Scientific Research Publishing

How Does Robotics Process Automation (RPA) Affect Project Management Practices

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Abstract

The main purpose of this literature review is to understand the effectiveness and impacts of Robotics Process Automation (RPA) on the practices of Project Management (PM). For attaining the purposes of the research study, an extensive literature review was conducted, which helped in gaining a theoretical understanding. These findings were then justified with the help of current and relevant secondary sources in the analysis section. The findings suggested that RPA is quite advantageous for implementing in varied aspects of a business, especially in the field of project management. However, it can pose several challenges, which need to be taken into due consideration by the organizations during execution such as the capabilities of the employees and the abilities of the existing systems to incorporate automation, among others. It was ultimately concluded that RPA is highly advantageous for project management teams but its effective implementation is the key to success.

1. Introduction

Robotics Process Automation (RPA) is a far-reaching development in business automation that offers businesses a substantial return even from the first year of implementation. RPA is software that mimics human activity in carrying out a task in a process and is useful in deploying in case of processes that involve lots of repetitive activities accurately and consistently. This has a positive impact on the employees whose time is freed up to work on tasks that include emotional intelligence, judgment, reasoning, and interactions with customers. It is critical to distinguish it from cognitive intelligence because in RPA mainly the physical

tasks are taken away that does not need any insights or knowledge.

RPA impacts the domain of project management through multiple perspectives. Its proposition for satisfying the customers in project management makes it a ready tool to be used in projects. Within the teams, it saves time for the members by taking out routine tasks and giving them more fulfilling work to execute. The increased relevance is also out of the exponential increase in data that is being experienced, and due to the compliance and consistency element as underlined by bureaucratic compulsions and audit regulations.

For project management, the importance of RPA also stems from its rapid use by companies in their processes. Thus, the project managers would need to deal with the assessment of these elements, factoring in the changed schedules and work completion timings as caused by streamlining the automation being executed in the project domain subjects. With the fourth industrial revolution, the integration of RPA in various domains is an area the project manager needs to be well in tune with since technology is a great application and integration in projects.

Another dimension for project management would be regarding a mandated plan and implementing RPA at a client. This will involve the project manager possessing deep knowledge and insight regarding the developments of RPA and making the right fit planning and implementation plan for the client. As discussed above, this report will explore the effectiveness and impacts of RPA on project management practices.

2. Literature Review

2.1. Robotic Process Automation

Patric Geary, who served as the director of marketing for the software business Blue Prism, coined the term "robotic process automation" in 2012 [1]. Jovanović, Đurić, and Šibalija (2018) [2] defined RPA as a phrase that refers to technologies that use the user interface to conduct activities in the same manner that humans do. In this regard, Miers *et al.* (2019) [3] stated that RPA technologies employ a mix of user interface (UI) interactions and Application Programming Interface (API) connections to drive mainframes, client servers, and HyperText Markup Language (HTML) code so that assertions on structured data can be conducted. Thus, RPA tools work by mapping a procedure for the software to follow in the tool language with runtime assigned by a control dashboard to facilitate the script [3]. It has also been analyzed by Vanhanen (2020) [4] that RPA has progressed beyond screen scraping and scripting and has become a comprehensive solution that can be used in conjunction with other technologies such as Enterprise Application Integration (EAI) and Business Process Management (BPM) to automate complicated processes and activities. Critically analyzing these findings, it can be said that RPA is a technological advancement that has recently increased in importance for helping related tools to imitate physical tasks or actions performed by humans through automation. Among these sources, Vanha-

nen (2020) [4] and Miers *et al.* (2019) [3] had been found to provide more detailed information on RPA than Taulli (2020) [1] and Jovanović, Đurić, and Šibalija (2018) [2]. Herein, the provision of detailed information on the concerned topic is the key strength of the sources.

