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LOGISTICAL CHALLENGES AND THE PERCEIVED IMPACT ON THE OPERATIONAL PERFORMANCE OF SELECTED MEDIUM ENTERPRISES IN CAVITE

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Abstract:

This study aims to identify the logistics challenges and the perceived level of impact on the operational performance of medium enterprises in Cavite. It specifically focuses on medium manufacturing enterprises located in the City of Dasmariñas, Cavite. A descriptive research design was employed to analyze the participants' profiles and assess the perceived impact of various logistical challenges. Out of 23 medium manufacturing enterprises in the city, seven agreed to participate, with a total of 107 managers and supervisors who responded to the survey questionnaire. The findings revealed that the primary logistics challenges include software glitches and insufficient data backups in terms of technological factors, rising fuel prices pertaining to external factors, and unsafe working conditions relating to internal factors. Among these, technological building blocks were perceived to have the highest-level impact on the operational performance of the enterprises. The study concluded that technological issues were perceived by participants to have the most significant impact on logistics operations, underscoring the vital role of modern technology in maintaining efficiency and competitiveness. The results further suggest that many medium-sized enterprises still lack the technological resources and

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modernization necessary to sustain operational performance. It is therefore recommended that medium enterprises invest in upgrading outdated equipment**,** enhancing technological systems, and implementing regular data backup procedures to minimize disruptions. To obtain a more thorough understanding of logistics performance among medium enterprises, future research is also encouraged to investigate logistics challenges beyond internal, external, and technological aspects. Additionally, a wider range of participants from different industries and geographic areas should be included.

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Keywords:

Logistic Challenges, Operational Performance, Medium Enterprises

Introduction

About 90% of all businesses worldwide are micro, small, and medium-sized enterprises (MSMEs), which account for over half of all jobs globally and are essential to economic growth, according to Kituyi (2020). Despite their ongoing growth, medium-sized businesses continue to encounter numerous obstacles, including poor operational integration and restricted finance access. These problems limit their ability to develop, innovate, make wise decisions, and achieve overall operational effectiveness.

In the business landscape, logistics plays a crucial role in ensuring a firm's success and sustainability. It involves the efficient management of how resources are acquired, stored, and distributed to their destinations. In the Philippines, MSMEs are categorized based on employment size and total assets. Within the CALABARZON region, Cavite stands as one of the country's major economic contributors, accounting for 28% of established business enterprises. Of the 41,446 registered establishments in the province, 5% are classified as medium enterprises (DTI as cited in e-FOI, 2021).

Over time, Cavite has shown significant economic growth driven by the expansion of numerous industries and business establishments. In addition, the study conducted by Kanyepe, Musasa, and Wilbert (2025) found that elements such as financial constraints, availability of competent workforce, data protection, and supplier dependability have a positive effect on the financial and operational outcomes of small and medium enterprises. Consequently, MSMEs should develop strategies to leverage these factors to overcome operational difficulties and improve their efficiency and competitiveness.

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While logistics challenges affecting micro, small, and medium-sized enterprises (MSMEs) have been discussed in prior studies, much of the existing research has concentrated on micro and small firms or has relied on objective performance measures examined through inferential or causal analyses. Studies that focus specifically on medium manufacturing enterprises and adopt a perception-based perspective remain limited, particularly within the Philippine setting.

This study contributes to the literature by giving attention to medium-sized manufacturing enterprises, an often-overlooked group in MSME research and by examining how logistics challenges are viewed by managers and supervisors who are directly involved in daily operations and decision-making. By focusing on enterprises located in Dasmarinas City, Cavite, which serves as a major manufacturing center in the CALABARZON region, the study offers localized insights that are not commonly captured in broader national or cross-country logistics research.

Literature Review

Theoretical Framework

The logistics 4.0 framework serves as a guide for the researchers to identify and define the relationship among variables.

