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Implementing robotic process automation to improve operational efficiency in the health-care sector

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***Abstract*---**Robotic Process Automation (RPA) is a technique that is rapidly being utilised as a tool to automate, maintain, analyse, and update existing databases in a cost-effective and error-free manner. The majority of healthcare procedures are the same. As a result, deploying Automation solutions in the healthcare industry pays off handsomely for the firm. The Patient Registration procedure is one of the best application reasons for RPA adoption. As requested by the hospital, collect information from patients. Finally, all of the patient's records should be integrated and updated in one location. Manually performing these activities takes a long time and can result in a lot of human mi stakes. Patients must also wait in line to submit their applications if they are done manually. RPA in Patient Register will not only speed up and streamline the process, but it will also improve customer satisfaction and provide a competitive advantage. As a result, a healthcare bot can take over such routine activities from a human staff, allowing them to focus on more important diagnostic and analytical tasks. In addition, an RPA database may be utilised to schedule doctor's visits and deliver all pertinent information to the doctor with a single click. Put your abstract here. Use single spacing and don’t exceed 200 words.

***Keywords*---**health-care, Robotic Process Automation (RPA), Implementing.

Introduction

Healthcare businesses confront a greater difficulty than ever before in acquiring and integrating data from multiple primary and secondary data sources. On a daily basis, the healthcare business acquires and analyses massive volumes of data from lab information management, medical studies, third-party portal, radiological data management, insurance portals, scheduling apps, HR applications, and ERP systems, among other sources. The integration of these technologies is equally difficult and time-consuming. Patients, health insurers, doctors, and a variety of other stakeholders must all work together to ensure that care is delivered in a timely and efficient manner. The administrative and support employees in a healthcare facility make up the back office. The back-office team is responsible for regulatory compliance, record-keeping, and IT, settlement, and clearance services [5]. Robotic process automation and other advanced automatic technologies assist healthcare firms minimise operating expenses, boost operational efficiency, and eliminate human error in data acquisition. RPA technologies can process data in a fraction of the time and address issues caused by human error.

Keywords
Robotic process automation, healthcare, bots, agents
Literature review

According to studies, the health sector spends $2.1 billion annually to automate all mistakes and poorly performed human processes related to data administration! As a result, automation and RPA in the healthcare sector have enormous potential. To keep up with COVID-19-related demand, Providence St. Joseph Health implemented an online testing and patient triage service. In addition, Mass General Bingham implemented the Partners Health COVID-19 Screener, a programme that asks patients questions to automatically distinguish between suspected COVID-19 instances and other illnesses.

According to McKinsey, using robotic process automation in health insurance promises a 30% decrease in claims processing expenses for organisations that automate 60-70 percent of claim administration tasks. Despite the fact that RPA is one of the biggest innovations, just 5% of the US healthcare professionals use smart bots to automate routine tasks and increase efficiency. As per Gartner, the number of RPA adopters in the healthcare business might increase to 50% in three years, and artificial intelligence will soon be used in 20% of all physician contacts.

RPA still relies on earlier advances in workflow and screen scraping, according to Aguirre et al.[1], even though RPA takes those technologies to a new level. To achieve intelligent processing, RPA concentrated on how to refine and alter its logic and low, as well as fortifying it using probabilistic algorithms (Berrutti, et al., 2017).

RPA is frequently aided by and integrated into business process modelling frameworks (Herm et al., 2021). Sampson suggested that researchers dig deeper into the healthcare setting and look for task features that are related to RPA.

(Schmitz and colleagues, 2019). In the RPA market, software refers to a single licence that operates 24 hours a day, seven days a week [5]. Staaby et al. (2020) expanded on dull work automation and urged working on robotizing more than just routine and repetitive tasks. In a process-oriented view, it comprises numerous lightweight IT solutions for adapting and enhancing resource-intensive processes using a continuously plan-do-check-act (PDCA) cycle (Syed et al., 2020).

Methodology

Robotic process automation (RPA) technique can help healthcare organisations with a variety of data transmission and clinical documentation use cases. The primary goal of this work is to improve operational efficiency, lower costs, and reduce the risk of human mistake. Figure 1 depicts the overall framework [8].

Fig 1: Overall Framework of RPA in Healthcare System

Data Management

RPA bots can conduct all of the basic information-related processes, such as data extraction, classifying files, and locating relevant contact information, at the entry level. There are a variety of practical use cases here. RPA can be used to automate registration processes, hold and work with medical records, and enter data in a repetitive manner.

Patient Appointment Scheduling

When it comes to scheduling appointments, Robotic Process Automation demonstrates its full potential. RPA bots, for example, can scan each doctor's accessibility, working hours, and expertise and provide patients with time slots based on their symptoms. Doctors will be able to manage patients more easily in the future because the bot has already gathered all of the necessary information. The app also delivers takeaway notes and maintains reminders.

- **Managing Claims**

In the healthcare industry, RPA helps with claim administration. The programme helps insurance firms discover fraud and errors in this case. The difficulties of inaccuracies and delays are eliminated with quicker data processing.

- **Optimal Care Delivery**

Manual inputs are no longer required thanks to RPA. It improves diagnosis accuracy by allowing doctors to compare past health information with the most up-to-date information about a patient's condition. The entire procedure is totally automated, reducing the amount of time and effort required to determine the most suited treatment. This allows you to work with unstructured data because RPA will use keywords to find the information you need.

In hospitals, RPA helps manage sophisticated Big Data. When done manually, the activity necessitates a significant amount of effort and resources. To tackle this problem more efficiently, the software incorporates increased data analytics. Aside from that, technology aids in the efficiency of administrative procedures, financial management, and delivery process synchronisation. Given the vast amounts of data health care organizations generate, RPA could streamline processes and take over some of the mundane tasks employees now perform.

