THE SMART ROBOTIC PROCESS AUTOMATION MODEL FOR STREAMLINING INDUSTRIAL PROCESSES

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Abstract

Currently, robots are helping humans in many fields. Robots are being used in many fields, including medicine and wastewater management. Automation systems used to create fully automated or semi-automated robots that can perform a series of tasks that humans can hardly perform, and to manufacture the spare parts needed for it, further enhance the robotic system. Automation is the process of using machines, computers, software, and other technologies to perform tasks commonly performed by humans. Most of the web pages, software, and automation that are in find on the Internet are the type of automation. In this paper, a smart robotic process automation model was proposed to enhance the automation efficiency of an industry. The proposed automation model has a high-level strategy for streamlining industrial processes. It regulates all processes in the industry and integrates them with automation software. The industries are likely to imp, wastewater management rove astonishingly when this proposed model is implemented.

Keywords:

Robots, Medicine, Automation Systems, Semi-Automated, Fully Automated, Automation Efficiency

1. INTRODUCTION

The use of robots is likely to increase in all fields in the coming years. Currently used in the medical field and the like. There are reports of robots being used in food and kitchens in many countries [1]. It can be said that robots do things that humans cannot do. Robotics process refers to software robots. These are capable of automatically controlling the software movement of the computer [2]. It is easy to integrate system processes with them in the current scenario. Intelligence process automation uses artificial intelligence to learn how humans perform tasks while using a computer program [3]. In this way the activity of human beings can be monitored. Industrial automation refers to machines that operate automatically using mechanical robots and special control systems [4-5].

In industry automation robots use flexible methods to automate human labor. These types of robots do not hesitate to perform tasks more efficiently than humans [6]. When we talk about automation and robotics, we usually refer to industrial automation. Industrial automation is the control of running processes [7]. This includes the use of software machines and control systems to automate tasks within an industrial process. An example of this would be a fully automated factory [8]. Nowadays fully automatic machines have arrived to make matches. There are many more automation plants like this. Both robotics and automation are intertwined [9]. But they are not identical. Mechanical robots can be used in automation technology. But many robots do not use automation technology [10]. Automation is not always used in automatic robots.

For example, a robot can arbitrarily follow a path or a fort. But it does not require automation. Because, it does not perform a specific task. But if a robot carries drugs in a hospital, it will require automation technology.

Robotics process automation technology arises from a combination of various sciences such as mechanics, electronics, computing or systems. This technology contributes to the delivery of hard work that cannot be done by a human being, which must be completed quickly and with minimal error. Tasks that were previously carried out by hundreds of people and took hours or even days can be completed by a robot in minutes, with minimal error [11]. This is one of the types of technology. In addition, robot technology has reduced the difficulties in businesses because they are unpaid, overtime working, without fatigue, or without retirement or vacation, lasting many years in the company, without retiring, only following orders, "labor". One would think that this is the time when robots can completely transform humans and become our subordinates and their servants. However, there is nothing beyond reality because this is only possible if one robot has the ability to create another brilliant robot. From that moment on the man loses his control.

Robotics technology has played a major role in the construction of hospitals, schools, and automobiles. Perhaps, robot technology will allow us to be from home to smart cities in the not-too-distant future. In general, robot technology understands its context and can perform actions that allow it to achieve the designed goal [12]. The first advances in robot technology helped to automate businesses. Today, applications for robot technology range from agriculture to space travel [13]. Designing a robot requires a combination of various engineering specialties such as electronics, mechanics, computing, control, and information technology; i.e., Mechatronics Engineering. All of these specializations together are now known as robotics engineering or mechatronics. Automata or state machinery and algebra are other branches integrated with mechatronics.

Robot technology is constantly advancing, along with its various applications. It plays a significant role in the automotive and electronics industries. But we can also see it in the fields of agriculture, fisheries, mining, research, transportation, education, medicine, geography, and the environment. Robotic technologies have been developed that are capable of determining people's moods. Its function is to establish social relations with the people. The main purpose of the existence of robot technology is to contribute to the difficult and dangerous tasks for humans. Its impact on the modern world has led some countries to reconsider their internal policies for its benefit and livelihood.

The invention of robot technology is becoming more and more complex every day. It begins to demand a more advanced and in-depth position and requires years of hard research to make a breakthrough. While this does not mean that it is a negative,

achieving these improvements requires a lot of collaboration between various companies, experts, centers and companies focusing on robot technology. Based on the extensive experience was gained from many years of mutual work [3].

