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IMPLEMENTATION OF JUST IN TIME, SUPPLY CHAIN MANAGEMENT AND TOTAL QUALITY MANAGEMENT ON OPERATIONAL PERFORMANCE WITH ENVIRONMENTAL RESPONSE AS A MODERATING VARIABLE

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Abstract

This study examines how contemporary operational management practices contribute to operational performance by considering environmental responsiveness as a contextual strengthening factor. The analysis focuses on the implementation of Just In Time (JIT), Supply Chain Management (SCM), and Total Quality Management (TQM) within manufacturing firms and small and medium enterprises (SMEs). A quantitative research design was employed using a survey approach, and data were gathered through structured questionnaires with 100 responden. The empirical analysis utilized SPSS to assess both direct relationships and moderating effects. The findings reveal that JIT, SCM, and TQM significantly enhance operasional performance, while environmental responsiveness intensifies theserelationships. Overall, the results emphasize that aligning operational efficiency with environmental considerations is essential for achieving sustained competitiveness and operasional performance increase.

Keywords: Just In Time, Supply Chain Management, Total Quality Management, Environmental Responsiveness, Performance operasional

INTRODUCTION

Financial reports represent management's accountability for the stewardship of entity Based on Law No. 20 of 2008, MSMEs are a crucial sector, considered the backbone of the Indonesian economy and a key contributor to job creation. The number of MSMEs, rather than decreasing, continues to increase annually. According to the Ministry of Cooperatives and Small and Medium Enterprises, as of March 2021, the number of MSMEs in Indonesia had reached 64.2 million, contributing 61.07% of the Gross Domestic Product (GDP) or IDR 8,573.89 trillion, absorbing 97% of the total workforce and accumulating up to 60.42% of total investment in Indonesia (Ministry of Finance of the Republic of Indonesia, 2022). Bekasi, a city of industry and commerce, boasts a rapidly growing number of MSMEs. According to data from the Department of Cooperatives and Small and Medium Enterprises, the number of MSMEs in Bekasi continues to increase year after year.

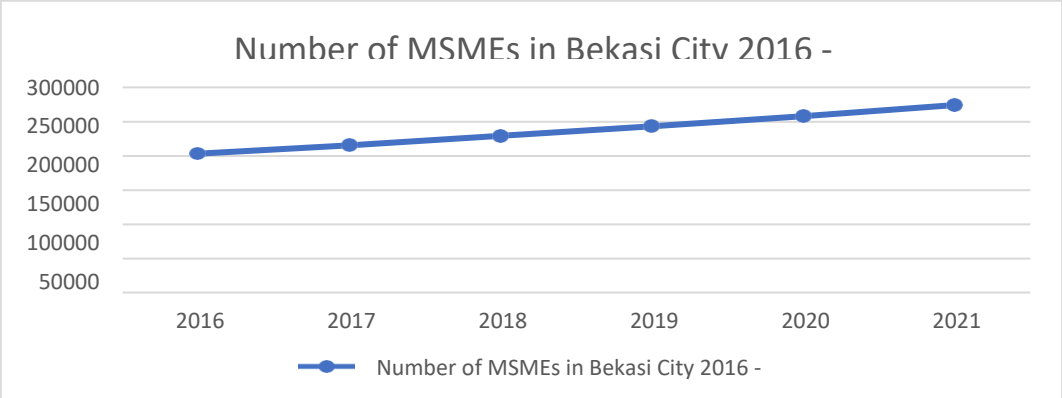

Figure 1. Number of MSMEs in Bekasi City 2016 – 2021
Source: Bekasi City Cooperatives and MSMEs Service

According to data from the Central Statistics Agency (BPS), the economic growth of MSMEs in Bekasi City continues to increase, driven by the MSME sector. Compared to the 2020 pandemic, when economic growth in Bekasi City was minus 2.55%, in 2021, the economy reached 3.22%, and in 2022, it increased to 4.9%. This means that the MSME sector in Bekasi City can significantly reduce poverty and unemployment. The data on the number of MSMEs in Bekasi City demonstrates the significant opportunities for MSMEs to advance the economy, thus ensuring the growth and financial performance of MSMEs is a priority for all parties. The significant contribution of MSMEs necessitates improving their financial performance for the sustainability and prosperity of their businesses. MSME financial performance depends on community mobility. Technological advances force MSMEs to adapt to face intense competition while simultaneously providing opportunities for advancement and development. Therefore, implementing a strategic competitive concept is a requirement in facing systematic, massive, and radical competition.

Increasing business competition is caused by various factors such as product quality, product design, delivery patterns, service, and product pricing. Internal and external competition factors also influence the competitive strategy of the Company's business processes. The Company's competitive strategy is influenced by efficient, effective, and economical internal business processes, logistics management support, and a quick and appropriate response to environmental changes. Modern business competition concepts have become the focus of management attention, such as the implementation of Supply Chain Management, Just In Time, and Total Quality Management. These three concepts, if implemented properly, will provide strong business competitiveness and be able to increase competitiveness in the long term. The Just In Time concept through operational efficiency by reducing logistics costs and speeding up the delivery of goods to consumers. The Just-in-Time (JIT) concept is a production method that focuses on eliminating activities that do not provide added value. The goal is to create a lean, efficient, and flexible production system so that it can respond quickly to fluctuations in customer demand. The implementation of JIT aims to eliminate all forms of waste while encouraging maximum quality, cost reduction, and optimization of resource utilization, as well as minimizing production and delivery times. The application of the Just In Time concept to business competitive strategy is related to business competitiveness and response to environmental changes, especially in meeting customer demand.

