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A BUSINESS PROCESS MODEL REDESIGN METHOD LEVERAGING DESIGN THINKING: FRAMEWORK DEVELOPMENT AND CASE STUDY APPLICATION

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ABSTRACT

The rapid evolution of information technology has significantly influenced the redesign of business processes to enhance efficiency and effectiveness. The adoption of information systems may necessitate the redesigned business process of a company. This study explores the integration of design thinking methodologies with BPI framework to design a structured design thinking method for business process redesign. The proposed method emphasizes customer-centric design principles and employs root cause analysis, value-added analysis, Business Process Modeling Notation (BPMN), and flow analysis in different phases. To validate the method, a demonstration using a case study of a redesigned recruitment business process in a talent acquisition division of a company was conducted. The results are that using the method can identify critical weaknesses in the company's existing business process (As-Is), such as inefficiencies in internal hiring, prolonged recruitment cycles, and lack of integration in approval and selection management systems. The proposed process model (To-Be) was designed by separating sourcing from hiring workflows and leveraging integrated Applicant Tracking Systems (ATS) with Human Resources Information Systems (HRIS). Evaluations of the redesigned process through flow analysis and simulation revealed significant efficiency gains: cycle time was reduced by 91.46%, cost reduced by 7.95%, and substantial improvements in average and maximum process times. These findings highlight the potential of combining design thinking with process modeling to enhance organizational workflows and meet dynamic industry demands.

Keywords: design thinking, process modelling, business process redesign

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1. INTRODUCTION

Digitalization changes the way people live and changes the work process in various aspects of people's lives. Furthermore, information technology then becomes an inseparable part of organizations when executing their business processes. With the rapid development of information technology, organizations also have the capability to redesign their business processes to be more efficient. A business process is a set of activities that take one or more inputs and create outputs that are useful for customers, however, activities in the business process can be done manually or with the help of an information system (Weske, 2007). For traditional business organizations that are accustomed to running their business without the support of information systems and then want to switch to adopting information systems in their business processes, their business processes may need to be re-designed. Changing business processes due to the implementation of information technology requires significant investment. Not only the investment cost is quite high, but challenges such as the possibility of changes in organizational structure, the unpreparedness of employees in running the new business processes, and other potential ones will arise.

Therefore, for the business process design to be effective, it needs to be based on an approach that allows for optimal value creation so that it can greatly be valued by the users/customers. Thus, the business process that can guarantee optimal value creation is one that is in accordance with customer desires (customer-centric). One of the well-known customer-based design approach is the design thinking method (Carlgren, et al., 2014). The process design approach using design thinking can be an alternative in carrying out process re-design (Liedtka, 2011). However, although design thinking has been used for many types of design, the use of it for business process modeling has been lacking (Carlgren, et al., 2014). There is an example that mentions it (Luebbe & Weske, 2011). However, although it follows the concept of iteration in design thinking, it does not follow the common framework of the design thinking approach (Corrales-Estrada, 2020; Geissdoerfer et al., 2016; Thoring & Müller, 2011; Waidelich et al., 2018). Therefore, there is a need to have a structured approach to re-designing business processes using design thinking.

This study aims to propose a structured approach for business process model re-design using design thinking. The basis is a structured design thinking model. Although there are different examples of design thinking models (Corrales-Estrada, 2020; Geissdoerfer et al., 2016), a model based on method engineering (Thoring & Müller, 2011) is chosen due to its close relevance to our purpose, which is re-designing business processes due to the adoption of information systems. This model is then adapted based on a Business Process Improvement (BPI) framework (Harrington, 1991). The framework was chosen due to its compatibility with the purpose of redesigning business processes that can work in incremental situations. To validate the approach, a demonstration using a case study in an EPC company was performed. An EPC (Engineering, Procurement, Construction) company provides consulting services for planning, procurement, and integrated construction work. In this case, the service provided is human resources management.

2. METHODS

The organization of the research methodology can be seen in Figure 1.

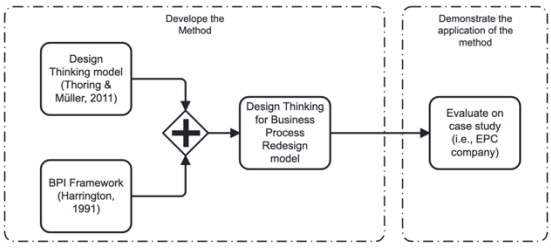

Figure 1. Design thinking for process redesign development concept

The proposed structured approach to redesigning business process models is based on the design thinking model (Thoring & Müller, 2011), which has several phases: Understand, Observe, Point of View, Ideate, Prototype, and Test. This model is explained as a process with BPMN process modeling notation and is intended for the information system development field. There are other models with similar phases, but the 'point of view' phase is

