IMPROVING THE FISHERY BUSINESS PERMIT ISSUANCE USING BUSINESS PROCESS IMPROVEMENT

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ABSTRACT

This study aims to analyse the actual business process applied in the Capital Investment Agency and One-Stop Licensing Centre of Aceh Province, mainly on issuing a fishery business permit. The institution has established 240 working hours (equivalent to 14,400 minutes) to issue the permit based on the SOP (standard operating procedures). However, a field observation showed that the actual process time exceed up to 600 hours (equivalent to 37,104 minutes). The initial observation revealed that time difference occurred due to technical issues such as manual disposition and the absence of authorized officials due to leave, business trips and long meetings in which caused delays on documents approval. To deeply investigate the gap and analyse the business process activities, this study employs Business Process Improvement (BPI) which consists of phase 1: organizing for improvement, phase 2: understanding the process, and phase 3: streamlining. This study occupies Bizagi Modeler to build and simulate a systematic business process model according to Business Process Modelling and Notation (BPMN). Based on the simulation process, the actual business process resulted 110 activities with total time 37,104 minutes, while the redesign model resulted 72 activities with total time 197.25 working hours (equivalent to 11,835 minutes). The redesign model further measured using devil's quadrangle and obtained 68.11% efficiency. The efficiency aligns with better flexibility and service quality improvement.

Keywords: *business process, business process improvement, business process modelling and notation, Bizagi modeller, devil's quadrangle.*

ABSTRAK

Penelitian ini bertujuan untuk menganalisis proses bisnis yang saat ini diterapkan di Dinas Penanaman Modal dan Pelayanan Terpadu Satu Pintu (DPMPTSP) Provinsi Aceh, terutama dalam penerbitan izin usaha perikanan. Lembaga tersebut telah menetapkan 240 jam kerja (setara dengan 14.400 menit) untuk mengeluarkan izin berdasarkan SOP (standar operasional prosedur). Namun, hasil observasi lapangan menunjukkan bahwa waktu proses yang sebenarnya melebihi 600 jam (setara dengan 37.104 menit). Berdasarkan observasi awal, perbedaan waktu aktual dan waktu observasi terjadi karena persoalan teknis seperti disposisi dan ketidakhadiran petugas yang berwenang karena cuti, perjalanan dinas dan pertemuan yang panjang, yang mengakibatkan tertundanya berkas-berkas administrasi yang harus disetujui. Untuk menyelidiki lebih detil gap yang terjadi dan menganalisis aktivitas proses bisnis, penelitian ini menggunakan Business Process Improvement (BPI) yang terdiri dari fase 1: pengorganisasian untuk perbaikan, fase 2: pemahaman proses, dan fase 3: perampingan. Kajian ini menggunakan Bizagi Modeler untuk membangun dan mensimulasikan model proses bisnis yang sistematis sesuai dengan Business Process Modeling and Notation (BPMN). Berdasarkan hasil simulasi, proses bisnis aktual menghasilkan 110 aktivitas dengan total waktu 37.104 menit, sedangkan model redesign menghasilkan 72 aktivitas dengan total waktu 197,25 jam kerja (setara dengan 11.835 menit). Usulan model proses bisnis selanjutnya diukur menggunakan devil's quadrangle dan memperoleh efisiensi 68,11%. Efisiensi tersebut sejalan dengan fleksibilitas yang lebih baik dan peningkatan kualitas layanan.

Kata kunci: *proses bisnis, business process improvement, business process modelling and notation, Bizagi modeller, devil's quadrangle.*

INTRODUCTION

Fishery is one of marine resources which widely distributed in Indonesian waters. Indonesian Statistical Agency (BPS) reveals that the need for fisheries resources based on

fish consumption target in 2019 reaches 54.5 kg per capita per year [1]. This potentiality significantly encourages fishery business activities growth in Indonesia. The business contributes to increase the value-added products in the fisheries sector, conducting export activities as well as creating job vacancies.

