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Robotic Process Automation Dashboard Platform for Streamlining Operations

Abstract: - Businesses may become highly profitable, adaptable, and quick by streamlining operations via the use of Robotic Process Automation (RPA). Eliminating monotonous duties throughout workers' schedules ultimately boosts their involvement, efficiency, and fulfillment. RPA is becoming more and more widespread as a result of its ability to save expenses, expedite procedures, and improve consumer satisfaction. With regard to this, the study's objectives are to provide units utilizing the processes the ability to monitor, educate the robots, and initiate the procedures, as well as to present all processes created under two separate licenses for RPA development on a single platform. This article focuses on RPA to make it feasible to efficiently supervise and operate robots and activate operations, as it will allow actions created utilizing Uipath and GenRPA to be handled on the platform. The suggested system allows for the submission of reports and the monitoring of robot occupancy rates. This improves process management transparency, lowers expenses, and boosts efficiency in operations. Moreover, it would improve operational unit productivity and streamline operation management to be able to oversee and control RPA activities. This will help minimize process errors and maximize the use of available resources.

Keywords: robotic process automation, management information systems, supply chain, operations management.

I. INTRODUCTION

Robotic Process Automation (RPA) is a disruptive force in the quickly changing global logistics scene, radically altering the manner in which supply chain activities are handled and optimized [1]. RPA has become a key technology in the logistics industry, significantly increasing operational accuracy, efficiency, and cost-effectiveness [2]. RPA lowers human error, speeds up the completion of procedures, and frees up human resources for more strategically important work by automating repetitive, rule-based processes [1]. The mature technology known as RPA has significantly raised efficiency, accuracy, and productivity across several industries, including logistics. RPA automates rule-driven, recurring tasks that are usually carried out by people utilizing software robots. Reducing operational expenses are one of the many benefits of incorporating RPA into logistics operations [3]. Numerous studies have demonstrated how RPA integration has transformed supply chain management (SCM) and logistics operations, and this integration has been widely researched in the field of logistics. This introduction looks at the relationship between RPA and logistics operations, identifies the research gap, and emphasizes the benefits of RPA. Numerous logistics applications, such as inventory management, order tracking, data collecting, and shipment tracking, employ RPA. By automating these procedures, RPA significantly increases operational accuracy and productivity [3] [4].

RPA improves logistics performance by automating order management, data collecting, and verification, leading to significant performance increases and operating cost savings. Automation allows employees for other valuable tasks, which improves overall business profitability and satisfaction among clients [3] [4]. Beyond just boosting productivity, RPA has several benefits. RPA is essential to the advancement of green logistics since it may streamline operations, cut carbon emissions, and lead to sustainability, thus, RPA enables businesses reduce their environmental impact and contribute to carbon-neutral supply chains by automating processes and improving resource use [5]. This synergy between technological innovation and environmental stewardship is essential for the potential growth of logistics and supply chain management. Even in difficult circumstances such as the COVID-19 a global epidemic, efficient RPA application may result in improved operational excellence as well as substantial savings on expenses [6].

This article focuses on RPA to make it feasible to efficiently supervise and operate robots and activate operations, as it will allow actions created utilizing Uipath and GenRPA to be handled on the platform with a concentration on a case study of a leading logistics company in Türkiye. The suggested system allows for the submission of reports and the monitoring via a dashboard. This improves process management transparency, and boosts efficiency in operations. Moreover, it would improve operational unit productivity and streamline operation

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management to be able to oversee and control RPA activities. This will help minimize process errors and maximize the use of available resources.

The organization of the paper as follows first section focuses on the introduction of the topic. Research background is explained in the second section. Furthermore, the third section concentrates on the case study under two headlines which are, initial process or as-is process and to-be process. The results are discussed in the fourth section. The last section concludes the paper.