changed into 'define' (Geissdoerfer et al., 2016), and another model with different initial phases, which are Empathize, Define, Ideate, Prototype, Test (Corrales-Estrada, 2020). Although those models have different phases in the beginning, they are similar in the later phases. It seems that the beginning phases are very significant to design thinking because it is relevant to how the wants and needs of the user can be captured. Therefore, we investigate other frameworks related to business process model design to adapt the beginning phase so that it can be more relevant. We use the BPI framework (Harrington, 1991), which is intended for improving business process performance. Another well-known approach, such as Business Process Reengineering (BPR) (O'Neill and Sohal, 1999), focuses on a radical redesign of business processes to achieve dramatic performance improvements. Unlike BPI, which seeks incremental changes, BPR is more disruptive and transformative. Another well-known approach in the redesign is Lean-Six Sigma (Atmaca and Girenes, 2013), a combination of Lean and Six Sigma, which focuses on eliminating waste and reducing defects and variability. However, although Lean Six Sigma is a very powerful method that can lead to redesigning the process by streamlining the process and adding value to the manufacturing process, it is not directly focused on the redesign of the business process. It is also focused on reducing variability, which is hard to apply if we want to cater to users'/customers' varied needs.

The phases in the BPI framework consist of organization of improvement, understanding the process, streamlining, measurements and control, and continuous improvement. The first phase in the BPI framework is where commitment is built, and business processes and their problems are identified, where the purpose of this phase is to determine the objectives of business process improvement. The second phase is carried out by creating a model of the current business process and analyzing the activities within, so that we can understand all processes in the business process. The third phase is to improve or enhance the business process by analyzing the existing business process so that we can improve the effectiveness, efficiency, and adaptability of the business process. To do this, there are 12 streamlining tools that can be used in this phase (Syarifudin et al., 2022), namely: bureaucracy elimination, duplicate elimination, value-added analysis, simplification, process cycle time reduction, error proofing, upgrading, simple language, standardization, supplier partnerships, big picture improvement, automation and/or mechanization. The next phase is the implementation of improvements or enhancements to business processes, while control is performed on the improved process for further improvements. The last phase is an evaluation of the improved business processes and an analysis of the impact of the improvements on business performance, and to identify new problems to be continuously improved.

3. FINDINGS AND DISCUSSION

3.1. Design Thinking for Business Process Model Redesign Method

Although the phases in the BPI Framework use different terms compared to the design thinking model, the purpose is aligned. The 'continuous improvement' phase also aligns with the design thinking principles of 'iteration' (Luebbe & Weske, 2011). Therefore, we adapted the design thinking model based on BPI framework (see Figure 2). This method is meant for generic process modeling and can be used across industries.

The redesign process starts with the management understanding the problems that the user faces and recognizing the challenge that the organization face in the design of the business process, which is phase 1. In the next phase 2, observation of the process is conducted while also collecting the necessary data through interviews with the users and documents study to collect information regarding the cycle time and cost for activities. The results are documented in the form of the existing (As-Is) process model (i.e., modeled using BPMN), complemented with the cycle time and activities cost table. In phase 3, root cause analysis and value-added analysis is conducted to pinpoint the part of the process that cause the problem and needs to be improved. Root cause analysis (RCA) is a valuable management tool to find the root of the problem that can be conducted at several levels of depth and complexity (Williams, 2001). In the

context of business process analysis, the RCA method is used to analyze and understand the things that cause the process not to work optimally. Of the several RCA tools, the tools commonly used for business process analysis are fishbone diagrams and why-why diagrams (Dumas et al., 2018). In this study, why-why diagrams are used as tools to find the root of the problem in the business process. The why-why diagram is made by asking "why" several times about a problem that occurs until the problem is found. Value Added Analysis (VAA) is a technique for analyzing unnecessary steps in a process with the aim of eliminating those steps (Dumas et al., 2018). In this analysis, the process is divided into 3 categories, namely Value Adding (VA), Business Value Adding (BVA), and Non-Value Adding (NVA). VA is a process that produces added value, BVA is a process that is needed for a business to run smoothly, while NVA is a process that does not have added value (Dumas et al., 2018)

