AI, AUTOMATION AND FUTURE OF WORK

Problem Statement: Examine the potential impact of automation on the job market and propose strategies for upskilling and reskilling the workforce to thriven in a technology-driven future

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INTRODUCTION

The Transformative Power of AI: Reshaping the Way We Work

AI transforms work, automating tasks with precision, Boosts productivity, speeds data-driven decision, Personalized experiences for employee rendition, Collaboration thrives, fostering team cohesion.HR processes evolve with AI's intervention, Innovation flourishes, sparking creative tension, Remote work enabled, enhancing remote vision, Skills are honed through AI-driven provision. Ethical concerns arise, needing supervision, Bias and privacy require thoughtful precision, AI's transformative power demands recognition, Balancing benefits and risks, a constant mission.

AI in Health Care

AI transforms healthcare with cost-effective solutions, optimizing resources and automating administrative processes. Its predictive analytics enhances patient care, proactively managing health and improving outcomes. Continuous learning through data analysis keeps professionals updated on the latest advancements. Despite benefits, ethical considerations, including transparency and bias mitigation, are imperative for patient trust. AI's ability to analyze diverse patient data demands fairness in healthcare outcomes.
Challenges notwithstanding, AI promises a future where technology and human expertise converge for efficient, accessible, and patient-centric healthcare solutions.

AI in Finance

AI technology revolutionizes finance by automating tasks, enhancing efficiency, and reducing operational costs. Machine learning algorithms analyze vast datasets, providing data-driven insights for informed decision-making in investment and risk management. Predictive analytics aids in fraud detection, improving security and safeguarding financial transactions. AI-driven chatbots offer personalized customer service, improving user experience in banking and financial services.
Algorithmic trading powered by AI optimizes investment strategies, maximizing returns. Ethical considerations, including data privacy and algorithmic fairness, are critical in responsible AI adoption in finance. Despite challenges, AI continues to reshape the financial landscape, fostering innovation and agility. The future sees AI playing a central role in financial operations, risk assessment, and customer engagement.

AI in Retail

AI technology transforms retail, enhancing customer experiences and operational efficiency. Machine learning algorithms analyze consumer data, enabling personalized recommendations and targeted marketing strategies. Inventory management is optimized through predictive analytics, reducing stock outs and overstock situations. AI- driven chatbots and virtual assistants streamline customer interactions, providing real-time support. Facial recognition and computer vision enhance security and personalized experience.

IMPACT OF AUTOMATION ON JOBS

Artificial intelligence (AI) is a game-changer, reshaping how industries and societies operate globally. India has a significant opportunity to benefit from this transformation, but it's crucial to understand the opportunities and challenges involved. In the realm of technological evolution, India is becoming a key player in the AI revolution, signaling sustainable growth. AI's impact is inevitable, and its implications are profound for both citizens and the world.

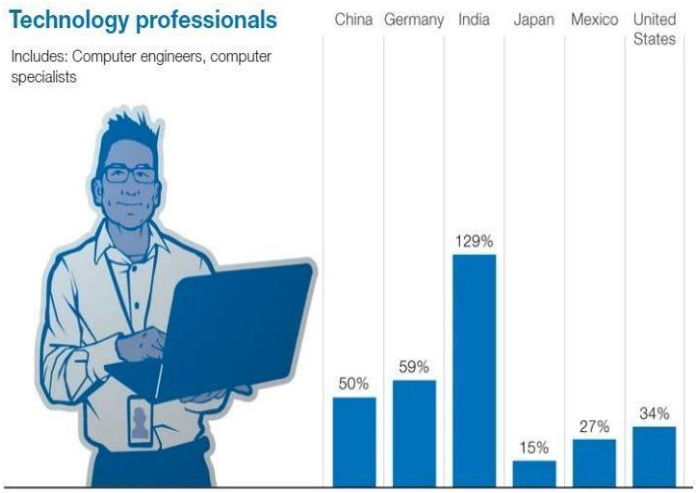
India's strength lies in its large population and the vast data generated by its diverse citizens. This creates an ideal environment for developing and applying AI technologies across various sectors. Projections by NASSCOM suggest that the Indian AI industry could reach a staggering USD 28.8 billion by 2025, with a 45% compound annual growth rate. Sectors like healthcare, transportation, finance, retail, agriculture, and manufacturing are all set to benefit.

