**Journal of Computer Networks, Architecture and High Performance Computing**
Volume 6, Number 2, April 2024
https://doi.org/10.47709/cnahpc.v6i2.3825

**Submitted** : Mei 5, 2024
**Accepted** : Mei 11, 2024
**Published** : Mei 12, 2024

# Implementation of Statistical Quality Control Method in Product Quality Monitoring Information System

**Iqbal Maulana Syahputra[1)*], Triase[2)], Septiana Dewi Andriana[3)]**
[1)2)] Universitas Islam Negeri Sumatera Utara, Medan, Indonesia [3)] Universitas Harapan Medan, Medan, Indonesia
[1)]iqbalmaulanasyahputra3@gmail.com, [2)]triase@uinsu.ac.id, [3)]septianad89@gmail.com

**ABSTRACT**

The business sector faced intensifying competition due to significant advancements in information systems and technology. PT. Florindo Makmur, a leading private company in the cassava processing industry producing tapioca flour, has proven to implement quality standards to uphold product quality and ensure customer satisfaction. The product quality inspection process had to meet standards before packaging; however, reporting remained manual using paper sheets, elevating the risk of data loss and reducing monthly evaluation efficiency due to manual calculations. The aim of this research was to design an efficient information system for monitoring product quality at PT. Florindo Makmur, utilizing the Statistical Quality Control (SQC) method. The quality control monitoring system played a central role in gathering quality control data to support management decisions regarding product quality certainty. Therefore, obtaining monitoring information promptly was crucial to ensure products met quality standards and reduce rejected product quantities. The research approach included observation, interviews, and literature review as data collection strategies, while the system development method used was the waterfall method encompassing system requirement analysis, design, coding, and implementation. This information system enabled PT. Florindo Makmur to efficiently monitor its products by applying SQC concepts such as data analysis and creating control charts to swiftly identify improvements in product defects and take appropriate actions.

**Keywords:** Monitoring; Product Quality; SQC; Waterfall Method; Website

## INTRODUCTION

Amidst the rapidly changing and increasingly competitive business dynamics, significant changes have been witnessed that altered the operational landscape of companies. Competition in the business world is no longer solely reliant on conventional strategies but also takes into account the impact of rapid advancements in information systems and technology. This phenomenon has led to the creation of a new paradigm where companies must continuously adapt and embrace the latest technological trends to remain relevant and competitive in an ever-evolving market. Consequently, a profound understanding of these changes becomes imperative for companies to stay on the right track in facing increasingly complex challenges.

In connection with this, business competition has intensified with the advancement of information systems and technology (Samudra et al., 2023). Companies endeavored to develop their businesses with innovative strategies. The progress of a company heavily relied on its ability to effectively monitor and utilize measurement devices to ensure optimal product quality (Khaeruman et al., 2023). Quality control was crucial to meet customer satisfaction and ensure products met established standards (Kuncoro, 2023). In the production process, producing flawless products was prioritized, while quality control aimed to ensure products reached optimal minimal standards (Shiyamy et al., 2021). Immediate evaluations were conducted in case of defects to identify causes and enable swift improvements for quality products within a short time frame (Pasaribu & Robecca, 2019).

PT. Florindo Makmur, a private company, operated in Village V, Pergulaan Village, Seirampah District, Serdang Bedagai Regency. The company specialized in converting cassava into tapioca flour. Initially, its products were only marketed around Medan, but due to increasing demand, they were now available in Medan, Aceh, Pekanbaru, and Padang. Before packaging, products underwent quality checks in the laboratory to ensure compliance with company standards, including moisture content (13.0-13.5), pH (5.20-7.00), SO2 (max 30), residual screen (max 0.050), color (min 93.5), and cooking color (min 57.0).

The product quality checking process had to meet standards before sale. After meeting the standards, packaging was carried out (Andriana, 2023). The results of the checks were recorded in daily reports using handwritten paper sheets, then audited and evaluated monthly (Handoko, 2023). However, the reporting process was still manual with paper sheets, facing the risk of data loss and damaged paper. The evaluation process compiled daily report data for a

* Corresponding author

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month and manually calculated the production and defective product numbers each month. To address these challenges, it was recommended to design a product quality monitoring system in the company. The quality control monitoring system played a crucial role in collecting data to support management and leaders related to product quality (Idris et al., 2023). Speed and responsiveness in obtaining product monitoring information were key to ensuring products met quality standards and reducing the number of rejected products (Farianingrum et al., 2023). This research utilized statistical quality control methods, starting from creating check sheets, Pareto diagrams to identify and prioritize major issues, and control chart preparation to evaluate the effectiveness of the company's quality control.