Proposed System

The patient appointments registration with RPA is intended as part of the overall architecture. Patients frequently register for medical care online and schedule appointments with doctors. Because health care businesses need gather patient information, test results, insurance details, and other information throughout the registration process, patient registration appointments are a time-consuming data procedure. RPA solutions can help medical organisations tackle difficulties like patient records and appointment scheduling. RPA robots may automate data collecting and processing operations for patients, as well as determine the optimal appointment time for them based on their condition, doctor availability, distance, and standards. It scans the patient's information to generate a report that can be forwarded to the referral management to confirm a legitimate appointment and inform the patient about the doctor's availability. If a doctor's appointment is unavailable, RPA software can keep track of the doctor's schedule and remind patients. This process is shown in Fig.2.

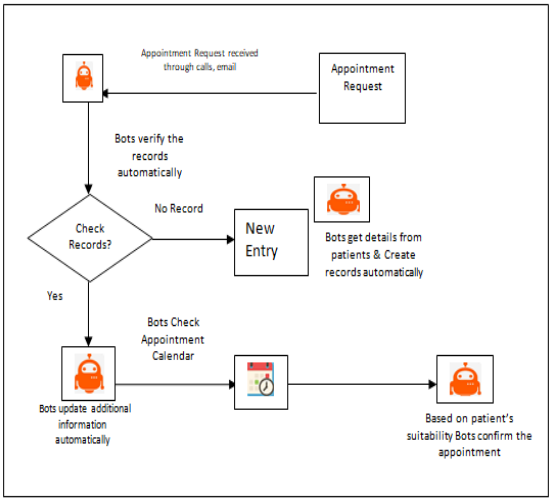

Fig.2: Patient Appointment Registration with Robotic Process Automation

Experimental results and discussion

UiPath Studio is an RPA-based process automation solution that can automate even the most difficult jobs. UiPath assists businesses in converting tedious, repetitive jobs into automated processes that may be completed using a variety of tools. Using UiPath, a bot is created to schedule patient appointments.

Patient inquiry is a critical module for keeping track of a patient's information. Administrator can see a list of patient information, add new patient records, and amend existing ones as in Fig.3. If a patient wants to schedule an appointment with a certain doctor, he or she must call the office and have the record verified as shown in Fig.4. If the record isn't available, the administrator will make the necessary updations in the data base.

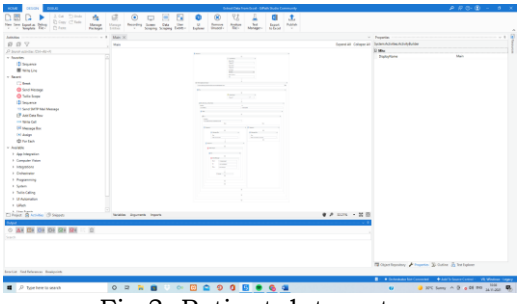

Fig.3: Patient data entry

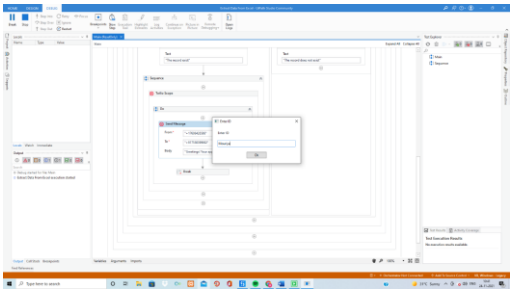

Fig.4: Patient details and verification

Otherwise, his information is tracked down, and an appointment is scheduled depending on the doctor's availability, with the time and date of the appointment sent to the patient through SMS as depicted in Fig.5. As a result, the doctor's database is updated, and he receives a notification. For a specific doctor's schedule, the system updates and cancels appointments. In the event of an emergency, the system can manage appointment schedules automatically.

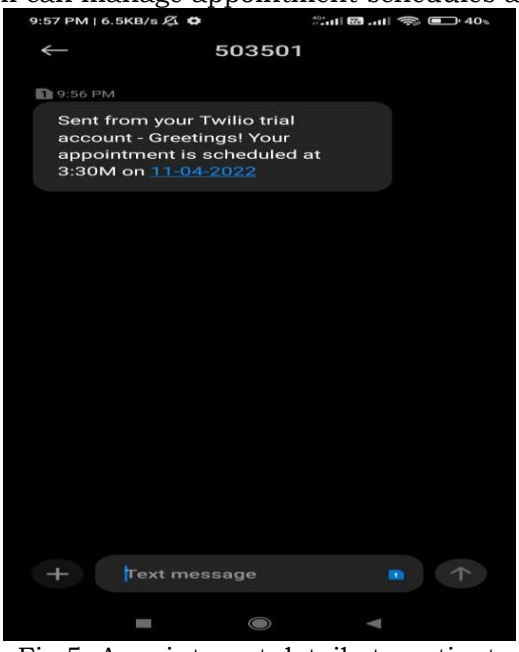

Fig 5: Appointment details to patient

Conclusion

Many innovation and transformations in the health-care business have been sparked by advances in machine learning and robotic process automation. As a result, the globe benefits from a healthy ecology and greater health-care delivery that saves lives. Medical businesses can use RPA solutions to streamline procedures without raising labour expenditures, which represent for 60% of overall operating costs. Healthcare organisations can reduce errors caused by manual data entry by delegating boring jobs to robots. As a result, health-care automation increases the quality of services provided.

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