
BUSINESS PROCESS IMPROVEMENT FOR REDUCING DELAY IN THE MATERIAL DOCUMENT ISSUE PROCESS IN THE FERTILISER MANUFACTURING INDUSTRY

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Submitted : 10 July 2023; Revision : 10 August 2023; Accepted : 28 August 2023

ABSTRACT

The business process will be carried out by the fertiliser company. Currently, process delays are a problem for one of the departments in this company. The delay contributor is an unsatisfied 3.5% gap rate in the material document issue process Key Performance Indicator (KPI). This will disrupt the process flow and can have a domino effect on end-users. Business process improvement (BPI) is one of the most powerful and effective methods to use for improving the business process and business process modeling notation (BPMN) provides a notation that is simple to understand for analysis of the business process. The result of the BPI tool is the design of a new business system with improved processes modeled using Bizagi Modeler, because several processes are still handled manually. So, the processing time is long and needs to be evaluated. Some of the activities will be elimination, upgrading, and simplification. The percentage increase in the total time of the proposed business process is 7% in the KPI. The process time decrease in the total time of the proposed business process is 10.90 days. Further research should be conducted to reduce delays in the material document issue process for the next levels, such as resource analysis and calendar analysis, it will be able to figure out what method is more appropriate for business process improvement in the material document issue.

Keywords Process Delay; KPI; BPI; BPMN; Bizagi Modeler; Efficiency;

Paper type Research paper

INTRODUCTION

All company needs to decide based on the more aggressive systems of competition and the era of globalisation. Even long-term strategies can help fertiliser companies expand further[1]. It must efficiently utilise human resources, machines, and especially in administration. The demand for the creation of a document is increasing in line with goods/spare parts. To prevent a delayed process, according to a journal by reference [2] shows the digitalisation of information flow improves transfer time and quality by reducing human error. Furthermore, the transfer speed has been increased. The digitalisation of information flow improves transfer time and quality by reducing the human error. Moreover, the transfer speed has been increased. Electronic document management is an effective way to enhance staff productivity and the quality of the task performed in the creation of documents [3].

The business objectives can accomplish when all factors, such as information technologies, work well. In this case, a key concept for a company's efficient and effective operation is its business process [4]. The company must pay attention to every factor because business processes are its most important asset [5]. The fertiliser company will carry out the business process. They are starting with the internal relations of one department and moving to another. The Department of Planning and Receiving of Goods and Services (PRGS) supports department order requests. It has several functions and duties, including handling documents request for goods/services from and to the unit production or user, demand planning in goods/spare parts, and the irregular and frequent timing of order requests. By comparing the "as-is model" with the "to-be model," one is better at showing where the deviations occur between the processes, which are a problem to be solved [6].

Material document issue process delays are a critical problem for this department; this will disrupt the process flow and can have a domino effect on end-users. Because the PRGS Department is the supporting department that supplies the necessary goods or spare parts for all departments. Some of the goods/spare parts are urgent items that must be processed quickly. Key performance indicators or KPIs are often evaluated to identify and define an organisation's strategic performance. It assists

companies in identifying and monitoring their progress toward achieving their objectives [7]. The KPI is a quantitative indicator used to assess advancements in innovation implementation efforts, which are critical to a company's success [8]. There are two areas of the material document issue KPI with three categories that are involved in this process: creating a purchase requisition (PR), creating a purchase order (PO), and creating good receipt (GR). But, the analysis of aspects only focuses on the categories that do not meet the target for a time duration in the process of creating material documents. It encounters problems in terms of the impact of the material document issue process on the process time itself. The total process time of a material document issue from January to June averages 53 days. The target for a time duration in creating material documents is to have an average of not more than 50 days of total time duration. On the other hand, the average process time for creating a PR is five days, a PO is 22 days, and a GR is five days. The target for a time duration in creating material documents is to have not more than three days for making a PR, not more than 15 days for creating a PO, and not more than three days for creating a GR.

To determine the specific causes of the problems, they must evaluate the business process [9]. BPI is one of the most powerful and effective methods to improve the business process. The result of the BPI design of a new business system is improved processes, such as decreasing process delays, making optimal use of resources, fostering understanding, and reducing the usage of present labour resources and expenses related to unnecessary spending [10]. The business process can be performed in a specific standard. BPMN is becoming the actual standard for modelling business processes [11]. Its practical notation gives business analysts a simple and expressive visual appearance [12]. BPMN provides a notation that is simple to understand for all employees from the business process analysis. Thus, modelling business processes that enable the analysis of such complex cooperation is a challenging issue for large organisations or industries, both to improve the system operation and to provide a valuable way to better understand the role of individual aspects of such systems [13]. So, the simulation is conducted to determine the proposed improvement's effectiveness and compare the current and proposed business processes using the business process modelling notation (BPMN). Then, based on the analysis, the delays in flow processes, especially in the material document issue category, can be reduced by providing improvement.