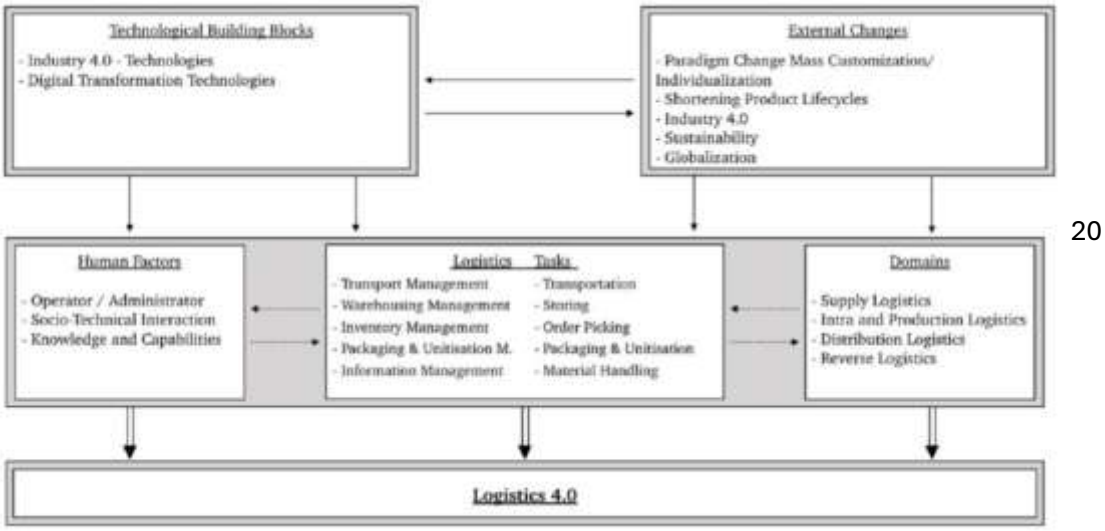

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Figure 1: Logistics 4.0

Anchored on the Logistics 4.0 framework proposed by Winkel Haus and Grosse (2020), the study conceptualizes logistics challenges as multidimensional constructs encompassing technological building blocks, external challenges, and internal factors. These dimensions are perceived by managers and supervisors to be associated with variations in operational performance. The framework provides a systematic lens through which logistics-related constraints are examined, emphasizing the role of digitalization, organizational readiness, and environmental conditions in shaping logistics effectiveness.

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Conceptual Framework of the Study