To ensure efficient product failure evaluations, this research was conducted as a development from two previous studies referenced by the author. The first study, conducted by Muhammad Rizki and Rini Malfiany, students from STMIK ROSMA, titled "Designing a Web-Based Quality Control Information System at PT Sanly Industries," aimed to reduce errors in quality control reports at PT Sanly Industries (Rizki & Malfiany, 2021). The second study, conducted by Meldayanoor and colleagues, students from Politeknik Negeri Tanah Laut, titled "Analysis of Statistical Quality Control (SQC) as Control and Improvement of Tortilla Product Quality at UD. Noor Dina Group," focused on evaluating the causes of product failures at UD. Noor Dina Group (Meldayanoor et al., 2019).

From the background provided, the author aimed to implement the Statistical Quality Control method in monitoring the quality of products in the research object. This was done to efficiently evaluate product failures with the goal of increasing speed and responsiveness in obtaining product monitoring information, which was crucial to ensuring products met quality standards and reducing the number of rejected products.

## LITERATURE REVIEW

In 2019, a study conducted by Nina Hairiyah, Raden Rizki Amalia, and Eva Luliyanti on the Statistical Quality Control (SQC) Analysis in Bread Production at Aremania Bakery revealed measures to reduce damage, such as establishing Standard Operating Procedures (SOP), modifying the oven by adding time and temperature controls, providing standardized molds, supervising the availability of raw materials, and applying a butter coating to prevent sticking (Hairiyah et al., 2019).

A subsequent study, undertaken by Figa Mahira and Hety Handayani Hidayat, aimed to identify the quality of sugar cane using Statistical Quality Control (SQC) analysis in the Post-Harvest Sugar Cane Process at PG. Madukismo (Mahira & Hidayat, 2022).

In 2022, research on Quality Control Using the Statistical Quality Control (SQC) Method in Fish Crackers Production at UD. Zahra Barokah by Najiyatul Qonita, Deny Andesta, and Hidayat found that comprehensive analysis of damage levels could provide valuable insights to enhance system efficiency and reliability (Qonita et al., 2022).

Building on prior research, this study aimed to innovate by implementing the Statistical Quality Control (SQC) Method to monitor product quality and undergo an audit evaluation process. The evaluation process would compile daily report data to obtain the production and defective product quantities each month. Consequently, this developed system enabled speed and responsiveness in obtaining information about the produced product monitoring to ensure product compliance with quality standards and reduce the number of rejected products.

## METHOD

By opting for a qualitative approach, this research was more focused on gaining a comprehensive understanding of the phenomena experienced by the research subjects. Various methods such as direct observation, in-depth interviews, comprehensive literature reviews, and the application of the waterfall system development method were utilized as instruments for gathering the necessary data in this study.

### Research Methodology

The qualitative approach is a research method that focuses on gaining in-depth understanding of the phenomena or issues under investigation. This approach emphasizes the collection of data in the form of words, images, or objects, as well as the interpretation of such data. Qualitative methods are often used to explore complex concepts, understand individual perspectives, and investigate the intricate relationships among various factors. It involves techniques such as participatory observation, in-depth interviews, and content analysis to gain a comprehensive understanding of the research subject.

### Data Collection Techniques

The data collection techniques employed in this study involved a qualitative approach to gain a deeper understanding of the phenomena. The following methods were utilized (Syahranitazli & Samsudin, 2023):

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Observation
In the initial phase, data on production from the research subject was gathered as the first step to strengthen the research foundation and facilitate the subsequent processes.
Interviews
The next step involved conducting interviews with the production head and company managers to obtain data that would serve as samples in the development of the planned system.

Literature Review
This process began with the search and collection of data and information available in books, journals, and relevant previous studies related to the research topic.

