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The Assessment of Robotic Process Automation Projects with a Portfolio Analysis: First Step - Evaluation Criteria Identification and Introduction of the Portfolio Concept

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Abstract: RPA's (Robotic Process Automation) usage in organizations has rapidly increased in recent years; as a result, companies have developed high expectations from this technology. However, according to Ernst & Young (E&Y), 30-50% of observed RPA projects initially fail and reveal several risks, which lead to investment losses. Consequently, the RPA project is prematurely retired, and the company is back to the manual process. This premature retirement is mainly because of wrong process selection and the not sufficient company automation (RPA) maturity. Therefore, this paper will introduce the concept of an RPA Portfolio, which will assess the complexity of business processes with a company's automation (RPA) maturity. The RPA Portfolio is a new innovative concept to simplify and visualize the business process selection for RPA projects, and will help to introduce successfully the right RPA projects.

Keywords: automation maturity; business process; portfolio; robotic process automation; technology assessment

1 INTRODUCTION

Robotic Process Automation (RPA) is a technology that emulates humans in executing repetitive and rule-based tasks in the office [1]. In comparison to other modes of business process automation, RPA bots act at the front-end level of the application such as understanding the text on the desktop screen, completing the keystrokes on the keyboard, identifying, and extracting data on the website or digital document, and other activities which require human-computer interaction [2, 3].

Currently, RPA is not wanted by large companies only, but also by SMEs (Small and Medium Sized Enterprises) [4]. Adopting RPA in SMEs is like hiring assistants for a fraction of the cost, and empowering employees to do high-value-added tasks [4]. SMEs can leverage the instant benefits of RPA such as increasing productivity, reducing operational costs, and improving the quality of customer services. In a nutshell, RPA can benefit SMEs to scale up their operations and revenues [5].

Once the foundation of RPA is started, any bot implemented will undergo a maintenance and monitoring phase [6, 7]. The Maintenance cost is sometimes higher than the implementation cost. It depends on the number of bots and the complexity of the process [8]. This condition burdens companies with a longer period of return on investment (ROI). On the other hand, without maintenance, the error rate of bots will increase, and more time will be spent fixing the errors [9]. This dilemma leads decision-makers to drop Bots before reaping the benefits and returning to manual processes [10, 11]. To avoid this circumstance, companies should select the right process by considering its complexity as well as the maturity of their automation. This research will provide a scientific approach that can help the company to select the best business process and assess its automation maturity, by answering the following research questions:

- How to identify the process selection criteria to evaluate the RPA project?
- How to identify the automation maturity criteria of an organization?

2 STATE OF KNOWLEDGE

2.1 The Challenges of RPA and Automation Maturity in the Organization

Companies have been increasingly adopting RPA in the last few years for automating their time-consuming, error-prone, and highly expensive business processes [12]. However, the challenges to adopting RPA are also enormous, which are defined into three dimensions:

- **Organizational:** (1) the inability to prioritize RPA initiatives related to process selection, (2) aversion to risk, (3) limited RPA skills and talents, and (4) little sense of urgency [10].
- **Technological:** (1) concerns about cybersecurity and data privacy, (2) difficulty in scaling applications, and (3) the difficulty of deciding on the best applications [13, 14].
- **Financial:** (1). High Implementation Costs, (2). Making better and more convincing business cases and (3) regulatory constraints [8, 15].

When all the challenges have been accounted for, the next step is to measure the automation maturity of the organization, so the company can understand where they currently stand and where they need to go in the future. According to Kumar (2016), The Company's automation maturity consists of five levels:

- **Level 1 Ad hoc**: the automation is not a planned activity, but it happens in small-small pockets across teams at different levels on a need basis. There is no management, and budget allocation.
- **Level 2 Opportunistic:** the automation is addressed to the specific issue, such as providing 24/7 service. At this level, the organization starts to create formal evaluation & governance tools and budget allocation.