METHOD

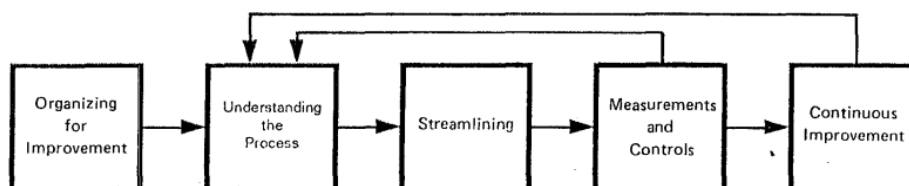
Business Process

An effective business process is one whose goals are achieved by what has been planned. At the same time, a company can manage time, cost, and resources by implementing an efficient business process [14]—the standard of the business process modelling notation (BPMN) to define business processes. Furthermore, the validity of the modelled business processes is validated to see if the model matches the data previously provided. Bizagi Modeler is an application that supports business process modelling notation.

The Business Process Improvement (BPI) Method

Business Process Improvement or BPI is designed to assist organisations to improve their business processes. BPI provides a method to optimise business operations and ensure efficient time management. Business process improvement has become important to the long-term company's success. It facilitates companies in increasing quality, increasing flexibility, reducing operating (cycle) time, increasing staff engagement, and increasing customer satisfaction [15].

The BPI method has been shown to be effective at improving a company's operations [16]. There are several methods and studies on the concept of business process improvement to find a suitable method that can be easily implemented in practice. According to reference [10], the following phase can be seen in Figure 1.



(Source: Business Process Improvement, 1998, p.23)

Figure 1. The Phases of BPI

To resolve errors and issues in business processes. Streamlining helps improvements to be performed to business processes, encouraging businesses to flow more effectively and efficiently. According to reference [10], it has 1BPI tools that can streamline the process. It has 12 tools in BPI that can be used to streamline the process. The explanation of the tools is as follows: (1) value-added assessment, it involves the use of business process evaluation to determine how much each action contributes to meeting customer needs, (2) simplification, it can be used to make a process less difficult, to create a process that is simple to comprehend and use, complex process steps might be abbreviated, (3) upgrading, it is improving the effectiveness with which tools or equipment are used in the workplace, (4) automation, it providing tools, machines, and computers the ability to carry out activities and tasks so that workers can concentrate to other activities, (5) bureaucracy elimination, it is the process of eliminating administrative, regulatory, and unnecessary paperwork, (6) standardisation, it is the process of equalising all employees' standard in performing activities, (7) duplication elimination, it is the process of eliminating tasks that are the same or nearly identical within different stages of a process, (8) process cycle-time reduction, it shortens cycle times and lowers process storage costs. This tool is commonly used to simplify a process that has a long cycle time, (9) error proofing, which is a tool used to produce it impossible for errors to occur during a procedure, (10) simple language, which is a tool used to minimise communication or writing complications. So, all business-related documents are designed to be simple to understand and read, (11) significant picture improvement, if none of the preceding ten tools work, this one is applied. Without being intimidated by current organisations and business procedures, this tool can assist in exploring new creative and innovative approaches, (12) supplier partnerships, the output quality is determined by supplied inputs. When the supplier raises the quality of the inputs it delivers, the value to the company will rise.

Business Process Modeling Notation (BPMN)

This section introduces Business Process Modelling Notation (BPMN), developed by Object Management Group, Inc. (OMG). Simple activities, events, gateways, data objects, pools, and lanes are all part of a basic BPMN model [5]. BPMN is designed to support a variety of model developments and enable the development of whole business processes. Because of its flexibility and simplicity, BPMN has risen to the top of the list of business process modelling tools [17]. According to reference [4], BPMN has four basic element categories: flow object, artefact, swim lane, and connecting objects. Bizagi Modeler is a tool for modelling and analysing business processes. This tool lets users see diagrams, models, and documents of existing business processes in a company. Simulation is a method that may be used to evaluate the efficiency of business processes to identify the probability of failure of the process, the existence of obstacles to the process, and the utilisation of resources participating in the business process that has been modelled.

DISCUSSION

Research started with the initial observation, and after that, it identified the problems that have occurred in the current system that need to be improved. Then, to simulate the current system, it needs to do a time study of the business process and analyse the recent result using the BPI tool. After the problem is analysed, the next step is improvement, which aims to improve the current system of the business process. To simulate the proposed system, first, it needs to propose improvements to the management. Three main categories of business processes will be proposed: a purchase request (PR), creating a purchase order (PO), and creating a good receipt (GR). After the proposed improvement is implemented by management, the next step is the indirect interview to determine the duration of the proposed business process. In the last steps of this research, a comparison is conducted between the current system and the resulting improvement.

The Number of Material Document Issues

The data downloaded on material document issues was taken from January to June 2022. The number of material document issues are divided into two areas: stock item of 80% and non-stock item of 20% related to the document creation. Because the active days in a month are Monday – Friday, which is 20 days, the total items average of material document issues from January until June is 1109 creations per month, which divides into the active days in a month. So, the total goods order is 55 items per day. There are two low points, or shutdowns, in February and May (see Table I), because the majority of the production at this company is under regular maintenance. As a result, more items were ordered in the preceding months.

