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Business Process Reengineering Approval Services For Spatial Use Activities

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Abstract

This Business Process Reengineering aims to redesign the business process of the Land Use Utilization Compliance Approval Service (PKKPR) in North Bolaang Mongondow Regency. The method used involves the following stages: 1) Engineering Preparation; 2) As-Is Process analysis; 3) To-Be Process Engineering; 4) Analysis of modified time base value added. After conducting the analysis of the 'To-be' Business Process, there has been an improvement in service value, which can be measured by: 1) An increase in VAR by 18.96%; 2) A significant increase in Business Process Effectiveness, reaching 100%, which can be described as Highly Effective; 3) A decrease in the complexity score of the business process to 2040, indicating that the business process has become less complex.

Introduction

In an increasingly competitive globalization era, the challenge to improve the efficiency and quality of public administration services is increasingly pressing. However, the available literature on process improvement in the public sector is still limited compared to the private sector. This is due to the difference in objectives between the private sector which prioritizes profits, and the public sector which prioritizes economic and social benefits.

However, with increasingly fierce competition and demands for better services, public administration also needs to improve the standard of efficiency and quality of its processes. The approach that may be needed is not just updating existing processes, but through a more thorough transformation by implementing Business Process Re-engineering. however, the application of this concept is still limited in public administration (Weerakkody et al., 2011).

Digital transformation is an important key in efforts to achieve a more efficient and user-friendly public administration. In the era of Industry 4.0, digitization is an unavoidable step to achieve the principles of interconnection, information transparency, technical assistance and decentralized decisions. Simplification of administrative processes, procedures, and systems aims to eliminate unnecessary complexity, reduce bureaucracy, and improve performance and user experience (Anslow et al., 2017).

Every organization, has a business process to manage and deliver products or services to its customers. A business process is a set of activities that accept one or more types of input and then produce output that is of value to the organization (Dumas et al., 2013). Every organization has a business process that contains a series of activities to produce a product or service as the end result (Ouali et al., 2016). Business processes are not only a tool for standardizing the running of an organization, but also a determining factor for the smooth running, performance, and success of an organization (Falahah, 2012). Business processes consist of a group of tasks that are interconnected and utilize the resources of the organization to achieve a desired result in support of organizational processes (Harrington, 1991).

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However, the challenges faced in public administration are still varied. Overlapping decision-making centers, inconsistent regulations, and a lack of understanding of business processes are obstacles. Building a culture based on process analysis and data-driven decision-making is the ultimate goal. To achieve this, support from top management, getting out of old habits, and involving all employees in the learning process is a crucial step.

Business Process Re-engineering (BPR) efforts are carried out to improve public services in the field of spatial planning, especially in issuing recommendations for the Appropriation of the Conformity of Space Utilization Activities (PKKPR) in North Bolaang Mongondow Regency. PKKPR is an important business process in spatial management. This process aims to ensure that the space utilization activities carried out by the company are in accordance with the applicable laws and regulations and will not have an adverse impact on the surrounding environment. Currently, PKKPR recommendations still take quite a long time, up to 1 (one) month from the submission of the application until the recommendation is issued. This is seen as ineffective and inefficient in public administration services, so it is necessary to make efforts to improve services.

By establishing the vision of BPR for PKKPR services, namely Providing PKKPR services that are effective, efficient and modern, it is hoped that the process of issuing recommendations for approval of suitability for spatial use activities can improve services so as to provide legal certainty for applicants and prevent violations of regulations that could harm the environment and society. This vision also shows a commitment to provide quality services to the community in order to support the creation of good and sustainable spatial planning. By carrying out digital transformation in BPR, it is hoped that it can realize the vision that has been previously set.

Literature Review

In the paper (Rehouma et al., 2020), the authors approach qualitative and quantitative research in public administration and ministries in two states in Germany, using mixed methods research to investigate employee acceptance of information technology (IT). One of the most effective measures for ensuring the acceptance of IT in the public sector is involving employees in the change process. In this context, projects are tailored to user needs, thereby increasing the usability of the software and increasing employee acceptance and motivation. This research uncovers several key aspects for successfully integrating participation in IT projects in the public sector: selection of appropriate methods within the project, use of established methods, and establishment of an information dissemination plan.