This collective mindset is caused by the need for research centers to generate revenue and the lack of staff and trained equipment to allow industries to evolve their robot technologies. Businesses need advances in robot technology to update their internal processes [4]. This is to provide high quality, reduce costs and improve their products. That's why they fund universities and research centers for their robot technology projects. Both parties' benefit from funding universities and businesses that receive the results of research conducted. This makes it possible for the individual to make progress in each area, including robotics technology. For example, in improving microprocessors and electronic components, programming languages, materials and power generation that are an integral part of this technology [10]. Robotics technology requires significant investment and the results of studies are many years. But with the advent of new technology, both universities and businesses are realizing that the return on investment will be short-lived and its benefits will last

2. LITERATURE SURVEY

Robotic Process Automation is a technology that is being implemented to reduce manpower in many key sectors including industry. Robotic Process Automation is a technology that is being implemented to reduce manpower in many key sectors including industry. It is based on software or artificial intelligence workers [1]. It is a form of business process automation technology. In short, the work done by 10 people can be done by the machine with this technology. It is enough if fewer people are hired to monitor whether this technology is working properly. Robotic Process Automation is the automation of the work that we do manually with our employees. Look at the word Robotic in this technology and do not think that robots will work in response to humans [2]. The word robotic can mean executor. The executor of the command. It's a kind of software. With this we will see how they automate the work done manually. It can automate routine tasks without even the slightest change. Take train stations for example [3]. We will go to the counter before and stand in line and pick up the tickets. But now if we pay the due amount inside the ticket machines kept at many railway stations, that is what gives us the tickets. Machines have been set up for both important jobs such as withdrawing and depositing money in some banks as well [5].

There are ATM machines for withdrawing cash and cash deposit machines for depositing money. The manpower that previously had to look after these works is now gone. As well as the nature of mistakes that occurs in the work of human beings [6]. But in Robotic Process Automation most mistakes do not happen. Mistakes are also less likely to occur. Automation can do repetitive, repetitive tasks that do not require thinking. RPAs are more likely to fail over time due to the lack of clearly defined processes in some organizations [7]. Business process professionals will play a key role in identifying tasks and processes at that moment and prioritizing them. The failure of the RPA was largely the result of the management of digital workers being sent into production. On the surface, it may seem that once the bot is built, the job is done and running spontaneously without any supervision. In fact, automation is more like a human worker than a software. RPA is used in most businesses, especially those covering a wide range of tasks, such as insurance, banking, finance, healthcare and telecommunications. RPA is used in finance to automate management, adjust accounts or process invoices.

There are many applications in robot technology that have allowed for advances in science and technology. Robotic technology has become an indispensable companion in the fields of education, medicine, research, industry, and martial arts. Robotic technology has allowed the creation of autonomous systems. This is possible because they can explain their situation and make decisions based on the information they receive. Human knowledge is essential to improve the production process. Similarly, tasks such as tracking with maximum accuracy can only be performed by man. In other words, there will always be processes that can only be done by one man. As robot technology advances, new specialties emerge and so new jobs are filled. If the total domain of robot technology is allowed in all existing tasks, it will pose a risk in the formation of human interaction and social relationships. So, this technology in all its forms is not released to the public unless human safety is guaranteed [8].

3. PROPOSED MODEL

With the development of science and technology, new materials and electronic components have been developed which have made it possible to create the most sophisticated robot technologies. Similarly, the development of increasingly complex programming languages and algorithm programs has allowed robot technology to become more autonomous. Science is the compilation of different disciplines of technology. Its purpose is to design robotic devices capable of performing various tasks automatically. And they perform actions that simulate human or animal behavior. All of these respond to the functions integrated in the robot's software. The robotic rules are listed below shown in Fig.1,

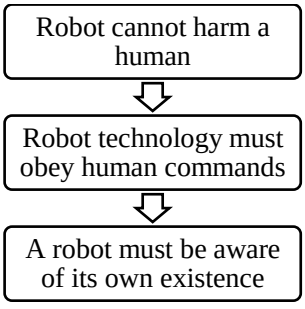

Fig.1. Robotic Process Automation Rules

- A robot cannot harm a human.
- Robot technology must obey human commands, as long as these commands do not harm another human.
- Until robotics violates the first and second rules, a robot must be aware of its own existence.

Industry is one of the most preferred sectors. Robotics technology has contributed to the automation of production and manufacturing processes in various industries. These smart

devices are designed with software that responds to various processes in the production chain. However, in recent years, technological advancement has increased the capability of these smart devices. Among the technologies integrated in robots, artificial vision and artificial intelligence made it possible to improve their functions. These robots are designed to perform complex functions that represent some danger to humanity. Likewise, they are those who embody effort and are capable of doing repetitive tasks in nature. These machines have the advantage of not being affected by common human factors such as fatigue, hunger, thirst, sleep, illness, and fatigue shown in Fig.2.

