Future Technology and Labour - Are we Heading Towards a Jobless Future?

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Abstract

Technological innovations and the invention of machines powered by Artificial intelligence[2]*have changed the way we work, interact and carry on our everyday lives. Automation wave has revolutionized the manner in which the traditional manufacturing and service-oriented industries are functioning today. The first industrial revolution was triggered with the invention of steam engine and also led to mechanical production. The invention of electricity and assembly lines resulted in the second industrial revolution where mass production became feasible. The third industrial revolution was driven by computer, digital technology and the internet. The future technologies have resulted in the fourth industrial revolution. The new age technological innovations and inventions such as the automated robots; big data and analytics; augmented reality; the cloud; cyber security; additive manufacturing; horizontal and vertical integration; the internet of things are transforming industrial production and labour relations. There is a drastic improvement in the entire chain of production ranging from design up to productivity, the speed and the quality at which the goods are produced. As a result of the new age technologies various concerns are raised especially its impact on the employment. Many labourers are rendered unemployed and redundant due to automation. The question that arises is whether we are approaching a jobless future?? The job market in India is also undergoing a transformation and posing many social, economic, legal and ethical challenges. Job structure is changing and the workers need to equip themselves with new skills to fit into the new jobs that are emerging as a result of technological innovation. The education system in any country plays a pivotal role in the overall development of an economy as it caters to the needs of the trained and skilled manpower. It is vital for the education system in the country to re-orient itself to cater to the needs of the students to fit into the changing paradigm. The focus of the education needs to be on imparting life-skills and to improve the thinking, problem-solving and decision-making ability of the individuals in a society. In the light of the above, it is also important to address and discuss the various changes, issues and challenges that are taking place in the labour market including the impact of these technologies on the working hours, wages, the working environment and the labour relations amongst others.*

Keywords: *Redundancy of Labour; Fourth Industrial Revolution; Artificial Intelligence*

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[2] The term, '*Artificial Intelligence*' describes the work processes of machines that would require intelligence if performed by human. It means investigating intelligent problem-solving behavior and creating intelligent computer systems (https://www.ibanet.org).

1. Introduction

Technological revolution has transformed human kind in a manner that was never perceived or fathomed before. The future technological innovations have become ubiquitous and all pervasive, touching every sphere of our lives. The impact is such that it has changed the way we live, work, communicate and relate to one another. The "*fourth revolution*", has given rise to a new category of people who are termed as "*technomy community*"[3] who are of the view that technology is actually instrumental in redefining business and society. Researchers from the Massachusetts Institute of Technology, Erik Brynjolfsson and Andrew McAfee in their book, *Race against the Machine*, have observed that as a result of developments in the computing technology, many jobs will be done by computers which at one time was believed unsuitable for computers.[4] Further they argued that the pace at which jobs are eliminated as a result of technological innovations is much faster than the creation of new jobs. Many economists like David Autor, Dr. Brynjolfsson and McAfee have expressed their concern regarding the paradigm shift in technologies and their impact on labour markets and have observed that as a result of these innovations many high skilled and low skilled jobs are created but the in-between jobs are vanishing.[5] The business editor of the MIT Technology Review, Mr. Antonio Regalado, is of the view that jobs which are repetitive in nature and also tasks which are well-structured run the danger of automation.[6] Computer Scientist Janor Lanier in his book who owns the future? observed that internet technology is impacting employment in such a manner that it is jeopardizing the middle class by replacing labour, creating job insecurity and in turn economic instability.[7] There is a lack of social cohesion and the inequalities have increased in the society as a result of the technological innovations. Elon Musk has stated that there is need for strict regulations in relation to Artificial Intelligence as they pose a threat to humanity.[8] Bill Gates suggests that the pace of automation need to slow down and that robots need to be taxed to compensate for greater efficiency compared to humans.[9]