Sustainable competitiveness is currently an interesting research theme, advances in information and communication technology provide opportunities and challenges for companies in increasing their competitiveness.Optimal operational performance is heavily influenced by an organization's competitiveness. This also relates to responding to the business environment by providing the best service to meet market demand. The primary objective of implementing Supply Chain Management (SCM) is to effectively align supply and demand to improve operational

efficiency, reduce costs, and maximize customer value. SCM optimizes the flow of goods, information, and funds from suppliers to end consumers to accelerate distribution, reduce excess inventory, and enhance the company's competitive advantage.

According to Dhamija et al. (2020); Dumitrascu et al. (2020) Supply chain management is a company's competitive strategy, which integrates the supplier chain with the company to minimize total costs from raw material costs, transportation costs, facility costs, production costs, inventory costs, and so on. Competitive Supply Chain is a series of physical flows of goods, information and processes to send products or provide services from the source location (supplier) to the destination location (customer or buyer). The supply chain is an integrated approach between suppliers, producers, warehouses and stores so that the goods produced and distributed show the right amount and time so as to minimize costs. According to Abdirad et al. (2021) and Dhamija et al. (2020), companies need to evaluate the company's sustainability periodically to be able to determine the company's operational performance and existence.

The next factor that influences a company's operational performance is the implementation of the Total Quality Management concept. TQM is a series of processes and company goals that are based on customers and followed by continuous improvement from the company (Luthra et al., 2021). Charantimath (2017) defines TQM as an effort made by a company to continuously improve quality in the long term by every aspect involved. Rabelo et al. (2022) also stated that TQM is a framework that focuses on customer satisfaction. The key dimensions of TQM implementation are customer satisfaction with a positive and fast response to customers, fact-based management, and continuous improvement. Furthermore, (Luthra et al., 2021) developed this concept so that TQM has eight (8) main dimensions, namely (1) creating a quality management environment, (2) developing teamwork, (3) quality control techniques, (4) customer focus, (5) focus on supplier relationships, (6) benchmarking, (7) process improvement, and (8) employee empowerment.

A company's operational performance is the result of its management activities, which serves as a parameter or benchmark for assessing its success in achieving its stated goals within a specific period. Company performance is the company's output over a specific period, based on predetermined standards. Business performance reflects the company's market-oriented and profit-oriented objectives.Of course, optimal operational performance is the hope of company management (Ardiansyah et al., 2024). Competitive operational performance is a key factor in determining business sustainability. Operational performance demonstrates a company's competitiveness by effectively responding to customer needs. Competitive operational performance reflects a company's ability to adapt and meet market demands or customer expectations, as well as its ability to compete with competitors in the long term (Ghazani & Wibowo, 2021).

Operational performance relates to a company's managerial activities, including planning, operations, evaluation, and improvement of production systems (Yani & Daka, 2022). Agita (2022) defines operational performance as a company's measurable efforts to produce output from its production activities. Similarly, research by Slack et al. (2022) states that operational performance is a set of multi-facility activities used to communicate internally and externally about the successful resolution of company problems, particularly in the operational field.

Operational performance assessments are divided into five dimensions to facilitate the assessment and evaluation process: service quality, service speed, service reliability, service flexibility, and service costs (Slack et al., 2022). The problem that arises is the demand for companies to be able to meet increasingly diverse consumer needs. Therefore, companies must be competitive by making efforts to improve product or service quality, production cost efficiency, and increasing innovation (Paramasivan et al., 2023). To face competition and survive, companies must have a competitive advantage (Tan & Li, 2023). A company's competitive advantage is the result of implementing an appropriate competitive strategy that is different from or has never been implemented by other competitors (Ahmadi & Pintado, 2022). This means that companies strive to develop competitive strategies by analyzing every change in the internal and external environment.

Based on the description above, the research problem that needs to be answered is: how does the implementation of Just In Time, Supply Chain Management, and Total Quality Management affect the company's operational performance through business environmental responsiveness. The purpose of this research is to analyze the effect of the implementation of the Just In Time, Supply Chain Management, and Total Quality Management concepts on operational performance and to prove whether environmental responsiveness moderates the implementation of the JIT, SCM, and TQM concepts on performance. In addition, the theoretical objective is to prove the relationship between the theoriesContingency, Transaction Cost Theory and Resource Based Theory.

LITERATURE REVIEW

Contingency Theory

Contingency theory was first introduced by Lawrence and Lorsch in 1967 and further developed by Katz and Rosenzweig in 1973. This theory explains that there is no single most effective approach to aligning internal organizational factors with external environmental conditions to achieve optimal organizational performance. This means that organizational performance is greatly influenced by managerial readiness and capabilities in dealing with various business problems. Contingency theory is an approach to solving organizational problems ranging from organizational design, planning, performance, organizational behavior, and determining overall competitive strategy (Khanifah, 2023). Contingency theory states that there is no single best way to manage an organization but depends on the internal and external conditions faced. Therefore, responding to changes in the internal and external environment is a tool to encourage the successful implementation of the concepts of JIT, SCM, and TQM in improving organizational performance. According to contingency theory, the design and control system must adapt to the situation of the company where the system is implemented. If the control system is aligned with the factors that affect the company, the performance of the company or individuals within it will increase (Ghufron, 2020). Therefore, contingency theory can be used as a tool for analyzing business competitive strategies for various purposes, including facing competitive challenges.

