NEED FOR LAWS IN INDIA TO REGULATE THE CURIOUS PREMISE OF AUTOMATION/ ALGORITHMIC BIAS IN ALGORITHMIC DECISION-MAKING SYSTEMS - AN ANALYTICAL STUDY WITH REFERENCE TO EU AND US AND INDIA

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Abstract

Artificial Intelligence has percolated in the deepest crevices of our lives. It is ubiquitously used by everyone. The working of artificial intelligence is dependent on algorithms. These algorithms decide on the output of that the system will produce. The data that is fed into the system is one of the most important factors to understand the reason for the outcome that the system produces. There can be certain inherent biases in the input data, that might affect the final outcome. Algorithmic data and bias are problem that we need to tackle, this bias is called automation bias, which needs to be mitigated or otherwise it can lead to plethora of problems. In United States of America and European Union, there has been some legislative effort to tackle this problem namely The Algorithmic Accountability Act 2019 and the proposed The Artificial Intelligence Act, EU which deals with private accountability of the companies in case of indiscretion exhibited by the algorithmic decisional systems. In India, data protection is the realm of fundamental rights and protected under the Right to privacy, however the automation/algorithmic bias has further repercussions which has been discussed at length in this article. The article has its premise mainly on three aspects 1) The idea of bias that exists in the algorithms 2) the comparison of the existing legislation to tackle bias and the effectiveness 3) the need for a legislation like the two nations to tackle automation bias**,** considering that India is a huge market with an enormous potential for data manipulation. The scholar understands that each country needs a unique feature in the legislation according to the diversity and the representative capacities.

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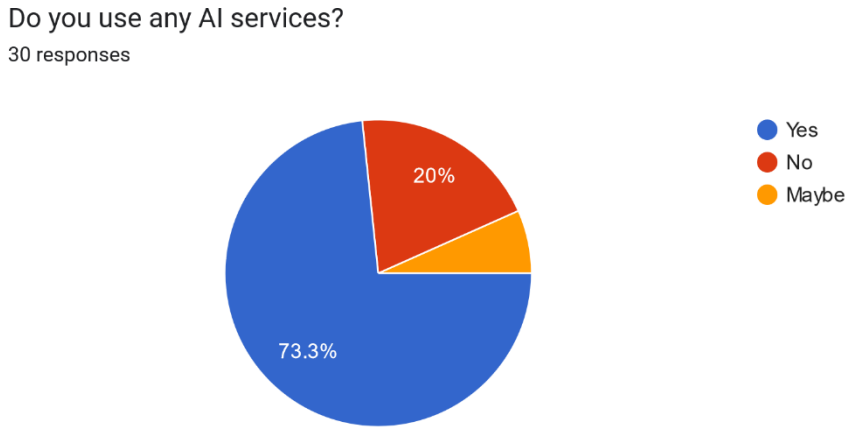
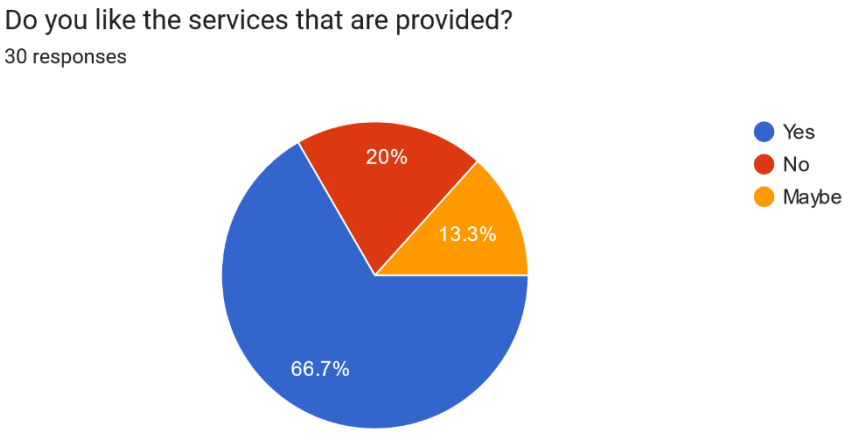
1. Introduction