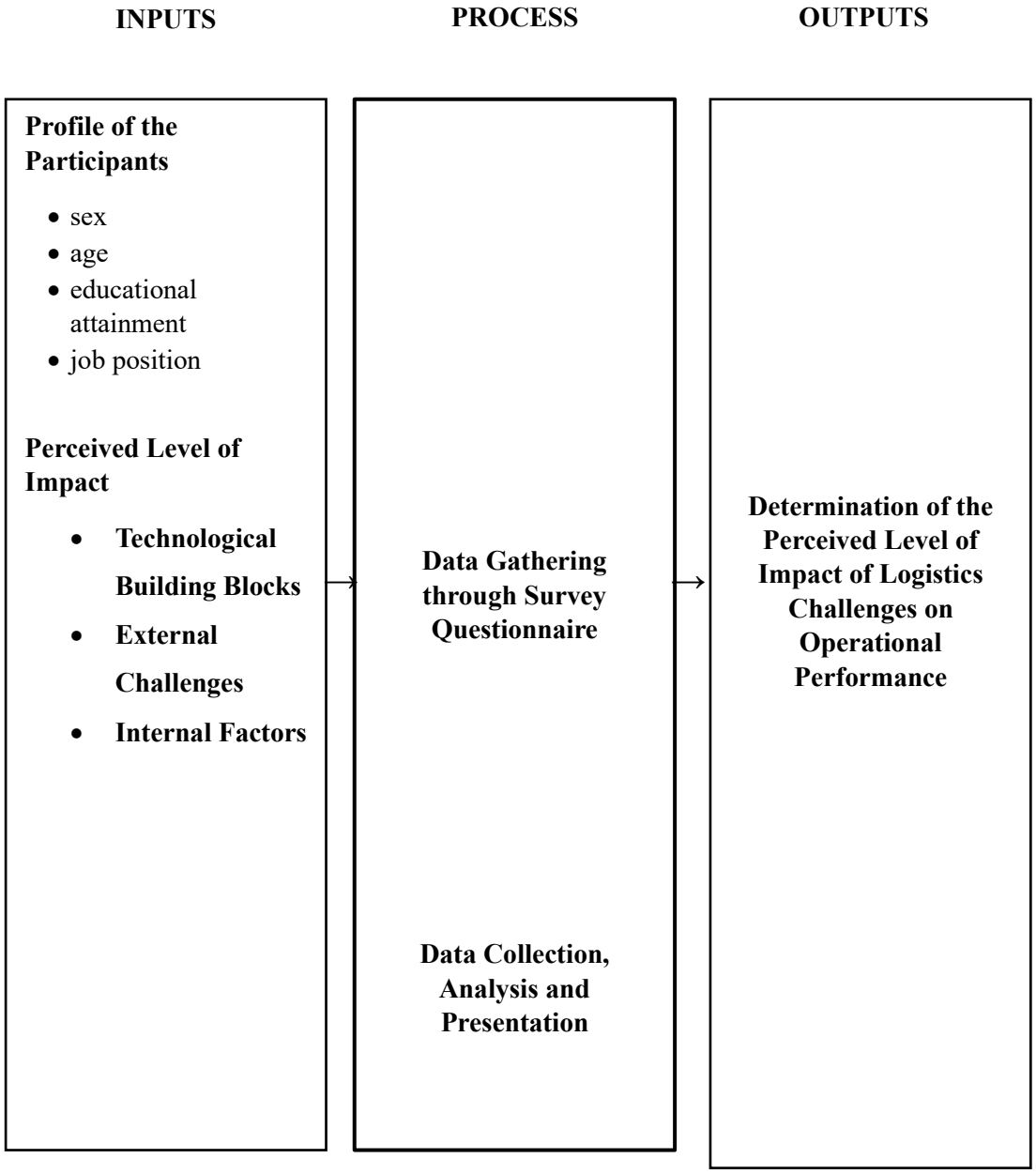

Figure 1: The Conceptual Framework of the Study

The input component consists of two major elements. The first includes the profile of the participants**,** specifically their sex, age, educational attainment, and job position. These characteristics provide contextual information about the participants and help describe the background of the managers and supervisors involved in logistics-related functions.

The second input includes the perceived level of impact of logistics challenges**,** which are categorized into technological building blocks, external challenges, and internal factors**.** These variables represent the key logistics-related concerns assessed in the study.

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The process component involves the data-gathering and analytical procedures employed by the researchers. Data were collected through a self-administered survey questionnaire distributed to managers and supervisors of selected medium manufacturing enterprises. The gathered data were then subjected to data collection, analysis, and presentation using descriptive statistical tools such as frequency distribution, weighted mean, and ranking to interpret perceptions.

The output of the study is the determination of the perceived level of impact of logistics challenges on operational performance. This output reflects the overall assessment of how technological, external, and internal logistics challenges are perceived by the participants to influence the operational performance of their respective enterprises. The framework does not imply a causal relationship but provides a structured representation of how the study examines perceived relationships among the variables.

Logistics Challenges

Agarwal (2025) evaluated the impact of recent disturbances, which revealed the conventional supply chain's weaknesses and highlighted the necessity of infrastructure development and digital transformation. There were problems unique to the FMCG industry, such as cold chain gaps. With the automobile industry's increased reliance on just-in-time logistics, suggesting the need for tailored strategic initiatives. The study ends with practical suggestions, such as the use of digital technologies, enhanced 3PL collaborations, and government-backed infrastructure, as well as educational initiatives to enhance logistics proficiency. These observations add to the scholarly discussions around supply chain efficiency while offering business executives and legislators practical strategies for enhancing resilience, cutting expenses, and obtaining a competitive edge in the manufacturing sector of India.

A study conducted by Transportify (2021) identified several challenges faced by logistics companies operating in the Philippines, including geography, poor infrastructure, unpredictable weather, demand patterns, and scattered demand. The study further emphasized that, since the Philippines is an archipelago composed of Luzon, Visayas, and Mindanao, managing logistics operations across the country is comparable to managing operations in multiple nations. This is primarily due to the heavy reliance on multimodal transportation systems, which require logistics managers to cater to smaller, region-specific markets. Additionally, language differences across regions and the higher cost of serving markets in the Visayas and Mindanao compared to Luzon further complicate logistics management in the country.

Further, Parilla and Abadilla (2021) suggested that manufacturing firms should continuously improve their supply chain management practices by benchmarking with industry standards and ensuring that their principles remain relevant and effective. By leveraging the advantages of an efficient supply chain, organizations can reduce financing costs and gain a competitive edge over their rivals. The study also emphasized the importance of maintaining organizational principles in hiring and retaining qualified personnel. Firms should continuously train their staff and update their knowledge on emerging trends and innovations in supply chain management. Investing in employee education and training should remain a top management priority since organizations cannot operate effectively without competent people. Skilled, experienced, and knowledgeable employees, supported by efficient systems, ensure sustained professional growth, which leads to higher organizational effectiveness and profitability. They further recommended the adoption of innovative technologies to manage and optimize supply chain systems.

