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Robotic Process Automation in Action: A Use Case in Accounting Task

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Abstracton

Robotic Process Automation (RPA) allows people focus on meaningful tasks rather than transferrable recurring and non-value-added ones. Whereas it provides an opportunity to foster agility and productivity, RPA is also perceived to put accountants at risk as many repetitive processes clinging to the profession can be substituted by the technology. Because there has been minimal research into how RPA is used, this research aims to fill this spot by designing an RPA solution for typical accounting task in telecommunication entity. Design science methodology (DSR) was employed to guide the process of artifact development. Building on the initial as-is process model, RPA-oriented process model was then produced and then processed according to DSR method into an instantiation. The accounting task design result shows substantive progress in average throughput time from pre-RPA task 02:41 minutes to post-RPA of 19 seconds with no error conceded, thus creating 7 times faster processing. The current research is an important breakthrough for organizations to foster adaptive business process, especially in accounting domain.

1. Introduction

Robotic Process Automation (RPA) promotes solution to automate rule-based processes or tasks that are repetitive, structured, and expected in results (Aguirre & Rodriguez, 2017). Soaring number of data business must maintain causes the workload of employees to increase which in turn affects employee's health. Undesired workload becomes the primary reason for work-related stress, depression, or anxiety (UK Health and Safety Executive, 2020). With its capability, RPA comes to be much talked development and increasingly receives attention (Hofmann et al., 2020). The Hype Cycle for Artificial Intelligence puts the technology at the peak of inflated expectations (Gartner, 2021) that has also be among the 12 technologies to impact economy by 2025 (Manyika et al., 2013).

Despite the promise, there is a growing interests and skepticism about how this automation might impact accounting. Accounting still ranks top of the professions to which process automation would bring great benefits and fundamentally transforms its operation. One of the impacts of automation is the shrink in clerical involvement, which

constitutes the main accounting tasks. **Figure 1** shows the decrease in accounting-related task is shrinking in developed countries (USA, Germany, and Japan), while most of the other occupation groups have a positive growth.

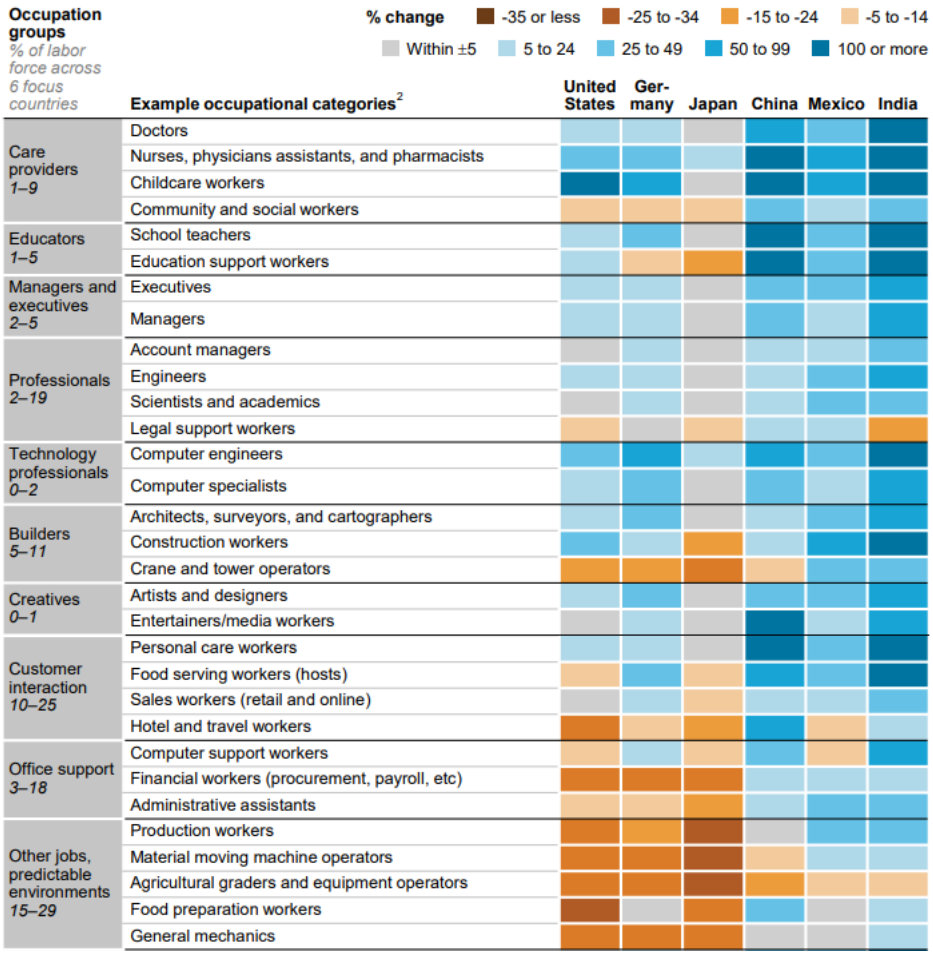

Figure 1. Employment Growth and decline by occupation.
Source: McKinsey Global Institute (Manyika et al., 2017)

RPA has increasingly been adopted in various industries and business processes. Composing the support functions in company's value chain, accounting deals paperwork and administrative tasks subjected to automation. In spite of the rising concern of RPA, there seems less efforts has been devoted on the synoptic development and implementation of RPA in the accounting domains (Hofmann et al., 2020; Kokina & Blanchette, 2019; Syed et al., 2020). To that end, it appears scientifically beneficial to introduce the design and implementation of RPA for accounting domain.