Legitimacy Theory

Legitimacy theory focuses on the relationship between companies and society, meaning companies must pay attention to the norms and regulations that apply in the environment in which they operate, in order to increase their legitimacy. Dowling & Pfeffer (1975) stated that legitimacy is an aspect that organizations need to pay attention to, due to the limitations contained in norms and regulations that can foster motivation for the importance of environmental management activities. Environmental management activities are a form of company attention to society and the environment in an effort to gain legitimacy from society. Thus, with this legitimacy, the company's image in the eyes of the public and shareholders will improve, which is expected to have an impact on increasing the company's value.

Stakeholder Theory

Stakeholder theory emphasizes the importance of a company as a business entity, ensuring its ability to provide benefits to its stakeholders (Freeman & Reed, 1983). Stakeholders play a crucial role in determining the existence and sustainability of a company's business. A company's survival depends on stakeholder support, and therefore, companies must strive to foster harmonious relationships with stakeholders. Environmental management activities represent a company's efforts to meet stakeholder interests as a form of responsibility for environmental impacts. Good environmental management motivates stakeholders to fully support the company, thereby increasing its value.

Just In Time (JIT) Concept

In 1950, Taiichi Ohno, Executive Vice President of Toyota Motor Company, was a pioneer who introduced the Just in Time (JIT) concept. The main objective of the Just In Time approach is to enable Toyota to efficiently produce various types of products in a short time to meet and respond to consumer demand. Just In Time is an operations management philosophy that seeks to reduce the use of raw materials, labor, and facilities efficiently and effectively. The Just In Time system is designed to improve quality, reduce production costs, and try to minimize waste of time and resources (Janson B & Nurcaya, 2019). Just In time aims to achieve the highest quality, reduce costs and save time, thus enabling the Company to reduce waste (Juardi et al., 2022).

The crucial role of Just In Time is to increase company profits and strengthen competitiveness by controlling production costs, improving product or service quality, and improving overall performance and quality (Janson B & Nurcaya, 2019). Just in Time is a production system designed to achieve quality, reduce costs, and achieve the most efficient delivery time possible by eliminating all waste in the production process, enabling companies to deliver products to consumers on time (Jeni Irmawati, et al., 2021).

Supply Chain Management (SCM) Concept

SCM plays a vital role in increasing an organization's competitiveness by responding quickly to changes in the market environment, ensuring stock availability, and improving customer satisfaction through real-time visibility. The implementation of SCM has become a competitive business strategy that focuses on meeting customer needs. SCM plays a crucial role in ensuring business competitiveness by meeting customer needs, according to Christopher (2011: 4). In line with changes in the competitive business environment, SCM has become an important approach for companies to supply quality products, faster delivery, and competitive product prices. The positive impact of implementing the SCM concept is increasing additional competitive advantages over competing companies. Lambert (2014: 2) shows a shift in the way that every business no longer competes as an autonomous business but competes in various aspects, such as the concept of the supply chain, which has experienced a paradigm shift in modern business.

The results of a MarkPlus Insight survey (2020) showed that 78% of company executives in Indonesia considered SCM a priority step in efforts to improve efficiency and competitiveness. The results of a survey by PWC and the MIT Forum for Supply Chain Innovation concluded that supply chain disruptions will have a significant negative impact on a company's operational performance (Pwc. 2013). This means that the level of profit or operational efficiency can be increased through the effective implementation of SCM. This means that the main focus of SCM is optimizing the overall value obtained from all business activities (Siburian, Hidayati, and Pituringsih 2022). This occurs because SCM integrates various elements such as suppliers, producers, distributors, retailers, and customers to be more efficient. Thus, SCM provides certainty about the quantity of goods produced, at the right time, and in the right place, so that overall costs can be reduced and the desired service quality is achieved (Yusuf & Soediantono, 2022).

Total Quality Management (TQM) Concept

Total Quality Management is a behavioral change at all levels of an organization that emphasizes the importance of customer satisfaction. In other words, nearly 99% of improvements are made continuously by everyone in the organization to understand, meet, and even exceed customer expectations. This total quality management philosophy emphasizes human resources and interpersonal relationships, not only relying on quality checks at the end of the process, but also emphasizing the process of establishing quality itself by eliminating deviations that occur during the production process.

The concept of TQM as a philosophy and management principles is a set of competitive strategies in improving the company's operational performance, namely fulfilling customer needs and satisfaction. In the global market there is continuous change, and fast delivery (speed of

delivery), and product quality determine competitiveness (competition). The implementation of TQM can improve product quality, minimize production costs and increase company productivity in the long term and sustainably. The implementation of TQM also has a positive impact on production costs and increased company profitability. Chase, et al. (2005), stated that TQM is a new paradigm in increasing company competitiveness through a focus on customer satisfaction, involvement of all employees, and continuous improvement in the quality of products, services, people, processes and the organizational environment.

Environmental response

The business environment relates to all conditions, including strengths and weaknesses, both within and outside each business unit. The conditions faced by the company will influence the direction of policies related to the management of all operational activities. The business environment relates to internal and external factors that can create opportunities or threats for the company. Analysis or response to the environment is an effort made to trace opportunities or threats to the root of the problem. Environmental analysis is important as a response in the strategic planning process to determine opportunities or threats to the company, Suyono, (2013). Indicators of business environmental response according to (Saputra, 2015) are: 1. Availability of labor, namely the condition where population growth can increase the number of the workforce. 2. Competitor level, an effort to demonstrate, show, or promote capabilities determined by the characteristics of the market itself. 3. Market dimension relates to the total sales of all producers in a market. Market dimension is also known as market demand and can refer to the current or potential size that a company can meet, Saputra, (2015).