In the paper (Giacomini & Muzzi, 2021), a case study is presented which provides an interesting indication of how digitalization can be used to innovate in contexts that are usually resistant to change, such as public administrations that are constantly exposed to policies of austerity and reduction of funds. While interesting and valuable, these papers do not use well-defined digital technologies to support BPRs with quantitative data and results. The paper introduced here clearly shows how processes in public administration can be optimized and improved through BPR using advanced digital technologies such as the creation of Digital Twins supported by Discrete Event Simulation.

Rehouma et al. (2020) conducted a qualitative and quantitative research approach in public administration and ministries in two states in Germany, following a mixed study to investigate employee acceptance of information technology (IT). One of the most effective measures for ensuring acceptance in the public sector is involving employees in the change process. In this context, projects are tailored to user needs, thereby increasing the usability of the software and increasing employee acceptance and motivation. This research uncovers several key aspects for successfully integrating participation in IT projects in the public sector: selection of

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appropriate methods within the project, use of established methods, and establishment of an information dissemination plan.

Related to e-Government, organizational challenges in implementing e-Government are grouped into two aspects: (i) restructuring of administrative functions and processes, and (ii) coordination and cooperation between different government departments and levels (Battilani et al. ., 2022). The main challenge faced is that sometimes it is not possible to unify business processes, automate and eliminate some unnecessary activities. Therefore, this paper presents an effective business process change methodology for public administration for the introduction of information technology in the public sector and defines the related changes in business processes, and information systems.

Rinaldi et al. combines BPR and Discrete Event Simulation to increase efficiency by redesigning the internal processes of public administration in Italy. The As Is/To Be simulation analysis shows good results even though it has not been implemented practically. Their analysis is divided into 5 steps: (i) Preparation for re-engineering, (ii) As Is Analysis, (iii) Data collection, (iv) Simulation modeling, and (v) To Be analysis. Various KPIs are used to evaluate the performance of the simulation model such as the maximum number of users in the queue, the average total waiting time, and the average employee saturation. This study proves the usefulness of simulation to evaluate various scenarios. For example, in this study, 50 different To Be scenarios were tested and related KPIs were analyzed. This shows the important role of simulation in the decision-making process when BPR cannot be practically implemented immediately (Rinaldi et al., 2015).

Methods

This research is a qualitative study that uses primary and secondary data collection by combining BPR and Event Simulation (Rinaldi et al., 2015). developed with a business process reengineering methodology described as follows; (1) Engineering Preparation Stage, namely identifying and analyzing related stakeholders and the required service requirements; (2) As Is Process Mapping with the bizagi modeler application; (3) Analysis of the As Is process with modified time base value added with the following formula:

$$Value\ Ratio = \frac{Advertised\ Time}{Hand\ Over\ Time}$$

$$Value\ Ratio = \frac{Advertised\ Time}{Hand\ Over\ Time} \quad \text{..... (1)}$$

$$Value\ Added = Advertised\ Time\ x\ Value\ Ratio \quad \text{..... (2)}$$

$$Value\ Added\ Ratio = \frac{\sum Value\ Added}{\sum Advertised\ Time}\ x\ 100 \quad \text{..... (3)}$$

While *Business Process Efficiency* can be calculated in the following ways:

$$BPE = \frac{\sum Advertised\ Time}{\sum Hand\ Over\ Time}\ x\ 100 \quad \text{..... (4)}$$

Information; (1) Advertised Time is the value (time) promised by the service provider to complete an activity in minutes; (2) Hand Over Time (HOT) is the average actual processing time of an activity in minutes; (3) Value Ratio (VR), is the depreciation ratio of Advertised Time due to HOT; (4) Value Added (VA), is the value obtained by users who have been affected by the shrinkage ratio; (5) Value Added Ratio (VAR), the presentation of added value obtained from service business processes; (6) Business Process Efficiency (BPE), is the efficiency of business processes in terms of time calculated by a comparison between the total time promised to the total Hand Over Time. > 7000 = inefficient, < 7000 = efficient

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To Be Engineering through brainstorming with the field of spatial planning to find problems in the As Is process and formulate potential solutions to those problems. Illustrated with engineering maps redesign, rework, remove, outsource and aoutomation. The results of To Be's engineering were analyzed modified time base value added to determine the efficiency of To Be's business engineering process.

Results and Discussion

Identification of stakeholder needs and requirements Process reengineering is part of an approach called a process-based approach or process vision, which is based on representing the organization through processes, making it possible to overcome hierarchical structures organized by function (Battilani et al., 2022). The process-based approach allows clear identification and definition of the organizational structure responsible for the process, which is called the process owner, namely the Spatial Planning Division of the Public Works and Spatial Planning Office of North Bolaang Mongondow Regency. to optimize the organization also through the establishment of cross-functional working groups, to overcome the fragmentation of tasks and skills, to define the needs and service standards based on the observation of results and the participation of all stakeholders. Then identify the actors involved in the PKKPR recommendation issuance service, service needs, service standards are formulated as in table 1.