This research may give a prominent contribution to the accounting and business process community in two perspectives. First, it is among the first research about RPA that focuses on the development of an RPA in the accounting domain. The RPA developed will be carried out based on the use case, then throughput after the RPA implementation will evaluated to validate the successfulness of RPA development and implementation in the Invoice process. Second, it explores the opportunity and challenges encountered for someone with an accounting background in developing the RPA. The discussion will provide an insight into how the RPA is developed, operated, and maintained based on the

Invoice processing process to the accountant. The discussion in the following section will be presented from the perspective of an accountant as the RPA user and the RPA developer.

The remainder of this paper proceeds as follows: Section 2 provides prior literature and conceptual foundation. Section 3 discusses the design science methodology along the related RPA use case to be used. The main discussion of the RPA development will be discussed comprehensively in section 4. This section delivered the steps conducted in build the RPA and often on how the RPA will be used after the deployment. Section 5 concludes the overall discussion

2. Literature Review

2.1. Robotic Process Automation

Gartner defines RPA as a productivity enabler to automatically perform certain human-computer interaction tasks which involves keystrokes through one or more scripts (bots) (Gartner, 2021). These bots are used to mimic a selected task or set of ordered activity of an individual. RPA consists of commands that are built without having to involve programming directly, but only based on models and drag and drops operation, imitating human work according to automation criteria. The technology has now also looked at the possibility of combining with intelligent automation to make more complex decisions. Examples of RPA providers includes UiPath, Automation Anywhere, and Blue Prism.

Generally, RPA can be characterized as attended robot, unattended robot, and hybrid robot. But, we use the attended and unattended robot in this research. The attended robots perform tasks which are invoked by human user to handle typical non lucid tasks. Unattended robots do not require human user but rather they are controlled through orchestrator which are usually long process. Orchestrator is a web-based engine that allows system administrator to organize RPA to execute repeated tasks. Readers are recommended to see further explanation in section Derive objectives and solution.

2.2. Related Work

Kokina & Blanchette (2019) are among scholars seek for early evidence of RPA adoption in accounting domain, in particular financial report preparation. They asked companies about their RPA implementation and its effect to their performance. They find that the role of accountants is evolving together with the required skill sets. Many confusions are observed on how to position the professions in parallel with operating the robots.

A recent work also tests the effectiveness and impact of implementing RPA (Aguirre & Rodriguez, 2017). The result is an increase in productivity attributed to RPA adoption, but not in time reduction since employees are used to perform the repetitive tasks. Another study concludes that RPA shows potential in diverse industries (Osman, 2019), including cost-saving and transaction processed. While RPA is beneficial, there are so many things to consider before deploying RPA encompassing software, its impact on organization, scope, and goals. While RPA make the task done easier or faster, there are challenges in terms of governance structure (Hofmann et al., 2020). In the daily practice, some company use center of excellence as the governance body that responsible to monitor and evaluated automation initiative.

2.3. Invoice Processing

The activity commences when a company receive invoice from vendor until the payment made is archived by system. Invoice processing is typically part of expenditure cycle or procure-to-pay, a recurring set of activities and related information processing operations associated with the purchase of and payment for goods and services Romney & Steinbart (2018). Normally it follows this sequence: place order, receive goods, approve vendor charge, and disburse cash. For business, invoice is pivotal for maintaining records related to procurement and demonstrating commitment to customers. To ensure authenticity, internal control is upheld. Among the most frequently used methods are traditional 3-way match and evaluated receipt settlement (2-way match). The 3-way match matches agreed upon information between purchase order, supplier Invoice, and receiving report that essentially marks a true event occurs. The evaluated receipt settlement adopts invoiceless approach with a two-way match of the purchase order and receiving report.

3. Methodology

3.1. Design Science Stages

The current research employs design science methodology that seeks to combine knowledge of solution design and development to enhance an existing system, solve its problems and create new artifact IT artifact (Dresch et al., 2015; Hevner et al., 2004; March & Smith, 1995). Artifacts include construct (theory and idea), model (representations), method (steps or logics to design), and instantiation (operational prototype) (Walls et al., 1992). We put emphasis on designing model and instantiation in which we aim to introduce the model of RPA in a particular accounting setting and eventually propose the working instantiation of RPA-powered invoice processing process.

Design science stages are introduced by Peffer et al. (2008) describing six stages to carry out DSR. Geerts (2011) also echoes the necessity for the stages to signify design science application in the field of accounting information system. Figure 2 re-illustrates the steps that must be taken in conducting research using design science. The blue boxes illustrate each stage, and the orange boxes represent further activities performed at each stage.