- **Level 3 Systematic:** at this level, the organization evaluates the automation initiatives, which means exploring areas of automation to achieve defined levels of accuracy, productivity, and quality.
- **Level 4 Institutionalized:** at this level, automation initiatives are taken up at the organization with a portfolio of different solution providers and tools. Automation becomes the way of life and there is a documented automation strategy. It includes the usage of advanced technologies such as machine learning, artificial intelligence, optical character recognition, natural language processing, chatbots, and so on.
- **Level 5 Adaptive:** at this highest level of automation, the automated process becomes adaptive to the changing demands of the business. The selected automation technology has the capabilities of self-learning, self-healing, auto-scaling, auto-optimization, and so on [16].

2.2 The Overview of RPA Process Selection

Before implementing RPA, organizations must be able to identify what types of processes can be automated. Fung (2014) suggested that non-complex processes with high repetition and high human error should be prioritized. Meanwhile, Tripathi, (2018) required more detail, that the process should have (1) repetitive steps, (2) time-consuming, (3) high risk, (4) low-added value, and (5) involving many people in multiple steps. Nevertheless, the other process is deserving to be automated, if (1) it is well-defined by rule-based task, (2) it has logic steps, (3) the input of the process can be diverted to the software system, (4) the output process is accessible and (5) the benefit of automation is higher than the cost [1, 17].

Doguc (2020) suggests that volume is a considerable factor to prioritize which processes deserve to be automated by RPA. The process with high volume and repetition should be selected first. While Capgemini Consultant (2017) and Siderska (2020) argue that the process complexity has a significant role to determine the best process for RPA [18–20].

3 RESEARCH METHODOLOGY

3.1 Systematic Literature Research (SLR)

According to Huelin and Payne (2015), SLR is a type of scientific study that is designed to address a specific research problem or question by collecting all the available information on a topic that is being defined at the outset by absolute inclusion and exclusion criteria [21, 22]. This research used SLR to synthesize existing scientific contributions about the topic: *the failures and challenges of RPA projects*, with searching queries: *RPA, robotic process automation, RPA benefits, robotic process automation benefits, RPA used cases, robotic process automation used cases, RPA challenges, robotic process automation challenges, RPA failures, and robotic process automation failures*.

SLR started by focusing on Computer Science databases such as ACM Digital Library and IEEE Xplore. Later, the literature search was extended to multidisciplinary databases such as Science Direct, Research Gate, and SpringerLink. Following this strategy, 574 academic contributions were found. Through title, keyword, and abstract analysis, 56 contributions remained. Subsequently, through full-text analysis, SLR identified only 13 contributions that are relevant to answer the research questions (see Fig. 1).

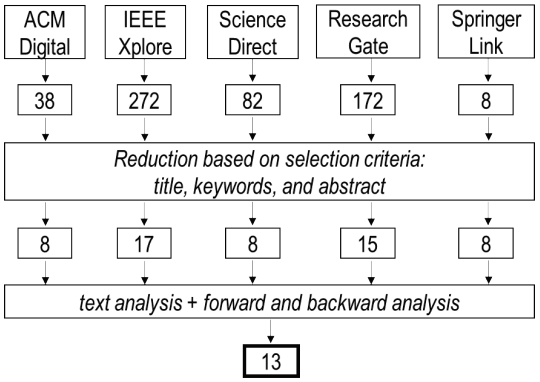

Figure 1 Result of the Systematic Literature Research

Since only $n = 13$ contributions dealing with challenges and failures were found, so, this was extended to Google search, where grey literature such as statistic reports, articles, and white papers from consulting firms and software development companies, describe real-world RPA challenges and failure reasons. As a result, in total $n = 35$ contributions were listed from academia and practitioner.

3.2 Expert Interviews and Questionnaires

Using RPA or Robotic Process Automation as a keyword, several experts were identified from the LinkedIn and LinkedIn groups such as "Robotic Process Automation (RPA), RPA (Robotic Process Automation) professionals Australia, Robotic Process Automation (RPA) / IPA / Artificial Intelligence / Machine Learning / Analytics, RPA Gurus Direct – India, RPA (Robotic Process Automation), VBA Excel & Access, Training, Jobs, Process Automation Solution" but only a few agreed to support this research topic that is 20 and out of it only 12 agreed for a detailed conversation over the telephone, but the expert questionnaires were filled by everybody. Due to the novelty of the topic and the low number of potential interviews locally, only telephonic interviews via Microsoft Teams and Zoom were opted to enable synchronous communication.