TABLE I. THE NUMBER OF MATERIAL DOCUMENT ISSUES IN JANUARY - JUNE 2022

| Quarter | Months | Stock Items | Non-Stock Items | Total Items |
|---------|----------|-------------|-----------------|-------------|
| Q1 | January | 975 | 244 | 1219 |
| | February | 535 | 134 | 669 |
| | March | 1285 | 321 | 1606 |
| Q2 | April | 1091 | 273 | 1364 |
| | May | 527 | 132 | 659 |
| | June | 909 | 227 | 1136 |

Material Document Issue Process Key Performance Indicator

As a measurable value displaying how successfully company accomplishes key objectives. A key performance indicator, or KPI, is a tool or metric that the PRGS department uses to measure performance with a specific time length indicator, such as, in this case, the PR, PO and GR creation process. The company's IT team assists the PRGS department in distributing to other departments. KPIs are conducted by the department every month. The key performance indicator (KPI) of the material document issue process was located within the action plan of the involved PRGS departments in the fertiliser company. In the action plan, there is a targeted KPI. The targeted KPI will then be compared with the actual achievement. The data was taken in January – June 2022 for the actual achievement of KPI. Table II is the comparison of the targeted KPI and actual KPI for the material document issue process.

TABLE II. COMPARISON OF TARGET & ACTUAL KPI IN Q1 AND Q2

| Action | Area | KPI Category | Target KPI | Actual KPI | |
|---------------------------------|-----------------|------------------------------|------------|------------|-----|
| | | | | Q1 | Q2 |
| Material Document Issue Process | Non-Stock Items | Proses speed for creating PR | 20% | 20% | 20% |
| | | Proses speed for creating PO | | 20% | 20% |
| | | Proses speed for creating GR | | 20% | 20% |
| | Stock Items | Proses speed for creating PR | 80% | 79% | 76% |
| | | Proses speed for creating PO | | 75% | 75% |
| | | Proses speed for creating GR | | 78% | 76% |

Stock items are the number of on-time document creations during the current month divided by the total document creations during the current month. So, based on the actual KPI achievement, stock items are the problem that needs to be solved. The actual KPI rate of stock items is unsatisfactory because it only averaged 76,5%, whereas the target is 80%. Thus, it has a gap of 3.5%.

Current Process time for Material Document Creation

The process of creating or issuing a PR document takes more than three days, a PO document takes more than seven days, and a GR document takes more than three days. The problem becomes more detailed and specific in this section. The problem breakdown is calculated for six months. The detailed average current process time of the material document creation process in each month is shown in Table III.

TABLE III. THE AVERAGE CURRENT PROCESS TIME OF THE MATERIAL DOCUMENT CREATION PROCESS

| Categories | January (Days) | February (Days) | March (Days) | April (Days) | May (Days) | June (Days) | Average |
|------------|----------------|-----------------|--------------|--------------|------------|-------------|-----------|
| Create PR | 4,99 | 4,9 | 4,78 | 5,09 | 4,67 | 5,12 | 4,9 days |
| Create PO | 21,72 | 23,52 | 22,6 | 21,63 | 21,68 | 21,97 | 22,1 days |
| Create GR | 4,78 | 5,09 | 4,55 | 4,69 | 5,13 | 5,02 | 4,8 days |

Current Business Process Overview

Based on exploring the problem, three main issues were involved: creating PR, PO, and GR. That is why the business process will be analysed in the current system of material document issues. The detailed overall flowchart of the existing material document issue process will be shown in Figure 2.

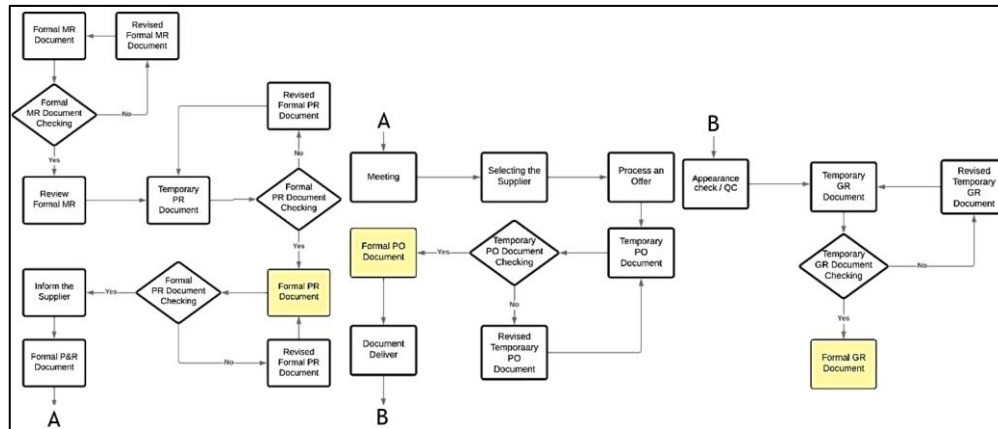


Figure 2. Flowchart of The Current Material Document Issue Process

Current System Analysis and Proposed System Improvement

This sub-chapter will simulate the current business processes (As-Is) and the proposed business processes (To-be). It will analyse the business processes carried out by the PRGS Department based on their components, namely: actors involved, description, document input, document output, and tools. The business process will be conducted using business process model and notation (BPMN) through Bizagi Modeler application. The current business processes include: creating PR, creating PO, and creating GR.