**System Development Methodology**
In the development of the information system to monitor product quality at the research subject, this research applied the waterfall method as the development approach, with Statistical Quality Control method as the primary analytical tool. The workflow steps are outlined as follows:

Problem Identification
This stage marks the initial phase of the system development process. Here, the identification of issues within the current company system will take place. Subsequently, these issues will be formulated, and their root causes will be sought in order to find solutions.

System Requirement Determination
At this stage, the author conducted interviews with production staff at the research subject to identify existing issues. Additionally, data was collected to determine the necessary fields for application development.

System Analysis
The author then analyzed the working procedures of the system and the methodology of Statistical Quality Control in quality control processes.

Design
Prior to coding, it is advisable to design the interface and database. This stage ensures that all user needs are met according to the analysis conducted.

Program Code Development
This process involves developing the application in a structured manner using PHP, HTML, and MySQL program codes based on the predefined design.

Testing
Following the completion of the coding phase, the application will be tested by users to determine the extent of its functionality alignment with the predetermined expectations.

Implementation
Once testing and revisions are completed, the application is ready for implementation at the research subject. Routine maintenance is necessary to ensure that the application operates as desired.

## RESULT

**Requirement Analysis**
Requirement analysis is a planning stage that consists of several steps: Analysis of the current system at the research subject, followed by the analysis of the proposed system to be developed.

Analysis of the Current System
Through the review and observation conducted by the author, it was found that there were issues and ineffectiveness in the product quality system procedures at the research subject. Some of the issues identified include:

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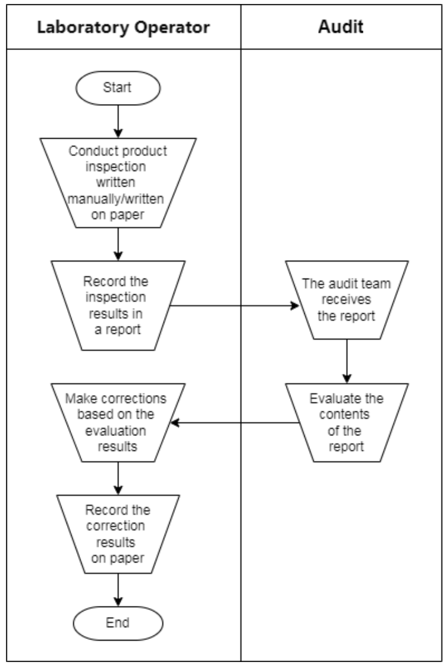


Fig. 1 The Current Information System Flow

**Analysis of the Proposed System**

In an effort to enhance the effectiveness of product quality monitoring, the author provided several recommendations to be considered in the development of a new system. It is hoped that this system will improve the effectiveness and accuracy of product quality control at the research subject. The proposed system overview is as follows:

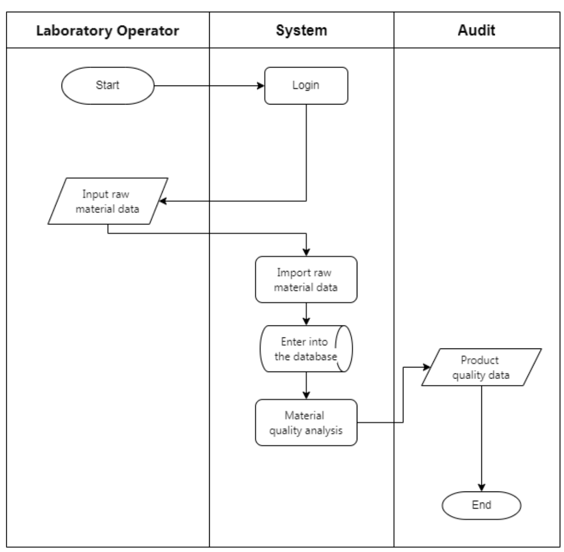


Fig. 2 The Proposed Information System Flow

**Implementation of Algorithm**

Statistic Quality Control (SQC) or statistical quality control is an analytical method that monitors, manages, and enhances the quality of products and processes using statistical approaches. SQC is often referred to as Statistical Process Control (SPC). According to Mayelett (1994), SQC has a broader scope as it encompasses SPC, acceptance sampling, and process capability analysis. The key concept in statistical quality control is Variability, which refers to the differences within or among samples, such as variations in mean or median values between samples, as well as

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variations like range or standard deviation within samples. Problem-solving in statistics involves two main steps: First, exceeding control limits when the process is out of control. Second, not exceeding control limits if the process remains in control.