Any individuals who operate a fishery business in a form of collecting, processing, preserving, and marketing fish in the territory of the Republic of Indonesia require a legal permit published by the Capital Investment Agency and One-Stop Licensing Centre. To obtain a fishery business permit, a business is obliged to prepare and submit required documents to the Capital Investment Agency and One-Stop Licensing Centre and a field visit to the business location in order to verify the documents. The agency has established a Standard Operating Procedures (SOP) concerning fishery business permit issuance. The SOP requires 240 working hours (equivalent to 14,400 minutes) starting from submitting the documents to issuing the permit. A case study to analyse the business process involved in the SOP was conducted in the agency. Based on field observations, the actual process of issuing a fishery business permit could exceed 600 working hours (equivalent to 37,104 minutes). To reveal the gap, this study conducted a field investigation and interviewed a Subject Matter Expert (SME) from the Agency. The results showed that the gap occurred due to technical issues such as manual disposition and the absence of authorized officials due to leave, business trips and long meetings in which caused delays on documents approval. The technical issues need to be improved by analysing and optimizing the business process activities. The business process need to be adjusted with the current dynamic environment to achieve competitive advantage [2] and continuously improve the performance and efficiency of the business process [3,4]. Therefore this study aims to investigate the actual business process in issuing a fishery business permit and improve the actual business process by constructing a redesigned model using Business Process Modelling and Notation (BPMN) and following the BPI phases. Furthermore, to evaluate the usefulness and advantageousness of the new pattern-based approach, the current and the proposed business process activities need to be measured. The measurement will use devil's quadrangle, and it will assess time, quality and flexibility of the current and the proposed business process activities.

The remainder of this paper is organized as follows. Section 2 covers literature overview concerning BPI and BPI phases according to Harrington [5], and devil's quadrangle as a measurement tool to analyse the business process models. The BPI phases used in this study consist of phase 1: organizing for improvement, phase 2: understanding the process, and phase 3: streamlining. In addition, the devil's quadrangle dimensions used consist of time, quality and flexibility. Section 3 covers data collection procedure, research model and data analysis using the BPI.

LITERATURE REVIEW

Business Process Improvement

Improving business processes is a core task in organizations and is an integral part of business process lifecycle [6] which aims to establish an effective, efficient and flexible processes [5]. Process improvement is a key to create sustainable value for customers concerning products innovation and or services [7]. Therefore, organizations generally link the process improvement to the business strategies [8]. Literature mentions diverse terms for business processes management and improvement, to cover Business Process Redesign [9,10], Business Process Reengineering [11], Core Process Redesign [12,13], Business Process Change [14], and Business Restructuring [15,16]. All of the terms address identical notion of enhancing the work in organizations through analysing the business processes.

Business Process Improvement (BPI) is a management process to improve accuracy, effectiveness and/or efficiency by analysing organization procedures and redesign the process to achieve improvements [17]. According to Harrington [5], BPI consists of five phases as shown in Figure 1. Each phase illustrates how BPI works with improvement by building commitment, identifying and analysing problems, improving effectiveness, efficiency and adaptability, controlling the improvement, and reviewing the entire process for sustainable improvement.

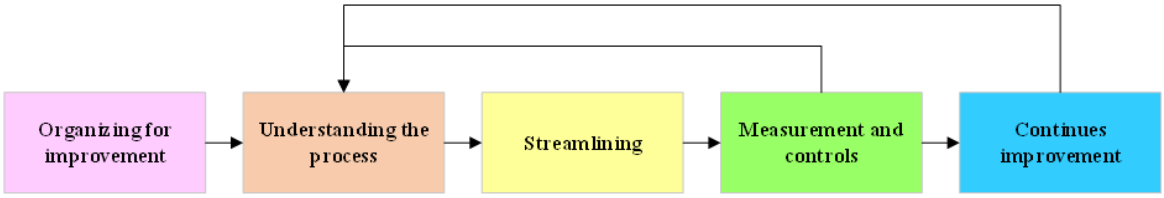

Figure 1. Business Process Improvement Framework [5]

BPI is a tool used by an organization in making progress in implementing its business processes [18]. BPI leads to quality improvement, service improvement, cost reduction, and productivity improvement from business activities or processes [5]. The application of BPI allows companies to find out the actual conditions of a business processes carried out for evaluation needs thus necessary corrective actions can be implemented optimally, as well as simplify the business process thus improving its efficiency.

