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Investigate The Use Of Robotic Process Automation (RPA) To Streamline Administrative Tasks In Healthcare, Such As Billing, Appointment Scheduling, And Claims Processing

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Abstract: The implementation of robotic process automation (RPA) is poised to usher in a new era of efficiency and innovation in healthcare operations. This is due to the fact that the landscape of digital health is constantly evolving. This article investigates the potential applications of robotic process automation (RPA) in the healthcare industry, analyzing its applications, benefits, and problems, as well as the transformational impact it is projected to have on the improvements of patient care and the streamlining of procedures. A number of operations, including patient scheduling, billing, claims processing, reporting, and data entry, can be automated with the use of robotic process automation (RPA), which can help reduce errors, save time, and free up staff for activities that provide more value. RPA, for instance, can make it possible for patients to arrange their appointments online without the need for human intervention and can also send automatic reminders to reduce the number of patients who do not show up for their visits.

1. Introduction

1.1 RPA In healthcare

In the context of software applications, the term "robotic process automation" refers to a system that has the ability to simulate repetitive human interactions [1-3]. Through the delegation of regular duties to bots, it frees up employees' time to focus on more important work while simultaneously improving the correctness of the fundamental procedures.

There are two primary categories that may be applied to any RPA bots: attended and unsupervised. Employees have access to a personal assistant in the form of Attended RPA, which is located on their desktops. In order for the bots to carry out their duties, they need to be triggered manually. They are capable of, among other things,

- Duplicate information.
- Distribute medical records.
- Check information for compliance with regulations.
- Complete the usual medical paperwork.
- Produce reports.

No human intervention is required with unsupervised bots. On the contrary, they begin and end their background operations in accordance with predetermined norms and schedules [4]. It is possible to set up such RPA to

- Download any attached files to your computer, and open any emails that come your way.
- Gain access to applications by use of application programming interfaces.
- Retrieve information from health records.
- Carry out additional administrative tasks.

The use of both forms of automation to ensure process continuity is commonplace in hospital workflows [5-10]. For instance, in the event that a robotic process assistant (RPA) in the back office is unable to finish an operation, a front desk agent will be notified, which will then notify a human employee to assess the situation and provide a solution. Bots, when used in tandem, can offer the following advantages to healthcare organizations.

Cost decrease. An analysis by CAQH found that healthcare firms might save as much as $13.3 billion by automating administrative processes.

Reduced frequency of appointments that were not kept. People are less likely to skip their doctor's appointments when they use RPA bots to set them up and remind them.

Avoidance of mistakes made by humans. Robots outperform humans in terms of rule adherence and error rate [11]. The amount of mistakes that cost the company money can be reduced by using RPA technologies.

Increased satisfaction for patients. Reduced wait times for responses are a direct result of RPA systems' ability to handle patient requests more quickly [12].

Worker happiness went up. Robotic process automation (RPA) solutions allow staff to focus on patient care rather than administrative chores that are monotonous, time-consuming, and repetitive.

We may discuss the technology underlying robotic process automation to have a better idea of how these benefits can be realized.[13]

2. Technologies Behind RPA Solutions

Using a pre-built RPA system is the simplest approach to include bots into everyday routine, regardless of industry. Even while RPA systems can vary slightly from one provider to another, the following are the main features:

- A platform for creating, testing, and fixing bots.
- A hub where bots can be scheduled and managed.
- An automated program to run the scripts in the live environment.