Our lives have changed significantly as a result of the internet. Algorithms and artificial intelligence (hereafter AI) have played a significant role in this change. Machine learning has curved up new avenues in our daily lives. These components of life were first centered on the idea that the task would be carried out by a natural person with specialized knowledge and abilities however, artificial intelligence (AI) and machine learning have replaced this idea, and today even seemingly insignificant areas of our lives like driving automobiles, writing newspaper articles, choosing the company we keep, and even making judgments are being managed by the AI. Here the question therefore arises is that how safe are we, when we use artificial intelligence. It has been seen that in many cases artificial intelligence suffers from the same bias that we humans have. The reason for that might be, because of the input data that is supplied by the human agency. In this case it is important to understand the concept of bias and how it can affect our lives in future. AI poses a greater threat to human rights than any other kind of technology, if not the greatest. Artificial intelligence use has risen quickly and significantly over the last several years, raising awareness of the threat that AI poses to human rights. In order to understand the issue further about the complex nature of algorithmic decision-making systems automation bias and the legal complexities let us first understand the meaning and notion of artificial intelligence. AI used for spying in an unregulated manner will significantly affect a person's liberty and ultimately promote self-censorship. Aside from running our social media world, legislators and politicians are increasingly relying on algorithms and AI to make good judgments. According to some research, using AI to make decisions about policies might lessen the impact of arbitrary and subjective biases, but it can also make AI "the principal decision-makers in public policy." Since this has influenced its application in the contemporary social, economic, and political environment. The scholar had conducted a survey to understand the level of awareness among consumers / persons about the concept of AI and Bias. The survey was based on the following parameters.

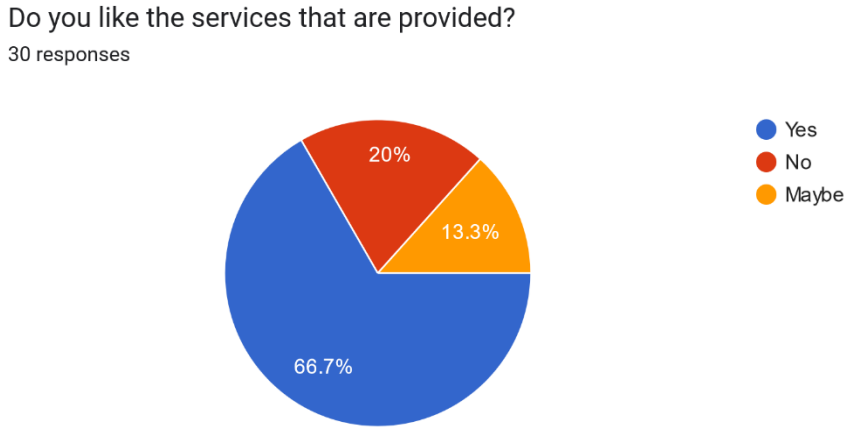
The age group was from 20-75, the following question and their responses were seen in the survey. Between the ages of 20-75 (this was inclusive of both male and female)73.3% said that they use AI based services, that included Home Assistants and Shopping Assistants) 20% of the users said that they do not include any use of AI services. 6.3% said that they are not aware whether they use any AI based services.



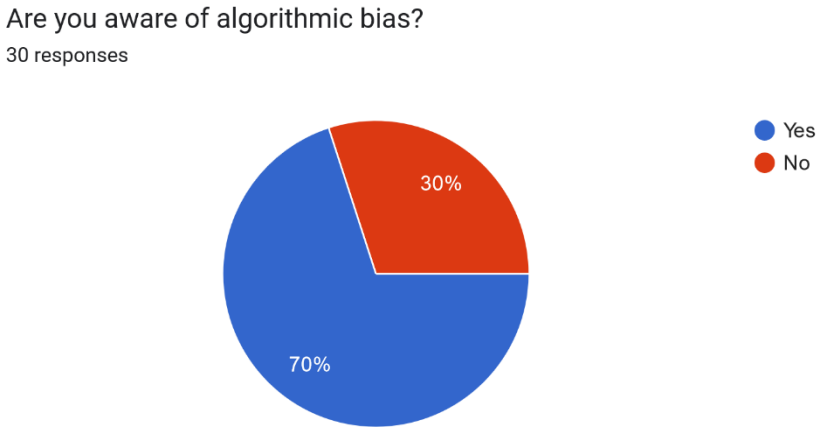
The second parameter was whether they liked AI based services. To which the response was 66.7% of the persons responded that yes, they like the services 20% said no and 13.3 % said may be.



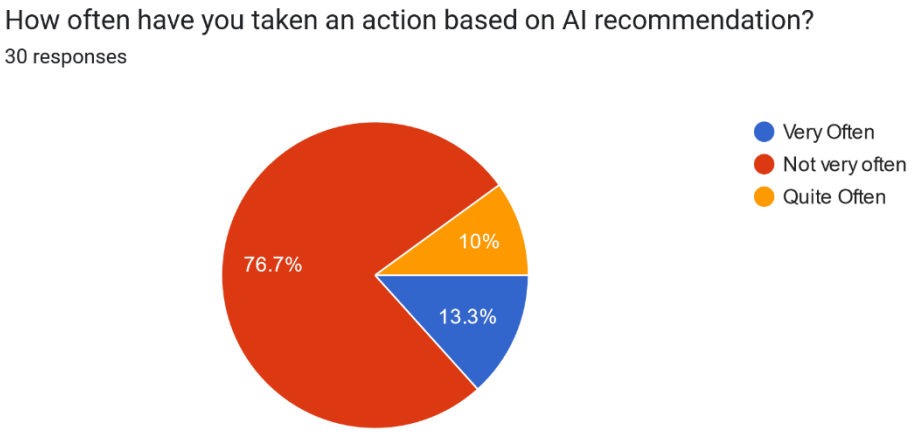
The third question was whether the persons felt that they were forced to take up services (extra)on the recommendation of AI, to which 43.3 % said No, 33.3%may be and 20% said yes.



