primary sources of information. Indonesian Institute for Counseling, Education and Therapy shall not be liable for any losses, actions, claims, proceedings, demands, costs, expenses, damages, and other liabilities whatsoever or howsoever caused arising directly or indirectly in connection with, in relation to, or arising out of the use of the content.

Jurnal Konseling dan Pendidikan is published by Indonesian Institute for Counseling, Education and Therapy comply with the [Principles of Transparency and Best Practice in Scholarly Publishing](#) at all stages of the publication process. Jurnal Konseling dan Pendidikan also may contain links to web sites operated by other parties. These links are provided purely for educational purpose.



This work is licensed under a [Creative Commons Attribution 4.0 International License](#).

Copyright Sutanto, S., Widyastuti, S., & Sihite, M. (2025).

The author(s) whose names are listed in this manuscript declared that they have NO affiliations with or involvement in any organization or entity with any financial interest (such as honoraria; educational grants; participation in speakers' bureaus; membership, employment, consultancies, stock ownership, or other equity interest; and expert testimony or patent-licensing arrangements), or non-financial interest (such as personal or professional relationships, affiliations, knowledge or beliefs) in the subject matter or materials discussed in this manuscript. This statement is signed by all the authors to indicate agreement that the all information in this article is true and correct.

Jurnal Konseling dan Pendidikan

ISSN 2337-6740 (Print) | ISSN 2337-6880 (Electronic)



Article

Human-centered strategies for sustainable firm growth through competitive advantage in the gypsum board industry in Indonesia



Sutanto Sutanto^{*}, Sri Widyastuti, Mombang Sihite

Faculty of Economics and Business, Universitas Pancasila, Jakarta, Indonesia

ABSTRACT

Keywords:

Human-Centered Strategy
Sustainable Firm Growth
Competitive Advantage
Agile Leadership
Gypsum Board Industry

This study explores the implementation of human-centered strategies to achieve sustainable firm growth through competitive advantage in Indonesia's gypsum board industry. Amidst a highly competitive landscape marked by market oversupply, dynamic economic cycles, and intense global consolidation, companies face increasing pressure to innovate and adapt. Using a mixed-methods approach—quantitative analysis with Partial Least Squares Structural Equation Modeling (PLS-SEM) and qualitative interviews—the study examines the influence of innovation, dynamic capabilities, and agile leadership on competitive advantage and sustainable growth. The findings reveal that agile leadership has the most substantial and direct impact on both competitive advantage and sustainable firm growth. Innovation and dynamic capabilities positively influence competitive advantage but do not directly affect growth unless mediated by that advantage. Notably, the moderating effect of the product life cycle is found to be insignificant, suggesting a homogeneous industry life stage and highlighting the need for deeper strategic differentiation. This study introduces a human-centered strategic framework that integrates leadership agility, employee-driven innovation, and adaptive organizational behavior as critical levers for long-term sustainability. It emphasizes the transformation of internal capabilities—creativity, responsiveness, and collaboration—into market-oriented advantages such as product quality, timely delivery, and brand reputation. By contributing to the theoretical discourse on the Resource-Based View and Dynamic Capability Theory, while providing practical insights for manufacturing sectors, this research offers a valuable roadmap for firms seeking to thrive in volatile and maturing industries.

Corresponding Author:

Sutanto Sutanto,
Universitas Pancasila
Email: sutanto5118230017@univpancasila.ac.id

Introduction

The gypsum board industry is one of the important sectors in infrastructure and housing development in Indonesia, especially in supporting the need for efficient, lightweight, and environmentally friendly construction materials (Lushnikova & Dvorkin, 2016; Sutanto et al., 2025). The rapid development of the property sector and urbanization has increased the demand for quality gypsum board products, encouraging companies to continue to innovate in their growth strategies (Shruthi et al., 2024; Wattie et al., 2024). However, in practice, many companies are still focused on cost efficiency and production volume, without paying attention to the human aspect as the center of long-term competitive advantage (Pirson & Lawrence, 2010).

In the context of the manufacturing industry, a human-centered approach is increasingly relevant, especially in creating sustainable value for the company (Norman & Verganti, 2014). Strategies that place human resources as drivers of innovation, transformative leadership, and organizational learning have been shown to strengthen the competitiveness of companies in various sectors, including the construction industry sector (Asad et al., 2021; Delery & Roumpi, 2017). In addition, employee involvement in decision-making and business strategy design is an important indicator in building knowledge-based competitive advantage (J. Barney, 1991; Nonaka, 2009).

Sustainability in company growth depends not only on external factors such as market conditions or government policies, but also on the company's internal ability to develop an adaptive and collaborative organizational culture (Porter & Kramer, 2011). In the highly competitive gypsum board industry which is affected by fluctuations in raw material prices and competition from substitute products, orientation towards human resource development is a strategic need (Amri et al., 2017; Gunarty, 2023). Therefore, the adoption of a human-centered strategy needs to be studied in depth as an innovative approach in responding to the challenges of sustainable growth (Martini et al., 2024).

In addition, changes in the global business environment, ESG (environmental, social, and governance) pressures, and digitalization also require companies to redesign their business processes with a more inclusive and participatory approach (Kim & Mauborgne, 2015; Prahalad & Ramaswamy, 2004). A strategy that not only relies on product differentiation but also pays attention to employee experience and capabilities holistically is considered capable of producing more resilient sustainable growth (R. M. Grant, 1996; Ulrich et al., 2010). Within this framework, it is important to examine how the human-centered strategy is specifically applied in the gypsum board industry in Indonesia which has its own characteristics.

The phenomenon of the economic cycle is the fluctuation of the economy between periods of expansion (growth) and contraction (recession). Factors such as gross domestic product (GDP), interest rates, total employment, and consumer spending, can help determine the current stage of the economic cycle. The four stages of the economic cycle are also referred to as the business cycle. The four stages are expansion, peak, contraction, and trough, as shown in Figure 1.

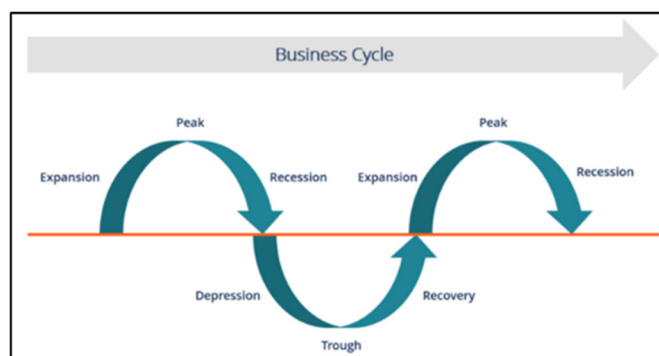


Figure 1 Business Life Cycle

Source: <https://corporatefinanceinstitute.com/resources/economics/business-cycle/>

In the expansion phase, the economy experiences relatively rapid growth, interest rates tend to be low, production increases, and inflationary pressures increase. The peak of a cycle is reached when growth reaches its maximum level. Peak growth usually creates some imbalances in the economy that need to be corrected. This correction occurs through a period of contraction when growth slows, employment falls, and prices stagnate. The trough of the cycle is reached when the economy reaches its lowest point and growth begins to recover.

According to Önder & Ula an (2018), Ibn Khaldun, who is known as one of the leading theorists in 14th-century Islamic political thought, Ibn Khaldun greatly influenced scholars with his thoughts on economics, history, sociology, and philosophy (Önder & Ulaşan, 2018). Thanks to his opinions and findings, Stowasser considers him the father of social science. One of Ibn Khaldun's most impressive ideas is the cycle theory that defines the rise and fall of sovereign powers (dynasties, empires, civilizations, states). The life cycle theory assumes that sovereign powers are like living organisms,

they are born, grow, mature, and die. To explain this pattern, Ibn Khaldun uses the concept of Umran and Asabiyya. Umran and Asabiyya are the glue of the cycle theory that explains the birth and death of sovereign power. Ibn Khaldun's cycle theory was then adopted in the world of economics, business, industry, organizations, products, technology and so on. In business there are many life cycles that are set which aim to classify the existence of a business for direction in decision making.

According to Li & Tan (2004) life cycle theory can help companies decide when, how, and whether to invest in a product or service. Furthermore, Li & Tan (2004) in their research see how companies can improve their performance by utilizing life cycle theory. It also focuses on the relationship between product life cycle, technology life cycle, business life cycle, organization life cycle, market life cycle and the company's strategic choices - relationships that are central to the field of strategy (Li & Tan, 2004).

A glimpse of the gypsum board industry in Indonesia. Initially, gypsum board products were present in Indonesia through imports from America, Korea, and Australia. However, since 1994 the first gypsum board company was produced by PT Petrojaya Boral Plasterboard with the Jayaboard brand. Indonesia with the fourth largest population is a very promising market. Since 1996, global companies, joint ventures, and local companies have invested in Indonesia. Competition in the gypsum board industry in Indonesia is very dynamic and tight, with the condition of installed production capacity still above market capacity consumption as shown in Figure 1.4. Market Vs Gypsum Industry Capacity Estimates in Indonesia, where the oversupply condition has occurred since 2012 until the estimated 2025F.

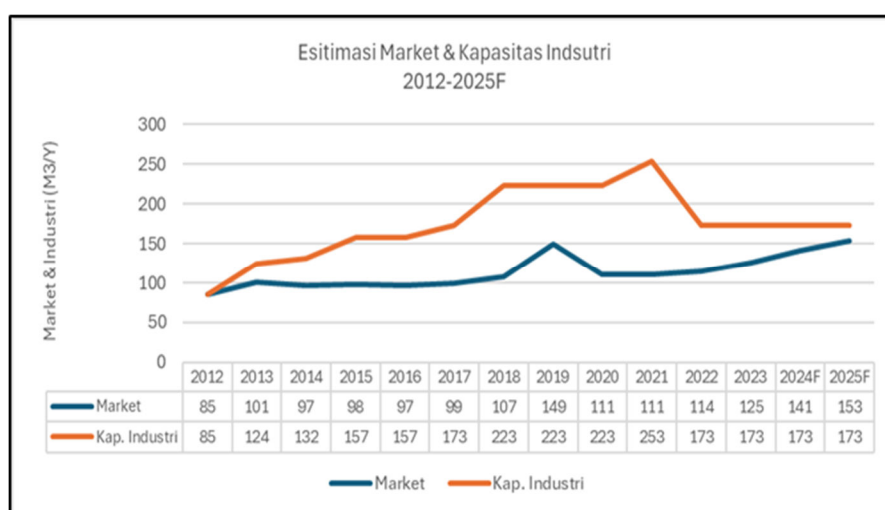


Figure 2 Market Estimates Vs Gypsum Industry Capacity in Indonesia
Source: Presurvey and internal data

The condition of industrial capacity is greater than the per capita consumption capacity, this causes a very competitive industrial competition condition, one of the companies must close operations (St Gobain) in 2021 in Indonesia and the acquisition of PT Petrojayaboard Plastrboard by PT Knauf Gypsum Indonesia in 2021, so that industrial capacity decreases drastically in Figure 4. This is the first gap research in this dissertation or the problem of oversupply in the Indonesian gypsum board industry, which causes the threat of companies closing operations or being acquired by other companies. The phenomenon of the life cycle of the gypsum board industry in Indonesia is an interesting background for further research. According to Marzieh (2015), every phenomenon has an unlimited life cycle, which can be considered from various aspects and can be classified based on different categories. In the industry there are many established life cycles that aim to classify the existence of the industry to facilitate the direction of decision making. The simplest life cycle in the industry and market area is the product life cycles, which describe the path of a product from the early stages of its birth to the final phase of its death from the insight of sales revenue (Shahmarichatghieh et al., 2015).

The current condition of the gypsum board industry cycle in Indonesia is still in the growth stage, as can be explained in Figure 3.

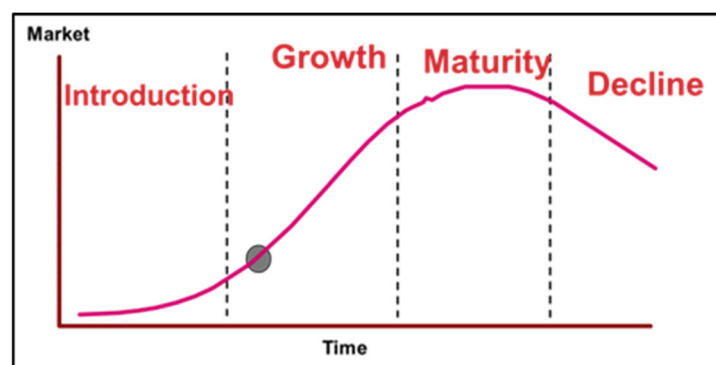


Figure 3 Life Cycle of Gypsum Board Industry

Source: Processed from research results

In Indonesia, per capita consumption per year is still very small, if observed in table 1.1. per capita consumption of gypsum board in Indonesia is 0.41m² in 2020 and the estimated per capita consumption is 0.65m² in 2025.