The interviews have not been recorded due to privacy constraints, but their ideas have been captured verbally and define the criteria for evaluating business process BP complexity and the criteria for measuring RPA's maturity model (see Tab. 1).

All the interviewees were from these backgrounds, some were Internal Consultants, some External Consultants, RPA Providers, RPA developers, and RPA leads. The average company size of every interviewee was more than 500 employees. The interviews were held from the time span of April to June 2022.

Table 1 Expert Interviewees

Interview	Date	Role	Company Size
I1	09.05.2022	Global Head - Intelligent Automation	48,500
I2	09.05.2022	Director Intelligent Automation	5,000
I3	13.05.2022	Principal Consultant	950
I4	16.05.2022	Internal Consultant	310,000
I5	18.05.2022	Senior Manager - Digital Transformation	55,000
I6	25.05.2022	RPA Lead	112,000
I7	31.05.2022	RPA Lead	29,800
I8	06.06.2022	Chief Transformation Officer - Intelligent Automation	130,000
I9	08.06.2022	RPA Lead	34,200
I10	15.06.2022	RPA Expert	1,000
I11	22.06.2022	External Consultant	8,000
I12	22.06.2022	Internal Consultant	500

4 RESULTS

4.1 General Overview

RPA is valuable to organizations that have many manual tasks typically performed on a daily, weekly, or monthly basis. However, not all organizations are successful to adopt RPA into their business process. It is a common tendency for organizations to shine on the R of Robotics and A of Automation but forget the P of Process in R-P-A).

According to SSON Analytics and Hofmann et al, 2019, "wrong process selection" is the leading cause of RPA project failures followed by "wrong tool selection", "insufficient change management support", and "lack of experience" [23, 24]. Shortlisting the wrong process to automate can cause the greatest headaches and is generally related to a highly complex, multi-step process that may contra productive with the goal of automation [25]. This condition will tarnish RPA's good name and be considered a technological "failure" which should have been avoided with more strategic anticipation in evaluating the process.

4.2 Criteria to Evaluate Business Process Complexity

Different RPA vendors have their own way of evaluating the business process complexity. Therefore, it is important that RPA should not simply be implemented to support the "as-is" process, without examining the current processes and identifying areas for improvement [26]. Examining the process from end-to-end with a clear focus on automation can help identify steps or sub-processes, which need to be simplified, standardized, and eliminated. Organizations should evaluate current business process's performance and review relevant business practices for immediate impactful improvements.

Table 2 Criteria to Evaluate Business Process Complexity

Evaluation Criteria	Definition	Effect on BP Complexity
Input Data Type [17] [Interview]	How much percentage of the data is structured and unstructured? It also specifies whether the data is digitalized or non-digitalized.	The higher the value of the Input data type, the lower will be the value of BP complexity (Inverse Trend)
Process Stability [3] [Interview]	How stable a process is in terms of its technicality, functioning, and reliability?	The higher the value of process stability, the lower will be the value of BP complexity. (Inverse Trend)
Number of Applications [1] [Interview]	How many numbers of applications or tools are involved in the process? The Applications can be MS Office, SAP, CRM and so on.	The higher the value of the number of applications, the higher will be the value of BP complexity. (Direct Trend)
Application Stability [14] [Interview]	How stable application(s) to run the process.	The higher the value of applications stability, the lower will be the value of BP complexity. (Inverse Trend)
Number of Process Steps [1, 24] [Interview]	How many steps are involved in a process for its completion?	The higher value of number of steps, the higher will be the value of BP complexity. (Direct Trend)
Complex Decisions [17, 19, 20] [Interview]	How is the decision complexity in each stage of the process? The simple decision process is the straightway process from one-step to another step (the complex decision process = the complex process).	The higher the value of complex decisions, the higher will be the value of BP complexity. (Direct Trend)
Standardization [1, 3] [Interview]	How much percentage of a rule-based or standardized process without individual justification?	The higher the value of standardization, the lower will be the value of BP complexity. (Inverse Trend)
OCR (Optical Character Recognition) [3, 14] [Interview]	How OCR involve in the process (the amount of document reading which is required in a process)?	The higher the value of OCR, the higher will be the value of BP complexity. (Direct Trend)
Process Frequency [1, 17, 18] [Interview]	How many times does the process repeat itself on a daily, weekly, or monthly basis?	The higher is the value of process frequency; the lower will be the value of BP complexity. (Inverse Trend)
Manual Hours [1] [Interview]	How many manual hours does a human workforce spend on that process?	The higher the value of manual hours, the lower will be the value of BP complexity. (Inverse Trend)