The influence of environmental responsiveness on a company's operational performance refers to how a company adapts, manages, and responds to external and internal environmental conditions to improve operational efficiency and results. A company's positive response to the environment, through improvements or a sound competitive strategy, will positively impact its operational performance. Environmental responsiveness demonstrates a company's positive reaction to the negative impacts that could arise if it fails to take corrective action to address potential environmental threats. This response includes compliance with environmental regulations, corporate social responsibility (CSR), and adapting its operational strategy to the dynamics of the business environment.

Operational Performance

According to Henríquez et al., (2021), operational performance is defined as the level of effectiveness and efficiency of an organization or business in carrying out all operational activities designed to achieve predetermined business objectives. This performance reflects the extent to which a business is able to optimize the use of available resources. Operational performance is directly related to the effectiveness and efficiency of a company's core activities, which ultimately impacts the company's overall success. According to Handoko (2010), operational performance includes the implementation of various managerial activities related to the selection, design, updating, operation, and supervision of production systems. Therefore, operational performance plays a crucial role in driving increased profitability, company competitive advantage, and customer satisfaction.

Operational performance is the process of implementing managerial activities that describe business processes carried out effectively and efficiently to achieve organizational goals. Operational performance indicators include operational costs, product or service quality, process flexibility, and delivery speed (Dewi et al., 2025). Operational performance indicators can also be measured based on factors such as customer service, delivery speed, delivery timeliness, production quantity flexibility, product variation flexibility, and new product development flexibility (Miftakhul, 2021).

Moeheriono (2013) explains that performance is a reflection of the level of achievement of a program, activity, or policy in realizing the vision, mission, targets, and objectives of an organization formulated in an organization's strategic planning. Performance is the result of implementing the plans prepared by the organization. Meanwhile, operational performance relates to the quality of activities in the movement of goods, the processing of raw materials into finished goods, and finally reaching the end consumer (Kurniawan & Rinofah, 2016). Operational performance can be measured using indicators such as productivity, product errors, and the timeliness of product delivery to consumers.The relationship between operational practices, environmental responsiveness, and product competitiveness based on recent previous research is presented below.

Table 1. Summary of Recent Previous Research (2018–2025)

Study	FocusStudy	Key Findings
Rashid & Rasheed 2025	JIT, TQM,GSCM,	JIT Integration and TQM
Lihua Sun, Chunguang Bai, Joseph Sarkis2025	Environmental Performance and Operational Performance	Increaseenvironmental and operational performance
Mohsin et al. 2024	TQM and SustainablePerformance	TQM has a significant influenceon sustainability performance
Saeidi et al. 2024	CSR, TQM,Environmental Performance	TQM mediates the relationship between CSR and performanceenvironment
Alshammari et al. 2025	TQM, Lean Manufacturing, Sustainability	TQM and leanimprove performancesustainability
Mahar et al. 2025	Green SCM and FirmPerformance	Green SCMincrease sustainable corporate performance
Hidayat, et al. (2025)	Jius In Time and Operational Performance	Implementation of Just in Time (JIT) on Operational Performance
Istiqomah, PS, Wanda, VN, & Sayekti, NP (2023).	JIT Implementation Operational Efficiency and Cost Control	JustIn-Time on operational efficiency and cost control
Kirani, D.A., & Laura, K. (2024)	Impact of JIT Logistics Management Efficiency	Just In Time principle in increasing logistics management efficiency
Peba et al., 2021	TQM and Operational Performance	The implementation of TQM has a significant positive effect on operational performance.
Hannes Widjaya & Nurpatria Suryawan, (2014)	TQM and Quality Management Information Company performance	The influence of Total Quality Management (TQM) and Quality Management Information (QMI) has a positive effect on Company Performance
Singh, Kumar, and Singh (2018)	TQM and Organizational Performance	The influence of TQM on organizational performance has a positive and significant influence.
Nasrun (2018)	The Effect Of TQM And Budget Participation On Managerial Performance	The TQM And Budget Participation On Managerial Performance has positive significance

Source: Processed by the author (2025)

Based on Table 2.1, it can be seen that Just In Time, Supply Chain Management, and Total Quality Management play a significant role in improving the operational performance of a company's business. Opportunities for conducting research on the topics of JIT, SCM, TQM and responses to changes in the business environment show a positive trend. This is related to advances in science and information and communication systems technology that are changing business patterns, systems, and processes in both manufacturing and services. Environmental aspects and business competitiveness, particularly operational performance in the context of manufacturing companies and MSMEs in Indonesia, still need to be studied by developing relevant research topics in line with current and future changes in business competition. Therefore, this study aims to analyze and empirically test the effect of the application of the concepts of Just In Time (JIT), Supply Chain Management (SCM), and Total Quality Management (TQM) on operational performance with environmental responsiveness as a moderating variable. The three concepts above are business competitive strategies in the modern era that have a crucial impact on business sustainability.

This research is motivated by the ideas of Adeniran and Johnston (2012), and Thompson and Martin (2010), who emphasize that managers must be able to manage aspects of business processes well and plan the use of organizational resources to build special capabilities that competitors do not have and are difficult to imitate. Business excellence is strongly influenced by competitive strategies through business operations that are strongly influenced by commitment to implementing the concepts of Just In Time, Supply Chain Management, Total Quality Management and Environmental Responsiveness. The motivation of this research is also based on the results of research by Sanjaya, Kusumawardhany and Rahayu (2016) which revealed that SCM practices on competitive advantage have a significant influence on strategic partnerships, customers, the level and quality of information sharing. Yun and Kurniawan (2017) also regarding SCM analysis on competitive advantage using an explanatory research approach, stated that strategic supplier partnerships and customer relationships have a positive effect on organizational competitiveness.