The simulation of the system analysis uses the following rules: simulations were carried out 55 from material document issues per day, based on the average number of material document issue from January to June 2022, all business process times in this business process are applied from the results of direct observation through a time study, each crossing (gateway), for each percentage-divided system in this business process, is applied from the results of direct observation.

Current System Analysis and Proposed System Improvement

The results of the current business process of creating PR analysis can be seen in Table IV.

TABLE IV. CURRENT BUSINESS PROCESS CREATE PR ANALYSIS

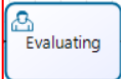
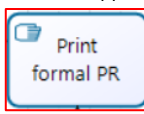
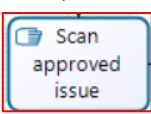
| Problem Analyses | Type of Improvement Tool |
|---|--------------------------|
| On task (Evaluating) | |
|  | Upgrading |

TABLE IV. CURRENT BUSINESS PROCESS CREATE PR ANALYSIS CONTINUE

| Problem Analyses | Type of Improvement Tool |
|---|--------------------------|
| On task (Print formal PR, and scan approved issue) | |
|   | Bureaucracy Elimination |
| On task (Send formal PR, receive formal PR, send revise PR, and receive revise PR) | Upgrading |

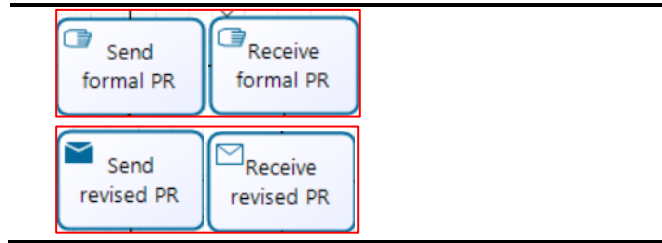


Table IV describes the problems that arise during the business process and the type of improvement tool of creating a purchase requisition (PR). The explanation of the proposed improvements are as follows:

On task (Evaluating)

The current task of evaluating on average, 60 minutes. It indicates the process of issuing, evaluating, and revising formal MR is time-consuming because of the slow computer loading time for each goods catalog and the increase in work at peak sessions. So, it upgrades the performance of the computer so that it is more optimal and faster at processing data. The proposed task of issuing, evaluating, and revising a formal MR takes, on average, 30 minutes.

On task (Print formal PR, and scan approved issue)

The current task of printing a formal PR and scanning an approved issue on average takes 1 minute. It indicates the existing system is still done manually. As a result, it must be printed and scanned. So, the printing and scanning processes will be eliminated.

On task (Send formal PR, receive formal PR, send revised PR, and receive revised PR)

The current tasks of sending formal and revising PR take 1 minute, and receiving formal and revising PR takes 15 seconds. It indicates the existing system process (sending and receiving) is still done manually. So, it must be delivered to the head of divisions or managers, and the person in charge of checking the document is frequently away from the office. So, it must be printed, and the person in charge of checking the document must wait for it to be given for approval; however, when the paper or document is delivered to the heads of divisions or managers, the person in charge of checking the paper or document is frequently not in the office. So, it upgrades the system so that sending and receiving tasks are done automatically using the system. The proposed tasks of sending formal and revising PR each take 2 seconds, and receiving formal and revising PR takes 2 seconds.

The results of the current business process of creating PO analysis can be seen in Table V.

TABLE V. CURRENT BUSINESS PROCESS CREATE PR ANALYSIS

| Problem Analyses | Type of Improvement Tool |
|--|--------------------------------|
| <p>On task (invite discussion, discussion, and result of discussion)</p> <pre> graph TD HeadGP[Head GP] --> PR[PR] PR --> Invite[Invite discussion] Invite --> D1{ } D1 -- Yes --> D2[Discussion] D1 -- No --> D2 D2 --> R1[Result of discussion] R1 --> D3[Discussion] D3 --> R2[Result of discussion] </pre> | <p>Bureaucracy Elimination</p> |