The implementation of the Statistic Quality Control method in the first stage involves data collection and data processing.

Mean Calculation
Data processing involves obtaining the mean value of the data. The mean data is calculated by dividing the sum of each variable by the total number of data available.

$$\bar{x} = \frac{(\Sigma xi)}{n} \qquad (1)$$

Standard Deviation
To calculate the standard deviation, it is necessary to take the square root of the sum of the samples per variable minus the mean value per variable divided by the number of sample data.

$$\sigma = \sqrt{\frac{(\sum xi - \bar{x})^2}{n}} \qquad (2)$$

$$(\Sigma xi - \bar{x})^2 = (x_1 - \bar{x})^2 + (x_2 - \bar{x})^2 + (x_3 - \bar{x})^2 \ldots\ldots\ldots.(x_n - \bar{x})^2$$

Finding Upper Control Limit (UCL) and Finding Lower Control Limit (LCL)

$$UCL = \bar{x} + k \,.\, \sigma \qquad (3)$$

$$LCL = \bar{x} - k \,.\, \sigma \qquad (4)$$

Pareto Diagram
To identify production defects in the company, a Pareto diagram will be used. The Pareto diagram is used to determine the extent of damage in each variable.

The following are the standard parameters used as benchmarks for the success or failure of the experiment:
Moisture content: 13.0 - 13.5
pH: 5.20 - 7.00
Color: Min 93.5
SO2: Max 30 PPM
Residual Screen: 0.05%
Color of cooked product: Min 57.0

The data on the number of damages and the cumulative percentage data for each variable can be seen in the table below.

Tabel 1. Level of Damage on Variables

| NO | Variable | Number of Damages | % | Cumulative % |
|---|---|---|---|---|
| 1 | Water Content | 2 | 15% | 15% |
| 2 | PH | 1 | 8% | 23% |
| 3 | SO2 | 3 | 23% | 46% |
| 4 | Residual Screen | 2 | 15% | 62% |
| 5 | Color | 3 | 23% | 85% |
| 6 | Cooking Color | 2 | 15% | 100% |
| | Total | 13 | 100% | |

After performing the calculations above, the damages can be visualized through a Pareto diagram. Subsequently, it can be observed in the image below.

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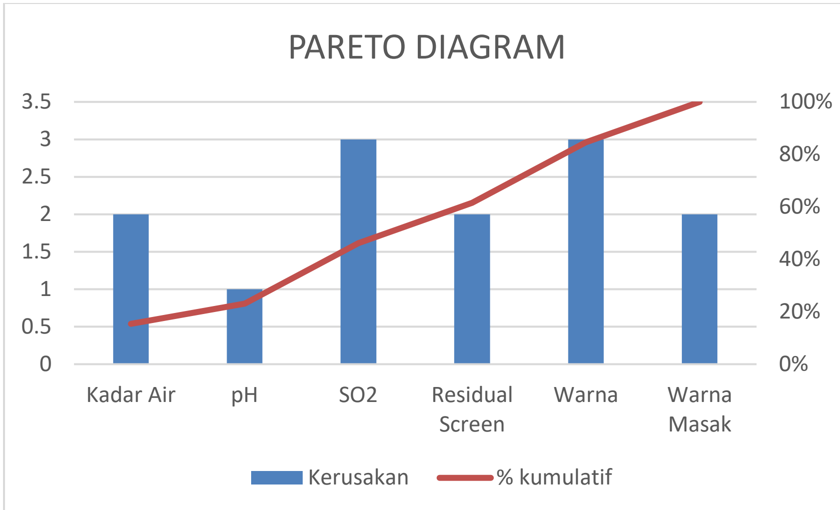


