

# Business Process Reengineering at Mulyoagung Village Community Service Office

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**Abstract**— The Mulyoagung Village Office is a community service office in Mulyoagung Village. The service for making identity cards currently implemented at the village office uses the SiPeduli Desa website, but the results of the analysis carried out show that the throughput efficiency obtained is still quite low. There are several processes that require a long waiting time and also manual processing processes so that this condition is still less efficient. Therefore, changes in business processes need to be made to improve the old system that is currently running into a more optimal system. This significant change in business processes is called Business Process Reengineering. The concept of reengineering was born to solve the shortcomings of the old system or legacy system in a business process. Completion of a business process with Business Process Reengineering is done by eliminating processes that do not provide added value and changing manual processes into automated processes by utilizing information technology. The results of this study are business process designs that increase throughput efficiency from 30.85% in the previous process to 89.61% in processes that have been carried out by Business Process Reengineering. The application of Business Process Reengineering can help provide the design of a new business recommendation model that is obtained after an analysis of old business processes and analysis of redesign alternatives is carried out. Business Process Reengineering is also able to improve old processes both in terms of service and speed.

**Keywords**— Business Process Reengineering; Kantor Desa Mulyoagung; Reengineering

## I. INTRODUCTION

The business world is now growing, plus transaction processes are increasingly complex and the scope of business is getting wider. Therefore, it has become a necessity for a company to further improve

its strategies and methods to succeed in the business world[1][2]. The Changes in business processes are sometimes needed to replace the old system that is currently running with a new system that is more optimal. This significant change in business processes is called Business Process Reengineering[3].

The term reengineering itself first appeared in the late 90s in the field of information technology (IT) by Michael Hammer who published an article in Harvard Business Review, which explains the importance of fundamental changes in an organization/company due to global changes in the economy, increasingly fierce competition, and changes in customer demand[4].

The concept of reengineering was born to solve the shortcomings of the old system or legacy system in a business process[5]. A business process is a series of related activities carried out to achieve business results that are in line with the overall business vision and mission [6][7].

Business Process Reengineering is part of reengineering which is a concept of updating business processes by evaluating the shortcomings that exist in business processes[8][9]. The concept is applied to optimize operations, reduce costs, accelerate business processes and improve services provided to clients to be more efficient and competitive[10][11].

Business Process Reengineering is one of the critical solutions for improving all business processes and performance measures. However, the use of Business Process Reengineering can also fail when the process tends to be focused without paying attention to the surrounding environment and company knowledge [12][13]. Therefore, the implementation of Business Process Reengineering must start with aligning the vision and mission within a company[13][14].

Several studies have shown that the use of the concept of Business Process Reengineering can provide significant changes and can improve company performance. The following are some examples of success from the implementation of Business Process Reengineering, the first of which was implemented at the Mojokerto PDAM, increasing throughput efficiency to 94.46%. Then the implementation of Business Process Reengineering at the Batu District Attorney's Office resulted in a throughput efficiency of 85.77% [4]. And lastly, the implementation of Business Process Reengineering at Indonesian A&A companies resulted in improvements in cost, time, quality, and flexibility factors [15].

Business Process Reengineering will be carried out in this research at the Mulyoagung Village Office. The business process that will be used is related to the community service work program, namely the process of making an ID card at the village office.

One of the existing business processes at the Mulyoagung village office is the system for making ID cards at the village office using the SiPeduli Desa website. The use of the website helps in sending data to the Department of Population and Civil Registration, but after analysis, there are several business processes that require a long waiting time and also manual processing processes so this condition is still less efficient.

Therefore, Business Process Reengineering was carried out on the business process of making ID cards at the village office. this is done to increase the level of efficiency during the process of making ID cards.

## II. METHOD

The method used to support this research is the Business Process Reengineering method which is shown in Figure 1 below.

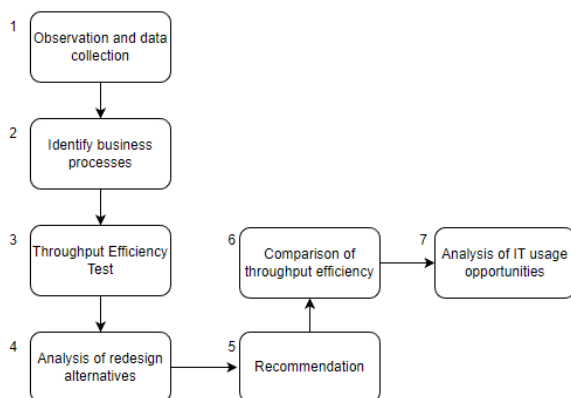


Fig. 1. Business Process Reengineering Method

Figure 1 shows the stages of the applied Business Process Reengineering methodology. Starting from the data collection stage to the solution stage.