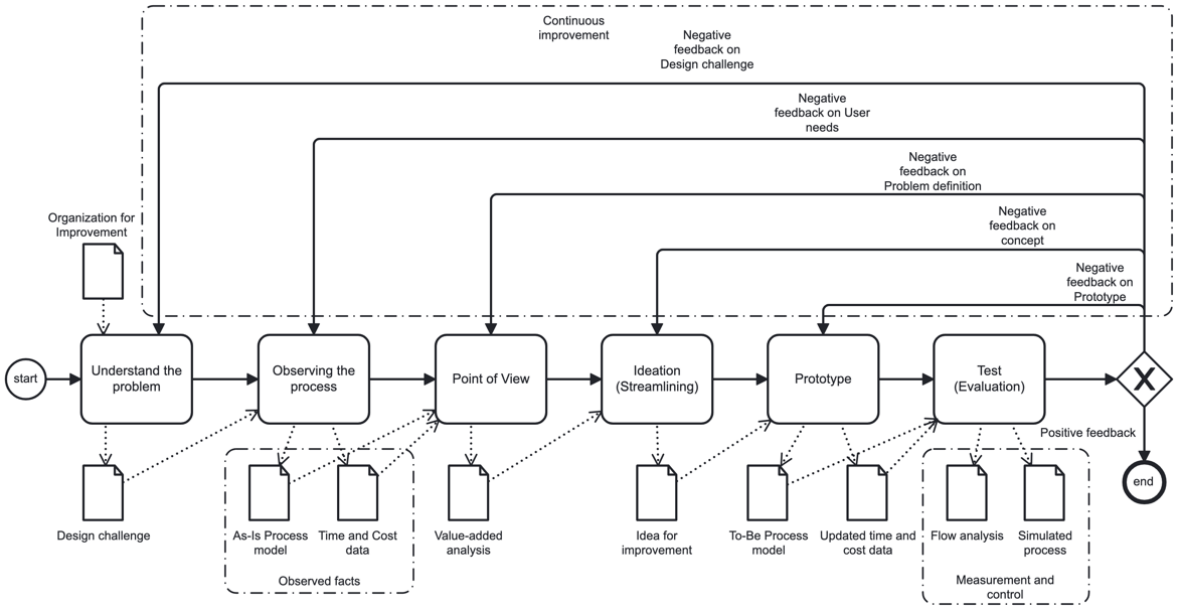

Figure 2. Design thinking for process redesign method

After 'point of view' phase, the process of defining the problem is finished and we are moving to the part of designing the solution. The fourth phase, namely ideate, use the streamlining approaches to search the ideas with the help of 12 streamlining tools, which will be used to design the proposed business process model. The next phase, prototype in the form of To-Be process model is designed. The change in process because of redesign may affect the cycle time and activity cost. Last phase, an evaluation of the proposed business process is conducted by testing it with flow analysis and process simulation (i.e., using process modeling software such as Bizagi) to determine the effectiveness of the business process improvements. Flow analysis is a method used to analyze the flow of activities in a business process by estimating the overall performance of the process (Dumas et al., 2018). Flow analysis is usually used to estimate process performance in terms of average cycle time and average process cost whereas in the context of business process improvement by estimating the average cycle time and average process cost for the current business process can be a benchmark for business process improvement. Process simulation is similar in essence to flow analysis, which results in time and cost calculation, but using the help of process modeling software (i.e., Bizagi).

3.2. Demonstration Using Case Study

3.2.1. Understanding the Problem

The EPC company that became the object of the case study has a problem regarding the delays in the process of providing qualified employees for the client's urgent work by the Talent Acquisition division. Because of the delays, it must pay

penalties to the client. This delay has occurred since Q3 2022 and even continued to increase in Q4 2023. Aside from the delays, the requested candidate was never fulfilled (see Table 1). The cause of this problem is the business process that is no longer relevant to the dynamics of the current EPC industry, which continues to increase in demand, and the difficulty of finding candidates who match the company's qualifications. Therefore, in addition to implementing a human resource information system to support its business process, the business process itself needs to be redesigned so that both can be aligned. Thus, a redesign of the process using the proposed approach was conducted.

Table 1. Project recruitment history (in 2023)

Recruitment steps	**Q1**	**Q2**	**Q3**	**Q4**	***Average***	***%***
Total candidate requested	78	45	88	29	60	10%
Internal Hiring fulfilled	8	4	9	3	6	
Total external applicants	424	141	668	87	330	39%
CV send to user	158	61	242	49	128	
CV accepted by user	91	55	131	30	77	60%
HR interview accepted	91	50	127	30	75	97%
User interview accepted	83	48	95	28	64	85%
Budget availability	83	47	93	28	63	99%
Offering accepted	70	41	79	26	54	86%

3.2.2 Observe the Process

In this phase, the process is observed, and the needed data is collected. The existing business process model (As-Is) is modeled using BPMN notation and Bizagi modeler software (see Figure 3) based on the work instruction documents belonging to the Talent Acquisition (TA) division and interview results with the division lead.

