

Accountability for Operational Costs Using the Business Process Management at Indonesian Oil and Gas Company

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Abstract

The accountability system in Indonesian oil and gas companies faces several critical problems such as low process efficiency, insufficient transparency, and a high potential for operational cost corruption and fraud. This study aims to analyze a business process of operating accountability cost using a cash card system in a shared service center in one Indonesian oil and gas company using Business Process Management. Business Process Management is performed by modeling and simulating the current (As-Is) process. Modeling As-Is process using iGrafx with Business Process Modeling and Notation (BPMN). Process management aims to understand the various activities related to the organization's operations and improve their efficiency. This study aims to identify processes that can be improved to reduce manual processes and time constraints. The proposed solutions are based on best practice methods that can be used to improve business processes. The researcher also suggested reviewing the entire process of making a new cash card so that users do not have to wait long to complete the process.

Keywords

Business Process Management, Cash Card, Operational Cost, Accountability

1. Introduction

Over the last decade, the oil and gas in Indonesia and worldwide have seen substantial volatility (Pwc 2020). One of the most common strategies that oil and gas companies implement to improve their profitability is to manage their operational cost (Pogorelov et al. 2018). The cost classification of oil and gas companies shows that operating costs are the highest costs in the oil and gas industry (Pwc 2020). Operational cost is a material impact on a project's profitability that affects the Company's dividend policy (Oil and Gas IQ 2019).

Indonesian oil and gas companies apply a cash card to manage their operational costs digitally (Berita Energia 2018). A cash card is a payment system using cards used by employees for operational purposes in carrying out their work programs (Berita Energia 2018). The cash card is non-amortized, which means it can be categorized as an operational expenditure (van der Cruysen et al. 2017).

Even though the cash card has been used to manage transactions digitally, many gaps in the system could lead to fraud. One of the reasons is evaluating procurement documents, verification processes, policies, monitoring, and audits which are still manually, which creates gaps for abuse (Dachyar and Karenina 2020).

A business process is a collection of predefined tasks and activities performed to achieve a specific objective. A process can be defined as a series of actions that transform a given resource into an output (Rocha and Reis 2018). They are usually carried out in a specific order and time, identifying outputs and inputs (De Sousa et al. 2015).

Business Process Management (BPM) is a process management tool that helps organizations identify the structure of their existing processes and develop modifications that can improve their operations (Hunt 1996). Similarly, BPM is a process modeling tool that optimizes processes (Khelif et al. 2009). The process modeling process helps organizations identify which components of their operations are most critical and require improvement (Khelif et al. 2009). BPM is

a business management strategy that focuses on analyzing and designing workflows and processes of materials and information within an organization (Leopold 2013). BPM recommends that the old process system be replaced with more innovative and effective methods (Astuti et al. 2015).

This study will analyze the current cash card's business process model. It is important to regularly review the operations of oil and gas companies to ensure that the processes are optimized and provide the best results. The oil and gas industry also needs to find ways to identify ideal scenarios for their various operations. We can find information systems that can minimize manual processes and increase efficiency in the accountability process through analysis. Data was collected through research and review of regulations and expenditure reports in Indonesia, observations of the cash card system, interviews, and focus group discussions with experts. Data processing and analysis of this research improvement were carried out using Business Process Management (BPM).

2. Literature Review

2.1 Shared Service Center (SSC)

Shared Service Center (SSC) is a separate function responsible for carrying out routine and positive and high-volume work in one of Indonesian oil and gas companies. Indonesian oil and gas company implements SSC as one of the strategic pillars to support their digital transformation. Standardization of processes and integrated technology will increase efficiency and effectiveness. Business units can focus on their business and improve their performance.

As a multinational company in Indonesia, the Indonesian oil and gas company has many subsidiaries and units spread over 108 locations throughout Indonesia and abroad. Each of which has its supporting function with different service standards. They are committed to establishing a multi-tower SSC consisting of finance, human capital, information technology, asset management, and procurement. The implementation of SSC began with the Pilot Project in the financial function and its 11 subsidiaries in stages. We can illustrate the advantages of implementing SSC in the current condition; one worker can process 19 invoices per day. With SSC that applies the latest technology and standardization of processes, one worker can complete up to 26 invoices per day. Which is, there is an increase in productivity of 37%. SSC is also equipped with various processes automation tools that allow its users to improve the efficiency of their operations.