The right process for RPA is the one that follows clearly defined business rules with minimal interruptions/ manipulations or exception handling. In summation, the data should be structured, digitalized, easily accessible, and logically formatted. Moreover, when identifying perfect candidate business processes for automation, rigid applications with no integration capabilities or applications, which are not stable, should be avoided.

When starting an RPA journey, low-complexity processes provide quick wins (low-hanging fruits) to demonstrate the rationality of RPA and help out building confidence and internal buy-in for the technology [19]. RPA is naturally a "strategically lean step" for companies whose business processes are supported through Shared-services or Business Process Optimization (BPO).

There are certain identified criteria that will evaluate the complexity of a Business Process. These criteria are very different from each other, for some criteria, a higher value will mean lower BP Complexity (and vice-a-versa) and for some other criteria, a higher value will mean higher BP Complexity (and vice-a-versa) which is negative while selecting a process for automation. Tab. 2 describes all the criteria identified from the systematic literature review (SLR) and expert interviews. Mostly the criteria identification came from the literature and the definition was created by literature and interview. These criteria play a role in assessing the complexity of a business process.

Every time, lower complexity processes should be selected at least during the initial start of the RPA journey and when a certain level of automation maturity has been achieved, then the company can automate the higher complexity processes with consideration of process viability and Return on Investment (ROI).

4.3 Criteria to Measure RPA Maturity

One of the risks associated with scaling up the RPA after initial deployment is the underutilization or overutilization of the company's present automation maturity or RPA maturity. So, ***what exactly is meant by maturity automation?*** It is a maturity model that evaluates an organization's ability for continuous improvement in the automation area. It is done by accessing the business against a certain set of characteristics or criteria. Over a while, companies can re-evaluate their automation maturity to measure progress and continue to drive toward perfection. Three connected areas form the basis of any technique for achieving automation maturity:

1. **Process Viability** or the first step towards a high-quality process is to examine and map out how a particular process works i.e. who is involved, what is involved, what works well and what does not.
2. **Process Automation**: Robotic Process Automation works from the digitalization of manual and paper-based processes to more complicated processes or projects that impact the synergy of human labor, processes, and automation systems.
3. **Process Improvement:** All automation projects should be seen as iterative and continuous processes. Analyses and insights into process performance should be the fuel for continuous process improvement and investment [27].

