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Disabled Workers in the era of Automation: Navigating Skill Transformation and Job Opportunities in AI-Driven Industries

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This study addresses the effects of automation and artificial intelligence (AI) on employment prospects for disabled individuals within the manufacturing sector, emphasising the distinctions between two age groups (18-35 and 36-55). As automation transforms the workforce from manual to technical, supervisory, and analytical roles, new opportunities arise for disabled workers, especially in positions that emphasise cognitive abilities over physical labour. The younger demographic (18-35) demonstrates optimism regarding these changes, viewing enhanced employment opportunities, whereas the older demographic (36-55) displays scepticism and apathy towards AI-driven positions. This generational divide underscores the necessity for reskilling initiatives to assist older employees in adapting. The study identifies positions such as AI Integration Specialist and Human-Machine Collaboration Coordinator as appropriate for individuals with disabilities. It asserts that inclusive hiring practices, assistive technologies, and extensive training programs are vital for creating a more accessible, technologically advanced workforce amidst increasing automation.
Keywords: Disabled job, new employment, AI-driven job roles, Reskilling for AI automation, Human-machine collaboration.

1. Introduction

Automation is a technological application in robotics that enables the manufacturing and productions of goods with minimal human intervention. The implementation of automation technology in robotics processes enhances the efficiency, reliability, and quality of the

production process (Margaret Rouse, 2024). various tools and systems are used to execute tasks without any continuous use of manual inputs, for these machines and various communication devices are used, such as programmable logic controllers (PLCs) and programmable automation controllers (PACs), which control industrial Robotic machines. This is necessary to achieve the automation production in industries or enterprises. Programmable logic controller or (PLC) is a digital computer which is used to automate electromechanical processes to control the industrial machineries, etc (Shubham Singh and Swapnil Namekar, 2020). Overall, this allows industries to manufacture and produce under supervision, adapting machine learning to meet demand and manufacturing needs through human interactions. But when tangible an application of machine learning and Artificial integration provide a new pathway for industrial process and the network be smart enough to detect the PLC and tie in the connections to the supervisory control and data acquisition (SCADA) by signal recognition and a software profile (Tobey Strauch, 2024). The integration of this all creates a job displacement and skill change in the manufacturing industries. Artificial intelligence is displacing many skilled, semi-skilled, and unskilled labourers' jobs. According to the World Economic Forum, in 2025, artificial intelligence will displace 75 million jobs globally; on the other hand, it will create 133 million new jobs. That means a net gain of 58 million new jobs globally (Robert Farrell, 2023). So, its shows that craft skilled works are not only needed in that additionally labourers are needed to learn machan leaning and AI programming. This indicates that skill change is happening in all manufacturing and production industries. It opens new job opportunities for physically disabled people in the manufacturing industries. These new job opportunities, which don't involve physical labour, necessitate critical thinking, creative problem-solving, and strong mental skills. The creation of new job roles will transition from operational tasks to supervisory and analytical roles, emphasizing the monitoring, troubleshooting, and optimization of automated systems in production industries.

The changing nature of skills

The transition of manufacturing industries towards automation, robotic technicians, mechanised learning, and artificial intelligence creates a need for a shift in workforce dynamics and skill demands as these advanced technologies gradually replace the manual and routine tasks previously performed by labourers. Therefore, workers need to acquire new skills to stay relevant in their jobs as the job market transitions from traditional operation roles to more complex, technical-oriented, and creative roles. So, this skill change has the potential to create job opportunities for disabled people. Here’s a detailed breakdown of the anticipated transformations:

Decline of Traditional Operational Roles

Manual labourers perform repetitive tasks in manufacturing industries, requiring more human intervention. However, the significant adoption of automation technologies in these industries reduces the need for human involvement and streamlines operations. Advanced artificial intelligence and machine learning capabilities enable these machines to handle tasks like assembly, line operations, production, quality control, and in some areas, even the decision-making process. As a result,

Operational Skills: Manual intervention skills such as basic machinery operation, routine

maintenance, or repetitive assembly work will become less critical.