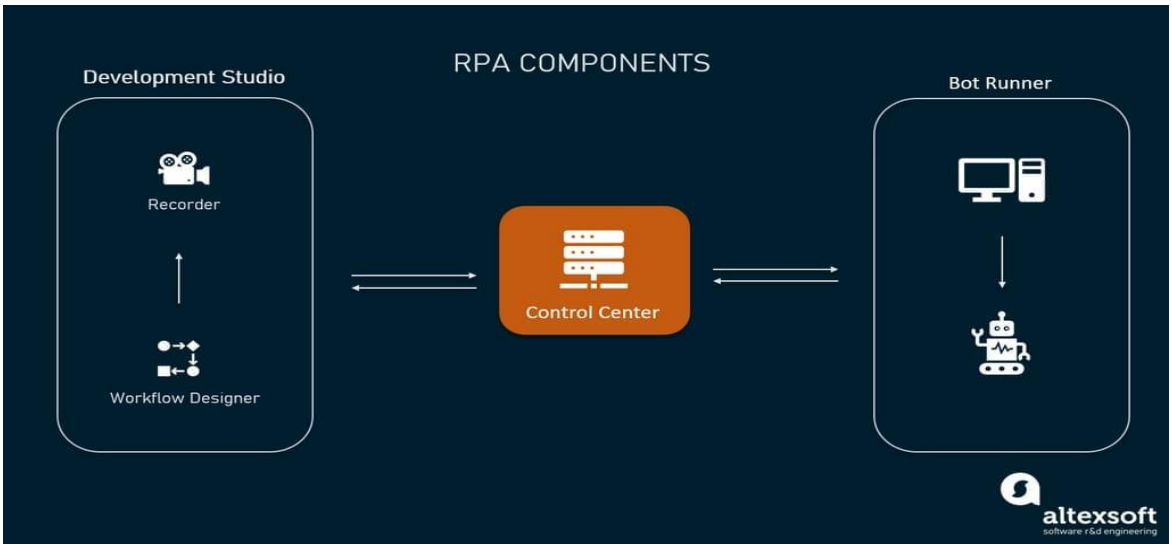

Fig 1: RPA Components

2.1 RPA tool components

The Development Environment — frequently referred to as the Development Studio—is a place where workflows can be designed, RPA scripts can be written, and triggers can be defined to execute them. It should be noted that programming is not necessary for many contemporary systems. At your disposal are user-friendly drag-and-drop tools instead.[14]

The Development Studio isn't complete without its recorder. By setting up the bot to record an employee's activities—like hovering, scrolling, and copying—it's possible to set up an automation sequence. The steps and procedures are transformed into code that can be used to automatically repeat those steps if the recording is halted.

Control Center allows users to easily schedule, manage, and scale bot activities from a central dashboard. On the bot runner, it runs the bots programmed in the development environment. Execution logs, success or failure, and other relevant status information are communicated to the control center by the bots.

Bot Runners run procedures set in the command center. An attended RPA requires human intervention to initiate the script.

By enhancing RPA with AI and providing bots with decision-making and cognitive capacities, advanced systems can expand beyond the traditional functions. Common bots can only carry out the most basic activities when given explicit instructions; nevertheless, they are capable of working independently and can do more complicated jobs.
[15]

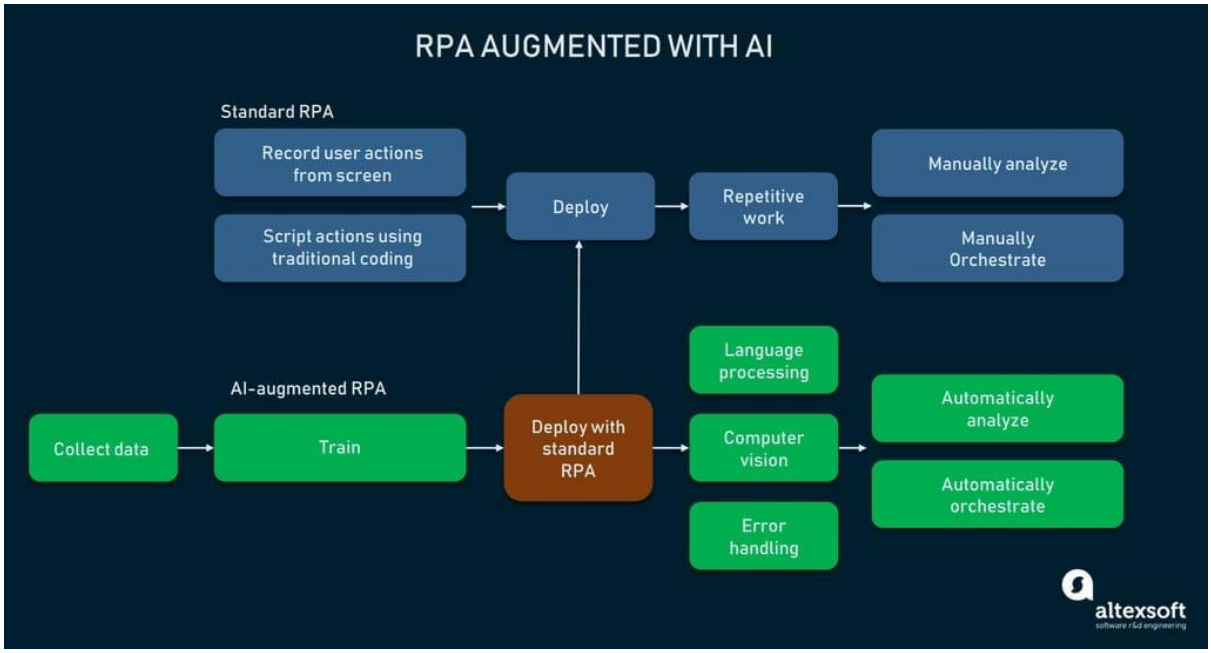

Fig 2: RPA Augmented with AI

2.2 Standard RPA implementation can be augmented with additional AI-driven capabilities.

When it comes to healthcare, intelligent document processing is one of the most common uses for RPA systems driven by AI. Included in it are technology like

- Optical Character Recognition (OCR) may "translate" scanned text by identifying individual letters, words, and phrases.
- using computer vision for document classification.
- Making use of Natural Language Processing (NLP) to glean useful information (such as names, email addresses, phone numbers, and PHI) from written documents.