Table 1. Estimates of Gypsum Board Consumption in Indonesia

	2020	2021	2022	2023	2024	2025F
Population (million)	270	273	276	279	282	286
Cons.per capita	0,41	0,41	0,41	0,45	0,5	0,65

Source: Processed from research results

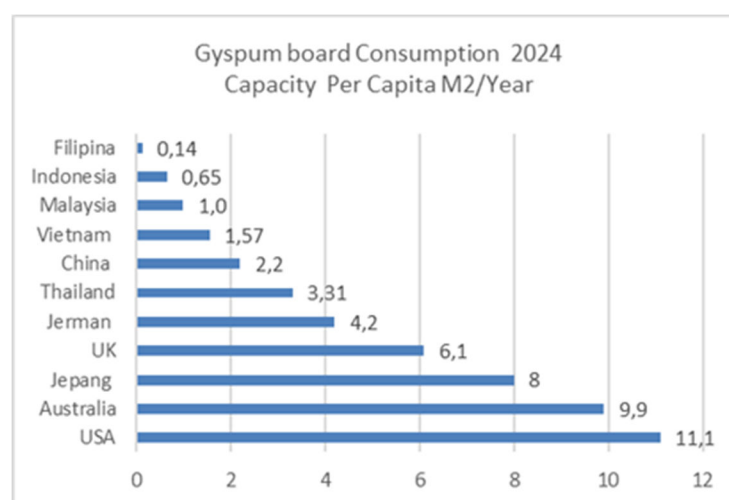


Figure 4 Gypsum Board Consumption in Developed Countries

Source: Global Gypsum

As a comparison, world per capita consumption in developed countries such as in Figure 1.4. such as America can reach 11.1 m²/capita/year, Japan reaches 8 m²/capita/year, European countries represented by England 6.1 m²/capita/year. For ASEAN standards, Thailand is the largest per capita consumption of gypsum board, Thailand as one of the largest gypsum mining reserves in the world.

Referring to Figure 5. about the product life cycle of the gypsum board industry in Indonesia is still in the early stages of introduction and still has a long way to go to continue to grow. We can compare this with the potential per capita consumption of gypsum board in Indonesia which is still relatively small compared to developed countries, as presented in Figure 1.6. about per capita consumption of gypsum board.

Gypsum board was first produced in Indonesia in 1994, under the name Jayaboard®, by PT Petrojaya Boral Plasterboard, which is a joint venture between PT Jaya Readymix Indonesia and BORAL from Australia. Then the gypsum board industry developed in the period from 1996 to 2000, where the Indonesian market was believed to be very promising with the potential of the population and economy that continued to grow. However, in 1997 there was a monetary crisis that started in Thailand which was known as the Tomyang Kung crisis, the fall of the Thai Bath currency, which had a domino effect on all countries in ASEAN. In 1998 in Indonesia there was also a political symptom, namely the fall of the New Order regime, this had an impact on all business worlds, industries, and especially the gypsum board industry. As a result of the political crisis in Indonesia in the period 1996-1999, several gypsum board industry companies were forced to close or be sold because they could not compete, as presented in table 2. Dynamics of Establishment, Merger & Acquisition of Gypsum Board Companies in Indonesia.

Table 2. Dynamics of Establishment, Merger & Acquisition of Gypsum Board Companies in Indonesia

Company	Year of Establishment	Investment Country/Group	Production capacity at beginning - (million m2/year)	Status	Brand Description
PT Petrojaya Boral Plasterboard (USGBORAL Indonesia)	1994	Australia & USA/ USGBORAL	65	April 2021 Merger & Acquisition by Knauf Germany	Knauf, Jayaboard, Indoboard
PT. CSR Prima Karya Plasterboard	1996	Australia/ CSR	18	2002, closed operations	CSR
PT Thai Gypsum Surya Indonesia	1996	Thailand & Indonesia JV /Thai Gypsum & Batara Surya Indonesia&	15	2003, 100% acquired by Knauf Germany	TG becomes Knauf Brand
PT Siam-Indo Gypsum Industry	1996	Indonesia& Thailand JV / SCG&Wings	22	Actively operating	Elephant, Eboard, Star
PT Ikad Kedaung Aneka Gypsum	1999	Indonesia/ Kedaung Group	40	2000 went bankrupt	Sky
PT Indal Aluminium	1999	Indonesia / Maspion	6	2020 100% acquired by Knauf Germany	Indalboard becomes Knauf
PT Aplus Pacific	2000	Indonesia	20	Actively operating	Aplus, Indogyp
PT. Saint-Gobain Construction Products Indonesia	2012	France/ Saint Gobain	33	2019 closed operations	Gyproc
PT Yoshino Indonesia	2018	Japan	30	Actively operating	Yoshino

Source: Processed from research results

A more detailed review of the development of the gypsum board industry and the profile of gypsum board companies, the dynamics of mergers & acquisitions, the closure of gypsum board factories in Indonesia will be presented more completely in CHAPTER IV. This is the reason for researchers to choose to analyze and study further.

Over the past decade, researchers' interest in the concept of dynamic capability has increased. This interest can be explained by growing awareness of the impact of dynamic capability on competitiveness, business practices, and performance outcomes (Giniuniene & Jurksiene, 2015). In the scientific literature, researchers (Eisenhardt & Martin, 2017; Porter, 2008; D. J. Teece, 2009; Winter, 2003) recognize dynamic capability as a key factor in organizational innovation and competitiveness. According to Teece, Pisano, & Shuen (1997), dynamic capability functions as an explanatory tool to analyze a company's ability to build competitive advantage in times of uncertainty and change (D. J. Teece et al., 1997). From the description above, the importance of dynamic capability in building competitive advantage to find sustainable company performance. Given the description of the company's aggressive expansion and acquisitions that show dynamic capability. This may also apply to the gypsum board industry in Indonesia.

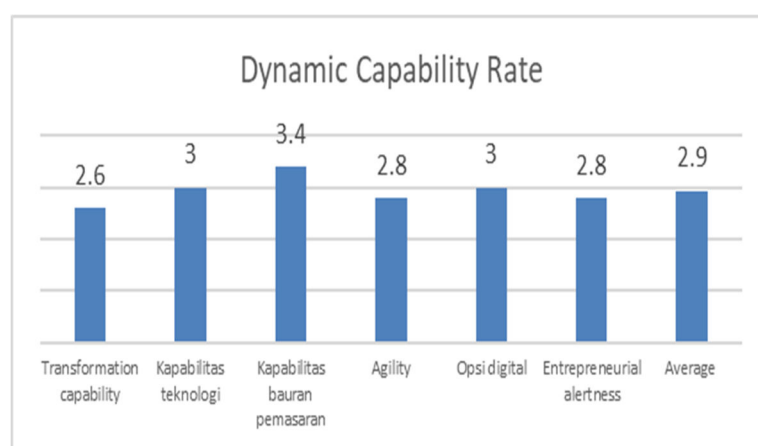


Figure 5 Pre-Survey of Dynamic Capability Implementation
Source: Pre-survey results of Five Gypsum Board Companies in Indonesia

Referring to the results of a pre-survey conducted on 5 gypsum board companies in Indonesia, it can be seen that the level of implementation of dynamic capability is still quite good, because the average score is only 2.9. Transformation capability, technological capability, marketing mix capability, agility, digital options, entrepreneurial alertness. It can be seen that only the marketing mix dimension has a fairly good level of implementation with a score of 3.4.

During an emergency, some companies can quickly reconfigure their innovation and production processes to help support health services and others to address the shortage of needed supplies. Using a dynamic capability perspective, this work aims to understand which capabilities enable companies to have a fast innovation reaction when they are not pursuing competitive advantage but are responding to community needs (Puliga & Ponta, 2022). The ability to reconfigure a company's resources has been widely studied by the dynamic capability framework (Bogers et al., 2019; D. Teece, 2020). This capability is critical to the success of companies in dynamic markets. So far, dynamic capability has always been considered as a determining factor for gaining competitive advantage and gaining economic benefits. In a stagnation phase situation, companies have a fast innovation response to address societal needs and not market success. Thus, the research gap investigated in this paper is to investigate the importance of dynamic capability to have a fast reaction not to gain competitive advantage but to address societal needs.

Referring to the results of the pre-survey conducted on 5 gypsum board companies in Indonesia, it is seen that the level of innovation implementation is still quite good, because the average score is only 2.9. Risk-taking culture, business intelligence, customer orientation, business planning, It can be seen that only the dimensions of customer orientation and knowledge capability have a fairly good level of implementation with a score of 3.2.

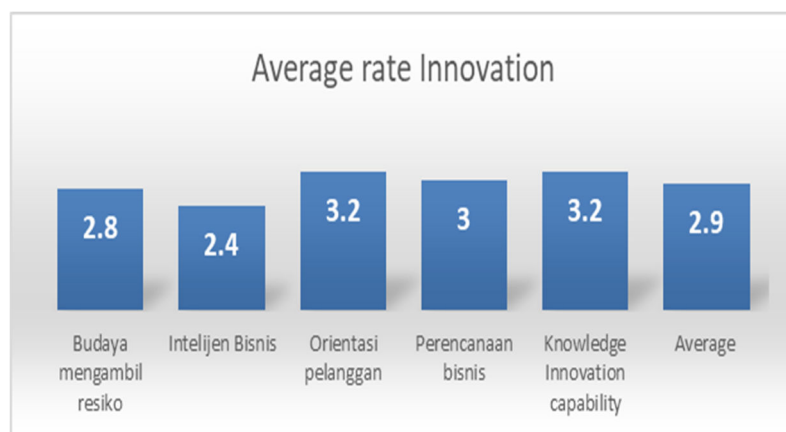


Figure 6 Pre-survey of Innovation Implementation

Source: Pre-survey results of Five Gypsum Board Companies in Indonesia

Table 3. Comparison of Gypsum Board Brands in Indonesia in Terms of Business Strategy

Feature	Gypsum Board Brands					
	Elephant	Usgboral	Knauf	Gyproc	Aplus	Yoshino
Product; features and quality	Premium quality	Premium quality & complete product range	Medium quality & complete product range	Medium quality & complete product range, Tour to Europe	Low quality & complete product range	Premium quality
CRM Strategies	Strong relationship & Tour target to Whole seller	Strong relationship at Architect	Strong relationship at Architect & tour to Knauf Germany	Relationship to Wholesale	Barter products with property for Big developers	relationship to distributor & factory tour Japan
R&D strategies	Using machine from Europe	Product technology by USG patent, technical design, installation, Jayaboard®	Product technology by KNAUF Germany, technical design, installation	Product by Gyproc England	Using Machine Technology from China	Product Technology by Yoshino Japan
Product innovation	Elephant premium, Eboard, Star for fighting brands	SHEETROCK® plasterboard which contains Sag-Defying-Strength™ technology, Jayaboard®	Densishield, Knauf Appetura gypsum board with sound absorbing featue	Habito hanging resistant gypsum board	The lightest gypsum board 13.3 kg, Aplus G strength	High clean gypsum board
		SHEETROCK® PROTECH is the first standard gypsum board in Indonesia				

Feature	Gypsum Board Brands					
	Elephant	Usqboral	Knauf	Gyproc	Aplus	Yoshino
		with Air-Purifying technology, as a form of Jayaboard®'s commitment to consistently provide high-quality products.				
System innovation	Economical full system product, introducing quickwall	Economical full system product, introducing easy finish walls	Full system product	Full system product	Full system & economical frame products, & gypsum accessories	Full system product

Source: Processed from research results

Marketing and sales leaders need to operate simultaneously across three distinct states: the current crisis, planning for recovery, and leading the next normal. The elements of speed and agility are particularly important because these once-in-a-generation horizon challenges are likely to have a profound impact on who is left standing when the crisis finally subsides. During a downturn, for example, consumers and customers tend to transact down, that is, buy cheaper products, resulting in major shifts at the top and bottom ends of the market. Consumers will reposition themselves and shift to digital channels, products, and services, opening up another front in the battle for new and existing customers (Gregg, Hazan, et al., 2020; Gregg, Kim, et al., 2020). According to Gies (2020), modern leadership is moving away from classic top-down management toward a bottom-up management philosophy. Technological advances, dynamic markets, and innovative competition require dynamically robust capabilities to act. Agile principles and procedures are becoming indispensable in innovative organizations (Gies, 2020). From the description above, the importance of agile leadership is able to adapt to business cycles that have high volatility and to increase competitive advantage, so as to have sustainable performance. This situation also applies to the gypsum board industry in Indonesia, where there have been changes in top and middle-level leadership.