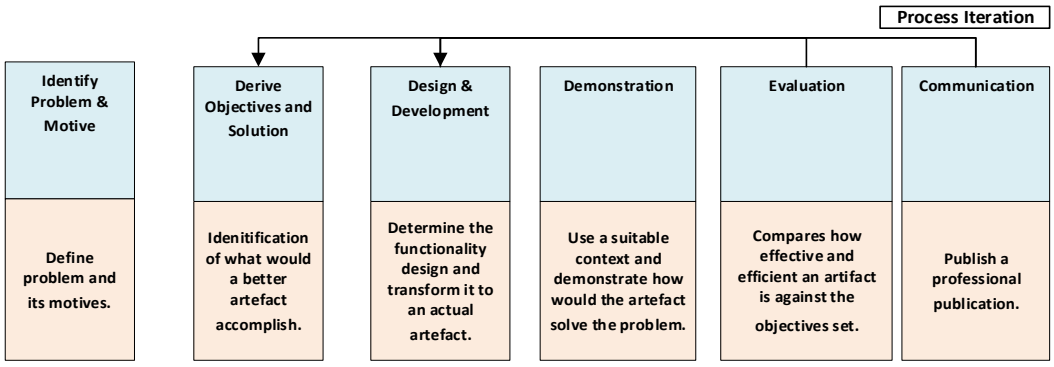

Figure 2 Design Science Research Stages
Source: Peffer et al. (2008)

The first thing that must be done in conducting research using design science research methods is defining the problem being researched. In this study, the

understanding of the problem existed was gained through the as-is model of the use case. The use case will be taken from one of the telecommunication companies in Indonesia and in a form of a narrative and Business Process and Modeling Notation (BPMN) model. The business process portrayed in the use case was conducted among various teams in finance division. Based on the as-is model, we identified which tasks can be automated and which do not, by assessing automation criteria towards each point.

When defining the objectives for a solution, the novelty and purposefulness aspects had to be delivered. An IT artifact must be innovative in order to be able to distinguish itself from previous artifacts and maintain its novelty. Quantitative measurements were conducted using quantitative indicators, such as error time, throughput, and availability (Kokina & Blanchette, 2019). The IT artifact is measured by error time existed and throughput time or time required to complete a task (Geerts, 2011). These indicators were used to assess artifact functionality in terms of productivity and accuracy and would be discussed further in the evaluation phase (Hevner et al., 2004; Hofmann et al., 2020; Kokina & Blanchette, 2019).

The development of RPA used UiPath software which is one leading RPA developer company. The development process was conducted with UiPath tool called UiPath Studio. In this tool, we built an RPA with drag drop and a few and simple programming code (to apply an advanced business logic). After creating a solution, it was then demonstrated. The demonstration will cover how to use an artefact and how it solves the problems from the traditional workflow scenario that have been defined (Geerts, 2011).The evaluation will be conducted by evaluating two indicators, which are the 1) amount of error that emerged and 2) throughput time after implementing the instantiation and compare it with the conditions before implementation. An error can be described as an act that is not right or true. In evaluating the artifact, an error may be identified if the output was not suited to its input (the payment receipt for a specific transaction doesn't match its Invoice). The throughput time (TTP) of a process is defined as the duration from the start to the end of the processing of an order (Trzyna et al., 2012):

$$TTP = Tproc.\ end - Tproc.\ start.$$

TTP	= Throughput Time
Tproc. End	= Time of process

Report was then prepared to communicate every result of the design science stages, including the model, design, demonstration, and evaluation of the artifact.

3.2. Invoice Process Use Case

To address anonymity concern, it was decided to maintain PT Abadi Telekomunikasi as an alternative name. The company is one of the Indonesian companies engaged in providing data communication services, internet & IT Services. PT company's finance division consists of a few teams, some of them are finance (Fin), Cash Management

(CM), and verification administration (VA). The Documents incorporating the invoice-to-pay process include:

1. PO (Purchase order): a procurement contract between company and vendor.
2. FPP : payment request form to pay an Invoice upon senior manager approval.
3. BPB: journal entry sheet for FPP submitted by applicants for vendor payment processing.
4. Invoice: Bills from vendors for services / goods consumed by the company.
5. Transfer Letter *(Surat Transfer*): internal document whose purpose of asking general manger and/or other Board of directors' approval to pay the FPP or Invoice.
6. Tax Invoice (*Tax Invoice*) is proof of tax collection by PKP which delivers Taxable Goods (*BKP*) or Taxable Services (*JKP*).
7. Payment receipt is proof of payment that has been made by the bank.
8. CRR (Cash realization report) is a report to show company's activity that involving its cash asset.
9. PDR (Payment delay report) is internal document to summarize payment application that was being postponed
10. BAST (Minutes of handover*)* is a letter indicating that the work has been completed implemented by vendors

4. Results and Discussions

This section describes how the robotic process automation (RPA) instantiation in the accounting domain developed. The development of RPA in this study uses an Invoice-to-payment or Invoice processing process in one of the telecommunication companies in Indonesia (for the purpose of anonymity, we called it PT Abadi Telekomunikasi). Based on the existing as-is process model, an IT artifact model of RPA based automated process was created through a reengineering process. This process of reengineering seeks to eliminate errors or redundancy in the flow that existed in the as-is process. At the same time, it also identifies processes that meet the automation criteria. This model will then be used as a reference for RPA development.

