ETHICS OF AI AND BIG DATA, ETHICAL RESEARCH PRACTICES

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Abstract :

Big data, as the name suggests, refers to bulk or huge data. It is not manageable to handle for operations; to function, tools are necessary. Data is redundant due to advances in information communication and technology. The data is bulky and needs to be strategically arranged, operated and analysed properly, so it needs some kinds of tools which are quite helpful to getting better results and for efficient working. The data is growing hugely in this era, but it is not manageable to work with; privacy matters, copyright infringement, and it needs to be arranged in a structured way. For careful handling, there are some ethical ways, so there are some parameters to use the data to get results accurately. In every Discipline of Knowledge, for research ethics are necessary.

Use of Artificial Intelligence in every field is quite common. Research is necessary in every field, and the use of AI is inevitable. While doing research, transparency, correctness, benefits of research and consent of participants are important. This paper studies why big data is essential with careful handling and the necessity of standards and ethics, are set to perform research and research publications.

Keywords : Research, Big Data, Artificial Intelligence, Ethics, Research Publication.

Introduction :

Big Data is huge data, large and complex in nature. It needs special tools to store, process and find relevance. Big data works after collecting the data from websites and through various sources. After storing it is operated by using Oracle platforms, Hadoop or Cloud Storage.

According to Dijicks, “The four characteristics defining big data are Volume, Velocity, Variety and Value.”

What is Big Data? As per geeksandgoks.org, it refers to large and bulky data that is handled with tools. In the Information Communication Technology era, due to the availability of digital platforms, online services and a variety of devices, data is generated abundantly, so it is necessary to operate it with some advanced tools and utilise, store the data.

It is the term for massive, complex datasets that standard computer tools cannot store or process easily. It is connected with the five V's.

1. Volume : The bulky data generated easily, which is generated from phones, web clicks and machines. Example: Facebook gets 500+ million posts.
2. Velocity : It handles data in less time and functions rapidly/quickly. Example: Weather sensors updating every second.
3. Variety : Works on Images, social media, numbers. Example: Different types of Survey forms.
4. Veracity : Accurate raw data. Concerns clarity. Example: Some data is wrong, so need to be cleaned.
5. Value : Relates to societal benefit. Example: Useful insights, after analysing, take decisions such as which district has low open access knowledge delivery system awareness.

Ethical research practices require informed consent, scientific validity, fair participant selection, confidentiality, independent review, and honest reporting, ensuring dignity and integrity throughout the research process.

Ethics are taken into consideration while conducting research, collecting and handling the data, interacting with participants, and sharing results. It is the standards which shows how you can do your research. It ensures research is conducted with clear standards and results. It protects participants, their rights and privacy.

Objectives :

1. To study big data and data analytics.
2. To know the benefits of research publications with the help of Artificial Intelligence.
3. To know the ethical values while conducting research.

Need of the topic :

Artificial Intelligence has entered every field. It helps to give personal assistance to persons for their research activity. This study mentions the necessity of Artificial Intelligence with ethical values. It is proven that social media and AI provide fake information, showing false data and various links with wrong statistics. So, to ensure clear and visible data, accurate data interpretation and unbiased results some standards are to be taken to use. These standards guide researchers to study on the right path and make correct decisions. It's necessary to study faculty-wise ethics and issues.

Benefits of Big Data :

It is necessary to make decisions correctly and avoid wasting time, energy, money and human resources by identifying patterns and current trends. Big data predicts customer behaviour based on personal user experiences. It is used to find loopholes and improve activity. It helps identify business opportunities. It finds threats and detects fraudulent activities.

Examples of Big Data :

1. Tracking Consumer Behaviour and shopping habits to deliver personalised retail product recommendations tailored to individual customers.
2. Monitoring patterns and analysing them against historical customer activity to detect fraud in real time.
3. Using image data from cameras and sensors as well as GPS data to detect potholes and improve road maintenance in cities.

Literature Review :

The following literature review will help clarify why Ethical values are necessary in handling big data and research.

1. Vuyani Langa & Sanjay Balkaran (2025). The authors discussed the ethical challenges of re-incarceration in the Artificial Intelligence era. The core ethical concerns include participants' biases and erosion of informed consent. Algorithmic bias & cultural insensitivity.

The author studied the Uni. of Zurich, which deployed AI bots on Reddit without participants' consent. (2) Face recognition technology with a higher error rate for women & darker skinned person. There are some ethical challenges- data privacy; it dilates moral & legal responsibility. It is surveyed that there is a gap between ethical awareness & Practice due to our own supportive institutions.

Artificial intelligence is a helpful tool that reduces our energy & time in knowledge production. It performs rapid operations to collect information. It manages & handles bulky data findings. Complex analysis and shows real-time findings. So, decision making task is easy. Shows real-time. Classical research ethics considerations in the Belmont Report and Declaration of Helsinki emphasise consent, human oversight & acceptable harm. Ethics embedded in design. Guided by justice and accountable.

