Journal of Emerging Information Systems and Business Intelligence
ISSN: 2774-3993
Journal homepage: https://ejournal.unesa.ac.id/index.php/JEISBI/

Broiler Chicken Meat Production Process Modeling at UD. Hari Ayam Using the Business Process Model and Notation (BPMN) Method

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ABSTRACT

UD. Hari Ayam is a business that has been operating since 1988 and currently produces around 100–150 kilograms of chicken meat per day. The production process covers everything from processing to distribution to customers. However, the business faces several challenges, particularly the lack of clear and standardized documentation of its business processes. This issue makes it difficult to objectively assess performance or improve efficiency. In addition, the entire operation still relies heavily on the owner, resulting in a high workload and a lack of optimal task delegation. The absence of proper records related to transactions, production, income, and expenses further complicates the overall management of the business. This study aims to apply the Business Process Model and Notation (BPMN) method using the Bizagi application to map out the chicken meat production process at UD. Hari Ayam. The research focuses on the production and distribution stages and is limited to the design phase of the business process lifecycle. Through evaluation and simulation, the study is expected to provide a more efficient and structured view of the business processes. The results are intended to offer practical input for the business owner to improve workflow, enhance operational efficiency, and facilitate better oversight in support of the company's future development.

Keyword: UD. Hari Ayam, Business Process, Business Process Model Notation, Analysis and Design, Broiler Chicken Production..

Article Info:
Article history:
Received June 25, 2025
Revised June 30, 2025
Accepted July 10, 2025

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1. INTRODUCTION

The global business landscape presents both opportunities and challenges, requiring businesses to optimize resources for profitability. Indonesia, rich in natural resources, especially in the livestock sector, holds significant potential for future business strategies. Livestock is a critical sector given the increasing public demand for animal products, which provide essential protein, energy, vitamins, and minerals, reflecting a growing awareness of nutritional importance [1].

Chicken meat is a primary source of animal protein due to its affordability, low fat content, and unsaturated fatty acids [2]. Projections from the Ministry of Agriculture's Satu Data (2022) indicate an average per capita broiler consumption of 11.41 kg/year for 2022-2026, with an estimated 10.84 kg/year in 2022, rising to 11.12 kg/year in 2023, and 11.41 kg/year in 2024. This trend underscores the need for chicken meat producers to align production with market demand.

UD. Hari Ayam, established in Surabaya in 1988 by Mr. Suhari, currently produces 100-150 kg of chicken meat daily. Its operations encompass live chicken procurement, processing, sales transactions, and payroll. However, UD. Hari Ayam lacks a well-defined business process structure; all divisions (marketing, finance, production, and warehouse) are managed by the owner. Furthermore, crucial processes like transactions, production, expenses, and income often lack proper recording. This deficiency poses potential problems, especially given the company's aspirations for growth. The absence of clear work instructions, detailed transaction records, monthly bookkeeping, and defined divisional responsibilities highlights the urgent need for process improvement to enhance quality and mitigate future issues. This research aims to address these challenges by focusing on business process optimization for UD. Hari Ayam.

2. METHODS

This research outlines the systematic steps taken to gather accurate information regarding the investigated problem, employing a structured Business Process Management approach. The methodology involves several key stages: literature review, observation and interviews, business process identification, current business process modeling, model validation, verification through simulation (using Bizagi application), business process analysis based on the model and interview findings, and finally, conclusion drawing.

2.1 Problem Formulation

Based on the background discussed, this research aims to address the following questions:

1. How can Business Process Model and Notation (BPMN) be effectively utilized in the Bizagi application to model the chicken meat production process?
2. What are the recommended improvements for the chicken meat production process using Business Process Model and Notation (BPMN) concepts through the Bizagi application?

2.2 Literature Review

This initial phase involved a comprehensive review of relevant literature to establish a strong theoretical foundation for the research. Key topics explored included Business Process, Business Process Management (BPM), Business Process Model and Notation (BPMN), the Bizagi application (a software tool for BPMN modeling), and chicken meat production. Information was gathered from diverse sources such as books, articles, websites, and journals, after which a draft of interview questions was prepared for subsequent stages of the research.

2.3 Observation and Interviews

Interviews were conducted with Mr. Hari, the owner of UD. Hari Ayam, to gather detailed information regarding the broiler chicken production process within his company. The interviews specifically focused on the various aspects of chicken meat production carried out by UD. Hari Ayam. Prior to the interviews, a structured list of questions was prepared to guide the discussion and ensure relevant data collection.