2.2 Cash Card

A cash card is the Company's debit card that serves as a means of financial transactions, allocated centrally to all functions and operating units within 1 (one) certain period (Jatmiko 2015). Cash cards are one of the many banking technologies modern companies use to facilitate retail payments (van der Cruysen et al. 2017). Cash cards are cards used to make payments by deleting funds from certain bank accounts (Rozzani et al. 2015).

The functional difference between a cash card and a credit card is that the disbursement of funds through a cash card is carried out immediately after the transaction. In contrast, a credit card accumulates funds that will be issued until the end of the month when the cardholder pays the bill (Fujiki and Tanaka 2018). Company workers have preferred cash cards because they offer faster payments to vendors. This cash card makes it easy for consumers who prefer to buy in smaller quantities to minimize their time to wait to complete the transaction (Klee 2011). In addition, cash cards gain a high market share at the point of sale because their electronic fund transfer payment mechanism allows users to minimize their cash holdings from the automatic teller machine (ATM) withdrawals (Berita Energia 2018; Jatmiko 2015).

2.3 Business Process Management (BPM)

Business process management is a process utilized for organizing various activities related to a company's products and services (Astuti et al. 2015). It aims to improve these processes' efficiency and enable the company to achieve its goals (Astuti et al. 2015). Business process management helps organizations improve operational flexibility and reactivity (Lamine et al. 2019). It focuses on achieving better overall performance and satisfying external stakeholders (Leopold 2013). BPM is a process that focuses on planning, organizing, and monitoring a process. It is recommended that the old process system be improved to be more innovative and effective in increasing efficiency (Dachyar and Christy 2014).

Business process management is a process-oriented discipline refined during the 1990s (Astuti et al. 2015). Various concepts and technologies influence it. A BPM system uses multiple methods, policies, and tools to manage the entire

lifecycle of a business (Rahimi et al. 2016). BPM is the methodology focused on the process and directly performed by the top management by improving to better performance (Niehaves et al. 2013). In a typical scenario, the specialist analyses the current state of the processes and then designs a new version based on the findings (Enríquez et al. 2019). There are four main reasons why businesses need to improve their operations. These reasons include reducing cycle time, improving customer service, reducing costs, and improving quality (Dachyar and Christy 2014; Zen and Dachyar 2021).

2.4 Business Process Modeling Notation (BPMN)

The term BPMN describes the end-to-end flow of a business process. It shows the sequence of steps in a circle and their messages to the other participants (Tangkawarow and Waworuntu 2016). According to Rosing et al. (2014), BPMN notation is explained as follows:

- Event - An event is a circle that happens during a process. It can affect the flow of the process and is usually associated with a cause or a result. There are three types of events: start, intermediate, and end. These events are also referred to as catching, throwing, and launching. A start event is a circle drawn in a thin line. The end event shows the result of a process, while the intermediate event refers to something that happened between the start and end events.
- Activity - Activity is represented by a rectangular object with an obtuse angle. There are two types of activities, Task and Sub-Process. The former shows a single work unit, while the latter offers a detail unrelated to the unit's operation. When a process's details are hidden or unknown to the public, the sub-process will show a "+" in the notation. This notation means that the current flow from the parent process can't exceed the sub-process boundary. Everything must be completed to be successful. If a transaction failed, it would be cancelled.
- Gateway - A Gateway is a shape that will determine the forking and merging of paths in each area.
- Object Connector - The object flows can be connected through the object connector. A sequence flow, which represents a solid line with an arrowhead, shows how activities will perform in a process. It can also have a symbol at its start, which indicates a conditional flow. A message flow represents the messages that flow across an organization's boundaries. A dotted line is a non-linear representation of an event or a text that can never be connected to the same pool. The object flows can be connected through the object connector.
- Swimlane - The goal of the BPMN is to enable processes to model tasks that are separated into visual categories using swim lanes. The BPMN supports two primary constructs for swimming lanes: the pool and the Lane. The former acts as a graphical container for dividing a set of activities from other collections, while the latter is a sub-partition extending the pool's length.
- Artifacts - BPMN was designed to allow modelers to extend the basic notation by providing additional context and flexibility to a specific modeling scenario. Any number of Artifacts may be added to a diagram to give another context. The existing version of the BPMN specification only defines three types of data objects: Data Objects, groups, and Annotation. These objects can be used to represent various types of data that are required or produced by an organization.

