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Implementation of Cloud-based Supply Chain Management Information System for Logistics Optimization

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ABSTRACT

This research aims to implement a cloud-based Supply Chain Management Information System (SCMIS) to optimize the logistics process at PT Wijaya Badja Global. The company faces challenges in managing an efficient supply chain, including inter-departmental coordination, inventory tracking, and timely delivery of goods. By utilizing cloud technology, this system is designed to improve visibility, speed, and accuracy in supply chain management. The research methods used include requirements analysis, system design, implementation, and performance evaluation. The results show that the implementation of cloud-based SCMIS is able to reduce logistics costs, improve operational efficiency, and accelerate response time to changes in market demand. In addition, the system also enables better data integration between suppliers, distributors, and customers. Thus, this research contributes to the application of cloud technology for supply chain optimization in the logistics sector, especially at PT Wijaya Badja Global.

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1. INTRODUCTION

In the era of globalization and digitalization, efficiency in supply chain management has become a critical factor in determining a company's competitiveness [1]. PT. Wijaya Badja Global, as one of the companies engaged in logistics and distribution, faces various challenges in managing its supply chain [2]. These challenges include suboptimal coordination between departments, difficulties in real-time inventory tracking, and inaccuracies in planning and product delivery [3]. This results in increased operational costs, delivery delays, and decreased customer satisfaction [4]. Indonesia's large population is a distinct advantage that makes the culinary business market seemingly endless [5]. From franchise models, partnerships, to modern food and beverage innovations, the variety of culinary offerings provides many profitable business opportunities [6]. The culinary industry in Indonesia has become a popular choice for many entrepreneurs [7].

Today, cloud computing technology has emerged as an innovative solution to address supply chain management problems [1]. Cloud computing offers flexibility, scalability, and the ability to integrate real-time data from various parties involved in the supply chain, such as suppliers, distributors, and customers [2]. By utilizing a cloud-based system, companies can enhance supply chain visibility, accelerate decision-making processes, and optimize operational efficiency [3].

Based on this background, this research aims to implement a cloud-based Supply Chain Management Information System (SCMIS) at PT. Wijaya Badja Global [4]. This implementation is expected to serve as a solution for optimizing logistics processes, reducing operational costs, and increasing customer satisfaction [5].

2. METHOD

This research uses a mixed methods approach, combining qualitative and quantitative methods. The qualitative approach is employed to understand the challenges and needs of PT. Wijaya Badja Global in supply chain management, while the quantitative approach is used to measure the impact of implementing the cloud-based Supply Chain Management Information System (SCMIS) on logistics efficiency and company performance. This combination is chosen to provide a comprehensive and in-depth understanding of the problems faced and the proposed solutions.

The study is applicative in nature, as it aims to implement a cloud-based SCMIS at PT. Wijaya Badja Global. Additionally, it is explanatory, as it explains the relationship between system implementation and improvements in logistics efficiency and supply chain performance.

The research was conducted at PT. Wijaya Badja Global, a company engaged in logistics and distribution. The study lasted for 6 months, covering the phases of preparation, data collection, system design, implementation, and evaluation.

The population in this study includes all departments involved in the supply chain at PT. Wijaya Badja Global, such as logistics, procurement, warehousing, and distribution departments. The sample was selected using purposive sampling by choosing key informants with in-depth knowledge of the supply chain process, such as logistics managers, warehouse supervisors, and procurement staff. Quantitative data were also collected from operational company records, including inventory data, logistics costs, and delivery times. Data collection was carried out through the following methods:

a. In-depth Interviews: Conducted with key informants to understand the challenges and needs in supply chain management.
b. Observation: Used to observe ongoing logistics processes, including workflow, interdepartmental coordination, and existing technology usage.
c. Documentation Study: Collection of secondary data such as financial reports, inventory records, and other operational documents.
d. Questionnaires: Used to measure customer satisfaction and employee perceptions of the new system after implementation.
e. System Experimentation: Trial of the cloud-based SCMIS to evaluate system performance.