2.4 Current Business Modelling

The next step involved modeling the existing business processes using the Bizagi application. This modeling phase focused on representing the general business processes with easily understandable BPMN notations.

2.5 Business Process Recommendation

In this stage, the newly designed process models are compared against the existing processes to assess their suitability and identify areas for future improvement. The resulting analysis considers the developed models, supplemented by insights from interviews that may not be explicitly detailed within the business process models themselves.

2.6 Conclusion

This final stage involves drawing conclusions after completing all preceding phases, including identification, modeling, validation, verification, and analysis of the business processes. The conclusions will specifically address how the use of BPMN in the chicken meat production business process contributes to increased effectiveness and efficiency.

3. RESULTS AND DISCUSSION

This research delivers a Business Process Model and Notation (BPMN) model for chicken meat production, alongside an analysis of this model to foster a more structured and efficient understanding of the business process flow.

3.1 Problem Identification

Following the successful identification of business processes, several issues became apparent, necessitating efforts for improvement. These identified problems are as follows:

Table 1. Problem Identification

No.	Problem	Risk
1.	The owner's role in the Live Chicken Procurement Process is too extensive, resulting in time inefficiency.	The process becomes inefficient and hampers the company's growth.
2.	Several stages of production are still performed manually by human labor.	Product quality is suboptimal and requires a relatively long completion time.
3.	Financial transactions, both expenses and income, have not yet been recorded.	Cash flow uncertainty and increased risk of fund leakage.
4.	Employee payroll and salary recording are still done manually.	Frequent data loss and difficulty when employees are absent.

Each business process presents unique challenges, requiring tailored solutions. Therefore, effective problem resolution necessitates a specific approach for each identified issue.

3.2 Analysis of Improvements

After identifying issues within the current business processes, several recommendations for improvement have been developed. In line with the BPM approach, these improvements aim to enhance the effectiveness and efficiency of the business processes. The following are the recommended improvements, tailored to address the identified problems.

Table 2. Analysis of Improvements

No.	Problem	Improvement Technique	Description
1.	The owner's role in the Live Chicken Procurement Process is too extensive, resulting in time inefficiency.	Input quality improvement	Increase employee involvement to accelerate the process.
2.	Several stages of production are still performed manually by human labor.	Mechanization	Addition of machines to improve efficiency in the production process.
3.	Financial transactions, both expenses and income, have not yet been recorded.	Automation	Adding an information system to record each transaction to assist in data processing and storage.
4.	Employee payroll and salary recording are still done manually.	Automation	Adding an information system to record employee and salary data based on levels to support data processing and storage.

3.3 Current Business Process

3.3.1 Current Live Chicken Procurement

The Live Chicken Procurement process at UD. Hari Ayam begins with the owner inquiring about raw material availability from the supplier (2 minutes). The supplier then checks their stock (10 minutes) and, if available, confirms with the owner (2 minutes). Subsequently, the supplier dispatches the raw materials (8 hours), which the owner receives (15 minutes) and inputs into inventory (10 minutes). Finally, if the delivery matches the order, the owner processes the payment (1 minute), which the supplier then receives (1 minute).

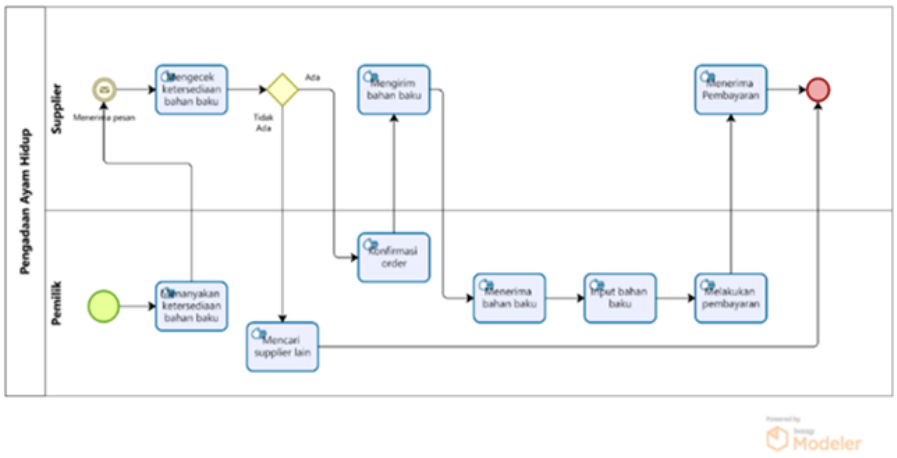

Figure 1. Current Live Chicken Procurement

3.3.2 Current Chicken Processing

The second business process, chicken processing, is largely a manual operation carried out by employees. This process involves several distinct stages: sorting and weighing chicken carcasses (30 minutes), slaughtering (15 minutes), feather softening (30 minutes), germ removal (20 minutes), and offal cleaning (20 minutes).