3. Methods

This study's initial stages began by observing and doing in-depth interviews with experts to map the cash card model's current (As-Is) business processes, Preparing Process Engineering for Operational Costs and Accountability for Oil and Gas Companies, looking for time process data, and simulation of the As-Is model, and Final Stage of Research (see figure 1). The As-Is business process model is modelled with Business Process Modelling Notation (BPMN) and simulated using iGrafx software. The result of the simulation was analysed to see the problems. Interviews and focus group discussions with experts were conducted to identify existing issues and needs of the accountabilities in the cash card system. The existing problems are combined with conditions identification to produce solution recommendations.

Early Stages of Research, conducting discussions with various experts and reviewing the literature to be able to determine and formulate the problems to be studied. After getting the topic of the problem, the next step is to determine the objectives and formulation of the problem. A literature study was also conducted to find out what methods could be used in this research. Preparing process management for accountability of operational costs and mapping and analysis of the as-is process is stages of data collection. At this stage, first study the procurement process business that is currently underway at the oil and gas company and conduct interviews with related functions and observations of the business processes that have been studied by checking the validation of the data that has been obtained.

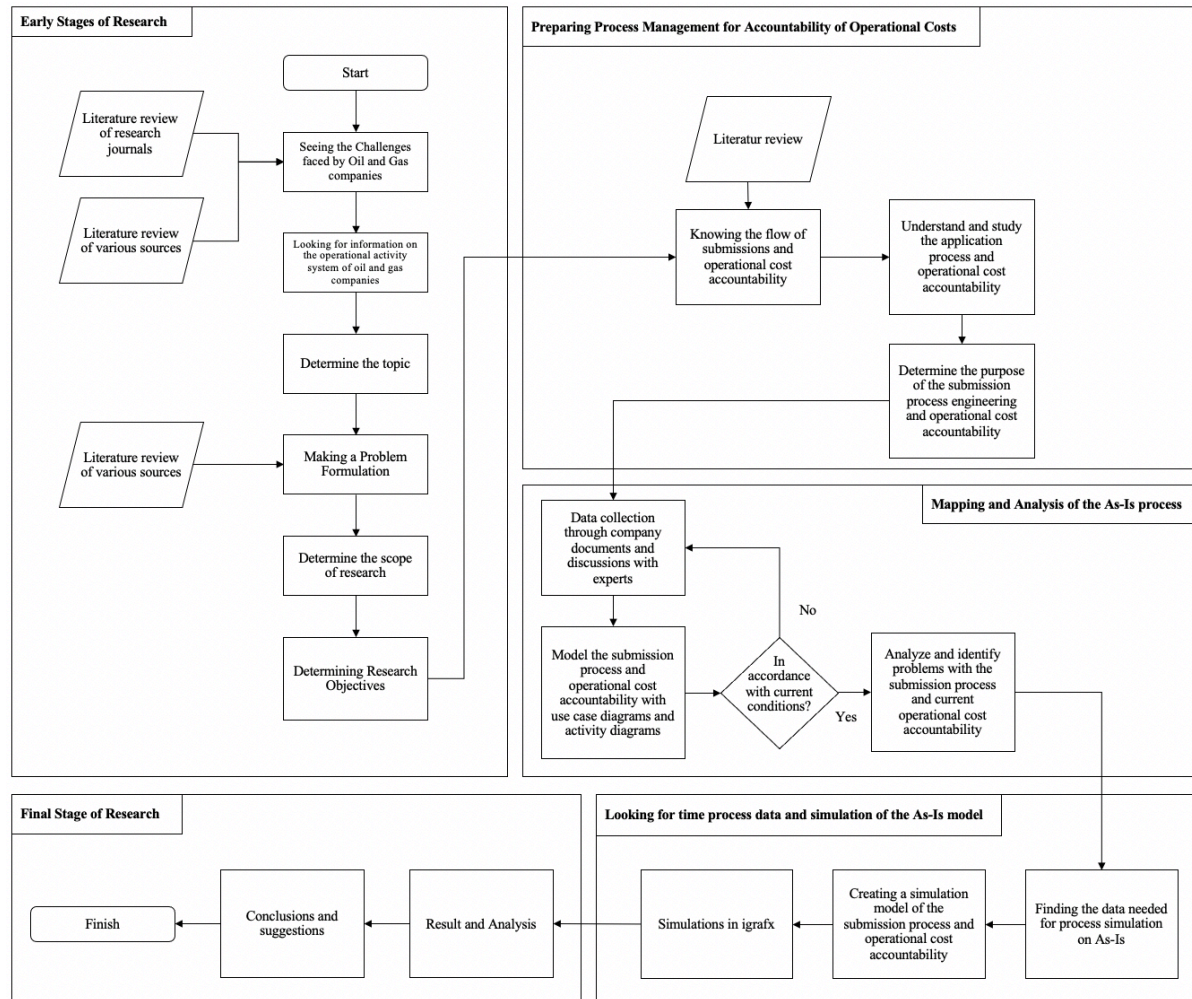


Figure 1. Research methodology

Then, validate the as-is process and review the shortcomings and problems in the as-is model that has been analyzed. Looking for time process data and simulation of the As-Is model, to find time process data and the As-Is model simulation that is ready to be entered into the as-is process simulation on igrafx. The final stage of research is results and analysis as well as conclusions.

4. Data Collection