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[3] www.ficci.in/spdocument/20787/FICCI-Indian-Higher-Education.Pdf
[4] digital.mit.edu/research/briefs/brynjolfsson_McAfee_Race_Against_the Machine.pdf
[5] https://www.technologyreview.com/s/515926/how-technology-is-destroying-jobs/
[6] http://www.strategicbusinessinsights.com/about/featured/2014/2014-02-tech-vs-labor.shtml
[7] ibid
[8] https://www.theguardian.com/.../elon-musk-regulation-ai-combat-existential-threat-test.
[9] http://fortune.com/2017/02/18/bill-gates-robot-taxes-automation/

Mc Kinsey Global Institute report[10]titled *The Disruptive Technologies-Advances that will transform life, business and global economy* projected that automation of knowledge work will occupy a second place out of the twelve disruptive technological advances. There is a huge potential of automation in various sectors like education, healthcare, drug development, management and law field. The knowledge work is impacted as a result of automation and technologies like the Internet of things, mobile internet etc. Taking proactive steps to deal with the problems that may arise due to future technologies the United Nations Organisation has opened a headquarter in the Hague to monitor development in AI as it is aware that robots could destabilise the world. One of the important goals of the new centre for Artificial Intelligence and Robotics is to understand the threats that may crop up as result of the deployment of robots in addition to the risk of mass unemployment.

The PwC, a consultancy firm has estimated that at least thirty percent of jobs in Britain are affected as a result of breakthroughs in artificial intelligence.[11] The International Bar Association has gone a step further by claiming that it would create pressure on the governments and force them to legislate for quotas of human workers.[12]

The United Nations Organisation was urged to initiate action to offset the dangers that are posed due to the use of artificial intelligence in warfare and also for weapons, sometimes referred to as "killer robots" by Elon Musk, the head of Tesla along with more than hundred robotics and artificial intelligence leaders.[13] Their fears were pinned on the fact that a third revolution in warfare threatens the mankind by the use of lethal autonomous weapons for once developed and permitted in armed conflict then the conflict will be fought at a scale greater than ever before and beyond the boundaries of what humans can comprehend."[14] Prof Stephen Hawking has warned that powerful artificial intelligence would prove to be "either the best or the worst thing ever to happen to humanity".[15]

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[10] https://www.mckinsey.com/~/media/McKinsey/Business%20Functions/McKinsey%20Digital/Our%20Insights/Disruptive%20technologies/MGI_Disruptive_technologies_Full_report_May2013.ashx

[11] https://www.pwc.co.uk/...services/.../pwcukeo-section-4-automation-march-2017-v2.p...

[12] https://www.theguardian.com/.../sep/.../robots-destabilise-world-war-unemployment-u...

[13] www.bbc.com/news/technology-40995835

[14] https://www.theguardian.com/technology/2017/sep/27/robots-destabilise-world-war-unemployment-un

[15] http://www.cam.ac.uk/research/news/the-best-or-worst-thing-to-happen-to-humanity-stephen-hawking-launches-centre-for-the-future-of

2. Labour Redundancy in India and Future Technology

India is on the threshold of the fourth industrial revolution as many entrepreneurs, industries and business houses have started using technologies that involve AI, the Internet of Things, 3D Printing, autonomous robots, driver less cars, drones etc., to carry on their activities. Over dependence on automation has aggravated India's problem of unemployment and labour redundancy. Many projections have been made by different organization regarding redundancy and job losses due to automation in industries. People Strong a technology company has projected that every one job that is lost out of the four job losses will be because of automation.[16] A study by the International Labour Organisation projects that the labour-intensive sectors like the textile and garment industries, footwear will be hardest hit by the use of robots or automation and the lower end jobs will become redundant.[17] For instance, India's textile giant Raymond proposes to replace 10,000 jobs with robots over the next two to three years.[18]