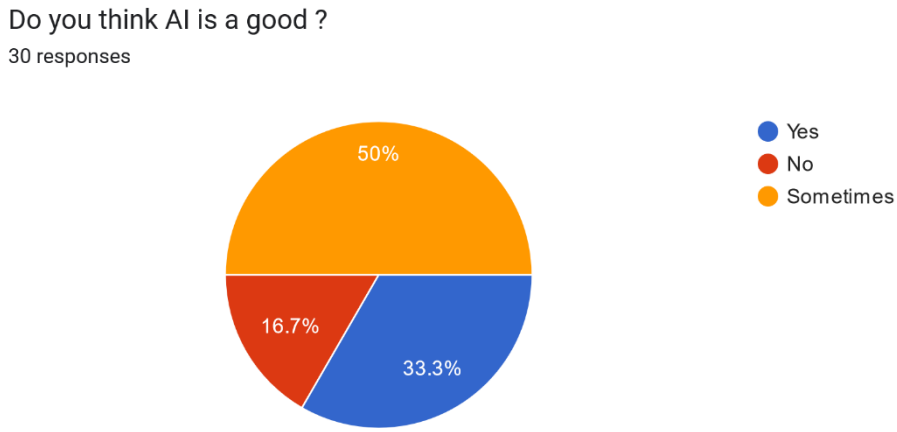
The next question was whether they are aware of algorithmic bias, to which the response was 70 % said yes and 30 % said No.



The next question was on the frequency of whether the person has taken any action based on AI recommendation, the answer to that was 76.7 % said 'not very often' 13.3% said 'very often and 10% said 'quite often'.



The last question was whether users thought if AI is good to that 50 % said Sometimes, 33.3 % said Yes and 16.7% said No.



So based on the survey, the following conclusions can be drawn, most of the users in India especially the ones who are working/retired professionals in the age group of 20-75 use AI services and also are aware of the bias that the system has, they do consider that AI is good but only sometimes. The users were also asked to put in their remarks for the same, to which some said that AI is important to be controlled. In order to further understand this, we need to understand the nuances that are involved in the concept of automation bias. However, for that we need to understand the different aspects involved in this process.

2. Research Methodology

The research methodology adopted by the scholar is doctrinal and survey method. The Scholar has conducted a survey to understand the whether bias is understood by the consumers. This methodology involved gathering responses from varied age groups over a questionnaire.

Analysis and Discussion

I. Definition of Artificial Intelligence

Let us first start with the definition, there is no accepted definition of artificial intelligence that is applicable universally. It has been defined in a variety of ways, such as "the automation of activities that we associate with human thinking, activities such as decision-making,

problem-solving, and learning"; "the art of creating machines that perform functions that require intelligence when performed by people"; "the study of the computations that make it possible to perceive, reason, and act"; and "the branch of computer science that is concerned with the automation of intelligent activities." Thomas H. Cormen defines it as "any well-defined computational procedure that takes some value, or set of values, as input and produces some value, or set of values, as output"

Artificial intelligence was developed with the intention of creating "strong AI," or machines with intelligence on par with that of a human. This expression was first introduced in 1980 by American philosopher John Searle; it is now widely used in the AI field. Due to the tremendous challenges involved, the ambition to develop strong AI later decreased, and researchers instead switched to developing AI that is focused on a specific job. Examples of this kind of artificial intelligence include Google Translate, Amazon's virtual assistant Alexa, and IBM's Deep Blue, which beat the global chess champion. These computer programmes are only able to react to inquiries that are pertinent to the goals for which they were created, hence they are unable to provide information in response to general enquiries. In contrast to this concept, the term "Artificial General Intellect" (AGI) emerged, which is occasionally used interchangeably with the phrase "strong AI" to refer to systems that exhibit all-around intelligence comparable to that of humans. They are both used to describe systems that exhibit all-around intelligence comparable to that of humans.

II. Strong AI, AGI and ANI

Strong AI, or AGI, is still in its infancy. The discussion therefore will concentrate on the different types of narrow AI or Artificial Narrow Intelligence which can either be traditional computer methods based on rules or logic, or more modern ones that have been quite well trained by data analytics to recognize patterns automatically and use them to make judgments and predictions. Such learning is referred to as "machine learning," while a further stage is referred to as "deep learning." Deep learning uses numerous layers of processors that resemble the biological human brain to provide insights about the links and patterns in a collection of data. Recent developments in image identification, computer vision, and natural language processing are mostly due to the two technologies mentioned.