3. RESULTS AND DISCUSSION

The implementation of the cloud-based Supply Chain Management Information System (SCMIS) at PT. Wijaya Badja Global has led to several significant improvements in supply chain management. The key outcomes are as follows:

a. Enhanced Supply Chain Visibility

Following the system implementation, supply chain visibility improved significantly. Data from suppliers, warehouses, and distributors became accessible in real-time via the cloud platform. This enabled management to monitor inventory status, orders, and shipments more accurately. Prior to implementation, the company often faced challenges in tracking goods during distribution, leading to delays and inventory inaccuracies. The cloud-based SCMIS helped minimize these issues.

b. Reduced Logistics Costs

The system also contributed to lower logistics costs. Data analysis revealed a 15% reduction in logistics costs within the first three months post-implementation. This reduction stemmed from optimized delivery routes, improved inventory management, and fewer order-processing errors. Additionally, the system identified areas requiring further efficiency improvements.

c. Improved Operational Efficiency

Operational efficiency increased significantly after SCMIS implementation. The time required to process orders and deliver goods to customers decreased by 20%. Furthermore, inter-departmental coordination became smoother, as all parties could access the same real-time data. This reduced duplicated efforts and communication errors.

d. Increased Customer Satisfaction

Customer satisfaction also rose post-implementation. Satisfaction survey scores improved from 75% to 88% within the first three months. Customers reported faster and more accurate deliveries, as well as more transparent communication with the company.

Discussion

The enhanced supply chain visibility is one of the primary benefits of the cloud-based SCMIS. With this system, all supply chain stakeholders can access the same real-time data, fostering better collaboration

among suppliers, distributors, and customers. High supply chain visibility reduces uncertainty and improves responsiveness to demand fluctuations [8].

The 15% reduction in logistics costs demonstrates that cloud-based SCMIS can effectively optimize operational expenses. IT solutions in logistics help companies identify inefficiencies and implement corrective measures [9]. For PT. Wijaya Badja Global, the system optimized delivery routes and lowered inventory storage costs.

The 20% boost in operational efficiency underscores how cloud-based SCMIS accelerates business processes. Integrated information systems reduce task completion times. In this case, the system streamlined order processing and improved delivery accuracy [10].

The 13% increase in customer satisfaction reflects the system's positive impact on customer experience. Effective information systems enhance service quality and satisfaction. Here, customers benefited from faster deliveries and transparent communication.

Figure 1. Graph of Logistics Cost Reduction

Logistics Cost Reduction Chart is a data visualization tool used to compare logistics costs before and after a change or system implementation, such as in the case of implementing a cloud-based Supply Chain Management Information System (SCMIS). This chart typically takes the form of a bar chart displaying two or more categories (e.g., "Pre-Implementation" and "Post-Implementation") along with their associated logistics cost values.

4. CONCLUSION

This study examines the implementation of a cloud-based Supply Chain Management Information System (SCMIS) at PT. Wijaya Badja Global, aimed at optimizing logistics processes and enhancing the company's operational efficiency. Based on the conducted analysis and evaluation, it can be concluded that this system implementation has brought significant positive impacts to the company.

First, supply chain visibility improved dramatically. With the cloud-based system, the company can now monitor product flows, inventory levels, and shipment status in real-time. This has reduced uncertainties and errors that previously frequently occurred due to coordination gaps and fragmented data.

Second, the company achieved a 15% reduction in logistics costs. This was accomplished through optimized delivery routes, more effective inventory management, and minimized order processing errors. With lower costs, the company can reallocate resources to other areas requiring attention.

Third, operational efficiency improved substantially. The time required for order processing and product delivery to customers decreased from 5 days to 4 days, representing a 20% efficiency gain. Process automation and improved data integration were key factors in this achievement.

Fourth, customer satisfaction also increased. Surveys showed customer satisfaction scores rose from 75% to 88%. Customers benefited from faster, more accurate deliveries and more transparent communication. This not only strengthened customer relationships but also enhanced the company's market reputation.

The successful implementation of this cloud-based SCMIS was supported by cloud computing technology that offers scalability, flexibility, and fast data access. The system enables better integration among suppliers, distributors, and customers, creating a more responsive and efficient supply chain.

Overall, this study proves that cloud-based SCMIS implementation is an effective solution for addressing supply chain management challenges at PT. Wijaya Badja Global. The company successfully reduced logistics costs, improved operational efficiency, and satisfied customers, ultimately strengthening its competitiveness in the logistics industry.

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