II. RESEARCH BACKGROUND

The effects of RPA on logistics and supply chain management for SMEs are examined by [4] and [3], who emphasize the gains in productivity, accuracy, and efficiency that can be made by automating processes like order management, gathering information, and tracking of deliveries. [7] and [8] concentrate on the obstacles and elements that contribute to the success of RPA deployment. Interdepartmental coordination is shown by [7] to be a hindrance to the benefits of RPA, but [8] place more emphasis on strategic alignment and well-defined procedures, offering models for successful RPA adoption and increased operational efficiency. In their investigation of RPA's application to green logistics, [5] emphasize the technology's capacity for process optimization, carbon emission reduction, and sustainability. [9] examine automation in logistics through the use of AI, supervised understanding, and machine learning, highlighting increased productivity, decreased mistake rates, and competitiveness. In order to integrate these technologies for competitive and sustainable logistics, both papers discuss potential and obstacles. The extensive advantages of RPA in operations management—such as heightened production, decreased mistakes, higher efficiency, and better data management—are covered by [10] and [11]. They draw attention to how RPA helps convert manual procedures into automated, more efficient systems. [12] concentrate on using RPA to automate non-value-adding operations in Industry 4.0, therefore tackling the eighth waste of Lean and enhancing productivity, employee happiness, and human resource utilization. In their discussion of the application of RPA in a variety of sectors, [6] provide case studies from IBM Korea that highlight the technology's advantages in work automation, efficiency gains, and addressing COVID-19 issues. RPA's function in digital transformation is reviewed by [13], who highlight the technology's capacity to automate corporate operations, boost productivity, and enhance organizational performance. They point out RPA's potential for major operational gains while identifying success criteria and recommended practices for adoption. The effects of RPA on logistics are examined by [14] and [15], they emphasize how the technology may save labor costs, boost productivity, and automate paperwork. They demonstrate successful solutions that reduce work hours and enhance the efficiency of operations. A model for implementing RPA in logistics is provided by [16], with an emphasis on process automation as a way to reduce costs and boost output. Critical success factors for effective adoption are also identified by the model. Automation may improve organizational performance, reduce errors, and increase productivity. [17] and [18] investigate how RPA affects procurement and business processes, respectively. [19] cite examples of how RPA may be used to improve item master data maintenance in manufacturing, emphasizing the cost-saving, error-reduction, and productivity benefits. In their discussions of RPA in logistics and complicated business processes, [20] and [21] respectively highlight the technology's ability to automate document processing, increase productivity, lower mistakes, and enable operations that are more intelligent. According to [22], RPA's capability to boost efficiency and cut down on errors might transform a variety of sectors, such as banking, healthcare, and telecommunications. [23] show when business process management (BPM) and robotic process automation (RPA) are integrated, the elimination of redundancies improves overall operational performance, which improves process automation [24] examines how rule-based, repetitive activities in a range of industries may be automated with RPA to increase output, accuracy, and efficiency. Additionally, it discusses how machine learning and AI will be employed with RPA in future generations.

Considerable gaps still exist in the study on RPA in logistics, despite its expanding body. Even though RPA has demonstrated to lower costs and boost productivity, further study is required to completely comprehend the larger implications on employee dynamics and the sustainability of businesses. The combination of RPA with AI and ML technologies also opens up new research avenues and presents new difficulties that might alter operational strategy. Sophisticated logistics businesses are using RPA systems, such as GenRPA and UiPath, in an important but understudied industry. Analyzing these systems' real-world uses might provide valuable information to fill in existing study gaps and advance our understanding of how RPA affects logistics operations.

III. CASE STUDY

Borusan Logistics, a pioneer in Turkey's logistics sector, is the focal company in this case study [25]. Known for its cutting-edge methods and innovations in technology, Borusan Logistics provides a wide range of services, such as supply chain management, warehousing, and logistics. The firm is a prime example of industry leadership and continues to influence logistics methods both locally and globally as a prominent institution within the Borusan Group. For these reasons, it is a perfect subject for a thorough examination. This section will first provide a detailed analysis of the procedures that were in existence before RPA was implemented. The procedures that were enhanced and changed as a result of the RPA integration will then be thoroughly described. This research will provide a thorough knowledge of the effect and value that RPA has brought to operational processes, focusing on the particular transformations and improvements that have been realized. This all-encompassing strategy guarantees that the complete extent of RPA's impact on the processes is comprehended.

A. Initial State (As-Is Process)

Before RPA was implemented, the logistical processes were mainly managed manually, which led to a lot of inefficiencies and challenges across the board. Important departments including generating customs declarations, establishing orders and visits, registering suppliers, finance and control, and document management and tracking were particularly prone to mistakes, long processing times, and discrepancies. General processes are as follows, customs declaration writing, order and trip creation, supplier registration processes, finance and control, and lastly, document control and tracking. Writing customs declarations is currently done by hand, which causes mistakes and delays. Furthermore, because customs declaration writing was done by hand, it was subject to delays and human mistake. Currently, customs declarations are written by hand, which leads to errors and delays. Additionally, because customs declarations were written by hand, errors and delays might occur. Due to human data entry, supplier registration was frequently tainted by errors and interruptions in the information flow. Because transactions in the fields of finance and control were done by hand, cost management is made more challenging by the mistakes and lost time that arise from performing activities by hand. Moreover, human error made it challenging to keep timely and correct records, which resulted in delays and omissions in document control and tracking. These challenges brought home the need for automation to raise overall operational performance, accuracy, and efficiency levels. These issues demonstrated the need for process optimization and automation to improve accuracy, efficiency, and overall operational performance.