Borazon et al. (2020) emphasized that small businesses should be encouraged to adopt information technologies that can facilitate faster integration of their internal operations. The study further suggested that the government could invest in enterprise application integration technologies to support businesses in streamlining operations through efficient information sharing. Additionally, mechanisms that promote and incentivize the use of information technology among businesses should be strengthened to enhance productivity and competitiveness.

Small and medium-sized businesses (SMEs) in the Western Balkans encounter obstacles while attempting to access supply chains, according to a study by Semencenko and Vasilic (2020). The researchers examined a number of variables that affect SMEs' involvement in domestic and global supply chains using a binary logistic regression technique. The results showed that among the main challenges are poor logistics infrastructure, limited access to financing, a lack of managerial skills, and inadequate technology capabilities. Furthermore, legislative obstacles and institutional inefficiencies make it difficult for SMEs to successfully integrate into larger supply networks. The report underlined that in order for SMEs in the Western Balkans to become more competitive and sustainable participants in global value chains, it is imperative that logistical performance be improved, digital adoption be increased, and government support be increased.

Cichosz et al. (2020) aimed to identify barriers to digital transformation and propose strategies to overcome them. The researchers employed a review of related literature and conducted case study analyses involving nine international and global logistics service providers. The findings revealed that the primary challenges were external in nature, particularly those associated with customers, business partners, and market competition. Moreover, the complexity of implementing new technologies within organizations emerged as a major internal challenge. The study recommended enhancing operational efficiency, improving customer experience, developing new services based on customer demand, and adopting platform-based business models to strengthen organizational performance and competitiveness.

Smith, Voak, and Gunasekera (2020) revealed that the quality of logistics infrastructure significantly influences the level of foreign direct investment. Their findings indicate that in eight out of ten ASEAN member states—excluding Singapore and Malaysia—the quality of infrastructure remains below the global average, thereby hindering regional economic productivity. Moreover, poorly developed and inadequately managed transportation networks serve as barriers to trade. Transportation safety and security were identified as major concerns requiring immediate attention, while inconsistent customs policies across the region contribute to longer processing times and higher import/export costs. As part of the new open-line initiative, ASEAN members have been encouraged to harmonize customs procedures, reduce documentation requirements, and enable electronic shipment processing. The study emphasized the urgent need for enhanced intergovernmental cooperation to ensure safety and regulatory consistency within the regional shipping industry. Additionally, while opportunities for infrastructure investment are abundant, the researchers recommend revising investment policies to attract more foreign investors and establishing a regional consumer credit rating bureau to support financial transparency and integration.

The study conducted by Arsić et al. (2020) examined various implications of logistics capacity on the economic sustainability of small and medium-sized enterprises (SMEs). The research aimed to address the existing gap in understanding how logistical capabilities influence a

company's long-term financial stability and performance. Previous studies by Zimon and Zimon focused on the impact of logistics on profitability, while Green explored the relationship between logistics performance and both marketing and financial outcomes. Building upon these earlier works, Arsić et al. expanded the scope by analyzing eight key business dimensions within the SME context, including supply chain position, export location and form, sales share, and supply chain volume.

Transportation cost over sales, warehousing cost over sales, inventory carrying cost over sales, physical inventory cost, and opportunity cost are the primary metrics used to assess a company's logistics performance, according to the Department of Trade and Industry (DTI, 2018). Beyond the country's geographic structure, the study noted that the unreliability of the logistics system also contributes to high logistics costs across various sectors such as electronics, automotive, furniture and décor, and even the food industry. To improve traditional logistics systems in the Philippines, the study recommended establishing a more reliable inter-island shipping network and strengthening the overall logistics infrastructure to ensure consistent connectivity and efficiency. These improvements would enable better strategic decision-making and cost reduction. Lastly, the study underlined how crucial it is to better understand logistics difficulties by encouraging the sharing of best practices and lessons gained, especially to help small and medium-sized businesses (SMEs) improve their operational performance.

Objectives of the Study

1. Determine the socio-economic profile of the participants in terms of age, sex, educational attainment, and job position.

2. Analyze the perceived level of impact of logistics challenges on the operational performance of medium enterprises in terms of technological building blocks, external challenges, and internal factors.