Fig. 3 The Pareto Diagram

Cause and Effect Diagram

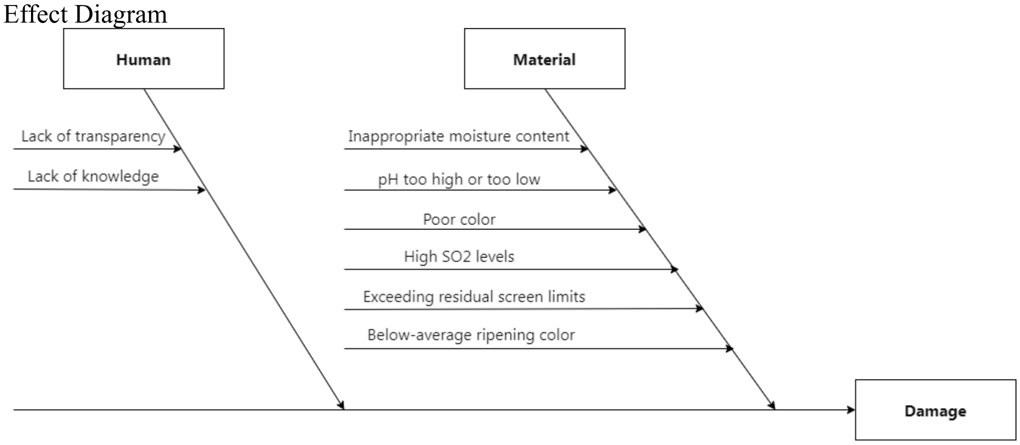


Fig. 4 The Cause and Effect Diagram

From the cause and effect diagram above, the results showed that the greatest cause of damage comes from 2 factors:

Material
It is the biggest factor in the damage. Damage caused by this material includes:
Inappropriate moisture content, where the optimal moisture content ranges from 13.00% to 13.5%.
pH levels that are too high or too low, with the optimal pH ranging from 5.20 to 7.00.
Poor or mismatched color, as the acceptable color value should not exceed 95.00.
Excessive $SO_2$ levels, which occur when the value exceeds the maximum limit of 30 PPM.
Exceeding the residual screen limit, as the quantity used exceeds the maximum value of 0.05%.
Subpar cooking color, which occurs when the entered value is below the standard minimum of 57.00.

Human
Inattentiveness of workers when using available materials.
Inexperienced workers can also cause product damage due to lack of knowledge.

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**Design System**

The next stage of system design involved an effort to comprehensively depict how the system would operate and interact with other components. For system developers, design tools such as use case diagrams served as important guidelines for visualizing and structuring the steps in system development (Batubara & Nasution, 2023).

Use Case Diagram

There were two use case diagrams in this system, namely the admin use case diagram and the user use case diagram (member). In this system, both the admin and user could perform login. The admin could input data, while the member could view the homepage, analysis results, and Pareto charts.
Below is the design of the admin and user use case diagrams:

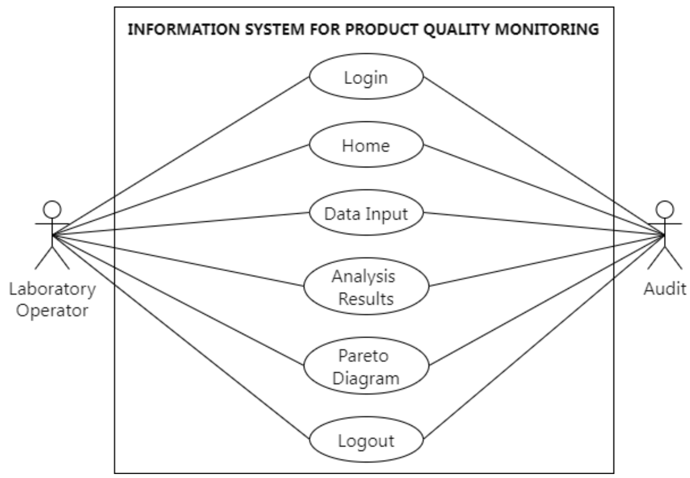


Fig. 5 The Use Case Diagram

**Implementation**

In this stage, the implementation and testing of the application were carried out. The data used in the implementation of this information system were the analysis data from the research subject. The implementation of the interface in the system to be developed was as follows:

Implementation of the Admin Data Input Menu

Below is an image showing the implementation of the admin data input interface. In this view, the admin can fill in the analysis data, such as Water Content, pH, SO2, Residual Screen, Color, and Cooking Color.