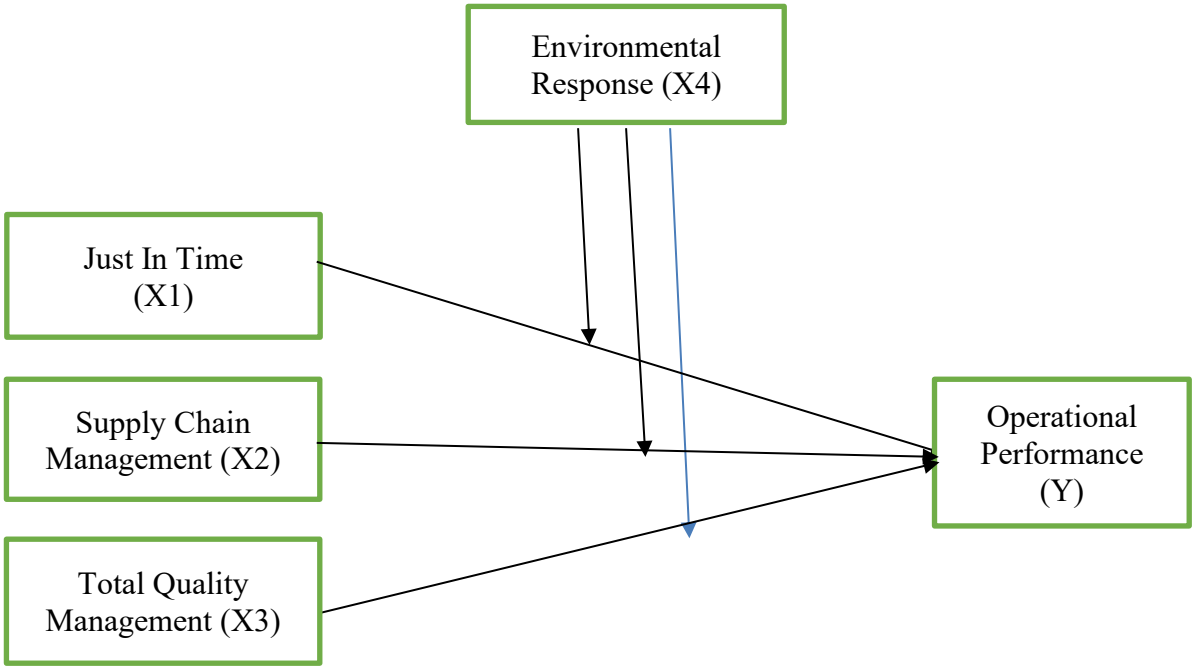

Figure 2. Research Framework and Hypothesis Development

RESEARCH METHODS

Types and Approaches of Research

This study was designed using an associative quantitative approach that aims to analyze the relationship between variables, namely the implementation of JIT, SCM, TQM and the moderating variable of environmental response to business operational performance. to test the causal relationship between research variables. An explanatory quantitative research design was chosen to explain the influence of JIT, SCM, TQM practices and environmental response to business operational performance.

Population and Sample

The study population consisted of small and medium enterprises and cooperatives domiciled in Bekasi City and its surrounding areas. The sampling technique used was purposive sampling.sampling with the criteria that respondents understand the Company's operational processes with a business concept. The number of research samples is 100 respondents. Data obtained through questionnaires are processed using SPSS software.

Data Collection Techniques

Data were collected through a closed-ended questionnaire using a Likert scale with the notations Strongly Disagree (STS=1), Disagree (ST=2), Neutral (N=3), Agree (S=4) and Strongly Agree (SS=5). The questionnaires were distributed directly to respondents.

Table 2. Operational Definition of Variables

Variables	Definition	Indicator	No Questions
Just In Time Rahayu (2017 and Jeni Irmawati, et al. 2021.	Just in time production system of quality, cost efficiency and fast delivery time eliminates waste	1. Stock in the right quantity and quality 2. Just in time production 3. Delivery of raw materials 4. Just in time environment 5. Minimize Waste	1-5
Supply Chain ManagementMudhifatul Jannah, U., & Rahmawati, ZN (2020) and Lambert, 2008	Supply Chain Management (SCM) is the integrated management of the flow of raw materials, information, and finances from suppliers, through the production process, to the end consumer.	Plan 1. Reliability of Raw Material Usage Plan 2. Goods Delivery Plan 3. Production Level Plan 4. Assets, Production Payback Period	6-10
		Source 1. Reliability of Raw Material Quality Level 2. Responsiveness Duration of Raw Material Procurement Time 3. Agility Ability to Fulfill Special Requests	11-13
		Make 1. Reliability of Use of Production Goods 2. Production Process Quality 3. Responsiveness Duration of Production Process	14-18