From problem observation, both tremendous amount of document processed in a single day and an inefficient process may lead to disarming the organization's advantages. Accountant professionals are advantaged in understanding the business process that leads to spotting the problem.

As this research used a model to gain a deeper understanding of the problem, this research implement the approach used by Gonzalez-huerta et al., (2017) to build a model artifact : refine the as-is model, apply process re-engineering, and use to-be model. In the process re-engineering, we also use an automation matrix to identified the process eligible to be automated using noun-verb labelling style built by Leopold et al., (2010). The result of this transformation process is consisting of to-be process model and RPA based automated process.

4.1. As-Is Process

The as-is process model used in this research is adopted the as-is business process in processing payment requests in PT Abadi Telekomunikasi. Though Gonzalez-huerta et al. (2017) suggests that the as-is process from an organization sometimes can be incomplete

or incorrect, the defect can not be detected due to research limitations to get access to interview or questioning users.

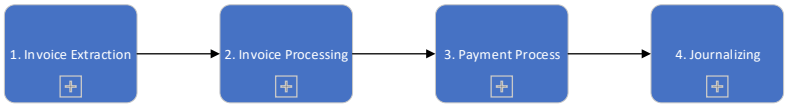

Figure 3. General Process of Invoice Processing in PT Abadi Telekomunikasi

The Invoice processing in PT Abadi Telekomunikasi consists of four groups of activity, namely Invoice extraction, Invoice processing, payment process, and Journalizing. This process involves both internal and external parties in its process. In this model, the day-to-day operation use a custom entity resource planning (ERP) as its information system infrastructure, third party's application (tax recorder from Indonesia's internal revenue service), and Microsoft Office suites.

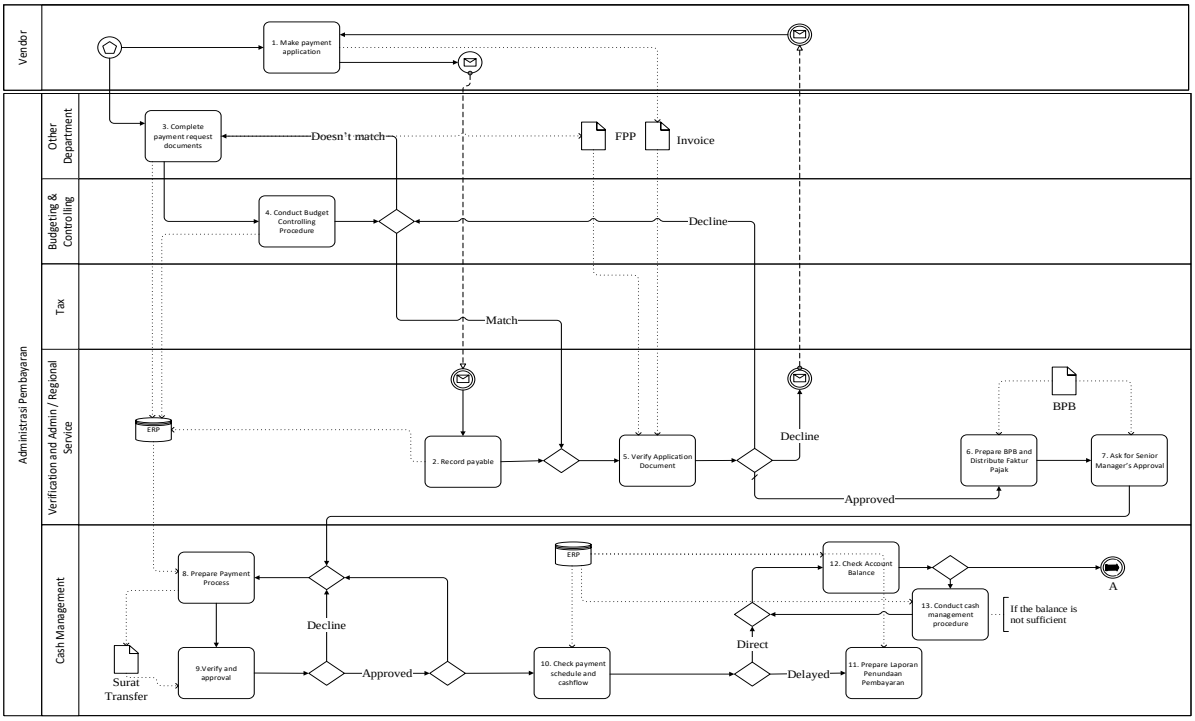

Figure 4 Preview As-Is Process BPMN Diagram[1]

In the as-is process depicted by figure 4, the matching process among invoice and its supporting documents is taken place in task number five in table 1 (VA verifies the application documents - FPP, Invoice, BAST, Tax Invoice, ERP. The matching process is using 3-way match account payable. Even though the picture only highlights the Invoice, FPP, and the data in the ERP in this task, table 1 provides greater detail. The company has several internal control mechanisms to prevent error and fraud. A user or developer with accounting background will identify these controls more easily to build a representative

[1] The task number in the BPMN model is correspond to the as-is process description in table 1

model. Apart from invoice matching task in task number five in table 1, internal controls can be identified directly and indirectly from the table.