Research Method

The study utilized the descriptive method, which was employed to present the socio-economic profile of the participants and to assess the extent to which logistical challenges are perceived to impact the operational performance of selected medium enterprises in Cavite.

Based on data from the City Government of Dasmariñas, there are 23 medium-sized manufacturing enterprises operating within the city. However, only seven of these enterprises agreed to participate in the study. All participating enterprises had been in operation for more than six months and were engaged in logistics management within the manufacturing sector.

In terms of sample size and representativeness, the study involved seven participating enterprises out of the 23 registered medium manufacturing firms operating in Dasmariñas City. Although participation was limited at the firm level, data were collected from 107 managers and supervisors, providing a sufficient number of responses for descriptive analysis. The participants came from various functional areas within the participating organizations, allowing the study to capture a range of perspectives related to logistics operations. However, it is recognized that enterprises that opted not to participate may face different logistics conditions.

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As such, the findings are interpreted within the context of the participating firms and are not intended to represent all medium manufacturing enterprises in the city.

To collect the primary data, the researchers used a self-constructed survey questionnaire. This instrument was content validated by experts in logistics management and pretested among 15 individuals who were not part of the actual study sample. The pre-test yielded a Cronbach's alpha coefficient of 0.886, which was interpreted as "good." The responses from the pre-test participants were not included in the main data collection but were solely used to evaluate the reliability of the instrument. The results confirmed that the questionnaire contained no major lapses or inconsistencies, thereby ensuring that the instrument was comprehensive, clear, and effective for the actual data-gathering process.

With respect to the measurement of operational performance, the study employed a perception-based approach. Rather than using objective financial or productivity indicators, operational performance was assessed based on participants' evaluations of logistics-related efficiency, coordination, process reliability, workforce effectiveness, information management, and workplace safety. This approach is consistent with earlier studies on SMEs and logistics management, particularly in settings where access to standardized performance data is limited. The use of Likert-scale items allowed participants to express their professional judgment regarding the extent to which logistics challenges influence operational performance.

The following scale was used to interpret the participants perceived level of impact of logistics challenges on operational performance.

Option	Rating Scale	Level of impact
5	4.2-5.0	Very high level of impact
4	3.4-4.1	High level of impact
3	2.6-3.3	Low level of impact
2	1.8-2.5	Very low impact
1	1.0-1.7	No impact at all

Results and Discussion

Socio-Economic Profile of the Participants

Table 1 presents the socio-economic profile of the participants. The majority of them were aged 31–40 years old, accounting for 62 participants (57.9%), followed by those aged 41–50 years old with 27 participants (25.2%). Meanwhile, 18 participants (16.8%) were aged 51 years old and above, and no participants were within the 21–30 years old age group. In terms of sex, the majority were male, comprising 81 participants (75.7%), while female participants accounted for 26 (25.3%) of the total sample. Regarding educational attainment, most participants were bachelor's degree holders with 86 participants (80.4%), followed by postgraduate degree holders with 21 participants (19.6%). No participants were classified as high school graduates or associate degree holders. Lastly, in terms of job position, the majority

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were supervisors, with 65 participants (60.7%), while 42 participants (39.3%) were managers or department heads.

Table 1: Profile of the Participants

Characteristic	Category	Frequency	Percentage
Age	21-30 years old	0	0
	31-40 years old	62	57.9
	41-50 years old	27	25.2
	51 years old and above	18	16.8
Sex	Male	81	75.7
	Female	26	24.3
Educational attainment	High School Graduate	0	0
	Associate degree	0	0
	Bachelor's Degree	86	80.4
	Postgraduate Degree	21	19.6
Job position	Manager or Department Head	42	39.3
	Supervisor	65	60.7

Perceived Impact of Logistic Challenges on the Operational Performance

Technological building blocks. Participants' perceptions of the impact of technology building blocks are shown in Table 2. With the highest mean score of 4.39, or "Very High," among the indicators, the statement "Glitches and insufficient backups" implies that participants face serious difficulties with system faults and inadequate data backup procedures. Although still regarded as a concern, problems with outdated handling equipment are thought to have a relatively smaller impact than other technological factors, according to the statement "Outdated material handling equipment (conveyors and forklifts) for loading goods," which received the lowest mean score of 3.88, or "High."