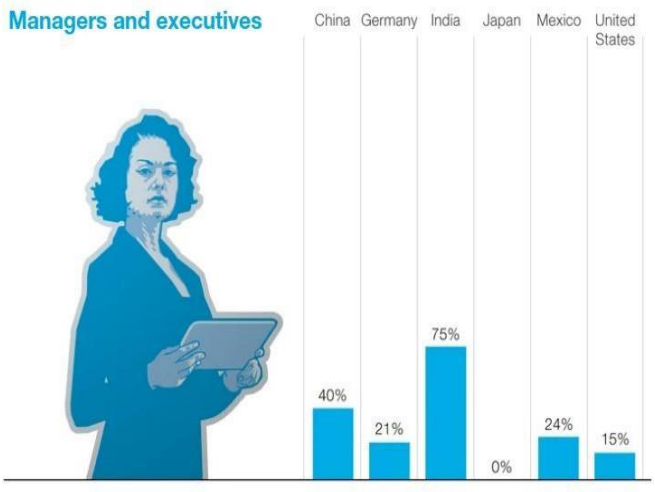
India stands out with three times the global average in AI skill penetration, making it a leader in the field. The demand for AI skills in India is robust, with a projected talent gap of 213,000 by 2022. The country already has 416,000 AI and data science professionals, but there's a significant demand- supply gap for key roles. A 22% shift in the job landscape is expected by 2028, driven by emerging AI roles.

The financial landscape in India is poised for a seismic shift due to AI's increasing integration. By 2025, AI could inject up to $500 billion into India's GDP, a figure that could surge to $967 billion by 2035. The AI software segment is projected to grow at an annual rate of 18% until 2025, supported by substantial investments, expected to reach $881 million this year.

Recognizing AI's pivotal role, the Indian government, academia, and industry are investing significantly in nurturing AI capabilities and skills. These strategic initiatives underscore a commitment to positioning India at the forefront of the global AI revolution, ensuring that the country harnesses the full potential of this transformative technology

Employment growth and decline by occupation , % change labour demand midpoint automation