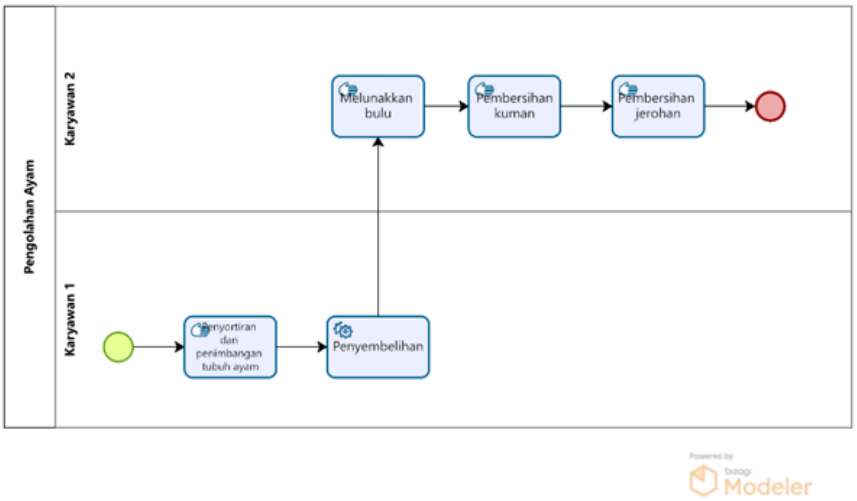

Figure 2. Current Chicken Processing

3.3.3 Current Sales Transaction

The third business process, Sales Transaction, involves both employees and the owner, with most activities performed manually. This process begins when a buyer places an order (1 minute), which the owner then records (1 minute) and subsequently checks for stock availability (1 minute). An employee then proceeds with cutting (2 minutes) and packing (2 minutes) the chicken. Finally, the owner hands over the chicken meat to the buyer (1 minute), and the buyer completes the payment (1 minute).

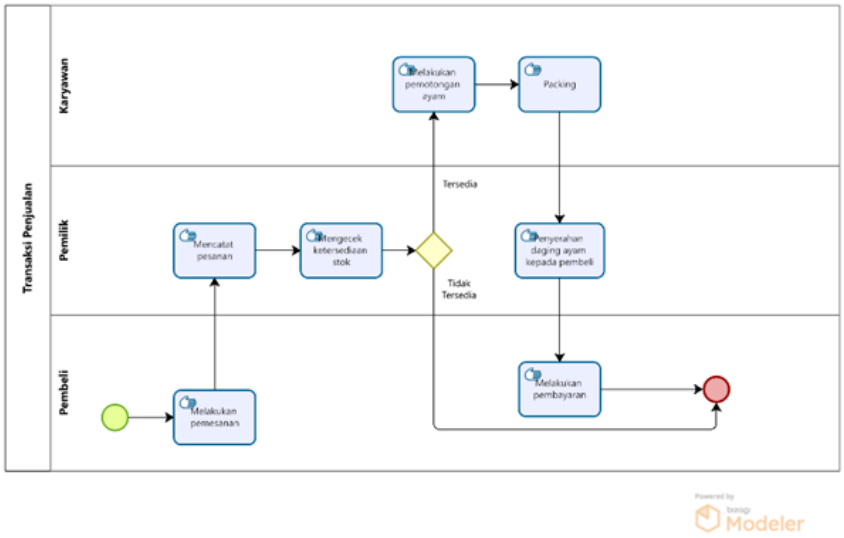

Figure 3. Current Sales Transaction Process

3.3.4 Current Employee Payroll

The fourth business process, Employee Payroll, involves both employees and the owner, with all activities performed manually. This process begins with employees gathering (10 minutes), after which the owner categorizes them based on their wages and tasks (5 minutes). Each employee then meets individually with the owner for a performance evaluation (15 minutes), concluding with the employee receiving their salary (1 minute).