Additionally, Syed *et al.* (2020) [5] highlighted that RPA's goal is to replace human work by automating structured processes in a cost-effective and timely manner. However, it has been argued that based on its operational aspects, it can be considered a robot. It has also been mentioned that RPA utilizes a software robot that executes activities via the front-end of IT processes and transmits via the back-end of other systems, mimicking operations piece-by-piece in the same manner in which a human would perform using productivity tools and ERP systems (Syed *et al.*, 2020) [5]. Thus, unlike the picture of a "robot" that comes to mind, an RPA robot is software that is installed on a computer rather than acting as a tangible equipment. Besides, it can be effectively used to improve operational efficiency with the help of tactical automation. Overall, the article of Syed *et al.* (2020) [5] had been effective enough to explore the contemporary challenges and themes related to RPA by using a wide range of credible sources, which is its strength, as this has not been examined in other studies. However, it does not investigate its effects on project management.

Reddy *et al.* (2019) [6] further opined that RPA alleviates the strain of repeated and easy activities on employees. The progressive nature of RPA and its quick development period set it apart from other automation options. RPA employs an outside-in strategy, which implies that current data systems are unaffected. No system modification is required; only human labor is substituted by agents. RPA technologies are in high demand since most businesses are searching for methods to decrease costs and integrate their old systems and apps. RPA is also considered a means to get a positive Return on Investment (RoI) in a short time [4]. Analyzing these findings, it can be said that RPA adoption is highly beneficial for companies and employees because easy and repetitive tasks can be performed by the RPA tools and robots, thereby allowing them to do other strenuous and creative activities. Herein, the key strength of the article by Reddy *et al.* (2019) [6] is that it has been effective in exploring RPA concerning AI and other technological advancements. Even though the information highlighted in the article is quite vital, only a few sources have been taken into due consideration by the authors. Hence, this article can be disadvantageous for the study. On the other hand, the article written by Sullivan *et al.* (2021) [7] explored the role of RPA efficiently concerning international logistics. Besides, the article can also be used as a guide to navigating the implementation of such technology, which makes this article better than Reddy *et al.* (2019) [6].

In addition, Madakam, Holmukhe, and Jaiswal (2019) [8] opined that a market of primarily RPA-oriented suppliers such as Automation Anywhere, Automation Edge, Blue Prism, Softomotive, Kryon Systems, and UiPath has emerged as a result of the increased demand. Penttinen, Kasslin, and Asatiani (2018) [9] further explored that RPA is a lightweight IT and that it is different from

Back-End System Automation, a Heavyweight IT with the help of case studies. The study briefly involved information concerning the impact of RPA on project management activities. It was in this concern found that Telco considering the implementation of RPA due to the scope of automation even in terminal stages and easy integration within the existing systems [8]. However, it did not explore these aspects in detail. Overall, RPA programs are driven by business demands, but it is significantly required to set up the infrastructure. On the other hand, Madakam *et al.* (2019) [8] have been effective enough to gather information about the development of RPA and its scope of implementation in varied sectors. Besides, the authors have used a wide range of credible sources, which can be one of their strengths. However, it does not explore RPA's impacts on project management practices, which can be considered to be one of its weaknesses.

2.1.1. Benefits of RPA

Penttinen *et al.* (2018) [9] have also identified numerous advantages of RPA that have been mentioned in previous research. Its compatibility with any program that a human operator would be using is one of them. RPA can tackle third-party application openness challenges, which limit the communication of several IT systems that are private and lack public APIs. In addition, as compared to corporate software interconnections, RPA may be implemented in a relatively short period. Furthermore, RPA robots are incredibly adaptable and adjustable, allowing them to be readily updated when procedures or software change. Unlike automation performed through back-end connectivity, current systems do not need to be redesigned [8]. In this concern, Boobier (2020) [10] also highlighted that RPA is a solution for off-shoring regular, non-core operations like bookkeeping, invoice processing, or data entry. Thus, RPA has several advantages; hence, it can be highly beneficial when incorporated into the activities of project management. This will not only help the project managers and the team to perform efficiently, but will also enable the businesses, irrespective of the sectors, to attain immense future growth. Nevertheless, in this book, RPA is just a small portion as it explores all the technologies that have been incorporated into the banking industry, such as Artificial Intelligence and Advanced Analytics, which is its key weakness as per the present research topic is concerned.