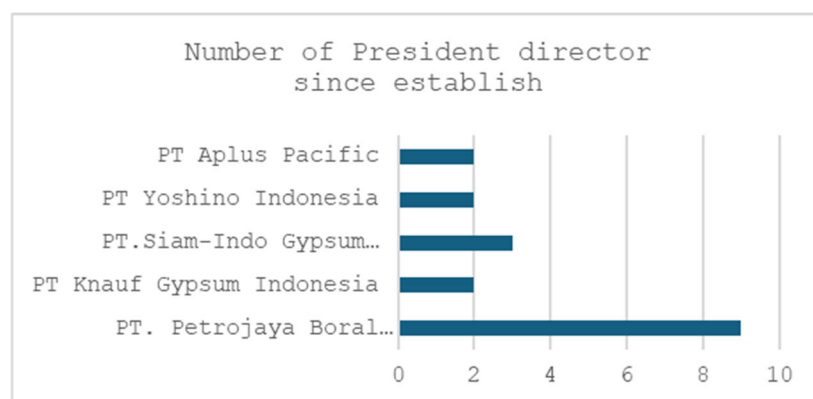


Figure 7. Agile Leader Pre-survey

Source: Pre-survey results of Five Gypsum Board Companies in Indonesia

To survive and thrive today, many organizations are making a fundamental shift from traditional organizational models designed for the industrial economy to agile models designed for today's

digital economy. This paradigm shift marks a new form of organization that enables innovation, collaboration, and value creation at unprecedented speed, scale, and impact. Agile organizations can develop products five times faster, make decisions three times faster, and reallocate resources quickly and rapidly (De Smet et al., 2018).

This new type of agile organization requires a new and fundamentally different type of leadership. Recent research confirms that leadership is more important in agile organizations. Leadership and how leadership shapes culture are the biggest barriers to and the biggest enablers of successful agile transformation (De Smet et al., 2018). From the description above, the importance of agile leadership, the dynamic capabilities of the organization in sustainable business growth. This may also apply to the gypsum board industry in Indonesia.

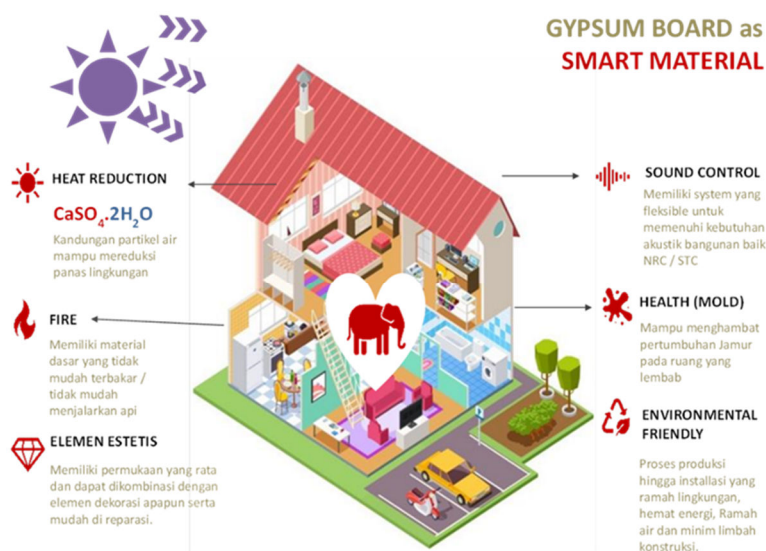


Figure 8. Advantages of Gypsum Board in Buildings
Source: Elephant® Gypsum

A glance at the application of gypsum board, gypsum board is basically an interior material used in residential and commercial buildings as a ceiling layer, or as a wall divider. The advantages of gypsum board material are that it is lightweight, easy to work with, easy to decorate, more heat resistant, more fire resistant, and environmentally friendly, as illustrated in figure 1.10. The application of gypsum board as a room divider or partition provides different properties such as reducing sound transmission between rooms, and moisture accumulation in bathrooms and kitchens, depending on the various additives added to the final gypsum board product. Depending on the application, gypsum board is also available in various sheet sizes and thicknesses. For example, acoustic gypsum board limits sound while thermal gypsum board helps reduce energy loss from buildings. With rapid urbanization across the world, especially in developing countries, leading to an exponential rise in the construction industry, the global market for gypsum board is projected to grow at a healthy rate during the forecast period 2016 to 2023.

From the description of the application of gypsum board as an interior material, the advantages of gypsum board, and the types of gypsum board products according to the needs of the application. In increasing competitive advantage, gypsum board manufacturers need to innovate products and applications, with the aim of achieving sustainable performance. Innovation has become a universal characteristic of corporate resilience. Almost no company can survive without innovation. Although innovation can refer to products, processes, systems, administrative procedures, or technology, managers need to think holistically. According to Prange & Schlegelmilch, (2017) to adopt this holistic perspective, namely by using three dimensions: change impact, strategic impact, and market impact (Prange & Schlegelmilch, 2018). The results of this study explain that it is necessary to apply an innovation strategy in competitive advantage in the gypsum board industry in Indonesia as described above. This is the basis for a study related to sustainable performance influenced by innovation and competitive advantage.

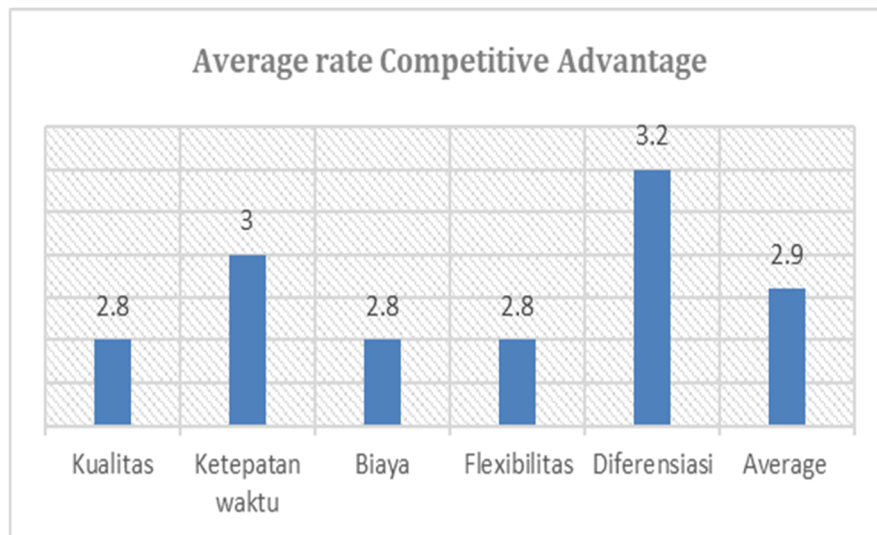


Figure 9. Pre-survey of Competitive Advantage Implementation
Source: Pre-survey results of five gypsum board companies in Indonesia

Referring to the results of the pre-survey conducted on 5 gypsum board companies in Indonesia, it can be seen that the level of implementation of competitive advantage is still quite good, because the average score is only 2.9. Quality, cost, and flexibility, only the dimensions of differentiation and timeliness are seen to have a fairly good level of implementation with a score of 3.2.

Competitive advantage is a management concept that has long been a literature in research (Dranove et al., 2017; G. Grant et al., 2019; Peteraf, 1993) and is becoming popular again today. In addition, the newer concept of Sustainable Competitive Advantage has also become a major area of research, especially in theoretical and empirical studies based on the resource-based view of the firm (J. B. Barney & Clark, 2007; Foss & Knudsen, 2003; Wiggins & Ruefli, 2002) and is currently popular (Lu & Thawattathree, 2011).

Table 4. Gypsum Board Companies Operating or Formerly Operating in Indonesia (Present)

Company	Establish	Investment Country/Group	Current Production Capacity m2/Year	Operational Status	Brand/Remark
PT Siam-Indo Gypsum Industry	1996	Joint Venture Indonesia & Thailand (SCG & Wings Group)	30	Active	Elephant, E'board, Star
PT Aplus Pacific	2000	Indonesia	28	Active	Aplus, Indogyp
PT Yoshino Indonesia	2018	Jepang (Yoshino Gypsum Co.)	30	Active	Yoshino
PT Knauf Plasterboard* Indonesia	2021	Germany (Knauf Group)	65	Active	Knauf, Jayaboard, Indoboard
PT Saint-Gobain Construction Products Indonesia	2012	France (Saint-Gobain Group)	33	Inactive (ceased operation (2019))	Gyproc

Source: Processed from research results

Note. **PT Knauf Plasterboard Indonesia is the result of a merger of several entities, including PT Petrojaya Boral Plasterboard and PT Knauf Gypsum Indonesia. All Knauf production is now centralized in the former Jayaboard factories located in Cilegon and Gresik, following the closure of the Knauf plant in Cikampek.*

Gypsum board manufacturers in Indonesia are also experiencing growth and intense competition, this is because the supply conditions are greater than the available market capacity. One of the multinational companies, namely Saint Gobain with the Gyproc gypsum board brand in 2020, has temporarily closed its business. At the global level in 2019, there was also a 100% acquisition of USG, the largest gypsum board producer in America by Knauf from Germany, this had an impact on the USG Boral joint venture in Asia Pacific, of course in Indonesia. In 2021, there was a merger between the pioneer and largest player in Indonesia, namely PT Petrojaya Boral Plasterboard with PT Knauf Gypsum Indonesia. From the description above, competitive advantages also apply to the gypsum board industry in Indonesia.

The global gypsum board market capitalization is expected to reach USD 30.77 Billion by 2026, according to a new report by Report and Data. The booming construction and infrastructure industry will drive the market growth. Rising disposable income, attributed to the growing population globally, will drive the market growth. Moreover, increasing investment in smart cities in developing countries will also boost the demand for gypsum board across the globe. Furthermore, innovation and advancement due to increasing investment in R&D in the construction sector are other factors responsible for the market growth. Development of eco-friendly and sustainable construction methods will impact the demand for gypsum board in the coming years from report and data, 2019.

Rising employment opportunities and availability of skilled labor due to the growing population across the globe are also impacting the market growth. This is also boosting commercial and residential construction projects across the globe. Gypsum board is primarily made up of gypsum. Countries such as China, the US, and Iran are the major producers of gypsum. The increasing demand for gypsum is due to large-scale industrialization that creates a need for rapid infrastructure improvements. This, in turn, drives the market for boards. In addition, increasing government investments and booming private real estate sector, due to increasing urban migration in developing countries, are also expected to contribute to the market growth in the future from report and data, 2019.

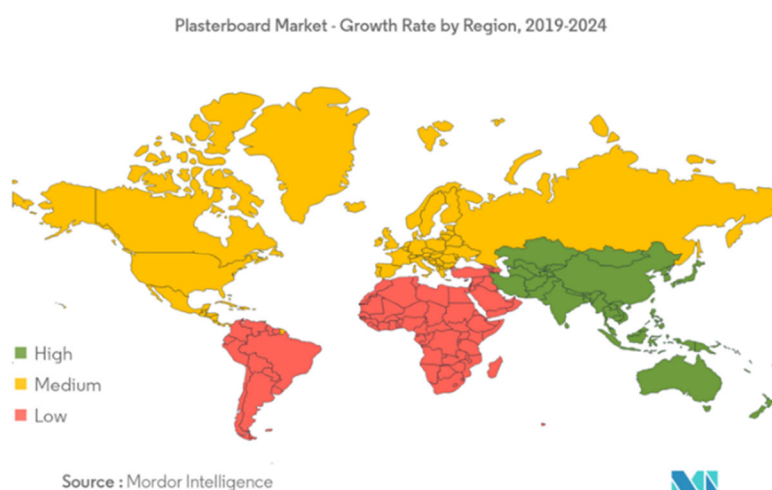


Figure 10 Plasterboard Market

The global gypsum board market is projected to grow by US\$ 8.9 Billion, driven by a compound growth of 5.5%. Standard, one of the segments analyzed and measured in the study, shows the potential to grow by over 5.9%. The shifting dynamics supporting this growth make it imperative for businesses in this space to stay abreast of the market changes. Poised to reach over US\$ 8.3 Billion by 2025, it will bring in healthy profits adding significant momentum to global growth by Reportlinker, 2019.