Table 1 As-Is Process

No	Task description
1	Vendor sends payment application, Invoice, and other supporting documents.
2	VA records payable in ERP based on vendor's Invoice
3	For FPP, user completes documents (Invoice, Tax Invoice, and FPP) and input non-contract payment application in the ERP
4	User validates budget in ERP (If it does not match, go back to process 3)
5	VA verifies the application documents (FPP, Invoice, BAST, Tax Invoice, ERP)
6	VA prints BPB, then distribute its hard copy along with Tax Invoice.
7	VA asks for manager approval regarding BPB
8	CM prepares payment process in ERP and generate Transfer Letter
9	CM asks for assistant manager's and manager's approval regarding Transfer Letter (If it rejected, go back to process 8)
10	CM prints payment schedule and cash flow in ERP (If the payment can be delayed go to process no. 11, if it's not then back to process no. 12)
11	CM creates Postponed Payment Report (If the payment delayed)
14	CM manager authorizes Transfer Letter
15	Finance asks for General Manager's authorization
16	If Transfer Letter ranges from 50-100 million rupiah, it requires the authorization of 1 director
17	If Transfer Letter more than 100 million rupiah, it requires the authorization of 1 director
18	If Transfer Letter less than 50 million rupiah, CM directly set payment method
19	If payment is by check, the check is sent to the user and the vendor. The vendor provides the TTD of receipt of the check
20	If payment is by bank transfer,
21	CM sends transfer receipt to vendor and user
22	CM generates encryption file
23	CM conducts authorization approval process with bank
24	Bank conduct releaser authorization process with Tim Finance
25	Transfer process is carried out by Bank
26	Bank send payment receipt to vendor and user
27	CM print payment receipt
28	CM prints Daily Journal and CRR in ERP
29	VA prepares proof of payment numbering and archives
30	Vendor receives payment receipt based on Invoice

12	CM Checks balance in the account		
13	CM conducts Cash Management procedure (If the balance is not sufficient)		

4.2. Re-engineering Automation Pattern

The process re-engineering attempts to improve the as-is process and identify task that fit to the automation criteria. The output of the re-engineering process will be delivered in two formats, 1) To-be process model, which changed the process sequences or task characteristics to improve process and reduce the pain points, and 2) RPA based automated process model, which focus on develop a model focused on certain processes to be automated.

As the to-be process aims to improve the process by encountering the pain point in the as-is process, researchers strived to maximize certain fitness function that embraces the automation possibility. Eliminating non-activity tasks performed within the company and breaking down the task into more granular to accommodate the requirement of RPA's implementation was then specified.

In identifying automation patterns, we used an approach used a noun-verb labeling style discussed by Leopold et al., (2010). This labeling style was used to support identifying automation pattern processes. Each label was tested against automation criteria, which repetitive task, rule-based, and structured data. If the task met each criteria (Y=yes), then the task can be categorized as "eligible" to be automated using RPA as shown in table 2. From 30 tasks in invoice processing process, eight tasks were eligible for RPA automation. These tasks mostly consisted of print, generate, send, send e-mail, and receive e-mail. Meanwhile, approval, decision, manual task (Handling physique documents), and input data from unstructured documents were ineligible for automation.

Table 2 Pattern Identification Matrix

No	Process description	Verb (Activity)	Noun (Document)	Actor (Person)	Repetitive task	Rule-Based	Structured Data	Automation Eligibility
1	Vendor send payment application, invoice, and other supporting documents	Send	Payment application	Vendor	N	N	N	Ineligible
2	VA record payable in ERP based on vendor's	Record	Payable	VA	Y	Y	Y	Eligible*

No	Process description	Verb (Activity)	Noun (Document)	Actor (Person)	Repetitive task	Rule-Based	Structured Data	Automation Eligibility
	e-mail and invoice							
3	User complete documents (Invoice, Tax Invoice, Payment Request form) and input non-contract payment application in ERP	Complete Input	Document Data	User User	Y Y	N N	Y N	Ineligible Ineligible Ineligible
4	User validates budget in ERP (If it does not match, go back to process 3)	Verify	Payment through budgeting	User	N	N	N	

4.3. To-Be Process

The to-be RPA-based model is shown in BPMN portrayed by figure 5 and 6. In these figures, the automated tasks will be shown in green color and unautomated in plain color. As complementary to these figures, the task will be written in detailed description sequentially. To enable the RPA running the task, a few tasks were transformed such as task number four showing that user must send an excel table to VA instead of input it in ERP. Many task variances in a single process, plus the intensity of this process were found that contributed to an increasing employee's workload which could push a rush in a throughput time and vulnerable to error (Trzyna et al., 2012). Therefore, the RPA is one of the best technology to solve these problems (Aguirre & Rodriguez, 2017; Kokina & Blanchette, 2019).