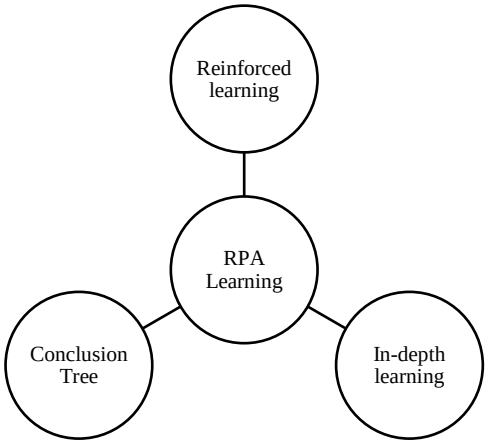

Fig.2. Proposed RPA Learning models

- **Reinforced learning**: Techniques such as reinforced learning are also used. Robots are empowered just as animals are trained to be rewarded for the successful execution of a given command. The robot executes its first sequence and it gets results, and then it improves its decision making.
- **Deep Learning**: Deep learning is another way of learning how robotics technology can be applied. This type of learning attempts to mimic the neural behavior of our brain. A first neuron receives information from its sensors such as eyes, touch, taste, smell and hearing, and the neural sequence is immediately activated to provide information on the event. As for robot technology, its sensors provide information that analyzes the parts. Take, for example, the case of a robot that recognizes a face. When detecting a face, its cyber neural network begins by analyzing the most basic data, understanding the colors that make up that face, and then dividing it into thousands of frames to finally visualize the details that make up the face.
- **Conclusion Tree**: It provides a progress plan based on the responses received. This type of program is very common in robotic technology programming algorithms. This is how computational algorithms programmed into a robot's computer or brain work. When faced with a challenge, it begins to implement many of its projects and stores information. Finally, when it successfully reaches the solution, it saves the results of the positive result to respond quickly the next time. It can be said that the robot learned based on his experience.

The stand-alone feature of these devices lays precisely their design because they have many arms and axles that allow them to be rotated to suit the needs of the industry. Therefore, they are versatile machines in production. The close connection between robot technology and the Internet is undeniable. Drones are robotic technology capable of flying without a crew. They have various sensors and devices to assist with your navigation. There are GPS for location, cameras with wireless connectivity, antennas for GSM and Wi-Fi connectivity, and other sensors depending on their use. They can be operated by a remote operator with a remote control, or, depending on how advanced the drone is, can follow the indicated coordinates and use its automatic pilot.

The development of robotics technology, it is another protagonist in the study of robotics technology. While this undoubtedly represents a benefit to its progress, it has also resulted in controversy over intellectual property. Companies involved in funding or developing robotics are increasingly discovering important developments that will establish the basis for other investigations. That is why companies have begun to focus on protecting their intellectual property by filing patent applications to protect their personal interests. Furthermore, with the development of robot technology over time, more and more industries are being incorporated and more specialties or fields are being developed from which it has become more common to apply for assault and defensive patents to protect intellectual property.

4. RESULTS AND DISCUSSIONS

The existing multi-perspective process model (MPPM), advance process analysis model (APAM), multi-criteria evaluation model (MCEM) and artificial intelligence cyber security algorithm (AICSA) models are compared with the proposed smart robotic process automation (SRPA)

4.1 MANIPULATOR ROBOTIC PROCESS AUTOMATION

This robotic technology is manipulated by man to perform simple tasks such as grabbing and moving objects. This type of technology has many applications such as SAR (Specific Absorption Ratio). A special fluid that mimics the chemical composition of man is placed inside a container in the form of a man. A cell phone is placed where the ear is integrated and a call is made.

Table.1. Comparison of Manipulator robotic process automation

Instruction	MPPM	APAM	MCEM	AICSA	SRPA
500	81.02	83.25	71.98	87.54	95.83
1000	80.69	81.75	71.39	85.67	94.82
1500	79.35	80.64	70.41	84.84	94.66
2000	78.68	79.27	69.69	83.32	93.93
2500	77.85	77.97	68.91	81.97	93.35
3000	77.01	76.66	68.12	80.62	92.76
3500	76.18	75.36	67.34	79.27	92.18

The robotic arm on a Cartesian plane indicates the exact points at which measurements are made using a special program. The robot gets the programming and makes the movements and gets the required measurements. It allows analyzing the effects of non-ionizing radiation, i.e., it is generated in the human body when the cell phone is exposed for a long time. Due to the accuracy of this study, it is necessary to use robot technology and any change like human pulse will change the results shown in Table.1.