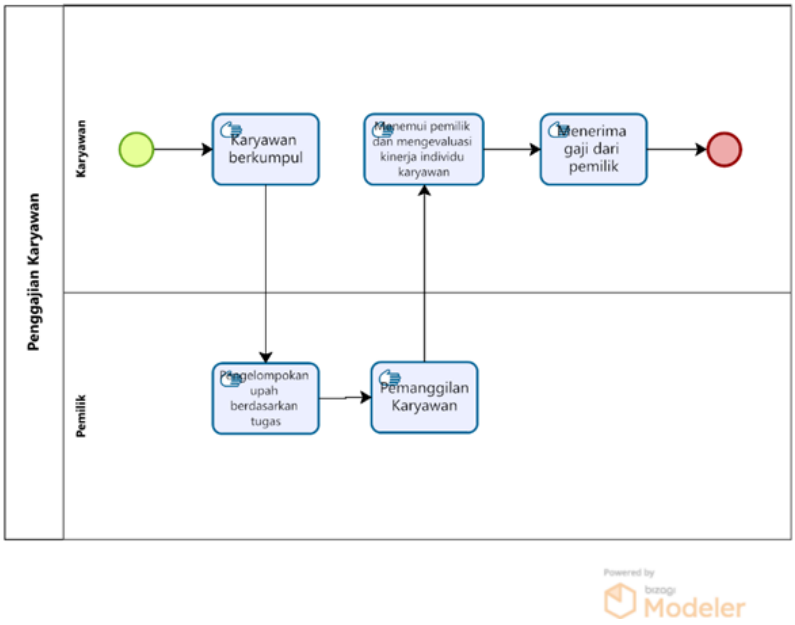

Figure 4. Current Employee Payroll Process

3.4 To-Be Business Process

The To-Be Business Process outlines the recommended improvements and restructured workflows for the various operations within the company, aiming to enhance overall efficiency and effectiveness based on the analysis of current issues.

3.4.1 To-Be Live Chicken Procurement

The To-Be Live Chicken Procurement Process begins with the owner sending a raw material request to the supplier (1 minute), who then receives it (1 minute) and dispatches the raw materials (8 hours). Upon arrival, an employee receives the raw materials (1 minute) and counts the quantity (5 minutes), then receives the raw material invoice (30 seconds). The owner subsequently records the raw material report (2 minutes) and proceeds with payment (1 minute), which the supplier then receives (30 seconds).

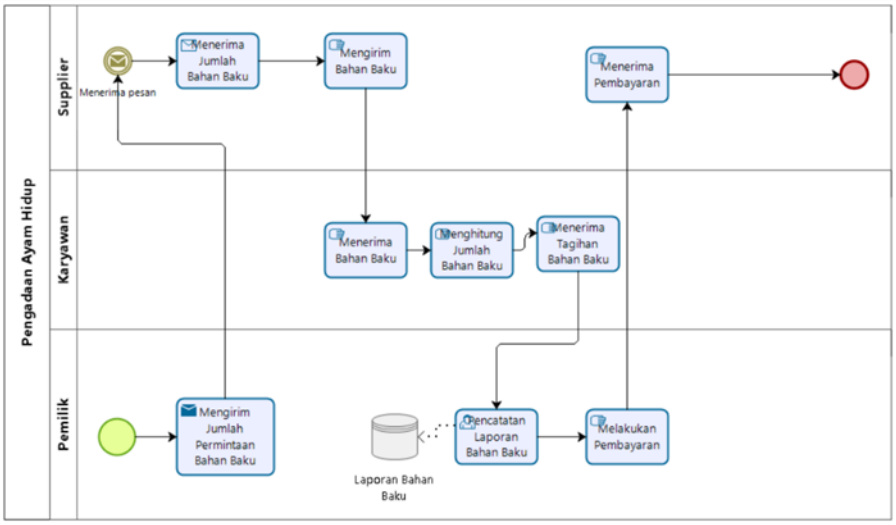

Figure 5. To-Be Live Chicken Procurement

3.4.2 To-Be Chicken Processing

The To-Be Chicken Processing Process streamlines operations by assigning specific roles and incorporating machinery. It begins with Employee 1 sorting and weighing chicken carcasses (30 minutes) and then performing machine-assisted slaughtering (15 minutes). Subsequently, Employee 2 handles machine-assisted feather softening (10 minutes), followed by machine-assisted germ removal (10 minutes), and finally, manual offal cleaning (10 minutes).

