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AN EXPLORATIVE STUDY ON IMPACT OF ROBOTICS AND ARTIFICIAL INTELLIGENCE IN ENHANCING ECONOMIC DEVELOPMENT IN INDIAN ECONOMY

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I. INTRODUCTION

Robotics is a branch of engineering and computer science that involves the conception, design, manufacture and operation of robots. The objective of the robotics field is to create intelligent machines that can assist humans in a variety of ways. Robotics can take on a number of forms. A robot might resemble a human or be in the form of a robotic application, such as robotic process automation, which simulates how humans engage with software to perform repetitive, rules-based tasks (Kinza Yasar, Technical Writer Katie Terrell Hanna).

Artificial intelligence (AI) is the theory and development of computer systems capable of performing tasks that historically required human intelligence, such as recognizing speech, making decisions, and identifying patterns. AI is an umbrella term that encompasses a wide variety of technologies, including machine learning, deep learning, and natural language processing (NLP). Common advantages of robotics include the following: Safety, Increased productivity, Accuracy, Flexibility. Cost savings. However, despite these benefits, robotics also comes with the following drawbacks:Task suitability. Economic problems. Cost. Increased dependency. Security risks. Power requirements, Artificial intelligence gaining emerging importance in the modern era. With the advancement in technology it is possible to get advanced results inturn which will be helpful to expect faster rate of development. The economy can reach its targets related to sectoral development and inclusive growth and financial inclusion (Coursera Staff, Apr 4, 2024).

II.REVIEW OF LITERATURE

The issues like AI in the world at a glance ,AI potentially to progress India. AI adoption in India,AI and its impact on selected industries/domains in India,barriers to adopt AI technologies in India,challenges for adoption of AI technologies in India,way out to overcome challenges.(A study on artificial intelligence for economic renaissance in India, Meda Srinivasa Rao et al).

The article considers self accumulation capability and non-rival quality when analyzing the effects of AI development on economic growth and wellbeing. The study examines issues such as the global economy, its potential to widen the gap between workers,organizations and nations,automation technology,the development of human capital and economic growth and wellbeing to highlight the significance of big data IOT and forecast research in the sector informal judgement too.

III. RESEARCH METHODOLOGY AND PROFILE OF THE STUDY AREA

Statement of the problem and need of the study: As involvement of robots and artificial intelligence creating peculiar problem of unemployment as more accuracy,flexibility, cost saving issue,safety, higher productivity required in the modern digital era involvement of robots, artificial intelligence and machine learning gaining more importance.

Objectives of the study

The study conducted with specific objectives ie., to examine the impact of robotics in enhancing development in Indian economy and to examine artificial intelligence in enhancing development in Indian economy.

Statistical Analysis

Chi square test for goodness of fit applied to verify and test the objectives and hypotheses of the study.
H0: Null Hypothesis: Robots and Artificial Intelligence donot have any impact on enhancing economic development of Indian economy.
H1: Alternative Hypothesis: Robots and Artificial Intelligence definitely have impact on enhancing economic development of Indian economy.

Decision: As it is evident from the statistical test Robots and Artificial Intelligence definitely have their impact on enhancing economic development of Indian economy, rejecting the Null hypothesis and accepting the alternative hypothesis.

Implications of the study

With this study it is possible to get full fledged conceptual clarity related to the robotics and artificial intelligence. Further it is possible to get familiar related to the application of robotics and artificial intelligence.

Scheme of Presentation

Section 1 deals with Introduction.
Section 2 deals with Review of literature.
Section 3 deals with Research Methodology and profile of the Study area.
Section 4 deals with Results and Discussion.

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Section 5 deals with Summary, Suggestions, Recommendations and Conclusion and also area of further research.

Limitation of the Study: The study focused only towards impact of robotics and Artificial intelligence in enhancing economic development of Indian Economy. The results are more applicable to those areas of the globe where similar conditions prevail.

IV.RESULTS AND DISCUSSION

Robotics Applications

Today, industrial robots, as well as many other types of robots, are used to perform repetitive tasks. They can take the form of a robotic arm, a collaborative robot (cobot), a robotic exoskeleton or traditional humanoid robots.

Robotics is a branch of engineering and computer science that involves the conception, design, manufacture and operation of robots. The objective of the robotics field is to create intelligent machines that can assist humans in a variety of ways. Robotics can take on a number of forms.

Industrial robots and robot arms are used by manufacturers and warehouses, such as those owned by Amazon and Best Buy. Machine learning and robotics intersect in a field known as robot learning. Robot learning is the study of techniques that enable a robot to acquire new knowledge or skills through ML algorithms.