Table 1. Service Needs and Requirements

Stakeholders	Necessity	Terms of Service
Applicant	- Easy Service Process - Fast Service Process	- Provide complete terms of service documents - Willingness to meet the conditions of service delivery - Cooperative nature during the service delivery process
Head of Spatial Planning	- Easy, effective and efficient service delivery procedures	- Business Process Effective and efficient service
FPRD Secretariat	- Minimal workload	- Process automation/digitization
FPRD	- Easy decision making - Right decision making - Effective and efficient deliberation process	- Provide a decision-making assistance system (DSS)
Head of PUPR Office	- Optimal Spatial Performance in Service Delivery	- Provide human resources that meet the quantity and quality criteria for the implementation of Spatial Affairs - Provide the budget needed for service improvement

Source: Analysis Results, 2023

As-IS Process Mapping

As-is business process mapping for PKKPR Recommendation Issuance services is carried out by mapping service standard procedures into business process diagrams using the Business

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Process Management Notation (BPMN) with the bizagi modeler program. This stage aims to identify the main differences by taking into account user needs and priority interventions through analysis of the current situation and modeling of the process to be re-engineered. This reengineering project focuses on identifying the key processes of an organization related to PKKPR services that are capable of creating value. From this business process mapping, current conditions can be identified and then analyzed for weaknesses and process nodes that might be improved by business process engineering later. There are 45 activities carried out manually by involving 7 main actors in the issuance of PKKPR. Starting from submitting an application to getting a recommendation. Can be seen in figure 1.

After mapping the process as is is then analyzed with Modified Time Based Value Added Analysis by identifying the steps of value creation. Where the minute value in Advertised Time (AT) is the value that has been determined through standard operating procedures, while the Hand Over Time (HOT) value is obtained by examining the PKKPR application register book which is recorded in 2022 by calculating the average time, based on the process since the application is received by the secretariat until the recommendation is issued. The HOT obtained is 32,578 minutes. Then identified further into activities that provide added value (VA) with a value of 2301.6 minutes, activities that are needed even though not felt by the user (NNVA) with a value of 189.71 minutes and activities that do not provide added value (NVA) with a value of 2 .36 minutes. Which results are translated into a VAR value of 76.36%.

Furthermore, from the results of the analysis, the value of business process efficiency (BPE) is 9.20%. The process complexity value obtained is 9765. The efficiency presentation and process complexity score indicate that the business processes implemented to provide services are complex and very inefficient. In addition, 5 wastes were identified from the As-is Business Process, namely Movement, Waiting, Extra Processing, Non-utilized Talent, and Overproduction. More details can be seen in table 2.