Demand for Automation Technicians: Employees need to develop their technical knowledge about modern automation systems. The Programmable Logic Controllers (PLCs), Programmable Automation Controllers (PACs), and Supervisory Control and Data Acquisition (SCADA) systems play a pivotal role in the automated production process. PLCs handle real-time machine control, ensuring precision and reliability in tasks like motor control processes. PACs, on the other hand, bring flexibility and advanced functionality, allowing for more complex tasks like process control and data analysis. SCADA systems oversee the entire operation, offering remote monitoring and control capabilities to ensure smooth workflows (Aseem garg, 2023). This technician needs to focus on mental work rather than physical work, which creates job opportunities for disabled people in the production industries.

Shift Toward Data Analysis and Interpretation skills

The automated robotic systems and artificial intelligence create new job opportunities for individuals with disabilities. These technologies generate massive amounts of data that can enhance the efficiency of production, predict issues, and streamline processes. Overall, this significantly enhances the workers' ability to engage in data-driven discussions, conduct analytics, and perform predictive maintenance. This shift presents significant opportunities for disabled individuals to excel in roles that prioritise analytical thinking and data interpretation over physically demanding tasks. Employees will need to interpret complex data sets, identify patterns, and uncover valuable information inside those influences business strategies. This task, which is primarily desk-based. So, these desk-based jobs in production industries are helping them overcome physical barriers that may have limited their participation in traditional manual jobs. In future analyses, we will define job roles as shifting from manual, repetitive tasks to more intellectually demanding positions. Individuals with disabilities have numerous opportunities to participate in the workforce, contributing their skills and benefits to the data workforce's flexibility and inclusiveness.

AI and Machine Learning Proficiency: As AI and machine learning get better day by day in this scenario workers who want to stay in the workforce will need to learn new skills. It is very important to learn how to look at data, use algorithms, and combine machine learning tools. As more and more things are automated, it will be important to know how to use programming languages like Python and tools like TensorFlow. These frameworks are used a lot in fields like deep learning, natural language processing, and predictive analytics. They help make production processes more efficient and make it easy for people and machines to work together (Emmanuel Ohiri, 2024).

Digital Literacy and Cybersecurity Awareness: As automation systems become more interconnected through digital networks, the importance of cybersecurity will grow. Employees will need to understand digital infrastructures, network protocols, and the potential cyber threats that could disrupt production. Keeping these systems secure will be a key responsibility, making cybersecurity awareness a core component of the skill set.

Supervisory and Managerial Roles

Robotic automated machines are effortlessly handling rotating tasks in the production process. So, these are creating significant job opportunities for people with disabilities as more workers

shift into overseas positions, managing and optimizing automated systems. So, it creates a demand for skills related to the system, oversight, efficiency, management, and leadership. These roles offer provision for disabled persons because they involve tasks that are less physically demanding and more relevant to cognitive and interpersonal ability in supervisory positions. Managers will need to prioritize system oversight to ensure the smooth functioning of automated processes such as monitoring system performance and conducting interviews. The problem arises in the production process. In an office or remote setting, this type of work provides disabled individuals with the ideal opportunity to perform critical roles without physical limitations. The supervisors and managers focus will be on answering that technologies are functioning as expected and making real-time decisions that maintain operational flow in a proper planned way. Leadership management will remain crucial, even as automation reduces the need for low lovers of operational work. Managing hybrid teams that consist of both human work and automated systems will require strong leadership, communication, and interpersonal skills. A disabled individual can excel in these manual positions by guiding teams, making strategic decisions, and fostering a productive work environment. The shift towards supervisory and manager positions because of automation opens a wealthy opportunity for disabled individuals. These roles rely more on cognitive and interpersonal skills than manual labour, allowing disabled workers to succeed in the overseas system, optimizing operations, and leading teams. Evaluation in the workforce creates space for people with disabilities to pursue rewarding careers in management and supervisory roles, contributing to the growth and efficiency of automated environments in the production process (Erik Brynjolfsson and Andrew McAfee, 2014).

Creation of new job roles

Automated robotics and artificial intelligence are enabling new job platforms in production industries. These provide significant opportunities for people with disabilities, especially since many of these roles focus on overseeing, managing, and analysing systems rather than performing physically demanding tasks.

Automation System Supervisors: The role of an automation system supervisor is crucial in production industries, as they heavily utilize automated robotics to minimize human intervention. These job roles are responsible for overseeing and managing automation processes from a remote location, using a supervisory control and data acquisition (SCADA) system. These types of roles are well suited for physically disabled individuals, especially those with mobility impairments. Automation supervisors typically monitor the production process, ensure that the systems are operating effectively, and intervene when necessary. If any error or malfunction occurs, they can make real-time adjustments to improve system performance and troubleshoot issues at the convenience of their computer workstation (Tim Otto, n.d.) (Jasmine Virhia and Ariela Kleinberg Shveid, 2024).