Artificial intelligence (AI), which includes everything from face recognition software to autonomous vehicles, search engines, translation apps, and software that forecasts stock market price movements, is changing our reality and the way societies and their institutions are maintained, organized, and governed. In order to analyse and respond to data that is generated, created, and stored electronically, AI outperforms traditional technologies. Despite the fact that AI clearly offers enormous advantages for humans in the form of more accurate diagnostic tools, better ways to combat crime, and the ability to prevent terrorism, critics nevertheless draw attention to the risks that might come along with this technological breakthrough. The 2015 Open Letter on AI, which was signed by eminent scientists and corporations, ignited a contentious debate on how to regulate AI and how to avoid potential issues brought on by the incorrect management of this technology.

In this regard, Stephen Hawking described artificial intelligence (AI) as the worst development in human history and warned that it may even be the end of mankind. Similar to those in Orwell's Nineteen Eighty-Four or Huxley's Brave New World, certain predictions regarding the technology that would enable AI are foreboding. Given the uncertainty associated with this degree of technological development, there has to be much discussion over the guiding principles for future AI research as well as its ethics and governance. New worries about the development of a global ethical and legal framework are also raised by these discussions.

II. The Conundrum of Algorithmic Bias

The idea of Bias is at the core of the argument in this discourse. This paper raises the question as to how bias can percolate in our everyday

life. A definition of an algorithm is a predetermined arrangement of computer operations that were required for a computing system to complete a job or solve a problem. It is to be mentioned that it was only because to the groundbreaking work of Marvin Minsky and John McCarthy that many parts of algorithms, including enabling computer systems and causing them to act in ways that would be termed intelligent comparable to a human, were able to be developed. The invention of learning algorithms that taught computing systems to construct usable internal representations of the world was made possible by the evolutionary work of such respected computer scientists and AI researchers. This made it possible for the systems' behavior, which was dependent on their performance measurements, to be updated and data entry to be streamlined and enhanced in their output. The main objective has always been to develop AI behavior to a point where it is on par with human intellect. Although the research has advanced considerably, the vulnerability linked to learning algorithms has not been resolved and many say that these algorithms are weak to the most fundamental aspect of their incoming data. The origin of the flaws in the datasets can be labelled as unrepresentative data, where the sources from which the data is collected is untrustworthy and hence the outcome is biased, or representative data where the data source might be authentic but the outcome can still be biased, as in the case of Amazon's hiring software which will be discussed later in the paper.

Here are some of the examples of bias that exist in AI- Big Data.

III. Different types of bias in AI

1.*Labelling bias*: These datasets were manually created by a research team tasked with creating an AI behavioral model. Such datasets provide a few people a great deal of unchecked authority to decide whether a certain subset of a category is harmful or not. This can include a person's own definition of "hate speech" or racial remarks, for instance. These training sets need a lot of various types of inputs, which makes them resource-intensive.

2. *Bias in sampling of Datasets*: Biases may appear when a machine learning system is trained on a small number of constrained inputs. For instance, if a dataset used to train an algorithm included a dataset with an over-representation of female teachers, the algorithm would only be correct for the over-represented population and would be inaccurate for the opposite group, such as male instructors.

In the discipline of AI known as computer visioning, algorithms are trained to comprehend the information of digital pictures. It reads traffic signs, controls driverless cars, and detects faces. Numerous biases in automation technologies have been identified and studied. Among these, latent machine learning is the most well-known and prevalent. Latent machine learning bias is created when an algorithm mistakenly links certain ideas and concepts to certain conceptions or prejudices

III a) AI bias in Medicine

In medicine however, there is often a bias in the data used to train computer vision algorithms. MIT showed that while comparing three main face-recognition technologies, the computers misclassified more than one-third of dark-skinned women but fewer than 1% of light-skinned males. An AI model to recognize melanomas based on clinical photos was developed in 2016.The programme recognized 95% of melanomas and 82.5% of moles, although as science journalist Stephanie Dutchen points out, more than 95% of the photos used in training were white-skinned. They trained the algorithm using more than 100,000 photographs of skin lesions labelled "malignant" or "benign." So here both false positives and false negatives have serious consequences: either patient malignancies are ignored, or clinicians and patients start to doubt a device that may save their lives.

The accuracy of these algorithms in diagnosing illnesses including PTSD, dementia, and heart disease is being tested by researchers. Voice analysis is only as good as its training data, much as computer visioning. Considering Winterlight Labs, a Toronto-based business that created a cognitive exam based on speech to identify Alzheimer's disease.

According to Quartz, the business discovered that, based on its training data, their system was only reliable for English speakers who spoke a certain Canadian dialect in 2016, after publishing their findings in the Journal of Alzheimer's Disease. A tic, pause, or grammatical error may be misconstrued for a disease condition by people who were assessed by the model but were not native speakers. The medical profession has a wide range of duties to attend to. Create datasets that are representative of the patient population first; this is crucial in light of the many ways that illnesses appear depending on ethnicity, culture, and society. When using medical AI, it's crucial to take the patient's context into account. Additionally, performance should take into account the user's native language and technological comfort levels.