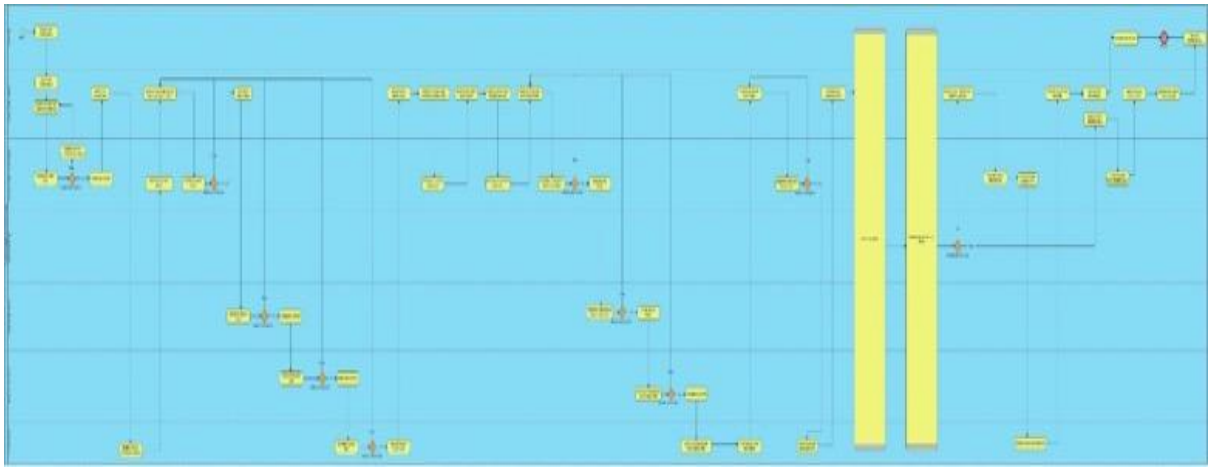

Figure 1. Process Map As Is PKKPR

Table 2. As-Is Analysis with Modified Time-Based Value Added

No	Activity	Advertised Time (Min)	Hand Over Time (Min)	Va (Min)	Nnva (Min)	Nva (Min)	Types of Waste
1	Apply	5	5	5			Movement
2	Application Registration	5	5	5			Waiting
3	Make A Disposition Request Service Document	10	120	0.83			Waiting

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4	Examine The Disposition Request Service Document	5	120		0.21		Waiting
5	Make Repair Notes	10	120	0.83			Waiting
6	Initialize	1	1	1			Waiting
7	Processing Official Documents	30	240		3.75		Movement
8	Gives Field Survey Disposition	10	4320	0.02			Waiting
9	Set A Survey Schedule	30	30	30			Waiting
10	Making Official Documents Of Assignment Letters And Survey Schedules	120	240		60		Waiting
11	Check Official Document By Kabid	15	5		45		Waiting
12	Processing Official Documents (Assignment Letters & Survey Schedules)	30	240	3.75			Movement
13	Examine The Official Documents By The Secretary Of Tkprd	15	4320	0.05			Extra Processing, Waiting
14	Initials By The Secretary Of Tkprd	1	1		1		
15	Examine The Official Document By The Deputy Head Of Tkprd	15	4320	0.05			Extra Processing, Waiting
16	Initials By Deputy Head Of Tkprd	1	1		1		Extra Processing, Waiting
17	Examine The Official Document By The Chairperson Of Tkprd	15	4320	0.05			Waiting
18	Signing The Letter Of Assignment By The Chairperson Of The Tkprd	1	1	1			Waiting
19	Carry Out A Location Survey	1440	1440	1440			Waiting
20	Make Survey Results Reports And Map Overlays	120	240	60			Waiting
21	Examine The Survey Result Report	15	120		1.875		Waiting
22	Carry Out Post-Survey Meetings	120	120	120			Waiting
23	Making Minutes Of Initial Recommendations	120	120	120			Waiting
24	Signing Minutes And Preliminary Recommendations	120	120	120			Waiting
25	Make A Request For A Tkprd Plenary Meeting	15	15		15		Waiting
26	Examine The Request For A Plenary Meeting By The Kabid	15	15		15		Waiting
27	Initials By Kabid	1	1			1	Overproduction
28	Examining The Request For A Plenary Meeting By The Secretary Of Tkprd	15	1440			0.16	Extra Processing, Waiting
29	Initials By The Secretary Of Tkprd	1	1	1			Overproduction
30	Examine The Tkprd Plenary Meeting Request By The Deputy Chairperson Of The Tkprd	15	1440			0.16	Extra Processing, Waiting
31	Initials By Deputy Head Of Tkprd	1	1			1	Overproduction
32	Examine The Request For A Plenary Meeting By The Chairperson Of The Tkprd	15	4320			0.05	Waiting
33	Determine The Plenary Meeting Schedule	5	5	5			Waiting
34	Make Invitations To Plenary Meetings	15	120		1.875		Waiting
35	Checking The Plenary Meeting Invitation By Kabid	5	5	5			Extra Processing, Waiting

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36	Signing The Meeting Invitation By The Chairman Of Tkprd	15	1440	0.16			Waiting
37	Distributing Meeting Invitations	240	1440		40		Non-Utillized Talent, Movement,
38	Carry Out Tkprd Plenary Meetings	240	240	240			Waiting
39	Signing Ba Plenary Tkprd	15	15	15			Waiting
40	Make A Recommendation Draft Along With Attachments	120	120	120			Waiting
41	Examine Draft Recommendations	15	120	1.875			Waiting
42	Sign Map Attachment	1	1	1			Waiting
43	Sign Recommendations	1	1440	0.00			Waiting
44	Record In The Register Book	5	5		5		Waiting
45	Publishing Recommendations	5	5	5			Waiting
Total		3014	32758	2301.61	189.71	2.37	
Var	76.36%						
Bpe	9.20%						
Process Complexity							
Actor	Application	Canal		Hand-Off	Process Steps	Score	
7	1	1		31	45	9765	

Source : Analysis Results, 2023

Engineering to be by Brainstorming

The 'To-be' engineering process for Business This process begins with brainstorming ideas after abstracting the problem from the As-is process. From the results of the brainstorming, the main technical problems were obtained along with an initial description of the solutions described in table 3.

