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Business Process Reengineering of Motor Vehicle Insurance Claims Using the Business Process Reengineering Method

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ABSTRACT

In the current era of digital transformation, motor vehicle insurance claim services can be rendered significantly more effective. However, PT Asuransi Umum Bumiputera Muda 1967 (BUMIDA) encounters challenges with manual vehicle surveys, which lead to prolonged queues in claim services. To address this issue, enhancing the business processes associated with the provision of motor vehicle insurance claim services is imperative. The objective of this research is to analyze the motor vehicle insurance claim process utilizing the Business Process Reengineering (BPR) method and to propose an optimized process. The methodology employed in this study encompasses analyzing the current (As-Is) business process, formulating the problem, designing the proposed (To-Be) business process, and ultimately executing a process simulation using BPMN 2.0 within the Visual Paradigm application. The primary finding indicates that the implementation of digital surveys integrated with video calling technology can significantly enhance the business process and eliminate bottlenecks within the vehicle surveying procedure. The newly proposed process and subsequent improvements are anticipated to substantially increase the efficiency of the motor vehicle insurance claim services provided by the company.

Keyword: BPMN, BPR, Insurance Claim, Business Process, BUMIDA

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1. INTRODUCTION

Current advancements in digital technology have driven fundamental transformations across various industrial sectors, including the insurance industry, by adopting digital innovations to enhance service efficiency and customer satisfaction [1]. This transformation replaces time-consuming manual methods with highly responsive, technology-based systems, thereby increasing overall efficiency [2]. Nevertheless, the motor vehicle claim handling process at PT Asuransi BUMIDA still relies on the physical presence of on-site surveyors to directly inspect vehicle conditions and assess damages. This overreliance on manual labor prolongs the claim process and renders it vulnerable to operational bottlenecks [3].

Business Process Reengineering (BPR) is an approach that fundamentally redesigns business processes by leveraging information technology to achieve significant improvements in operational segments and efficiency [1]. The implementation of Business Process Reengineering assists organizations in streamlining workflows and enhancing operational effectiveness through the utilization of digital technology [4]. Furthermore, BPR can reduce expenses, accelerate operations, and elevate service quality [5]. Integrating automation and process redesign within the industry has proven effective in mitigating inefficiencies stemming from manual procedures, which are a primary source of delays [3]. Technological transformation in the industry is capable of accelerating the claim cycle while simultaneously expanding service coverage for customers [6]. Moreover, the utilization of electronic meetings and video conferencing technologies facilitates remote communication devoid of geographical barriers [7].

Addressing these issues, this study proposes the reengineering of the motor vehicle claim business process at BUMIDA by transitioning from manual technical procedures to online video-based inspections utilizing applications such as Zoom or Google Meet [7]. Through this approach, surveyors can conduct real-time vehicle condition inspections without the necessity of being physically present on-site [6]. Consequently, this process can expedite the acquisition of information and the overall claim processing [7].

The novelty of this research lies in the specific implementation of the business process reengineering method to transition historically manual process stages by integrating video conferencing technology as a direct substitute for physical surveys [3][7].

2. METHODS

The research stages described in this chapter are based on the activities carried out throughout the research process. Business Process Reengineering (BPR) techniques or activities were applied in this study. This is illustrated in Figure:

