A Comprehensive Analysis of Societal Changes with the Invent Of Internet of Things and Robotics

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Abstract: The term "Internet of Things" describes how data gathered by embedded sensors and actuators in machines and other physical objects are used to power intelligently connected devices and systems. IoT is anticipated to grow quickly over the upcoming years, and this convergence will open up a new realm of services that enhance consumer quality of life and business productivity, demonstrating the impact of IoT on society.The robotics revolution, on the other side is rapidly accelerating, as fast-paced technological advances in automation, engineering, energy storage, artificial intelligence, and machine learning converge. The outcome will change robot capabilities and their capacity to take over duties formerly performed by humans.This article highlights the societal changes that bloomed after the IoT and Robotics invention. It proposes a change to the Internet of Things (IoT) impact on society in light of the IoT and Robotic rising popularity and the devices' ongoing technological advancement.

Keywords: 1. IoT, 2.Robotics, 3.applications, 4.societal changes, 5.smart cities, 6.healthcare, 7.ChatGPT.

1. Introduction

The term "Internet of Things" describes how data gathered by embedded sensors and actuators in machines and other physical objects are used to power intelligently connected devices and systems. Over the following years, it is predicted that IoT will expand quickly. This convergence will create a new set of services that improve consumer quality of life and company productivity, highlighting the social impact of IoT. In a number of ways, encompassing many parts of life, ranging from connected homes, cities, and vehicles to connected roads and personal tracking devices.A well-known field of technology called“Robotics” is concerned with the development, manufacture, use, and application of robots furthermore the computer systems that are used to control, sense, and analyze data from them.

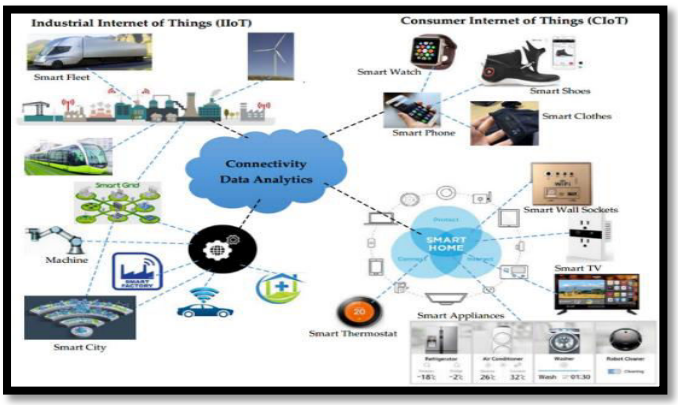

Figure 1: Industrial IoT and Consumer IoT [1]

The robotics revolution, on the other side is at its fast-paced technological advancements in automation, engineering, energy storage, artificial intelligence, and machine learning converge. The outcome will change robot capabilities and their capacity to take over tasks formerly performed by humans. Cobots are small, highly mobile, dexterous machines that can easily collaborate with people. They are making their way into the industrial and logistics sectors, and they can be easily "taught" to work alongside people to increase productivity.Through this article, we try to present a brief of the applications, benefits and societal behavior towards IoT and Robotics.

2. Applications of IoT

According to the study of K. K. Patel et.al[2], the practices for the IoT span a range of industries, including industry and the industrial sector, health care, agriculture, smart cities, smart environment and emergency situations, among many others.

2.1 Health care*:* The tracking of patients, staff, and objects, the identification and authentication of individuals, and the automatic data collection and sensing are among the many advantages that IoT applications offer in the healthcare sector. Once patient flow is monitored, hospital workflow can be significantly enhanced. Additionally, record maintenance, infant mismatch cases, and incidents that could be harmful to patients are all decreased by authentication and identification [3].

2.2 Agriculture*:*V. Sundareswaran, et. al[4] asserts that the IoT can strengthen and improve the agricultural industry by measuring soil moisture and, in the case of vineyards, the trunk diameter. IoT would make it possible to regulate microclimate conditions in order to maximize the production of vegetables and fruits as well as their quality. Studying weather patterns also enables forecasting of ice information, drought, changes in wind direction, rain, or snow, controlling temperature and humidity levels to ward off fungus and other microbial contaminants.