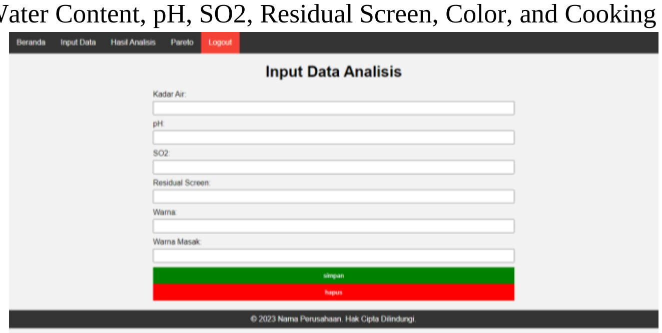


Fig. 6 Implementation of Admin Data Input Interface

Implementation of Analysis Results Menu Display

Below is the implementation of the analysis results on the Product Quality Monitoring Information System at the research subject Using Statistical Quality Control Method. In this display, the admin can take actions to modify or edit existing analysis data.

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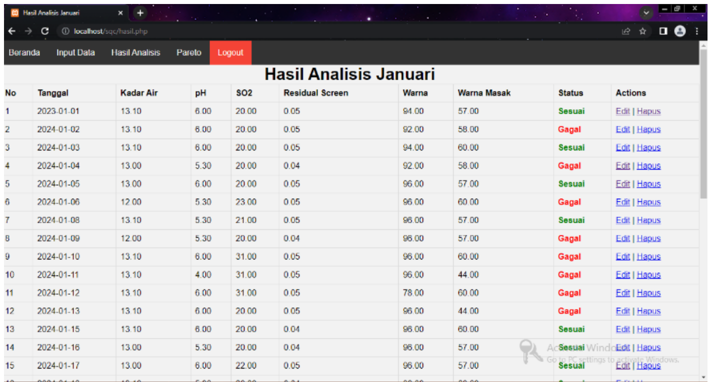


Fig. 7 Implementation of Analysis Results Menu Display

Implementation of Pareto Menu

Below is the implementation of the Pareto menu in the Product Quality Monitoring Information System at the research subject using the Statistical Quality Control Method. In this menu, the admin can view the diagram of the data results in the analysis results menu.

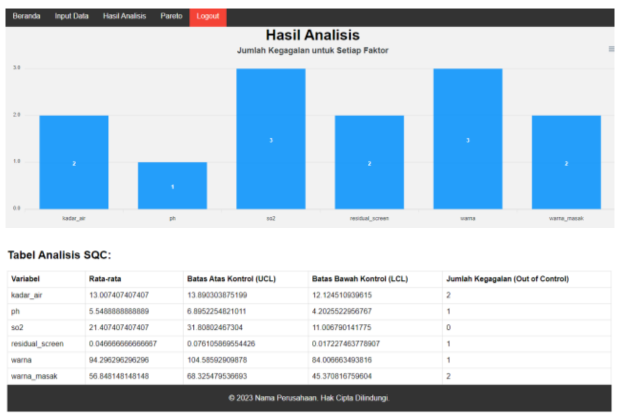


Fig. 8 Implementation of Pareto Menu

Implementation of User Analysis Results Menu

Below is the implementation of the user analysis results display. In this interface, users can view the analysis results data that the admin has added in the admin menu.