Table 3. Problems and potential solutions

Problem	Potential Solutions
There are still activities that do not add value such as the Official Manuscript Process	Eliminate activities that do not add value
The existence of a process with a very long waiting time	Automating processes, changing work procedures
There is a process that requires expertise that is not possessed by the implementer	Outsource the process by creating a decision-making assistance system
There are *bottlenecks* on some task nodes	Redesign processes and procedures to prevent bottlenecks
Business Processes that are still offline so they are limited by the time and place of service	Switch processes from offline to online

Source: Analysis Results, 2023

From the results of determining the subject matter, it can be categorized that all technical problems are critical to improving business processes. Where there are four main targets of business process reengineering, namely: 1). Reducing waste of business processes; 2). Improving Business Process Efficiency; 3). Improving/maximizing the Added Value that can be obtained from Business Processes; and 4). Reducing the complexity of Business Processes.

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To achieve this main target, 5 engineering processes were carried out namely (Heizer et al.,). (1). Redesign, namely by redesigning probis procedures that are repetitive and which are a source of business process inefficiencies; (2). Rework, namely by changing the method of carrying out procedures from offline to online, and summarizing convoluted procedures; (3). Remove, namely by removing unnecessary activities/tasks; (4). Outsource, namely by outsourcing processes and procedures that are difficult for actors to carry out; (5). Automation, namely by diverting some manual procedures to automatic procedures using the siPetarung and GisTaru applications. Can be seen in Figure 3.

Furthermore, engineering modeling of the to-be process is carried out. Where there is a very significant change in the map of the procedure, initially there were 45 activities with 7 actors which were done manually (offline) to 17 activities with 4 actors by utilizing the Sipefighter and Gistaru applications. Described in figure 4.

