Review Article

Robotic process automation in healthcare-a review

Abstract

Robotic Process Automation (RPA) is a technological revolution in the offing and is aimed at taking up the mundane and repetitive tasks from people's daily workload. It throws up a new vista of research to the researcher community and lot many research works are going on in this domain. It is not Robotics but is different technology altogether. RPA is a recent and fast growing sub-domain of Robotics. In this paper the authors highlight the key aspects about RPA and review its usage in the all-important healthcare domain.

Keywords: robotics, process automation, healthcare, technology, artificial intelligence

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Introduction

Robotic process automation (or RPA) is an emerging form of business process automation technology based on the notion of software robots or artificial intelligence (AI) workers.[1] RPA is software based automation approach which automates the business processes by understanding the existing processes & practices. In essence, it is software which mimics the virtual human workforce and performs the tasks & activities which are repetitive in nature reducing the involvement of human in the process. Today the business world is extremely competitive and everyone wants to be ahead of its competitor for gaining the advantage. Hence, the RPA technology is proving to be effective in increasing profitability, efficiency of the business houses when certain recurrent processes are automated. This type of automation help the human employees to focus on more critical tasks, be more innovative and devote time to enhance their knowledge & skills in the domain. Planning, Implementation and Monitoring & Evaluation are the three major phases of any RPS project. RPA is considered to be a significant technological evolution of this technique in the sense that new software platforms are emerging which are sufficiently mature, resilient, scalable and reliable to make this approach viable for use in large enterprises.[2] Researchers opine that RPA will usher in a new wave of productivity & efficiency gains in the global workforce once the technology becomes more matured and stable in the coming decade or so.[3] RPA is proving to be the technology of future and its goal is to provide a sustainable solution that reduces costs and delivery time, improves quality, speed and operational efficiency of a business process.

According to a report by Global Market Insights, Robotic Processing Automation (RPA) market will likely reach $5bn by 2024. Figure 1, as given below depicts the trend in the RPA market by services and the survey was carried out by a firm based in California State of USA. The report shows that RPA is gaining its applicability in the professional as well as training services.

The Robotic Process Automation is thus a Disruptive Technology and is finding its applications in the domains where task repetition is there. RPA results in cost improvements and operational efficiencies for the companies who are deploying RPA. It helps in removing the human involvement from repeated tasks and help in improving the accuracy by reducing the errors. It works 24/7 throughout the year without any break and also reduces risks, have a measurable outcome with visible impact for the enterprises.
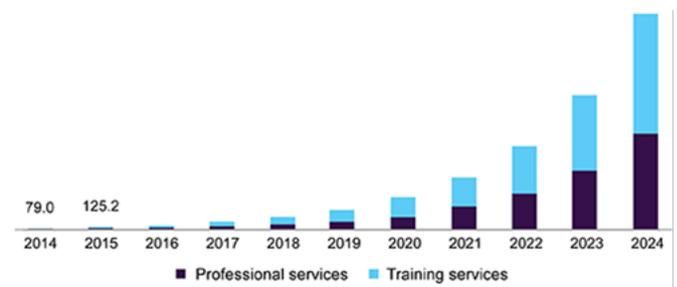
Figure 1 Global robotic process automation market by services, 2014-2024 (in USD Millions).

RPA vs traditional IT based automation of processes

There is an extremely thin line that separates RPA based and IT based automation of business processes. To a layman both approaches will look same but in reality they are very much different. Following are some of the aspects which differentiate RPA from traditional IT based automation of processes.

Nature of focus

Both RPA and traditional IT based automation focus on different areas of the business and are designed with different objectives. Automation leads to the optimization of operational processes. IT based process automation is primarily tasked to improve profitability by reducing the costs and improving upon delivery time to the end users. The robotic process automation covers a broader set of simpler functions, exceeding well beyond the IT department and into just about every facet of the business, from accounting to marketing. RPA is being leveraged to make the jobs of the end-users easier and more efficient. ITPA, is focused more on the needs and weak points of the company's complex IT infrastructure.

User-friendliness (UI/UX)

One of the features of RPA is that the tools and applications are very user-friendly and have better user interfaces (UI) & provide better user experiences (UX). The goal is to create clear and simple user interfaces that are customized to the needs of the final users and can be operated by basically everyone with a basic IT-understanding.

On the contrary, the traditional IT based process automation tools and applications have less appeal to the end users w.r.t. the UI/UX. Therefore, traditional IT based process automation applications are more complex and require some advanced IT-skills. These applications are often created through coding and even the use of these ITPA applications can require some programming skills.