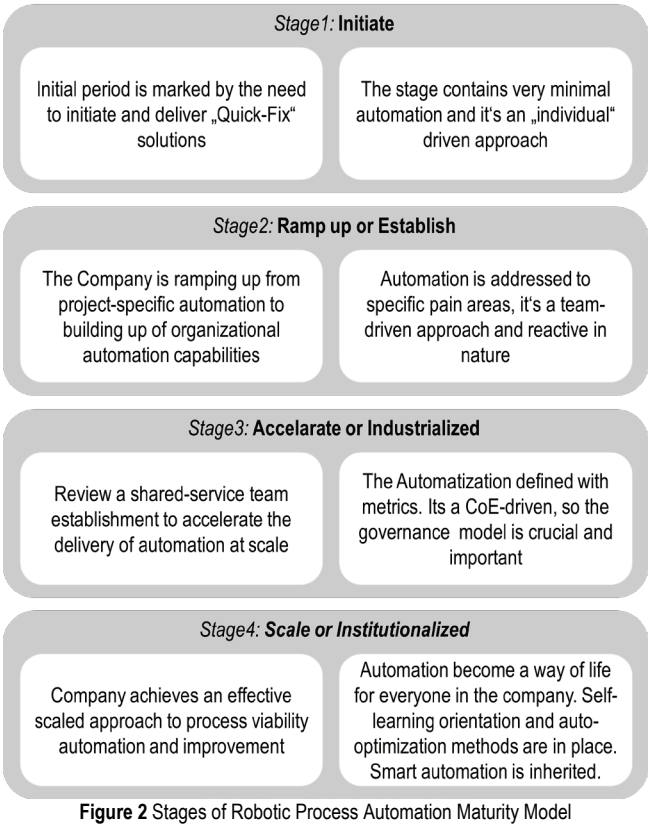

Figure 2 Stages of Robotic Process Automation Maturity Model

Companies using process automation more extensively establish an organization-wide, standardized, people-centric approach. However, less mature or "emerging" companies consider process automation to be impromptu, unmatched, process-centric projects predominantly geared around fixing a specific problem. The following is a further explanation of how established and emerging organizations differ in their view of the automation process.

Emerging Organizations: Organizations see process automation as a one-off project case, whether it is a "fire-fighting" meaning fixing a broken process, or an extemporary investment. It is an approach to fixing an immediate problem. It of no doubt that such kind of initiative produces a greater value to the organization and good ROI but still the company scratches only at the surface and doesn't produce a great benefit [27]. These types of organizations have a process-centric approach, where the automation happens on a process-by-process basis [27].

Established Organizations: Organizations sees process automation as an organization-wide, centralized, and standardized approach. The projects are planned strategically and systematically in order to scale up the technology. A culture is created in the organization where everybody is encouraged and empowered to pro-actively contribute to process automation. It is more like a people-centric approach as everyone in the organization is involved. This centralized body that takes ownership over the process automation decisions is called the Centre of Excellence (CoE). This body

helps to identify & update the processes, develops areas of improvement, and improve the skill and automation capability of people/worker in the organization [27].

In this research, four stages of the Robotic Process Automation Maturity model have been identified and evaluated against the criteria. Each stage is more advanced on the road to maturity than the previous stage, in terms of process viability, automation, and improvements (see Fig. 2). As the company matures, it moves from one stage to the next and evolves from a process-centric focus to people-centric culture [10, 27]. The Robotic Process Automation Maturity Model estimates and describes fourteen unique criteria to identify a company at a specific stage. Each of the four stages provides a measuring scale to determine each criteria's positioning.

Tab. 3 demonstrates the fourteen criteria along with their definitions. The criteria are defined by a systematic literature review and expert interviews. Some criteria have inferential or quantitative value for all stages, which means they can be easily measured in a specific value. However, there are also some criteria that have descriptive or qualitative values, which means that each stage must be quantified based on textual values so that it becomes measurable.