		4. Agility Ability to Fulfill Sudden Requests Deliver 1. Reliability Completion Rate Number of Requests 2. Responsiveness Duration of Stock Replenishment Period 3. Agility Ability to Fulfill Special Orders Return 1. Reliability of Complaint Handling 2. Responsiveness Duration of Fulfillment of Return of Production Goods	19-22 23-25
Total Quality ManagementSingh et al. (2018) and Flynn et al., (1994)	Continuous improvement, customer focus, quality control involving all employees	1. Top Management Support, 2. Quality Information, 3. Process Management, 4. Product Design, 5. Workforce Management, 6. Supplier Involvement, 7. Customer Involvement, 8. Employee Empowerment	26-33
Environmental Response Anjasari and Andriati (2016), and Sawitri (2017)	Business environmental response is a company's strategic approach to adapting to changing external and internal factors to maintain continuity and competitiveness. Adaptation occurs through trend monitoring, product innovation, diversification, and operational adjustments in a dynamic market.	1. External Environment a. Adapting to Market Changes b. Response to Competitors c. Management of Substitute Goods d. Adjustments to Regulations & Policies e. Utilization of Technology 2. Internal Environment a. Labor Availability & Productivity b. Business Cost Efficiency c. Flexibility of Organizational Structure d. Product/Service Quality & Innovation 3. Response Result (Output) a. Profitability Level (Profit) b. Competitiveness/Market Position c. Corporate/Brand Image	34-38 39-42 43-45

Operational Performance(Dewi et al., 2025) and Miftakhul, (2021).	Operational performance is the ability of an organization to manage resources efficiently and effectively to achieve the company's strategic goals.	1. operating costs 2. product or service quality 3. level of flexibility in the process 4. speed of delivery 5. customer service 6. on-time delivery, 7. flexibility of production quantities, product variations, and new product development,	46-52

RESULTS AND DISCUSSION

Research Location

This research was conducted in the Bekasi area considering that Bekasi City is one of the buffer cities of the Capital City and an industrial area that has the potential for MSME growth with various types of businesses, small, medium and cooperative scale, thus providing an opportunity to conduct this research.

Table 3. Descriptive characteristics of research samples

No	Characteristics	Classification	Amount	Percentage
1	Age	17 – 25 years old	12	12%
		26 – 36 years old	30	30%
		37 – 45 years old	35	35%
		46 > years	23	23%
2	Educational level	Elementary School	4	4%
		JUNIOR HIGH SCHOOL	28	28%
		SENIOR HIGH SCHOOL	40	40%
		D3	18	18%
		S1	10	10%
3	Years of service	0 – 11 months	0	0%
		12 years old	7	7%
		3 – 4 years	19	19%
		5 – 6 years	31	31%
		6 > years	45	45%
4	Work unit	Pekayon	7	7%
		North Tambun	22	22%
		South Tambun	12	12%
		Faithful Blossom	23	23%

4	Work Area	Medan Satria	21	21%
		New Hope	8	8%
		Beautiful Hope	7	7%

Source: Spss Data Processing (2025)

Descriptive Statistics of Respondents

The respondents in this study consisted of managers and operational staff from manufacturing companies and MSMEs who understand the implementation of Just-In-Time, Supply Chain Management, and Total Quality Management. The majority of respondents had more than six years of work experience, thus being considered capable of providing objective assessments of operational practices.In general, the results of descriptive statistics show that the average respondent's answer is in the agree category, which indicates that the company has implemented JIT, SCM, and TQM practices and has a relatively good level of environmental responsiveness.

Normality Test

The normality test is used to measure whether data is normally distributed, allowing it to be used in parametric statistics (inferential statistics). The Kolmogorov-Smirnov test was used to test normality in this study. Data are considered normally distributed if the significance level is greater than 5% or 0.05.

Table 4. Normality Test Results

One-Sample Kolmogorov-Smirnov Test		
		Unstandardized Residual
N		100
Normal Parametersa,b	Mean	,0000000
	Standard Deviation	3.79764929
Most Extreme Differences	Absolute	,091
	Positive	,071
	Negative	-,091
Test Statistics		,091
Asymp. Sig. (2-tailed)		,200c,d

Source: primary data processed 2025

The table above shows that the processed data is normally distributed. This is evidenced by a significance value of 0.200, which is greater than 0.05, indicating that the regression model is suitable for use.

Table 5. Results of the coefficient of determination

Model Summary				
Model	R	R Square	Adjusted R Square	Standard Error of the Estimate
1	,760a	,62	,502	3.93835

Source: primary data processed 2025

The test results show that the R^2 value of product competitiveness is 0.62, which means that 62% of the variation in product competitiveness can be explained by Just In Time, Supply Chain Management, Total Quality Management, and environmental responsiveness. This value indicates that the research model has strong predictive capabilities.

Table 6. Hasil Uji Reliabilitas

Variabel	Cronbach's Alpha	Rule of Thumb	Keterangan
Just In Time (X 1)	0,724	0,60	Reliabel
Supplay Chain Management (X2)	0,884	0,60	Reliabel
Total Quality Management (X3)	0,849	0,60	Reliabel
Responsi Lingkungan	0,872	0,60	Reliabel
Kinerja Operasional (Y)	0,794	0,60	Reliabel

Source: primary data processed

Based on the table above, it can be seen that the results of the reliability test of the independent variables, namely JIT (X1), Supply Chain Management (X2), Total Quality Management (X3), and Environmental Responsiveness (X4) and the dependent variable, namely Operational Performance (Y) show that the value is above 0.60, which means that the research variables are reliable.Based on table 4.5, the multiple linear regression equation model can be obtained as follows:

Y = 1.035 + 0.227X1 + 0.184X2 + 0.264X3+ 0.303X4

The equation above can be explained as follows:

1. Constant = 1.035
   This means that if the variables Just In Time (X1), Supply Chain Management (X2), Total Quality Management (X3), and Environmental Response (X4) have a value of zero, then the operational performance variable (Y) has a value of 1.035.
2. Coefficient X1 = 0.228
   This shows that if the customer focus variable increases by one unit, it will increase operational performance by 0.227, assuming other variables are constant.
3. Coefficient X2 = 0.184
   The regression coefficient for the influence of Supply Chain Management on operational performance is 0.184. This indicates that a one-unit increase in Supply Chain Management will increase operational performance by 0.184, assuming other variables remain constant.
4. Coefficient X3 = 0.264
   The regression coefficient for the effect of Total Quality Management on operational performance is 0.264. This indicates that a one-unit increase in Total Quality Management will increase operational performance by 0.264, assuming other variables remain constant.
5. Coefficient X4 = 0.303
   The regression coefficient for the influence of Environmental Responsiveness on operational performance is 0.303. This indicates that if the Environmental Responsiveness variable increases by one unit, operational performance will increase by 0.303, assuming other variables remain constant.

