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Artificial Intelligence and its Impact on the Indian Labour Sector - A Critical Analysis

Mrs. Remya Pradosh
Assistant Professor of Law (Research Scholar)
Bharath Institute of Law, Bharath Institute of Higher Education and Education and Research, Chennai, Tamil Nadu
remyapradosh2021@gmail.com

Abstract: *Artificial intelligence (ai) has undergone a remarkable evolution since its conceptualization, with significant advancements reshaping various facets of human life. Ai's presence can be seen in almost every sector be it healthcare, finance, education, education, manufacturing, media, or entertainment the list is exhaustive and the labor sector is no exception. There are always pros and cons to any technological advancement, and so does ai. It is an undisputed fact that ai has revolutionized the labour market which furthers economic growth but at the cost of job displacement. Even though it has been said that there will be more employment generated, there will be a need to learn and get skilled for those positions. It is not possible that everyone will have the opportunity to learn the skills required for the new jobs generated by ai. Another alarming concern is the co-existence of humans and robots which means that measures for ensuring the safety of workers will have to be enforced, as they interact with ai systems. The occupational safety and health of the workers (physical and mental) may be affected by these changed relationships between workers and employers. A dedicated specific regulation addressing the use of ai in the workplace can to some extent provide sustainable growth for both the employer and the employee. Labour codes must delve into key dimensions like job displacement, worker rights and collective bargaining, discrimination and privacy, regulation, and protection, new job opportunities, and skill development. In this non-empirical research paper, a comprehensive analysis of ai regulation in india by examining perspectives of the government, industry, and laborers is dealt with in detail. It evaluates the current regulations in place and their pros and cons and provides insightful suggestions to curb the negative influence to the largest extent possible.*

Keywords: Artificial intelligence

I. INTRODUCTION

Artificial intelligence (ai) is progressively transforming the service industry by taking on various tasks, serving as a significant driver of innovation while also posing a threat to human employment. We propose a theory of ai-driven job displacement to explore this dual impact. This theory identifies four types of intelligence essential for service tasks—mechanical, analytical, intuitive, and empathetic—and outlines how firms should determine whether humans or machines are better suited for these roles. Ai is advancing in a foreseeable sequence, with mechanical intelligence generally developing before analytical, analytical before intuitive, and intuitive before empathetic intelligence. A key takeaway from our theory is that analytical skills will gradually diminish in significance as ai increasingly handles analytical tasks. Consequently, "softer" skills such as intuition and empathy will become even more critical for service employees. Over time, ai will evolve to perform even these intuitive and empathetic functions, paving the way for innovative human-machine collaboration in service delivery. However, this advancement also poses a fundamental risk to human employment. Recognizing that ai is both a powerful driver of innovation and a growing force in job displacement, we are motivated to examine more thoroughly how it will transform the service industry. When ai replaces jobs, employees face job loss, and customers miss out on the benefits of human interaction in service.

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Meaning of artificial intelligence

Artificial intelligence (ai) refers to a collection of technologies that allow computers to carry out complex tasks, such as visual recognition, interpreting and translating speech and text, data analysis, generating recommendations, and more. Artificial intelligence (ai) is a broad scientific discipline with roots in philosophy, mathematics, and computer science that aims to understand and develop systems that display properties of intelligence. The purpose of artificial intelligence is to acquire knowledge of required subjects. It is the mechanical stimulation system of collecting knowledge and information and processing the intelligence of the universe. The expression "artificial intelligence" was introduced by john maccarthy in the year 1955 at standford university. Since that time, several experts and institutions attempted to define ai. Seamen and furman defined ai as "a loose term used for describing different advanced technologies which have intelligence similar to the humans and includes autonomous robotics, machine learning, neural networks, virtual agents, language processing, and computer vision." In a wide sense, ai is considered an algorithm, wherein computers imitate the intelligence shown by humans