3. Use Cases And Real-Life Implementation Of RPA In Healthcare

Financial services, retail, and human resources are among the many industries that have embraced RPA. [16] With bots already participating in critical procedures, the healthcare business is progressively stepping up its game.

3.1 Payment processing

The processing of payments include managing a large number of invoices that include patient expenses, such as those for tests, doctor's consultations, and ward pricing. In order to provide a patient cost estimate, software robots can automatically gather, match, standardize, and transform insurer benefit and eligibility data with contracted rates and charges. [17] If a patient requires an appendectomy, for instance, the typical RPA bots will access his insurance company's website to determine if the procedure is covered. The patient's estimated cost is then based on this information and historical data on comparable operations. Afterwards, the RPA assistants powered by AI apply ML algorithms to estimate costs based on past insurance claims. New data is added to the model on a regular basis to ensure it is always as accurate as possible. [18] Less patients cancel their appointments since they get the estimates beforehand.

The academic medical organization Baylor Scott & White Health (BSWH), which includes 52 hospitals in Texas, is a great example of a business that uses RPA for payment processing. It had been seeking a solution to optimize net revenue, decrease the cost of invoice collection, and improve the patient financial experience for almost eight years. After much effort, they were able to do all of this with the help of Waystar's RPA technologies powered by AI.[19]

Before treating a patient, the device calculates an estimate of the total cost of care. In the past, employees would have to manually calculate everything, which would take them around 5 to 7 minutes and yielded inaccurate results. The use of AI and RPA has allowed us to automate the production of 70% of our estimates, which not only saves time but also reduces the likelihood of human error. Additionally, BSWH experienced a 60 to 100% improvement in point-of-service collections.[20]

3.2 Insurance claims processing

Manually processing claims is not only tedious, but also very error-prone. Annually, 200 million claims are denied for different reasons, according to AARP. Mistakes in paperwork are a common cause of rejection.

Where does automation fit into this scenario? Let's revisit BSWH, another insurance collections company that uses RPA for claim processing.

Collectors had to manually access different payer accounts or call them before RPA was used. The bot now routinely accesses payer websites to verify the current state of unpaid claims. The claim will be scheduled for payment after it has been accepted. This makes collectors' jobs easier. So, they avoid dealing with anything other than disallowed claims that require assessment. The technology, which is driven by AI, can also forecast the likelihood of an insurance claim being paid out or denied.

3.3 Medical document processing

Maintaining optimal patient care while also juggling several administrative responsibilities is an almost difficult feat for healthcare providers. Medical professionals are under constant pressure to quickly process mountains of paper and electronic records while simultaneously attending to their patients.

Built-in models in RPA technologies employ integrated rules and machine learning algorithms to resolve this issue. Medical documents such as insurance cards, claims forms, medical reports, etc. are sorted into several categories by the robots using recorded data of on-screen clicks and activities. In addition to reading and processing PDFs, handwriting, emails, photos, and scans, it can also extract data from these sources.[21]

The US Food and Drug Administration (FDA), for instance, must accurately and quickly scan reams of electronic health records every day. Because of its ability to extract useful information from medical records, the public health agency entrusted this task to ABBYY's digital intelligence platform. The essential details collected from complicated documents are guaranteed to have an accuracy rate of more than 99 percent with this technology.

3.4 Appointment scheduling

Gathering information such as a patient's diagnosis, insurance details, social security number, and appointment scheduling is a time-consuming and laborious process. Additionally, patients have the burdensome task of making sure their availability matches that of the doctor. Robotic process automation (RPA) solutions can automate data collection and doctor-patient matching according to criteria such as availability, diagnosis, location, standards, and more, thereby resolving these issues. Regular appointment reminders can be sent to patients via these RPA technologies. In the event that the doctor is unavailable, it notifies the patients and allows them to change or schedule new appointments. Clinic appointment scheduling with UIPath is a great example.[22]

Cloud-based scheduling technology for hospitals developed by UiPath and Swiftqueue is utilized by healthcare institutions in the US, Canada, Ireland, and the UK. Appointments with doctors and lab testing can be more easily scheduled with this tool.

The scheduling platform receives patient data and doctor availability slots from all departments through software bots that access hospital records systems. Individual patient accounts containing all appointment information are now available to patients. They have the ability to modify or cancel their appointments using their accounts. In certain countries, where customers can only reschedule appointments over the phone, this option can be a cost-saver.[23]

3.5 Approach to RPA

In order to use bots effectively, the RPA installation covers multiple critical steps.