Based on data from the July 2020 edition of the Global Gypsum report, the gypsum board industry records a map of the gypsum board industry in twenty-five countries in the world, with production capacity, market share percentage, per capita consumption and number of factories as in table 1.5. map of production capacity and per capita consumption of the world gypsum board industry. Currently, Indonesia is ranked fifteenth in the world, still below Thailand at thirteenth.

In terms of producers in the gypsum board industry in the world. According to a survey in the report in Global Gypsum magazine, the ten largest Gypsum board producers in the world in 2020. Currently, Knauf is listed as the largest producer in the world, this position was achieved after Knauf acquired USG in America, where USG is the largest producer in the United States in 2019. The business strategy that is widely used by large producers in the world is to expand to other countries such as developed countries in Asia. Another strategy is to carry out mergers and acquisitions and also mergers or joint ventures between gypsum board producers. The gypsum board industry in the world is dominated by ten of the world's top 10 players who control 81% of the world's market share.

According to Global Gypsum, the two most aggressive manufacturers expanding their business worldwide are Knauf and Saint Gobain from Europe, namely, the names and estimated production capacity of the ten largest manufacturers in the world can be seen in Figure 11.

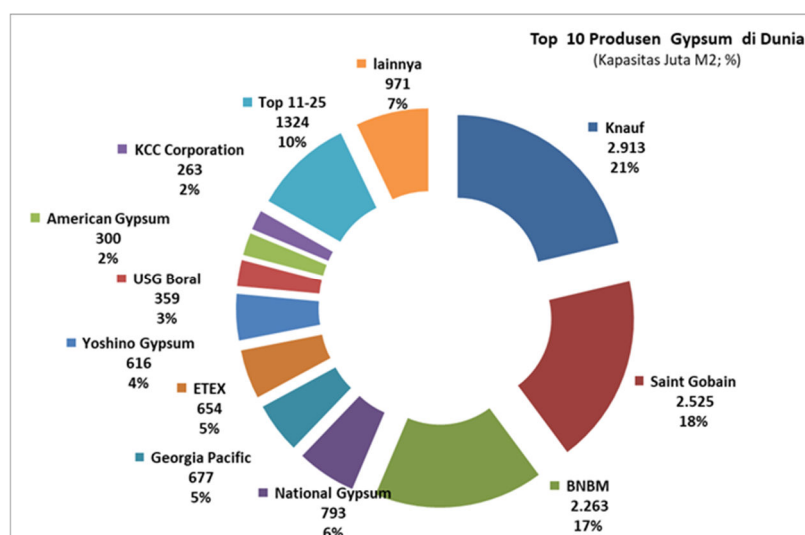


Figure 11 The 10 largest Gypsum Board Companies in the World
Source: Global Gypsum

Table 6 shows the annual production capacity data, global percentage, and number of factories of twenty-five gypsum board manufacturers in the world. The three largest manufacturers in the world with a production capacity of more than two thousand two hundred million square meters per year are Knauf, Saint Gabain from Europe, and BNBM from China. For the fourth place is National Gypsum from America which before being occupied by USG Corp., USG disappeared as a company but remained as a brand in the American market, this was due to the acquisition made by Knauf. Merger and acquisition strategies often occur in the gypsum board industry in the world.

Companies that grow and develop well, historically exceeding the specified targets, are an indication that the company is trusted by the market because it has a good reputation (Kiouis et al., 2007). A good reputation has the potential to increase the company's performance targets because the market trusts the company (Keh & Xie, 2009). The growth of good company performance is certainly inseparable from the human resources within it, achieving a company's reputation as an initial step in achieving competitive advantage is seen as important to be created by human resources within it, this certainly has an ultimate goal, namely sustainable company performance. If referring to the survey conducted, gypsum board companies in Indonesia such as USG Boral, Knauf, Saint Gobain, Yoshino are multinational companies that have a good reputation and besides other

companies such as Siam-Indo are also subsidiaries of SCG and Wings Group. From the description above, the importance of competitive advantage in finding sustainable company performance. This may also apply to the gypsum board industry in Indonesia.

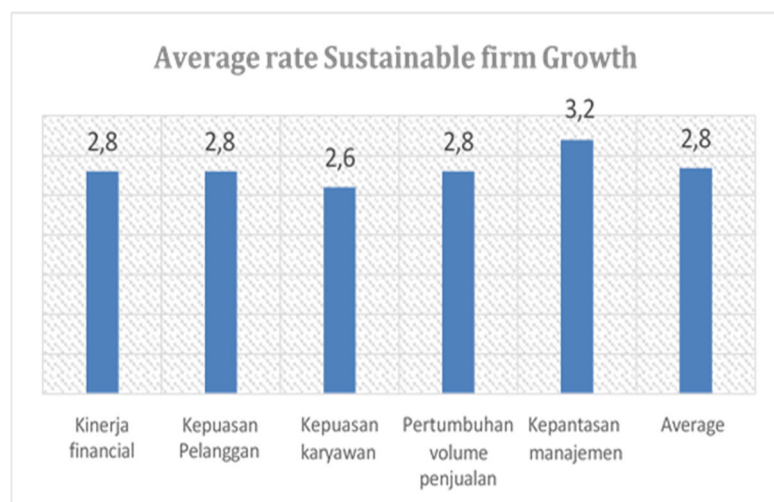


Figure 12 Presurvey Sustainable Firm Growth

Source: Pre-survey results of Five Gypsum Board Companies in Indonesia

Referring to the results of a pre-survey conducted on 5 gypsum board companies in Indonesia, it can be seen that the level of implementation of sustainable firm growth is still quite good, because the average score is only 2.8. Financial performance. Employee satisfaction, sales volume growth. It can be seen that only the dimensions and appropriateness of management have a fairly good level of implementation with a score of 3.2

The gypsum board industry competition is also experiencing a very tight and dynamic level of competition, this occurs both at the global level and at the regional level and also at the national level in Indonesia. Companies have adopted various strategies, including mergers, acquisitions, and partnerships to achieve the company's sustainable goals and new developments have emerged in the market by Report and Data, 2019. The second gap research is the existence of gypsum board companies that are growing and there are gypsum board companies that are declining in performance or closing their operations.

Based on the observed problem symptoms, it is clear that sustainable business growth is closely tied to agile leadership, dynamic capabilities, and continuous innovation to maintain competitive advantage. This is ultimately the goal of sustainable business performance. The preliminary findings also apply to the gypsum board industry in Indonesia, where a presurvey and industry data indicate low sustainable business growth, marked by industry players failing to survive competition or undergoing mergers and acquisitions. This also applies to the global parent companies of the gypsum board industry, especially following the April 2021 acquisition of USGBORAL by Knauf, a family business. As a result of this acquisition, in January 2022, PT Petrojaya Boral Plasterboard, a pioneer in the Indonesian gypsum industry with the Jayaboard brand, officially merged with PT Knauf Gypsum Indonesia, forming a new entity under PT Knauf Plasterboard Indonesia, while maintaining both Jayaboard and Knauf brands in Indonesia.

Currently, there are only four gypsum board manufacturers left in Indonesia: two global players, one joint venture with a local company, and one local investment company. The growth prospects for the gypsum board industry in Indonesia are still in the early stages, with per capita consumption at a low 0.41 m²/year in 2020. With an economic growth rate of 5.3% in 2020 and a population of approximately 264.1 million, the estimated total market size is around 145 million m². However, with installed production capacity at 178 million m², the industry faces an oversupply condition.

The research background has highlighted the connection between sustainable company growth, sustained competitive advantage, and product life cycle. Sustainable business growth can be achieved

through continuous innovation, dynamic organizational capabilities, and agile leadership. Thus, the focus of this research is on Sustainable Growth Strategies Through Competitive Advantage in the Gypsum Board Industry in Indonesia.

This study makes a novel contribution to strategic management and sustainable firm growth, particularly within the under-researched building materials manufacturing industry in Indonesia. It empirically demonstrates the significant role of competitive advantage as a mediator between innovation, dynamic capabilities, and agile leadership in driving sustainable growth. The research also challenges the relevance of the product life cycle (PLC) as a moderator in industries with stable product life cycles, enriching the theoretical literature. Additionally, the study introduces cluster analysis to categorize companies based on product life cycle characteristics, offering a new analytical approach in industry strategy research. Focusing on the gypsum board industry in Indonesia, a field previously underexplored in sustainability and strategy literature, the study provides valuable contextual insights. By combining quantitative methods with qualitative interviews, the research offers a comprehensive view of growth strategies that are both theoretically and practically relevant.

This study aims to examine in depth how human-centered strategies can be implemented in the gypsum board industry in Indonesia to achieve sustainable corporate growth through the formation of competitive advantages. This study also aims to formulate a strategic framework that can be used as a practical reference by industry players to face dynamic challenges in the national construction sector.

Methods

The research method is a framework outlining the procedures to obtain information. This scientific research aims to reveal phenomena in a systematic, controlled, empirical, and critical manner. The study uses a descriptive approach to understand the position or perception of research variables and an associative approach to examine the relationships between variables through hypotheses. It focuses on strategic management, specifically studying the impact of innovation, dynamic capability, agile leadership on competitive advantage, and their implications for sustainable firm growth, moderated by the product life cycle.

A mixed-method research approach is used, combining both qualitative and quantitative data to provide a comprehensive explanation. Explanatory sequential research is employed to test hypotheses using inferential statistics for generalization. Data will be collected through a census of all gypsum board companies in Indonesia, with random sampling for employee perceptions and customer feedback regarding gypsum board usage.

This study uses a cross-sectional time horizon, with data collected between January and March 2025. Descriptive research aims to understand the implementation of management practices related to innovation, dynamic capability, agile leadership, competitive advantage, and sustainable firm growth. Associative research seeks to examine relationships between variables. Data on the impact of innovation, dynamic capability, and agile leadership on competitive advantage and sustainable firm growth, moderated by the product life cycle, will be collected and operationalized.

Data Source

This study uses two types of data sources: primary and secondary data. Primary data is collected through a census of gypsum board industry business unit leaders (directors or managers) in Indonesia, as they are most knowledgeable about innovation, dynamic capabilities, agile leadership, competitive advantage, and sustainable firm growth, moderated by the product life cycle. Secondary data, collected from gypsum board companies, supports the research by providing relevant information on these variables. The research is correlational and cross-sectional, aiming to test the relationships between the variables at a specific point in time. The data sources are summarized in the following table 5

Table 5. Data Source

Data Type	Description	Source Data
Primary	Innovation, Dynamic Capability, Agile Leadership, Competitive Advantage, Sustainable Firm Growth, Product Life Cycle	Business unit directors or managers of gypsum board companies in Indonesia
Secondary	Company data related to the gypsum board industry in Indonesia	Relevant gypsum board companies in Indonesia

Population and Sample

This study uses a population-based approach, targeting all active gypsum board companies in Indonesia with publicly available information. The four companies selected are PT Siam-Indo Gypsum Industry, PT Aplus Pacific, PT Knauf Gypsum Indonesia, and PT Yoshino Gypsum Indonesia. A census method was applied, and data was collected through questionnaires from 52 respondents, consisting of Assistant Managers to Directors. After validation, 27 complete responses were used for analysis. Although the sample size is relatively small, it is deemed sufficient for analysis using Partial Least Squares Structural Equation Modeling (PLS-SEM), as the sample size meets the requirements for regression analysis based on power analysis (G*Power) (Faul et al., 2009; Hair, 1998).

To complement the quantitative data, in-depth interviews were conducted with two key informants from different companies at different product life cycle stages (growth and decline). These informants, a President Director and a Senior Marketing Manager, provided strategic insights on managerial practices and product life cycles. The combination of quantitative and qualitative approaches allows for a comprehensive understanding of sustainable growth strategies in Indonesia's gypsum board industry.

Data Collection Methods

This study employs a combination of data collection methods, including questionnaires, in-depth interviews, focus group discussions (FGD), and observations, to gather both quantitative and qualitative data. The questionnaires, structured with closed-ended questions, are used for both descriptive and explanatory surveys to assess the relationship between various variables such as innovation, dynamic capability, agile leadership, and competitive advantage. The respondents are business unit directors and managers from gypsum board companies in Indonesia.

