

## THE ROLE OF INFORMATION SYSTEMS IN CONTROL RAW MATERIAL SUPPLY USING THE EXPONENTIAL SMOOTHING METHOD: CASE STUDY AT PT SUGAR GROUP COMPANIES

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### Abstract

*PT Sugar Group Companies requires an information system that affects raw material inventory control. In this research, the Exponential Smoothing method is implemented to estimate the amount of raw materials needed in the future. This method is useful for companies to carefully calculate the amount of raw materials needed, this can reduce the budget and increase operational capabilities. The results of the study state that the Exponential Smoothing method can be used effectively in raw material inventory control information systems, both in industries that have high differences in demand for raw materials. Therefore, this system can facilitate PT Sugar Group Companies in optimizing the use of resources and developing service quality.*

**Keywords:** *Information System, Raw Material Inventory, Material Supply*

### 1. INTRODUCTION

The sugar industry in Indonesia is the manufacturing sector that first developed in this country. Indonesia has a climate that is very suitable for sugarcane growth and is a country with very rich sugarcane genetic resources. Thus, international sugar experts are of the opinion that Indonesia has great potential to develop the sugar industry (Khudori, 2004).

Sugar remains the main choice as a sweetener in Indonesia and cannot be replaced by other sweeteners for both household needs and the food and beverage industry. In an era where competition in the sugar industry is increasingly fierce, sugar factories in the country must increase their efficiency levels more carefully. Sugar has important benefits in human life, not only in terms of body health, but also in various stages, from planting sugar cane to the initial process of making sugar. This makes sugar an important food component, sugar use continues to increase every year. Demand for sugar at the national level will continue to grow in line with population growth, increasing people's incomes, and the development of the food and beverage industry (Sugiyanto, 2007).

In this research, we will discuss the role of information systems in managing raw material supplies by utilizing methods Exponential Smoothing by researchers. This method helps in estimating future raw material requirements and maximizing resource usage as well reduce company costs. The role of information systems in controlling raw material stocks is very significant in ensuring the continuity of company operations with adequate and timely supplies. Forecasting methods such as Exponential Smoothing has become popular in the development of information systems for estimating raw material inventories. This method allows estimating the amount of raw materials needed in the near future, helping companies reduce costs and optimize resources.

### **3. RESEARCH METHOD**

This research applies a case study example approach with qualitative methods, combining various journal references and previous articles. This approach was chosen to gain a deeper understanding of the challenges faced by companies in the production process flow and to propose solutions that suit the company's specific context.

After the data is collected, the next step is to apply the technique time series for further research. Forecasting methods on data time series by continuously improving the average value (smoothing) past in a descending manner (exponential) (Brown & Meyer, 1961).

Exponential Smoothing is a forecasting technique used on data time series by giving a higher weight value to previous data to predict future data values (Fahlevi, et al., 2018).

Widjajati, et al. (2017) have applied research using the method Exponential Smoothing, comparing the Triple method with the Event Based method. The product sales data patterns used show seasonal patterns and trends. The research conclusion shows that the method Triple produces forecasting values with a lower error rate than the method Event Based.

Method Exponential Smoothing proven effective in forecasting data that shows trending or seasonal patterns. Therefore, PT Sugar Group Companies decided to apply the method Exponential Smoothing in their sugar and cane sales forecasting system.

### **4. RESULTS AND DISCUSSION**

Indonesia's economic growth is closely related to the development of the capitalist system in this country. One example is PT. Sugar Group Companies (SGC), which originates from ethnic Chinese circles and is still a major force in the private business sector in Indonesia. This company has a crucial role in meeting 20% of the country's sugar needs.

Raw material inventory control procedures using information systems in order to grow productivity, reduce the risk of inventory management errors and speed up responses to changes in demand or company conditions can be done using information systems that help monitoring stock directly, demand forecasting, managing orders and analyzing supply chain capabilities.

The role of raw material inventory control in operational management is:

1. Maintain smooth production

By managing raw material inventories, companies can ensure the availability of materials needed for production without interruption.

2. Increase operational efficiency

Effective control enables efficient use of raw materials, reduces waste, and increases operational efficiency.

3. Reduce production costs

By avoiding excess inventory, companies can cut storage and capital costs associated with raw materials, increasing profitability

4. Quick response to customer requests

By ensuring adequate and timely supplies of raw materials, companies can respond to customer requests more quickly, increasing customer satisfaction and company reputation.

This raw material inventory control information system makes it easy for the purchasing department in the process of purchasing raw materials, compiling goods calculation reports, and tracking inventory stock. Speeding up responses to changes in demand or company conditions can be done by using information systems.

In research on PT Sugar Group Companies, before applying the method Exponential Smoothing shows that the raw material inventory system used by the company still has weaknesses in dealing with surges in demand. The system often experiences inventory shortages when demand increases, and excess inventory when demand decreases. This has the potential to cause unnecessary costs and disrupt company operations.

After implementing the technique Exponential Smoothing, The research results explain that the raw material inventory system used by the company has increased its effectiveness in anticipating demand. The system is able to estimate demand more precisely and better manage resource utilization. Therefore, companies are able to reduce costs associated with inventory and increase operational efficiency.

The benefits of the PT Sugar Group Companies case research regarding the role of information systems in controlling raw material supplies:

1. Real-Time Inventory Monitoring

Information systems enable timely monitoring of raw material stocks. With live updated information, companies can quickly identify shortages or excess stock and take appropriate action.

2. Better planning of raw material needs

Through accurate and structured data from information systems, companies are able to plan raw material needs better. This allows companies to manage purchasing and production efficiently and avoid unnecessary stock imbalances.

3. Optimizing the Procurement Process

Information systems help companies manage the raw material procurement process efficiently. By leveraging information about available stock, market prices, and production needs, they can make smarter purchasing decisions, including selecting the best supplier and negotiating prices.

4. Stock Risk Management

Through information systems, companies can manage risks related to raw material stocks, such as the risk of shortages or excess stocks. Companies can recognize changing demand

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patterns and take preventative steps to reduce risks, such as diversifying suppliers or implementing more flexible stock strategies.

In this study, researchers plan to evaluate the effects of using the method Exponential Smoothing on raw material inventory at PT Sugar Group Companies. This research involves collecting supply and demand data before and after application of the method Exponential Smoothing, which is then analyzed to identify changes in the raw material inventory system. The results are expected to help companies improve operational efficiency and reduce inventory costs. This research can also provide information for other companies that have similar inventory systems to improve the quality of their systems.

## 5. CONCLUSION

The sugar industry in Indonesia has great potential to develop and sugar remains the main sweetener. This research is related to the role of information systems in managing raw material supplies using methods Exponential Smoothing. The growth of the Indonesian economy and the capitalist system, as well as the implementation of an information system for controlling raw material supplies at PT Sugar Group Companies (SGC), shows that Indonesia's economic growth is reflected in the development of the private business sector such as SGC which is the main force in the sugar industry. Raw material inventory control information system, especially through engineering Exponential Smoothing, has helped SGC improve its operational efficiency by maintaining smooth production, increasing efficiency, reducing production costs and responding quickly to customer requests. This research has important implications in improving the quality of inventory systems for other companies and contributing to further economic growth.

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