Previous study at the application of business process improvement showed that "…th e major drivers prompting companies and other organizations to change their processes are cost savings and increased productivity as well as the need to improve products, customer satisfaction or organizational responsiveness to stay competitive" [19]. On a study regarding the adaptation of BPI into organizational context, Beerepoot et al [20] identified that organizational contexts are worthwhile to distinguish relevant contextual factors (i.e. workarounds, stakeholders) which derived a set of essential improvement activities for each of the context. Therefore, several cases studies mention that to improve a process in respect of given objectives (e.g. reduce costs, shorten cycle time, etc.), BPI performers require structured methods and techniques [21], instructions that explaining and documenting changes and approaches that rely on human creativity and personal experience [22]. Therefore, the use of a measurement tool is one possible solution that meets those requirements.

Devil's Quadrangle

Devil's quadrangle is a measurement tool which consists of four dimensions: cost, quality, time, and flexibility (shown in Fig. 2). Dumas et al [23] stated that to graph the goals of the process redesign (proposed model or process improvement) effort, organizations can construct a Devil's Quadrangle, which occupies the performance dimensions. The redesign model of business processes ideally would reduce the time needed to handle orders, reduce costs required to run business processes, improve quality of services provided, and improve business process capabilities [23, 24].

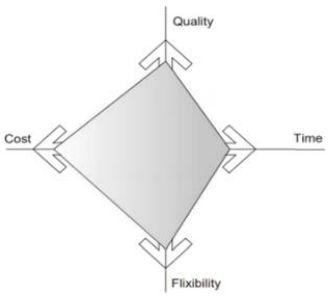

Figure 2. Devil's Quandrangle Dimensions [23]

Generally, the indicators of Devil's Quadrangle cannot be improved at the same time, however, it affects each other. Increasing the number of available resources will decrease the execution time but increases the cost [25]. To determine which indicators should be maximized, organizations will align it goals and strategy to the process redesign [26], and the goals compliance must be assured during the process [23]. The entire part of organization is the owner of the process redesign.

Both academia and practitioners have occupied (modified or not) the four indicators of Devils' Quadrangle and agree that the initial concept of competitive priorities fits to analyse the impact of improvement patterns on Business Processes [27]. The initial idea of Hayers and Wheelwright [cited in 27] explained that Devil's Quadrangle sets the performance indicators used to evaluate the impact of Business Process Improvement models. The basic measurement indicators of time, cost, quality, and flexibility include in the assessment of all business activities [27]. The statement is supported by Harrington [5], who compared the elements of time and cost to describe the results of business process improvement, and revealed that the improvement of these two elements will improve other indicators in business processes such as efficiency, effectiveness, customer satisfaction and Return on Investment (ROI). Therefore, combining BPI and Devil's Quadrangle will provide outcomes improvement of a business process.

RESEARCH METHOD

Data Collection

This is a qualitative study which employs primary and secondary data collection. Primary data consists of actual business process activities obtained from direct observation and interviewing the Subject Matter Expert (SME) who response to the entire process of issuing a fishery business permit. While the secondary data consists of organisational chart and process flow of fishery business permit issuance obtained from the organization as shown in Figure 3.