In-depth interviews and FGDs are conducted to complement the quantitative data, involving key informants such as company leaders and customers. These qualitative methods help confirm and refine the quantitative findings. The qualitative data is analyzed through data reduction and presentation, using techniques like the Delphi Method to reach consensus among experts.

The research follows a mixed-methods approach, with quantitative data collected first, followed by qualitative analysis to confirm and deepen the understanding of the findings. The data analysis includes descriptive and associative analyses, particularly through Structural Equation Modeling (SEM), to test hypotheses. The results from both quantitative and qualitative methods are then integrated to provide a comprehensive understanding of sustainable firm growth strategies in the gypsum board industry in Indonesia.

Research Findings Application Techniques

The application of research findings will be based on descriptive analysis and statistical verification, showing significant relationships between variables. The application in the gypsum board industry involves adapting innovation, enhancing dynamic capabilities, agile leadership, achieving competitive advantage, and fostering sustainable growth moderated by the product life cycle.

To formulate strategies, identified solution variables are used to create strategic plans, as shown in the strategy mapping diagram. This strategy serves as a foundation for developing strategies in the industry, especially in product and service sectors. The strategies include maximizing innovation,

dynamic capabilities, and agile leadership for improved competitive advantage and sustainable growth.

Strategy implementation focuses on key operational aspects, such as product and process innovation, technological capabilities, marketing mix, agility, digital options, and entrepreneurial awareness. For dynamic capabilities, attention is given to transformation, technology, marketing, agility, and digital options. Agile leadership emphasizes vision, creativity, leadership agility, and humility. Competitive advantage focuses on quality, timing, cost, flexibility, and differentiation. Sustainable firm growth is measured through customer and employee satisfaction and sales volume growth. Product life cycle considerations include pricing adjustments, rebranding, product strategy, efficiency, and R&D.

Monitoring and evaluation of the strategy will follow a structured plan, with clear responsibilities, necessary resources, and concrete recommendations for effective implementation and continuous improvement in the gypsum board industry in Indonesia.

Results and Discussion

Gypsum Board Company Profile in Indonesia

This study examines the gypsum board industry in Indonesia, focusing on key companies such as PT Knauf Plasterboard Indonesia, PT Siam-Indo Gypsum Industry, PT Yoshino Indonesia, PT Aplus Pacific, and PT Saint-Gobain. These companies dominate the market and have undergone various mergers and acquisitions, such as the acquisition of PT Petrojaya Boral Plasterboard by Knauf in 2021. The study uses both quantitative and qualitative methods, with surveys distributed to 52 respondents, including directors, managers, and assistant managers from the active gypsum companies in Indonesia. A total of 32 questionnaires were returned, and 27 valid responses were analyzed.

For qualitative data, in-depth interviews were conducted with key informants, including a President Director and a Senior Manager from companies in different stages of their product life cycle. The respondents were mostly male (77.8%) with significant work experience (over 10 years for 77.8% of quantitative respondents). The majority of respondents had an educational background of S1 (70.4%), and they were mostly from the Sales & Marketing (37%) and Production departments (25.9%).

The study also included demographic analysis, showing that most respondents were aged above 45 years, and the majority had over 10 years of experience in the industry. The findings suggest that the respondents are highly experienced and loyal to their respective companies, which strengthens the data's reliability.

Descriptive Hypothesis Analysis (H1a-H1f)

This study examines various factors influencing sustainable growth in Indonesia's gypsum board industry, focusing on innovation, dynamic capability, agile leadership, competitive advantage, product life cycle, and sustainable firm growth.

Innovation

Table 6. Innovation in the Gypsum Board Industry

Dimension	Key Indicators	Qualitative Findings (Depth Interview Company A & Company B)	Qual Score	Quan Score
Risk-Taking Culture	Innovative, adaptive, risk-taking	Supports innovation, but with careful risk considerations	74	72
Business Intelligence	Competitor monitoring, market intelligence	Following market trends to develop business strategies	82	81
Customer Orientation	Customer solutions, value-added, needs evaluation	Intensive focus on customer needs	84	83

The findings highlight that while innovation is well-established, areas such as risk-taking and digitalization require further improvement.

Innovation in the gypsum board industry is critical for maintaining competitive advantage and supporting sustainable growth. Hypothesis testing for innovation showed a significant positive result with a mean score of 3.99 (p-value = 0.001), indicating that companies in the industry are performing well in terms of innovation. Qualitative findings align with these results, showing strong customer orientation and business planning.

Dynamic Capability

Dynamic capabilities are essential for adapting to market changes and enhancing competitiveness. The t-test for dynamic capability resulted in a mean score of 3.648 (p-value = 0.001), suggesting that companies are performing well in this aspect. Triangulation with qualitative data supports this, particularly in marketing capabilities.

Table 7. Dynamic Capabilities

Dimension	Key Indicators	Qualitative Findings (Depth Interview Company A & B)	Qual Score	Quan Score
Transformation Capacity	Creating, accessing, leveraging	Long-term vision & commitment to change	73	72
Technology Capability	R&D, design, production	R&D division supports product development	74	77
Marketing Mix Capability	Sales, distribution, promotion	Strengthening distribution and promotion	78	78

The highest score is in marketing capabilities, while digital options and entrepreneurial alertness require improvement.

Agile Leadership

Agile leadership is assessed in terms of vision, creativity, and adaptability. The hypothesis test for agile leadership yielded a mean score of 3.73 (p-value = 0.001), indicating that leadership is generally effective. However, areas such as leadership agility and creativity need strengthening.

Table 8. Agile Leadership

Dimension	Key Indicators	Qualitative Findings (Depth Interview Company A & Company B)	Qual Score	Quan Score
Visionary	Long-term vision, short-term uncertainty	Leaders have clear vision and strategic goals	76	75
Context Setting	Reading environment, anticipating change	Leaders understand and respond to changes	78	78

The highest score is in context setting, while leadership agility needs further development.

Competitive Advantage

Competitive advantage is assessed through dimensions like quality, cost, and flexibility. The hypothesis test showed a mean score of 4.074 (p-value = 0.001), indicating that companies have a strong competitive advantage. Key factors include product quality and timely delivery.

Table 9. Competitive Advantage

Dimension	Indicators	Qualitative Findings (Depth Interview Company A & Company B)	Qual Score	Quan Score
Quality	Product & service standards, warranty	Focus on high-quality raw materials, high production standards, and certifications	91	91
Timeliness	Delivery time, consistency, supply chain	Optimizing the supply chain for consistent delivery	87	87

Companies perform well in quality and timing, but differentiation remains weak.

Product Life Cycle

Product life cycle (PLC) is crucial for adapting strategies based on market changes. The t-test showed a mean score of 3.817 (p-value = 0.001), indicating good implementation of PLC strategies.

Table 10. Product Life Cycle

Dimension	Key Indicators	Qualitative Findings (Depth Interview Company A & Company B)	Qual Score	Quan Score
Price Adjustment	Discount, Geographical, Dynamic Pricing	Discount strategy applied, dynamic pricing still manual	77	77
Rebranding Strategy	Line extension, Brand extension	Line extension successful, no co-branding yet	70	74
Product Strategy	Quality, price, value, image, service	Focus on improving product performance and service quality	79	78

Price adjustment and efficiency are strengths, but R&D and rebranding need improvement.

Sustainable Growth

Sustainable firm growth (SFG) is essential for long-term competitiveness. The t-test showed a mean score of 3.548 (p-value = 0.013), indicating that firms in the gypsum industry generally experience sustainable growth.

Table 11. Sustainable Firm Growth

Dimension	Key Indicators	Qualitative Findings (Depth Interview Company A & Company B)	Qual Score	Quan Score
Financial Performance	Profitability, growth, efficiency	Stable, but needs optimization in efficiency and risk management	75	80
Customer Satisfaction	Loyalty, retention, general satisfaction	High loyalty supported by innovation and consistent service	88	87
Employee Satisfaction	Turnover, wages, career development	Need improvement in welfare and employee loyalty	60	65

Customer satisfaction and sales growth are key drivers, while employee satisfaction needs improvement. Overall, the gypsum board industry in Indonesia shows strong foundations in innovation, dynamic capabilities, agile leadership, competitive advantage, and product life cycle management, but there are areas for improvement, particularly in differentiation, digitalization, and employee satisfaction.

Analysis of Associative Hypotheses (H2-H9)

This study examines the relationships between innovation, dynamic capability, and agile leadership with competitive advantage and sustainable firm growth, as well as the moderating role of the product life cycle.

Table 12. Results of Hypothesis Testing (H2 H9)

Code	Path Hypothesis	Coefficient t	T Statistic	P-Value	Significant
H2	Innovation → Competitive Advantage	0.313	2.232	0.026	Yes
H3	Dynamic Capability → Competitive Advantage	0.369	2.593	0.010	Yes
H4	Agile Leadership → Competitive Advantage	0.507	4.193	0.000	Yes
H5	Innovation → Sustainable Firm Growth	0.213	1.578	0.115	No

Code	Path Hypothesis	Coefficient t	T Statistic	P-Value	Significant
H6	Dynamic Capability → Sustainable Firm Growth	0.110	1.893	0.059	No
H7	Agile Leadership → Sustainable Firm Growth	0.406	2.679	0.008	Yes
H8	Moderation PLC (CA × PLC → SFG)	0.096	0.722	0.471	No
H9	Competitive Advantage → Sustainable Firm Growth	0.321	2.414	0.016	Yes

Impact of Innovation on Competitive Advantage (H2)

The test results show that innovation has a positive and significant impact on competitive advantage with a coefficient of 0.313 and a p-value of 0.026.

Impact of Dynamic Capability on Competitive Advantage (H3)

Dynamic capability has a significant effect on competitive advantage with a coefficient of 0.369 and a p-value of 0.010.

Impact of Agile Leadership on Competitive Advantage (H4)

Agile leadership has a strong positive impact on competitive advantage with a coefficient of 0.507 and a p-value of 0.000.

Impact of Innovation on Sustainable Firm Growth (H5)

Innovation does not have a significant impact on sustainable firm growth with a p-value of 0.115, indicating that innovation does not directly contribute to sustainable growth.

Impact of Dynamic Capability on Sustainable Firm Growth (H6)

Dynamic capability also does not significantly affect sustainable firm growth with a p-value of 0.059.

Impact of Agile Leadership on Sustainable Firm Growth (H7)

Agile leadership significantly impacts sustainable firm growth with a coefficient of 0.406 and a p-value of 0.008.

Moderation of Product Life Cycle on the Relationship Between Competitive Advantage and Sustainable Firm Growth (H8)

Product life cycle does not significantly moderate the relationship between competitive advantage and sustainable firm growth with a p-value of 0.471.

Impact of Competitive Advantage on Sustainable Firm Growth (H9)

Competitive advantage has a significant impact on sustainable firm growth with a coefficient of 0.321 and a p-value of 0.016.

The findings show that innovation, dynamic capability, and agile leadership influence competitive advantage, with agile leadership and competitive advantage directly contributing to sustainable firm growth. However, the direct impacts of innovation and dynamic capability on sustainable growth, as well as the moderating role of product life cycle, are not significant.