Process mining. Accessing all operations across and across the healthcare organization's many departments is the first step. The term for this is process mining. Finding out which tasks, such appointment scheduling, document processing, and claims processing, may be automated to save time and resources is the goal here. [24]

Find an RPA developer. As we indicated before, the majority of platforms offer drag-and-drop tools for creating code-free bots. An RPA developer, however, is required for the design of more complicated workflows. In addition to assisting businesses in the early stages, these experts construct, test, and maintain bots. They take involved in selecting an RPA platform, writing technical documentation, and collecting requirements.

Choose the right platform. The healthcare organization's desired automation tasks should guide your choice of RPA solution. Cognitive automation, utilizing technologies such as computer vision (document processing) or Natural Language Processing (patient scheduling), may be necessary for some jobs.

Devise a structured plan. Considerations such as process scalability, financial stability, and future-readiness should be incorporated into your plan beyond its implementation. A smaller system may be sufficient for attended RPA, but a bigger investment may be necessary for unattended RPA. Irrespective of the automation style, it is important to pilot a small set of jobs to gauge performance, and then scale up the RPA tool to handle larger sets of identical tasks. Doing so will also allow you to have a good idea of how much integration will cost.

Discuss innovations with employees. Gaining the trust of your staff is crucial for the successful implementation of RPA, thus it is vital that they are aware of your intentions. They may be most concerned about their job security. The solution is to have direct and honest conversations with staff about the necessity of automation, the advantages of it, and how it will improve the lives of both employees and patients.

Measure performance. To know if your RPA solution is successful, you must monitor how it performs. Comparing the amount of work that has to be completed after human error with the amount of work that needs to be redone after RPA adoption is one of the key approaches to measure the effectiveness of RPA. Obtaining employee input is also a part of control operations. Is it true that bots improve their life and save them time? Otherwise, retraining of personnel or redesign of the RPA will be necessary.

4. Challenges Of RPA In Healthcare

While RPA has a lot of promising applications in healthcare, it's important to weigh the pros and risks before committing to its implementation. You may recognize some of these limitations from my earlier warnings about potential problems with new AI technologies; however, you should constantly bear them in mind. Here are some of the difficulties:

- **Data security and privacy:** Numerous regulations, including HIPAA and GDPR, govern the handling of sensitive healthcare data. Data encryption, anonymization, secure storage, and access restriction to authorized users are essential features of RPA solutions. For RPA solutions to be transparent and accountable, they must also meet reporting and audit trail requirements.
- **Integration and interoperability:** Many programs and platforms used in healthcare systems are complex and disjointed, and there is no guarantee that they will be interoperable or standardized. Without interfering with workflows or lowering data quality, RPA solutions must be able to incorporate with current systems and procedures without any hitches. RPA systems should also be flexible enough to work with both organized and unstructured data, among other types of data.
- **Digital transformation and governance:** A change in mindset and an understanding of the end goal are necessary for the successful implementation of RPA technologies in healthcare. Planning, designing, testing, deploying, and monitoring RPA systems requires healthcare organizations to include stakeholders from all levels and departments. Organisations in the healthcare sector should also define who is responsible for what when it comes to RPA solution management, including but not limited to: ownership, maintenance, updates, performance evaluation, and risk mitigation.[25]

Even though these new technologies are still in their infancy, we may already draw on past experiences to inform our future decisions. The following is important for organizations to grasp.

With RPA, it's not just about buying new equipment; it's about completely revamping your company.

Learn the skills one by one, and keep in mind that this is a shift just like any other—it requires guidance and support.

- Conduct a pilot process to learn about the internal process's scope, potential trouble spots, and, most importantly, your organization's ability to employ RPA.
- Involve and give authority to all important parties early on who will be impacted by the change.
- Get in touch with your legal team as soon as possible to find out about any regulatory hurdles.

By automating repetitive and error-prone processes, RPA is a new technology with the potential to revolutionize healthcare operations and results. [26] Before implementing RPA systems in healthcare settings, it is important to thoroughly analyze the problems that are presented. To ensure data security, integration, change management, and governance, healthcare organizations must first review their present processes and requirements. Then, they must assess the practicality and appropriateness of RPA solutions for their unique use cases. Finally, they must use best practices.

5. Methodology

This study examines the usage of RPA in a residential hot water solutions provider's company to determine how it improves the utilization of human talent. Using the Automation Anywhere tool, a bot is constructed to automate repetitive activities.

A methodology was developed to perform the study that led to the implementation of RPA. Figure 3 shows the main phases of this technique.