For a number of reasons, creating a single interface to manage RPA operations is imperative. Initially, it offers a single platform for monitoring and controlling all automated tasks, which lessens the complexity involved in juggling several, unrelated systems [22]. The portal provides tailored solutions that increase flexibility and scalability by utilizing two or more licenses, meeting a variety of demands across several departments and processes. Centralized control of these processes through a portal ensures uniformity and standards across the organization, which is necessary to maintain data integrity and operational efficiency [23]. A single point of access makes it easier to keep track of developments, ensure compliance, and make necessary changes in real-time, which lowers the likelihood of errors and delays. Furthermore, the portal streamlines comprehensive reporting by merging data from several sources into a single, approachable format. This makes it possible to make decisions that are quicker and more precise since all pertinent information is readily available [6]. Additionally, centralized reporting makes the auditing process more efficient by guaranteeing that all activities and results are accessible and recorded [26]. The business may employ specialized features to handle specific operational needs, such as registering suppliers, generating orders and trips, maintaining various licenses inside the portal, finance and control, and document monitoring. By doing this, every process is optimized and the workflow as a whole is guaranteed to be in line with the strategic goals of the company. To summarize, the optimization of RPA operations, maintenance of operational consistency, and facilitation of well-informed decision-making necessitate a centralized site including dual-license administration and strong reporting features. It offers an environment that is safe, adaptable, and scalable, which improves the productivity and efficacy of the company's automation initiatives.

B. To-Be Process

The company planned to automate the aforementioned processes by using RPA due to high manual error rate, and process time. The technology and techniques employed in the development of RPA procedures are essential for automating tasks [24]. One of the most popular RPA development platforms is UiPath, which provides a robust toolkit to enable process automation [1]. There are four key components of UiPath which are studio, orchestrator, robots and assistant. The development environment used by developers to design, implement, and test automation

processes is called UiPath Studio. Its drag-and-drop interface and rich library of activities allow users to design complex automation workflows without requiring extensive coding knowledge. Orchestrator is a web application used for the centralized management, deployment, and monitoring of automation processes. Orchestrator allows for scheduling workflows, monitoring robots, and tracking the progress of business processes in real-time. Robots execute the developed RPA processes. Robots are constituted of two types which are attended and unattended. Attended robots operate on user workstations and are used for tasks that require human interaction. Unattended robots operate in a fully automated manner, typically on servers, without the need for human intervention. The last component of UiPath platform is assistant. It is a desktop application that allows users to manage their automation processes in conjunction with robots. Through this application, users can start, stop, and monitor robots. In the main screen of UiPath Orchestrator, this screen displays the status of running jobs, jobs in queue, jobs that have been stopped or terminated, and so on. On the right side of the screen, the number of successful, failed, and stopped jobs is visually represented in a graph. In the following graph, job details for the last 24 hours are provided. In the processes tab, information about the processes is displayed. On this screen, you can view process names, versions, and descriptions. In the Jobs tab, the status of processes on the robots is displayed. In the triggers tab, the defined schedules for processes are displayed. In the logs tab, the logs written for the processes are displayed. In the monitoring screen, the machines tab displays information about robot machines. In the Processes tab, general information about the processes is displayed. In the queues tab, general queue information for processes is displayed. In the Queues screen, information about the queues for current processes is displayed. Here, records of the data used in each process are kept. In the Assets screen, shared variables or credentials that can be used in automation projects are displayed.

The other platform employed is GenRPA platform. It is more suitable for organizations that need a simpler, possibly more logistics-focused solution. It possesses three components that are Studio, Control Room and Robots. GenRPA Studio is the development environment where developers create, design, and test automation processes. Its drag-and-drop interface and rich library of activities allow users to design complex automation workflows without requiring extensive coding knowledge. Gen Control Room is a web application used for centralized management, deployment, and monitoring of automation processes. It allows for scheduling workflows, monitoring robots, and tracking the progress of business processes in real-time. GenRPA Robots execute the developed RPA processes. There are two types of robots just as in UiPath, attended and unattended. Attended robots operate on user workstations and are used for tasks that require human interaction. Unattended robots operate in a fully automated manner, typically on servers, without the need for human intervention. On the GenRPA Dashboard screen, running and queued jobs are displayed. Below, graphs showing completed jobs are presented. In the Global Variables screen, shared variables or credentials that can be used in automation projects are displayed. In the Processes screen, information about the processes is displayed. On this screen, you can view process names and pending, successfully completed, failed, and terminated jobs related to the processes are also displayed. In the Queues screen, information about the queues for current processes is displayed. Here, records of the data used in each process are kept. In the Schedules tab, the defined schedules for processes are displayed. Artificial Intelligence (AI) and Machine Learning (ML), Natural Language Processing (NLP), OCR (Optical Character Recognition), and API Integrations are the technologies utilized in RPA development procedures. RPA procedures can utilize machine learning (ML) and artificial intelligence (AI) algorithms for predictive analytics or support systems for decisions. Natural language processing and user interaction are improved by NLP. RPA may be used with chatbots or virtual assistants, for example, to automatically manage user queries. RPA makes advantage of API interfaces to make data transfer across various apps and systems easier.