Furthermore, according to Devarajan (2018) [11], RPA users have experienced significant cost, process accuracy, efficiency, regulatory compliance, error reduction, and speed to dependability, better user satisfaction benefits, all of which typically occur at the same time. When it comes to the workforce, RPA allows people who are performing regular chores to go on to more productive jobs and tasks. RPA also provides professions, such as robot management, analytics, and consultancy [10]. It can be asserted from this study that RPA is a technology, which has been outperforming several other technologies that were used earlier with the help of case studies. Besides, it also provides a separate section that outlines all the possible benefits attained from the use of RPA. Thus, this article can be considered to have a significant amount of strength as com-

pared to other sources. In this concern, analyzing the automation opportunities and choosing the right strategy to incorporate RPA tools along with techniques are deemed as vital for attaining an optimal level of benefits.

2.1.2. Challenges of RPA

The advantages of using RPA are widely known. However, Fernandez and Aman (2021) [12] argue that the advantages of using RPA in a company ought not to be taken for granted. As a result, they assert that supporting variables of value realization, such as organizational preparedness, RPA technology acceptance, deployment, provision of RPA solutions, and benefit measurement, ought to be addressed further by establishing a systematic methodology [11]. If these challenges are addressed then a company can attain several advantages such as time, cost, error, and human resource savings. However, as per my understanding, RPA provides more than just these concrete and obvious outputs because it can facilitate strategic planning and hyperautomation alongside helping companies to develop more effective technological solutions. Fernandez and Aman (2021)'s [12] article seems to be highly credible as it uses a wide range of plausible sources for gathering secondary data and interviews were considered for collecting primary data. Nevertheless, Fernandez and Aman (2021) [12] do not focus solely on understanding the impacts of RPA on project management practices. According to Kedziora *et al.* (2021) [13], RPA is said to lack back-end integration capacity but is now viewed as a transitory solution that bridges the gap between manual operations reliant on legacy IT systems and new processes operating on automated processes. Despite the clear enthusiasm around RPA as a result of its lofty promises, it currently lacks a solid reputation [12]. Thus, a compelling business case is required to persuade prospective businesses to opt for this technological adoption.

Kedziora *et al.* (2021) [13] further highlighted that there has been significant skepticism about RPA's influence on the occupations it replaces. Even though no large job losses have been reported as a result of the implementations, robots might still be viewed as job rivals. This may cause conflict between management and staff. As a result, RPA deployment must be adequately handled and conveyed. There are certain issues with RPA's relationship to IT activities as well. Misconceptions regarding RPA's characteristics, its compatibility with corporate IT infrastructures, governance, skill sets, and security protocols frequently obstruct RPA adoption and cause delays in reaping its benefits. To overcome this hurdle, Kedziora *et al.* (2021) [13] argue that CIOs as well as other IT experts who play a key role in RPA's success must understand how RPA may be used in the long run. All these indicate that there are certain negative impacts that RPA can pose on the practices. Hence, it is the exclusive liability of the management and the experts to overcome these challenges and reap positive impacts. Herein, it needs to be noted that the key strengths of this article involve the use of a wide range of resources for gathering secondary data and narrative analysis was conducted for understanding the findings better. Besides, the article is based on the

area of project management.

2.1.3. Process Selection and RPA Implementation

As per Meironke and Kuehnel (2022) [14], the first step in determining whether jobs are ideal for RPA is to establish if they are routine or non-routine and whether they involve manual or cognitive effort. In principle, cognitive jobs that involve innovative thinking and non-routine activities with no discernible repeated patterns have low automation potential. The activities and procedures that are most suited for RPA are those which can be meticulously written out step by step, including all conceivable events and consequences [13]. However, additional aspects should be addressed while evaluating the feasibility and long-term viability of RPA. Table 1 below illustrates key characteristics that may be used as a guide in sound decision-making for both enterprises contemplating RPA installation and RPA vendors selling the technology. Companies and vendors can consider the assessment criteria and figure out effective ways in which RPA tools and technologies can be effectively applied in their operations. Besides, they can also understand if the technology is suitable to be implemented in the concerned process or not. This will further ensure positive outcomes after its implementation. For instance, if the RPA tool is generating positive outcomes in a stable environment, then the concerned tool can be considered suitable for implementation.