4.2 LEARNING ROBOTIC PROCESS AUTOMATION

This technology observes, memorizes and implements based on its experience and database. In this generation, robots are characterized by their learning. There are many different ways to learn robotics, one of which is imitation. The robot observes an operator, records their movements, stores them in its internal memory, and then tries to copy them shown in Table.2.

Table.2: Comparison of learning robotic process automation

Instruction	MPPM	APAM	MCEM	AICSA	SRPA
500	78.21	80.26	69.20	83.93	93.70
1000	77.16	79.25	68.06	83.01	94.13
1500	76.11	78.24	66.92	82.09	94.56
2000	75.06	77.23	65.78	81.17	94.99
2500	74.01	76.22	64.64	80.25	95.42
3000	72.96	75.21	63.50	79.33	95.85
3500	71.91	74.20	62.36	78.41	96.28

4.3 SENSITIVE CONTROL ROBOTIC PROCESS AUTOMATION

This type of robotic technology reacts to sensory information through its sensors, which in turn comes from commands sent by its controller or internal computer. Even with previous programming, the robot can reprogram itself according to the data it receives from its environment. This type of robot technology relies heavily on its sensors to implement its control programs. In other words, when they realize that part, the execution of their plans begins to execute the right movements. The most basic example of this generation is the black line that follows the vehicle. When it deviates from the black line, the infrared sensors transmit the deflection without detecting the black and its internal programming goes on to adjust its course shown in Table.3.

Table.3. Comparison of Sensitive control RPA

Instruction	MPPM	APAM	MCEM	AICSA	SRPA
500	76.45	78.32	66.95	81.68	92.93
1000	75.15	77.32	66.25	80.81	92.78
1500	73.85	76.32	65.55	79.94	92.63
2000	72.55	75.32	64.85	79.07	92.48
2500	71.25	74.32	64.15	78.20	92.33
3000	69.95	73.32	63.45	77.33	92.18
3500	68.65	72.32	62.75	76.46	92.03

4.4 INTELLIGENT ROBOTIC PROCESS AUTOMATION

The difference between the former robot technology and the intelligent technology is that the latter refers to the process of progress to the controller. It enables the best decision maker to act quickly and accurately for the event. This robot technology has more sophisticated sensors and more complex logic programs than third generation robots. Basically, this robot technology has the ability to adapt and learn the environment around them shown in Table.4.

Table.4. Comparison of Intelligent robotic process automation

Instruction	MPPM	APAM	MCEM	AICSA	SRPA
500	83.32	85.55	68.58	84.80	96.74
1000	82.99	84.05	67.99	82.93	95.70
1500	81.65	82.94	67.01	82.10	95.57
2000	80.51	82.56	65.80	81.19	94.61
2500	79.68	81.26	65.02	79.84	94.03
3000	78.70	80.25	64.08	78.67	93.37
3500	77.72	79.24	63.15	77.51	92.72

4.5 SERVICE ROBOTIC PROCESS AUTOMATION

The service robotics technology includes the ability for these devices to operate partially or completely autonomously. This capability is due to the design of intelligent software integrated with artificial intelligence and artificial vision. These types of components, due to their ability to perform complex tasks, have provided solutions for industry and different work areas. Offering many functions and applications, Service Robotics technology is without a doubt one of the most widely implemented in the world. The use of these brilliant robots opens up a range of business opportunities for the production machine shown in Table.5.

Table.5. Comparison of Service robotic process automation

Instruction	MPPM	APAM	MCEM	AICSA	SRPA
500	79.46	81.55	64.66	80.27	95.04
1000	78.75	80.62	63.55	78.94	93.80
1500	77.45	79.62	62.85	78.07	93.69
2000	76.54	78.67	61.88	76.89	92.83
2500	75.54	77.70	60.97	75.79	92.15
3000	74.53	76.74	60.07	74.69	91.48
3500	73.53	75.77	59.16	73.59	90.80

5. CONCLUSION

Robotic technology is the science responsible for the research, design, development and construction of all types of robots. Similarly, robot technology has provided useful solutions in various fields such as medicine, industry, electronics, agriculture, forestry, military, automotive, helping people associated with vulnerable sectors such as the disabled, the sick and the elderly. Robotics offers another benefit, improving production processes,

improving production line time, reducing costs and increasing the quality of the final product. On the other hand, another unique feature of robotic technology is its use in highly hazardous environments for humans, which can help workers reduce occupational accidents or even explore terrain with extreme conditions such as exploring other planets. Similarly, it is considered positive for children to interact with robot technology, which allows them to develop their logical thinking ability. In this sense, they can establish relationships between sensors and motors. Therefore, it is a way to stimulate children's motivation and deductive thinking.

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