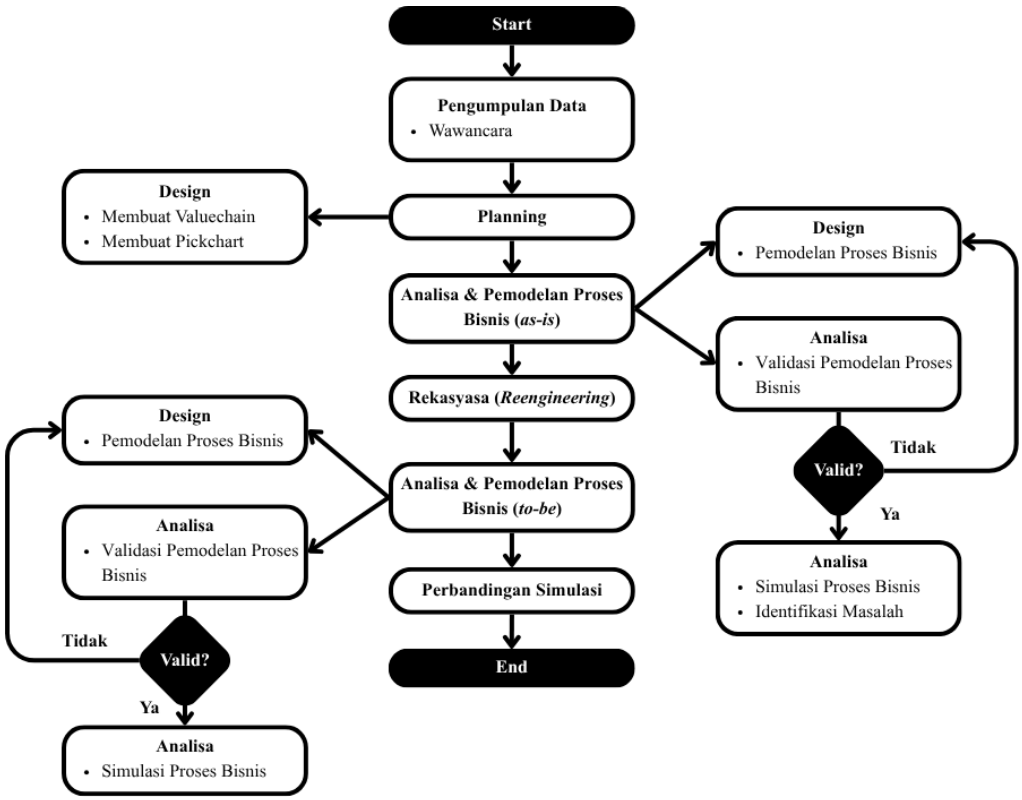


Figure 1 Research Methodology

2.1 Data Collection

At this stage, qualitative data was collected to gather information regarding the business process flow for motor vehicle insurance claims at PT BUMIDA. The data was obtained through online interviews conducted via Microsoft Teams and WhatsApp with the Head of the Information Technology Division [8]. Because they allow for flexible data collection without being constrained by geographic location, interviews are a successful online tool in qualitative research.

2.2 Planning

At this stage, planning is conducted by developing a value chain to explicitly map the primary and support activities within the company [9]. Subsequently, a PICK chart is formulated as a visual tool to prioritize issues based on two primary parameters: the level of generated impact (Impact) and the complexity of implementing the solution (Difficulty). Through this PICK chart, the most urgent and rational problems to be addressed first during the reengineering phase can be systematically determined.

2.3 Business Process Analysis and Modeling (As-Is)

This phase focuses on developing the current (As-Is) business process model for motor vehicle insurance claims. Utilizing the Business Process Model and Notation (BPMN 2.0) standard to visualize the workflow in a structured manner [10], which is implemented via Visual Paradigm software, business process simulations assist organizations in evaluating process modifications prior to actual implementation [11]. Once the model is designed, validation is conducted by presenting the modeling results and conducting follow-up interviews with key informants at BUMIDA. This step is undertaken to verify the accuracy and validity of the workflow depicted in the diagram. Upon confirming the model's validity, a business process simulation is executed to measure the existing performance outcomes. The results of this simulation are subsequently utilized to identify issues and inefficiencies occurring within the current process.

2.4 Reengineering

This stage aims to design solutions for the operational issues and inefficiencies identified in the existing (As-Is) business process model. This reengineering approach does not intend to eliminate workflow stages; rather, it focuses on upgrading the execution methods of the business process to become more modern and efficient [12]. The primary focus of the improvement lies in the Surveyor's operational phase, where physical inspections necessitating on-site visits are replaced by remote inspections (Digital Surveys) utilizing video calling technology. This methodological transformation is designed to address the issues of prolonged queue times and travel expenses without compromising the validity of the claim verification process itself. Through this methodological substitution, the proposed (To-Be) business process model is expected to operate in a significantly more responsive, practical, and optimal manner.

2.5 Business Process Analysis and Modeling (To-Be)

This phase is conducted after obtaining the results from the Business Process Reengineering (BPR) method, which yields redesign recommendations for the motor vehicle insurance claim business process. At this stage, the proposed (To-Be) business process modeling is executed utilizing Visual Paradigm software. The selection of this notation is founded on the advantages of the BPMN standard, which possesses high expressiveness, thereby presenting workflow visualizations that are easily comprehensible to all organizational stakeholders [13]. Once the new design model is formulated, subsequent validation is conducted with BUMIDA to ensure that the proposed improvements do not conflict with

company policies or regulations. Upon confirming the model's validity, the subsequent step involves executing a simulation of the To-Be business process. This simulation aims to project future performance to verify that the new design operates more efficiently prior to its actual implementation [14].