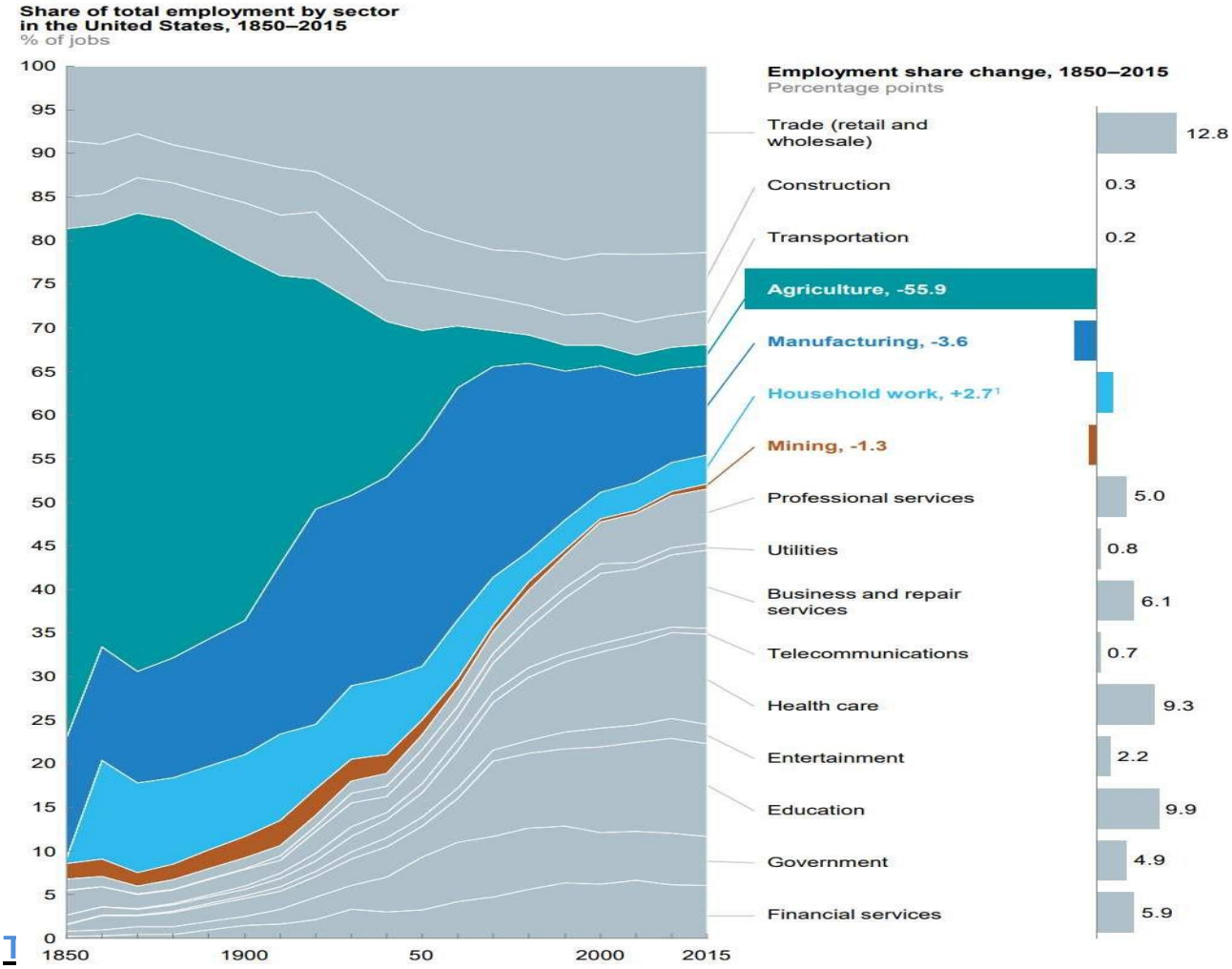
Future of Work

Artificial Intelligence will completely transform the way we live. History shows that Technology has brought large scale changes in human life in their economic, political and social sphere. Development of Computers, telecommunication, printing press etc has really disrupted the dynamics of society and became the catalyst for the large scale changes in the economy. If we go back in the History we find that People initially have always been critical and fearful in accepting the new technology because of the mass job losses initially. In 1859 Queen Elizabeth 1 refused to grant a patent to a stocking frame invented by William Lee because she was concerned about its effect on the Hand knitters. Similarly In the 19th century textile workers in Britain and France smashed out the automated handloom to protest the arrival of Steam powered presses. The reason I am bringing the historical examples is because it provides valuable context and lessons for the **future of labor** demand at the time of automation. Contrary to the popular notion that Automation has led to the killing of large no jobs the historical analysis has shown that Technological innovation has created many more new jobs than it has destroyed, raising providing, increasing living standards, and creating many more new opportunities and bringing about a shift in the balance between work and leisure. It has always been very easy to point fingers at the fact that AI has destroyed a huge number of jobs but equally important is the fact that Automation has created many new opportunities which were not visible in the short term. It is true there will be some problems in the transition period but the new avenues which are created by the proliferation of Artificial Intelligence and other technological innovation is something which needs to be pondered upon. Automation has the potential to raise **productivity growth and GDP growth**, but our analysis reveals that a key factor in whether this will be achieved without large adverse effects on employment and wages is how quickly displaced workers are reemployed in other job.

Throughout history, large-scale sector employment declines have been countered by growth of new sectors that have absorbed workers

Since the First Industrial Revolution began in England in the 18th century, the economies of Europe, the United States, and other countries have undergone two profound waves of structural change. Mechanization enabled a revolution in agriculture and in industry, prompting a migration of workers from the countryside to cities. A second structural shift has occurred in the past 60 years as the share of manufacturing employment has declined in some countries even as growth in service sectors accelerates.

In the United States, for instance, the agriculture share of employment declined from 58 percent of total employment in 1850 to 2.5 percent of employment today. In just 40 years, between 1880 and 1920, the share of agricultural employment declined 25 percentage points.During the same decades, other sectors were being transformed by mechanization and electrification as well: the share of miners and household workers, for example maids and servants, also declined, although these shifts affected fewer workers. Since 1960, when the second wave of structural transformation began, manufacturing fell from 27 percent of total US employment to 9 percent today, as automation and global trade transformed manufacturing and as demand for services exploded.



1 unforeseen ways

It is easy to see which jobs are being destroyed by Automation but it is difficult to imagine which jobs will be created by it. If we take the example of telephone operators who were once lamenting over the loss of their jobs could have imagined that one day there will be devices like smartphones which has led to the creation of millions of jobs around the world

years ago Joseph Schumpeter coined the term "**Creative Destruction"** to describe the age-old phenomena in which arrival of new technology destroys jobs by rendering them obsolete and creates new jobs in their wake.