Some applications that have been explored by robot learning include grasping objects, object categorization and even linguistic interaction with a human peer. Learning can happen through self-exploration or guidance from a human operator.

To learn, intelligent robots must accumulate facts through human input or sensors. Then, the robot's processing unit compares the newly acquired data with previously stored information to predict the best course of action based on the data it has acquired. However, it's important to understand that a robot can only solve problems that it's built to solve. Common advantages of robotics include the following:

- **Safety.** Safety is arguably one of robotics' greatest benefits, as many dangerous or unhealthy environments no longer require the human element. Examples include the nuclear industry, space, defense and maintenance. With robots or robotic systems, workers can avoid exposure to hazardous chemicals and even limit psychosocial and ergonomic health risks.
- **Increased productivity.** Robots don't readily become tired or worn out as humans do. They can work continuously without breaks while performing repetitive jobs, which boosts productivity.
- **Accuracy.** Robots can perform precise tasks with greater consistency and accuracy than humans can. This eliminates the risk of errors and inconsistencies.
- **Flexibility.** Robots can be programmed to carry out a variety of tasks and are easily adaptable to new use cases.
- **Cost savings.** By automating repetitive tasks, robots can reduce labor costs (Vandana, January 7, 2023 **).**

Despite these benefits, robotics also comes with the following drawbacks

- **Task suitability.** Certain tasks are simply better suited for humans -- for example, those jobs that require creativity, adaptability and critical decision-making skills.
- **Economic problems.** Since robots can perform most jobs that humans do with more precision, speed and accuracy, there's always a potential risk that they could eventually replace human jobs.
- **Cost.** Most robotic systems have a high initial cost. It can also cost a lot to repair and maintain robots.
- **Increased dependency.** Overreliance on robots can result in a decrease in human talents and problem-solving abilities as well as an increase in technological dependence.
- **Security risks.** There's always a risk of robotic devices getting hacked or hijacked, especially if they're being used for defense and security purposes.
- **Power requirements.** Robots consume a lot of energy and constant power to operate. Regular upkeep and maintenance are also needed to keep them in good working condition (Vandana, January 7, 2023 **).**
- The future of robotics

Robots are becoming more efficient, flexible and autonomous as AI, machine learning and sensor technologies progress. They're predicted to play an increasingly essential role in a variety of industries and applications in the future. A study by Spherical Insights and Consulting.

- estimated that the size of the global robotics market will increase from $25.82 billion in 2022 to $115.88 billion by 2032.
- However, there are also possible concerns about employment losses associated with the exponential adoption of robotics across various industries. According to Oxford Economics, up to 20 million manufacturing jobs could be lost to robots by 2030. On the flip side, robots are likely to generate new professional opportunities in fields such as programming and maintenance, despite the looming possibility of job losses.
- *Manufacturing organizations are using robotics and AI to improve operations and boost productivity (Mike Thomas).*
- **Artificial intelligence (AI)** is the theory and development of computer systems capable of performing tasks that historically required human intelligence, such as recognizing speech, making decisions, and identifying patterns. AI is an umbrella term that encompasses a wide variety of technologies, including machine learning, deep learning, and natural language processing (NLP).

V.SUMMARY,SUGGESTIONS, RECOMMENDATIONS, CONCLUSION, AREA OF FURTHER RESEARCH

Thus, Artificial general intelligence (AGI) refers to a theoretical state in which computer systems will be able to achieve or exceed

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human intelligence. A robot might resemble a human or be in the form of a robotic application, such as robotic process automation, which simulates how humans engage with software to perform repetitive, rules-based tasks.

Suggestion: Technical Qualified people should aware about the advantages of the involvement of robots in the digital era and also should be aware about the application of artificial intelligence and they should train non technical persons so that all the people can get the benefits of robots and artificial intelligence and machine language , then only one can expect faster rate of development with more accuracy in the economy.

Recommendation: Central and State Governments should provide required financial assistance to the technical persons, so that they can expertise themselves related to robotic application and artificial intelligence applications and they can provide training for the same for other non technical persons, then only we can achieve the targets related to sectoral development in Indian economy.

Area of Further Research

1.Robotics and artificial intelligence application in agricultural sector can be made.
2.Robotics application and artificial intelligence application in not only in few large scale industries but also micro, small, medium and all types of large scale industries can be conducted.
3.Robotics application and artificial intelligence application in Service sector can be made.

Key words: Robotics, Artificial intelligence, Machine learning, Inclusive growth, Power requirements.

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