III b. AI Bias in Free Speech

In actuality, the EU Parliament's study on the ethics of artificial intelligence, acknowledges explicitly that AI will have a significant negative impact on free speech and communication The greatest illustration of this is the AI chatbot Tay, who began sending insulting and harmful tweets after ingesting malicious user data. Therefore, the fundamental problem still exists, namely that eliminating automation bias is a difficult process that requires human assistance. Since the phrase "Artificial Intelligence" was first coined, the whole field of technology has had several ups and downs. The capabilities of AI in general and machine learning in particular have been growing as a result of several research developments and applications that are now readily accessible. Each year, the capability of computer systems has increased as its manufacturing costs are falling, its value has been rising. As a result, AI has developed further and had a significant influence on a variety of industries. Online content moderation is one such industry. Here, artificial intelligence is used to weed out hazardous information and create safe and secure social interactions. The amount and range of online information have both dramatically risen, and access to the internet has become universal. AI-driven monitoring has a chilling impact on freedom by obfuscating the boundaries between the private and public spheres, leading many people to self-censor because they are unclear of the status and impact of their speech. Emotional quotient analysis technologies are being used more often to determine the online speech's tone and tenor and are frequently programmed to automatically remove content.

The majority of governments are unable to set up a "timely and effective" framework to guard against the potential dangers to human rights offered by AI because of the complexity and quickening pace of technical development. On the other side, some of them include worries about employment rights being at risk and concerns about discrimination brought on by machine learning algorithms used for targeted recruitment and advertising. Instead, then concentrating on the broad responsibility of enterprises for their impact on human rights, the bulk of these articles either advocate ethics and the social advantages of AI in general or just address particular human rights problems. As previously mentioned, the Indian Government has shown interest in using AI to perform emotive analysis, spot news that is fake, and improve India's reputation on social media platforms and even email.

III c). AI Bias and social media / business organizations

The algorithms used by today's AI systems are trained using large data, social media data, and customized data, allowing businesses to operate with automatic results. Social media and general internet platforms (such as Facebook, Google, and Twitter), e-commerce firms (such as Amazon and Zalando), and industrial AI/automation companies are the three main categories of commercial organizations that use AI (e.g. SAP, Bosch and Siemens). Due of Germany's emphasis on industrial AI, large corporations would control the platforms and market their AI services and products to other businesses (e.g. BMW and Volkswagen). These artificial intelligence platforms collect data to train their algorithms in order to increase productivity and efficiency for the benefit of customers. In this case it will be interesting to understand the case of the hiring software used by Amazon. The company had been developing it since 2014 however the decisions that the

software made was not gender neutral. The reason being that the majority of the software market was dominated by male persons, therefore the outcome was biased towards male employees rather than female employees. Amazon finally had to scrap the use of this software as it was blatantly biased.

The use of AI for voice has advanced significantly, with speech recognition and natural language processing (NLP) algorithms analyzing spoken words and other linguistic components. An example of bias in natural language processing is male and female pronouns are interchangeable in Hungarian, for instance. Users of Reddit revealed in March 2021 that Google attempts to decide the topic of Hungarian translations on its own, enforcing gender stereotypes while also strengthening them (Reddit 2021). It turns out that the sentences' topics were chosen based on the verbs, in accordance with harmful stereotypes about gender. She "cleans," "raises a child," or "cooks." He "is a professor," "makes money," or "is a politician."

Large social media sites may utilize this profiling, although not always for moral reasons. According to a ProPublica investigation, Facebook uses this kind of profiling to let marketers exclude people based on their race. Due to this, some material was blocked from multiethnic groups, and their data was used without their knowledge or permission. Since the previous ten years, users' worries regarding their data have multiplied. As repurposed data, which may be used for a variety of reasons, is processed and collected about people, how to govern its distribution, and profile derivations are all key concerns. For instance, a system to sell books may be created using the data of book purchasers. Depending on their selections, adverts are returned to them. This data is difficult to trace and are often converted into anonymized data by deleting the subject's name and other common identifiers.

III d). The Curious Case of Algorithmic Complacency

Organizations and Businesses have both created a variety of AI-related voluntary rules and principles. The majority of these articles don't emphasize the larger responsibility of businesses for their influence on human rights; instead, they either focus only on specific human rights issues or advocate ethics and the social advantages of AI in general. All the parties involved have been concerned about the ongoing automation of these different industries. Numerous studies from various disciplines have attempted to investigate and analyze the causes of automation bias. It has been discovered that the main cause of the problem is an excessive reliance on artificial intelligence (AI) and the results it produces, which ultimately replaces the curious spirit of an individual to seek the truth. This is called algorithmic appreciation which in my opinion is also algorithmic complacency. This complacency can steer people or corporations to make decisions which are unreasonable and arbitrary even if not prima facie.