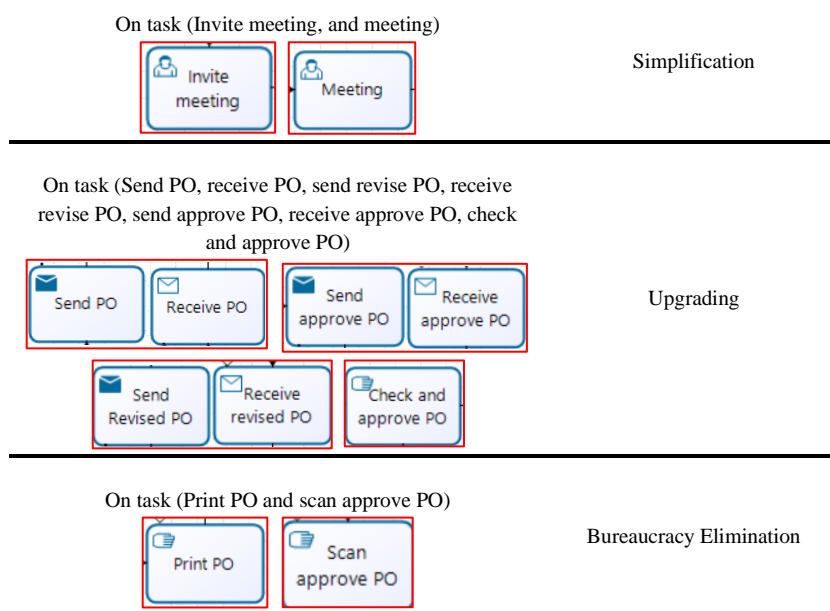


Table V describes the problems that arise during the business process and the type of improvement tool for creating a purchase order (PO). The explanation of the proposed improvements are as follows:

On task (invite discussion, discussion, and result of discussion)

The current task of inviting discussion on average takes 3 minutes, the discussion on average takes 30 minutes, and the result of the discussion on average takes 10 seconds. It indicates the discussion process involves time-consuming and repeated checks because PRGS staff and users with the capability and responsibility have carried out the checks. So, it eliminates the invitation to discuss, the discussion, and the result of the discussion.

On task (Invite meeting, and meeting)

The current task of inviting a meeting takes, on average, 8 minutes, and the meeting takes 180 minutes. It indicates the meeting process is time-consuming. So, online meetings will simplify the meeting process from direct to indirect. The proposed task of inviting a meeting takes on average 1 minute, and the meeting itself takes 60 minutes.

On task (Send PO, receive PO, send revised PO, receive revised PO, send approved PO, receive approved PO, check and approve PO)

The current task of sending PO, receiving PO, revising PO, and approving PO all on average take 1 minute; receiving PO, revising PO, and approving PO all on average take 15 seconds, and checking and approving PO all on average take 5 minutes. It indicates the existing system is time-consuming and can be used by heads of divisions or managers to view and check documents. However, the approval process (signing) is still done manually. So, it must be printed, and the person in charge of checking the document must wait for it to be given for approval; however, when the paper or document is delivered to the heads of divisions or managers, the person in charge of checking the form or document is frequently not in the office. So, it upgrades the approval process (signing) from manual to digital, and the sending and receiving tasks will be done automatically using the system. The proposed task of sending PO, receiving PO, revising PO, and approving PO all on average take 2 seconds, receiving

PO, revising PO, and approving PO all on average take 2 seconds, and checking and approving PO all on average take 3 minutes.

On task (Print PO and scan approve PO)

The current task of printing takes, on average, 1 minute, and scanning the approved PO itself takes, on average, 1 minute. It indicates the existing system is still done manually. As a result, it must be printed and scanned. The printing and scanning processes will be eliminated.

The results of the current business process of creating GR analysis can be seen in Table VI.

TABLE VI. CURRENT BUSINESS PROCESS CREATE GR ANALYSIS


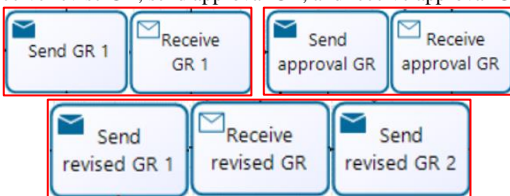
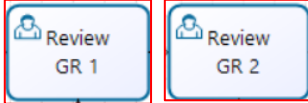
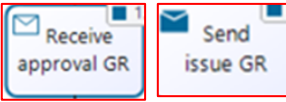
| Problem Analyses | Type of Improvement Tool |
|--|--------------------------|
| <p>On task (Print GR, and scan approval GR)</p>  | Bureaucracy Elimination |
| <p>On task (Send GR 1 & 2, receive GR 1 & 2, send revised GR 1 & 2, receive revise GR, send approval GR, and receive approval GR)</p>  | Upgrading |
| <p>On task (Review GR 1 & 2)</p>  | Upgrading |
| <p>On task (Receive approval GR, and Send issue GR)</p>  | Bureaucracy Elimination |

Table VI describes the problems that arise during the business process and the type of improvement tool for creating a goods receipt (GR). The explanation of the proposed improvements is as follows:

On task (Print GR, and scan approval GR)

The current task of printing GR and scanning GR that has been approved takes 1 minute. It indicates the existing system is still done manually. As a result, it must be printed and scanned. So, eliminate the printing and scanning processes.