### 1. Observation and Data Collection

At this stage, data collection and data search are carried out to meet the needs needed. Data were obtained from observations and interviews with the Mulyoagung Village Office as well as conducting a literature study related to Business Process Reengineering. At this stage, data collection and data search are carried out to meet the needs needed. Data were obtained from observations and interviews with the Mulyoagung Village Office as well as conducting a literature study related to Business Process Reengineering.

### 2. Identify Business Process

At this stage, the results of data collection carried out will be identified to determine the business processes applied to the process of making ID cards at the Mulyoagung village office. Then the mapping was carried out using the ASME standard map.

### 3. Throughput Efficiency Test

In the throughput efficiency test phase, Equation 1 will be used below.

$$\text{Throughput Efficiency} = \frac{\text{processing time is not a delay}}{\text{total time in the system}} \times 100\% \quad (1)$$

The value used in the throughput efficiency test is based on the time result of business process performance using ASME (American Society of Mechanical Engineers) standards. Furthermore, a comparison will be made between the throughput efficiency results from the initial business process and the throughput efficiency results from the new business process reengineering.

### 4. Analysis of Redesign Alternatives

At this stage, an analysis of the business processes that have deficiencies is carried out and improvements to the business process design are carried out. The improvement process is carried out by simplifying the process, reducing processing time, eliminating errors in the process, standardizing and automating the process.

### 5. Recommendations

At this stage, a business redesign is carried out based on the results of alternative analysis which is formed into a new, more efficient business process. Then mapping using ASME standard maps and testing the efficiency of throughput.

### 6. Comparison of Throughput Efficiency

At this stage a comparison of the overall service time is carried out on the initial business process and the redesigned business process. Comparisons were made based on the results of the percentage of overall service time using the ASME standard map.

7. Analysis of IT Usage Opportunities

At this stage an analysis is carried out to find out the opportunities for using Information Technology (IT) that can support the redesign of business process designs

III. RESULT AND DISCUSSION

1. Observation and Data Collection

From the results of observations and interviews on October 10 and 13, 2022 at the Mulyoagung Village Office, the system for making ID cards at the village office uses the SiPedulil Desa website. The use of the website helps in sending data to the Department of Population and Civil Registration, but after analyzing there are several business processes that require a long waiting time and also manual processing processes so that this condition is still less efficient.

The hypothesis obtained from the results of observations and interviews related to the business process of making ID cards at the Mulyoagung village

office that needs to be reengineered where the process of submitting an ID card is already using the website, but for the process of submitting the manufacture is still constrained by queuing problems and also the number of document processing processes that cause sufficient queuing time long. In addition, the process of verification and approval of data requires a process that is quite time consuming.

2. Identify Business Process

From the results of data collection conducted at the Mulyoagung Village Office, it was found that the process of making ID cards at the village office was identified as having a weak point of speed. In the business process, there are several parts involved in this business process, namely: applicants, village office employees, sub-district office employees, service operators, and heads of services. The flow of the business process for making ID cards at the Mulyoagung village office is shown in Figure 2.