The overall mean of 4.11 for technological building blocks ranked as the highest perceived impact among the logistical challenges. This indicates that medium enterprises face a notable limitation of technological resources and support, highlighting the crucial role of technology in their operations. The finding implies that technological advancement significantly influences MSMEs, as many still struggle to invest in modern tools and systems needed to keep pace with current industry trends. A similar study emphasized that government support is essential in fostering technological development among MSMEs. For instance, Taiwan's government established a national information and communications infrastructure that serves as a platform for data exchange (Borazon, Elaine, Supangco, & Vivien, 2020). Likewise, Parilla and Abadilla (2021) found that innovative technology adoption is necessary for MSMEs in the Philippines to effectively manage logistics challenges and enhance enterprise performance.

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Table 2: Perceived Level of Impact on Technological Building Blocks

Indicator	Mean	SD	Interpretation
1. Cannot keep up with technological innovations that are related to logistics management such as outdated logistics software	4.08	0.56837	High
2. Connectivity issue in logistics management specifically under the integration of systems	4.00	0.59874	High
3. Glitches in software and insufficient backups	4.39	0.68346	**Very High**
4. Lack of maintenance, updates, and monitoring for technological processes	4.22	0.53249	Very High
5. Outdated material handling equipment (conveyors and forklifts) for loading goods	3.88	0.60983	High
OVERALL TECHNOLOGICAL BUILDING BLOCKS	4.11		High

External challenges. Table 3 shows the perceived level of impact of external challenges on the participants. The statement "Logistics costs increased due to rising oil prices" had the highest mean score of 4.21, or Very High, out of all the indicators. This suggests that changes in fuel prices have a major effect on total logistics operations and expenses. However, the statement "Limited access and available resources due to the archipelagic structure of the country" received the lowest mean score of 3.04, which is interpreted as “Low”. This indicates that although there are geographical limitations, companies believe they have a smaller impact than other external challenges.

Lastly, the overall mean of 3.66 for external challenges ranked lowest on the logistic challenges. This highlighted how the cost and reliability issues of medium enterprises logistics are influenced by legislation, environmental concerns, and other logistic rates. An organization's internal problems, particularly those related to labor, research and development, and a shortage of subject-matter experts, are one of the main supply chain problems it faces, according to Narkhede and Rajhans (2019). These problems make the system as a whole less efficient and well-organized.

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Table 3: Perceived Level of Impact of External Challenges

Indicator	Mean	SD	Interpretation
1. Government regulations and Local Government Unit (LGU) ordinances regarding truck bans, vehicular coding and city permits affect the firm's operations.	3.79	0.66925	High
2. Environmental issues such as carbon emissions and water contamination that a firm's operations.	3.07	0.76813	Low
3. Limited access and available resources due to the archipelagic structure of the country.	3.04	0.69940	Low
4. Increase in freight rates, taxes and tariffs across regions or countries	4.05	0.52094	High
5. Logistics costs increased due to rising oil prices	4.21	0.61026	**Very High**
6. Lack of options in mass customization	3.81	0.72854	High
OVERALL EXTERNAL CHALLENGES	3.66		High

Internal Factors. The results show a considerable concern for workplace safety and employee welfare, with unsafe working conditions regarded to have the highest impact on logistical operations among internal factors. On the other hand, the absence of terminal amenities such dock shelters were thought to have the least effect, indicating that inadequate infrastructure is not thought to be a significant internal problem. The participants believed that internal variables had a significant influence on logistics performance overall, with a mean score of 3.77.

The overall mean of 3.77 for internal factors ranked second among the logistics challenges, indicating that issues related to transportation, information management, and human resources have a high level of impact on the operational performance of medium enterprises, particularly in the manufacturing industry. These internal challenges significantly affect the efficiency and reliability of business operations. Findings from ASEAN (2020) emphasized the need for enhanced inter-governmental collaboration to ensure consistency in logistics processes, noting that incongruent customs policies across the region contribute to increased time and costs in import and export activities. Conversely, the Department of Trade and Industry (2018) reported that the archipelagic structure of the Philippines and poor road conditions pose the most significant external logistics challenges, while environmental regulations were also identified as highly impactful factors influencing logistics performance.