To better understand the pattern of job creation and destruction, we conducted case studies of two technologies in the United States—personal computers and automobiles— to estimate the number and types of jobs lost to the new technology and the number of new jobs created. In both cases, our research reveals that while some work activities declined, sometimes rapidly, new types of work activities were created. The net impact of both technologies was highly positive, creating new jobs that made up 10 percent of total employment over four decades.

Automation will impact job growth initially but as the workers are properly reskilled according to the demand in the market then this transition can be smooth. Our team has identified some of the important areas where there will be significant creation of jobs. Workers in occupations in the following groups spend considerable time on work activities that are among the least susceptible to automation based on our analysis, as they require human capabilities including social and emotional interaction, higher-level logical reasoning, creativity, and application of expertise that machines for now are less capable of accomplishing.

Future Career Opportunities

1) **Care Providers -** Doctors, Nurses, home health aides and others in the health care occupations will be in greater demand due to rising health care spending both from rising prosperity and ageing.

2) **Professionals -** White-Collar occupations that require academic training and expertise in a particular industry and functional area. These include **accountants**, **engineers, and scientists**. Most of these occupations cut across a wide range of sectors. While generally less automatable than other job types, certain supporting occupations such as **paralegals and scientific technicians** may face high automation.

3) **Technology Professionals** - Technology experts will be in continued demand everywhere as automation is increasingly adopted, although the total numbers remain quite small compared with other occupations. That said, occupations such as web developers and electronic technicians at the secondary level of education are more vulnerable to automation than the technology workers with higher degrees.

4) **Builders** - In this category we have included architects, surveyors, cartographers as well as construction occupations and maintenance and repair workers such as labourers, electricians, carpenters, and plumbers. Since most of their jobs are in unpredictable settings, Automation will not have much effect on this sector.

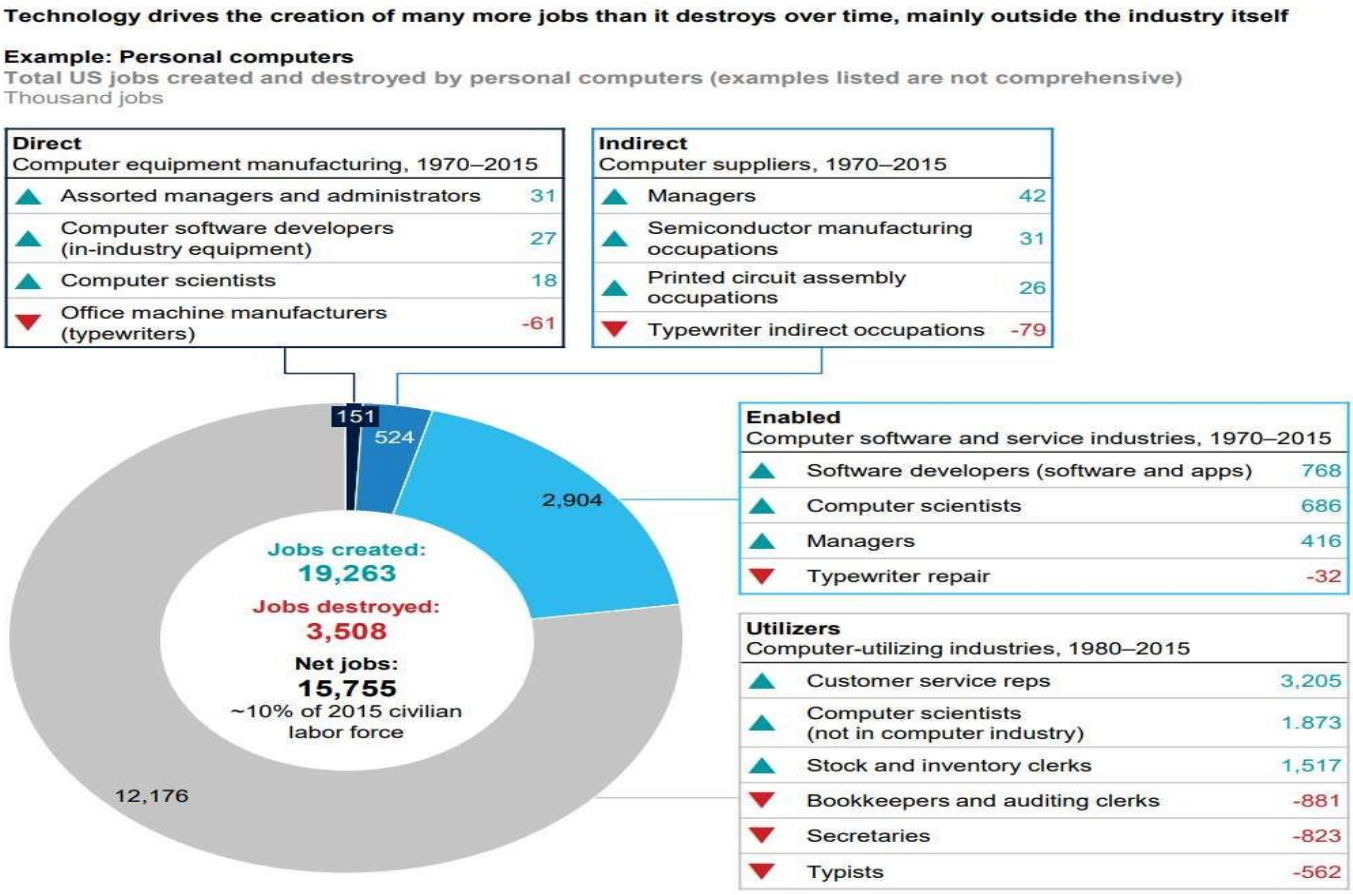
5) **Managers and executives-** They also cut across all sectors and cannot easily be replaced by machines, as much of their work involves **interacting** with and **managing**