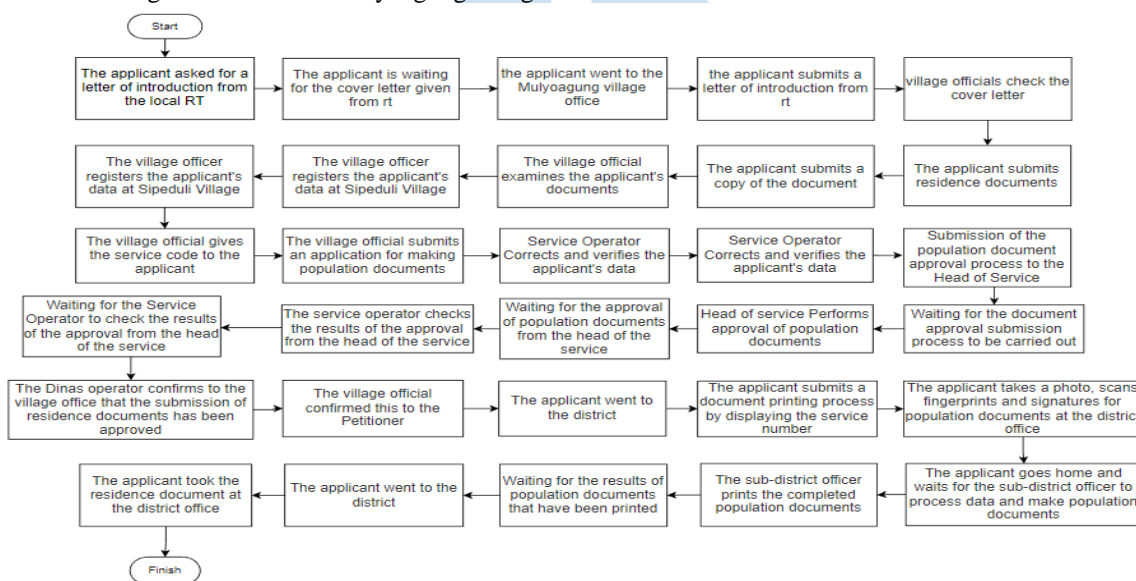


Fig 2. Business Process Flow for Making ID Cards at the Mulyoagung Village Office

3. Throughput Efficiency Test

At this stage, the business process for making ID cards is tested at the Mulyoagung village office using a throughput efficiency test. This test is mapped with ASME (American Society of Mechanical Engineers) standard maps. This test is carried out to measure the percentage of overall service time, the test results will

be compared with the business process recommendations in terms of models and results.

The following is a map of the ASME standard and the throughput efficiency test of the business process for making ID cards at the Mulyoagung village office.

TABLE I. IMPROVING THE BUSINESS PROCESS FOR MAKING ID CARDS AT THE VILLAGE OFFICE

No	Business Process	○	□	⇒	D	▽	⊙	Time / Minute	Process Owner
1.	Applicant request a cover letter from the local RT	●						120	Applicant

2.	Applicant is waiting for the cover letter given from RT							1320	Applicant
3.	Applicant goes to the mulyoagung village office							20	Applicant
4.	Applicant submits a cover letter from rt							5	Applicant
5.	Village officer checks cover letter							10	Village Officer
6.	Applicant submits a residence document							5	Applicant
7.	Submit a copy of the document							10	Applicant
8.	Village officials check the applicant's documents							30	Village Officer
9.	The officer scans the applicant's documents							15	Village Officer
10.	Village officers register applicant data at Sipeduli Desa							20	Village Officer
11.	The village officer gives the service code to the applicant							10	Village Officer
12.	Village officials apply for residence documents							10	Village Officer
13.	Service Operators Correcting and verifying applicant data							480	Service Operator
14.	Waiting for correction and verification of applicant data							960	Service Operator
15.	Service Operators Submit for the population document approval process to the Head of Service							480	Service Operator
16.	Waiting for the document approval process to be done							960	Service Operator
17.	Head of department Approve the residence document to be published							480	Head of Department
18.	Waiting for the approval of the residence document							960	Head of Department

	from the head of the service								
19.	Service Operators check the results of approval from the head of service		●					480	Service Operator
20.	Waiting for the Service Operator to check the results of the approval from the head of the service				●			960	Service Operator
21.	The Operator confirms to the village office that the application for residence documents has been approved	●						30	Service Operator
22.	Village officer confirms to applicant	●						30	Village Officer
23.	The Applicant goes to the district				●			20	Applicant
24.	The Applicant submits the document printing process by displaying the service code	●						10	Applicant
25.	The Applicant takes photos, scans fingerprints and signs for residence documents at the sub-district office	●						120	Applicant
26.	Applicant go home and wait for sub-district officers to process data and create population documents							480	Applicant
27.	The sub-district officer prints the finished residence document	●						480	Petugas Kecamatan
28.	Waiting for the results of the residence documents that have been printed							960	Petugas Kecamatan
29.	The Applicant goes to the district				●			20	Applicant
30.	The Applicant takes the residence document at the sub-district office	●						60	Applicant
	Number of Stages	17	3	3	7	0	0		
		2,365	520	60	6,600	0	0		9,545

Table 1 shows the ASME standard map of the process of making ID cards at the Mulyoagung village office. Table 1 contains process stages, process symbols, processing time in minutes, and process owners.

Furthermore, throughput efficiency testing was carried out to measure the overall service time performance from the results of the ASME standard mapping of the new installation process as follows.

$$\text{throughput efficiency} = \frac{2,945}{9,545} \times 100\% = 30.85\%$$

The results of testing the throughput efficiency of the ASME standard mapping on the process of making ID

cards at the Mulyoagung village office. The value of 2,945 is the processing time without delay, while the value of 9.545 is all processing time including the delay. The results of the throughput efficiency test obtained are 30.85% and the remaining time is 69.15% in the process is not running.