Table 1. RPA suitability assessment criteria.

Assessment Criteria	Definition
High transaction volumes	The job is examined for RPA is performed often or has a large number of sub-tasks.
Accessing multiple systems	The task necessitates the use of several systems. Copying data from a spreadsheet to a customer database is one example.
Stable environment	A task is carried out inside a specified set of IT systems that remain the same each time it is carried out.
Low cognitive requirements	No originality, subjective judgment, or complicated interpretation abilities are required for this task.
Easy decomposition into clear rules	The task may be easily broken down into clear, rule-based processes with no room for ambiguity or misinterpretation. As an example, all incoming invoices from Company X with a value of €3000 or more should be assigned to category Y.
Proneness to human error	Human mistake is more likely to occur in a task than it is in a computer. Matching numbers across many columns is an example.
Limited need for handling exceptions	The task has a lot of consistency. During the completion of a task, there are few or no exceptions.
Clear comprehension of current manual costs	The company understands the present cost structure of a work and can estimate the cost difference and compute RPA's return on investment (ROI).

(Šperka and Halaška, 2022) [15].

It has also been stated by Meironke and Kuehnel (2022) [14] that RPA development is particularly lightweight compared to conventional software development since it utilizes the advantage of the inherent presentation layers of programs, as well as their logic and reliability. In terms of RPA implementation, the authors further suggested that, while the concept of RPA is simple, time must be set aside to review, analyze, and design the process. This is critical not just for the robot's effective configuration and implementation, but also for establishing a clear economic case for skeptical users. Because RPA as a study subject has only lately begun to gain traction, the information on implementation strategies for RPA is still limited. For the selection and implementation of RPA, companies, and specialists have established several recommendations and guidelines, as well as case studies that detail the implementation procedures of firms that have used RPA [13]. However, this kind of information may not always be accurate and applicable in all business scenarios. Therefore, more exploration of this subject matter (RPA) is essential both at practical and research levels. The study by Meironke and Kuehnel (2022) [14] is a credible source, which effectively explored how RPA benefits could be measured. For this, the authors reviewed the evaluation methods, metrics, and indicators of RPA benefits but they did not specifically explore its effects on project management practices, which can be considered as one of the drawbacks of Meironke and Kuehnel (2022) [14].

2.2. Progressive Automation Requirements

According to Huang &Vasarhelyi (2019) [16], automation is described as a technology that allows a process or operation to be completed with the least amount of human intervention. For a lengthy period, the technological system in question could only be built as a finite-state machine. At the turn of the century, program-controlled automated systems, such as looms with swipe card controls, greatly increased the automation capabilities of processes and activities. The present advanced technologies have always set the boundaries of automation over time. The quantity of processing information necessary to complete a task was regarded as a limiting factor near the end of the twentieth century. It has also been understood that accessible ICT has recently evolved so much due to advancements in RPA that the basic automation capabilities have also greatly grown [16]. Therefore, there is a requirement to encourage progressive automation, which can be possible through RPA and its related tools and technologies. Herein, the article of Huang & Vasarhelyi (2019) [16] proposed an RPA framework and with its implementation, the study can be considered to be highly valuable. This is because the findings of this study can provide significant insights but it only focused on auditing and no other activities. On the other hand, the article of Siderska (2020) [17] provided several case studies as evidence to explore whether RPA has a driver of digital transformation. However, in this study as well, project management aspects were not specifically taken into consideration. These findings show a research gap in the existing literature, which is intend to be abridged from the current study.