Table 16. Summary of Hypothesis Test Results

Hypothesis Code	Path Relationship	Test Type	Coefficient / Average / T-Stat / P-Value	Significance	Remarks
H1a	Innovation (Descriptive)	One-sample t-test	Mean = 3.76; T = 5.146; p = 0.000	Significant	Innovation rated high
H1b	Dynamic Capability (Descriptive)	One-sample t-test	Mean = 3.68; T = 4.982; p = 0.000	Significant	High dynamic capability

Hypothesis Code	Path Relationship	Test Type	Coefficient / Average / T-Stat / P-Value	Significance	Remarks
H1c	Agile Leadership (Descriptive)	One-sample t-test	Mean = 3.85; T = 6.012; p = 0.000	Significant	High agile leadership
H1d	Competitive Advantage (Descriptive)	One-sample t-test	Mean = 3.80; T = 5.723; p = 0.000	Significant	High competitive advantage
H1e	Product Life Cycle (Descriptive)	One-sample t-test	Mean = 3.42; T = 2.986; p = 0.005	Significant	Product life cycle is dynamic
H1f	Sustainable Firm Growth (Descriptive)	One-sample t-test	Mean = 3.74; T = 4.895; p = 0.000	Significant	High sustainable growth
H2	Innovation → Competitive Advantage	SEM-PLS	= 0.313; T = 2.232; p = 0.026	Significant	Supported
H3	Dynamic Capability → Competitive Advantage	SEM-PLS	= 0.369; T = 2.593; p = 0.010	Significant	Supported
H4	Agile Leadership → Competitive Advantage	SEM-PLS	= 0.507; T = 4.193; p = 0.000	Significant	Supported
H5	Innovation → Sustainable Firm Growth	SEM-PLS	= 0.213; T = 1.578; p = 0.115	Not Significant	Rejected
H6	Dynamic Capability → Sustainable Firm Growth	SEM-PLS	= 0.110; T = 1.893; p = 0.059	Not Significant	Rejected
H7	Agile Leadership → Sustainable Firm Growth	SEM-PLS	= 0.406; T = 2.679; p = 0.008	Significant	Supported
H8	Competitive Advantage x Product Life Cycle → Sustainable Firm Growth (Moderation)	SEM-PLS	= 0.040; T = 0.387; p = 0.699	Not Significant	Rejected
H9	Competitive Advantage → Sustainable Firm Growth	SEM-PLS	= 0.399; T = 2.668; p = 0.008	Significant	Supported

Based on the hypothesis tests, both descriptive (H1a–H1f) and associative statistics (H2–H9), most of the relationships between variables in the model are significant and support the proposed theoretical framework. Innovation, dynamic capability, and agile leadership play essential roles in shaping competitive advantage. This competitive advantage, in turn, significantly contributes to sustainable firm growth. However, some relationships, such as the direct effects of innovation and dynamic capability on sustainable firm growth and the moderating role of product life cycle, were

not significant. These findings provide valuable insights for further development of both the theoretical model and practical applications.

Research Findings

Based on the conceptual framework, quantitative analysis, and in-depth interviews, several key findings were identified: (1) Innovation → Competitive Advantage. Innovation was found to have a significant impact on the competitive advantage of companies. This emphasizes that efforts to develop innovative products and processes are primary drivers of competitiveness in the gypsum board industry; (2) Dynamic Capability → Competitive Advantage and Sustainable Firm Growth. Dynamic capability directly influences both competitive advantage and sustainable firm growth. However, its role as a moderator between innovation/agile leadership and competitive advantage was found to be insignificant, suggesting that dynamic capability is more appropriately considered as an independent variable rather than a moderating one; (3) Agile Leadership → Competitive Advantage and Sustainable Firm Growth. Agile leadership significantly contributes to competitive advantage and sustainable firm growth. Its effectiveness is enhanced when supported by innovation and dynamic capabilities, indicating that leadership flexibility plays a crucial role in fostering long-term growth; (4) Competitive Advantage as a Mediator. Competitive advantage was shown to mediate the influence of innovation, dynamic capability, and agile leadership on sustainable firm growth. This reinforces its critical role as a pathway to long-term growth and stability within the industry; (5) Product Life Cycle as a Moderator. The product life cycle did not significantly moderate the relationship between competitive advantage and sustainable firm growth. This lack of significance could be attributed to the homogeneity of the product life cycle stages in the sample (with most companies in the growth and maturity phases) or the stronger direct influence of competitive advantage. Although it was not significant as a moderator, the product life cycle remains strategically relevant. In the gypsum board industry, product life cycles are non-linear and can be extended through continuous innovation. Therefore, it is recommended to develop a new model where the product life cycle is treated as an independent variable influencing innovation, dynamic capability, and agile leadership, with competitive advantage continuing to serve as the main mediator for sustainable firm growth.

Theoretical Implications: (1) Supporting the Resource-Based View (RBV): Competitive advantage is a core element of sustainable growth. This aligns with the RBV, which emphasizes that a firm's unique resources and capabilities are central to achieving long-term success and sustaining competitive advantage; (2) Supporting the Dynamic Capability Theory (Teece, 1997): Dynamic capability plays a crucial role in the formation of competitive advantage. It underscores the importance of a firm's ability to adapt, integrate, and reconfigure internal and external competencies to address rapidly changing environments and maintain a competitive edge; (3) Supporting Agile Leadership Theory: Agile leadership directly drives competitive advantage and long-term growth. This theory highlights the importance of flexible, adaptive, and innovative leadership in responding to market changes and leading organizations toward sustained success.

Human-Centered Strategy as the Pillar of Competitive Advantage

The human-centered approach in Indonesia's gypsum board industry is not merely about positioning human resources as executors of strategy, but rather recognizing them as strategic agents in building and sustaining long-term competitive advantage. In this study, the approach is operationalized through three pillars: innovation, dynamic capabilities, and agile leadership, all of which collectively contribute to sustainable firm value creation.

Innovation as an Expression of Human Creativity

Findings indicate that innovation has a significant impact on competitive advantage ($\beta = 0.313$; $p = 0.026$), although it does not directly influence sustainable growth ($H5$: $p = 0.115$). This means that innovation yields optimal results when channeled through differentiation, product quality improvement, and enhanced market positioning. The strength of innovation in this industry is demonstrated through: (1) Customer orientation: Interviewed companies showed strong commitment to delivering value-added, customer-driven solutions; (2) Business intelligence: Marketing teams actively monitor market trends and competitor behavior; (3) Risk-taking culture: Although generally cautious, some firms are beginning to take bold steps, such as launching Air-Purifying Boards and sound-absorbing panels.

However, digital innovation and systematic internal innovation structures remain weak and underdeveloped, suggesting a need for stronger innovation ecosystems and cultural embedding within organizations.

Dynamic Capability as Collective Adaptive Capacity

Dynamic capabilities ($\beta = 0.369$; $p = 0.010$) reinforce competitive advantage through the ability to sense, seize, and reconfigure organizational assets and operations. In practice, this is manifested in: (1) Marketing mix adaptability: Companies are strengthening distribution and promotional strategies to address market oversupply; (2) Technological capability: Internal R&D plays a critical role in maintaining product and process quality; (3) Transformation readiness: Companies exhibit a readiness for structural changes, such as mergers, factory relocations, and brand repositioning. Nevertheless, entrepreneurial alertness and digital agility are underdeveloped across several firms, particularly local players lacking digital investment or forward-looking strategies.

Agile Leadership as a Strategic Catalyst

Agile leadership holds the strongest influence on both competitive advantage ($\beta = 0.507$; $p = 0.000$) and sustainable firm growth ($\beta = 0.406$; $p = 0.008$). This underscores the critical role of leaders who are visionary, adaptive, and participative in steering innovation and organizational responsiveness. Key insights include: (1) Context setting: Leaders demonstrate strong environmental scanning and responsiveness to external change; (2) Visionary leadership: Executives communicate clear strategic goals aligned with long-term transformation and ESG orientation; (3) Leadership agility: Still underdeveloped, especially among mid-level managers who lack tactical responsiveness training.

In some companies, the successful adoption of bottom-up leadership practices, including employee involvement in strategic decisions, has fostered a sense of ownership and emotional engagement across teams.

Competitive Advantage as a Mediating Pathway

Within the structural model tested using PLS-SEM, competitive advantage acts as the central mediating variable, bridging the three human-centered strategic factors to sustainable firm growth. Empirical findings show: (1) Competitive advantage significantly influences sustainable growth ($\beta = 0.321$; $p = 0.016$); (2) The direct effects of innovation and dynamic capability on growth are not significant unless mediated by competitive advantage.

This reinforces the Resource-Based View (RBV), which suggests that internally developed, hard-to-imitate capabilities must be transformed into competitive outputs—such as superior product quality, delivery efficiency, and brand differentiation—to generate long-term value.

The Role of Innovation in Strengthening Competitive Advantage

Innovation in the gypsum board industry in Indonesia is not merely a technological pursuit—it is a strategic expression of human-centered thinking, where employees' creativity, risk awareness, and responsiveness to market needs become critical drivers of competitiveness. The study reveals that innovation significantly impacts competitive advantage ($\beta = 0.313$; $p = 0.026$), but its direct influence on sustainable firm growth is not statistically significant ($H5$: $p = 0.115$). This indicates that innovation acts as a foundational enabler, but its full potential is only realized when it is channeled through the creation of competitive advantage.

Innovation as a Human-Centered Strategic Lever

The study's qualitative findings confirm that firms in the industry recognize innovation as a people-driven process. This is evident in several key areas: (1) Customer orientation scored highly both qualitatively and quantitatively (Qual: 84, Quan: 83), suggesting that employees and teams are deeply involved in identifying and solving user problems—an essential principle of human-centered design; (2) Business intelligence and competitor monitoring were actively practiced, indicating that frontline staff and marketing teams are empowered to scan, interpret, and act on market signals; (3) Business planning, tied to strategic foresight, showed alignment with long-term goals, although still fragmented across firms.

However, while innovation is present, it lacks structural reinforcement and systemic integration. The innovation culture remains sporadic and is often led by top management or external partners

rather than being embedded across all organizational layers. This limits the role of employees as co-creators in the innovation process.

The Missing Links: Risk-Taking and Digital Innovation

Two critical components of innovation – risk-taking culture and digital transformation – were found to be underdeveloped. Risk aversion is still prevalent in several firms, particularly in product experimentation and market segmentation. This stifles the ability to generate radical or breakthrough innovations that can lead to new growth curves.

Digital innovation, a vital tool for enhancing responsiveness and product customization, is also underutilized. The lack of digital integration in R&D, product development, and customer experience limits agility. In a human-centered framework, this reflects a disconnect between organizational systems and employee-driven ideas, where the tools and autonomy to innovate are insufficient.

Translating Innovation into Competitive Advantage

Despite its limitations, innovation significantly contributes to competitive advantage through several dimensions: (1) Product differentiation: Companies like USGBORAL and Yoshino have launched gypsum boards with advanced features (e.g., sag-defying strength, air-purifying capabilities), reflecting innovation based on user experience and performance needs; (2) Speed to market and customer feedback loops: Firms with stronger customer orientation are better positioned to turn innovation into tailored product offerings, enhancing brand preference and customer loyalty; (3) System innovation: The development of complete wall systems and accessories by brands like Knauf and Aplus demonstrates innovation not just in products, but in end-to-end solutions, further boosting competitive positioning.

Thus, innovation plays a pivotal mediating role, where the value created through human ingenuity is only impactful when it feeds into the firm's differentiation, quality, and market relevance.

Strategic Implication: Human-Centered Innovation as a Growth Accelerator

To unlock innovation's full value for sustainable growth, the gypsum board industry must deepen its commitment to human-centered innovation ecosystems. This means: (1) Empowering employees across departments (not just R&D) to contribute ideas and improvements; (2) Embedding innovation KPIs into performance appraisals and leadership development programs; (3) Investing in digital tools and data systems that allow frontline teams to respond rapidly to shifting customer needs and construction trends.

In conclusion, innovation becomes a powerful lever for competitive advantage when human creativity is supported structurally, when risk-taking is normalized, and when organizations adopt tools that allow employees to co-create value with customers. Within Indonesia's gypsum board industry – still in a growth phase with low per capita consumption – the capacity to innovate through people is the differentiator that will sustain firm performance amid market saturation and global competition.

Dynamic Capabilities for Strategic Adaptation: A Human-Centered Approach

In alignment with the study's title "Human-Centered Strategies for Sustainable Firm Growth through Competitive Advantage in the Gypsum Board Industry in Indonesia" – dynamic capabilities must be understood not only as strategic assets but as human-embedded organizational behaviors that allow firms to adapt, transform, and compete in volatile markets. The research reveals that dynamic capabilities have a significant positive influence on competitive advantage ($H3: \beta = 0.369; p = 0.010$), but do not have a direct significant impact on sustainable firm growth ($H6: p = 0.059$). This finding provides critical insight into the indirect but vital role that human-driven dynamic capabilities play in sustaining business performance.

Defining Dynamic Capabilities in Human Terms

Dynamic capabilities refer to the firm's ability to integrate, build, and reconfigure internal and external competencies to address rapidly changing environments (Teece et al., 1997). In this study, they are framed within a human-centered strategic lens, where these capabilities are not merely organizational routines, but collective capacities developed, owned, and executed by people.

The dimensions of dynamic capability assessed include: (1) Transformation capacity (e.g., reconfiguring workflows, adapting strategies); (2) Technological capability (e.g., product design, digital tools); (3) Marketing mix capability (e.g., pricing, promotion, and channel strategies); (4) Entrepreneurial alertness; (5) Agility and digital readiness.

Among these, marketing mix capability emerged as the strongest dimension (Quantitative score: 78; Qualitative score: 78), suggesting that frontline marketing and sales teams are playing a critical role in adapting product offerings and promotions in response to market oversupply and customer segmentation. However, digital agility and entrepreneurial alertness are still underdeveloped highlighting a need for human capital renewal.