2.3 Retail& Logistics*:* Executing the IoT in Supply Chain or retail operation has numerous benefits. Some include; observing storehouse conditions throughout the force chain, product shadowing to enable trace capability purposes, payment processing depending on the position or exertion period in public transport, theme premises, gymnasiums, and others.P. Tadejko[5] stated that IoT be applied to various applications in commercial premises, such as based on a pre-selected list for in-store inspection, fast payment processes such as automatic checkout with biometric data, identification of possible perspectives, allergenic products and product rotation management on the shelf and in the warehouse operations for storage automation

2.4 Smart cities*:*Intelligent transportation systems [6], smart buildings, waste management [7], traffic congestion [6, 8], smart parking [6, 8], and urban maps are a few IoT applications for building smart cities. This could involve installing sound monitoring equipment in sensitive areas of cities, monitoring the levels of pedestrians and vehicles, and keeping an eye on things like the number of parking spaces available in the city, bridge vibrations, and the material condition of buildings.

2.5 Smart Living*:*IoT can be applied to remote control devices in which devices can be switched on and off by remote control, thereby preventing accidents and saving energy. M. Miraz, M. Ali, P. Excell[1] suggested that IoT can help monitor smart home devices such as refrigerators equipped with LCD (Liquid Crystal Display) displays that let know what's inside, what's left, expiring and what requires refilling, through the smartphone application in which case it can access outside the home, buying what you need. In addition, washing machines can enable remote laundry monitoring with. In addition, the IoT can be connected to a range of kitchen and home appliances via smartphone.

2.6 Smart environment: Numerous initiatives have been made to create a healthy environment by eradicating pollution and minimizing resource waste. S. Rajguruet. al [9] stated that through data collection from remote sensors located throughout cities and 24/7 geographic coverage, IoT technology enables the observation and management of air quality in order to improve traffic congestion in major cities. IoT technology can also be used to measure water pollution levels and, as a result, inform choices about how much water to use. IoT can be utilized in waste management involving a variety of waste types, including chemicals and pollutants that are harmful to the environment as well as to people, animals, and plants. This can be accomplished through environmental protection by reducing industrial pollution using real-time monitoring and management systems, supervision, and decision-making networks.

3. Applications of Robotics

3.1 Home: Robots are also common in homes, where they assist with chores around the house, keep the kids entertained, and other minor tasks. The best examples of this robot vacuum cleaner moving around the house and cleaning things are when it is helping people.

3.2 Healthcare: In the healthcare sector, where many departments are run by robots, shows admirable performance. Engineers are working on ways to improve healthcare so that every disease can be treated easily. Robots are capable of performing both physical therapy and surgeries. The best example of this type of robot is Toyota's healthcare assistants, which assist people in getting back on their feet following any accident or other circumstance.

3.3 Travel: Many self-driving cars, which were desired many years ago, are now available on the market thanks to development. It is encouraging because robotics and data science are combining to create self-driving cars for Tesla, Ford, BMW, etc. To eliminate the need for humans to safely operate them, these companies are all working to produce more vehicles that are of same kind in the future.

3.4 Manufacturing: Robotics is primarily having trouble in the manufacturing sector. Because they are more productive than a human laborer, these robots are used in engineering departments. Robots have successfully taken the position of humans in a number of industries, including the auto sector.

4. Societal Behavior Towards IoT and Robotics

There is no doubt that the Internet of Things has a great deal of potential to change society and will benefit millions of people around the globe. This has become even more obvious, according to [10], as various governments from around the world have expressed interest in the IoT concept by increasing funding in the area that is intended to facilitate further research. China's government is a prime illustration.Bikash Pradhan et. al. [11] provided a comprehensive description of the features of the ideal IoT-aided robotic system for healthcare applications, including real-time monitoring of patient health data, remote medical assistance, automated appointment scheduling, inventory management, and more. and facilitating solutions for telemedicine.By Mohsen HallajAsghar et. al. [12], Internet use has significantly altered how we live and how people engage with one another, level in a range of settings, from social interactions to professional life. IoT has ability to create new achieving the goal of "anywhere, anything, anytime, any media" communication by allowing the processing of communication by the smart objects. They made an effort to demonstrate the significance of the Internet of Things going forward.As reported by Vikas et. al. [13], the IoT is expected to dramatically improve both the quality of living for individuals and business productivity. Possibly, the Internet of Things can provide extensions and enhancements to basic services in the areas of transportation, logistics,