   stakeholders. However some of their more routine activities will be automated, such as collecting information, analyzing data, or preparing reports.

6) **Educators** - School teachers and early childhood educators will also see an increase in demand as the automation increases. Child care workers and early childhood educators will also be in demand as more child care is shifted to paid providers in the form of babysitting.

7) **Creatives** - Rising incomes in emerging economies will create more demand for leisure and recreational activities. This in turn will create demand for artists, performers, and entertainers, although the total numbers will remain relatively small.

In India, much of the projected growth in activity hours will be in **physical activities**, driven by demand for **construction work**, particularly in the step-up scenario. China, which has higher levels of existing infrastructure and building development, will still see some growth in physical activities. However, most of the growth will be in activities similar to its advanced-economy counterparts, such as **interacting with stakeholders** and **applying professional expertise**. More work activities will require **social and emotional skills and advanced cognitive capabilities**, such as high-level **logical reasoning**—capabilities that are required today for only a relatively limited number of jobs. This will be a challenge for education, training, and skill assessment models, which for now do not always emphasize “soft skills” such as **social and emotional reasoning and sensing.**



Opportunities and Displacements:

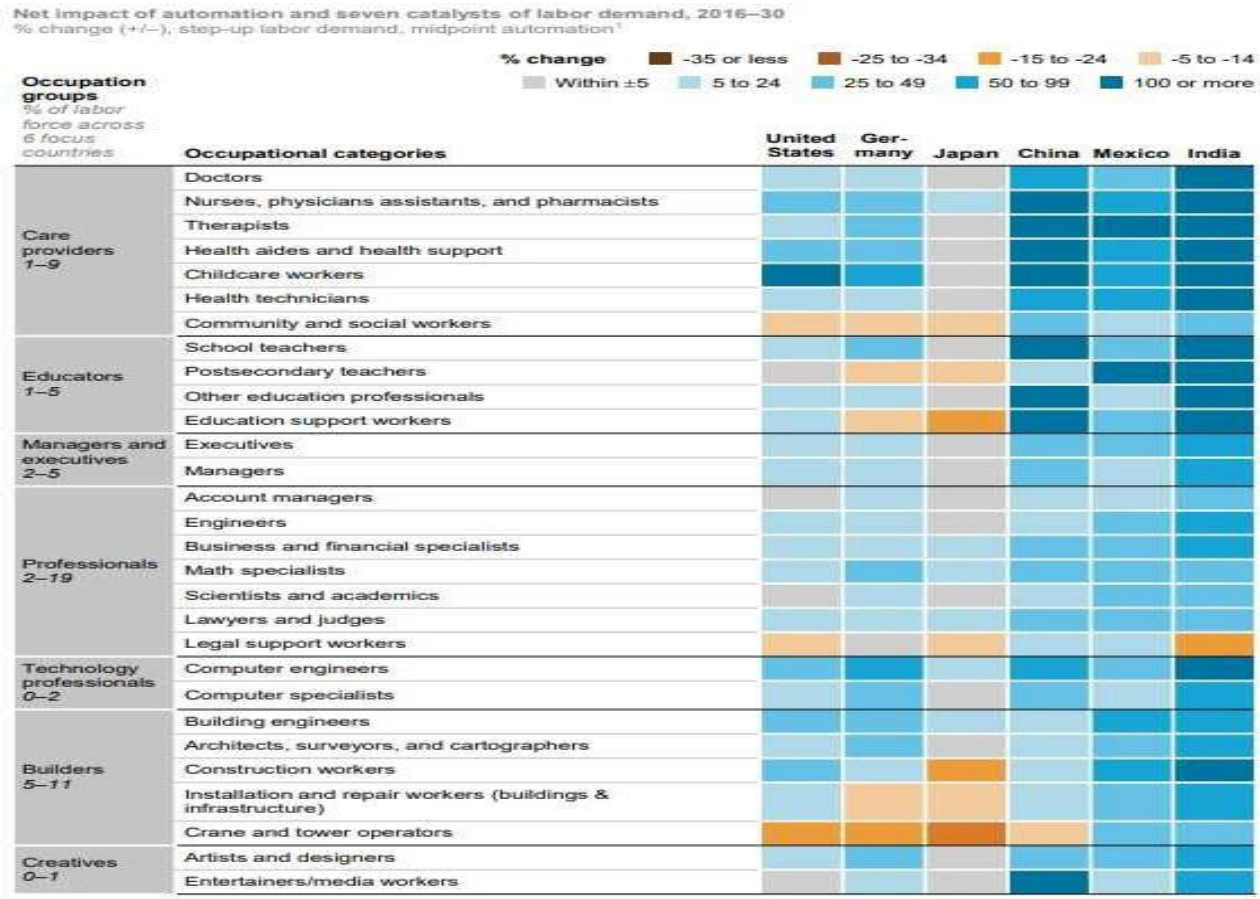
Opportunities

- Responsibilities and work for an average employee increases because of automation which leads to higher productivity for an organization.
- Repetitive tasks will be replaced like the work done in call centers, data auditing, this will help in using and training the human resource available in an organization for better purposes.
- Advance level jobs will also be done by automation like heart surgeons, fire fighters, this kind of works done by automation leads to boom in new jobs like Bio-medical engineer, robotics engineer.
- Jobs in IT, coding, ML, prompt engineers will increase multi-fold as it effects many industries like creative fields movies, weddings, core IT jobs, banking, construction, content creation, fitness industry and space industry.

Displacements –