International labour organizations emphasize that technologies are flexible and accessible for individuals with disabilities, particularly in sectors where remote work and automation are prevalent. Similarly, the study highlights the positive impact of technology and workspace in a nearby city, demonstrating how automated systems can empower employees with disabilities to perform their tasks efficiently and open up new job opportunities (ILO and ONCE, 2021).

AI Integration Specialists: This job role mainly focusses on cognitive tasks rather than physical

tasks. Therefore, this role provides employment opportunities for individuals with disabilities. People with backgrounds in artificial intelligence and machine learning can perform in this field by designing, developing, and optimizing AI algorithms to enhance manufacturing processes. Their work involves integrating AI-driven solutions to streamline steam line workflows and improve operational efficiency (Loren Webb, 2020) (Charles Daniel, 2024).

Robotics Maintenance Engineers: Previously, engineers would perform hands-on tasks such as troubleshooting, repairing, and maintaining robotic missionary systems; but with the advancements in remote diagnostics and telepresence technology, engineers with mobility can now perform these tasks from a distance. Serious disabilities can increasingly perform the task from a distance. Remote troubleshooting enables engineers to identify and resolve issues without being physically present, while telepresence technology allows them to guide on-site personnel or monitoring systems in real time. As robotics and automation systems become more sophisticated, virtual collaboration tools further expand opportunities for engineers to manage complex robotic systems remotely. This combination of technologies makes the role more accessible and offers significant potential for engineers with disabilities to contribute to the field effectively (Jasmine Virhia and Ariela Kleinberg Shveid, 2024) (Mercedes-Benz, n.d.).

Human-Machine Collaboration Coordinators: Human machine collaboration coordinators are playing an important role by bridging the gap between human workers and machines. They are ensuring that both entities interact effectively and harmoniously in industries where automation is becoming increasingly prevalent. These coordinators facilitate the adaptation of new technology by training human workers on how to effectively use, maintain, and optimise automated robotic systems in the industry. This role is crucial for effective production in the manufacturing industries. These coordinators advocate for the design of human-machine interfaces that are accessible to all workers, including those with disabilities. They advocate for automated systems that are adaptable and usable by people with physical, cognitive, and sensor needs, thereby contributing to a more inclusive workforce. These human-machine collaboration coordinators participate in the design and feedback process for automation technologies. They work very closely with engineers and developers to develop refinance systems that accommodate a variety of work needs (Allison Ryder, 2021) (Nathan Cunningham, 2021).

The integration of automation, robotics, AI, and machine learning into manufacturing industries is revolutionising workforce dynamics, creating a shift from traditional operational roles to more specialised, technical, and supervisory roles. This transformation opens new opportunities for workers, particularly those with disabilities, by offering positions that prioritise cognitive and analytical skills over physical labour.

Job occupied by disabled peoples in the production industries.

In production industries, disabled people are occupying a variety of roles depending on their specific impairments. We can divide this impairment into two categories such as locomotor impairment and impairment of deafness and dumbness. Disabilities are conditions that make it challenging for a person to do certain actions or interact with the world (Meghan L. Mills, 2023). The U.S Department of Labour's Bureau of Labour statistics in 2023 they made an News Releases on employment statistical data of people with disabilities in U.S (U.S. Bureau

of Labor Statistics, 2024).

TABLE 1 Labour and Employment rate of disable in U.S.

Year	Labour Force participation rate, with a disability	Employment population ratio, with a disability
2009	22.4	19.2
2010	21.8	18.6
2011	20.9	17.8
2012	20.6	17.8
2013	20.3	17.6
2014	19.5	17.1
2015	19.5	17.5
2016	20.0	17.9
2017	20.6	18.7
2018	20.8	19.1
2019	20.8	19.3
2020	20.5	17.9
2021	21.3	19.1
2022	23.1	21.3
2023	24.2	22.5

[i]Labour and Employment rate of disable from 2009 to 2023 in U.S. https://www.bls.gov/opub/ted/2024/employment-population-ratio-for-people-with-a-disability-increases-to-series-high-in-2023.htm

The table 1 indicates an increase in the percentage of employment among disabled people over the past decade. In 2009, the labour force participation rate for individuals with disabilities was 22.4%. The employment population rate of disability is 19.2%. In 2023, labour force participation rate of disability is 24.2%, and employment population rate of disability is 22.5% in the U.S (U.S. Bureau of Labor Statistics, 2024).