2.6 Simulation Comparison

Following the simulation of both the current (As-Is) and proposed (To-Be) business processes, a comparison of their respective efficiency levels is conducted. This comparison evaluates three primary indicators derived from the simulation results: cycle and queue times (Time), operational costs (Cost), and human resource workload (Resource Utilization) [15]. To execute the assessment of the As-Is and To-Be processes more systematically, BPMN offers an organized methodology for visualizing, evaluating, and enhancing business processes. Consequently, this comparative analysis serves as empirical evidence and a definitive conclusion to demonstrate the extent of the performance improvements and cost savings achieved by the company through the implementation of the business process redesign.

3. RESULTS AND DISCUSSION

3.1 Modeling and Business Process (As-Is)

The first step in business process reengineering is to map or model the current operational conditions (As-Is). The author uses visual modelling software based on the Business Process Model and Notation (BPMN 2.0) standard to model the motor vehicle insurance claims service process at PT BUMIDA.

In the existing motor vehicle insurance claim business process, several departments and external parties are involved in the workflow, namely the Customer, Claim Admin, Surveyor, Claim Analyst, Finance, and Partner Workshop. This business process entails the following stages:

a. The process is initiated in the Underwriting lane via a Message Start Event when the system receives a claim submission message from the Customer.
b. The Underwriting staff follows up on the initial report by sending instructions requesting the completion of required documents and claim forms to the Customer.
c. Underwriting receives the uploaded files back from the Customer through an Intermediate Catch Event (Message). This activity generates a physical Data Object within the system referred to as the "Claim Document".
d. Utilizing the "Claim Document" Data Object, the Underwriting staff performs administrative tasks to verify the validity of the contract and the active period of the customer's policy through the company's internal system.
e. If the policy is expired or invalid, the workflow terminates at a Message End Event labeled "Claim Rejected," and the rejection is communicated to the Customer.
f. If the policy status is valid, the workflow proceeds to the subsequent administrative stage.
g. The Underwriting staff records the registration data and uploads all the customer's claim document files into the system portal.
h. Underwriting issues an assignment ticket or Survey Order, which automatically transitions the process flow to the Surveyor department (lane).
i. The Surveyor receives the Survey Order, then contacts the Customer and/or Partner Workshop to confirm the scheduled availability for the inspection.

j. According to the agreed schedule, the Surveyor conducts a physical field inspection (Conducting Survey). At this stage, the Surveyor is tasked with validating the vehicle's identity, verifying the chronology of events, and ensuring the physical damage aligns with the coverage stipulated in the policy.

k. If the damage does not correspond with the policy or if fraud is indicated, the workflow terminates at the "Claim Rejected" Message End Event, and the information is dispatched to the Customer.

l. If the damage is covered, the workflow continues.

m. The Surveyor sends an initial approval signal via an Intermediate Throw Event (Message) distributed in parallel to the Customer and Partner Workshop, indicating that the vehicle has been authorized to enter and be processed by the workshop.

n. The workflow shifts to the Claim Analyst lane, triggered by an Intermediate Catch Event (Message). This message is received after the Partner Workshop has completed the estimation and submitted the detailed repair costs.

o. Prior to the issuance of the work approval document, the workflow must pass through an operational waiting period in the form of a 1-day Intermediate Timer Event. This duration represents the Service Level Agreement (SLA) of the maximum working time for the Claim Analyst to conduct price reviews and negotiate spare parts with the workshop.

p. Once the cost estimate is approved within the SLA timeframe, the Claim Analyst creates an official work authorization document, which generates the "SPK" (Work Order) Data Object.

q. The Claim Analyst digitally distributes the "SPK" Data Object to the Partner Workshop via an Intermediate Throw Event (Message). This SPK serves as the legal foundation for the workshop to immediately commence physical vehicle repairs.

r. The Finance department receives a notification along with physical/digital invoice documents from the Partner Workshop stating that the vehicle has been repaired. This information is recorded as an "Invoice" Data Object.

s. Before funds are disbursed, the "Invoice" Data Object enters a maximum 30-day payment queue cycle via an Intermediate Timer Event. This time retention acts as a form of compliance with the company's prevailing Term of Payment (ToP) policy.

t. After the terminology deadline is reached and the data is verified, the Finance staff executes the fund transfer to the Partner Workshop's account via a Message End Event. The workshop receives the funds, and the entire motor vehicle insurance claim business process is declared complete (Closed).