Transition to adopting new technology and new environment will lead to lot of unemployment as especially if there is a significant skill mismatch, this happens if there is no enough workforce to train people in the technology, AI has the potential to automate routine and repetitive tasks across various industries, leading to the displacement of some job roles. Tasks that can be easily defined, quantified, and performed algorithmically are more susceptible to automation. For example, in manufacturing, AI-powered robots can replace human workers on assembly lines. In customer service, chatbots are becoming increasingly adept at handling basic inquiries.

Also people with better education qualifications have higher chances of adopting to new technology as they will be having a better understanding of the situations in market and adopting to the AI, industries like construction which uses lot of manual labor might see a steep decline in job displacement resulting in huge



backlash from the community in order resulting social disorder and in order to control this government should bring in a system in place where the labor force which has much lesser educational background in sectors like construction and manufacturing ,delivery sectors are educated which makes them ready to quickly adopt when the transition period happens

In the above graph we can see the percentage of jobs effected in different professions with respect to different countries and we can observe that the effect of automation is more in countries like India and China followed by Mexico while Japan and US to be least effected in care provider and education sector, in construction/builders sector we can see India to be most effected followed by US, Germany , Japan to be most effected. In overall summary we can conclude that transition of automation of different is seen in different sectors of India because if which so many people might become unemployed if they are no trained before the transition period.

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Importance of Upskilling & Reskilling

Strategies:

- Education institutions –

From schooling onwards proper awareness and curriculum regarding AI, automation should be introduced, there is a trend in educational institution for following the same syllabus for decades, this should be changed, every two or 3 years there should be a change in the curriculum according to present day technology which in turn helps students to keep up with the industry demand.