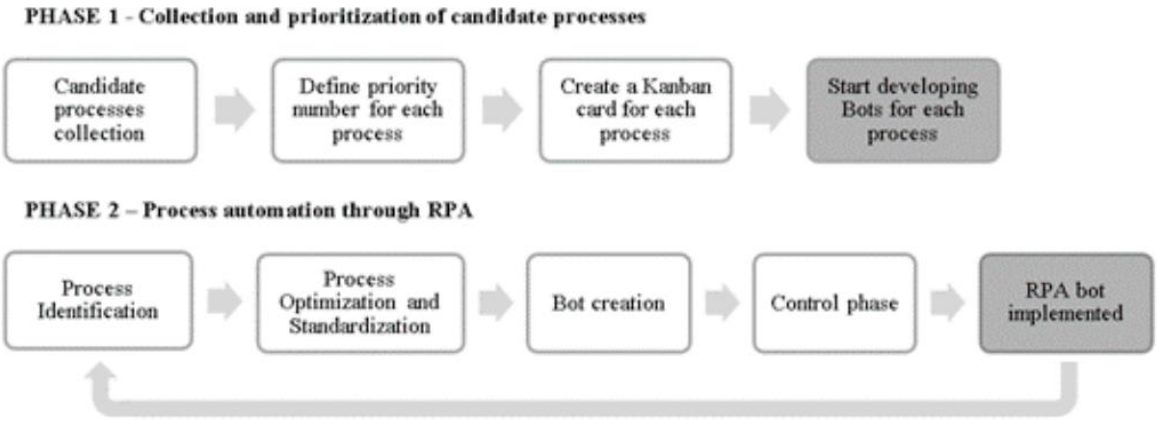

Fig. 3. Robotic Process Automation Implementation Methodology

Since the RPA deployment project is novel to the organization, the first step is to prioritize which processes will be automated first. The first step is to identify potential RPA-friendly processes in each department. The next step is to utilize a tool to rank the processes according to how suitable they are for RPA. We will prioritize automating the processes that are most important to you. Making a card for each procedure on a Kanban board is the third step in this phase. Kanban, literally "visual card" in Japanese, is a lean technology that makes scheduling more visual, which improves production and inventory control. A "Kanban board visualizes the workflow by having cards progress through several columns named, for example, 'Backlog,' 'Ready,' 'In Process,' and 'Done,'" as stated by Parsons et al. (2019). Project managers can benefit from the Kanban approach because it allows them to see the big picture, track the progress of each process, and limit the number of operations that can be automated at once. The procedures are ranked in order of importance after these three stages.

When a new process is decided to be automated, the second phase starts. Identifying the process is the initial step. In order to determine whether a process is appropriate for RPA, certain criteria must be met: I. rule-based; (ii) processing a large number of transactions; (iii) being predictable and stable; (iv) being an advanced system; (v) being vulnerable to human mistake; (vi) not requiring human involvement; and (vii) having no cognitive demands. standardized. It is important to carefully select the process to automate because its suitability may affect the RPA implementation's success. High levels of maturity, stability, and predictability are required of the process, which must also consist of simple rules with few exceptions. Time is typically an issue in processes that handle a large number of transactions. Automation presents a chance to improve process performance, decrease error likelihood, and lower costs in this context. The procedure cannot necessitate substantial human involvement or cognitive demands due to robots' inability to think creatively and analytically. It is necessary to digitize processes that involve non-electronic data first, as RPA is not yet equipped to handle this input type. To ensure that RPA can easily capture data, such as invoices from suppliers, a uniform format form is also required.

6. Results

Each area manager was responsible for collecting processes that they thought could be automated by RPA. They did this by sending an email outlining the processes in question. We were able to collect 83 potential processes. Establishing a sequence for the operations to be studied and automated was the goal of the "Define priority number for each process" stage. Figure 4 is the resulting Figure of Merit form. The Figure of Merit's value changes for each criterion in Table 1 that takes process classification into account.