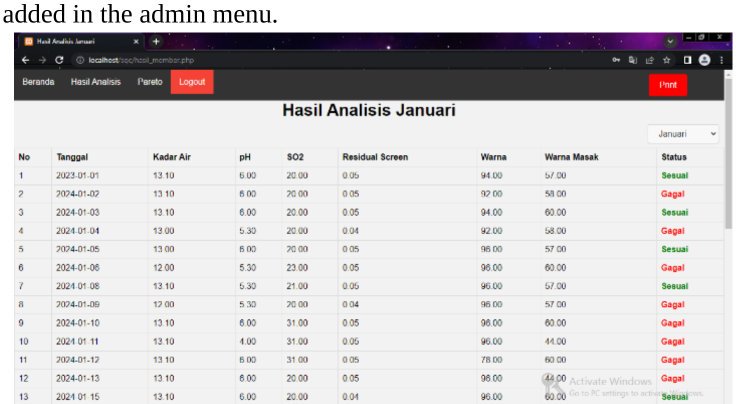


Fig. 9 Implementation of User Analysis Results Menu

Implementation of Pareto Menu Display for Users

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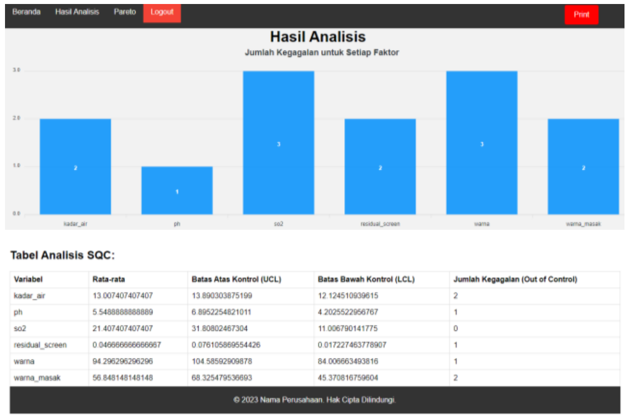
The image below shows the implementation of the Pareto menu display in the Quality Product Monitoring Information System at the research subject using the Statistical Quality Control Method. In this menu, users can view the analysis results of failure counts with a Pareto diagram.




| Variabel | Rata-rata | Batas Atas Kontrol (UCL) | Batas Bawah Kontrol (LCL) | Jumlah Kegagalan (Out of Control) |
|---|---|---|---|---|
| kadar_air | 13.007407407407 | 13.890303875199 | 12.124510939615 | 2 |
| ph | 5.5488888888889 | 6.8952254821011 | 4.2025522956767 | 1 |
| so2 | 21.407407407407 | 31.80802467304 | 11.006790141775 | 0 |
| residual_screen | 0.046666666666667 | 0.076105869554426 | 0.017227463778907 | 1 |
| warna | 94.296296296296 | 104.58592909878 | 84.006663493816 | 1 |
| warna_masak | 56.848148148148 | 68.325479536693 | 45.370816759604 | 2 |

Fig. 10 Implementation of Pareto Menu Display for Users

## DISCUSSIONS

Based on the analysis results through the implementation of the Statistical Quality Control (SQC) Method, it was found that the number of failures for each factor was evident in the Pareto diagram, where the analysis of failures for each factor was as follows: Water Content experienced 2 failures, pH experienced 1 failure, SO2 did not experience any failures, Residual Screen experienced 1 failure, Color experienced 1 failure, and Cooked Color experienced 2 failures. As a result, the company could improve operational efficiency, reduce production costs, and enhance profitability. The Statistical Quality Control Method also utilized statistical analysis techniques and data to monitor and control product quality, enabling the audit team to directly observe the outcomes of implementing this method in monitoring and enhancing product quality. For future research endeavors, enhancing the integration of the system with real-time production processes became crucial. This could be achieved by integrating data directly from production equipment into the system, allowing for more accurate monitoring and swift responses to quality changes. Additionally, the use of advanced data analysis or artificial intelligence to predict potential quality issues before they occur became necessary. These measures could assist the company in proactively taking preventive actions.

## CONCLUSION

The research findings have indicated that the development of a monitoring information system through the implementation of the Statistical Quality Control Method had proceeded well and could enhance efficiency in monitoring and improving product quality. The utilization of this method assisted the company in identifying and reducing unnecessary variability in the production process. This was evidenced by the analysis results that utilized the Statistical Quality Control Method in this study, demonstrating that the status or quality of the products had been in accordance. Based on these findings, the information system through the utilization of SQC enabled the company to improve operational efficiency, reduce production costs, and enhance profitability. The Statistical Quality Control Method also employed statistical analysis techniques and data to monitor and control product quality, allowing the audit team to directly observe the outcomes of implementing this method in monitoring and enhancing product quality.

## REFERENCES

Andriana, A. N. (2023). DINAMIKA HARGA MINYAK GORENG SERTA DAMPAKNYA TERHADAP PENGUKURAN STANDAR KUALITAS PRODUK. *Ekuitas: Jurnal Ekonomi Dan Keuangan*, *7*(1), 62–80. https://doi.org/10.24034/j25485024.y2023.v7.i1.5186

Batubara, M. Z., & Nasution, M. I. P. (2023). Sistem Informasi Online Pengelolaan Dana Sosial Pada Rumah Yatim Sumatera Utara. *Jurnal Teknologi Dan Sistem Informasi Bisnis*, *5*(3), 164–171.