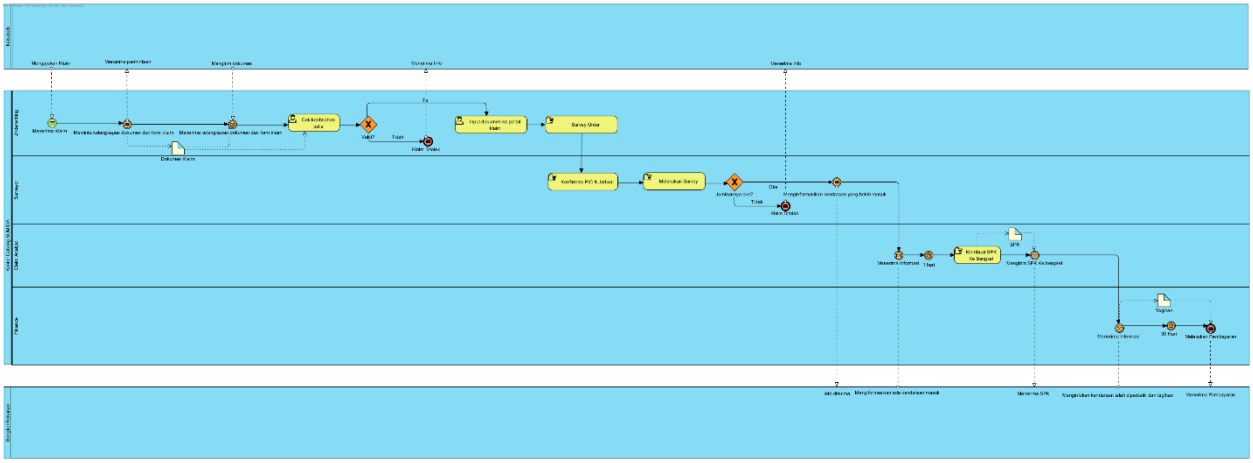


Figure 2 BPMN Model of the Motor Vehicle Insurance Claim Business Process (As-Is).

3.2 Business Process Simulation Results (As-Is)

The performance simulation of the existing (As-Is) business process is focused on cycle time (time performance) analysis, executed utilizing Visual Paradigm software. Based on the simulation results, the entire motor vehicle insurance claim service business process requires an average completion time of 31 days, 20 hours, and 30 minutes, with a minimum time of 40 minutes (for claim submission scenarios that are immediately rejected during the Underwriting validation stage), and a maximum time reaching 31 days, 20 hours, and 30 minutes (for approved claim scenarios extending through the payment queue deadline).

More specifically, regarding the employees' operational work stages, the time simulation results indicate that the "Conducting Survey" activity is the primary contributor to the extended duration. This activity necessitates a pure execution time of 120 minutes per case, which subsequently generates a substantial queue time buildup, reaching up to 9 hours before a document can be processed.

3.3 Business Process Problem Identification

The preceding business process was analyzed, and subsequently, issues associated with each task were identified prior to implementing improvements. Problem identification was conducted by reviewing interview results, time analysis, and resource utilization analysis, as detailed in the Table 1.

Table 1. Problem Identification in the Motor Vehicle Insurance Claim Process.

Tasks	Problems	Risk
Conducting Survey	The current operational system necessitates the Surveyor to be physically present at the workshop or customer's location. This creates a complete dependency on travel distance and vulnerability to external constraints such as traffic congestion.	The occurrence of transportation waste renders the workload as a Non-Value Adding (NVA) activity. Consequently, this poses a risk of creating substantial queues (bottlenecks) and diminishing customer satisfaction due to prolonged waiting times.

3.4 Implementation of Business Process Reengineering

Table 2. Implementation of Business Process Reengineering.

Tasks	Problems	Risk
Conducting Survey	The current operational system requires the Surveyor to be physically present at the workshop or the customer's location. This creates a complete dependency on travel distance and vulnerability to external constraints such as traffic congestion.	The occurrence of transportation waste renders the workload a Non-Value Adding (NVA) activity. This poses a risk of creating substantial queues (bottlenecks) and diminishing customer satisfaction due to prolonged waiting times.

The implementation of Business Process Reengineering (BPR) within the motor vehicle claim service workflow of PT BUMIDA is focused on resolving the root cause of bottlenecks at the field operational stage. This reengineering is executed by transforming the conventional

physical verification process, which is highly time-consuming and costly, into a significantly more streamlined and digitized process. The implementation details of this operational method replacement are elaborated in the Table 2.