Also when compared to previous generation all the information is readily available in the internet and

students can easily get information from internet, so just rote learning is not sufficient, application oriented, projects oriented learning is very much needed, this helps students in next stages of their careers.

Also in classes between 5th-8th only there should be a segregation of students depending upon their interests, hobbies, IQ level and psychology analysis as not all students need to learn all the concepts of AI or automation for example a child or students who wants to go into sports like cricket or football or if the child wants to pursue a career in music or want to go into army their requirements for learning AI or automation will be different than students/children who have the skillset of core IT related fields, this will help proper utilization of resources also in the long term there will not be issues like unemployment or underutilization of human resources.

- **Existing workforce –**

One initiative by government which will really help's the existing workforce and students is creating education hubs for individual districts where all the new technology will be taught by industry experts, along with projects also with the certification of the course completion and placement assistance for merit students which gives added value to the students while attending the jobs and with minimal fees as compared with private players, this will encourage many students to get themselves educated in the new age technologies like and get themselves proper jobs elated to those technologies

Another way of upskilling and creating jobs in the market to meet the market demand and to fulfil the deficit between the work force available and jobs there in the market, government should introduce schemes for entrepreneurs and start ups to start new projects related to automations or AI and bring new solutions to the existing problems like forecasting floods and helping people stay safe through early warning systems, monitoring prenatal health, fighting pest infestations of crops, helping people with non-standard speech connect and be understood. This will eventually lead to more jobs clearing the gap between the available workforce and jobs.

Priorities for Government, Business and Individuals

Automation will be a powerful motor of future economic growth, but the challenges it presents for workforce transitions are sure to be very substantial. Policy makers, business leaders, and individual workers will need to be flexible, creative, and even visionary as they look to harness these rapidly-emerging technologies and ensure that the time of automation is a productive and prosperous one.

Priorities for the Government include the following -

- Radically scale **midcareer training** opportunities to make lifelong learning a reality.
- **Modernize** educational systems for the 21st century
- Expand **transition support** measures for workers
- Create **income support** measures consistent with the new wage realities
- Make Job creation and worker **redeployment** a national priority.

Priorities for the Business Leaders are as follows -

- Accelerate **deployment of automation** and AI
- Redesign **Business Processes** to unlock productivity gains.
- Building core **digital** and **analytic** capabilities.
- Adapt talent strategies and manage workforce transitions.
- Consider Partnership for talent development.

Individuals must prepare for lifelong learning and Evolving careers

- All individuals will need to adopt a more **entrepreneurial approach** to navigate through the world of work and managing their careers.
- Acquire the skills that will be in demand and embark on a journey of **lifelong learning**.
- Consider **new ways** of working
- Prepare for a world of **digital job search**

Conclusion

Automation represents both hope and challenge. The global economy needs the boost to productivity and growth that it will bring, especially at a time when aging populations are acting as a drag on GDP growth. For companies, the technologies can lift productivity and profits to new heights. For society as a whole, machines can take on work that is routine, dangerous, or dirty, and may allow us all to use our intrinsically human talents more fully and enjoy more leisure. Yet even as we benefit, our societies will need to prepare for complex transitions ahead, as machines replace workers in many areas. Our research suggests that it may be time to refocus the current anxious debate about automation toward issues of demand growth, and how to manage the inevitable transitions created by automation. The task at hand is to prepare for a more automated future by emphasizing the skills that will be needed and ensuring dynamic job creation. The technology is advancing rapidly; the policy choices should not tarry.

References

- *The Future of Work We Want: A Global Dialogue*. Report: The Future of Work We Want: A Global Dialogue. (2017, August 17). https://www.ilo.org/global/topics/future-of-work/dialogue/WCMS_570282/lang--en/index.htm

- Manyika, J., Lund, S., Chui, M., Bughin, J., Woetzel, J., Batra, P., Ko, R., & Sanghvi, S. (2017, November 28). *Jobs Lost, jobs gained: What the future of work will mean for jobs, skills, and wages*. McKinsey & Company. https://www.mckinsey.com/featured-insights/future-of-work/jobs-lost-jobs-gained-what-the-future-of-work-will-mean-for-jobs-skills-and-wages

- Chapter 3. understanding the downward trend in labor income shares. (n.d.-a). https://www.elibrary.imf.org/display/book/9781475564655/ch003.xml