As per the report of Auth, Jokisch, and Dürk (2019) [18], the value-added potential of RPA in the German economy alone is roughly €430 billion by 2030. The focus was not just on labor tasks, which are more easily automated owing to their repetitiveness but also on pre-defined procedures and predefined decision parameters. Learning RPA systems that can adjust to changing scenarios and respond without human assistance was also emphasized in this report [18]. Hence, RPA can enable projects to be brought to the application's attention. For instance, a project may be likened to a Go game, which requires the player's imagination, intuition, and project management or strategic thinking. Herein, basic cognitive skills that are indicative of human intelligence, such as memory, audiovisual cognition, learning, problem-solving, and planning are required as prerequisites. The key strength of the article of Auth *et al.* (2019) [18] has been that it particularly focuses on project management practices. However, it majorly covers Artificial Intelligence approaches and is not narrowed down to RPA.

2.3. RPA for Project Automation: A Conceptualization

As highlighted by Ruiz *et al.* (2022) [19] RPA is focused on the construction of intelligent agents that can sense their surroundings and perform deduced actions. Moreover, such artificial systems may function independently, survive for extended periods, adjust to changes, and create and monitor goals [19]. Besides, the so-called rational agents show a unique potential for effective project planning and execution. Their enlarged capabilities enable them to aim for the best result in their activities or the most desirable outcome under uncertainties. RPA employs concepts and techniques from statistics, mathematics, computer science, cognition, psychology, and neuroscience in its application-oriented scientific environment. Agents frequently handle vast volumes of codified knowledge, which is obtained from data, for increasingly complicated applications [20]. Therefore, it can be understood that RPA is highly beneficial for project automation, especially when used along with AI and other technologies such as Optical Character Recognition (OCR). This has been effectively explored in the study of Shidaganti *et al.* (2021) [20]. However, it does not explore its application in PM activities, thus, making it less reliable for the present study. On the other hand, Ruiz *et al.* (2022) [19] provided ample information, which could apply to PM. Besides, it also explores how RPA can continuously boost the industry.

As per Ilieva *et al.* (2021) [21] principles from the data management fields are also significant in the debate about RPA because of this relationship between data and knowledge, although their ties to RPA are often not well delineated. In the context of this article's practical focus, these words include Business Intelligence (BI), Big Data, and Analytics. BI, unlike RPA, focuses on a specific application context, which is oriented on assisting human decision-makers in practical decision-making procedures by providing relevant information. Certain technological implementation aspects, such as dashboards, multidimensional analysis, and reporting, have a considerable effect on the word BI. The word analytics,

on the other hand, has a more objective and technical focus, although it nevertheless aspires for more particular "local" decision-making from a technological standpoint. Big Data, the most current phrase in this sequence, broadens the previously described notions by introducing "new" technical capabilities for processing and analyzing fast-rising (velocity) data sets, extremely huge (feature volume), as well as highly diverse (variety) data sets. RPA systems or procedures, on the other hand, may be employed in all three notions as instruments to reach advanced goals. In the sphere of the above-mentioned ideas—for example, data mining, the integration of RPA techniques with methodologies has resulted in the development of new conceptual inventions such as advanced analytics, predictive analytics, or data-driven RPA [18]. All this information together indicate that RPA has a huge scope of further implications mainly because it can be used with other technologies to make better decisions. This source has varied strengths as it explores the potential of incorporating RPA with AI and BI, among others. Nonetheless, it does not particularly explore RPA in PM, which is its weakness.

2.4. A Unified Understanding of Project Management

Auth *et al.* (2019) [18] further asserted that RPA has proven to be a multi-layered and diversified concept so far. However, it is worth noting that project management is not much different. Although the core meaning is generally agreed upon, a deeper investigation reveals a wide and dynamic range of content-related conceptual elements and their features, such as process models, sub-areas, methodologies, techniques, roles and structures, and project kinds. Several decades of standardization efforts in the Project Management (PM) field have established agreed definitions of terminology, which have helped to mitigate this variation [18]. Overall, RPA can efficiently complement PM practices as it has a huge scope of performing almost every activity easily but it has certain limitations, which must be taken into due consideration by the businesses and project teams.