Advantages of implementing ai in the indian labour sector

India is among the nine nations that have embraced artificial intelligence (ai). With the establishment of innovation centers by various companies and a supportive ecosystem fostered by government initiatives like digital india, the country has the potential to emerge as a global leader in ai. By 2035, ai is expected to contribute approximately 15% to india's gross value added (gva). Currently, nearly 75% of indian businesses are already witnessing positive returns on their ai investments. Key factors driving this adoption include reduced operational costs, increased productivity, and improved efficiency. While there may be slight variations in the exact figures regarding ai adoption among indian corporations, one thing remains clear—the country's it sector is actively advancing in ai integration. Ai can add around 15% of gva - gross value added of the nation's economy by the year 2035. Around 75% of the indian companies are already getting a positive return on the investment made by them on ai. Although there is a bit of alteration on the real data of the share of indian ai adopting corporations, one thing is evident the it hub of india is quite forthcoming with respect to the adoption of ai.

Some of the transformative effects of ai on India's growth are

Workforce expansion due to ai in india

With the incorporation of ai, there has been a huge positive change with regard to the creation of job opportunities. It has been estimated that the indian service and manufacturing sector will see an enhancement in employment opportunities from 38 million to around 48 million by the upcoming year due to the rise of ai-related technology . In the it sector, the impact of ai will result in the creation of new job options namely big data analyst, ai programmer, and data scientist, but they shall possess new skills. The short-term effect of ml or ai may cause the displacement of repetitive manual tasks. However, long-term advantage of the adoption of ai is that it will enhance productivity, which will ensure a high-value involvement option for employment. Thus, the job creation will outweigh the potential short-term employment issues. Several studies and research have shown that by virtue of ai, there will be the generation or creation of new job options in the labour market. Around 2.1 lakh jobs will be generated in the indian agricultural sector. Further, it has been found that the job of big data analytics is estimated to enhance from 62,000 to 1,40,000 in the upcoming 3 years . Some of the other scopes for jobs in the indian labour market are teaching and advisory jobs for ai and related technologies in the education sector; data architects, language processing specialists, etc in the it sector; & data analysts, counsellors, bioinformatics experts, and technician in the healthcare sector. As per the reports of meity, the ai inculcation will lead to the creation of around 20 million new job opportunities in the nation. The main industries that will see the influx of new opportunities are it, agriculture, manufacturing, logistics, and transport . While dealing with the matter of whether ai has created or displaced jobs, the majority of the leaders and employees are of the opinion that ai will bring a positive impact by creating new jobs despite few jobs being replaced by it. Although ai has not been equipped enough to replace all the jobs, it can affect those jobs only which are non-cognitive and routine-based work. The introduction of data labeling and annotation companies in the nation renders a wide range of opportunities for the

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nation's high-school graduates and these kinds of trainable works can enhance the employability pattern of the nation on the emerging workforce

Automative repetitive tasks to improve efficiency

Ai has been instrumental in impacting the labour sector by automating repetitive or mundane work.

By delegation such works to the machinery, human employees can easily redirect their labour and mind towards more value-added and creative works/endeavours . Automating repetitive tasks helps improve efficiency by reducing manual effort, minimizing errors, saving time, and allowing individuals to focus on more strategic and creative activities.

Steam lined workflow

A streamlined workflow refers to a process that has been optimized to reduce inefficiencies, eliminate unnecessary steps, and improve overall efficiency. It involves structuring tasks in a logical, smooth, and coordinated manner to ensure minimal delays and maximum productivity. A streamlined workflow helps businesses and individuals save time, reduce costs, and improve output quality, leading to enhanced productivity and smoother operations. It has been revealed that there is a material and positive relationship between ai-adopting companies and total growth in productivity[11] .