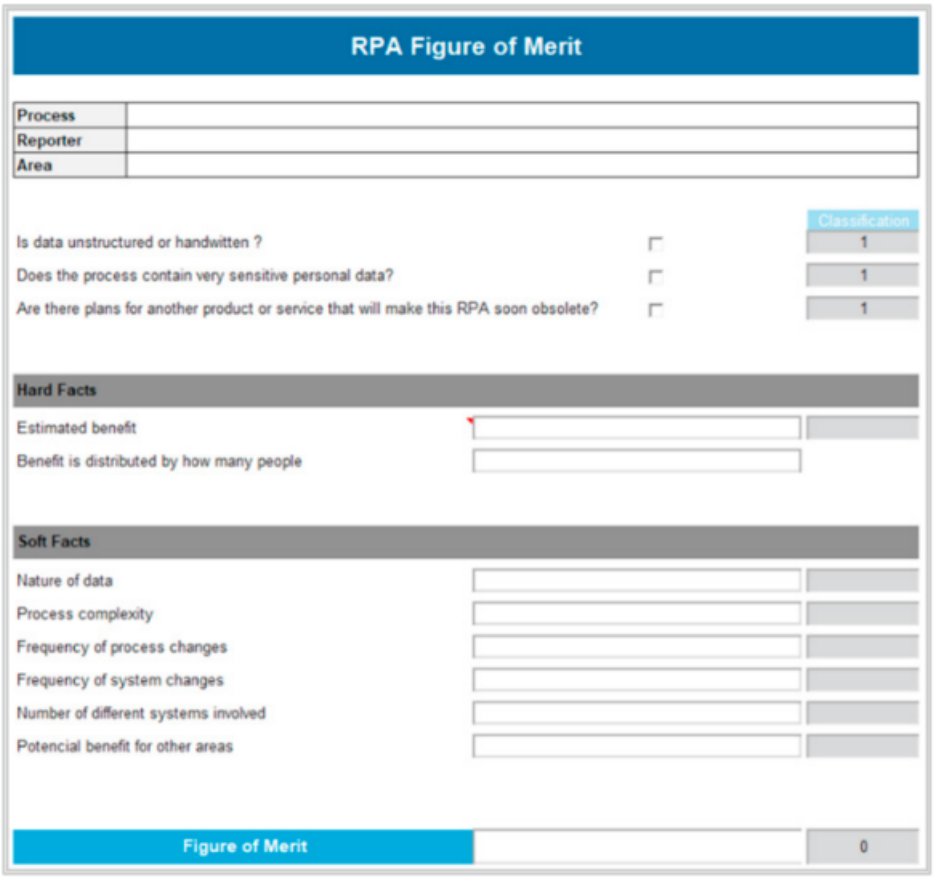

Fig. 4. Figure of Merit form for assigning automation priority to each process

Three categories—"stoppage factors," "hard facts," and "soft facts"—make up the form. The purpose of the form's three questions is to determine whether the process has any factors that could cause it to stop:

- Unstructured or handwritten data: The research suggests that in order to automate procedures that involve unstructured or handwritten data, digitization of the data is necessary. Since these processes would necessitate an alternative solution before being evaluated for this project phase, they were therefore deemed unsuitable.
- Very sensitive personal data: Bosch takes the security of its workers' personal information very seriously. It was decided to postpone these activities for a later stage of the project because the technology is new to the organization and has certain security risks.
- RPA soon obsolete: Implementing RPA is a laborious and expensive procedure that takes a lot of time. There is no use in automating a process if it will soon be terminated or changed; the investment will go down the drain.

Table 1. Criteria used to assign the figure of merit to each process

Criteria	Points	
Estimated benefits per person	FTE < 0.05	1
	0.05 =< FTE < 0.1	2
	0.1 =< FTE <0.5	3
	FTE >= 0.5	4
Nature of data	Handwritten, Unstructured	1
	A mix of digital and handwriting	2
	Digital structured data (e.g., human handled excel)	3
	Digital standard data (e.g., template or database)	4
Process complexity	Very challenging process	1
	Moderately challenging process	2
	Relatively straightforward process	3
	Straightforward process	4
Frequency of process changes	Commonly	1
	Somewhat commonly	2
	Rarely	3
	Very rare	4
Frequency of system changes	Externally built, very uncertain	1
	Regular changes	2
	Not commonly changing	3
	Inhouse, well built, and robust	4

Superior healthcare quality

Perhaps the most significant advantage of RPA in healthcare is this. Automation boosts patient satisfaction since it saves time, eliminates the possibility of human mistake, and frees up staff to focus on more important, patient-centered tasks.

Healthcare may find new uses as a result of the enhanced operational efficiency. More people's needs could be met by the healthcare system as a result. When it comes to healthcare, RPA is more than just an option because it promises enough treatment for more and more individuals.

For example, human resources departments can automate payroll and time attendance to make more room in their schedules. See an RPA demo of these same operations automated down below.