Table 3 Fourteen Criteria Measuring Robotic Process Automation's Maturity Model

Criteria	Definitions
Outlook on Process Automation Technology [3] [Interview]	The criteria measures to how a company views on this low-code automation technology.
View on Low-Code Automation Provider(s) [Interview]	The criteria refers to how RPA vendor(s) or supplier(s) is selected by the decision maker for the process automation.
Disposition on Process Automation needs [13, 24] [Interview]	The criteria evaluates how process automation is viewed and used within an organization.
Deployment Purpose [13, 24, 26] [Interview]	The criteria looks at the reasons why processes are being automated. Across all stages, the reason to why an organization adopts a low-code automation may differ. In the initial stage, a team or an individual may seek out a tool to get a specific job done fast. However, as an organization matures, this approach is then standardized across different departments. The objective becomes clear on functional and cross-departmental needs to enable an ongoing cycle of digital transformation.
Number of Processes Automated with Low-Code Automation [27] [Interview]	The criteria measures an organization's level of process automation adoption. It includes assessing an organization's use of RPA. It also measures how an organization views on process automation.
Number of Departments with Access to Process Automation outcomes [27] [Interview]	The criteria reflects the ability of an organization to scale robotic process automation across entire organization / department.
Process Mapping Initiatives Connected to Process Automation [27] [Interview]	The criteria measures how process mapping is available within an organization. Typically, process mapping occurs within the line of business and ranges somewhere between the use of enterprise-grade process mapping technology (mature) and the use of less scalable methods such as Excel or Visio (emerging).
Number of Processes Mapped with Process Mapping Technology [27] [Interview]	The criteria measures the number of end-to-end processes that a company has mapped and are currently managing it. The earlier stages include a learning curve on how best to map and understand the process. The later stages recognize the importance of discovering and mapping process.
Number of Departments with Access to Process Mapping Technology [27] [Interview]	The criteria measures the number of departments with access to process mapping technology. It indicates the ability of an organization to scale process mapping across many departments in the company. If a single department uses a process mapping technology for themselves that is a good start, however the ability to gain maximum ROI, comes with scaling process mapping technology across other areas in the company.
Enterprise Strategy on Right Mix of Low-Code Automation Tools, [Interview]	The criteria measures an organization's mix of Low-Code Automation providers to gain more out this initiative.
Deployment Model [Interview]	The criteria measures the quality of Process Automation Deployment strategies. Process Automation excellence initiative can start as a one-off solution and modify over time into larger strategic business solutions.
Process Excellence included in Hiring/ Training Plans [6, 27, 28] [Interview]	The criteria measures whether process excellence is influencing or being reflected in hiring and training programs in the company. Evolving into a process excellence culture means that process excellence is not the job of just a few, but of everyone. Maturing to a scalable people-centric culture requires regular training of existing personnel with access to collaborative process mapping tools.
Governance Model [7, 28, 29] [Interview]	The criteria measures whether an organization is empowered to solve its own problems related to Process Automation flow, and, therefore, scales it efficiently. Empowering the organization's workforce with automation technology can also present challenges. The most mature organization have a well-defined governance model, which ensures a secure and enterprise-grade path.
Process Excellence/ Automation Executive Sponsorship [10, 27, 28] [Interview]	The criteria surveys the amount of executive sponsorship within an organization. The most successful initiatives always have executive sponsorship to clearly signal their importance. Without strong executive sponsorship that is reinforced at every turn, many large-scale initiatives will fail.

4.4 Robotic Process Automation Portfolio

The Most common reason for failed automation initiatives is wrong process selection, and then the most common risk associated with it, is over or under-utilization of automation maturity. Our proposed innovation is a 2-Dimensional graph (see Fig. 3) with two variables, the Y-Axis which represents business process (BP) complexity, and the X-Axis which represents automation / RPA maturity.

The BP complexity (Y-Axis) is a dependent variable, which is divided into three levels: **Maximum, Average, and Minimum.** The Criteria to define BP complexity have already been listed in Tab. 2. While, The Automation /RPA maturity (X-Axis) is an independent variable, which is divided into four stages: **Stage 1, Stage 2, Stage 3, and Stage 4.** The Criteria to define automation / RPA maturity are listed in Tab. 3. The criteria on the variables X and Y are assessed, weighted, and averaged to the value from 0 to 1.