The current monitoring process flow is determined through in-depth interviews with experts. The flow is mapped through a Flow Process Chart that describes the stages of the process and the types of procedures that occur in the accountability for operational costs in Indonesian oil and gas companies. There are three stages of the process: application of new cash card, the process of top-up application of operational fund, and the process of accountability of operational cost.

The current top-up application of new cash card process flow is determined through in-depth interviews with the manager cash card. There are 30 operations, 1 movement, and 4 delays. Four actors who are involved in the application of new cash card are User, Employee and OS Service/HC Region, Invoice and Payment - Employee Payables, and Bank. The processes' times were based on historical data. The processes time that was not documented was identified through the questionnaire (see table 1). The processing time that had been determined might be overestimated or underestimated since it doesn't consider the allowance time for each process.

Table 1. Process Time of application of new cash card

Actor	No. Process	Process	Time Process (Second)
User	1	Request New Cash Card	220.63
	2	Print SKPU	468.88
	3	Sign SKPU with supervisor	374.65
	4	Send original SKPU	278.97
Employee and OS Service/HC Region	5	Receive original SKPU	65.32
	6	SKPU signature	438.24
	7	Send Softcopy SKPU	250.34
	8	Save original SKPU	65.75
User	9	Receive softcopy SKPU	69.41
	10	Upload SKPU	234.09
	11	Approval Form Supervisor	77.37
	12	Automatic Ticket Creation	8.73
Invoice and Payment - Employee Payables	13	Accept new Cash Card requests	60.57
	14	Verification and Validation data	595.29
	15	Send Request New Cash Card to Bank	299.31
	16	Send revision notification to User	287.81
User	17	Receive Notifications	63.22
	18	Notification Review	205.47
	19	Complete Revision	1089.02
	20	Send back to Superior for approval	274.11
Bank	21	Create New Cash Card	1577.76
	22	Send New Cash Card according to SLA	254.76
Invoice and Payment - Employee Payables	23	Receive New Cash Card	140.70
	24	Verify data and send New Cash Card	284.38
	25	Close Ticket	9.84
Employee and OS Service/HC Region	26	Receive New Cash Card	30.63
	27	Confirm and send New Cash Card	374.99
User	28	Receive New Cash Card	131.58
	29	Send New Cash Card Activation Request	230.63
Invoice and Payment - Employee Payables	30	Activate the new Cash card	120.14