Human-Centered Execution of Dynamic Capabilities

From a human-centered standpoint, dynamic capabilities in the gypsum board industry are largely driven by people's ability to sense and seize opportunities, especially amid price volatility, product substitution, and regulatory changes in sustainable construction. Interviews with senior leaders revealed: (1) A high commitment to long-term transformation (e.g., mergers, plant closures, rebranding), driven by top management but not always translated to operational levels; (2) R&D departments are relatively active, particularly in joint ventures or foreign-invested firms (e.g., Knauf, Yoshino), but there is limited cross-functional collaboration, which constrains the full realization of transformation efforts; (3) Some firms lack entrepreneurial initiative among mid-level managers, reflecting a cultural gap in empowering employees to act as internal change agents.

This gap suggests that dynamic capability is often concentrated at the top level, making it vulnerable to bottlenecks. A human-centered strategy would distribute the ownership of adaptation across layers of the organization allowing mid-level and operational teams to experiment, pilot innovations, and drive micro-adjustments to strategy.

Competitive Advantage as a Necessary Conversion Mechanism

The non-significant direct effect of dynamic capability on sustainable growth underscores an important insight: capability alone does not ensure growth unless it is effectively translated into market-based competitive advantage. This means: (1) Transformation projects (e.g., plant relocations, product diversification) need to be converted into improved customer responsiveness, product quality, or cost efficiency; (2) Technological upgrades must lead to faster delivery, better customization, or sustainability credentials that customers value.

Thus, the human-centered strategy must bridge internal adaptive capacities with external market impacts, with competitive advantage serving as the key conversion mechanism.

Implications for the Indonesian Gypsum Board Industry

In the context of Indonesia's gypsum board industry, which is marked by oversupply, fluctuating demand, and underutilized capacity, the ability to dynamically reconfigure resources is essential. However, the study reveals that: (1) Only a few firms have fully leveraged their dynamic capabilities to differentiate themselves; (2) Many firms still lack the internal agility to repurpose underutilized assets, re-skill human resources, or reposition their brands strategically; (3) Smaller or local firms tend to focus on price competition, which is not sustainable without supporting capabilities in transformation and innovation.

To remain competitive, especially in a market still at a low per capita consumption stage (0.41 m² in 2020 vs. >6 m² in developed countries), firms must invest in people who can sense, respond, and reconfigure at scale. This includes: (1) Cross-training programs for employees in marketing, R&D, and operations to understand and influence strategy; (2) Decentralized decision-making frameworks that empower teams to lead local transformations; (3) Building organizational routines around learning, experimentation, and knowledge sharing.

Agile Leadership as a Driver of Sustainable Growth: A Human-Centered Catalyst

Agile leadership is revealed in this study as the most powerful human-centered strategic driver showing significant direct effects on both competitive advantage (H4: $\beta = 0.507$; $p = 0.000$) and sustainable firm growth (H7: $\beta = 0.406$; $p = 0.008$). Unlike innovation and dynamic capabilities, whose impacts on growth must flow through competitive advantage, agile leadership uniquely

influences both domains directly and simultaneously, highlighting its pivotal role in orchestrating strategic alignment, responsiveness, and organizational vitality.

This reinforces the core thesis of the study: that growth and competitive edge in the gypsum board industry are shaped by human-centered strategies, especially those driven by the quality of leadership embedded across the organization.

Agile Leadership in the Gypsum Board Industry: Interpreting the Data

The quantitative and qualitative analyses show that among the three components of agile leadership: (1) Context setting had the strongest scores (Qualitative: 82, Quantitative: 87); (2) Followed by visionary thinking (Qualitative: 80, Quantitative: 82); (3) While leadership agility the practical ability to act swiftly and mobilize teams had the lowest scores (Qualitative: 68, Quantitative: 71).

These findings suggest that most top-level leaders in Indonesia's gypsum board companies are strategically aware and future-oriented, but face limitations in distributing agility throughout the organization, especially at middle and operational levels.

Leadership here is not just about authority; it is about the capability to translate uncertainty into opportunity, and that capability resides not in systems alone, but in the decisions, interpretations, and actions of people—hence, human-centered.

What Makes Agile Leadership Human-Centered?

A human-centered view of agile leadership goes beyond technical management competencies. It places the leader as a steward of people, meaning, and change. In the context of Indonesia's gypsum board sector, this manifests in several ways.

First visionary thinking as a human anchor for strategic navigation. Leaders who are future-facing give employees clarity and direction in a volatile market. Firms like Knauf and USGBORAL, for instance, were found to articulate clear sustainability goals (e.g., reducing carbon footprint, product modularization), which employees could rally behind. This clarity empowers internal innovation and reduces resistance to change.

Second context setting as an empathy-driven competency. Leaders who excel at reading contextual shifts—such as rising raw material costs, ESG regulations, or local market saturation—demonstrate empathy by aligning business goals with stakeholder realities. This capacity was observed particularly in firms that localized product design and distribution strategies based on regional demand and purchasing power.

Third leadership agility as an area for development. Despite strong cognitive leadership, executional agility remains weak. Many companies still operate in hierarchical models, where decision-making is centralized, limiting the ability of teams to respond rapidly to disruptions. This undermines both innovation and adaptability at the front line.

From Leadership to Competitive Advantage and Growth

Agile leadership directly strengthens competitive advantage by enabling: (1) Faster strategic execution in response to market changes; (2) Improved internal alignment between R&D, operations, and marketing; (3) Cultural resilience—i.e., the capacity of teams to work effectively during crisis or uncertainty; (4) Higher employee engagement, which improves service quality, innovation speed, and retention of skilled talent.

At the same time, it drives sustainable growth by ensuring: (1) Strategic consistency in transformation initiatives; (2) Empowered teams who act as local problem-solvers; (3) Organizational adaptability, allowing firms to reallocate resources quickly, reprioritize products, and enter niche markets (e.g., green buildings, soundproof boards). Agile leadership, in this context, serves as the human-centered integrator—converting strategic intent into competitive reality and sustainable performance through people, not just systems.

Strategic Implications for the Indonesian Gypsum Industry

In a market characterized by: (1) Undifferentiated products; (2) Overcapacity (with consumption at only ~0.4 m² per capita); (3) Regional infrastructure disparity; (4) Limited digital penetration.

Agile leadership is not a luxury it is a necessity. The study suggests that only firms with leadership agility embedded across layers from executives to factory supervisors can: (1) Launch innovations that reflect local needs; (2) Shift production lines quickly; (3) Upskill human resources to meet ESG or digital demands; (4) Compete with foreign-invested brands not just on price, but on value. This human-centered agility transforms gypsum board companies from rigid producers into adaptive solution providers.

Competitive Advantage as the Strategic Bridge to Sustainable Growth: The Human-Centered Linkage

competitive advantage emerges as the critical mediating variable that links human-centered strategic actions to long-term business performance. The research confirms that competitive advantage has a statistically significant effect on sustainable firm growth (H9: $\beta = 0.321$; $p = 0.016$), affirming its role as the essential channel through which human-centered capabilities (innovation, dynamic capabilities, and agile leadership) generate tangible organizational outcomes.

This section argues that without competitive advantage, human-centered efforts remain internal potentials, not external value. Competitive advantage thus acts as a strategic translation mechanism that converts internal capabilities often tacit and people-driven into market-recognized strengths.

Competitive Advantage as a Mediator, Not Just a Result

The study's structural equation model clearly demonstrates that innovation and dynamic capabilities do not directly affect sustainable growth, but instead must flow through competitive advantage. Agile leadership is the only construct with a direct effect on both.

This insight underscores the importance of competitive advantage not as a final outcome, but as a functional intermediary a bridge. In human-centered terms, it means that organizations cannot expect innovation or internal transformation alone to produce growth; they must convert those strengths into superior value propositions that are visible, relevant, and desirable in the market.

Key Competitive Dimensions in the Gypsum Board Industry

Based on the findings, the key competitive advantages observed in Indonesian gypsum board companies are: (1) Product Quality Firms consistently emphasized durability, structural performance, and safety certifications. These qualities were recognized as market strengths and tied closely to frontline workers' commitment to manufacturing excellence; (2) On-Time Delivery Operational reliability emerged as a differentiator, where firms with better internal coordination and empowered logistics teams could consistently fulfill orders faster than competitors.

Both dimensions quality and reliability are human-executed, involving skilled operators, supply chain teams, and customer service staff. Their performance directly reflects the extent to which human-centered practices (training, autonomy, motivation) have been implemented.

Gaps in Differentiation and Flexibility

Despite strengths in quality and delivery, the study revealed critical weaknesses in: (1) Product Differentiation Many products across firms remain standardized and commoditized, with minimal variation in design, utility, or customer segmentation. This reflects under-leveraged innovation processes and limited customer co-creation; (2) Strategic Flexibility Most firms showed limited ability to reconfigure product portfolios quickly in response to market shifts. This reflects organizational rigidity and an insufficient culture of experimentation.

From a human-centered view, these weaknesses highlight untapped potential: (1) R&D teams are not fully integrated with customer insights; (2) Field teams are not sufficiently empowered to inform product adjustments; (3) Mid-level management lacks discretion to initiate local product innovation.

The result is a narrow competitive positioning, where firms compete mainly on operational consistency, not on high-value customer experience or tailored solutions.

Human-Centeredness as the Source of Sustainable Advantage

Drawing from the Resource-Based View (RBV), competitive advantage that is valuable, rare, inimitable, and organizationally embedded (VRIO) becomes the basis for long-term growth. In this context: (1) Valuable → rooted in team expertise and trust-based customer service; (2) Rare → shaped by internal cultures of excellence and responsiveness; (3) Inimitable → built through tacit knowledge, routines, and shared meanings among teams; (4) Organizationally embedded → sustained by HR systems, leadership support, and cross-functional coordination.

Thus, competitive advantage is not simply a reflection of product features or price points—it is a human system, sustained by values, mindsets, and competencies. This is the essence of human-centered strategy: people, when equipped and empowered, generate superior performance not only through individual effort, but through collective synergy.

Strategic Pathway to Sustainable Growth

The implications are clear: (1) Firms that invest in human systems—agile teams, customer-aware innovation, adaptive logistics—can sustain their competitive edge even in a commoditized, low-growth industry; (2) Firms that fail to translate internal capabilities into market advantages—particularly in differentiation and speed—will be trapped in price wars and declining margins.

Competitive advantage, then, is the strategic bridge that: (1) Converts human-centered innovation into market-leading products; (2) Translates adaptive capabilities into reliable execution; (3) Embeds agile leadership into brand value and customer trust. Only through this bridge can companies transition from internal excellence to external sustainability.

The Limited Role of Product Life Cycle (PLC): A Strategic Reflection in a Human-Centered Industry

Understanding the Product Life Cycle Context in This Industry

The PLC concept assumes that products move through four phases—introduction, growth, maturity, and decline—each requiring distinct strategies for pricing, promotion, innovation, and investment. However, the findings suggest that in the gypsum board industry in Indonesia: (1) The majority of products are clustered in the growth stage, with minimal variance across firms; (2) Product evolution is slow and incremental, with limited disruptions or radical innovation shaping distinct cycles; (3) Substitutability is low, as gypsum board remains a dominant material in partitioning and ceiling systems, and usage remains fairly standardized across the market.

This homogeneity of the life cycle stage across product portfolios and firms reduces the strategic variance that would allow PLC to moderate relationships between capabilities and performance. In short, there is not enough differentiation in product lifecycle positions to influence the path from competitive advantage to growth.

Human-Centered Interpretation of the Findings

Although the PLC effect was statistically insignificant, from a human-centered strategic standpoint, this finding is still meaningful.

Organizational perception and responsiveness are human-driven. Many firms do not actively track or manage product life cycles in practice. Decisions about product introduction, withdrawal, or redesign are rarely systematic and are often driven by intuitive leadership judgment rather than structured life-cycle analytics. This reflects an opportunity to improve strategic agility and decision-making by training managers to better anticipate product transitions and market saturation.

Frontline insights are underutilized. Sales and customer service teams—who directly observe shifts in buyer preferences, contractor behaviors, and feedback on new features—are rarely involved in product phase assessment. This lack of integration limits the organization's ability to respond preemptively to signs of maturity or decline in product offerings.