India's top manufacturing industries are cutting on jobs. Just a few years back one of the biggest layoffs was witnessed when Larsen & Toubro (L&T), which is one of the largest engineering and infrastructure firm rendered 14,000 employees redundant as a result of the digitisation and productivity enhancement initiatives taken by the company.[19] This is not of one of instance, many other industries are following suit with Tata Motors' India's largest automaker rendered nearly 1,500 workers jobless. One such example is Maruti Suzuki, which has already started using robots in its factory in Manesar, Haryana. It has nearly around 7000 workers and 1,100 robots. Some analysts are positive about the effects of automation and are of the view that human labour will be required in the industry. The predictions that are making rounds regarding the future of the workforce are that the change that will be witnessed will be dramatic but it will not be catastrophic in nature.[20] Mr. Harel Tayeb, the CEO of a New Jersey based firm namely Kryon Systems, is of the opinion that the jobs in various industries such as in BPO's, Information technology based industries and in financial services

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[16] https://www.businesstoday.in/magazine/cover-story/going-going-gone/story/253260.html

[17] http://www.ilo.org/global/about-the-ilo/newsroom/news/WCMS_496766/lang--en/index.htm

[18] www.thehindu.com/thread/economy/should-we...taxing-robots/article19949121.ece

[19] https://economictimes.indiatimes.com/industry/indl-goods/svs/engineering/in-one-of-indias-biggest-ever-layoffs-lt-sheds-14000-employees-from-its-workforce/articleshow/55570052.cms

[20] https://qz.com/990558/machines-vs-humans-the-battle-for-jobs-in-india-is-affecting-not-just-it-engineers/

are in for a major change but however he is of the opinion that jobs will not disappear.

In countries like Japan and Germany 90% of production line automation is carried out with the use of industrial robotics. This is due to the fact that the labour cost is very high and more than half the population is in the age group of 60 to 65 years.[21] In India, the level of automation is comparatively less due to the availability of cheap labour and the trade-off is high when it comes to replacing humans with robots. In order to attain automation the Indian strategy is to adopt a process where industrial robots work alongside human beings. For instance, as of June 2015, an average of 30 to 40% automation was standard across all big automobile plants.

Chat bots and even humanoid robots are used by many banks and financial institutions. For instance, Canara Bank, Bengaluru is using a Kannada-speaking robot to direct a customer to the right counter. Ira robot is used in HDFC Bank to helps customers choose the right financial products and services. Sometimes robots are used to answer Frequently Asked Questions (FAQs). In course of time human labour will be replaced when robots become more and more sophisticated.[22] There is an increase in the use of Industrial robotics by manufacturing units world-wide in order to achieve automation.

The use of data analytics in the agricultural sectors has opened up various avenues which were not in existence earlier. Cargill India had adopted the mobile based pricing data system which is made use of by thousands of traders. India is in the fourth largest app economy according to mobile analytics firm App Annie. Tim Cook, the CEO of Apple company has observed that more than about seven lakh jobs can be attributed to apps on the Apple IoS platform. Indian developers have created one lakh apps; registering a growth of fifty seven percent over 2016.[23]

To tackle the problems arising out of automation, unemployed and redundant labour the National Institution for Transforming India (NITI Aayog),[24] has proposed to the Government to set up a labour utilisation fund which can be utilised for training and enhancing the skills of the Indian workforce. Mr. Rajiv Kumar, the Vice-Chairman of NITI Aayog emphasised that the labour utilization fund will not be used to pay salaries but should be used for organising training programmes and for payment of provident fund contribution and to cover health costs. In developed countries the Public

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[21] https://www.mckinsey.com/.../what-the-future-of-work-will-mean-for-jobs-skills-and-...

[22] https://www.weforum.org/agenda/2017/10/kranti-nation-india-and-the-fourth-industrial-revolution/

[23] ibid

[24] niti.gov.in/

sector undertakings play a pivotal role in generating employment. In labour-intensive sectors such as construction, exports, garments, tourism, education and health should be in focus for the proposed labour utilisation fund.