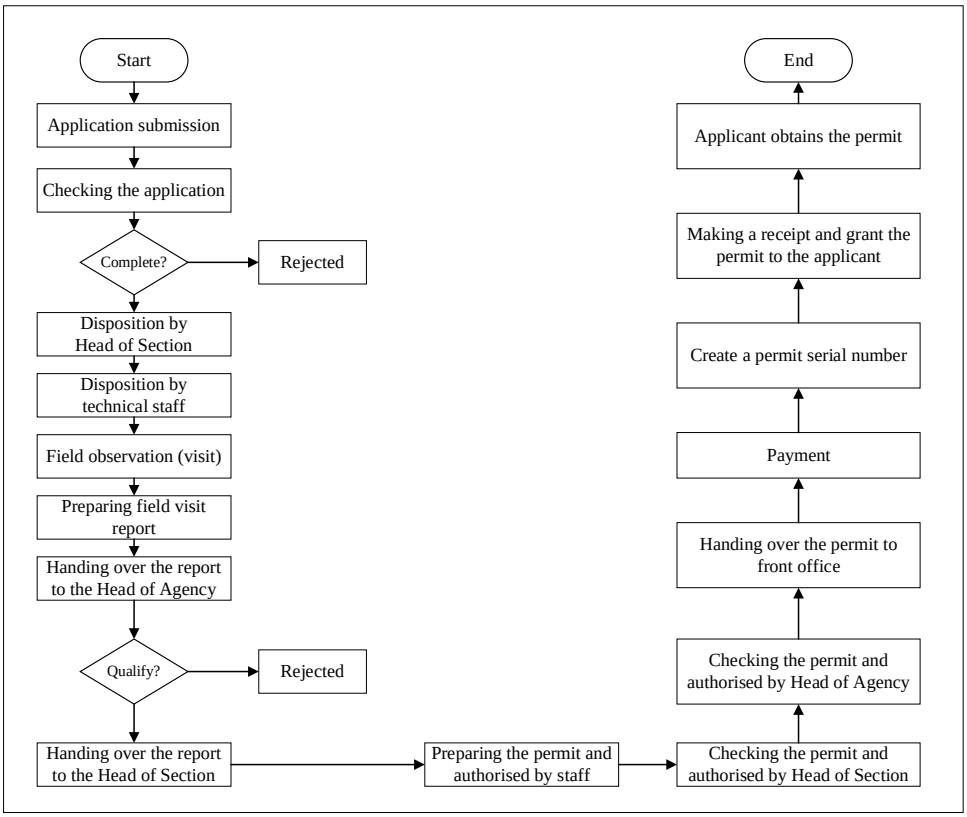

Figure 3. Process Flow on Issuing a Fishery Business Permit

Data Analysis

Data analysis will occupy BPI phases (phase 1 to 4) according to Harrington [5]. The process start at phase I by defining a business process that needs to be improved, analysing the business process by assessing value added, non-value added and real value added of each activities involved and construct the process as-is (current process activities) in phase II, improving the business process and construct the redesign model in phase III, and measure the process redesign in phase IV.

The study occupies Business Process Modelling and Notation (BPMN) to construct the process as-is and redesign using Bizagi modeller software, which can simulate time and activities. Furthermore, the study will occupies Devil's Quadrangle to measure the process (as-is and redesign) and provide the indicators outcomes.

RESULTS AND DISCUSSION

Phase 1: Orginizing for Improvement

Phase 1 marks initial implementation stage of BPI which involves reviewing business strategies and customer needs, and selecting critical processes within the company to determine the process to be improved. This study concerns with business process activities in issuing a fishery business permit which conducted by the Division of Licensing and Non-Licensing Service Provider of the Capital Investment Agency and One-Stop Licensing Centre. Table 1 shows the description of the selected business process, which need to be disseminated to staff and authorised parties who performed the business process activities.

Table 1. Business Process Description in Issuing the Fishery Business Permit

Process	**Description**
Business process definition	Fishery business permit process consists of activities of submitting requirement (documents), verifying documents and field visit, and issuing the permit.
Objective	Provide quality services to customer to obtain fishery business permit.
Internal environment	1. Head of the Capital Investment Agency and One-Stop Licensing Centre 2. Head of Licensing and Non-Licensing Service Provider Division 3. Head of Licensing and Non-Licensing Services Section 4. Administration staff 5. Technical staff
External environment	Individual or business applicant
Input	Requirement documents
Output	Business permit document

Phase 2: Understanding the Process

Phase 2 of BPI involves activities of defining business processes, determining the boundaries of business processes flow that occurs at the start and end processes, determining the actors of the business process being studied including their roles and responsibilities, transitional stages between units in the business process, making actual business process models, and analysing existing activities in the business process. To further understand the current business process in issuing a fishery business permit, this study collected the established process flow (Figure 3) and develop the actual business process model (process as-is) using BPMN and Bizagi modeller software. The model is shown in Figure 4.

Based on the simulation (Figure 4), the actual business process consists of 110 tasks, 4 gateways, 1 start event, 2 end events, 20 intermediate events, and 8 sub-processes. Tasks define basic activities of a process, gateway defines dividing and merging activities, start