3.5 Business Modeling (To-Be)

The results of the Business Process Reengineering (BPR) implementation are subsequently visualized in graphical notation using Visual Paradigm software, in accordance with the Business Process Model and Notation (BPMN 2.0) standard, as follows:

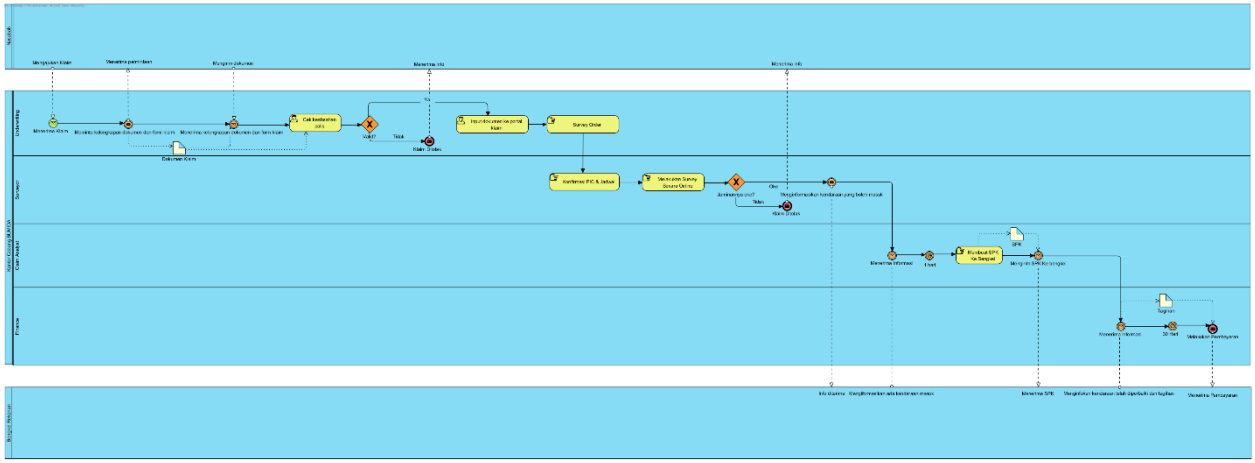


Figure 3 BPMN Model of the Motor Vehicle Insurance Claim Business Process (To-Be).

This stage represents the improvement design following the reengineering of the current business process. The primary focus of the modification lies in the transformation of working methods within the Surveyor department to eliminate waiting time and travel costs. The proposed business process workflow (To-Be) is outlined as follows:

a. The process is initiated in the Underwriting Lane via a Message Start Event when the system receives a claim submission message from the Customer.
b. The Underwriting staff follows up on the initial report by sending instructions requesting the completion of required documents and claim forms to the Customer.
c. Underwriting receives the uploaded files back from the Customer through an Intermediate Catch Event (Message). This activity generates a physical Data Object within the system referred to as the "Claim Document".
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h. Underwriting issues an assignment ticket or Survey Order, which automatically transitions the process flow to the Surveyor department (lane).
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j. According to the agreed schedule, the Surveyor conducts a physical field inspection (Conducting Survey). At this stage, the Surveyor is tasked with validating the vehicle's identity, verifying the chronology of events, and ensuring the physical damage aligns with the coverage stipulated in the policy.

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t. After the terminology deadline is reached and the data is verified, the Finance staff executes the fund transfer to the Partner Workshop's account via a Message End Event. The workshop receives the funds, and the entire motor vehicle insurance claim business process is declared complete (Closed).

3.6 Business Process Simulation Results (To-Be)

Table 3. Comparison Results of the Motor Vehicle Insurance Claim Business Process Simulation.

Waktu	As-is	To-be	% Perbedaan
Minimum Time	30 minutes	30 minutes	0%
Maximum Time	31 days, 20 hours, 30 minutes	31 days, 08 hours, 30 minutes	1,569%
Active Operational Time	20 hours, 30 minutes	08 hours, 30 minutes	58,536%

The simulation phase of the proposed (To-Be) business process is conducted using Visual Paradigm software to measure the efficiency level following the implementation of Business

Process Reengineering. The primary focus of this simulation is to evaluate the impact of transforming the survey execution into an online process utilizing video call technology.

CONCLUSION

Based on the research findings, the Business Process Reengineering (BPR) method for motor vehicle insurance claims at PT BUMIDA was successfully implemented, resulting in a more efficient business process through digital surveys using video call technology. This transformation successfully reduced obstacles in the survey process, which had previously been the main cause of delays in claim services.

The simulation results show that the To-Be model represents a more effective business process than the As-Is model. The active operational time was optimized from 20 hours and 30 minutes to only 8 hours and 30 minutes, resulting in an efficiency improvement of 58.536%. In addition, the digitization of the survey process reduced backlogs and minimized unnecessary transportation costs without compromising the credibility of the claims verification process.

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The authors acknowledge that this study still possesses certain limitations. Therefore, constructive criticisms and suggestions are highly welcomed to improve future research endeavors and to ensure that this study yields meaningful benefits for readers and other relevant stakeholders.

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