Labour force

Ai has remarkable capability to enhance the labour supply, by improving the quality, quantity, and effective usage of employees in the nation's economy- all of which would bring development. The increase in labor supply will further lead to betterment in the nation's education and healthcare sector. Firstly, ai is expected to help both educators and learners in the classroom and thereby ensure a rise in educational attainment by 6%. An educated labour force will be more effective and productive, which will further cause a rise in productivity. Secondly, ai and labour supply can assist a healthier public and thus a healthier employee, which will lead lower welfare costs, more productive work, and fewer lost workdays. Thirdly, ai assists in job-matching and bringing improvement in the effective usage of employees .

Advanced reasoning

The integration of ai into the indian labor industry has significantly improved decision-making. Ai-driven analytics are highly beneficial for institutions seeking to enhance their decision-making processes. By analyzing vast amounts of data and extracting the most relevant insights, ai equips stakeholders with a deeper understanding of consumer behavior and market dynamics. These tools can convert industry and company data into actionable strategies, enabling businesses to make informed and strategic choices. Employers who need to take proactive measures to address industry challenges can leverage ai to ensure more effective and well-informed decision-making.

Skill enhancement and skill transformation

Ai helps identify skill gaps and provides personalized training suggestions, enabling employees to reskill and upskill their abilities to effectively use ai-driven applications in the workplace.

Upgraded customer interaction

Ai-powered software, such as virtual assistants and chatbots, plays a crucial role in improving customer service. By providing immediate assistance and personalized recommendations, these technologies enhance the overall customer experience. As a result, customer satisfaction increases, leading to stronger brand loyalty. This, in turn, helps businesses retain their customers and sustain jobs in service-related sectors, ensuring continued growth and stability in the industry.

Transformative impact of ai

Advanced technology tool like ai has the potential in contributing around $450 to 500 billion to the gdp of india in coming few years. Around 45% of the said value is expected to be derived from key sectors namely, retail and consumer goods, finance and banking and agriculture

Farming

Ai is ready to transform the agriculture sector in india by dealing with issues such as lack of capital, knowledge, and infrastructure for the farmers. Ai tools in agriculture include weather forecasting, ai-assisted crop price forecasting, soil monitoring mechanisms, assessment of crop health through drones, precision farming, agricultural robotics, and weed and pest detection. Ai seems to lessen the burden in the agriculture industry and encourage ai-driven farming, resulting

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in enhanced output. Several organizations and startups are leveraging ai in the field of agriculture, with approximately 72 ai in indian agriculture startups. Support and initiatives from the state, along with enhanced internet penetration, are fostering the development of technology-assisted agriculture. The indian agritech sector is expected to cross the mark of us$30 to 35 billion by the year 2025, attracting major investments from venture capital and private equity firms. This assistance from the government seems to bring substantial growth and development in the nation with respect to the agricultural value chain

Tech industry

The it industry of india is home to popular international companies such as infosys, tech mahindra, wipro, and tcs. These it companies are developing tech avenues like data and cyber security, ai, and cloud to keep pace with modern needs. Their main focus is on cutting-edge technologies namely "machine learning (ml) and artificial intelligence (ai)", which seeks to invest in research & development to cater to the demands of clients

Medical management

Ai is bringing transformation in the healthcare industry of india. The projection depicts a positive growth of ai in the healthcare sector. Artificial intelligence (ai) is adopted in the areas such as predictive analysis, improved patient experience, remote monitoring, personalized treatment and diagnostics. Ai is resolving the issue of radiologist shortage by ensuring accurate and speedier diagnoses. Ai algorithms have developed the personalized treatment strategies on the basis of patient's information, resulting into better output. The remote monitoring application is enabling the medical practitioners to take care of the patients remotely, particularly those suffering from chronic or serious disease. Ai-assisted chatbots give immediate answers and mental health assistance, bringing enhancement in patient experience. Similarly, another ai tool i.e., predictive analysis assists in identifying the high-risk patients, ensuring early detection and intervention

Financial services

Ai is drastically changing the indian banking sector in positive manner by improving the customer service and efficiency. Start-ups are using ai for data analysis and chatbots in finance market. Ai has brought a revolution in hiring, asset management and customer service. It is pertinent to note that reserve bank of india (rbi) is promoting advanced technology like blockchain for enhancing the consumer experience. The fintech sector in india is contributing for making the nation a hub for innovation .