It may be claimed that an algorithmic bias/ appreciation has a limited influence when it affects more commercial recreational datasets, such as when a political compass wrongly predicts a person's political leaning or when voice commands fail to locate an item, however, when prejudice is present during the making of the algorithm itself it sees its reflection on digital platforms, this consequently raises several questions about the effect and limitation of the usage of artificial intelligence in our daily lives. Many do not perceive the threat of algorithmic complacency as grave, however later in the paper when we discuss the need for meaningful human control of human oversight, it would be clear that it indeed can cause biases which had not been anticipated before.

In order to sum up the various facets of algorithmic bias here are some points which entail the major problems of data bias:

- *False positives and false negatives:* When using automated techniques for content moderation, there is a chance that some results will be incorrect. Former refers to situations when something is mistakenly flagged as alert. The former indicates that the technology fails to filter problematic information, while the latter fails equally in

this regard. This may have a significant problem in diagnosing the real condition.

- Potential discrimination and bias in algorithms: Unsupervised machine learning find datasets without human assistance, which may lead to subpar performance based on prior biased training datasets. This unsupervised learning has the potential to suppress communities or fail to address unpleasant information relating to them, which might damage the groups with insufficient representation and result in problems prejudice and discrimination.
- *Limited regulation*: Human supervision is required for AI to operate. The automated tools might serve as an expedient means of content censorship. However, without traditional human control, these technologies may infringe the users' digital rights, raising the issue of the legal process. Training datasets are where algorithmic bias originates, and it can be roughly divided into two categories.

V Existing Legal Paradigm for AI and bias:

There has not been much stress on the idea of regulation of AI as far as bias is concerned. The EU law on General Data Protection Regulation has given certain rights to the Data Subjects, here the rights of the data subjects are protected from Article 12 to 23. It is noteworthy that here Article 22 is of the major concern which talks about automated individual decision-making including profiling. Here the process has to be automated from start to finish, otherwise the GDPR rules will not be applicable. In many cases therefore implicitly it is seen the need for human oversight. In many cases. Governance techniques like a human-in-the-loop (HITL), human-on-the-loop (HOTL), or human-in-command (HIC) approach may be used to accomplish oversight. HITL refers to the potential for human involvement in each cycle of the system's decision-making, which is often neither feasible nor desired. The term "human intervention during the system design cycle and monitoring of the system's operation" (HOTL) refers to this capacity. HIC is the capacity to monitor an AI system's entire operation, including its larger economic, sociological, legal, and ethical implications, as well as the competence to choose when and how to employ the system in any given circumstance. Here it is important to point out that many times the outcome generated by algorithms would be considered sacrosanct, so the involvement of human may or may not affect the decision. So here we can clearly see that the rules are not capable of defending the rights of the persons in case of automated bias. The use of human agency negates the applicability of the Regulation in place. The European Commission's proposed Artificial Intelligence Act (EU AIA) is the most significant illustration of that pattern (2021). It must be mentioned in brief that Articles 10, 12 and 13 cumulatively suggests a better framework for bias regulation, however the lack of clarity in the definition of quality of data, data collection and effective oversight (human based) guidelines again put to question as to how to determine whether bias would be an inherent feature in the data samples.

The Algorithmic Accountability Act of 2022 suggests that organizations using these systems adopt a number of practical measures to recognize and reduce the social, ethical, and legal dangers. The Act is the most recent achievement in a global tendency to supplement or replace self-regulation in this area with law. It seeks to control Algorithmic Decisional systems across sectors. It is majorly stressed on the fact that the companies are required to do an impact assessment of the programs that they are using to avoid any ethical concerns. Impact evaluations do, however, have limits, just like all other governance instruments. They could, for instance, fail to recognize and address particular problems or reduce ethics to a mere exercise. The Act however talks about “large companies” which are under the jurisdiction of the Federal Trade Corporation. This again increases the doubt that the ADS systems used by other companies will remain outside the purview of this Act. Sect. 4.4 in the US AAA, covered entities are required to “perform ongoing evaluation of any differential performance associated with data subjects’ race, color, sex, gender, age, disability, religion, family-, socioeconomic-, or veteran status… for which the covered entity has information” now here again the standard of performance has not been given. This may lead to companies

coming with different solutions of performance.