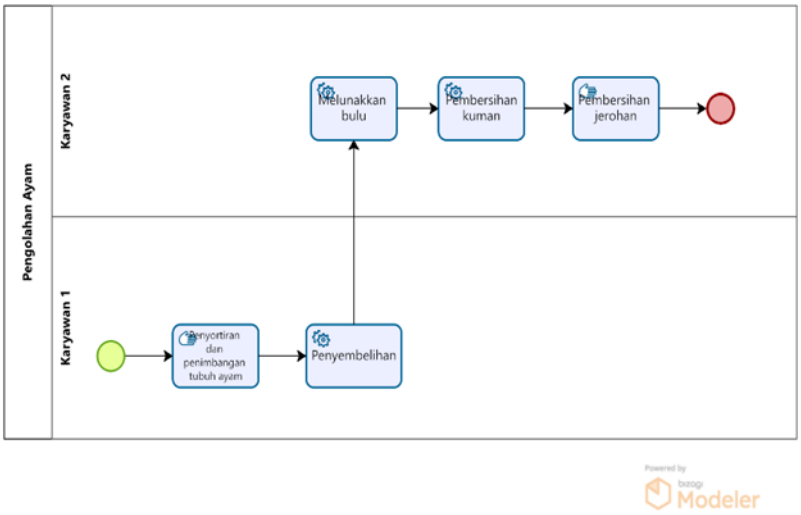

Figure 6. To-Be Chicken Processing

3.4.3 To-Be Sales Transaction

The To-Be Sales Transaction begins with the buyer placing an order (1 minute), which the owner then records (1 minute). An employee checks stock availability (1 minute), proceeds to cut the chicken (30 seconds), and then packs it (30 seconds). The owner hands the chicken meat to the buyer (30 seconds), who then completes the payment (30 seconds). Finally, an employee records the transaction recap (30 seconds).

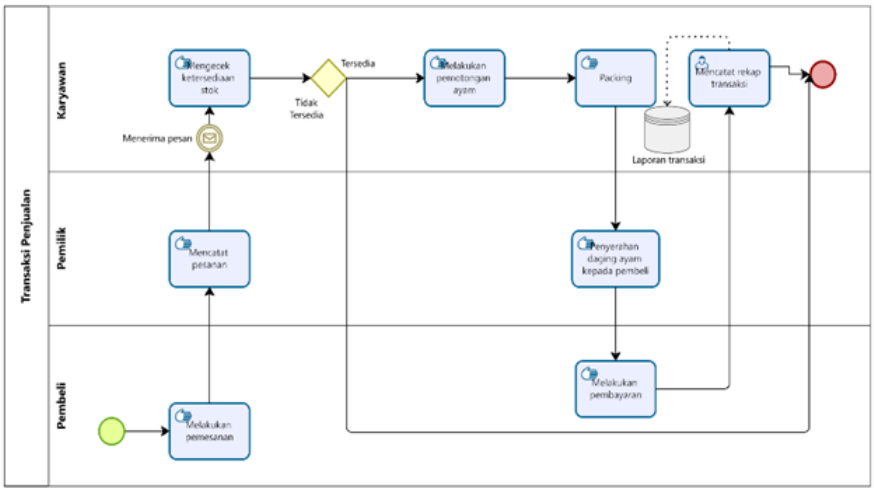

Figure 7. To-Be Sales Transaction Process

3.4.4 To-Be Employee Payroll

The To-Be Employee Payroll Process streamlines the current system. It begins with the owner checking employee data (1 minute) and then preparing a weekly salary recap (2 minutes). The owner subsequently disburses salaries (15 seconds), either directly or via transfer if an employee is absent (1 minute), after which the employee receives their payment (15 seconds).