India needs to collaborate with various countries like USA, Germany and the EU in its effort to create a long term ecosystem with the primary object of training and educating professionals. In order to reap the benefits of the fourth industrial revolution technologies it is necessary for the central government to create a platform where all the stake-holders such as ministers, State Governments and the industrial bodies& organisations can come together to take policy decisions.

3. The Promises as Well as the Pitfalls of the Technological Revolution

Many countries are joining the race of adopting the future technologies in their industries and other workplaces due to various reasons. The most important amongst them being the following:

a. Reduction in Costs

Industries can cut down on their direct and overhead costs by using industrial robots which are flexible and can be programmed to adapt to new production lines without any training. With minimal supervision the robots can function for a longer duration and less margin of error. The end products are free from defects and hence reduce product failure and wastages. Further they do not require additional expenditure on health care, insurance and income. Energy consumption is reduced considerably by the use of these robots as they require minimum heating and lighting. The saving by the manufacturing unit can be routed for skill enhancement of existing employees, and research and development activities.

b. Increased Production

The production of any industries can be increased with the adoption of future technologies when compared to human labour as the humans have their own limitations and can only work for a limited hours. Robots can be put to work without any such limitation. Thus, the initial capital expenditure incurred in procuring robots can be recovered over the course of few years due to increased production and profitability.

c. Quality Enhancement

The quality of goods is enhanced when it is produced with the help of automated machines or by the use of industrial robots as the chances of defect in goods produced is less. Operational deviations are eliminated which are usually caused due to faulty human supervision and standardization in the production can be maintained.

d. Skill Enhancement

In many industries, many technicians and workers are required to perform repetitive tasks and are underpaid inspite of having the potential to

do skilled labour. Use of industrial robots will give the industries an edge over other and they will also benefit financially and this improves their scope for skill enhancement of their employees and better utilization of human resources.

e. Better Industrial Relations

The problems associated with employment of labour can be eliminated by switching to industrial robotics. The India labour and industrial relation laws are archaic and pro-workmen. The pressure on the employers is high as there is strong trade unionism in most of the industrial regions and the process of industrial dispute resolution is long-drawn and cumbersome. Strikes and frequent wage revision demands adversely affect the production output, which has a consequent ripple effect over the entire supply chain. These problems can be eliminated by switching to industrial robotics.

f. Sustainability

Robots foster sustainability by adapting to new tasks without much efforts and reducing redundancy. Manufacturing units become more sustainable due to seamless and efficient manufacturing. The ability to develop and implement the technological methods without jeopardizing the potential for future generation is termed as sustainability.

g. Waste Management

Employment of industrial robots held towards economic utilization of materials, helps in monitoring safety requirement, reduce waste generation due to defaults and quality errors, minimize industrial hazards by predicting malfunctioning of machines and are helpful in monitoring environmental parameters for effluent and waste discharge.

4. Impact of Future Technology on the Labour Market

FICCI, Nasscom and EY have conducted a study and has in its report[25] projected the impact of advanced technologies on five important sectors in India like the Information Technology services, textiles, apparel, auto and financial services. The study projected that at least 37% of workers will be in jobs that require different kinds of skill sets and 9% out of the 600 million estimated work forces would be in new jobs that do not exist today. It has also been observed in the report that by the year 2022, an individual will have to upgrade oneself and be a constant learner and no person could afford to rest on one's achievements. The report highlights the fact that the future jobs will depend on a country's response to the megatrends which include demographic changes like a rising middle class, business innovations, adoption of exponential technologies, creation of highly

[25] www.ey.com/Publication/vwLUAssets/ey...jobs...india/.../ey-future-of-jobs-in-india.pd...

optimised chains and globalisation linked factors like overseas job market for Indian as well as the level of FDI flows and Indian exports. There will be an increase in the employment especially in the service and the organised manufacturing sectors from the current 38 million to 46-48 million. Research firm Gartner has predicted that by 2022, at least 2.3 million new jobs will be created.