2. Sanka V (2025) The author clarifies that the consequences of unaddressed ethical concerns extend beyond technical performance metrics. It affects millions of individuals through discriminatory practices & decision making. Algorithmic bias emerges when AI systems increase social prejudices, neither work nor demolish. In big data concerns, biased views are problematic due to the diversity of data sources and financial constraints; historical data

creates discrimination.

3. UNESCO (2024) Recommendation on the Ethics of Artificial Intelligence. In Nov. 2021, UNESCO's 193 member states adopted a global standard on AI ethics. It declares AI must respect human rights and human dignity. It has the principles of transparency, fairness, environmental sustainability, and human oversight of AI systems. The member states should respect, promote & protect the ethical values, principles & standards regarding AI. States should strive to extend and complement their own actions in respect of recommendations by cooperating with all relevant national and international governmental and non-governmental organisations.

4. 2024 Arora S. & Thota, S (2024) The authors studied the difficulties of AI use. Here, we research to evaluate existing literature, regulatory structures, framework policies, systems, real-world case studies & ethical recommendations.

AI is a powerful tool with personalised digital assistance. It is indispensable day by day. AI ethics comprises a set of guidelines & procedures designed to control the development & use of AI. Many organizations developing specific codes of AI ethics. They are known as AI value propositions. Isaac Asimov. The science fiction writer spoke about autonomous AI agents they were developed Formulated 3 laws of robotics as a means to reduce risks.

He stated that the code of ethics behind this any action of robots which are harmful or causes injury by robotic actions is prohibited: the 2nd law is that robots are obligated to adhere to human commands; the 3rd law requires that robot prioritize own self-preservation as long as it is Consistent with the values set by the first two laws.

Challenges of Implementing Big Data Analytics :

1. Lack of data skills and experience with advanced data tools.
2. Speed of data growth : data is increasing day by day, so storing, processing, networking and security needs are main barriers.
3. Problems of data quality : due to bulky data, difficult to curate; quality analysis and decision making is not accurate always. If the data is not accurate or properly analysed, it is not possible to get better results.
4. Security concerns : Big data contains valuable business and customer information. It stores high-value targets for attackers, so strategies must be adopted.

Ethics involves ensuring that massive data collection and machine learning systems respect human rights, privacy and fairness.

Core Ethical Issues :

1. **Data Privacy :** It relates to the matter without clear consent of participants. Researchers collect vast amounts of data without prior permission from the

participants who are directly or indirectly involved in research.

2. **Algorithmic Bias :** Sometimes training AI on flawed data leads to unfair discrimination against certain groups.
3. **Lack of Transparency :** Operating as a black box, where users cannot see how decisions are made.
4. **Erosion of Autonomy:** Using big data to manipulate user behaviour, choices and attention.

Key Principles of Responsible Use :

The following parameters are a set of standards which gives a right direction while conducting research and after publishing research.

1. **Fairness :** Treating all people equitably and working to remove bias view.
2. **Accountability :** Assigning clear human responsibility for what an AI system does.
3. **Explainability :** Building systems that can clearly explain the reasons behind their choices.
4. **Data Protection :** Securing information and collecting only what is needed.

According to the Belmont Report, research ethics are based on the values as 1. Respect for persons 2. Beneficence, which reflects minimum harm and maximum benefits 3. Justice relates to benefits with burdens.

Six core research ethics principles :

1. It shows the responsibilities and risks of authors while using AI help. Users should inform to study with the benefits as well as risks without pressure.
2. Beneficence : it is a must to mention the benefits of research and not to harm and be careful about the possible risks.
3. Integrity and Scientific Validity : the research must be conducted honestly and with transparency. Collect data and analyse properly. Give proper credit and avoid data falsification and fabrication. The results are clearly reported.
4. Justice : the benefits of research must be distributed equally to needy people.
5. Confidentiality and data protection : participants trust researchers with personal information. Data security and privacy are expected from the participants.
6. Accountability : Ethical research committees should check that the research follows ethical standards. The committee should review the study plan of research and continue to monitor the research progress.

Conclusion :

Ethical codes are the basic standards which stress of research and for publishing research. It's based on the value which are beneficial to society. The research and the implications of research should be useful to society, not harmful to society. Day by day, through various developments in all fields of Science, research, and Information Technology,

the data grows and not all the time the growth of information in a right way. Big data handling is one of the major challenges in the ICT World. Handling big data properly distributed, maintenance, analysed and maintain and use of data is necessary. An ethical code shows how to put forth the research in every field so every one get benefitted to proper way.

Artificial Intelligence is one of the helpful tools to assist human resources, but the machine is not a humanised power to think and social awareness, so, while taking help from AI, one should check correctness, accuracy and societal usefulness.

Humans are social animals. Humans are irreplaceable with machines, and machines are our assistants to show directions and help with our work within the sphere of limits. Ethically, Human kinds are thinking about social benefits, not machines, so it is necessary to use AI with limited use and careful handling. Ethical parameters are set by our society, so handle AI and other technology with awareness.

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