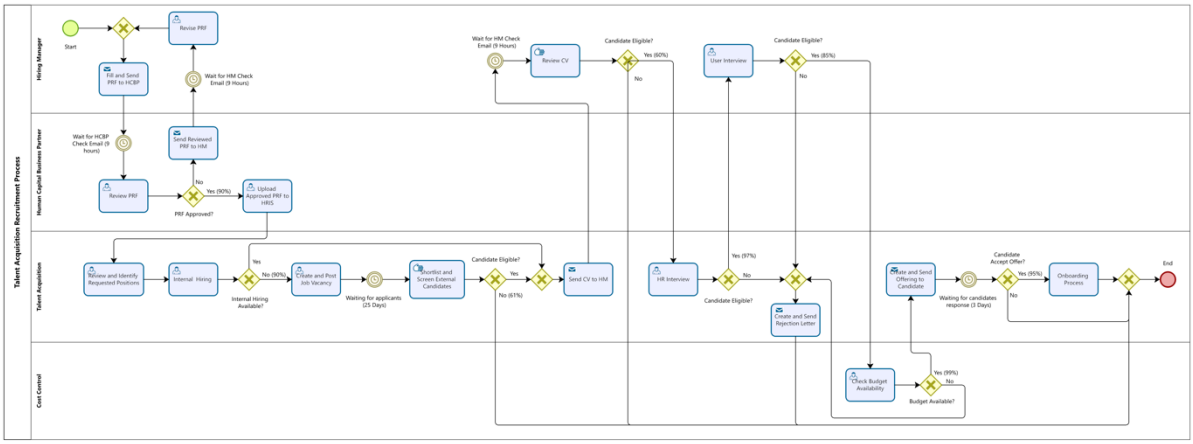

Figure 3. As-Is process model

Along with modelling the As-Is process, data for average cycle time and resource cost were collected (see Table 2). The cycle time for each activity is obtained by observation, and resource costs are obtained from the average employee salary work hours. Cycle time is calculated based on the average time multiplied by the probability of the task occurring. Due to the split of flow in the process that requires decision-making to choose one of the paths, there is probability for the activity to happen. The probability is 1 if there is no gateway before the task; if there is a gateway, then the probability is obtained from the percentage of a path that might be chosen in the gateway (see Figure 3). However, if a rework occurs within the process (e.g., 'Review PRF' task which can be repeated if there is a PRF revision), the probability of rework task (r*) is calculated using the formula "$r^* = 1/(1-r)$", where 'r' is the probability of the path that leads to rework.

Table 2. Cycle time and Resource cost data for the recruitment process

Activity	Probability	Average time *(minute)*	Total *Cycle Time (minute)*	*Resource Cost (rupiah)*	Total *Cost (rupiah)*
Fill and *send PRF to HCBP*	1,1	10	11	Rp. 75.000	Rp. 75.000
Wait for HCBP Check Email	1,1	540	594	0	0
Review PRF	1,1	15	16,5	Rp. 100.000	Rp. 10.000
Send Reviewed PRF to HM	0,1	5	0,5	0	0
Wait for HM Check Email	0,1	540	54	Rp. 100.000	Rp. 118.000
Revise PRF	0,1	15	1,5	Rp. 75.000	Rp. 75.000
Upload Approved PRF to HRIS	0,9	5	4,5	Rp. 100.000	Rp. 90.000
Review and Identify Requested Positions	0,9	15	13,5	Rp. 56.250	Rp. 50.625
Internal Hiring	0,9	540	486	Rp. 56.250	Rp. 50.625
Create and Post Job Vacancy	0,9	540	486	Rp. 56.250	Rp. 50.625
Waiting for Applicants	0,9	57600	51840	0	0
Shortlist and Screen External Candidates	0,9	5	4,5	Rp. 56.250	Rp. 50.625
Send CV to Hiring Manager	0,39	5	1,95	Rp. 56.250	Rp. 21.937
Wait for HM Check Email	0,39	540	210,6	0	0
Review CV	0,39	10	3,9	Rp. 75.000	Rp. 29.250
HR Interview	0,6	30	18	Rp. 56.250	Rp. 33.750
User Interview	0,97	120	116,4	Rp. 75.000	Rp. 72. 750
Create and Send Rejection Letter	0,19	10	1,9	Rp. 56.250	Rp. 10.687
Check Budget Availability	0,85	15	12,75	Rp. 59.357	Rp. 50.454
Create and Send Offering to Candidate	0,99	15	14,58	Rp. 56.250	Rp. 55.687
Waiting for Candidate Response	0,99	4320	4276,8	0	0
Onboarding Process	1,1	30	25,8	Rp. 56.250	Rp. 48.375
TOTAL		**58194,68 minute (40,4 days)**			**Rp. 893.390**

3.2.3 Point of View

This phase defines the problem that need to be solved. A value-added analysis was then carried out to analyze the added value in each task within the process (see Table 3). The non-value-adding (NVA) category includes several tasks, which will become the focus in improving business processes. For example, the task of sending PRF to the hiring manager by HCBP, which is considered NVA because the task can be run automatically with the help of HRIS.