On task (Send GR 1 & 2, receive GR 1 & 2, send revised GR 1 & 2, receive revised GR, send approval GR, and receive approval GR)

The current tasks of sending GR 1 & 2, sending revised GR 1, and sending approval GR take 1 minute; receiving GR 1 & 2, receiving revised GR, and receiving approval GR takes 15 seconds. It indicates that the existing system process (sending and receiving) is still done manually. So, it must be delivered to the head of divisions or managers, and the person in charge of checking the document is frequently away from

the office. As a result, it upgrades the system so that sending and receiving tasks are performed automatically by the system. The proposed tasks of sending GR 1 & 2, sending revised GR 1, and sending approval GR each take 2 seconds; receiving GR 1 & 2, receiving revised GR, and receiving approval GR each take 2 seconds.

On task (Review GR 1 & 2)

The current task of reviewing GR 1 and 2 takes 8 minutes. The process of reviewing GR 1 and GR 2 is time-consuming because it takes a necessary amount of waiting time to review the hard copy of GR, and the waiting time for review is increasing at peak sessions. So, it must be delivered to the head of divisions or managers, and the person in charge of checking the document is frequently away from the office. So, it must be printed, and the person in charge of checking the document must wait for it to be given for approval; however, when the paper or document is delivered to the heads of divisions or managers, the person in charge of checking the paper or document is frequently not in the office. So, it simplifies the review process from the hard copy to the soft copy file. The proposed task of reviewing GR 1 and 2 takes 5 minutes..

On task (Receive approval GR, and Send issue GR)

The current task of receiving approval GR and sending issue GR is eliminated because the document is not needed to approve the printing and scanning processes. The approval is done digitally, and from the manager to finance, it is done directly. As a result, the process is eliminated.

Summary of Improvement

This research aims to reduce the processing delay of material document issues through business process improvement. It is necessary to compare the business process between the current and proposed system (see Table VII) and measure the KPI of the proposed system related to processing time. Time plays a crucial role in shaping the manufacturing performance of organisations. Efficient time-based manufacturing has emerged as a significant focal point for global manufacturing entities, enabling them to gain a competitive edge[18].

TABLE VII. COMPARISON BETWEEN THE CURRENT AND PROPOSED SYSTEM

| Area | Current System | Proposed System |
|-----------|---|---|
| Create PR | The task of evaluating is time-consuming because of the slow computer loading time. | Upgrade the computer's performance so the processes are more optimal and faster at processing data. |
| | The task of printing and scanning a document is still done manually. | The print and scan processes will be eliminated. (E-approval) |
| | The tasks of sending and receiving a document are still handled manually. | DOF automates the send-and-receive process. (E-approval) |

TABLE VII. SUMMARY OF IMPROVEMENT (CONTINUED)

| Area | Current System | Proposed System |
|-----------|---|--|
| Create PO | The discussion process involves repeated checks by PRGS staff and users with the capability and responsibility. | The invitation to discuss, the discussion, and the results of the discussion will all be eliminated. |
| | The meeting process is time-consuming. It is necessary to wait for the other parties. | The meeting process will be simplified from direct to indirect through online meetings. |
| | The tasks of sending and receiving a document are still handled manually. | DOF automates the send-and-receive process. (E-approval) |
| | The task of printing and scanning a document is still done manually. | The print and scan processes will be eliminated. (E-approval) |

| | | |
|-----------|--|---|
| Create GR | The task of printing and scanning a document is still done manually. | The print and scan processes will be eliminated. (E-approval) |
| | The tasks of sending and receiving a document are still handled manually. | DOF automates the send and receive process. (E-approval) |
| | The tasks of reviewing a document are still handled manually. | It simplifies the review process from the hard copy file to the soft copy file. |
| | The task of receiving an approval GR and sending an issue GR is needed because it needs to be approved manually. | The approval is already done digitally, and from the manager to finance, it is done directly. As a result, the process is eliminated. |

Comparison of Simulation Results

Comparisons are generated after simulating the current business process and the proposed business process regarding the time comparison results of the simulation results. it can be summarised that the time comparison of the simulation results for creating a PR, a PO, and a GR business process is as follows:

For creating PR

The total time to process the PR-creating business was reduced from the previous four days 12 hours 29 minutes 43 seconds to 3 Days 17 Hours 13 Minutes 4 Seconds. The proposed business process's total time has increased by 17.77%.

For creating PO

The total time to process the business of creating PO was reduced from the previous 10 Days 14 Hours 55 Minutes 43 Seconds to 4 Days 12 Hours 29 Minutes 18 Seconds. The percentage increase in the total time of the proposed business process is 73.03%.

For creating GR

The total time to process the business of creating GR, it reduced from the previous 1 Day 12 Hours 5 Minutes 19 Seconds to 20 Hours 3 Minutes 34 Seconds. The percentage increase in the total time of the proposed business process is 44.42%.