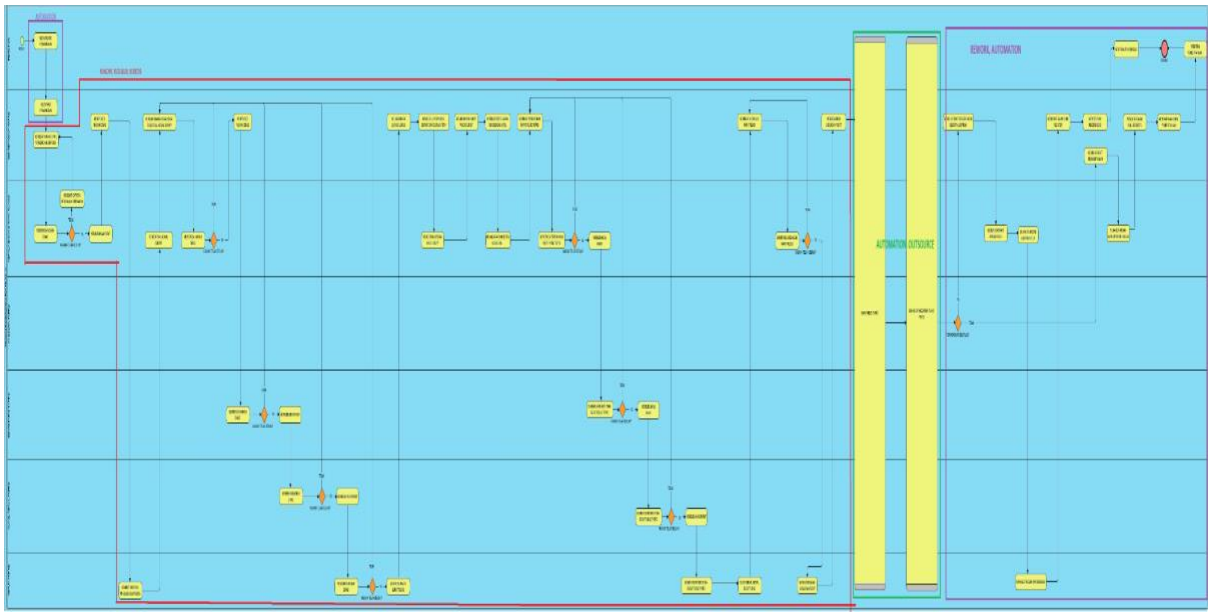

Figure 3. PKKPR Process Engineering

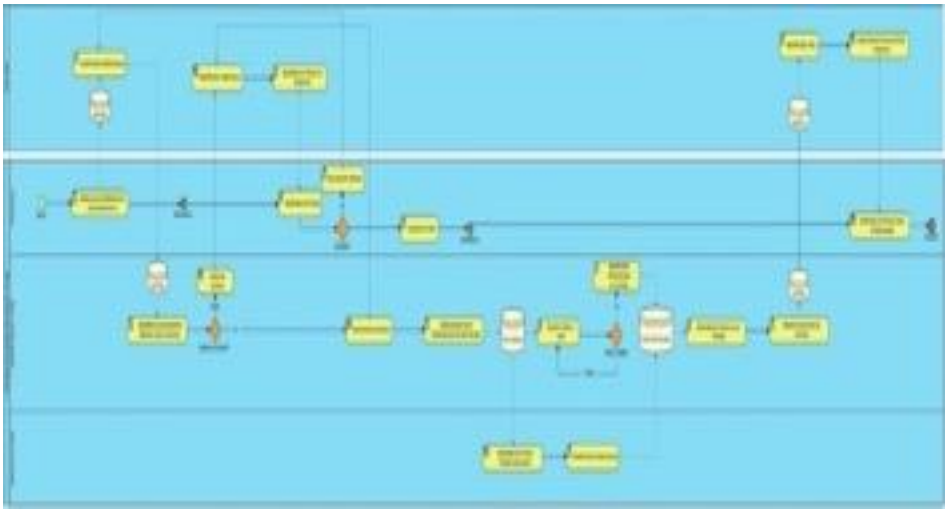

Figure 4. To-Be Process Engineering Map

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Table 4. Analysis of Modified Time Base Value Added Process To Be

No	Activity	Advertised time (min)	Hand over time (min)	Va (min)	Nnva (min)	Nva (min)	Process waste
1	Apply	10	10	10			
2	Processing applications	1	1	1			
3	Check the completeness of uploaded files	10	10	10			Waiting
4	Verify files	1	1		1		Waiting
5	Processing feedback	1	1	1			
6	Sending notifications to requesters	1	1	1			
7	Receiving notifications (applicant)	1	1	1			
8	Pay pnbp	120	120	120			Movement
9	Uploading application data to sipetarung	15	15	15			Waiting
10	Receive application notifications	1	1		1		
12	Processing applications	1	1	1			
13	Send notifications of process results	1	1		1		
14	Upload results to gistaru	5	5		5		Waiting, extra processi ng
15	Processing results	1	1	1			
16	Sending notifications to requesters	1	1	1			
17	Receive notification of application results	1	1	1			
Total		171	171	163	8	0	
Where	95.32%						
Bpe	100.00%						
Process Complexities							
Actor	Application	Canal		Hand -off	Process steps	Score	
4	3	1		10	17	2040	

Source : analysis results, 2023

Business process analysis to be modified time base value added

The AT and HOT values obtained were 171 minutes. Then identified further into activities that provide added value (VA) with a value of 163 minutes, activities that are needed even though not felt by the user (NNVA) with a value of 8 minutes and activities that do not provide added value (NVA) with a value of 0 minutes. Which results are translated into a VAR value of 95.32% S. From the results of the analysis, a business process efficiency (BPE) value of 100% is obtained. The process complexity value obtained is 2040. The efficiency presentation and process complexity score indicate that the business processes implemented to provide services are not complex and efficient. Even so, there are still 5 wasted Business Processes to-be, namely Movement, Waiting, and Extra Processing. More details can be seen in table 4.

Conclusion

There was an increase in service value after the 'To-be' Business Process analysis showed an improvement in service which could be measured from: 1) Increase in VAR of 18.96%, from 76.36% to 95.32%; 2) Very significant increase in Business Process Effectiveness, namely from less than 10% to 100%, which can be translated as Very Effective; 3) Decreasing the business process complexity score from 9765 to 2040 indicates that business processes start from very complex to not complex.

Thus, the Rural Banks that carry out PKKPR Publishing Recommendation Services by utilizing technology, in this case the SiPetarung and Gistaru applications, can realize the vision, namely

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PKKPR services that are effective, efficient and modern. This proves that the use of information technology today can provide significant value benefits for improving services in the government sector. However, not all waste in business processes can be eliminated. This shows that this Business Process can still be refined/developed in the next implementation. This can be carried out by monitoring and evaluating at the implementation stage later.

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