Table 3. Value-added analysis for existing process

Task	Actor	VAA category	Description
Fill and Send PRF to HCBP	*Hiring Manager*	VA	Adds value because enable the recruitment flow to begin
Wait for HCBP Check Email	-	BVA	A task that is required for the continuation of the process.
Send Reviewed PRF to HM	HCBP	NVA	An important administrative task, but this task can be automated.
Wait for HM Check Email	-	BVA	A task that is required for the continuation of the process.
Review PRF	HCBP	VA	An important task to ensure that the recruitment is aligned with the company's needs.
Revise PRF	*Hiring Manager*	VA	Revisions need to be done if there is feedback by HCBP.

Task	Actor	VAA category	Description
Upload Approved PRF to HRIS	HCBP	NVA	Can be automated if the previous process was not done via email.
Review and Identify Requested Positions	TA	VA	An important task to prepare for the recruitment process.
Internal Hiring	TA	VA	If there is a request from the hiring manager, internal employees are prioritized before the external hiring.
Create and Post Job Vacancy	TA	VA	To open opportunities to get candidates who fit the company's needs.
Waiting for Applicant	-	BVA	A task that is required for the continuation of the process.
Shortlist and Screen External Candidates	TA	VA	To ensure that only candidates who meet the criteria will be processed further.
Send CV to Hiring Manager	TA	VA	Allows decision making in the next stage.
Wait for HM Check Email	-	BVA	A task that is required for the continuation of the process.
Review CV	*Hiring Manager*	VA	It is important to ensure that the candidate being recruited matches the hiring manager's expectations.
HR Interview	TA	VA	Assess to check qualification

Next, the root cause of the problem is analyzed with a root cause analysis (i.e., a why-why diagram). The 'why-why' diagram shows how the delay might happen (see Figure 4).

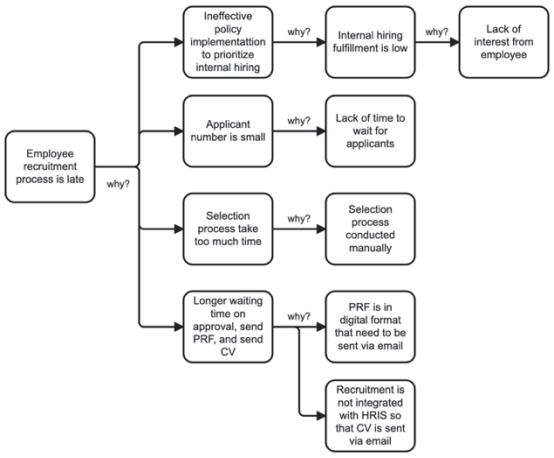

Figure 4. Root cause analysis using why-why diagram

By investigating further, several causes of problems are found in the As-Is business process, namely frequent repetition of the selection process due to differences in expectations of candidate qualifications between the hiring manager and the TA division, then the overall recruitment process which takes a long time caused by several consequences, next is the absence of separation of internal hiring and external hiring processes, then lastly the applicant selection process which is still manual, and the difficulty of finding candidates who match the company's qualifications.

3.2.4 Ideate

After analyzing the As-Is business process and defining the causes of the problem, improvement suggestions are proposed. The idea for improvement is generated using the 12 streamlining tools (see Table 4). In this case, the causes of the problem that are analyzed previously are addressed thoroughly to ensure that the solution can be traced back to the problem.