Product strategy is not embedded in human processes. In more dynamic industries, PLC management is embedded into R&D, marketing, and HR systems. For example, a product entering maturity might trigger investment in re-skilling workers or transitioning marketing efforts to emphasize differentiation. However, in this industry, such cross-functional response mechanisms are weak or absent.

Strategic Implications: Moving Beyond Static PLC Thinking

Even though PLC did not emerge as a moderator, it remains strategically relevant in several ways: (1) Pricing Strategy: Understanding where products stand in the lifecycle can guide discounting, bundling, or premium positioning strategies; (2) Innovation Timing: Firms can better time investments in new gypsum board variants (e.g., moisture-resistant, green-certified, modular boards) if they track lifecycle saturation; (3) Cost Optimization: Lifecycle awareness can help operational teams optimize production volumes, inventory levels, and supplier contracts especially during early or declining phases.

What's missing is the human-centered system for perceiving and responding to lifecycle shifts. In industries where change is slow and products appear stable, there is a tendency for strategic complacency. Thus, the absence of a significant PLC role may actually reflect a cultural and managerial blind spot not a lack of relevance, but a lack of activation.

Recommendations: Making PLC Strategically Actionable

To realize the potential of PLC as a value-adding tool in a human-centered strategy, firms must: (1) Train middle managers and product teams to assess lifecycle metrics and use them in decision-making; (2) Involve sales and customer-facing employees in lifecycle planning through structured feedback loops and data systems; (2) Use lifecycle mapping as a strategic conversation tool, not just a product planning model especially during leadership and budgeting cycles. Integrate PLC awareness into agile leadership practices, ensuring that teams are trained to pivot product strategies when market signals shift.

Practical Strategy Framework Recommendations

Based on the research results, a practical human-centered strategy framework can be formulated for the Indonesian gypsum board industry: (1) Customer Needs-Based Innovation: Focus on customer orientation, product segmentation, and collaboration with architects or contractors; (2) Dynamic Capability Strengthening: Building a market information system and technology adaptation based on digitalization and automation; (3) Agile Leadership Development: Leadership training based on long-term vision, quick decision-making, and collective leadership; (4) Optimizing Competitive Advantage: Through quality, distribution speed, cost efficiency, and product system innovation (for example, integrated wall systems or fire-resistant gypsum); (5) Organizational Culture Transformation: Creating a collaborative work culture and organizational learning to encourage employee involvement as strategic actors.

Implications

Theoretical Implications

This research supports the Resource-Based View (RBV) and Dynamic Capability Theory, showing that organizational growth is not merely resource-dependent, but contingent on how well firms adapt and lead through human-centered mechanisms. It also confirms agile leadership theory, positioning leadership agility as a pivotal growth enabler in volatile industries.

Practical Implications for Industry and Companies

For companies, this study offers a practical framework for building competitive advantage through people, not just products. It emphasizes: (1) The need for cross-functional empowerment, especially in R&D and operations; (2) Structuring leadership pipelines to embed agility and responsiveness; (3) Strengthening innovation systems and encouraging bottom-up creativity.

Policy Implications for the Government

The government can: (1) Encourage adoption of agile manufacturing and innovation incentives; (2) Support capacity development for digital transformation in local industries; (3) Facilitate collaborative platforms between academia, SMEs, and large firms to accelerate learning and capability building in construction materials sectors.

Conclusion

This study concludes that a human-centered strategic approach embodied in innovation, dynamic capabilities, and agile leadership is crucial in forming competitive advantage, which in turn drives

sustainable firm growth in Indonesia's gypsum board industry. Among the three strategic drivers, agile leadership showed the most significant and direct influence on both competitive advantage and growth. Innovation and dynamic capabilities also contribute meaningfully, but their impact on growth is mediated through competitive advantage. The study confirms that competitive advantage acts as the central bridge between internal capabilities and long-term firm success. In contrast, the product life cycle did not significantly moderate the relationship between strategy and performance, suggesting that firms must focus more on capability execution than lifecycle positioning.

The novelty of this study lies in its human-centered strategic framework applied to an under-researched industry. It contributes to literature by: (1) Validating the mediating role of competitive advantage between organizational capabilities and sustainable growth; (2) Introducing PLC-stage mapping and strategic clustering of firms, an uncommon method in industrial studies; (3) Emphasizing agile leadership as a direct driver of growth—an insight valuable to dynamic industries.

Providing a contextual strategy model specific to the Indonesian gypsum board industry, bridging theory and practice.

Limitations

This study is subject to several limitations. First, the sample size though adequate for PLS-SEM analysis was relatively small, encompassing 27 managerial respondents from four active firms. Second, the focus on Indonesia's gypsum board industry may limit generalizability to other sectors or countries. Third, the cross-sectional nature of the study restricts causal inference over time. Lastly, the moderation effect of the product life cycle may require a more heterogeneous sample across varied lifecycle stages to yield clearer effects.

References

- Amri, A., Tahir, S., & Mirza, M. (2017). Analisis Kepuasan Pelanggan Pemakaian Produk Gypsum dengan Menggunakan Metode Quality Function Deployment. *Industrial Engineering Journal*, 6(2).
- Asad, M., Asif, M. U., Bakar, L. J. A., & Sheikh, U. A. (2021). Transformational leadership, sustainable human resource practices, sustainable innovation and performance of SMEs. *2021 International Conference on Decision Aid Sciences and Application (DASA)*, 797–802.
- Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, 17(1), 99–120.
- Barney, J. B., & Clark, D. N. (2007). *Resource-based theory: Creating and sustaining competitive advantage*. Oup Oxford.
- Bogers, M., Chesbrough, H., Heaton, S., & Teece, D. J. (2019). Strategic management of open innovation: A dynamic capabilities perspective. *California Management Review*, 62(1), 77–94.
- De Smet, A., Lurie, M., & St George, A. (2018). Leading agile transformation: The new capabilities leaders need to build 21st-century organizations. *McKinsey & Company*, 15(1), 1–27.
- Delery, J. E., & Roumpi, D. (2017). Strategic human resource management, human capital and competitive advantage: is the field going in circles? *Human Resource Management Journal*, 27(1), 1–21.
- Dranove, D., Besanko, D., Shanley, M., & Schaefer, S. (2017). *Economics of strategy*. John Wiley & Sons.
- Eisenhardt, K. M., & Martin, J. A. (2017). Dynamic capabilities: what are they? *The SMS Blackwell Handbook of Organizational Capabilities*, 341–363.
- Faul, F., Erdfelder, E., Buchner, A., & Lang, A.-G. (2009). Statistical power analyses using G* Power 3.1: Tests for correlation and regression analyses. *Behavior Research Methods*, 41(4), 1149–1160.
- Foss, N. J., & Knudsen, T. (2003). The resource based tangle: towards a sustainable explanation of competitive advantage. *Managerial and Decision Economics*, 24(4), 291–307.
- Giniuniene, J., & Jurksiene, L. (2015). Dynamic capabilities, innovation and organizational learning: Interrelations and impact on firm performance. *Procedia-Social and Behavioral Sciences*, 213, 985–991.

- Grant, G., Cuganesan, S., & Knight, E. (2019). *Creating Agile Leadership Teams: How shared leadership models can better manage the ambiguities of sustainable innovation and growth*.
- Grant, R. M. (1996). Prospering in dynamically-competitive environments: Organizational capability as knowledge integration. *Organization Science*, 7(4), 375–387.
- Gregg, B., Hazan, E., Khanna, R., Kim, A., Perrey, J., & Spillecke, D. (2020). Rapid revenue recovery: a roadmap for post-COVID-19 growth. *McKinsey Digital*.
- Gregg, B., Kim, A., & Perrey, J. (2020). Leading with purpose: How marketing and sales leaders can shape the next normal. *McKinsey & Company*, 10.
- Gunarty, Y. (2023). Transformasi Digital dalam Industri: Tantangan dan Peluang. *Circle Archive*, 1(3).
- Hair, J. F. (1998). *Multivariate Data Analysis* (5th ed.). Prentice Hall.
- Keh, H. T., & Xie, Y. (2009). Corporate reputation and customer behavioral intentions: The roles of trust, identification and commitment. *Industrial Marketing Management*, 38(7), 732–742.
- Kim, W. C., & Mauborgne, R. (2015). *Blue ocean strategy, expanded edition: How to create uncontested market*. Harvard Business Press Massachusetts.
- Kioudis, S., Popescu, C., & Mitrook, M. (2007). Understanding influence on corporate reputation: An examination of public relations efforts, media coverage, public opinion, and financial performance from an agenda-building and agenda-setting perspective. *Journal of Public Relations Research*, 19(2), 147–165.
- Li, H.-H. J. K., & Tan, K. H. (2004). Taking product to market: a selection framework based on life cycle theories. *International Journal of Services and Standards*, 1(1), 4–17.
- Lu, C., & Thawatthathree, A. (2011). *Use value innovation to create competitive advantages in Blue Ocean: A case study of IKEA in Nanjing*.
- Lushnikova, N., & Dvorkin, L. (2016). Sustainability of gypsum products as a construction material. In *Sustainability of Construction Materials* (pp. 643–681). Elsevier.
- Martini, B., Bellisario, D., & Coletti, P. (2024). Human-centered and sustainable artificial intelligence in industry 5.0: Challenges and perspectives. *Sustainability*, 16(13), 5448.
- Nonaka, I. (2009). The knowledge-creating company. In *The economic impact of knowledge* (pp. 175–187). Routledge.
- Norman, D. A., & Verganti, R. (2014). Incremental and radical innovation: Design research vs. technology and meaning change. *Design Issues*, 30(1), 78–96.
- Önder, M., & Ulaan, F. (2018). Ibn Khaldun's cyclical theory on the rise and fall of sovereign powers: The case of Ottoman Empire. *Adam Academy Journal of Social Sciences*, 8(2), 231–266.
- Peteraf, M. A. (1993). The cornerstones of competitive advantage: a resource-based view. *Strategic Management Journal*, 14(3), 179–191.
- Pirson, M. A., & Lawrence, P. R. (2010). Humanism in business – towards a paradigm shift? *Journal of Business Ethics*, 93(4), 553–565.
- Porter, M. E. (2008). *Competitive advantage: Creating and sustaining superior performance*. Simon and Schuster.
- Porter, M. E., & Kramer, M. R. (2011). Creating shared value: Harvard business review. *From the Magazine (January–February 2011)*.
- Prahalad, C. K., & Ramaswamy, V. (2004). *The future of competition: Co-creating unique value with customers*. Harvard Business Press.
- Prange, C., & Schlegelmilch, B. B. (2018). Managing innovation dilemmas: The cube solution. *Business Horizons*, 61(2), 309–322.
- Puliga, G., & Ponta, L. (2022). COVID-19 firms' fast innovation reaction analyzed through dynamic capabilities. *R&D Management*, 52(2), 331–342.
- Shahmarichatghieh, M., Tolonen, A., & Haapasalo, H. (2015). Product life cycle, technology life cycle and market life cycle; similarities, differences and applications. *Technology, Innovation and Industrial Management Joint International Conference*, 1143–1151.
- Shruthi, Prakash, N. B., Dhumgond, P., Goiba, P. K., & Laxmanarayanan, M. (2024). The benefits of gypsum for sustainable management and utilization of acid soils. *Plant and Soil*, 504(1), 5–28.
- Sutanto, S., Widyastuti, S., & Sihite, M. (2025). Sustainable Corporate Growth Strategy Through Competitive Advantage in the Gypsum Board Industry in Indonesia. *Journal of the American Institute*, 2(8), 1115–1157.

- Teece, D. (2020). Hand in glove: Open innovation and the dynamic capabilities framework. *Available at SSRN 5399445*.
- Teece, D. J. (2009). *Dynamic capabilities and strategic management: Organizing for innovation and growth*. Oxford University Press.
- Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic Management Journal*, 18(7), 509–533.
- Ulrich, D., Brockbank, W., Johnson, D., Sandholtz, K., & Younger, J. (2010). *HR competencies: mastery at the intersection of people and business*. SAGE Publications Sage India: New Delhi, India.
- Wattie, Y., Suparno, O., & Raharja, S. (2024). Enhancing competitiveness in the Indonesian meat processing industry: a literature review. *IOP Conference Series: Earth and Environmental Science*, 1358(1), 12042.
- Wiggins, R. R., & Ruefli, T. W. (2002). Sustained competitive advantage: Temporal dynamics and the incidence and persistence of superior economic performance. *Organization Science*, 13(1), 81–105.
- Winter, S. G. (2003). Understanding dynamic capabilities. *Strategic Management Journal*, 24(10), 991–995.