Comparison of Process Time

After simulating the business process of material document issue, the next step to be performed is measuring the processing time after implementing the new business process. The processing time results from January until June 2022 will be compared with those in October or after the proposed system is implemented. The processing time decreases significantly based on the proposed business processes. The detailed process time comparison can be seen in Table VIII.

TABLE VIII. SUMMARY OF PROCESS TIME

| Category | Average Process time for Jan – June 2022 (Days) | Average Process time for October 2022 (Days) | Difference (Days) |
|--------------------|---|--|-------------------|
| PO | 22.19 | 14.93 | 7.26 |
| PR | 4.92 | 3.31 | 1.61 |
| GR | 4.88 | 2.84 | 2.03 |
| Total Process time | 31.99 | 21.09 | 10.90 Days |

As shown in Table VIII, it can be summarised that the time comparison of the simulation results Result of Internal Customer Satisfaction KPI is as follows: the results of create PO, create PR, and create GR, were decreased from the previous in total days of 7.26 days for create PO, 1.61 days for create PR, and 2.03 days for make GR. The processing time in the total time of the proposed business process is 10.90 days. The proposed system can save the material issue processing time by improving the business process.

CONCLUSION

Based on the results of research that has been conducted at a fertiliser company: the causes of process delays of material document issue were not meeting the internal customer satisfaction level of 80% in each category, it has 3.5% gap rate in the internal customer satisfaction KPI. The process of creating the purchase order (PO), purchase requisition (PR), and goods receipt (GR), and the Process time became 53 days or more. The time duration process of the material document issue process is unsatisfied. The fertiliser company's current material document issue process has been delayed because several activities have not been processed quickly, which causes delays in the approval, meeting, and evaluation processes. Some activities will be eliminated, upgraded, or simplified to determine these processes. By using BPI tools that are streamlining and adding some proposed improvements to the system, the system can meet the target of time duration in the material document issue process. The total time of the proposed business process is 10.90 days, an increase of 20.90 days from the current business process of 31.80 days

ACKNOWLEDGMENT

The researcher would like to thank the Industrial Engineering Department of the President University for their encouragement and support. We hope this research can be helpful and developed for further research in the same field.