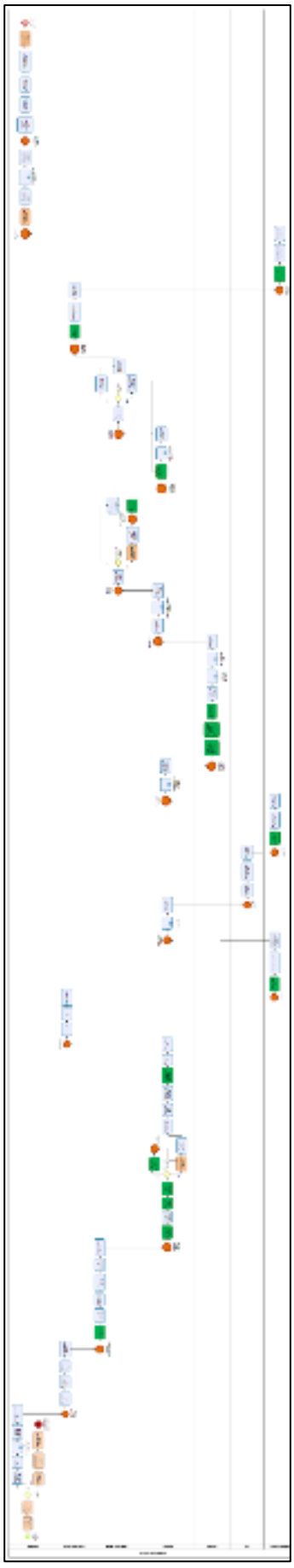

Figure 5. Actual Business Process

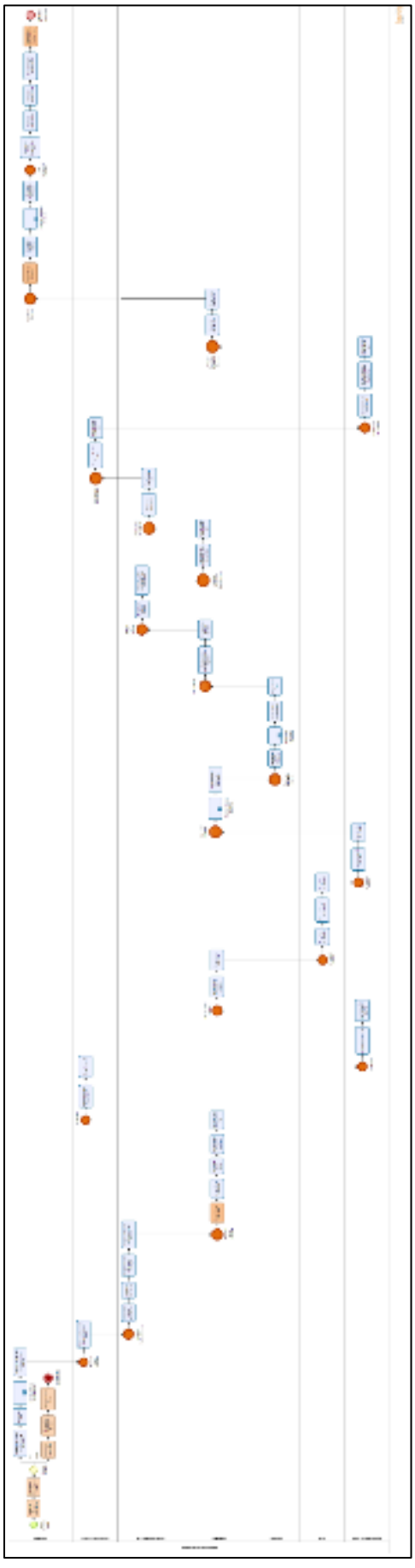

Figure 6. Business Process Redesign

event defines the beginning of a process, end event defines the end of a process, intermediate event defines factors affecting process flow without starting or ending a process directly, and sub-process defines extended activities of a process. The Bizagi modeller also revealed a total time for the overall business process activities for 37,104 minutes or equivalent to 618.4 working hours. The simulation showed seven activities which have longer time as shown in Table 2. The longer time activities could be improved and or eliminated based on the assessment in phase three.

Table 2. Longer Time Activities Based on Bizagi Modeller

Activities	Time (min)	Justification
Checking the number of applicants	18,000	The number of application needs to be checked periodically and continuously until the quota fulfilled.
Awaiting application schedule	1,440	Applications will be submitted once the quota sufficient. This cause delays on applications which has been submitted earlier.
Conducting field visit	540	Overlapping bureaucracy and authorization for field observations.
Preparing field visit report	2,705	Occurs due to complexity report format and findings that needs to be conveyed in the report.
Preparing activities report	775	Delay on finishing field visit report, unintegrated data, and overlapping information.
Assessing the activities report	10,470	Assessing the report takes longer time to check the accuracy of information stated on the report.
Checking the permit's manuscripts	540	Delays due to unavailability of authorized officials (i.e. leave, sick leave, business trips, long meetings) who asses the permit's applications.