TABLE 2 Employment rate of disable in U.K.

Year	Number of disabled people	Number of disabled people in employment	Percentage of disabled people in employment
2013/14	6,892	3,063	44.4
2014/15	7,100	3,295	46.4
2015/16	7,332	3,469	47.3
2016/17	7,411	3,649	49.2
2017/18	7,473	3,793	50.8
2018/19	7,815	4,018	51.4
2019/20	8,273	4,423	53.5

2020/21	8,277	4,331	52.3
2021/22	9,006	4,892	54.3
2022/23	9,484	5,112	53.9

[ii]Employment of disabled people 2023, Table LMS002 https://www.gov.uk/government/statistics/the-employment-of-disabled-people-2023/employment-of-disabled-people-2023

Table 2 presents the employment positions held by individuals with disabilities in the UK from 2013 to 2023. This clearly indicates a slight increase in the numbers of jobs occupied by people with disabilities, from 44.4 percent in 2013 to 53.9 percent in 2022 (Aniysa Ruhi et al., 2023).

This tables 1 and 2 indicates that there is increase in the employment of disabled individuals over the past decade. However, in the production industry, people with locomotor impairments are unable to perform manual labour due to their physical disabilities. These individuals hold desk jobs in various industrial sectors, including human resource managers, accounts department employees, receptionists, supervisors, and so on. On the other hand, individuals with hearing and speech impairments can perform both desk-based tasks and physical labour tasks. However, these individuals are permitted to perform repetitive tasks such as packing, quality checking, loading, and unloading materials, which prevents them from performing heavy manual labour. This type of labourers are unskilled and semiskilled individuals. These hearing and speech impairments are given tasks like packaging, quality control, or loading and unloading because these activities are repetitive and do not require extensive communication or heavy physical needs. These roles reduce the risk of accidents or miscommunications as compared to more physically demanding or dangerous positions.

Lack of awareness about their new employment opportunity.

WHO defines Disability is an umbrella term that covers impairments, activity limitations, and participation restrictions. Impairment refers to a problem in body function or structure and activity limitation is a difficulty encountered by an individual in executing an action; while participation restriction refers to a problem experienced by an individual in involvement in life situations (World Health Organization, 2001). Due to physical and social barriers, people with disabilities face significant challenges in accessing employment opportunities in manufacturing industries. However, the rise of artificial intelligence and automated in production sectors creates unique opportunities to change these situations. Artificial intelligence and automation advancements are transforming the landscape of manufacturing and production processes, and creating roles that individuals with physical impairments can perform but they need a proper qualification which related to the field of AI and robotics.

TABLE 3 Employment rate by qualification of disable.

Year	Highest qualification	Number of disabled people in employment	Number of disabled people not in employment	Percentage of disabled people in employment
2013/14	Total	3,063	3,829	44.4
2013/14	Degree or equivalent	723	331	68.6
2013/14	Higher education	340	231	59.5
2013/14	A level	746	628	54.3

2013/14	GCSE A* to C	670	852	44.0
2013/14	Other qualification	308	553	35.8
2013/14	No qualification	243	1,188	17.0
2014/15	Total	3,295	3,804	46.4
2014/15	Degree or equivalent	811	330	71.0
2014/15	Higher education	342	237	59.0
2014/15	A level	794	650	55.0
2014/15	GCSE A* to C	718	857	45.6
2014/15	Other qualification	344	544	38.8
2014/15	No qualification	246	1,138	17.8
2015/16	Total	3,469	3,862	47.3
2015/16	Degree or equivalent	879	346	71.7
2015/16	Higher education	376	230	62.1
2015/16	A level	805	661	54.9
2015/16	GCSE A* to C	796	919	46.4
2015/16	Other qualification	335	541	38.2
2015/16	No qualification	228	1,105	17.1
2016/17	Total	3,649	3,762	49.2
2016/17	Degree or equivalent	973	385	71.6
2016/17	Higher education	370	233	61.4
2016/17	A level	854	661	56.4
2016/17	GCSE A* to C	823	914	47.4
2016/17	Other qualification	338	488	40.9
2016/17	No qualification	233	1,010	18.7
2017/18	Total	3,793	3,680	50.8
2017/18	Degree or equivalent	1,030	408	71.6
2017/18	Higher education	392	234	62.6
2017/18	A level	876	636	57.9
2017/18	GCSE A* to C	846	898	48.5
2017/18	Other qualification	339	482	41.3
2017/18	No qualification	242	951	20.3
2018/19	Total	4,018	3,797	51.4
2018/19	Degree or equivalent	1,159	431	72.9
2018/19	Higher education	415	245	62.9
2018/19	A level	911	666	57.8
2018/19	GCSE A* to C	891	944	48.6
2018/19	Other qualification	325	464	41.2
2018/19	No qualification	259	977	20.9