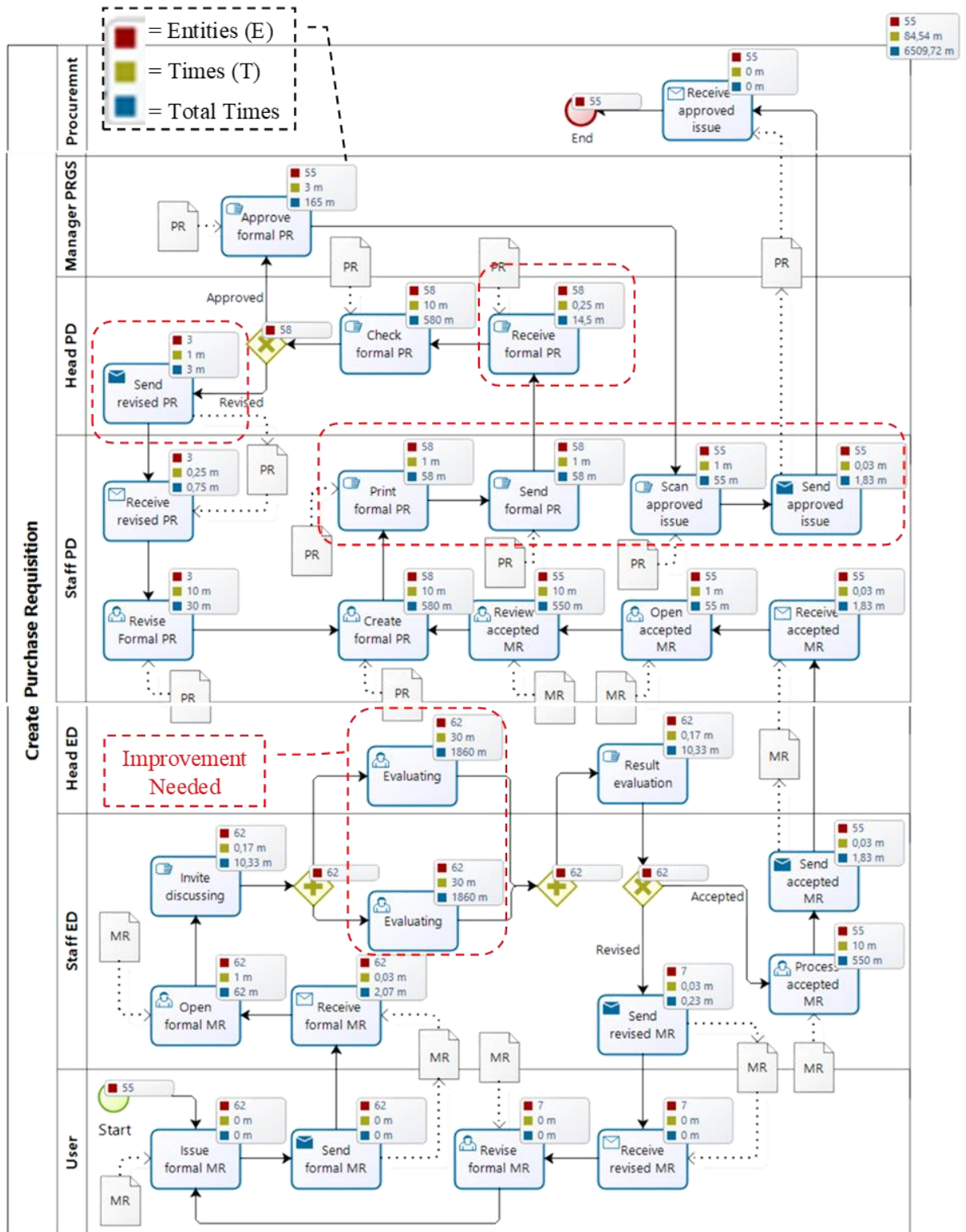
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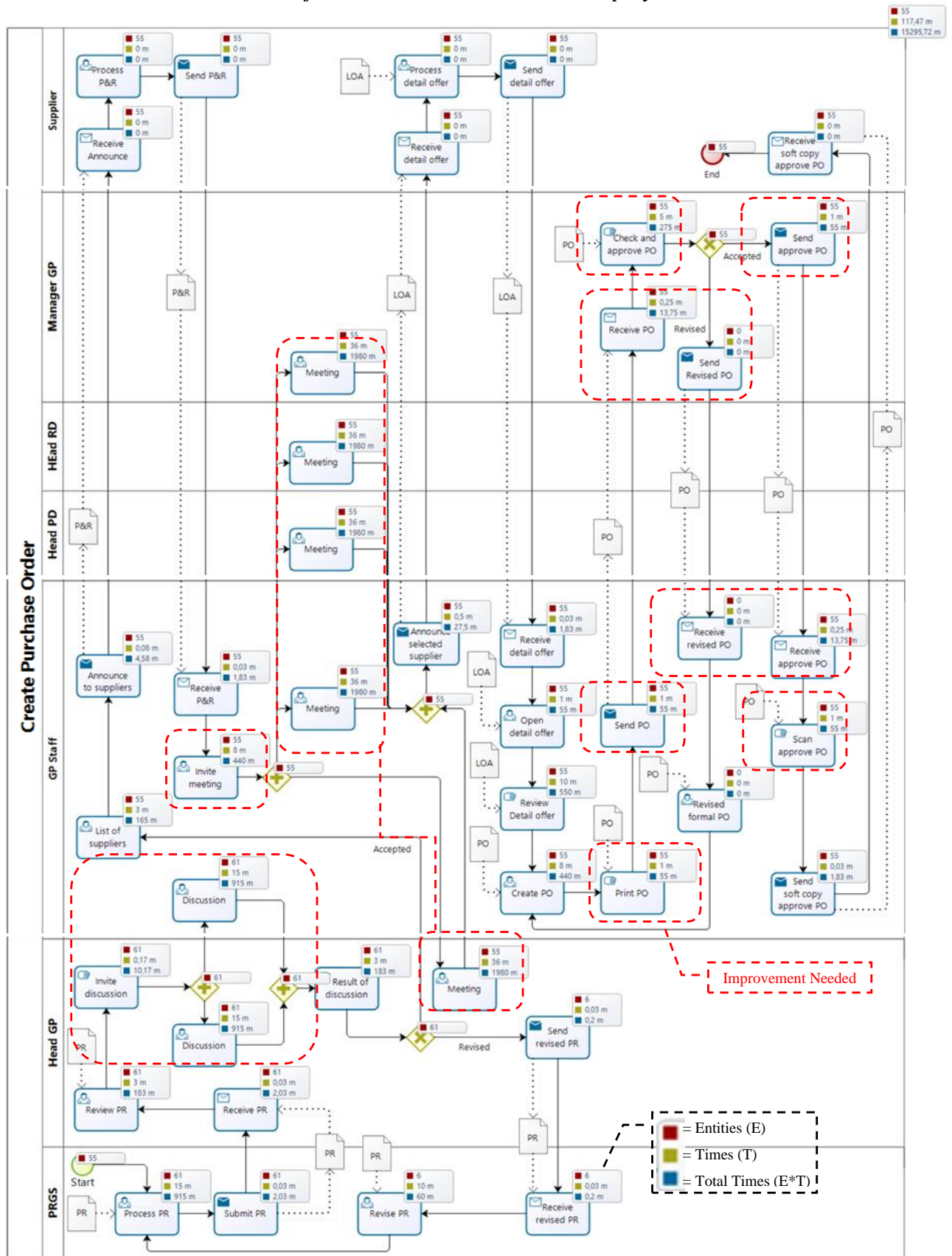
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Appendix

Current BPMN of Create PR Process at Fertilizer Company



Current BPMN of Create PO Process at Fertilizer Company



Current BPMN of Create GR Process at Fertilizer Company