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Table 4: Perceived Level of Impact of Internal Factors

Indicator	Mean	SD	Interpretation
1. Shortage of trucks and shipping containers.	2.60	0.72502	Low
2. Lack of terminal facilities such as dock shelter.	2.45	0.77986	Very Low
3. High expenses in overheads such as maintenance and repair.	2.80	0.78234	Low
4. High expenses on other modes of transportation such as sea cargo to air cargo	2.73	0.84194	Low
5. Inefficient delivery due to poor route planning or distribution pattern.	3.12	0.84351	Low
6. Weak logistics management file confidentiality.	4.18	0.57974	High
7. Poor disposal of information assets under logistics cargo department.	3.97	0.74553	High
8. Ineffective and inefficient communication between logistics departments and other departments.	4.40	0.73792	Very High
9. Lack of memorandum and other similar communication devices between logistics department and other departments.	3.99	0.70704	High
10. Unorganized documents and files in the logistics department.	4.01	0.75854	High
11. Logistical service defects due to lack of manpower such as truck drivers.	4.22	0.48191	Very High
12. Decrease the company's profits due to the increase in the value of the logistics labor force.	4.57	0.53398	Very High
13. Lack of general training and seminars for employees on logistics management.	4.38	0.56041	Very High
14. Lack of experts or trainers for employees in logistics management.	4.36	0.55376	Very High
15. Unsafe working conditions for employees in the logistics department	4.72	0.45130	**Very High**
OVERALL INTERNAL FACTORS	3.77		High

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Table 5: Summary of the Perceived Level of Impact of Logistics Challenges

Indicator	Mean	SD	Interpretation	Rank
Technological Building Blocks	4.11	0.62418	High	1
External Challenges	3.66	0.80751	High	3
Internal Factors	3.77	1.02307	High	2

Conclusions

1. The majority of the participants were 31–40 years old, male, supervisors, and bachelor's degree holders. This suggests that men are more likely to be employed in labor-intensive and machine-focused environments, such as manufacturing industries, compared to women. Furthermore, this indicates that the participants are experienced professionals who possess the necessary knowledge and competence to address various logistics challenges within their organizations.
2. Problems relating to technology were perceived to have the highest impact of all logistical considerations, highlighting how important technology is to corporate operations. Efficiency is hampered by system errors, inadequate backups, and antiquated equipment, according to the findings, which show that many medium-sized enterprises still lack the technology resources and modernization necessary to compete in the market
3. The rising cost of fuel, which directly raises overall logistics prices, is one of the external concerns that significantly affect logistics operations. Physical limitations resulting from the nation's archipelagic nature are acknowledged, but they are thought to have less of an impact than economic considerations, emphasizing that the most important external factor affecting logistics performance is still shifting oil prices.
4. Given that among internal issues, unsafe working conditions were thought to have the highest impact on logistical operations, the results show a considerable concern for workplace safety and employee welfare. The absence of terminal amenities like dock shelters, on the other hand, was thought to have the least impact, indicating that inadequate infrastructure is not seen as a significant internal crisis.

Recommendations

1. To improve supervisors' and employees' knowledge and proficiency in handling logistical difficulties, offer them training and skill development programs.
2. To become more efficient and competitive, medium-sized enterprises should invest to replace outdated equipment, enhance technical systems, and make sure that frequent data backups are performed.
3. Businesses should investigate fuel-efficient tactics including route optimization, routine auto maintenance, and alternate energy sources to mitigate the effects of growing oil prices.
4. Enhance safety procedures, supply protective gear, and carry out routine inspections to guarantee secure working environments and safeguard worker welfare.
5. While terminal facilities have less of an influence, enhancing storage rooms and dock shelters can nevertheless assist efficiency and improve overall logistics operations.

6. It is recommended that future research look at logistical difficulties from perspectives other than internal, external, and technology ones. A more thorough grasp of the variables affecting logistics performance among medium-sized enterprises will be possible by broadening the focus to these areas and including a larger number of participants from different sectors and geographical areas.

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Ethics Statement: Option A (For Studies Involving Human Participants)
This study was conducted in accordance with ethical research standards. All procedures involving human participants were reviewed and approved by the [Ms. Kimberly Joy Alcaraz].

	Informed consent was obtained from all participants prior to data collection. Participation was voluntary, and respondents were assured of confidentiality and anonymity. The data collected were used solely for academic purposes.
Author Contribution Statement:	The corresponding author and research adviser conceptualized the study, provided overall supervision, guided the research methodology, and reviewed and approved the final manuscript. Authors 2–5 were primarily responsible for the preparation of Chapters 1 to 5, including the literature review, research design, data collection, analysis, and interpretation of results. They also contributed to the drafting and revision of the manuscript. All authors read and approved the final version prior to submission.

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