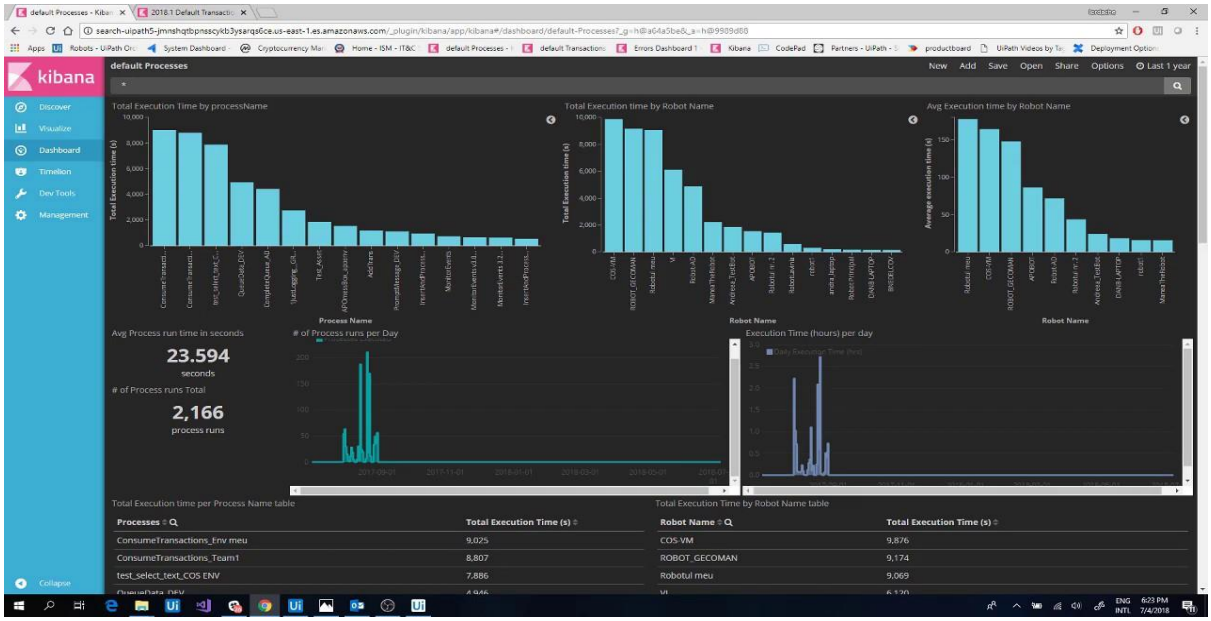

Fig 5: Superior healthcare quality

7. Conclusion

It is reasonable to assume that RPA will trigger a paradigm shift in the healthcare sector due to its shown ability to reduce expenses, effort, and time. By automating routine tasks with robots, medical staff will have more time to concentrate on making patients better.Expanding access to care will be greatly aided by the digital workforce's ability to quickly and accurately input, organise, and analyse massive volumes of medical data. There is great hope for revolutionary transformation in the healthcare industry from the future of robotic process automation. If healthcare organizations want to optimize operations, manage costs, and improve patient care while technology continues to grow, they must face issues and embrace innovations. Implementing RPA is more than simply a technical change; it's a strategic step toward a healthcare ecosystem that is more efficient, accurate, and patient-centric. With automation, human resources can concentrate on providing high-quality treatment, which is what really matters.

References

[1] Fernandez, D. and Aman, A. (2018) Impacts of Robotic Process Automation on Global Accounting Services. Asian Journal of Accounting and Governance, 9, 123–32. https://doi.org/10.17576/ajag-2018-09-11

[2] Siderska, J. (2020) Robotic Process Automation-a driver of digital transformation? Engineering Management in Production and Services, 12, 21–31. https://doi.org/10.2478/emj-2020-0009

[3] Kadir, B.A. and Broberg, O. (2021) Human-centered design of work systems in the transition to industry 4.0. Applied Ergonomics, Elsevier Ltd. 92, 103334. https://doi.org/10.1016/j.apergo.2020.103334

[4] Hecklau, F., Galeitzke, M., Flachs, S. and Kohl, H. (2016) Holistic Approach for Human Resource Management in Industry 4.0. Procedia CIRP, The Author(s). 54, 1–6. https://doi.org/10.1016/j.procir.2016.05.102

[5] Zhou, B. (2016) Lean principles, practices, and impacts: a study on small and medium-sized enterprises (SMEs). Ann Oper Res, 241, 457–74. https://doi.org/10.1007/s10479-012-1177-3

[6] Mrugalska, B. and Wyrwicka, M.K. (2017) Towards Lean Production in Industry 4.0. Procedia Engineering, Elsevier Ltd. 182, 466–73. https://doi.org/10.1016/J.PROENG.2017.03.135

[7] Igwe, C., Hammad, A. and Nasiri, F. (2020) International Journal of Construction Management ISSN: (Print) (Online) Journal homepage: https://www.tandfonline.com/loi/tjcm20 Influence of lean construction wastes on the transformation-flow-value process of construction Influence of lean construction wastes on the transformation-flow-value process of construction. https://doi.org/10.1080/15623599.2020.1812153

[8] Jerman, A., Pejić Bach, M. and Aleksić, A. (2020) Transformation towards smart factory system: Examining new job profiles and competencies. Systems Research and Behavioral Science, 37, 388–402. https://doi.org/10.1002/sres.2657

[9] Ventura, K. and Özkan Özen, Y.D. (2017) Exploring the Interaction Between Internal Customer Satisfaction and Talent Waste: A Lean Management Perspective. Journal of Business Research - Turk, Journal of Business Research - Turk. 3, 345–59. https://doi.org/10.20491/isarder.2017.303

[10] Knowles-Cutler, A. and Lewis, H. (2016) Talent for survival: Essential skills for humans working in the machine age [Internet]. Deloitte.