With a sample size of 50 and independent variables of 4, the degrees of freedom (df) = n – k – 1 = 100 – 4 – 1 = 95. Based on the significance of α = 0.05 (two-sided), the t table value is obtained = 2.014. With the following equation:

t table df = (α/2 ; n – k – 1)
= (0.10/2 ; 100 – 4 – 1)
= (0.05 ; 95)
= 2,014

So it can be explained the influence of each – each variables free from operational performance, that:

1. Hypothesis 1 (X1 – Just In Time → Y)
   The t-test results show that the calculated t-value is 2.186 > t-table 2.014 with a sig. value of 0.034 < 0.05. This means that the Just In Time variable (X1) has a positive and significant effect on operational performance (Y), so H1 in this study is accepted.
2. Hypothesis 2 (X2 – Supply Chain Management → Y)
   The t-test results show that the calculated t-value is 2.038 > t-table 2.014 with a sig. value of 0.047 < 0.05. This means that the Supply Chain Management variable (X2) has a positive and significant effect on operational performance (Y), so H2 in this study is accepted.
3. Hypothesis 3 (X3 – Total Quality Management → Y)
   The t-test results show that the calculated t-value is 2.399 > t-table 2.014 with a sig. value of 0.021 < 0.05. This means that the Total Quality Management variable (X3) has a positive and significant effect on operational performance (Y), so H3 in this study is accepted.
4. Hypothesis 4 (X4 – Environmental Response → Y)
   The t-test results show that the calculated t-value is 2.666 > t-table 2.014 with a sig. value of 0.011 < 0.05. This means that the Environmental Responsiveness variable (X4) has a positive and significant effect on operational performance (Y), so H4 in this study is accepted.

Discussion of Research Results

The Impact of Just In Time on Operational Performance

The research results show that Just In Time has a positive and significant impact on the operational performance of MSMEs in Bekasi. This finding indicates that implementing just-in-time production and inventory minimization can improve cost efficiency andmarket response speed. These results are in line with research by Rashid and Rasheed (2025) which states that JIT practices contribute to improving operational performance and company sustainability. The Impact of Just In Time (JIT) on Operational Performance The implementation of the Just in Time (JIT) system has a significant impact on improving operational performance in an organization or company, in line with research conducted (Gia & Perdana, 2020), the results of the study show that JIT has a positive effect on company performance. Thus, companies can avoid excess inventory and minimize waste. The implementation of JIT can have an impact on several things, including: The implementation of JIT can have an impact on cost efficiency. By reducing the amount of inventory stored, storage costs, maintenance, and the risk of damage to goods can be significantly reduced. This increases overall operational cost efficiency. The results of the study are supported by research by Pradnyana, (2023), that Just In Time has a significant positive effect on operational performance.

The implementation of JIT can encourage suppliers and production teams to maintain high product quality standards, thus positively impacting customer satisfaction and the company's reputation. Research by Istiqomah et al., *2023) also revealed that the implementation of JIT has a positive impact on efforts to increase the efficiency and effectiveness of company operations. By reducing inventory stocks, increasing production efficiency, and improving product and service quality, companies can optimize resource use and increase customer satisfaction, with production speed and accuracy, processes become leaner and faster because they only produce based on

actual demand. This makes companies more responsive to market needs and reduces production cycle times. These results are supported by research by Antonny, (2022), that the implementation of JIT in MSME manufacturing systems can reduce production time, namely activities that do not add value in the production process so that MSMEs do not mass produce but only produce when there is an order. Reducing Waste (Waste) JIT is closely related to the lean philosophy which aims to eliminate non-value-added activities. This includes waste in the form of waiting time, overproduction, and inefficient labor.

The Impact of Supply Chain Management on Operational Performance

Supply Chain Management has been shown to have the strongest positive impact on the operational performance of MSMEs in Bekasi. This demonstrates that effective supply chain integration and coordination can improve distribution reliability and customer satisfaction.The results of this study align with those of Mahar et al. (2025), who stated that supply chain management practices positively contribute to a company's operational performance. Supply chain management has both direct and indirect relationships with operational performance. A company with sound supply chain management will improve its operational performance. Implementing integrated supply chain management can improve the quality of products and services provided to consumers. If supply chain management performance declines, operational performance will also suffer. This is consistent with research conducted by Li et al. (2006), which demonstrated that supply chain management refers to the integration of business processes within an interconnected network of suppliers, manufacturers, distribution centers, and retailers to improve the delivery of goods, services, and information from suppliers to customers.

The Influence of Total Quality Management on Operational Performance

Total Quality Management has a positive effect on the operational performance of MSMEs in Bekasi. This means that the TQM concept, when implemented consistently and sustainably through quality improvement and product defect reduction, provides customer satisfaction. This finding aligns with Mohsin et al. (2024) and Alshammari et al. (2025) who emphasized that TQM plays a crucial role in improving a company's sustainability performance and competitive advantage. TQM has a positive and significant impact on improving a company's operational performance. Consistent TQM implementation drives increased productivity, reduced operational costs, and customer satisfaction, while minimizing production errors through continuous improvement.