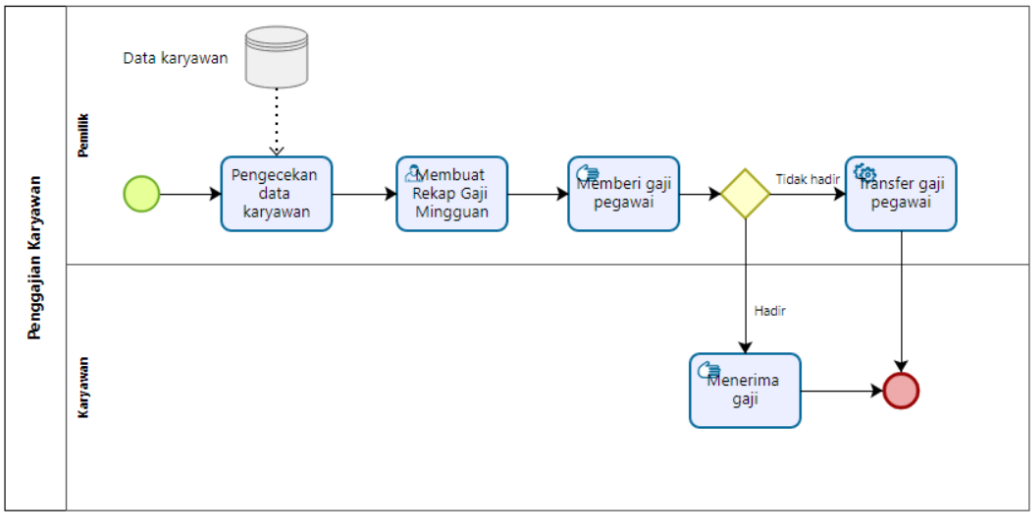

Figure 8. To-Be Employee Payroll Process

3.5 Business Process Comparison

After analyzing the simulation results for both the current and To-Be business processes, the following comparative findings were observed:

3.5.1 Live Chicken Procurement

Table 3. Live Chicken Procurement Process Comparison

Time	Current Business Process	To-Be Business Process
Min. Time	8h 40m	8h 12m
Max. Time	8h 40m	8h 12m
Avg. Time	8h 40m	8h 12m
Total Time	8h 40m	8h 12m

The table above illustrates the time comparison from simulating both the current and To-Be Live Chicken Procurement processes. Notably, the proposed process achieves a total time reduction of 15 minutes in live chicken procurement.

3.5.2 Chicken Processing

Table 4. Chicken Processing Comparison

Time	Current Business Process	To-Be Business Process
Min. Time	1h 55m	1h 25m
Max. Time	1h 55m	1h 25m

Avg. Time	1h 55m	1h 25m
Total Time	3h 55m	2h 50m

The table above presents the time comparison derived from simulating both the current and To-Be chicken processing workflows. Significantly, the proposed process demonstrates a total time reduction of 1 hour and 5 minutes in chicken meat production.

3.5.3 Sales Transaction

Table 5. Sales Transaction Process Comparison

Time	Current Business Process	To-Be Business Process
Min. Time	3m	3m
Max. Time	9m	5m 30s
Avg. Time	6m 7s	4m 21s
Total Time	5h 6m	3h 37m 30s

The table above illustrates the time comparison derived from simulating both the current and To-Be sales transaction processes. Notably, the proposed process achieves a significant total time reduction of 1 hour, 28 minutes, and 30 seconds in sales transactions.

3.5.4 Employee Payroll

Table 6. Employee Payroll Process Comparison

Time	Current Business Process	To-Be Business Process
Min. Time	36m	3m 30s
Max. Time	36m	4m 15s
Avg. Time	36m	3m 52s
Total Time	1h 12m	7 m 54s

The table above illustrates the time comparison derived from simulating both the current and To-Be employee payroll processes. Significantly, the proposed process achieves a total time reduction of 1 hour, 4 minutes, and 6 seconds in employee payroll.

CONCLUSION

Based on the business process analysis, it's evident that UD. Hari Ayam's current operations are hampered by the owner's excessive involvement in live chicken procurement, leading to inefficiency that could be mitigated through more structured task allocation. Furthermore, several manual production stages require mechanization for improved speed and consistency, while the absence of automated financial and payroll recording necessitates the implementation of an automated system to enhance accuracy and administrative efficiency. These proposed improvements collectively yield significant time savings across four key business processes: live chicken procurement is reduced from 8 hours 40 minutes to 8 hours 12 minutes, chicken processing from 3 hours 55 minutes to 2 hours 50 minutes, sales transactions dramatically decrease from 3 hours 37 minutes 30 seconds to just 7 minutes 54 seconds, and employee payroll shortens from 1 hour 12 minutes to 7 minutes 54 seconds. These substantial gains highlight the potential for UD. Hari Ayam to achieve more effective and efficient operational

completion. For future research, it is recommended to conduct studies during active business operations for greater data accuracy, incorporate additional methodologies for varied results and more effective solutions, and further develop the business process analysis by integrating supporting information systems for structured, monitored, and sustainable process flow.

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