#### 4. Analysis of Redesign Alternatives

At this stage, the process design is refined by simplifying the process, reducing processing time, eliminating errors in the process, standardizing and automating the process.

TABLE II. IMPROVING THE BUSINESS PROCESS FOR MAKING ID CARDS AT THE VILLAGE OFFICE

No	Process Stage	Completion Step
1	Applicant asks for a cover letter from the local RT	Elimination
2	Applicant is waiting for the cover letter given from rt	Elimination
3	Applicant submits a cover letter from rt	Elimination
4	Village officer checks cover letter	Elimination
5	Service Operators Correcting and verifying applicant data	Automate
6	Waiting for correction and verification of applicant data	Elimination
7	Service Operators Submit for the population document approval process to the Head of Service	Automate
8	Waiting for the document approval process to be done	Elimination
9	Head of department Approve the residence document to be published	Automate
10	Waiting for the approval of the residence document from the head of the service	Elimination
11	Service Operators check the results of approval from the head of service	Elimination
12	Waiting for the Service Operator to check the results of the approval from the head of the service	Elimination
13	The Operator confirms to the village office that the application for residence documents has been approved	Elimination
14	The Applicant goes to the district	Elimination

15	Applicant go home and wait for sub-district officers to process data and create population documents	Elimination
16	The sub-district officer prints the finished residence document	Automate
17	Waiting for the results of the residence documents that have been printed	Elimination
18	The Applicant goes to the district	Elimination
19	The Applicant takes the residence document at the sub-district office	Elimination

Table 2 is the result of improving the business process design for making ID cards at the Village Office by eliminating several processes that are considered lacking or can be changed into a new

process. Then automate the process to make it easier to do using IT.

TABLE III. ALTERNATIVE BUSINESS PROCESS FOR MAKING ID CARDS AT THE VILLAGE OFFICE

No	Task Name	Alternative
1	Registration process via village account	This can provide 2 village accounts, a computer, and a scanner to speed up the process of submitting population documents.
2	The Service Operator verifies the applicant's data and submits the residence document approval to the Head of the Service	Automate data verification as well as apply for approval when data has been verified
3	Head of Service Approve the population documents to be issued	Automate the approval process and send confirmation messages to the village or related applicants via e-mail or phone number.
4	The process of printing the finished residence document	This can be done at the village office by providing a tool for printing residence document cards

Table 3 above is an alternative process offered so as to reduce the waiting time that occurs in several processes.

##### 5. Recommendations

New business processes are designed following an analysis of redesign alternatives that eliminate and

automate some business processes. Adjustments were then made based on the results of the analysis of opportunities for using IT for the business process of recommendations for making a new Mulyoagung village office ID card.

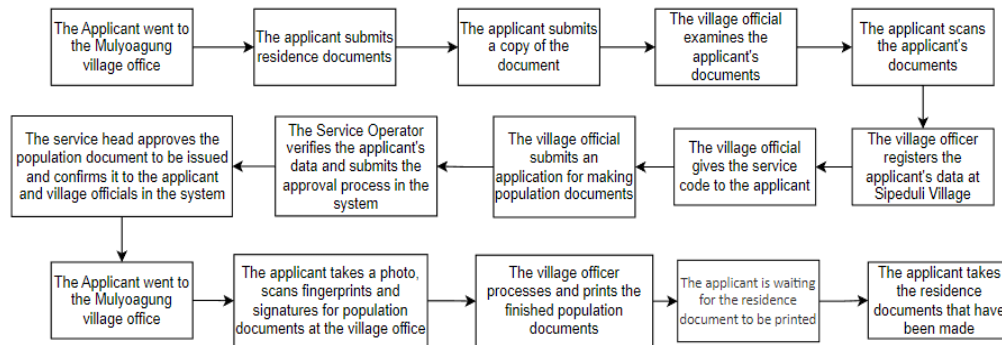


Fig 3. Business Process Recommendations for Making KTPs at the Mulyoagung Village Office

Figure 3 is a business process recommendation for making a new Mulyoagung village office ID card. Where in the business process, the applicant's recommendation does not need to ask for a cover letter from the RT and the process of making an ID card can be done at the Mulyoagung village office.

From the recommendation business process that has been designed, mapping is carried out using ASME standards and throughput efficiency testing to test the overall service time.