Table 7. Results of Moderating Variable Tests

Hypothesis	ConnectionVariables	Coefficient	t-statistic	p-value	Decision
H4	JIT ×Environmental Response x Operational Performance	0.176	2.21	0.028	Accepted
H5	SCM ×Environmental Response x Operational Performance	0.194	2.47	0.014	Accepted
H6	TQM ×Environmental Response x Operational Performance	0.217	2.68	0.008	Accepted

Source: Processed data (2025)

The Role of Environmental Response on Operational Performance Through Just In Time

The results of the moderation test indicate that environmental responsiveness strengthens the influence of JIT on operational performance. This finding indicates that companies with a high level of environmental awareness are able to maximize operational performance and create competitive advantage. These results support the view that integrating operational and environmental strategies is key to sustainable corporate competitiveness.These findings indicate

that environmental responsiveness serves as a strategic mechanism that strengthens the effectiveness of operational practices, rather than simply a supporting element, in the face of increasingly complex business competition. These findings align with research by Kurniawan & Rinofah (2016), Safutri (2016), Nasutra (2022), and Hastawati & Sarsiti (2016).

The results of this study prove that a fast and appropriate environmental response has a strong influence in strengthening the Company's competitive strategy through the implementation of just in time.

The Moderating Role of Environmental Response on Operational Performance Through Supply Chain Management

The results of the moderation test show that environmental responsiveness strengthens the influence of SCM on operational performance. In this era of rapidly evolving technology, companies face a constantly changing business environment, both external and internal. The business environment is a crucial component that can impact operational performance. The work environment determines whether a company performs well or poorly (Ahmad, 2022; Mappamiring, 2022; Mustari, 2022). Environmental factors play a crucial role in determining company performance. Companies that prioritize environmental management can generate added value (Tjahjono, 2013; Eko, 2013). Environmental factors encompass all external variables that can influence a company's operations, decisions, and results. The more a company participates in environmental activities, the better its public image (Haholongan, 2016). These factors include government regulations, market conditions, technology, social trends, and more.

The Moderating Role of Environmental Response on Operational Performance Through Total Quality Management

The results of the moderation test indicate that environmental responsiveness strengthens the influence of TQM on operational performance. This means that better and faster environmental responsiveness by the company will have a positive impact on operational performance. The results of this study align with Kurniawan & Rinofah (2016) and Hardiana & Ridho'i (2022) findings that environmental responsiveness has a positive effect on operational performance. Safutri's (2016) study concluded that the business environment and operational strategy have a positive influence on operational performance. Rahmawati (2012) stated that good environmental management can avoid public and government claims and improve product quality, which ultimately can increase a company's financial profits.Similarly, research by Fitriani (2013) and Tunggal & Fachrurrozie (2014) concluded a positive relationship between environmental responsiveness or performance and operational performance. This means that companies that respond to rapid environmental changes will have a positive impact on their operational performance.

CONCLUSION

Based on the results of data processing and the discussion described above, the following conclusions can be drawn:

1. The Just In Time variable has a positive and significant effect on the operational performance of MSMEs in Bekasi.. The impact of implementing the Just in Time (JIT) system has a significant influence on improving the company's operational performance,
2. VariablesSupply Chain Management has been proven to positively impact the operational performance of MSMEs in Bekasi. This demonstrates that effective supply chain integration and coordination can improve distribution reliability and customer satisfaction.The implementation of integrated supply chain management can improve the quality of products and services provided to consumers.
3. Total Quality Management (TQM) has a positive impact on the operational performance of MSMEs in Bekasi. Consistent TQM implementation drives increased productivity, reduced

operational costs, and customer satisfaction, while minimizing production errors through continuous improvement.

4. Environmental response interaction has been proven to play a moderating role in the implementation of Just In Time on the operational performance of MSMEs in Bekasi. This means that operational practices and environmental awareness are strategic factors in creating sustainable competitive advantages.
5. Environmental Response Interaction moderation of the application of the supply chain management concept to the operational performance of MSMEs in Bekasi. This means that high environmental awareness is able to maximize operational performance in creating competitive advantages.
6. Environmental responsiveness interaction strengthens the influence of TQM on the operational performance of MSMEs in Bekasi. This means that the better and faster the environmental response by the Company will have a positive impact on operational performance.
7. The environmental responsiveness variable has a positive effect on the operational performance of MSMEs in Bekasi. This means that environmental responsiveness is a significant factor influencing a company's operational performance.

Managerial Implications

The results of this study provide theoretical and application implications. The theoretical implication is that the results of the study can be used by academics and researchers to conduct studies based on the findings of this study. Furthermore, the results of the study will enrich the research theory of bibliographic materials in supporting research related to the concepts of just in time, supply chain management, total quality management and environmental responsiveness. The application implication is that users such as company management, investors and potential investors can use the results of this study as a consideration in decision making. For companies, it is necessary to integrate JIT, SCM, and TQM practices with proactive environmental policies. The implementation of environmentally responsive operational strategies not only improves efficiency and quality, but also strengthens the reputation and competitiveness of products in the market.

Limitations and Suggestions for Further Research

This study has limitations, particularly in the research object, namely MSMEs. MSME managers do not yet have a good and positive perspective related to the concept and implementation of just-in-time, supply chain management, total quality management, and responsiveness to the environment. Further research is needed using mixed methods to obtain data that can reflect the actual facts. Future research is recommended to use longitudinal data and add other variables such as green innovation or digital supply chain.

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