The current top-up application of operational fund process flow is determined through in-depth interviews with the manager's cash card. The flow is mapped through a Flow Process Chart which describes the stages of the process and the types of processes that occur in the cash card unit. There are 12 movements and 1 delay. The processes time that

was not documented was identified through the questionnaire (see table 2). The processing time that had been determined might be overestimated or underestimated since it doesn't consider the allowance time for each process.

Table 2. Process time top-up application of operational fund

Actor	No. Process	Process	Time Process (Second)
User	1	Request Purchase Requisition (PR)	472.50
	2	Create Top-Up request	289.14
	3	Send Top-up Request	233.54
	4	Automatically Create Ticket	12.05
Invoice and Payment - Employee Payable	5	Accept requests	72.51
	6	Request Verification	761.08
	7	Top-Up Cash Card	204.53
	8	Send revision notification	282.85
User	9	Receive and review notifications	136.47
Invoice and Payment - Employee Payable	10	Top-Up Cash Card	71.84
	11	Send notification of Top-up is success	11.59
User	12	Receive success notifications	12.46

The current accountability of operational cost process flow is determined through in-depth interviews with the manager's cash card. The flow is mapped through a Flow Process Chart which describes the stages of the process and the types of processes that occur in the cash card unit. There are 18 movements and 1 delay. The processes time that was not documented was identified through the questionnaire (see table 3). The processing time that had been determined might be overestimated or underestimated since it doesn't consider the allowance time for each process

Table 3. Process Time of accountability of operational cost

Actor	No. Process	Process	Time Process (Second)
User	1	Create Purchase Order (PO)	525.99
	2	Attach a softcopy of accountability and supporting documents on the application	312.46
	3	Fill in tax information	295.85
	4	Send accountability	287.82
	5	Automatically create tickets	10.39
Invoice and Payment - Employee Payable	6	Accept accountability requests	12.38
	7	Tax verification and calculation	1411.31
	8	Send notification containing verification result data	225.81
User	9	Receive results and verification data	12.05

Actor	No. Process	Process	Time Process (Second)
	10	Transfer remaining funds	1170.92
	11	Send a softcopy of transfer and supporting documents	215.64
	12	Approval by Supervisor	172.20
	13	Receive notifications	463.90
	14	Accept accountability requests	10.19
Invoice and Payment - Employee Payable	15	Accountability verification	614.86
	16	Posting and clearing	273.71
	17	Send notification for revision	297.98
User	18	Receive revision notifications	9.54

5. Results and Discussion

5.1 As-Is Model

The process of accountabilities of operational costs in oil and gas company begins when the User requests to make a new cash card through an application provided by the company by attaching a signed "Salary Deduction Power of Attorney/ Surat Kuasa Pemotongan Upah" (SKPU) together with the relevant authorization officer then sent to the Employee and OS Section Service/HC Region (see figure 2). The Employee and OS Service/ HC Region section receives the SKPU and signs the document, then sends it back to the User in the form of a softcopy.