Thus the technological revolution will bring about a sea change in the way industries function, the economic structures, working atmosphere, job profiles, working time and remuneration models. Unemployment, poverty and social distortions will be on the rise. Both the blue collar and white collar sectors will be affected. Not just industrial jobs but it will impact the service sectors also.

In order to keep up with the changes, the future workers need to gear up and upgrade themselves with the qualification, skills, technical and other expertise to carry on the new jobs that may come to the fore. The demand for qualified workers will be higher and the focus will be on the people who can find creative solutions to problems.

It is also necessary that the education system must adapt itself to the changing scenario. According to the World Economic Forum 2016, Universities and schools must not concentrate on teaching how the world was but be more futuristic in approach and concentrate on teaching how the world will be.[26] It was also emphasized that there is a need to adopt an inter-disciplinary approach. Students must be encouraged to study technology related subjects such as science, mathematics, computer science, information technology etc. Faculty also need to upgrade themselves and be tech savvy. Skill based vocational training in the field of Information TSechnology, communication and sciences must be made compulsory. In order to make employees ready for the future labour market the employers need to focus on improving their soft skills.

It is also very important to equip the employees with various skills such as the problem solving, analytical, negotiation, communication, management of human resources communication skills, people management and cognitive flexibility. Further, customized training modules need to be developed to help the future job seekers owing to the individual's time constraints, location etc. In order to achieve this innovative use of technology and new pedagogical techniques are required. Pedagogical innovations to promote experiential learning, gamification technique, virtual reality and simulators integrated with the real life experience are the need of

[26] http://www2.caict.ac.cn/zscp/qqzkgz/qqzkgz_zdzsq/201705/P020170519521253649145.pdf

the hour to enhance the learning experience of the learners. Universities of the future must encourage change and not resist change.

Due to technological advancement and online platforms new jobs such as crowd-workers have come to the fore which raises many questions that need to be addressed. Crowd-workers are freelancers who offer their skills on the online platform. In the gig economy, the working world has changed for the white-collared workers and crowd-workers are a symbol of such change. The services offered by these crowd-workers range from writing product reviews, helping in testing software, giving legal advice, ghost writings, designing and programming of websites etc. It is cost-efficient to employ the services of crowd-workers in assisting/ rendering legal services. The best example would be American platforms such as Avvo or Legal Zoom on which many American lawyers offer their services. As these are new class of workers various issues come to the fore. Firstly as they are freelancers, whether protection can be extended to them for unfair dismissal or whether they can be given the benefit of continued payment of remuneration during sickness needs to be delved into. Further it is also necessary to check whether the legal rights which extend to workers can be extended to them owing to the fact that they are freelancers. There is also the difficulty with regard to the choice of law that needs to be applied due to internationalisation of online platform on which this crowd workers and click workers offer their services. Further the important question that needs to be addressed is whether we need to apply the law of the country where the order is placed, received or performed? There is a need to determine the legal status of a crowd worker and the minimum levels of remuneration and benefits that need to be applied to them. It is also necessary to delve into the tax regime, social security and welfare rules that need to be applicable to them.

The gap between law and technology is increasing and there is an urge to keep pace with the changing technological landscape. Labour market & relations is one of the most affected areas which need immediate consideration. Law makers need to reconsidered various legislations in the light of the changed paradigm such as the laws relating to intellectual property, information technology, product liability, competition, labour and employment laws. Data protection and privacy issues are also to be addressed.

5. Labour Redundancy and Dismissal: Legal and Ethical Considerations

In a labour abundant country like India the era of artificial intelligence and robotics poses many legal and ethical challenges. When the labour is done by automated machines and robots it is important to align our labour laws to meet the future challenges.