2019/20	Total	4,423	3,849	53.5
2019/20	Degree or equivalent	1,344	445	75.1
2019/20	Higher education	445	247	64.3
2019/20	A level	1,012	671	60.1
2019/20	GCSE A* to C	919	976	48.5
2019/20	Other qualification	365	452	44.7
2019/20	No qualification	268	980	21.5
2020/21	Total	4,331	3,946	52.3
2020/21	Degree or equivalent	1,478	510	74.3
2020/21	Higher education	422	251	62.7
2020/21	A level	999	731	57.8
2020/21	GCSE A* to C	860	1,050	45.0
2020/21	Other qualification	308	444	41.0
2020/21	No qualification	208	880	19.1

[iii]Employment of disabled people 2023, Table LMS006. https://www.gov.uk/government/statistics/the-employment-of-disabled-people-2023/employment-of-disabled-people-2023

Table 3 shows that individuals with disabilities who has a degree, or an equivalent qualification can access employment opportunities across various sectors. But half of the qualified disabled individuals are unemployed. This indicates a persistent deficiency in awareness. From 2013 to 2020, nearly 45% of qualified disabled people were unemployed, a problem that has persisted for many years, because of limited job availability for these individuals. However, with the artificial intelligence and robotics, new job opportunities are emerging and it's necessitating the need for proper qualification to access those jobs in AI automated manufacturing industries. So, if they got proper guidance. They can easily access future job opportunities, which can significantly enhance their lives. These resources aid them in overcoming the societal stigma they encounter in the workplace.

2. DATA AND METHOD

Data source

In this study, we analysed and compared the responses of two distinct age groups of disabled people: those aged 18 to 35 and 36 to 55. The manufacturing industry employs both age groups. The samples primarily work in two types of roles: desk jobs and non-desk jobs. To collect data from the samples, we use the structured questions by the survey method, this allows for detailed qualitative data collection. This research aims to understand not only their current employment situation but also their career development in new job roles and the changing skills on the job, particularly the rise of artificial intelligence in industries.

The sample size for this research is 223 disability samples. Most disabled workers in production-based industries work in desk-based roles, with only a small number exclusively on the production line. This study employs a structured questionnaire for data collection from each participant. By dividing the sample into these two age groups, we aim to capture

generational differences in career trajectories and attitudes toward the evolving job landscape. Individuals in the 36 to 55 age group have already established themselves in their careers. They have qualifications and experience, often lacking exposure to newer, technology-driven trends. The younger group, aged 18 to 35, is a cohort that frequently engages in both work and education. Many of them are striving to enhance their professional skills, readying themselves for future roles shaped by the increasing impact of artificial intelligence and automation in the industry.

We select samples from 12 different manufacturing industries. We select these samples from the southern part of India. [iv]The Tamil Nadu government of India mandates that industries provide 3% of their job vacancies for disabled individuals. These 12 industries employed 530 disabled individuals in their respective sectors. Sample size is selected by the formula 223.

the sample size (n) selected by using this formula:

$n = n_0 / 1 + n_0 – 1/N$

$n_0 = z^2 p (1 - p)/ E^2$

Assumption:

- Significant level or confidence level: 95% (Z= 1.96)
- Error level: $\pm$ 5% (E= 0.05)
- Probability value: P= 0.5
- Population size: (N= 534)

Calculate the sample size without population size (n_0):

$n_0 = z^2 p (1 - p)/ E^2$

$n_0 = (1.96)^2 0.5 (1- 0.5)/ (0.05)^2$

$n_0 = 384$

Calculate the sample size with population size (n):

$n = 1 + N/n_0 – 1$

$n = 384/ 1+ 384 – 1/ 530$

$n = 223$

The systematic sampling method was adapted to select the samples. This sampling selecting sample from an ordered sampling frame.