Table 4. Idea generation for solutions

Task	**VAA Category**	**Cause of problem**	**Streamlining tools**	**Improvement suggestion**
Fill and send PRF to HCBP	VA	PRF is in digital format that need to be sent via email	*Upgrading*	change PRF into form that is integrated with HRIS
Wait for HCBP Check Email	BVA	Longer waiting time	*Process Cycle Time Reduction*	PRF integrated into HRIS to reduce cycle time significantly
Send Reviewed PRF to HM	NVA	Longer waiting time because need to be sent via email	*Bureaucracy elimination*	Task elimination because PRF is already in HRIS
Wait for HM Check Email	BVA	Longer waiting time	*Process Cycle Time Reduction*	HRIS notification for sent PRF can reduce waiting time
Review PRF	VA	-	-	-
Revise PRF	VA	-	-	-
Upload Approved PRF to HRIS	NVA	Recruitment is not integrated to HRIS, thus CV is sent via email	*Bureaucracy elimination*	Task elimination because PRF is already in HRIS
Review and Identify Requested Positions	VA	-	-	-
Internal Hiring	VA	Ineffective policy implementation to prioritize internal hiring	*Simplification*	Separation of internal hiring and external hiring into different process
Create and Post Job Vacancy	VA	-	-	-
Waiting for Applicant	BVA	Lack of time to wait for applicants	*Big picture improvement*	Accepting application is always open and conducted even before request for recruitment
Shortlist and Screen External Candidates	VA	Selection process take too much time because conducted manually	*Upgrading*	Use of Applicant Tracking System (ATS) integrated with HRIS for selection

3.2.5 Prototype

Based on the improvement proposal, the proposed (To-Be) business process model is designed. In the proposed business process, the candidate search and selection process are carried out before there is a request, therefore the recruitment process is divided into two processes, namely the 'sourcing process' (see Figure 5) and the 'hiring process' (see Figure 6). The sourcing process is always open. The TA division need only to identify the needed vacancy and regularly classify and manage the stored candidate information.

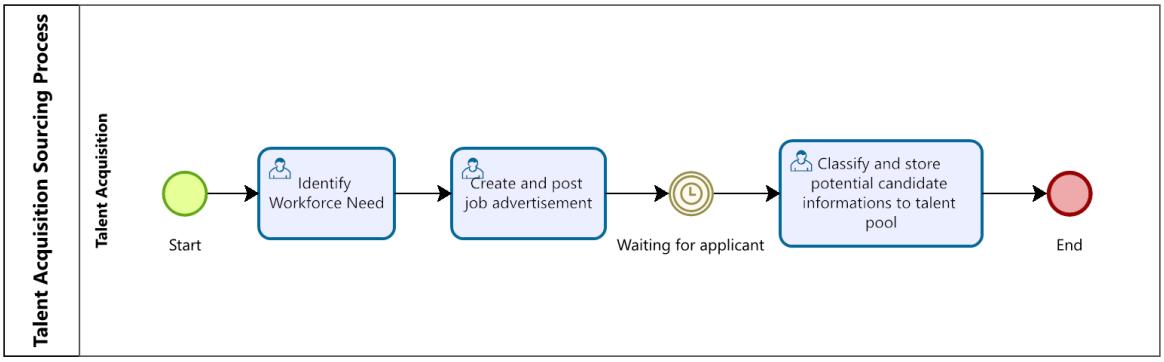

Figure 5. Sourcing business process model (To-Be)

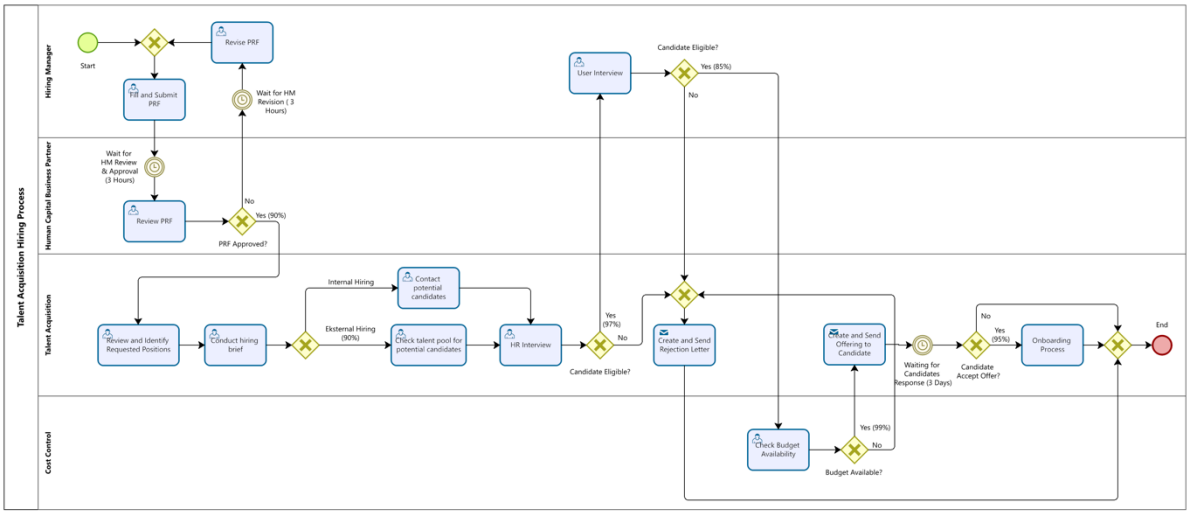

Figure 6. Hiring business process model (To-Be)

The separation of the sourcing and hiring processes was to significantly reduce the processing time so that when there was a request to recruit candidates, the TA division already had a ready list of candidates so that it did not need to start sourcing first. In addition, several processes that had problems were also improved, such as eliminating processes that were categorized as NVA, and using Applicant Tracking System technology to select candidates to fasten the process.