2.5. RPA Applications in Project Management

Since there is a huge literature gap concerning the application of RPA in PM, the present study intends to reduce this gap. The major question that has been asked since the early stage of the development of RPA technologies has been whether human-developed technological systems have cognitive abilities. Due to the importance of the Turing test, Alan Turing examined this subject in 1950. RPA's constraints have always been determined by the capacity of Information Technology (IT) in terms of data quantity and processing power, because of the direct interaction involving RPA, information, and data processing [22]. With this, RPA can be effectively applied in PM with the help of related tools and techniques. Contextually, RPA when applied in PM will enable a company to recreate a particular task or workflow through automation, which will further reap more

beneficial results than manual handling of those tasks. However, this may not be applicable to all kinds of tasks. Furthermore, three categories are discussed, which were recognized as content-related key topics in our inquiry into the current status of RPA development in PM. The order of the groups is determined by the increasing amount of "strong" RPA.

2.6. Project Management Based on Data

In the study of You and Wu (2019) [23], it has been found that the basic concept of data-driven PM (DdPM) is well understood since the more knowledge about a decision situation that is accessible, the more trusonerthy the optimal option alternative may be chosen. Because data is the foundation of knowledge, each PM decision has to be based on reliable facts. This database, according to the DdPM concept, must be paired with the expertise and insight of a real project manager to make judgments, DdPM's first focus is on the fundamental problem of resource-constrained project scheduling and, as a result, the controlling and planning functions in terms of duration, costs, risk, and effectiveness [24]. Established statistical and mathematical approaches such as Critical Path or Chain, Earned Value Management (EVM), Program Evaluation and Review Technique (PERT), (Lean) Six Sigma Analytical Hierarchy Process (AHP), and (Lean) Six Sigma are among the methods in the repertory. However, as the world becomes more digitalized, more data and high-performance IT infrastructure become accessible for processing. In light of this, DdPM is increasingly relying on analytical approaches. These use the results of traditional, past, or present-oriented approaches to make predictions about future events (hence predictive analytics). For example, You and Wu (2019) [23] developed techniques and application examples for the PM domain based on linear regression for predicting changes in costs during project scope and duration extensions. Because the volume of data and the number of variables affect the informative value of predictive analytics outputs, particular data analysis tools are required for practical use. Some scholars coined the name Project Intelligence (based on Business Intelligence) to describe this new trend, although it has yet to gain widespread acceptance [17]. These imply that RPA can be effectively applied in PM practices and processes for attaining better outcomes. Herein, both You and Wu (2019) [23] and Delen and Ram (2018) [24] provided an ample amount of information concerning PM, which indicated that there is a huge scope of future implications on the part of RPA tools and technologies in PM practices.

2.7. RPA Platforms for Project Management

RPA platforms for PM may be seen as the next step in the evolution of DdPM, to unlock new possibilities using RPA in the context of analytics and big data. It has also been noted that certain vendors have established cloud-based service platforms that deliver RPA-based services as a result of the combination of high installation effort for a single organization on one hand and high user aspira-

tions on the other. As per Lavasani *et al.* (2021) [25] Deloitte, for example, is a renowned consultancy business that offers a service called Predictive Project Analytics, which is based on a specific analytics engine paired with a huge database gathered from over 2000 projects. In addition, generic algorithms and neural neonerks are utilized to augment the traditional DPM technique. Complexity and success evaluations, assessment, and talent recruitment for project teams are all key areas of application [25] [26]. Both sources effectively explored the project management areas. Nevertheless, Lavasani *et al.* (2021) [25] explored big data analytics while Martínez-Rojas *et al.* (2020) [27] particularly focused on RPA projects. Therefore, the latter source is more credible and relatable to the present study than the former.