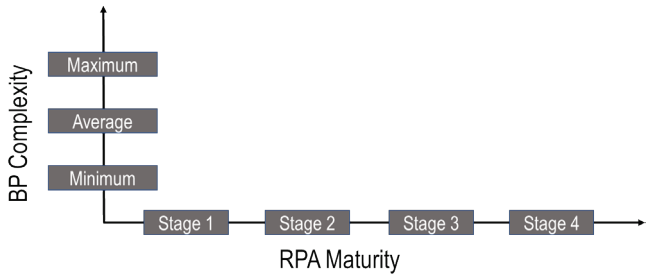

Figure 3 Robotic Process Automation Portfolio

The area between the X-axis and Y-Axis is divided into four quadrants: Long-Term Improvement, No Brainer, Must Do Improvement, and Quick Wins (see Fig. 4). The values or the proportion of the area covered by each of these quadrants is 25% each and equally. The maximum value that "No-Brainer" quadrant will take is $X = 0.5$ and $Y = 0.5$, so, any business processes whose X and Y values are under these maximum values will be treated as "No-Brainer" projects. "Long-Term Improvement" quadrant will take $X = 0.5$ and $Y = 1$, so, any business processes whose X and Y values are under these maximum values will be treated as "Long-Term Improvement" projects. "Must-Do Improvement" quadrant will take $X = 1$ and $Y = 1$, so, any business processes whose X and Y values are under these maximum values will be treated as "Must-Do Improvement" projects. Finally, "Quick-Wins" quadrant will take $X = 1$ and $Y = 0.5$, so, any business processes whose X and Y value are under these maximum values will be treated as "Quick-Wins" projects.

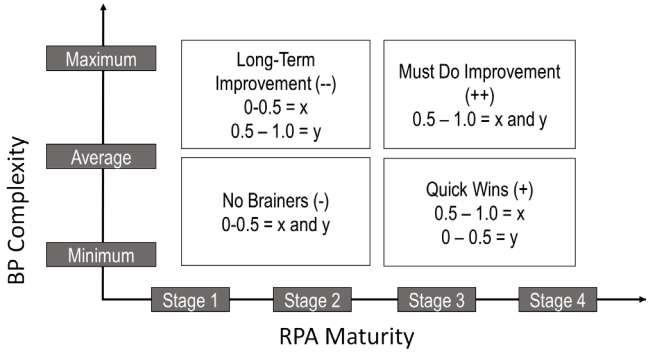

Figure 4 Robotic Process Automation Portfolio with Benefits

4.5 Robotic Process Automation Portfolio Benefits

As already described above there are four quadrants inside RPA Portfolio, starting from the bottom left which is "No-Brainers" and moving clockwise in order – "Long-Term Improvement". "Must-Do Improvement" and "Quick-Wins" (see Figure 4). From the results of the literature study and the interviews, we have created a draft description of the four quadrants for better orientation and understanding. This draft description needs to be verified and improved in future research.

No-Brainers (-): RPA Projects that are easily implemented without any complications and have low outcomes in terms of investments are referred to as "No-Brainers". Their benefits are expected to be less as compared with the "Quick-Wins", as the RPA Maturity of a company is not so advanced yet. Even though the complexity of a process is not much complicated in terms of, the flow development or its working but still the automated process will be a premature baby with no one to take care of or be responsible for its working and monitoring.

There can be frequent stoppages of the bot and every time the company has to be dependent upon external partners to fix it, as there is no expert yet in the company who can easily monitor the process execution and in times of breakages, they can fix it. Therefore, in terms of economics related to the implementation of that RPA Project, the maintenance cost would be rising significantly with no or little chance to jump over the total cost of RPA implementation and hence generate or give less ROI or no ROI at all.

Whenever a process has these kinds of characteristics, it is essential for the organizations to set their expectations and priorities right. Oftentimes, an RPA project becomes a "No-Brainers" project instead of a "Quick-Wins" project when the outcome is not much scalable. However, "No-Brainers" projects have specific advantages, like serving as a self-learning tool before more complicated and impactful processes are automated. Since "No-Brainers" are less impactful as compared to "Quick Wins", therefore, organizations with the low level of automation maturity can first move up the learning curve before moving on to the "Quick-Wins" projects. Just to get a glimpse of what RPA is what it can do, a company with little maturity in RPA can go on automating low-complexity processes and later on, when the automaton maturity is improved, the same process, which was under "No-Brainer" category, can easily be moved to "Quick-Wins" category.