A system of Central and State specific labour laws are followed in

India. The provisions relating to the termination of employment are covered in various enactments like the Industrial Disputes Act, 1947; Model Standing Orders of the Industrial Employment (Standing Orders) Act, 1946 and State-specific statutes applicable to Shops and Commercial Establishments in addition to the employment contract. An employee can be terminated on reasonable grounds of misconduct. However there is no specific definition for the term redundancy. Indian courts have interpreted this term in the context of an employee's role becoming redundant for reasons such as the cessation of a particular type of business and the introduction of new technology. Loss of job on automation, outsourcing, organisational restructuring and other business and trade-related reasons have been held to be valid grounds for termination of employment. Pro-employee approach is usually adopted by the courts while dealing with redundancy and retrenchment of the workforce.

5.1. Concept of 'Retrenchment 'under the Industrial Disputes Act, 1947

Section 2 (oo) of the Industrial Disputes Act, 1947 defines, 'Retrenchment 'as the 'termination by the employer of the service of a workman for any reason whatsoever, otherwise than as punishment inflicted by way of disciplinary action. Retrenchment excludes termination of employment due to:

1. voluntary retirement;
2. retirement on reaching the age of the superannuation; and
3. continued ill health.[27]

The Supreme Court of India has observed that the right of employers to retrench the economic deadweight of surplus labour is inherent in the right of employers to manage their business. However, this is subject to compliance with the conditions of retrenchment prescribed under law.

5.2. Concept of Workmen under the Industrial Disputes Act, 1947

Section 2 (s) of the Industrial Disputes Act, 1947 defines a workman, "as any person (including an apprentice) employed in any industry to do any manual, unskilled, skilled, technical, operational, clerical or supervisory work for hire or reward, whether the terms of employment be express or implied, and for the purposes of any proceeding under this Act in relation to an industrial dispute, includes any person who has been dismissed, discharged or retrenched in connection with, or as a consequence of, that dispute, or whose dismissal, discharge or retrenchment has led to that dispute, but does not include any such person-

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[27] Anand Prakash, *Definition of 'retrenchment' under the Industrial Disputes Act, 1947: recent pronouncements of the supreme court, Journal of the Indian Law Institute,* Vol. 19, No. 1 (January-March 1977), pp. 84-8

(i) Who is subject to the Air Force Act, 1950 (45 of 1950), or the Army Act, 1950 (46 of 1950), or the Navy Act, 1957 (62 of 1957); or

(ii) Who is employed in the police service or as an officer or other employee of a prison; or

(iii) Who is employed mainly in a managerial or administrative capacity; or

(iv) Who, being employed in a supervisory capacity, draws wages exceeding one thousand six hundred rupees per mensem or exercises, either by the nature of the duties attached to the office or by reason of the powers vested in him, functions mainly of a managerial nature.[28]

Persons who are not workmen may however continue to be governed by state specific legislation applicable in the case of shops and commercial establishments and /or the employment contract.

Whether an individual is a workman remains the most litigated employment law aspect in India.

Factories with minimum of 100 workmen are required to get the prior permission of the labour authorities in order to terminate or retrench its workmen. Reasons behind the termination of employees need to be given. The parties should be given an opportunity to be heard. Any retrenchment of a workman without the permission or in contravention of the order refusing permission will be deemed to be illegal and inoperative in law. In case of both factories with less than 100 workmen and commercial establishments the employer has to notify the labour authorities of the employment termination.

In India, if the terms of the collective bargaining agreement or employment contract are more beneficial to the employees than those provided in the law, the terms of the contract prevails.

If there is no alternative agreement between the employer and workman, the employer must follow the last in, first out process at the time of the retrenchment. However this rule is not immutable.

Courts in India have taken the view that an employer has a right to reorganise its business; however, such a right should be exercised in a bonafide manner and not with the ulterior objective of victimising employees.

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[28] https://labour.gov.in/sites/default/files/THEINDUSTRIALDISPUTES_ACT1947_0.pdf

6. Issues on the Technological Front

On the technological front the use of AI has raised many legal and ethical questions. The following are the some of the areas that need to be addressed.