security, utilities, education, healthcare, and other areas as well, while also supplying a new ecosystem for application development.Rachel Macrorie et al. [14] stated that the use of robots in urban contexts has both potential benefits and drawbacks. On one hand, it can improve efficiency, infrastructure, healthcare services and everyday life for some people living in cities. However, on the other hand there are risks associated with its implementation such as reinforcing existing disparities between different groups within a city or even across multiple cities. It's important to consider these implications before implementing any new technology so informed decisions can be made about which technologies should be used where they will have maximum benefit without creating further inequalities or disadvantages for certain populations. V.C. Chijindu et. al. [15] describes that many nations that are following the present global trend have a significant potential for installing robots. Since their entrance to the workforce, robot density statistics have been rising, which is a clear indication that people are being gradually and increasingly displaced by robots. 'Central life interest' may diminish as robots replace them. This shows that there may arise chances of the new technical jobs being produced by the entrance of robots into the workplace.In contrast, due to their high level of technicality, these new vocations will necessitate considerable amounts of training and retraining.Due in part to concerns about security, safety and health, the role of robotics in social life is still in its infancy and may at first appear limited. This is because real-world experimentation outside of the controlledenvironment of factories and laboratories is currently limited by these concerns. It's tempting to think of these systems as science fiction from a far-off time. In many areas of society, such as trading, retail, logistics, engineering, transport management, resource extraction, hospital operations, security, etc., large-scale and real-time automated calculative processes already support and guide decision-making. Furthermore, some applications—such as contemporary spying techniques—are carried out covertly. the creation of hardware, software, and materials; improvements in global positioning systems; ubiquitous digital WiFi networks; information-gathering ICTs (sensors and remote control capabilities) [16].According to the news article in THE TIMES OF INDIA dated August 28, 2019, Indus International School, Bengaluru has introduced humanoid robots(Eagle 2.0) built in-house by a team of 17 members who were trained in robot development in china for almost 2 months. This humanoid robot act as education assistant for grade 7, 8 & 9 for five major subjects that is chemistry, biology, physics, history and geography. Eagle 2.0 is efficient of two-way interaction with the students in assistance with the teacher in delivering lessons.The idea that modern cities are evolving into "a distributed robot, a collection of sensors and functions linked through invisible networks of communication" has been put forth[17].Atharva M. et. al [18] concluded that the trap of Robotic Things (IoRT) is a recently proposed concept that aims to illustrate the blending of mechanical technology advancements in IoT situations. IoT and mechanical technology research networks have recently started working together in an impressive way.AshwiniSheth et. al. [19] studied various applications of robotics and has put forth her concern about robots increasingly replacing human labor in all areas and occupations. As a result, humans must develop the necessary skills to ensure take over by the robots.

5. Discussion and Conclusion

The fact that IoT & robotics technology can be utilized to enhance healthcare services is the key takeaways from this research paper.IoT is becoming increasingly popular and will have a major impact on society. It may promise to improve quality of life for consumers, productivity for businesses, as well as connecting homes, cities, cars and roads together. Additionally, it predicts multitude internet-connected devices by 2025 with mobile phones being seen as an important part in making all these connections possible. Robotization, artificial intelligence, and machine learning revolutions are converging at a rapid speed, which is quickly driving the field of robotics. As a result, robots' capacities and capacity to take over tasks previously performed by humans will change. All in all, its won't be wrong by saying that we all are getting addicted to the automation.In view, the definitions of "Robot-enhanced IoT" and "IoT-aided robotics" are too narrow. This

motivate researchers in both fields to start creating an ecosystem made up of IoT agents, robots, and the cloud that fully integrates the two aforementioned readings. A vision for the future can be the "Internet of Robotic Things," which combines robotics with ubiquitous sensors and items.Recently, a new AI-based model called ChatGPT(another form of automation), or Generative Pre-trained Transformer, is revolutionizing how people engage with technology. It is a method of natural language processing (NLP) that creates dialogues that sound human. Customer support to personal assistants are just a few of the uses for Chat GPT. Due to its capacity to produce precise and informed discussions, it is growing in popularity.The intellectual skills of humans have degraded due to progress of IoT, Robotics and AI. Now humans have to think beyond Robotics and IoT. Development, progress and advancement in intellectual skills is the moto today. Although machines can accomplish the programmed task in very less time with high accuracy, the human dependence on machines have increased, humans are becoming less physically active resulting in the growth of life threatening health issues which are too signaled out by the advancements in the IoT and Robotics. Therefore, the era of IoT and Robotics can promise a healthy and happy society in the upcoming years.

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