Other application ideas based on the platform approach include team member selection. For example, the startup Cloverleaf creates software for forming project teams based on employee data, such as the capacity to adjust to the desired scientific model or consensus with cultural values, in addition to aspects such as qualifications and experience. TARA, a Californian company, takes a more complete approach with its original platform. Originally intended to streamline the process of hiring external software engineers, the focus has since shifted to project planning and management [11]. Thus, companies such as TARA employed technology to automate the preliminary definition of the project's objective, task, and scheduling, the formation of the project team, as well as project monitoring and prediction to attain better team and organizational outcomes.

2.8. Project Management Bots

Furthermore, Auth *et al.* (2019) [18] suggested that in the Hype Cycle for Project and Portfolio Management, research company Gartner invented the term Project Management Bots (PMB), which refers to a type of autonomous software robot focused on project management. However, unlike RPA bots, there is little emphasis on graphical user interfaces. PMBs are more likely to have speech or textual interfaces for interacting with humans, and so have Chabot-like capabilities. While a bot presents itself to the outside world as a single actor via one or more central connecting interfaces, bots with advanced capabilities are almost always multi-agent systems. The fact that the connected agents engage with one another to pursue a common goal distinguishes them. Interaction, for example, might take the shape of bargaining and is centered on the agents' communication. Multi-agent neonerks in project management have been discussed for much longer than the new name PMB was coined [27]. Thanks to technical advancements in recent years that not just research models but also commercialized items are now accessible for practical usage, which is beneficial in every aspect.

2.9. Further Project Management Aspects Relating to RPA

With the understanding derived from the above-reviewed literature, it can be

suggested that RPA has a huge scope in the field of PM. This has been effectively explored in the study of Syed *et al.* (2020) [5]. This study particularly suggested that aside from the preceding RPA examples in the project management domain, there are a few closely related areas of research, like Intelligent Information Management (IIM), which stresses the incorporation of existing RPA procedures and technologies into information management. PMIS (project management information systems) and IIM's potential are inextricably intertwined. RPA is also well-suited to well-structured, less complicated regular operations [5]. By critically analyzing this study, it can be vigilantly understood that RPA may incorporate project monitoring and control. Herein, some examples can be cited such as keeping thresholds, planning and optimization, or even reporting and documentation.

2.10. Critical Analysis of the Findings

Based on the literature reviewed in the above section, it can be analyzed that the proper application of RPA in project management practices can be highly beneficial. Similarly, El Khatib, Al Falasi, Al Moosawi, and Shafi (2021) [28] highlighted the successful application of robotics, "human intellect-based augmented reality systems" and Artificial Intelligence (AI) tools for carrying out different processes and tasks at the time of uncertainties such as COVID-19 outbreak. It was also affirmed by El Khatib *et al.* (2019) [29] that technologies such as AI and cloud computing are increasingly being used in the business horizon. This has particularly improved operational services and enhanced product efficiencies, thereby enabling organizations including telecom enterprises to develop better products and provide efficient customer services. Additionally, digital disruption has also been highlighted in the study. On a similar note, El Khatib, Hamidi, Al Ameeri, Al Zaabi, and Al Marqab (2022) [30] suggested that for the effectual deployment of big data and digital disruption in the healthcare sector, it is imperative to identify the technical and managerial capabilities of employees so that they can be adequately implemented in the processes. All these indicate that the purpose of the present research study has been met.

Furthermore, RPA has also been evident to be incorporated in not only planning but also execution of project management. Considering the above findings, it can be analyzed that it is the responsibility of the project management team and the members involved in it to adequately implement RPA within the processes and tasks of the organization. For instance, the implementation of the robot named "poppy" in the LPAN Process or a robotic system (Jaibot) for planning as well as executing the operations of overhead drilling [31]. Similarly, 3 bots were effectively deployed for enhancing the processing of customer services availed by the government [32]. Thus, it can be said that RPA has been positively affecting the work execution of a project team. It was also found from the findings that RPA even impacted the work scheduling of a project team, which was also understood in the study of Baranauskas (2018) [33], which explored the