The three legislations that have been mentioned here do provide some comfort as far as bias is concerned as some action is taken in that regard. In contrast to that there has not been much awareness about this in India, even though there is great push towards digital governance, however there has not been any significant steps towards ADS regulation in India. It is to be noted that the Data Protection and security a bill has been tabled , however the bill does not address the aspect of algorithmic bias. Data security has been a slippery slope and has been somewhat connected to the right to privacy that is implicitly protected by several clauses in the constitutions of India. Despite the rising acceptance of the notion that AI is a transformational technology that might advance societal good, this basic right is affected. Any kind of bias in the data might have a negative impact on the results that such AI produces since it depends on the data to construct behavioral models and enhance its performance. India is a varied and growing nation that has particular difficulties in terms of gathering training data, which eventually leads to algorithmic biases. In India, systematic data gathering is often difficult, and there is little access to accurate and trustworthy data. For data exchange, the Indian government has established an Open Data Platform; nonetheless the problem of data parity has not changed much, and its limited success has not improved. Inequitable access to marginalized and disadvantaged populations, from whom it is difficult to collect and verify reliable data, exacerbates the issue. Due to the frequency of these biases, it is not possible that the training datasets created in India to assist methods prejudices. Therefore, using these datasets as input while developing automated censorship techniques will unintentionally produce automatic bias. The major problem of algorithmic decision making is that there is cost of fairness that we have to pay for it. On the other hand, a draught of the Personal Data Protection Bill, 2018 has recently been made public by a committee that the Union government created to study and suggest countrywide data protection standards. (Hereinafter referred to as the "Srikrishna Committee," this committee is led by Justice B. N. Srikrishna, a former Supreme Court of India justice.) This proposed legislation includes several constructive measures for data protection. For instance, it mandates compliance with the concepts of purpose restriction, collection limitation, and data breach reporting on the part of data fiduciaries, which is a term used to refer to any legal organizations that handle data, including people, governments, and businesses.

The Indian Supreme Court ruled in Puttaswamy v. Union of India, it was unambiguously determined that privacy is a component of a basic right. The court also ruled that it should include informational privacy. This emphasizes the importance of protecting people' personal information privacy and the potential for abuse. Profiling, which involves gathering information about a person's personal characteristics for an automated system to utilize, is a crucial facet of informational privacy tool that enable AI to draw conclusions from such data. This data that is used for profiling can be misused as well. This can generate bias in results of data sets and data sharing. It is also a well known fact that in India data collection tools are also insufficient so it is quite possible that there could be further repercussions in data that is analyzed and generated.

3. Conclusion

Data is the new Oil- it can be manipulated in various ways. It is important to understand that the laws in place may give some protection to collection and use of data, however the data that is collected and analyzed by the AI may be biased to say the least. It has been seen that it is important to come up with a proper framework to decide on the standards for data collection and profiling. However it is submitted that the efforts of both EU and USA has been on the right track that is recognizing the gravitas that bias in algorithms can have. The idea of fairness is subjective but some standard guidelines can be useful in this regard.

Comparing the situation in both the countries it can be said that India is a huge market for the digital economy it is high time that there should be more awareness regarding it. It is also important that policy makers realize the importance of this and frame appropriate rules to regulate Algorithmic decision making. There is an urgent need to come up with laws for tackling of bias, as explained that in India there is always a risk of representative bias as there is lack of sophisticated data collection tools, this can enhance the quantum of bias in the algorithms. The scholar suggests that the government should frame guidelines for commercial entities to draft a Data Impact Assessment Model, to help analyse and mitigate bias at all levels as this could have serious repercussions otherwise in a country so data rich as India.

4. Reference

1. A. Michael Froomkinn, Big Data: Destroyer of Informed Consent, 21 YALE J. L. & TECH. 27, 32-33 (2019)
2. Barocas, S., Bradley, E., Honavar V., & Provost F., 2017. Big Data, Data Science, and Civil Rights. „Computers and Society"
3. Introduction to Algorithms,https://www.studocu.com/row/document/brac-university/algorithm/introduction-to-algorithms-by-thomas-h-cormen-charles-e-leiserson-ronald-l-rivest-clifford-stein-z-lib/22543486, last accessed on 22/05/2023 by Thomas H.Cormen,Charles E. Lieserson, Ronald L. Rivest, Clifford Stein.
4. Cormen, T.H. (Ed.), 2009. Introduction to algorithms, 3rd ed. ed. MIT Press, Cambridge, Mass
5. Example of computer vision discrimination was in 2015 when Google Photo labeled a photo of a black software developer, Jacky Alciné, with his black friend as "gorillas" (Wall Street Journal 2015). The situation happened moments after launching the Google Photos app, which was supposed to allow categorizing and labeling photos using machine learning. Google was "appalled and genuinely sorry that this happened" and said it would make every effort to fix the problem (BBC 2015). The first step in this direction was to disable the ability to categorize images by the keyword "gorilla," "monkey," etc. to prevent deepening inequality. However, it turns out that Google5 has left solving the problem at this stage (WIRED 2018).
6. Research priorities for robust and beneficial artificial intelligence, Future of Life Institute. 23 January 2015, last accessed on 24 April 2015.
7. Harris, A.P., Sen, M., 2019. Bias and Judging. Annu. Rev. Polit. Sci. 22, 241–259.
8. In 2021, Facebook AI put a "primates" label on video of black men (The New York Times 2021)
9. Doa Abu-Elyouunes, Contextual Fairness: A Legal and Policy Analysis of Algorithmic Fairness, 2020 J. L. TECH. POL'Y 1, 6 (2020) see also Anya E.R. Prince & Daniel Schwarcz, Proxy Discrimination in the Age of Artificial Intelligence and Big Data, 105 IOWA L. REV. 1257, 1260 (2020). For more examples of algorithmic discrimination and its mitigation see: Nicol Turner Lee, Detecting racial bias in algorithms and machine learning. „Journal of Information, Communication and Ethics in Society" Vol. 16 No. 3, 2018, pp. 252-260.
10. Robert H. Sloan & Richard Warner, Beyond Bias: Artificial Intelligence and Social Justice, 24 VA. J. L. TECH. 1, 13-14 (2020)
11. Celi, L.A., Cellini, J., Charpignon, M.L., Dee, E.C., Dernoncourt, F., Eber, R., Mitchell, W.G., Moukheiber, L., Schirmer, J., Situ, J. and Paguio, J., 2022. Sources of bias in artificial intelligence that perpetuate healthcare disparities—A global review. PLOS Digital Health, 1(3), p.e0000022.
12. Peter K. Yu, The Algorithmic Divide and Equality in the Age of Artificial Intelligence, 72 FLA. L. REV. 331, 334 (2020)
13. Nelson, G.S., 2019. Bias in artificial intelligence. North Carolina medical journal, 80(4), pp.220-222.
14. DeCamp, M. and Lindvall, C., 2020. Latent bias and the implementation of artificial intelligence in medicine. Journal of the