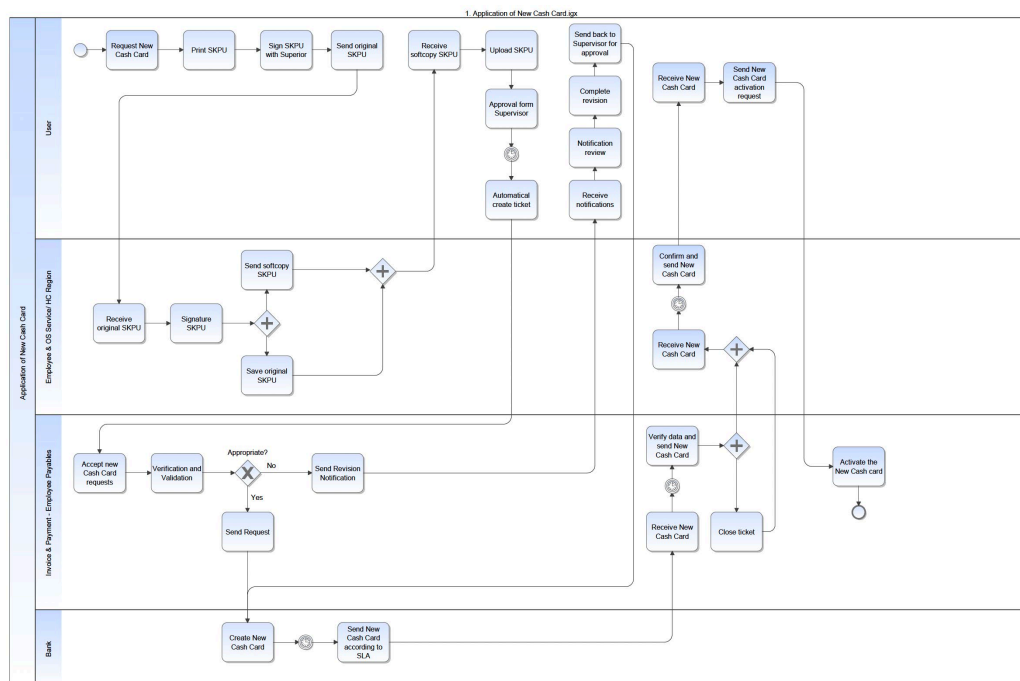


Figure 2. As-Is process of application of new Cash Card

Meanwhile, the hardcopy will be stored in the company's valuable document storage area. Furthermore, the User receives a softcopy of the SKPU and uploads and sends it back via an application which the relevant official then approves following the authorization to the Invoice and Payment - Employee Payable Section. The Invoice and Payment - Employee Payable section will receive and verify the request for making a new cash card following applicable regulations. If the request is correct, then the Invoice and Payment - Employee Payable Section will request

a new cash card to the Bank. If it is not appropriate, the Invoice and Payment - Employee Payable Section will notify the User to complete/correct the new cash card request. The Bank receives a request for a new cash card from the Invoice and Payment - Employee Payable Section and makes a new cash card following the applicable SLA (30 working days). After reaching the applicable SLA, the Bank sends a new cash card to the Invoice and Payment – Employee Payable Section. Invoice and Payment Section – Employee Payable receives a new cash card and validates data before sending it to the Employee and OS Service/ HC Region Section and closes the "completed" ticket after sending the new cash card. The Employee and OS Service/ HC Region section receives a new cash card and sends a notification to collect it. The User sends a new cash card activation request to the Invoice and Payment Section – Employee Payable and the Invoice and Payment Section – Employee Payable to activate the cash card so that the User can top-up to finance operational activities following applicable regulations.

After the user obtains a new cash card, the next step is the operational fund top-up process (see figure 3). This process starts when the User makes a Purchase Requisition (PR) on the ERP system. Next, the User requests submitting a top-up for operational funds through the application by adding the PR number that was previously obtained and sending a request to the Invoice and Payment - Employee Payable Section. In this section, the ticket will be created automatically.