Determine the sampling interval (K): K calculated by dividing the population size N to find sample size n.

K= 530/223

K= 2.38 round to the nearest integer K= 2

By using this sampling interval K= 2 selected the sample 1,3,5, 7….,223.

In this sample size of 223, the age of 18 to 35 is 136 disabled individuals, and the age of 36 to 55 is 87 disabled individuals.

Survey measures

Our empirical aims are to capture: (a) the emergence of new job opportunities in production industries for disabled people, and (b) to find out the awareness of skill requirements for disabled workers to adapt these new job roles. For shorthand, we refer to these two parts of our analysis as 'new job opportunities' and 'skill adaptation.' While described separately here in this section, later, in presenting our findings, these two parts of the study come together with the two different age group disabled individuals, as we analysis the relationship between the availability of new roles and the awareness among two age groups disabled individuals regarding future job opportunities in production industries.

The Impact of Automation and AI on Employment Opportunities and skill change.

By asking these questions to disabled individuals to gather their experiences and perceptions regarding automation and AI in the workforce.

To what extent do you believe automation and AI have affected job availability in your field?

a. Significantly reduced job opportunities

b. Moderately reduced job opportunities

c. No noticeable effect

d. Moderately increased job opportunities

e. Significantly increased job opportunities.

The first question about job availability in production industries is how different individuals feel automation has impacted their employment opportunities. Those who perceive a significant reduction in job opportunities might point to areas where automation has supplanted traditional roles, whereas those who perceive an increase might identify fields where AI and automation have generated new opportunities, particularly in technical or supervisory roles.

Which of the following areas do you think will experience the most growth in job opportunities for disabled individuals?

a. AI Integration

b. Human-Machine Collaboration

c. Supervisory Roles in Automated Industries

d. Data Analysis and Interpretation.

The second question will highlight which sectors disabled individuals see as having the most potential for growth in job opportunities. By identifying whether respondents believe fields like AI integration, human-machine collaboration, or data analysis are most promising, we can understand where they feel the greatest opportunities lie and which sectors may need more development or accessibility.

In your opinion, what would be the most effective way to increase employment opportunities for disabled individuals in AI-automated industries?

a. Increased training and reskilling programs

b. Policies promoting inclusive hiring practices

c. Development of assistive technologies

d. Greater collaboration between governments and AI industries

The third question focuses on solutions to increase employment for disabled individuals in AI-automated industries. Responses here will offer insights into whether individuals prioritize training, inclusive hiring policies, assistive technologies, or government-industry collaboration. Understanding these preferences can guide policymakers, educators, and industry leaders in implementing targeted strategies that would best support disabled individuals entering or advancing in AI-automated industries.

The awareness of skill requirements for disabled workers to adapt these new roles.

Which of the following job roles do you believe are best suited for disabled individuals in the automated production industries?

a. Automation System Supervisor

b. AI Integration Specialist

c. Data Analyst in Automated Processes

d. Human-Machine Collaboration Coordinator

The fourth question about job roles best suited for disabled individuals helps identify which specific roles they feel are most accessible and aligned with their abilities in automated industries. Responses will shed light on whether roles such as AI Integration Specialists, Supervisory Roles, or Human-Machine Collaboration Coordinators are seen as more suitable, helping identify sectors that may need more adaptation or support to be truly inclusive.

Do you believe you have the necessary skills to work in an AI-driven automated production environment?

a. Yes, I am confident in my skills

b. Somewhat, I have relevant skills but need more training

c. No, I do not have the required skills

The fifth question about skills allows us to assess whether disabled individuals feel prepared to work in an AI-driven environment. This helps gauge the current skill gap and whether these individuals believe they have received adequate training or education to thrive in such industries. It may also highlight the need for more targeted reskilling programs or training opportunities for individuals with disabilities.

Do you believe that individuals with disabilities are given fair opportunities to apply for roles in AI and automation-driven industries?

a. Yes, opportunities are fair and equal

b. Somewhat, but there is room for improvement

c. No, opportunities are lacking

The sixth question about fair opportunities will reveal perceptions about inclusivity and hiring practices within AI and automation-driven industries. If many individuals respond negatively, this could indicate a significant gap in how these industries promote accessibility, diversity, and inclusion for disabled workers. Positive responses, on the other hand, might suggest that some industries are moving in the right direction.