Manufacturing

Ai has played a significant role in automation of certain repetitive jobs in the manufacturing industry, resulting into making the work efficient. It further generates job opportunities for the skilled employees with respect to management and maintenance of ai-driven robotics and systems. Ai adoption ensures predictive maintenance wherein ai can examine the data from machine and assess the floor processes for predicting or preventing breakdowns.

Ai can also optimize manufacturing mechanism for minimizing the resource consumption and ensure waste reduction. The inculcation of ai ensures enhanced productivity among the workers, because they require less time on mundane or repetitive work. Thus, ai enables the manufacturers to attain unprecedented levels of customization, productivity and efficiency .

Consumerism

Ai has transformed the education industry by through ensuring automated grading, intelligent tutoring systems, and personalized learning experience. It has capability to affect the teaching roles by automation of administrative works, but it also results into creation of new opportunities for the teachers who use ai-driven tools. Ai enables the immersive learning by augmented reality and virtual reality (vr) . Ai can assist the administrators and educators to make effective decision by rendering insights into areas which requires improvement. These advanced technologies can be also used to address the issue in relation to inaccessibility of experienced educators in remote areas with the assistance of robotic teaching assistants

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Factors dependent on the effective usage of ai

Ai has the capabilities to generate more job opportunities than it destroys, but the said capability is dependent on some factors. Firstly, the adoption of modern technology like ai will be most efficient when it is utilized in conjunction with the human beings. for ai to give rise to more jobs, it requires to be paired with the human having potential to help train the machine and assure that its target is in consonance with those of the human workers. Moreover, the incorporation of ai will be successful only when ai is in conjunction with other related processes or technologies which have already been established to be efficient and successful prior to the time when it is being combined with ai. For instance, where ai-assisted robot producers attempt to manufacture vehicle without utilizing robotics as an element of the process, then it will work properly only when relevant employees knowing about them is hired and adequate building of factory has been established.

Position of ai under legislative structure of india

There is no clear or proper law relating to ai and labour sector in india. There is a lack of precedents related to legal standing of ai, its application and implementation of the existing legislations. The authorities in india are yet to identify the importance and relevance of ai in indian labour sector. The development and growth of ai and other technologies has boosted the indian economy there are some laws which have indirect nexus with the technological advancement like ai. They have been explained in following manners are -

Copyright act 1957

Under the 1957 act, ai algorithm can be granted copyright under the ambit of literary work and thus author can claim ownership of ai25. However, some experts are of the opinion that there is no clear picture with respect to author of ai-generated work

Competition act 2002

This enactment regulates the competition in indian market and seeks to prevent any form of abusing the dominant position. Ai can assist in these matters in the labour market and thus has a wider scope.

information technology act (it) 2000

This is a principal statute governing e-governance and digital transactions. Section 43a of the enactment provides for payment of damages for breach of confidential & sensitive personal data. Ai is covered under section 72a as well as section 43a of the act. Therefore, ai is being implicitly incorporated.

it rules 2021

The it rules 2021 also relates to the ai in some aspects. Under the said rule, the intermediaries are bound to restrict the transmission publication, modification, uploading, displaying and hosting of unlawful content. The intermediaries are also obliged to prohibit such type of ai models which permits discrimination or bias. The users have been empowered to apply before the grievance officer for taking action against unlawful content .

digital personal data protection act 2023

This act is applicable on the personal data processing, which includes ai-assisted disclosure and collection. The present law applies to partly or fully automation of personal data. The definition of “automated” under the enactment involves ai system which could take decision without any kind of intervention from the humans. The enactment deals with principles such as privacy by design, that can affect the manner in which ai system are evolved and used. The statute includes the “idea of significant data fiduciaries” that can impose stricter scrutiny on the ai companies handling huge bulk of data .