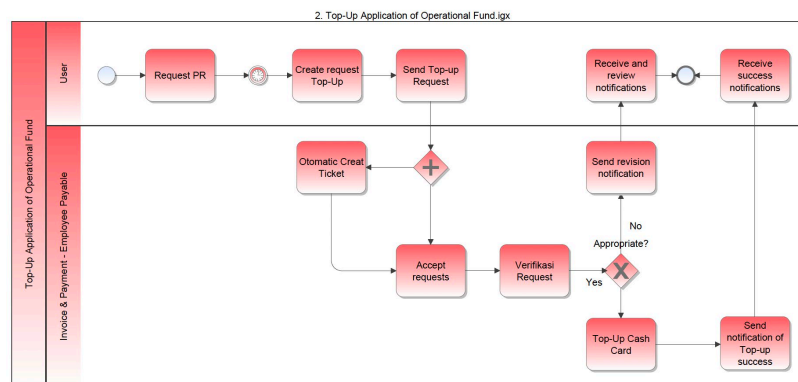


Figure 3. As-Is process of top-up application of operational fund

Invoice and Payment – The employee Payable section accepts requests from users and performs verification by applicable regulations. If the request does not match, the Invoice and Payment - Employee Payable Section will send a revision notification to the User. The User must complete the lack of the operational fund application. If appropriate, then the Invoice and Payment – Employee Payable Section will top-up operating funds following the applicable authorization value. The system will send a success notification to the User, and the User can use the cash card.

After the User uses the cash card funds that have been submitted in the previous process (see Figure 4), users must take responsibility for operational costs starting from making a Purchase Requisition (PR) on the ERP system.

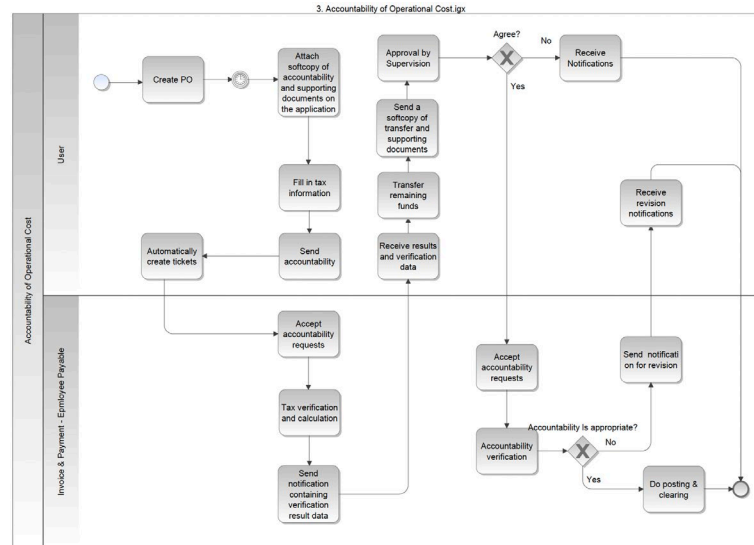


Figure 4. As-Is process of accountability of operational cost

Then, the User must send a softcopy of the cash card's usage accountability document through the application no later than the 15th and the end of the period according to the current month by adding the PR number that the number previously obtained. Users must also fill in the tax form in the application by the applicable transaction and send accountability to the Invoice and Payment - Employee Payable Section. In this process, the ticket will be created automatically. The Invoice and Payment - Employee Payable section will receive a softcopy of the accountability document from the User and verify the paper according to the costs incurred. The Invoice and Payment – Employee Payable section will notify the User to refund the remaining funds and the applicable tax value. The User receives a notification of the verification result and transfers according to the calculation given by the Invoice and Payment - Employee Payable section to the company account. Then, the user attaches a softcopy of the remaining refund and tax calculation documents through the application and sends it to the supervisor for approval before being re-verified by the Invoice and Payment - Employee Payable Section for close settlement. In the end, the Invoice and Payment - Employee Payable Section accepts the request for operational cost accountability and verifies the responsibility. If appropriate, Invoice and Payment - Employee Payable Section will make settlement report, and if not, Invoice and Payment - Employee Payable Section will send a revision notification to User. The process returns to point “User sending a softcopy of the cash card usage accountability document via the application”.

The model is simulated to determine the time required to process the application of a new cash card, the top-up application of operational funds, and the accountability of operating costs from end to end. The simulation results show that:

- The average time required to complete the application of a new cash card process is 80 working days. Processing time for User, Employee and OS Service/ HC Region, Invoice and Payment – Employee Payable, and Bank is 31.04, 6.43, 8.16, and 33.61. Activities at the Bank take longer than activities in other parts because the waiting time for SLA is relatively large, reaching 30 working days (see table 4). This very long process happens because the bank collects the number of cash cards in the agreed SLA until a new cash card is made.