3.2.6 Test

The next step is to evaluate the To-Be business process model to determine the effectiveness of the proposed business process. The evaluation is carried out using flow analysis and business process simulation, then the results are compared with the As-Is business process. The following is an example of flow analysis of the To-Be business process for the hiring process (see Table 5)

Table 5. Flow analysis for Hiring process (To-Be)

Task	**Probability**	**Cycle time** (minute)	**Total CT** (minute)	***Resource Cost***	**Total *Cost***
Fill and Submit PRF	1,1	10	11	Rp. 75.000	Rp. 82.500
Wait for HCBP Review & Approval	1,1	180	198	0	0

Task	Probability	Cycle time (minute)	Total CT (minute)	*Resource Cost*	Total *Cost*
Review PRF	1,18	15	17,7	Rp. 100.000	Rp. 118.000
Wait for HM Revision	0,1	180	18	0	0
Revise PRF	0,1	15	1,5	Rp. 75.000	Rp. 75.000
Review and Identify Requested Positions	0,9	15	13,5	Rp. 56.250	Rp. 50.625
Contact Potential Candidates	0,1	540	54	Rp. 56.250	Rp. 5.625
Check Talent Pool for Potential Candidates	0,9	30	27	Rp. 56.250	Rp. 50.625
Submit Candidates Profile to HM	0,9	3	2,7	Rp. 56.250	Rp. 50.625
Wait for HM Review Candidates Profile	0,9	180	162	0	0
Review Candidates Profile	0,9	5	4,5	Rp. 75.000	Rp. 67.500
HR Interview	0,6	30	18	Rp. 56.250	Rp. 33.750
User Interview	0,97	120	116,4	Rp. 75.000	Rp. 72. 750
Create and Send Rejection Letter	0,19	10	1,9	Rp. 56.250	Rp. 56.250
Check Budget Availability	0,85	15	12,75	Rp. 59.357	Rp. 50.454
Create and Send Offering to Candidate	0,99	15	14,58	Rp. 56.250	Rp. 55.687
Waiting for Candidate Response	0,99	4320	4276,8	0	0
Onboarding Process	0,95	30	28,05	Rp. 56.250	Rp. 53.438
TOTAL	**4975,83 Minutes (3,45 days)**				**Rp. 822.329**

The results can be compared by identifying the cycle time and cost of both the As-Is and To-Be business processes (see Table 6 for comparison).

Table 6. As-Is and To-Be process comparison using flow analysis

Criteria	As-is process	To-be process	Efficiency improvement
Cycle Time	40,4 days	3,45 days	91,46%
Cost	Rp. 893.390	Rp. 822.329	7,95%

The process used in the To-Be process is the hiring process because this process is calculated as the TA division's SLA. Table 6 shows that a significant decrease was obtained in terms of cycle time and cost, where previously, in the as-is business process, the cycle time obtained was 40.4 days, and the cost was Rp. 893,390, while in the to-be business process, the time decreased by 91.46%, which is 3.45 days, and the cost decreased by 7,95%, which is Rp. 822,329.

Further analysis using process simulation software (see Figure 7) also shows a significant decrease in process time and costs, including the minimum time, the maximum time, the average time, and the costs (see Table 7).