To improve RPA's functionality, the description will discuss the appropriate robot types (attended or unattended robot) for each task. The robot type for each task may vary due to the task's properties and requirements. This will help the developer to understand how the robot should work to meet the user's goal. Adopting a model as a reference in developing the RPA potentially prevents the risk of the undesired or delayed output of this

project. In the following points, each task is described in a way of the RPA will be carried out and its robot types

1. VA records payable based on FPP and Invoice approved **(Unattended robot)**
2. VA sends notification if the application cannot be proceeded **(Unattended robot)**.
3. VA prepares BPB **(Attended robot)**
4. VA sends BPB to tax by e-mail **(Unattended robot)**
5. CM prepares Transfer Letter **(Attended robot)**
6. CM creates PDR, if the payment is delayed (**Attended robot**)
7. CM prints payment receipt **(Unattended robot)**
8. CM prepares CRR **(Unattended robot)**

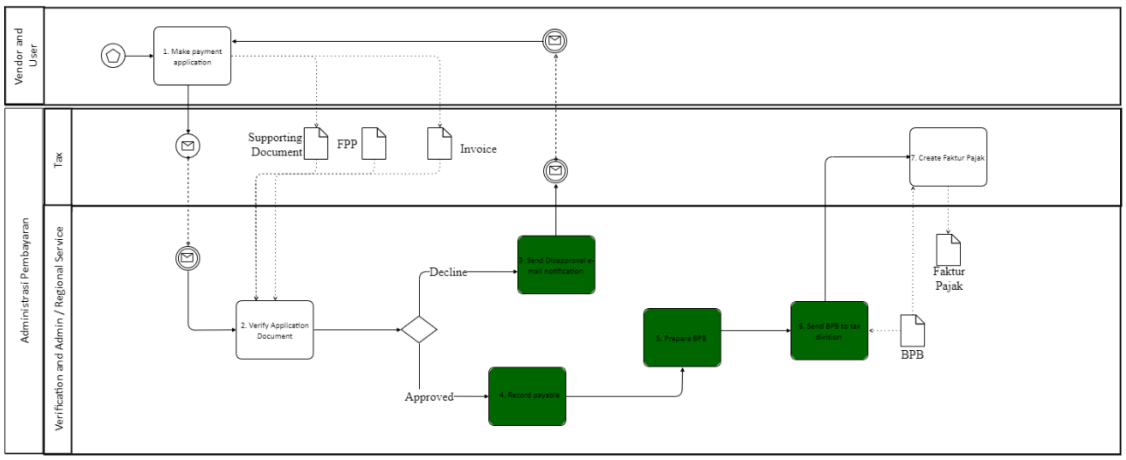

Figure 5**Error! No text of specified style in document.** RPA Based Automated Process Model

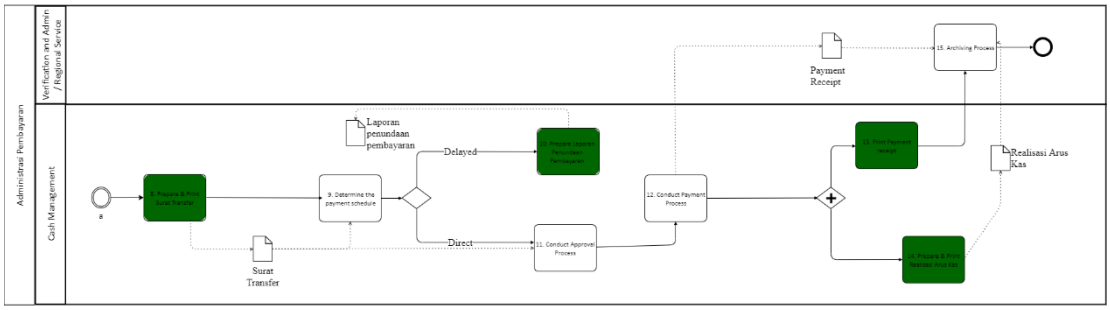

Figure 6 RPA Based Automated Process Model (Cont.)

4.4. Derive objectives and solution

As the instantiation of this research, the RPA solution in Invoice processing will be evaluated based on its throughput time and the number of errors that emerged during Invoice processing process execution. The evaluation will validate whether the RPA solution will bring down the throughput times and errors in Invoice processing. According to RPA based automated process, eight robots are going to be built in this research. Each robot is developed by UiPath Studio X, which by default requires the user to have some background in coding.

In developing a robot, UiPath provides multiple options to perform a certain thing by a template manager that helps the user to indicate or point which information that will be extracted by the robot. Once the development is completed and the robot moves to production or engages state, the robot will identify each document based on this template. The robot will produce a confidence percentage of each information in each document and extract it. If the document extracted has the same template or format as the document in the template manager, the robot will tend to produce a high confidence level. But, if the document is different from the template, then the confidence level produced will be small, or even worse, the robot cannot identify the appropriate information.