Non-disruptiveness

Traditional IT based process automation developments are designed to transform or change the existing less-than-optimal processes and systems, in order to make them more efficient. So, it is pretty obvious that they will disrupt the current IT architecture. Instead, RPA tools lean towards light IT requirements and do not, for example, disturb underlying computer systems. The robots access end-user computer systems exactly as a human does-via the user interface with an established access control mechanism-so no underlying system change is required.

Both the above approaches to automation are important and if a company can use them together, it is surely going to gain an edge over its competitors. There are two school of thoughts having different viewpoints on the implementation of RPA in different domains. One section feels that RPA will prove to be a job killer mainly the backend or back office jobs which are handled by Business Process Outsourcing (BPO) firms since software robots will perform those tasks without getting tired and without errors. But then there is another school of thoughts and people like Violino explains that the technology itself will provide opportunities because organizations will need people who are skilled in implementing, managing, and maintaining the programs. In fact, there is going to be a need for new skill sets in lower and middle management, for people who are able to work with RPA platforms and understand how to manage them. In addition, companies could move some of the displaced workers into more interesting and challenging types of jobs either in IT or other areas of the business.[4]

RPA in healthcare–an overview

Healthcare industry in any country is one of the largest sectors, when it comes to revenue generation and employment. It comprises of medical devices, clinical trials, health insurance and medical equipment etc. To manage and process information spread across many internal and external sources, including clinical applications, lab information systems, third-party portals, insurance portals, radiology information systems, scheduling applications, ERPs and HR applications is a challenging task in any healthcare system. Since integration across these systems is often complex, healthcare organizations have to rely on humans to perform manual labour-intensive tasks to process information.[5]

The main entities of healthcare are patients, doctors, insurance companies etc. To maintain a balance between the increasing number of patients and paperwork that is needed for follow up and insurance claim etc., there is an urgent requirement of a more efficient and accurate back office process. In this regard, present day advanced automation solutions such as Robotic Process Automation (RPA), can help healthcare organizations increase operational efficiency, lower costs and limit the possibility of human error when processing information including Physician credentialing, Enrolment and patient eligibility, Patient scheduling, Coding, Claims administration, Clinical documentation, Medicare billing and compliance, Secondary claims management, Accounts receivable and denial recovery, and Patient self-pay administration.[6]

Also, the healthcare companies face challenges in bringing new drugs to the market as they need to maintain their quality, along with efficiency and profitability. The innovation processes in the healthcare industry often faces regulatory and reporting challenges which can be addressed using the process automation solutions. These solutions enable the healthcare companies to improve safety and bring effective drugs to the market.

Potential benefits of RPA in the healthcare industry

a) RPA implementation happening in the healthcare today will help in:

b) Mitigating the challenges of the healthcare sector in terms of the complexities of processes, volume of patient & hospital data from multitude of sources by integrating disparate systems using software robots to automatically acquire and integrate data from clinical applications, lab information systems, third party portals, insurance portals, radiology information systems, scheduling applications, ERPs and HR applications

c) Free employees from repetitive tasks so they can apply their skills to scenarios that require a human touch

d) Minimize expenditure on budget and human resources, infusing speed, intelligence, efficiency and quality into the healthcare processes

e) Automate tasks like eligibility requests to access information for better communication to providers and patients

f) Automate claims status requests and perform reviews of claims to deliver better revenue cycle management

g) Create a digital workforce which will work side by side with the employees to achieve greater efficiency

Conclusion

RPA has a lot of applications in a number of industries including healthcare and medicine and it provides some very promising results, but just like any other new technology, it suffers from various challenges. It has the potential to cut out monotonous tasks across a wide variety of roles, functions, and departments; and a relatively unobtrusive technical implementation with a shallow learning curve for those in the organization who rely on it. As different organizations roll out RPA, a configuration that works for one may not work for another, from enterprise-wide setups where every function is incorporated, to smaller deployments with more limited scope. There are still some trust issues involved as not many people are still convinced to include robots in surgeries. Then there is governance and policy issue as there are still not proper guidelines to implement RPA in healthcare and medicine. It's clear that with the development in RPA and its adoption can create a lot of IT jobs for people to manage and maintain the software programs but on the other hand the fact that it will bring unemployment for a lot of people can't be ignored.

Acknowledgments

Conflicts of interest

The author declares there are no conflicts of interest.

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