IV. Results & Discussion

When developing RPA processes, the technologies and tools used play a crucial role in automating workflows. UiPath is one of the most widely used platforms for RPA development, offering a comprehensive toolset that facilitates the automation of processes. The other platform employed is GenRPA platform. It is more suitable for organizations that need a simpler, possibly more logistics-focused solution. This allows processes to operate automatically across multiple platforms. The RPA solutions are applied for thirteen logistics processes seen as follows,

1. Process for recording incoming international invoices for the Road Transport Unit in the Atlas system.
2. Process for verifying invoices received through SAP in the ETA system.
3. Process for completing declaration procedures for export invoices sent to the robot via the Evrim system.
4. Process for creating orders from incoming emails.

5. Process for processing orders sent in Excel documents via email into LTL using the robot.
6. Process for downloading receipt images from the Ebirlik website and tracking them by users.
7. Process for updating BEx reports at the end of the month based on the email from the business unit.
8. Process for completing declaration procedures for import invoices sent to the robot via the Evrim system.
9. Process for completing warehouse deduction procedures for import invoices sent to the robot via the Evrim system.
10. Process for sending monthly reconciliation emails, collecting responses to these emails, and reporting them.
11. Process for classifying documents left in the shared area and moving them to relevant folders.
12. Process for classifying load documents and recording them into the Atlas system.
13. Process for backing up emails containing export files into folders.

Key stakeholders in RPA process development are business unit owners, business analysts, RPA developers, RPA managers, information technology (IT) team, end users, senior executives/managers, test engineers, and external consultants or service providers. Business unit owners are the owners of the business processes where RPA projects will be implemented. These individuals provide details and requirements of the processes, helping to determine where automation can be applied. Business Analysts analyze business processes, identify automation opportunities, and gather business requirements. Business analysts play a crucial role in understanding how processes work and identifying requirements by examining all aspects of the process. RPA developers design, develop, and implement automation solutions. RPA developers create and test software robots to automate business processes. RPA managers handle project planning, resource management, and progress monitoring. The IT team manages system integrations, data security, and technical infrastructure. They ensure that RPA solutions work seamlessly with existing systems. End users use automation solutions in their daily work. User feedback is important for enhancing the efficiency of automation. Senior managers define the strategic direction of RPA projects and allocate financial resources. They assess return on investment (ROI) and project success. Test engineers conduct tests to ensure that automation solutions work correctly and meet business requirements. The testing process ensures the quality and reliability of the software. External consultants/service providers may provide additional expertise and experience in implementing or optimizing RPA solutions.

This project is a newly started project. A dataset based on a wider time weight is required to obtain more accurate values. Based on this, the initial situation can be determined by proceeding with the existing data in this article. In these conditions, the interpretation will be made based on the initial data we have. Looking at the data, the best improvement is observed in the fifth process, "Process for processing orders sent in Excel documents via email into LTL using the robot." with an improvement of 96.92%. The second-best improvement with a rate of 80% is seen in the first process "Process for recording incoming international invoices for the Road Transport Unit in the Atlas system." The processes whose process length remains the same are the third, eighth and ninth processes. In order to avoid any errors in the documents prepared in the RPA system, if an error is detected in the input of the document, the system takes it as pending and waits. Thus, the error rate is fixed at 0.

V. Conclusion

By using RPA to streamline processes, firms may become more nimble, flexible, and lucrative. Employee engagement, productivity, and work satisfaction are all greatly increased by automating monotonous chores. RPA is becoming more and more popular due to its ability to save expenses, speed up procedures, and improve customer satisfaction. This study aims to empower units to monitor, train, and initiate processes using RPA, integrating workflows from Uipath and GenRPA under two separate licenses onto a single platformThe emphasis on RPA enables efficient process initiation, robot monitoring, and robot operation. The suggested solution makes it easier to provide reports and track robot occupancy rates, which enhances process management transparency, lowers expenses, and boosts operational effectiveness.

There's still a lot to learn about how RPA might improve supply chain sustainability. To measure its environmental advantages and determine the best deployment strategies, further empirical research is required. Analyzing the relationships between RPA and other sustainable initiatives, such zero-emission car substitutes and circular economy concepts, might yield insightful data for business participants. Regarding RPA's potential to advance supply chain sustainability, there is still much to learn. Further empirical study is needed to quantify its environmental benefits and identify the most effective deployment techniques.

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