6.1. Electronic Contracts

In an AI ecosystem the following questions come to the fore. The question regarding the nature of AI is unclear. AI has not given personhood and does not qualify as a legal person under the eye of law. This raises the questions of how the relationship between robots driven by AI and employers in manufacturing unit should be structured in the absence of the valid contract. The validity of electronic contracts which can be entered into through electronic means if they satisfy the general conditions of a valid paper contract provided for in the Indian Contract Act, 1872is dealt with under Section 10-A of the IT Act. However, the Indian Contract Act, 1872 provides that a contract can be entered into between "legal persons" who are competent to enter into a contract. With the advent of technology, automation and AI, there is a need to rework existing contractual legal regime in order to accommodate a regulated existence of AI. Contract frameworks also need to establish liability regimes and clarify the validity of smart contracts.

6.2. Liability, Negligence, and Standards of Care Regime

With the changing future the liability regime needs to be reworked in an AI driven ecosystem. There has been a significant debate around whether robots or autonomous systems should be attributed a legal personality and if they qualify as legal persons in order to be held liable in themselves. Further the structure of liability also needs to be determined for instance, whether the liability will change depending on the criticality of the situation. At present in India standards of strict product liability law applies which holds the manufacturer liable if the product is defective. Negligence on the part of an individual will be taken into consideration to determine the liability of an individual. Many legal regimes impose the liability on the manufacturer as AI technology machines or robots cannot be held for damages causes. EU directive holds the manufacturer of the robot liable only in cases where manufacturing defects have led to foreseeable damage. In India, the tort law standard of care requires that there must exist a duty of care towards the injured party, and the breach of such duty must cause a legal damage to her. The law on negligence covers those kinds of harms which are reasonably foreseeable, which poses interesting questions when AI is used. How should liability be determined in a case where both human and machine decision-making is involved which eventually leads to the harm caused? The standard of reasonable foresee ability will need to be examined by the courts to see how they may be applied in cases involving

algorithmic decision making. Globally, the courts have shown reluctance in relying upon the principle of negligence where software products are involved, and prefer to invoke product liability rules.

6.3. Privacy Issues

Privacy concerns over the use of AI across sectors have been raised particularly in light of a lack of comprehensive data protection laws in India. The use and functioning of AI across domains is dependent on the collection of data and analytics to arrive at solutions. This has resulted in the AI technology accessing large sets of data including Personally Identifiable Information (PII). AI systems and technologies now have the ability to track behavioural patterns, individual interests, location and everyday movements of a person. In light of the recognition of privacy as a fundamental right under the Constitution of India in K.S. Puttaswamy v UOI,[29] these concerns become even more prominent and need immediate remedies. The Hon'ble Supreme Court also recognised growing use of emerging technologies and stated that there is an immediate necessity to come up with a data protection framework in light of technological developments.

The rules mandated under Section 43-A of the IT Act create a quasi-data protection framework and make it compulsory for the body corporate to inform the data provider as to the reason for collecting the said data after taking his/her consent for the same. Further, the data provider should be updated with the information such as the recipients of data in future and should be given details regarding data retention. These rules would have clear applicability to AI driven systems collecting and using the PI of consumers and users.

7. Changes in Law School Curriculum

Roscoe Pound the famous jurist has rightly observed that law needs to be stable but not static. Law schools need to gear up to face the challenges posed by automation and use AI. The use of AI has impacted the legal profession and it is one of the most disrupted sectors of the consulting industry today. Legal profession and practice has changed with the rise in Legal Tech, Artificial Intelligence and block chain technology, the sharing economy, and platform companies. It is high time that lawyers start focussing on developing specialized expertise and acquire technical skills in the areas of digital communication, collaboration etc. The profile of legal professionals is changing with the coming in of new roles tech lawyers, legal process managers, legal technicians etc. Many law schools such BCG & Bucerius Law School and the World economic forum have updated their curriculum and are offering courses on legal tech and case management processes.