TABLE IV. ASME STANDARD MAP BUSINESS PROCESS RECOMMENDATIONS FOR MAKING KTP AT THE VILLAGE OFFICE

No	Business Process	○	□	⇒	D	▽	⊗	Time /Minute	Process Owner
1.	The applicant goes to the mulyoagung village office			●				20	Applicant
2.	The applicant submits a residence document	●						5	Applicant
3.	Applicant Submit a copy of the document	●						10	Applicant
4.	Village officials check the applicant's documents		●					30	Village Officer
5.	The applicant scans the applicant's documents	●						15	Applicant
6.	Village officers help register applicant data at Sipeduli Desa	●						20	Village Officer
7.	The village officer gives the service code to the applicant	●						10	Village Officer
8.	Village officials apply for residence documents	●						10	Village Officer



9.	The Service Operator verifies the applicant's data and submits the approval process in the system		●					480	Service Operator
10.	Head of service Approval of population documents to be issued and confirm to the applicant and village officials in the system		●					480	Head of Department
11.	the applicant goes to the mulyoagung village office							20	Applicant
12.	The applicant takes a photo, scans fingerprints and signs for residence documents at the village office	●						120	Applicant
13.	Village officials process and print ready-made residence documents	●						120	Village Officer
14.	The applicant waits for the residence document to finish printing							180	Applicant
15.	The applicant takes the completed residence document	●						20	Applicant
	Number of Stages	9	3	2	1	0	0		
		330	990	40	180	0	0		1,540

Table 6 is the result of mapping the business process recommendations for making KTPs at the Mulyoagung village office using the ASME standard map. Furthermore, throughput efficiency testing is carried out based on the results of the recommendation business process mapping.

$$efisiensi\ throughput = \frac{1.380}{1.540} \times 100\% = 89,61\%$$

The results of the throughput efficiency test carried out on the business process recommendations for

making ID cards at the Mulyoagung village office gave very good results with a high percentage of 89.61% and 10.39% of service times that were not running. This percentage increase is due to several processes that are less efficient and require a long time to be eliminated and automated so that they can help the process to be more efficient.

6. Comparison of Throughput Efficiency

At this stage, a comparison of the overall service time on the initial business process and the recommendation

business process is carried out based on the mapping results with ASME standards and the value obtained from the throughput efficiency test results

TABLE V. COMPARISON OF BUSINESS PROCESSES FOR MAKING ID CARDS AT THE VILLAGE OFFICE

No	Business process	Initial Throughput Efficiency	Recommended Throughput Efficiency	Initial Processing Speed	Recommended Processing Speed
1.	The Business Process of Making an ID Card at the Village Office	30,85%	89,61%	9545 Minutes	1540 Minutes

Table 7 is the result of the comparison of the initial business processes and the recommended business processes. The results obtained are the throughput efficiency value increased by 58.76% from 30.85% to 89.61% and also the processing speed increased from 9,545 minutes to 1,540 minutes.

### 7. Analysis of IT Usage Opportunities

Utilization of Information Technology can increase the efficiency of a business process. Therefore, at this stage an analysis is carried out to find out the opportunities for using information technology to support the redesign of the business process for making ID cards at the Mulyoagung village office

TABLE VI. HARDWARE REQUIREMENTS ANALYSIS RESULTS

No	Hardware	Number of Devices	Unit price
1.	Computer/PC	1	Rp 7.000.000,00
2.	Scanner	2	Rp 5.000.000,00
3.	Card Printing Tool	1	Rp 20.000.000,00
4.	Camera	1	Rp 4.500.000,00
5.	Wifi	1	Rp 500.000,00
	Total Price		Rp 42.000.000,00

TABLE VII. SOFTWARE REQUIREMENTS ANALYSIS RESULTS

No	Software
1.	Microsoft Office
2.	Browser
3.	Website SiPeduli Desa

Table 4 and Table 5 components of information technology that can be used in the business process of making ID cards at the Mulyoagung village office. By

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utilizing this technology, the waiting time in the queue for the KTP making process at the Muryoagung village office can be shortened, and the KTP issuance process can be simplified so that the KTP can be issued directly at the Muryoagung village office.

### IV. CONCLUSION

The application of Business Process Reengineering can help change old business processes to new business processes, so as to be able to get more efficient processes. Completion of a business process is done by eliminating processes that do not provide added value and changing manual processes into automated processes with the help of information technology.

Business Process Reengineering is also able to find the difference between the old process and the new process. Both in terms of service, speed, and cost. In the business process of making ID cards, throughput efficiency tests were carried out with the results of the old business process being 30.85% and the new business recommendation process being 89.61%. In the new business recommendation process, it is superior because the ID card creation time is 89.61% running well with a speed of 1,540 minutes.

Business Process Reengineering can provide new business recommendation model designs that are obtained after analysis of old business processes and analysis of redesign alternatives.

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