This survey targeting disabled individuals aged 18 to 35 and 36 to 55 could reveal interesting differences in how these groups perceive the impact of automation and AI on job opportunities in the manufacturing sector.

3. FINDINGS

While this analysis focuses on the differences between the two age groups (18-35 and 36-55) of disabled individuals working in manufacturing industries, it also highlights skill changes in employment rolls, perceptions of AI and automation's impact, and the suitability of various roles within the evolving industrial landscape for disabled people. The individuals with hearing or speech impairments predominantly occupy roles as physical labour. supervisory, technical, and administrative are involve both locomotor disabilities and hearing or speech impairments people with the help of specialized equipment based on the specific needs of disabled workers. The distribution of different roles among disabled workers in the manufacturing sector becomes clearer with this broader perspective.

TABLE 4 comparison table of two age group of disabled people

Age Group	18 to 35	36 to 55	Total
Employment role			
Operational (physical labour)	29	9	38
Supervisory/Managerial	23	36	59
Technical/Analytical	24	2	26
Administrative/Desk job	60	40	100
Total	136	87	223
Impact of AI and Automation for new job availability			
Significantly increased job opportunities	109	0	109
Moderately increased job opportunities	25	22	47
No noticeable change	2	54	56
Reduced job opportunities	0	10	10
Significantly reduced job opportunities	0	1	1
Total	136	87	223
Suitable job for disabled People			

Automation System Supervisor	30	2	32
AI Integration Specialist	46	3	49
Robotics Maintenance Engineer	42	1	43
Data Analyst	17	6	23
Administrative	1	36	37
Accounts management	0	39	39
Total	136	87	223
You are equipped to operate a AI driven machines			
Yes, I am fully equipped	5	0	5
Somewhat equipped, but I need further training	34	2	36
No, I do not have the necessary skills	97	16	113
I am not interested in this field	0	69	69
Total	136	87	223
New Job opportunities for disabled individuals			
Supervisory/Managerial roles	4	54	58
Data analysis and interpretation	50	3	53
Technical support roles (e.g., system monitoring, maintenance)	31	30	61
Training and human-machine collaboration	51	0	51
Total	136	87	223

Note: This data has collected from different manufacturing industries disable employees

Table 4 mention that Individuals with hearing or speech impairments dominate the operational or physical labour roles, particularly in the younger age group (29 out of 38). in other hand (36 to 55) age group (9 out of 38) occupies these physically demanding roles. The fact that there are a lot of people with hearing or speech impairments in these roles suggests that physical work is easier for them to do than for people who have locomotor disabilities because they are unable to do labour workers. In contrast, both age groups are represented in supervisory and managerial roles by individuals with locomotor disabilities and those with hearing or speech impairments. The older age group (36 out of 59) leads in these positions, reflecting their accumulated experience and perhaps a greater reliance on special equipment that supports their managerial duties. Technical and analytical positions majorly got dominance by the younger group, (24 out of 26) roles filled by individuals between 18 and 35. These roles involve more technology and problem-solving tasks, and individuals with both locomotor and hearing/speech impairments participate here. individuals with locomotor disabilities may use adaptive workstations, while those with hearing impairments might rely on communication aids or enhanced visual interfaces to perform their analytical tasks. The two age groups also distribute administrative or desk jobs, which are less physically demanding, survey shows 100 individuals are in administrative positions in that 60 belong to the 18 to 35 age group and 40 from 36 to 55 age group. the locomotor and hearing / speech-impaired individuals contribute to these roles, supported by adaptive equipment like voice-to-text systems, modified desks, or