Initiatives by indian government to foster ai

The indian government has attempted to encourage ai through several schemes and they are described below-

Airawat

“ai research, analytics and knowledge dissemination platform (airawat)” is a shared platform for carrying out ai research in india, which was launched by ministry of electronics and it. This is an essential element of the nation’s digital infrastructure for ensuring technological and scientific development in every area including labour market. The vision of airawat has spelt out by the indian prime minister, mr narendra modi as- the introduction of this platform has dual objective namely- encouraging indigenous ai and using ai-assisted application for economic and social upliftment in the nation .

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National strategy on artificial intelligence (nsai)

nsai is a scheme which seeks to utilize ai for addressing national issues, bring improvement in social condition and foster economic development. Niti aayog formulated this strategy. The focal areas of the scheme are to identify ai-driven application for ensuring greatest social effect; taking lessons from the world's most effective ai technologies, ensuring indian-made solution for the entire developing nations; fostering investment in research which could ensure maximization of economic growth and democratising the development & enabling access to ai .

New education policy (nep) 2020

The nep 2020 identifies the significance of ai in the education sector. The policy aims to utilize the ai for improving the quality of learning. The nep 2020 gives the proposal for integration of ai in learning, teaching and administration process in different manner including curriculum, virtual reality and augmented reality, multilingualism, personalized learning, ai-assisted assessment and teacher training with the help of ai-driven software.

Suggestions

While looking into the merits guaranteed to the society by virtue of ai, there is also the need to see the negatives involved with it. Few suggestions and manner in which policies regulating ai was provided by ministry of commerce in its report, which should be taken into consideration.

For the purpose of availing the maximum benefits of ai in indian labour sector for the widest possible part of the nation, the researcher has given following suggestions-

Foster the widespread adoption of ai

It is suggested that ai should be adopted across the economy by reducing the hindrances in accessing ai and by harnessing its capability to enhance the skills and education for everyone. By doing this, the state can enable ai and related technologies for fulfilling its promise as a social-levelling application which equalises the access to opportunities.

Upgrading market infrastructure and labour

There is a need to upgrade the market infrastructure and employees for coping up with the dynamic pace of the advance society wherein ai is likely to be implemented. This involves training the employees with the required skill regarding the ai and ml and the social security, which further includes job-matching services, financial safety nets, etc- for maximizing the employment.

Harnessing the potential of ai

The potential of ai should be harnessed for improving the job quality. This can be done by sharing the best possible practice by the government which can be followed by the ai using companies. The concerned government must be involved in planning the practical contingency which will ensure a better future in labour sector.

Training and education

Imparting essential training and education related to ai at workforce shall be ensured. Ai education strategy should be introduced which seeks to fulfil the requirements and needs of the concerned industry.

Safeguards for unskilled or gig employees

The government should identify and protect the rights and interests of its people under new job roles including the weaker class of society like gig workers and unskilled employees.

Formulating a social policy

The government should reframe the social protection policy framework with a view to bring ai into reality in labour sector

Incentivising the investment in labour-assisting ai technology

The investment in labour-augmenting ai application should be encouraged. The national issues related workforce should be addressed. By providing rewards to the small-scale innovation, the transformation brought by ai can be drastically scaled up and the impact could be immediately further afield.

II. CONCLUSION

based on the above analysis, it can be concluded that ai holds immense potential, which should be effectively shaped in the comin g years. The present research establishes that ai impacts employment through both substitution and creation

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effects. Its adoption can help reduce costs associated with equipment and machinery. Ai offers numerous advantages, including automation of repetitive tasks, enhancement of job quality, generation of employment opportunities, increased productivity, and support for workforce skills in research and development. It has proven to be transformative across various sectors such as it, agriculture, healthcare, and transportation. The positive impact of ai is indeed encouraging, making its adoption crucial for shaping a better future for a nation like india. However, challenges such as job displacement, privacy concerns, discrimination, and economic inequality must be addressed to ensure that this advanced technology is utilized in the right direction.

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