American Medical Informatics Association, 27(12), pp.2020-2023.
15. Mauriice E. Stuicke & Ariel Ezrachi, How Digital Assistants Can Harm Our Autonomy, Privacy, and Democracy, 32 BERKELEY TECH. L.J. 1239, 1270-71 (2017)
16. Dias Oliva, T., 2020. Content moderation technologies: Applying human rights standards to protect freedom of expression. Human Rights Law Review, 20(4), pp.607-640. See also Shimo, S., 2020, November. Risks of Bias in AI-Based Emotional Analysis Technology from Diversity Perspectives. In 2020 IEEE International Symposium on Technology and Society (ISTAS) (pp. 66-68). IEEE
17. MIREILLE HILDEBRANDT, SMART TECHNOLOGIES AND THE END(S) OF LAW: NOVEL ENTANGLEMENTS OF LAW AND TECHNOLOGY 183-84 (2015)
18. Hungarian has no gendered pronouns, so Google Translate makes some assumptions, 2021. https://www.reddit.com/r/europe/comments/m9uphb/hungarian_has_no_gendered_pro nouns_so_google/ (accessed 11.30.21)
19. Facebook has a broader algorithmic discrimination history. For example, excluding racial/ethnic groups as recipients of particular Facebook ads can be mentioned (Angwin et al., 2017). In 2016 ProPublica revealed that Facebook advertisers could choose to target housing ads to whites only (Angwin et al., 2016).See also EUR-Lex - 32016R0679 - EN - EUR-Lex https://eur-lex.europa.eu/eli/reg/2016/679/oj (accessed 12.1.21).
20. Turner Lee, N. (2018), "Detecting racial bias in algorithms and machine learning, Journal of Information, Communication and Ethics in Society, Vol. 16 No. 3, pp. 252-260. https://doi.org/10.1108/JICES-06-2018-0056
21. Pałka, P., 2019. Data Management Law for the 2020s: The Lost Origins and the New Needs (SSRN Scholarly Paper No. ID 3435608). Social Science Research Network, Rochester, NY
22. Kordzadeh, N. and Ghasemaghaei, M., 2022. Algorithmic bias: review, synthesis, and future research directions. European Journal of Information Systems, 31(3), pp.388-409.
23. Castets-Renard, C., 2019. Accountability of algorithms in the GDPR and beyond: A European legal framework on automated decision-making. Fordham Intell. Prop. Media & Ent. LJ, 30, p.91.
24. Brkan, M., 2019. Do algorithms rule the world? Algorithmic decision-making and data protection in the framework of the GDPR and beyond. International journal of law and information technology, 27(2), pp.91-121.
25. Sandra Mayson goes a step further and describes this situation as bias in, bias out, which directly corresponds to the problem of biased algorithms (Mayson 2019 (8): 2224)
26. Perri Keller, Participatory Accountability at the Dawn of Artificial Intelligence 16 (King's Coll. London Dickson Poon Sch. of Law Legal Studies Research Paper No. 2019-31)
27. Section 17 of the PDP Bill, which is currently being debated and has not yet been enacted into Indian law, proposes that data fiduciaries have the power to handle personal data. Personal information for an appropriate cause and one in which they have an interest. The ability of the Data Protection Authority (DPA) under section 17 sub- clause 3 to permit waiver of a notification that entitled the user to know about the purpose for which his personal data is being processed is another, and maybe the most contentious, component of this law.
28. ((2017) 10 SCC 1)