other assistive technologies designed to meet their disability-related needs. When it comes to the impact of AI and automation on job opportunities. Out of the 136 younger workers, 109 believe that AI and automation have the potential to significantly increase job opportunities because they received their education primarily in technical areas, whereas the older age group appears more sceptical. None of the older workers share the younger group's enthusiasm, and 54 of 87 believe there has been no significant change in job availability. This disparity could be attributed to the older generation's greater reliance on established routines and roles, whereas younger workers, equipped with specialised devices or training, believe they are more capable of adapting to new technologies at work. In terms of roles suitable for disabled individuals, technical roles such as Automation System Supervisor (30 out of 32), AI Integration Specialist (46 out of 49), and Robotics Maintenance Engineer (42 out of 43) have a high representation of younger workers. Interestingly, the older group primarily focuses on non-technical roles such as administrative jobs (36 out of 37) and accounts management (39 out of 39). Based on their skills and equipment, these roles are better. For example, individuals with locomotor disabilities may perform desk jobs from accessible workstations, while those with hearing impairments may benefit from communication tools that assist in their administrative duties. The younger workers express the need for further training to operate AI-driven machines, while some already possess the necessary skills. Special equipment tailored to their impairments plays a crucial role in bridging this skills gap. In contrast, the older group largely shows disinterest in this field, with many preferring not to engage with AI-driven tasks. However, among the younger group, adaptive technologies that align with their disabilities are providing new opportunities in this field, with equipment that compensates for physical or communication barriers.to meet their disability-related needs.

4. DISCUSSION AND CONCLUSION

The findings of this study highlight the transformations by automation and artificial intelligence (AI) in the manufacturing sector and its focus on the new job roles available and change in kill to individuals with disabilities. Much like the changes observed in other sectors due to technology, the manufacturing industry is also witnessing a shift from traditional operational roles to supervisory, analytical, and technical positions. The literature suggests that automation and AI integration in industries have resulted in both the displacement of routine jobs and the creation of new opportunities (Rouse, 2024; Singh & Namekar, 2020). This is consistent with the World Economic Forum's (2023) prediction that while millions of jobs will be displaced, even more will be created due to advancements in technology. The data reveals a clear divide between age groups regarding the perception of job opportunities resulting from automation. Younger workers (aged 18-35), especially those with disabilities, show a strong belief that AI and automation significantly increase job opportunities. This group is more attuned to the new technical roles, such as Automation System Supervisors and AI Integration Specialists, suggesting that their recent education and familiarity with advanced technologies contribute to their optimism. This aligns with Tobey Strauch's (2024) insights into how machine learning and AI are reshaping industries, opening pathways for data-driven, technical roles that require less physical intervention and more cognitive engagement.

Conversely, older workers (aged 36-55) displayed a more skeptical attitude toward AI's role

in creating job opportunities, with many perceiving no noticeable change in job availability. This reflects the finding that older workers, especially those in managerial or administrative roles, may feel less prepared to adapt to AI-driven environments. Erik Brynjolfsson and Andrew McAfee (2014) emphasize that as automation grows, workers in leadership roles must focus on system optimization and decision-making. However, it appears that older workers, despite their managerial experience, may feel less equipped for these technology-intensive tasks, reinforcing the need for retraining and skill development.

The study also found that physically disabled individuals are well-positioned to take advantage of supervisory and technical roles. Jobs such as AI Integration Specialists or Human-Machine Collaboration Coordinators require cognitive skills, problem-solving, and system oversight—qualities that are not limited by physical impairments. This is supported by research showing how assistive technologies and adaptable work environments can make technical roles more accessible to disabled individuals (ILO & ONCE, 2021). The most notable findings are the gap in skill preparedness between the two age groups. Younger workers express the need for further training to fully integrate into AI-driven roles, while older workers, many of whom are already established in non-technical roles, show disinterest in learning these new skills. and these disabled individuals require awareness about future job perspectives, as research clearly indicates that they perform repetitive tasks daily. However, they lack knowledge about the skills they need to acquire to maintain their current jobs and transition into new roles. This suggests that while automation offers promising opportunities for people with disabilities, particularly in supervisory and technical roles, there is an urgent need for reskilling programs to bridge the knowledge gap. Emmanuel Ohiri's (2024) work on the importance of learning AI and machine learning tools supports this, as industries increasingly rely on programming languages and analytical skills for efficiency.

In conclusion, this study reveals both opportunities and challenges for disabled individuals in AI-automated industries. Younger workers, with their openness to new technology and education in advanced systems, are better poised to take on emerging roles in automation. In contrast, older workers may struggle to adapt without targeted reskilling initiatives. To maximize the benefits of automation for disabled workers, industries must provide comprehensive training programs, promote inclusive hiring practices, and develop assistive technologies to ensure that all workers, regardless of age or disability, can thrive in this new industrial landscape. The findings echo the broader discourse on how automation, while displacing some jobs, has the potential to create a more inclusive and technologically empowered workforce (Farrell, 2023; Webb, 2020).

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