In order for the user to use the ready-to-use robot, the process prototype has to be published to the orchestrator platform provided by UiPath. After the process is published to the orchestrator, the robot has to be managed to perform as expected. The user, the unattended robot, the machine, and the process have to be tuned up (see the Figure 7 below that illustrates the steps required). In the beginning, the user is created by sending an invitation to the user's email whose roles are already recorded according to the respective authorization. Next, assign the unattended robot to a user in the user section. Then, set and deploy the machine[2] to the folder project. Set a process and its trigger setting, to specific

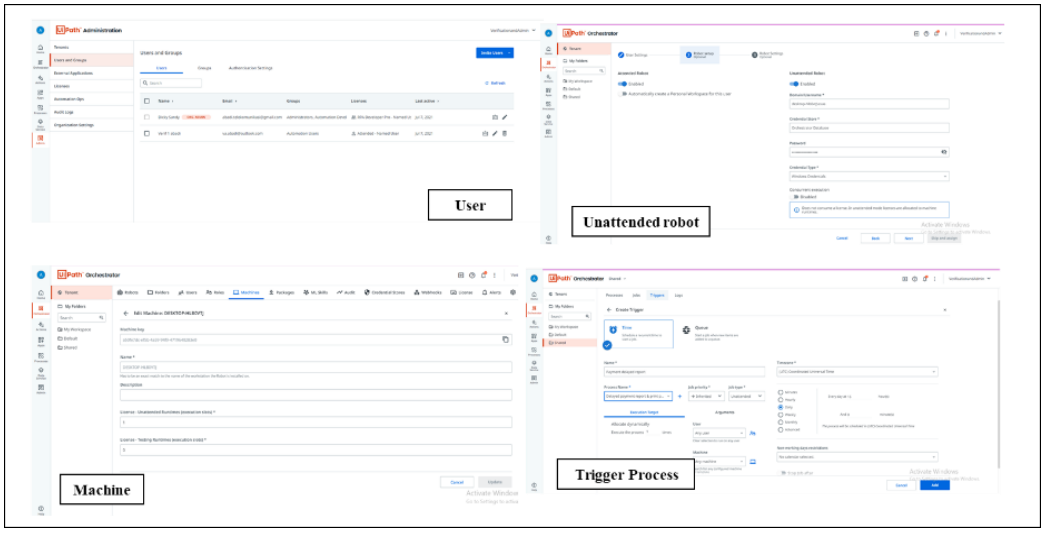

Figure 7. Deployment Process.

times or sequences (E.g., the robot will run after the previous robot running is complete).

4.5. Evaluation

A technology created may sound really breakthrough or innovative, but if it cannot work properly, its value will be diminished. The evaluation is needed to prove artifact functionality and its capability to fulfill the people's expectations of it. In this study, the evaluation was conducted by evaluating two indicators, which are the 1) throughput and 2) amount of error that emerged after implementing the artifact and compare it with the

[2] In Orchestrator, a machine entity works as an API key generator, which authorizes the connection between the UiPath Robot and Orchestrator (https://docs.uipath.com/orchestrator/docs/about-machines) .

conditions before implementation. The throughput times before the RPA implementation is measured based on the end time minus the start time using a timer.

Table 2 User Role

Description	Roles	E-mail	Password
Admin	Admin	abadi.telekomunikasi@ outlook.com	xxxx
VA	Automation User	va.abadi@outlook.com	dipatiukur662
CM	Automation User	cm.abadi@outlook.com	jatinangor626

The eight robots created in this research aim to mimic human work. The result is shown in Table 3 below. Please note that the last robot performs two unattended tasks, task 7 and 8. In the first task, record payable, a human worker extract Invoice and store it in a payable table in 02:51 minutes, meanwhile the robot performed the same task in 7 seconds. The second task, send a notification, can be performed by the user in 01:30 minutes, meanwhile the robot requires 4 seconds. The third task, processing BPB, takes 01:45 minutes to be completed by the user, but only takes 25 seconds for robot to finished it. The fourth task, sending the BPB, requires 01:30 minutes for user and 5 seconds for robots to be completed. The fifth task is preparing the Transfer Letter, the user needs 05:28 minutes, while the robot needs 40 seconds to download BPB, prepare Transfer Letter, and send it. The sixth process, created postponed payment report, takes the user three minutes to download attachment and prepare Postponed Payment Report, while the robot needs 14 seconds. The seventh and eight tasks is performed by a single robot, this merger occurred to improve the automation performances, as both processes can be performed simultaneously. The robot can produce CRR, print it along with the Payment Receipt in 19 seconds, while the user will need 02:41 minutes to complete it.