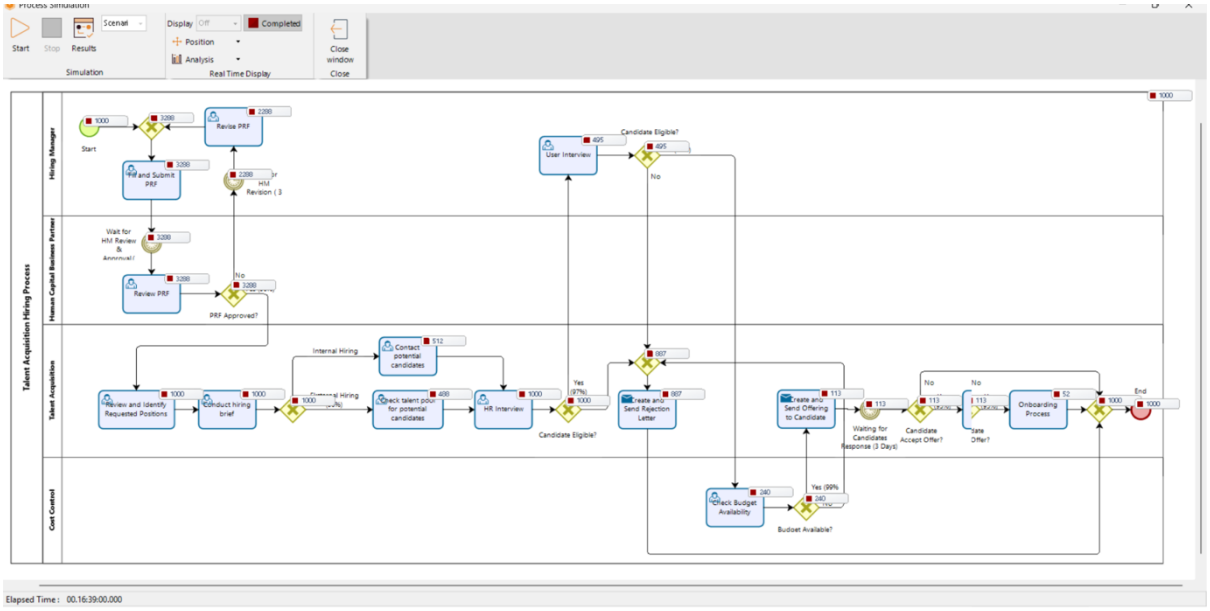

Figure 7. Hiring process (To-Be) simulation using Bizagi software

Table 7. As-Is and To-Be process comparison using process simulation

Criteria	As-is process	To-be process	Efficiency improvement
Min. time	4 days 8 hours 8 minutes	11 hours 29 minutes	88,97%
Max. time	53 days 11 hours 8 minutes	11 days 7 hours 25 minutes	78,82%
Avg. time	43 days 14 hours 30 minutes	3 days 18 hours 26 minutes	91,36%
Cost	Rp. 16.952.837	Rp. 10.307.748	39,20%

3.3 Limitations and Future Research

The proposed method of business process model redesign, which leverages the design thinking approach, has proven that process designers can redesign business processes according to the needs of customers/users. Process design heavily relies on the designers themselves. Different designers may have different ways to design a process model. However, a method that can guide step by step and can be traced back to the needs of the users can provide a more objective and relevant to the user needs.

The results of the comparison between As-Is and To-Be process models through flow analysis and simulation, using time-based and cost-based analysis, can provide an evaluation of how the proposed redesigned process model can improve the business process's performance. However, while this simple time and cost-based analysis is beneficial, it may be lacking if the data used is not correctly provided. Thus, incorporating additional methods such as time-study analysis that uses direct observation and data collection to analyze each step in a process and activity-based costing can strengthen the evaluation. A more advanced method, such as process mining and event log analysis that uses actual system data logs to measure cycle time instead of manual observation, may provide better results if the organization already has sufficient database management.

4. CONCLUSION

This research concludes that design thinking is a suitable approach to business process model redesign. An adapted design thinking model following the BPI framework has been used as a structured approach. The method follows six phases: understanding the problem, observing the process, defining the point of view, ideating, prototyping, and testing. The tools and techniques incorporated in the method are adequate for each phase.

A demonstration using a real business case study of a recruitment process has validated this method. Using this method in the case study has shown that the organization has problems regarding its recruitment business process. The problem is recognized through in-depth observation of the process, interviews with the key users, and a study of the company documents. The observed business process is modeled as an As-Is process model using BPMN. Further analysis through value-added analysis and root-cause analysis uncovers several weaknesses in the recruitment business process, such as the ineffectiveness of the internal hiring prioritization policy, the longer time needed to get applicants, and approval and sending documents takes time because it is not yet integrated with HRIS. An idea generation using 12 streamlining tools can be used to guide the redesign process. The To-Be process model becomes the prototype for the proposed new business process. Proposed improvements to the recruitment business process include separating the sourcing and hiring processes so that the recruitment process can be faster because the sourcing is always open. Thus, the candidates are already available when there is a request from the hiring manager. In addition, using the Applicant Tracking System (ATS) to speed up selection, changing the sending of PRFs from email to a form integrated with HRIS, and integrating the recruitment platform with HRIS to reduce the waiting time for CV review by the hiring manager are also recommended. The results of the evaluation of the proposed business process using the flow analysis and simulation methods showed significant improvements. With flow analysis, time efficiency increased by 91,46% and cost efficiency by 7,95%. Meanwhile, business process simulation showed an increase in minimum time efficiency of 88,97%, maximum time of 78,82%, average time of 91,36%, and cost efficiency of 39,2%.

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