Farianingrum, A., Prastyanti, S., Istiyanto, B., Sugito, T., & Noegroho, A. (2023). STRATEGI KOMUNIKASI CORPORATE IDENTITY BPJS KETENAGAKERJAAN MELALUI MEDIA DIGITAL. *Kinesik*, *10*(1), 12–28.

* Corresponding author

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Hairiyah, N., Amalia, R. R., & Luliyanti, E. (2019). Analisis Statistical Quality Control (SQC) pada Produksi Roti di Aremania Bakery. *Industria: Jurnal Teknologi Dan Manajemen Agroindustri*, *8*(1), 41–48.

Handoko, D. T. (2023). ANALISIS PENGENDALIAN INTERNAL ATAS PEMBAYARAN UANG MAKAN PADA KANTOR PERWAKILAN BPKP PROVINSI SUMATERA SELATAN. *Majalah Ilmiah Manajemen*, *12*(2), 69–90.

Idris, H., Nurnajamuddin, M., & Nurpadila, N. (2023). Transformasi Manajemen Produksi melalui Inovasi dan Total Quality Management (TQM): Memperkuat Kualitas dan Efisiensi Operasional: A Narative Review. *SEIKO : Journal of Management & Business*, *6*(2), 457–473.

Khaeruman, Suflani, Mukhlis, A., & Romli, O. (2023). Analisis Efektivitas Strategi Penilaian Kinerja Dalam Meningkatkan Produktivitas Karyawan di Indomaret Kota Serang. *Jurnal Manajemen STIE Muhammadiyah Palopo*, *9*(2), 352–363.

Kuncoro, B. N. (2023). PENGENDALIAN KUALITAS PRODUKSI DENGAN METODE SIX- SIGMA PADA INDUSTRI AMDK PRODUK 600 ML PT TIRTA INVESTAMA (AQUA) Bayu. *JURNAL JTS*, *2*(1), 1–7.

Mahira, F., & Hidayat, H. H. (2022). IMPLEMENTASI SQC ( STATISTICAL QUALITY CONTROL ) DALAM PROSES PASCAPANEN TEBU DI PG . MADUKISMO. *STRING (Satuan Tulisan Riset Dan Inovasi Teknologi)*, *7*(1), 33–40.

Meldayanoor, Amalia, R. R., & Ramadhani, M. (2019). Analisis Statistical Quality Control (SQC) Sebagai Pengendalian dan Perbaikan Kualitas Produk Tortilla di UD. Noor Dina Group. *JURNAL TEKNOLOGI AGRO-INDUSTRI*, *5*(2), 132–140.

Pasaribu, M. V. D., & Robecca, J. (2019). METODE FAILURE MODE AND EFFECT ANALYSIS UNTUK MENGURANGI CACAT PRODUK. *Inaque*, *7*(2), 117–125.

Qonita, N., Andesta, D., & Hidayat. (2022). Pengendalian Kualitas Menggunakan Metode Statistical Quality Control (SQC) pada Produk Kerupuk Ikan UD. Zahra Barokah. *Jurnal Optimalisasi*, *8*(1), 67–75.

Rizki, M., & Malfiany, R. (2021). Perancangan Sistem Informasi Quality Control Pada PT Sanly Industries Berbasis Web. *Seminar Nasional : Inovasi & Adopsi Teknologi*, *1*(1), 315–326.

Samudra, B., Sulistyanto, A., Johan, & Mengkasrinal, T. (2023). PERANCANGAN SISTEM INFORMASI PERSEDIAAN BARANG BERBASIS WEB STUDI KASUS PT. EPSINDO JAYA PRATAMA. *Jurnal Manajemen Informatika Jayakarta*, *3*(2), 142–156.

Shiyamy, A. F., Rohmat, S., & Sopian, A. (2021). ANALISIS PENGENDALIAN KUALITAS PRODUK DENGAN STATISTICAL PROCESS CONTROL. *KOMITMEN: Jurnal Ilmiah Manajemen*, *2*(2), 32–45.

Syahranitazli, & Samsudin. (2023). SISTEM INFORMASI GEOGRAFIS PERSEBARAN PONDOK PESANTREN KABUPATEN LANGKAT DAN BINJAI MENGGUNAKAN LEAFLET. *Jurnal Pendidikan Teknologi Informasi (JUKANTI)*, *6*(1), 2621–1467.

* Corresponding author