On one hand the average throughput time of the process in manual workflow setting is 2 minutes and 41 seconds and has occasional errors. On the other hand, the process after the RPA implementation shows an improvement in terms of these factors. The throughput time is reduced to 19 seconds with 0 error recorded (Refer to table 4 below). In total, the instantiation reduced throughput times by 745% or 7 times faster. A reduction in throughput times an RPA brings proves that this technology functionality helps the human employee by automate the repetitive tasks efficiently. This result exceeds the 20% improvement in productivity as result in Aguirre & Rodriguez (2017). The difference in productivity improvement percentage in our research and their research is may vary and driven by how long does the worker has been perform the task manually. As they suggest that a worker, who do a task for a short period of time, is not familiar with it and requires more times to do it. After all, our research emphasizes (Aguirre & Rodriguez, 2017) finding that an improvement of productivity after RPA implementation is proven.

Table 3 Evaluation Result

No	Process Name	Evaluation Indicator				Actual Functional Output
		Manual Process		Automated Process (RPA)		
		Throughput Time*	Error	Throughput Time*	Error	
1	Record payable	00:02:51	0	00:00:07	0	Extract invoice and store it in payable table.
2	Send rejection notification	00:01:30	0	00:00:04	0	Send email to vendor/user about incomplete document.
3	Preparing BPB	00:01:45	1	00:00:25	0	Creates BPB based on invoice and FPP.
4	Send email (BPB) to tax department	00:01:30	0	00:00:05	0	Send BPB to other users.
5	Preparing Transfer Letter	00:05:28	0	00:00:40	0	Download BPB, prepare Transfer Letter, and send it.
6	Creates Postponed Payment Report	00:02:40	0	00:00:14	0	Download attachment and prepare Postponed Payment Report
7	Prints payment receipt and prepares Cash Realization Report	00:03:00	0	00:00:38	0	Download payment receipt, prepare Cash Realization Report, print it along with payment receipt
	Average through times	0:02:41		0:00:19		**Improvements 745%**

**(HH:MM:SS)*

5. Conclusions

IT artifacts are correlated toward each other as the "theory" (construct) stipulates "the effective development practice" (method) to develop "a solution" (instantiation) for "a particular class of user requirements" (models) (Walls et al., 1992). Using this conclusion, this research attempts to harmonizing 2 IT artifacts with an instantiation as the end goal. These will provide a perspective on how to create robotic process automation (RPA) based on an Invoice processing business process of a telecommunication company in Indonesia using design science research methods popularized (Peffer et al., 2008).

A model (one of the IT artifacts produced in design research) may aid to understand the problem and solution required (Gonzalez-huerta et al., 2017). Based on that reason, we set the IT artifact model in the problem identification stage or the first stage. In developing the IT artifact model, the researcher uses the as-is process model that exists in a telecommunications company in Indonesia. Next, we attempts to use the approach

proposed by Gonzalez-huerta et al. (2017) in processing as-is proses to become a to-be proses model. That research performed a model transformation in 3 steps. These steps begin with 1) refining the as-is model, 2) apply process re-engineering and automation patterns to generate a to-be model, and the last 3) use to-be model developed to derive analysis and for the later use (especially for the purpose of solution development), which will be used to develop RPA based automated process. Other than this approach, the researcher also use the noun-verb labeling style proposed by Leopold et al., (2010). The RPA based automated process model may consider as the reference of the instantiation, as it will be the researcher's reference when developing it.

As the reference used in developing the instantiation, the automated process model from Invoice processing activity in one of the telecommunication companies in Indonesia consists of 8 automated processes and 7 unautomated processes. The automated process starts from the recording payable, sending application rejection, preparing BPB, sending BPB, preparing Transfer Letter, preparing Postponed Payment Report, printing payment receipt, and preparing CRR. These processes are categorized as an automated process since they are repetitive processes, doesn't involve human judgment, and have standardized input (Aguirre & Rodriguez, 2017).

The instantiation developed is using RPA Studio provided by UiPath, one of the hottest RPA provider powerhouses in the world. For this particular research scope, there are 8 out of 35 processes that can be automated. The instantiation performs each process in less than 40 seconds and on average by 19 seconds by the robot and no failed process. Compared to the previous manual setting, where the throughput time exceeds 01:30 minutes or 2 minutes and 41 seconds on average. RPA implementation reduces throughput time up to 745% or performed 7 times faster than before the RPA implementation.

Finally, it can be said that implementing Robotic Process Automation (RPA) in the accounting domain is an important breakthrough. The instantiation developed in this research is successful, as the robot running in an efficient way and no error. Therefore, we are confident that RPA is showing a promising future for the user to be more automated. Moreover, Gartner predicts in the next four years, or by 2024 almost half of all new RPA clients will be business user or non-IT department. Arising of RPA in the future will let accountant and other business user explore his skill relating to RPA related skills, such as business improvement, RPA development, dan automation governance (Kokina & Blanchette, 2019) more easily due to his familiarity with business process.

The following are suggestions for development proposed for further research, including: 1) Use a real case so artifact can be implemented directly. 2) Escalate the RPA capability by use hyper-automation that will implement machine learning to produce a judgment (based on criteria). 3) Connect the RPA to the ERP system to show how these technologies hand-in-hand support user to democratize his work.

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