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[29] Writ Petition (Civil) No. 494/2012

It is important for lawyers to become tech savvy and get acquainted with the new technologies in the field of law which will help them to streamline the firm's processes such as matter management, fees tracking, invoicing etc. Being tech-savvy is helpful for law school students with an interest in non-lawyer roles too. Law librarians, legal head hunters, para-legal, management consultants and law firm administrators also need to be prepared with the skills that the market demands.

8. Forward-Thinking Law Schools and Future Technologies- Some Instances

Many forward looking law schools have already starting working in the direction of upgrading and updating themselves with the future technologies to keep pace with the changing times.

a) Open Innovation Lab - Bucerius law School[30]

One of the most forward thinking law schools in Germany is the Bucerius Law School based in Hamburg. It has opened an Open Innovation Lab; a collaborative platform that includes legal professionals from various sections such the commercial law firms, legal departments, alternative service providers and it studies the latest management and technological legal trends. Further the lab also enables the collection of data and also encourages insights into the future of the legal profession and encourages collaborations between participants for gearing up them to face the future challenges.

b) Law With Out Wall (LWOW)-Miami Law School[31]

Law without Walls (LWOW) is the future of legal education. It is an organization under the umbrella of Miami Law School. It focuses on developing educational projects which will help in preparing students to face the challenges posed by AI and automation. It is a collaborative platform where many international students, mentors, academicians and entrepreneurs work together to develop educational projects that will help law students to be future ready. A collaborative effort is made by a team of law and business school students to use technology to solve legal problems. The focus is on giving students practical projects. Feed forward is a good example of such a project which is performance management software designed to channelize the internal communication of law firms. For example, the failure to receive timely feedback on their work.

c) Legal Research and Development –Michigan State University[32]

In order to find out the lacunae in the legal industry it is important to have a system of legal research and development in place. Another forward

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[30] https://www.bucerius-education.de/home/bucerius-clp/oil/
[31] https://www.law.miami.edu/academics/law-without-walls
[32] https://www.law.msu.edu/lawtech/index.html

thinking law school Michigan State University has set up a Legal Research and Development centre which is dedicated to improve the way legal services are delivered. Students are trained with modern business methods like lean thinking and other areas to shape them for the future. One of the most important work of the centre is to conduct research to improve legal services, engaging with the legal industry, and impart training for the 21st century, T-Shaped lawyers. Innovation and legal technology are an important part of the research and development process of the student centre.

d) Training the next generation of lawyers -Vanderbilt Law School[33]

Nashville-based Vanderbilt Law School has trained lawyers for 140 years. This law schools offers a special law program, called Law and Innovation that equips students with the skills needed in today's changing legal environment. The program's curriculum has four main pillars:

- The Legal Industry
- Legal Technologies
- Legal Innovation and Entrepreneurship
- Access to Legal Services

There are various activities which focus on giving a practical exposure to students and expose them to the practical aspects of law which will have an influence on the way they practice law. Students are required to work on legal innovation research and this is done mainly through legal project management, technology and other legal service delivery methodologies.

e) Science, Technology and Law - Stanford University[34]

One more leap in the right direction is the step taken by Stanford University which offers a course in Science, technology and law focussing on multi-disciplinary approach to law studies.

Thus it is very important that along with imparting traditional legal knowledge, law schools also focus on offering course with multi-disciplinary approach especially technology-oriented programs to study the interface between law and technology. Lack of knowledge on the technological front especially in the legal field has been viewed as an obstacle for legal professionals. All predictions with regard to future of law and legal profession show that technology will be an indispensable part of it. It's time for a change, not only in the legal profession but in educational systems too. Hence, it is high time that we gear up to face the challenges posed by the future technologies.

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[33] https://law.vanderbilt.edu/

[34] https://law.stanford.edu/stanford-program-in-law-science-technology/