Table 4. As-is application of new cash card model simulation result

Process	Swimlane	Avg Cycle (Days)
Application of new Cash Card	User	31.04
	Employee and OS Service/ HC Region	6.43

Invoice and Payment – Employee Payable	8.16
Bank	33.61

- b. The average time needed to complete the Top-up application of operational funds is 64.77 Minutes. User processing time and Invoice and Payment – Employee Payable is 47.28 and 35.91 Minutes. Users more dominate process activities because users need waiting time for PR and superiors' approval for the following process (see table 5).

Table 5. As-is Top-up application of operational fund model simulation result

Process	Swimlane	Avg Cycle (Minutes)
Top-up application of operational fund	User	47.28
	Invoice and Payment – Employee Payable	35.91

- c. The average time required to complete the Accountability of the operational cost process is 15 working days. User processing time, and Invoice and Payment – Employee Payable of 11.31 and 0.26 Days. Users dominate process activities because users need waiting time when making PO and approval from superiors for the following process (see table 6).

Table 6. As-is Accountability of operational cost model simulation result

Process	Swimlane	Avg Cycle (Days)
Accountability of operational cost	User	11.31
	Invoice and Payment – Employee Payable	0.26

5.2 Analyzing As-Is Model

The simulation results show that it takes 95 days for a user to receive a new cash card (see table 7). The operator team said that the submission time could be longer if many users did not make revisions by the specified SLA so the application was cancelled. In such a situation, the time to get a new cash card will be longer. This will hamper operational activities and make it difficult for companies to find operational funds so they have to borrow cash cards from other departments to fulfil their activities.

Table 7. transaction time of accountability of operational cost in oil and gas company

Transaction Time (Day)			
Process	Avg Cycle	Avg Work	Avg Wait
Application of new Cash Card	79,24	30,08	49,15
Transaction Detail (Day)			
User	31,03	0,03	30,99
Employee and OS Service/ HC Region	6,43	5,01	1,42
Invoice and Payment – Employee Payable	8,16	5,02	3,15
Bank	33,61	20,02	13,56

Transaction Time (Minute)			
Top-up application of operational fund	79,24	30,08	49,15
Transaction Detail (Minutes)			
User	47,28	26,79	20,48
Invoice and Payment – Employee Payable	35,91	18,81	17,10
Transaction Time (Day)			
Accountability of operational cost	11,57	0,07	11,50
Transaction Detail (Day)			
User	11,31	0,04	11,27
Invoice and Payment – Employee Payable	0,26	0,03	0,24

Stakeholders said the processing time could be longer if many users delay making revisions and are responsible for operating expenses. In such a situation, the accountability period will be more extended, and the costs that have been used are still not considered, so they become a backlog category. These backlog items will be a loss for a company.

On the other hand, the SLA applied to the Bank is also long, namely 30 working days until the User can receive the new cash card. These 30 working days will cause a very long waiting time. In addition, many processes are still carried out manually, such as creating PO, verifying data, and monitoring data. These manual processes will cause the User to have a long waiting time and trigger the User's desire to delay the following procedure.

6. Conclusion

This study proposes the need to evaluate the submission process and operational cost accountability by recommending several scenarios to reduce User waiting and processing time caused by manual processes. Process improvement can be designed using Business process reengineering using various best-practice methods such as separating large tasks into manageable ones, creating a task list with multiple small ones, and considering parallel tasks.

It evaluates cooperation with the Bank issuing cash cards to speed up the manufacturing process to delivery. After assessing the process and SLA with the relevant banks, another suggestion put forward by this research is to enable the User to make cash cards at the nearest bank branch by showing supporting documents that are validated as a valid requirement for making a cash card. It will allow them to complete their work in about an hour to run more optimally the entire cash card process.

The researcher suggests reviewing the bank process of making a new cash card. It is recommended that the User come directly to the Bank, as is the case with debit card making in general so that it does not take a long time until the User must wait up to 30 working days. This research is very possible to do a redesign using the concept of reengineering by applying digitization to each process to cut down on a shorter process time such as submitting a new cash card to the bank directly using the relevant user's mobile phone without having to wait for a longer waiting time.

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