Phase 3: Streamlining

Phase 3 of BPI relates to identifying potential improvements, simplifying the processes, providing efforts to reduce bureaucratic time and each process, eliminating any non-value-added (NVA) activities, standardisation and process automation to enable efficiency improvement, and effectiveness and adaptability of business processes recommendation. Based on the total of 110 actual business process activities, 14 activities determined as NVA activities and will be eliminated; 22 activities determined as the combining of business value-added (BVA) activities and real value-added (RVA) activities and remain in the business process; 74 activities defined as BVA in which 28 of it needs to be improved using streamlining tools as shown in Table 3. The recommendations are further used to construct a redesigned model of business process as shown in Figure 5.

Table 3. Improving Activities

Streamlining tools	Recommendations
Upgrading	Front office is in charge to specify the proposed type of permit.
	Implementing e-government as an integrated database to upgrade manual activities (i.e. disposition, input documents and or reports, access to documents, signing documents, authorizing tasks).
Duplication elimination	Reviewing roles and responsibilities to ensure that tasks are delivered by designated staff thus eliminating repetition.
Automation	Reducing paper-based activities to cloud database using computer and other electronic devices to ease any access of supporting documents related to the permit processing.
Simplification	Combining interrelated tasks to avoid error.
Standardization	Setting standards for specific conditions such as the amount of business permit fees according to its area, the number of staff to conduct field visit verification, report formats.

Continued Table 3. Improving Activities

Streamlining tools	Recommendations
Process cycle time reduction	Setting standard time to minimize delay on dependencies i.e. standard time for field visit report and or activities report is maximum 14 working days after the field visit.
Bureaucracy elimination	Admin staff is in charge to do printing for any documents (supporting, report) once the documents approved.

Based on the simulation (Figure 5), the redesigned model consists of 72 tasks, 1 gateway, 1 start event, 2 end events, 19 intermediate events, and 4 sub-processes. The total time for the overall business process activities resulted in 11,835 minute or equivalent to 197.25 working hours. On the redesigned model, the longer time activities reduced to 3 activities: assessing the activities report, preparing field visit report, and preparing activities report. These activities relate to administrative issues that could be reduced to smooth the process. As mention by Bukvić and Babić [28], "…the government should direct more attention to reducing administrative burdens and bureaucratization, as well as tax and parafiscal burdens placed upon companies."

Devil's Quadrangle

A business process needs to formulate appropriate key performance indicators to achieve the maximum efficiency using Devil's Quadrangle. Table 4 shows the comparison between actual and redesigned business process model while Table 5 shows the measurement results. Time indicator improves 68.11% as the number of activities reduced from 110 to 72 activities, which also determines the improvement of system flexibility in adapting the redesigned model. Considering the proposed recommendations using streamlining tools in Table 3, the service quality will likely to improve positively.

Table 4. Business Process Comparison

Activities	Actual Business Process	Redesigned Business Process
Tasks	110	72
Gateway	4	1
Start event	1	1
End event	2	2
Intermediate event	20	19
Sub process	8	4
Time	37,104 min	11,835 min

CONCLUSION

To sum up, this study provides the following results related to issuing a fishery business permit using BPI phases:

1. The actual business process based on Bizagi modeler consists of 110 tasks with total time 37,104 minutes or equivalent to 618.4 working hours. The resulted time has a significant gap with the SOP provided by the Capital Investment Agency and One-Stop Licensing Centre, which is 14,400 minutes or equivalent to 240 working hours.
2. The redesigned model as the improvement of the actual business process resulted in 72 tasks with total time 11,835 minutes or equivalent to 197.25 working hours. The redesign model provides recommendations for activities improvement using streamlining tools.
3. Devil's Quadrangle measurement towards the redesigned model provides 68.11% efficiency which improves the business process flexibility and services quality.

Furthermore, this study owns limitations which needs to be improved in future study. First, the redesigned business model could not be implemented due to time limit of the

study and time consuming in dealing with administrative procedures in the agency. Therefore, the future study could employ the results of this study to implement, measure and control (phase 4) the redesigned model, thus, approve the efficiency rate which obtained from this study. The analysis of the redesigned model implementation could be used for company continuous improvement (phase 5). Second, the streamlining process (phase 3) provides initial recommendations for the agency to improve their business process activities. To assist the agency implements the recommendation, the future study could employ Streamline Process Improvement (SPI), which concerns on simplifying or eliminating unnecessary work-related activities. This method could support the BPI phase 4 and 5.

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