[11] Ratia, M., Myllärniemi, J. and Helander, N. (2018) Robotic process automation - Creating value by digitalizing work in the private healthcare? ACM International Conference Proceeding Series, 222–7. https://doi.org/10.1145/3275116.3275129

[12] Uskenbayeva, R., Kalpeyeva, Z., Satybaldiyeva, R., Moldagulova, A. and Kassymova, A. (2019) Applying of RPA in Administrative Processes of Public Administration. Proceedings - 21st IEEE Conference on Business Informatics, CBI 2019, IEEE. 2, 9–12. https://doi.org/10.1109/CBI.2019.10089.

[13] Ramya Thatikonda, Adithya Padthe, Srinivas Aditya Vaddadi, Pandu Ranga Rao Arnepalli, Effective Secure Data Agreement Approach-based cloud storage for a healthcare organization, International Journal of Smart Sensor and Adhoc Network, Pp 60-70.

[14] Ramya Thatikonda, Bibhu Dash, Meraj Farheen Ansari, Srinivas Aditya Vaddadi, E-Business Trends and Challenges in the Modern Digital Enterprises in Asia, Digital Natives as a Disruptive Force in Asian Businesses and Societies, Pp 22-43.

[15] Santosh Vishwakarma, Rajat Subhra Goswami, P Prathap Nayudu, Krovi Raja Sekhar, Pandu Ranga Rao Arnepalli, Ramya Thatikonda, Wael MF Abdel-Rehim, Secure federated learning architecture for fuzzy classifier in healthcare environment, Soft Computing, Pp 1-12, 2023.
[16] N Simhadri Apparao Polireddi, J Kavitha, Effectiveness of automated chatbots for operational support and self-service based on fuzzy classifier for ASD, Soft Computing, Pages 1-8. 2023.
[17] Naga Simhadri Apparao Polireddi, K Chaitanya, Web accessibility evaluation of private and government websites for people with disabilities through fuzzy classifier in the USA, Soft Computing, Pages 1-9. 2023.
[18] Adithya Padthe Srinivas Aditya Vaddadi , Pandu Ranga Rao Arnepalli , RamyaThatikonda, , Effective Malware Detection Approach based on Deep Learning in Cyber-Physical Systems, International Journal of Computer Science and Information Technology, Volume 14, Issue 6, Pp 01-12.
[19] R Pulimamidi, P Ravichandran, Connected Health: Revolutionizing Patient Care Through Artificial Intelligence Innovations, Tuijin Jishu/Journal of Propulsion Technology 44 (3), 3940-3947.
[20] R Pulimamidi, P Ravichandran, Enhancing Healthcare Delivery: AI Applications In Remote Patient Monitoring, Tuijin Jishu/Journal of Propulsion Technology 44 (3), 3948-3954.
[21] R Pulimamidi, GP Buddha, Applications of Artificial Intelligence Based Technologies in The Healthcare Industry, Tuijin Jishu/Journal of Propulsion Technology 44 (3), 4513-4519.
[22] R Pulimamidi, GP Buddha, AI-Enabled Health Systems: Transforming Personalized Medicine And Wellness, Tuijin Jishu/Journal of Propulsion Technology 44 (3), 4520-4526.
[23] GP Buddha, SP Kumar, CMR Reddy, Electronic system for authorization and use of cross-linked resource instruments, US Patent App. 17/203,879.
[24] Dash, B., & Ansari, M. F. (2022a). Self-service analytics for data-driven decision making during COVID-19 pandemic: An organization's best defense. *Academia Letters*, 2.
[25] Dash, B., Sharma, P., & Ali, A. (2022a). Federated learning for privacy-preserving: A review of PII data analysis in Fintech. *International Journal of Software Engineering & Applications*, *13*(4), 1-13. https://doi.org/10.5121/ijsea.2022.13401
[26] Sharma, P., & Dash, B. (2022a) THE DIGITAL CARBON FOOTPRINT: THREAT TO AN ENVIRONMENTALLY SUSTAINABLE FUTURE. IJCSIT. https://doi.org/ 10.5121/ijcsit.2022.14302