impact of RPA in non-manufacturing organizations. Furthermore, the study findings also suggested that RPA is effective when embedded in management techniques. It was particularly evident in the study of Haleem, Javaid, Singh, Rab, and Suman (2021) [34] that RPA and other technological advancements within an organization can motivate employees and increase their happiness, thereby creating a value-added workforce with enhanced teamwork and improved productivity. All these findings along with the literature reviewed affirmed that RPA can be effectively applied in project management practices but several challenges need to be addressed. It has also been evident that RPA has several positive impacts on business practices, which can enhance team and organizational outcomes. Therefore, it can be said that all the research objectives have been effectively met.

3. Recommendations

The findings of the present study suggested that RPA involved several challenges, which are imperative to overcome by an organization so that positive outcomes can be attained. Several studies such as El Khatib *et al.* (2019) [29] suggested that both public and private organizations of varied sectors should be technologically dynamic as well as updated so that RPAs and related technologies can be adopted more efficiently. Overall, the findings suggest that enhanced use of RPA in existing processes will not only provide better monitoring and control capabilities but also inspire the development of new and improved platforms [35]. This will further enhance the capacity of the PM to embed technological advancements and be ready for the new tomorrow.

4. Conclusion

Based on the understanding derived from the above analysis and study findings, it can be concluded that multiple applications of RPA have come to the fore and are being researched and developed relating to PM. This leverages the capacity of the automation system to provide more efficient and reliable services as opposed to the human interface regarding project control and monitoring. As technology gets more integrative and advanced, it is to the project manager's benefit that he or she enhances his/her understanding as well as knowledge of the ongoing innovations and uses developed features to assist the team in various areas of project management.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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Appendix. Questionnaire and Interview

Interview with Mr. Khalifa Khaled Manager in Arkan Trading L.L.C

The transformations were Paperless Initiative in Arkan company. And SAP Software which is a software helps organizations to manage nearly every aspect of the business, from finances to HR, procurement and logistics. Which help produce strong reporting and analytics features that aid in decision-making. Federal Government's HR Management Information System "BAYANATI", an integrated electronic system for the employees and federal government entities. Also, the E-Health Information System "Wareed", an integrated electronic system for managing health information in all hospitals and healthcare centres.

Key digital transformations were Zoom Meetings, Cryptocurrency, P2P commerce involves two individuals interacting directly without a go-between, selling and buying goods and services to each other.

First element of digital distruption is in business and Impact of the Element Relevant to Your Organization is business transactions may accept cryptocurrency. Furthermore in Technology is using the SAP software helps automate some processes. Also, in Industry Zoom meetings cut time of transportation and travelling for meetings. Finally, in society social media impacts relationships between employees.

Going over the compotators needs to understand our stage so, Compotator number1 offer same day delivery. And competitor number 2 tries to minimize carbon footprint by using more sustainable technologies. Competition analysis can provide insights into several digital disruptions. Use the NOISE framework to get the top three initiatives of your competitors.

We are making progress with our understanding of the digital initiatives. Now how about getting some ideas going?

Let's look at each of the key areas of digital disruption one by one using the trend-benefit framework.

Finally, you must list the top three initiatives across all five areas of digital disruption in the table below.

In Marketing and distribution Using social media for marketing. In product and service, Cloud computing and introduction of CRM software made it possible to manage customer relationships from anywhere at any time. In Processes Atomizing most business processes. In eco system Using AI to replace some individuals. Finally, in supply chain, **IoT:** IoT is essentially a network of objects that have been technologically equipped with sensors to collect, exchange, and transmit data. This gathering of data gives employees access to real-time information.

In platforms we have block chain. In customer network Facebook.

A TAF framework captures three key details about the technology.

- Use cases: List of use cases of technology in the industry e.g., AI being used for customer segmentation.
- Reference point: Is there anybody already doing it? Reference point helps you

validate the feasibility of the use case.

- Benefits: What's the expected outcome of the initiatives? Improved customer helps you understand the outcome of the use case implementation.

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