Long-Term Improvement (--): Automation projects with high complexity and benefits similar to or even lesser than those of "No-Brainers" projects are referred to as “Long Term Improvement” projects. These projects bear even lesser benefits as compared to the "No-Brainers", so, companies should be vigilant enough to see that if their Business Process Complexity comes out to be high and on the other hand, the company is not much advanced in the RPA Maturity, then these types of projects are to be completely neglected or be left out.

The higher complexity of the process means the greater cost for development, server, consultancy, and so on. It covers around 50% or even more of the total RPA implementation cost. In addition, the benefits of projects are even lesser than the "No-Brainers" projects, so, in such cases or projects, the companies should not come under the perception of trying out the technology just for experiment or fun or if they did then very badly, they would be failing on RPA implementation with huge monitory losses. So, avoid automating such a category of projects. So, why "Long Term Improvement" project name given to such a quadrant or benefit is because without thinking anything long-term plans should be made to improve the company’s current level of automation maturity if it wants to automate such complicated processes and side by side making that process less complex and standardizing it.

Must Do Improvement (++): Must Do Improvement project bears high complexity of the business process in contrast to very high RPA Maturity. Such projects possess greater benefits than "Quick-Wins" projects as the more complex the process is, the higher the outcome in terms of quality, ROI, and efficiency of the process with no human error at all, while executing a process. Automating such processes which are highly complicated and possess overall greater benefits, should definitely be automated.

The company has a high level of RPA maturity where there's a capability of automatically arranging the unstructured data into a structured one, the frequency of the process is pretty high, and the process is pretty much impactful to the customers (whether internal or external). Of all the quadrants, "Must Do Improvement" projects possibly possess the greatest challenge to any RPA journey since project investments are high while their business impact is also high. So, why is "Must Do Improvement" the name given to such quadrant or benefit even if the outcome of the process is huge, the company or RPA in that company has such capabilities of improving the process, improving its bottlenecks and making it much cleaner and more straightforward with little time to invest on it and generating tremendous benefits.

Quick-Wins (+): RPA projects which are implemented fast and swiftly generate returns are referred to as Quick-Wins projects. They bear low complexity yet still have high reward potential. Low-complexity automation projects can be implemented easily and do not need much customization afterward. The development cost of the RPA project is very much low compared to other costs associated with RPA. The maintenance cost is also significantly very low as the company can solve the errors by itself during the execution of the program.

There is a proper centralized team (CoE) which is responsible for the RPA projects in that company. The "know-how" can be easily transferred from one department to another without any restrictions or anything. A proper Governance model is there with the capability of mapping out the processes that can be considered for automation. Some medium-complexity projects can still be defined as Quick-Wins where data transfers between applications are required. There is a positive ROI and no chance of getting an RPA project failed.

Success is being seen across all the departments of a company and automation is just like another daily routine thing for all the employees. RPA bots work non-stop through the pre-defined, consistent working method. There is scalable work force and an increased focus on value creation. RPA bears low risks by working on online servers without any help from a human. The processing speed is quite high.

5 CONCLUSION AND FUTURE RESEARCH

The design of the Robotic Process Automation Portfolio fulfills the objective of providing a relevant theoretical and practical understanding of RPA projects for company so that they can successfully select business processes (BP) that match their automation maturity, thus avoiding RPA early retirement. Literature reviews and expert interviews were used to identify criteria for the two portfolio variables (*X*) BP complexity and (*Y*) RPA automation/maturity. As a result, there are 10 criteria for business process complexity and 14 criteria for automation / RPA maturity.

The two-variable approach does not guarantee a comprehensive assessment, it is necessary to have other variables such as costs, benefits, usability, technology readiness, and company readiness, as suggested by Axmann and Harmoko (2020) [10]. However, to speed up decision-making as well as the suitability assessment of RPA to the organization, the initiation of two variables is sufficient.
Subsequent research is aimed at creating a broader portfolio while answering other emerging questions such as "How do organizations use automated portfolios?", and "How do organizations calculate the value of *X* and *Y* variables?".

6 REFERENCE

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