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Global Issue: Big Data for Sustainable Development
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Big data has become a popular term in recent years and has become a powerful tool in the search for sustainable development. Sustainable development is all about balancing economic growth, social well-being, and protecting the environment, while making sure that the future generations are also able to do the same things. Whereas, big data is all about the massive amounts of data or information collected from various sources which can be used to analyze and make better and informed decisions.

Goals:
The goal of using Big Data for sustainable development is to make progress on the Sustainable Development Goals (SDG) by improving how we track, analyze and address key issues like environmental degradation, social inequality, and economic instability.

Implementing Big Data for better data collection and monitoring is one of the goals for sustainable development. The traditional methods for collecting data like censuses or surveys are very slow and less likely to capture the rapidly changing environments and conditions. In the regions that lack proper data infrastructure, big data can be very beneficial in helping the governments and organizations track the progress. For instance, big data tools like satellite imaging data have already been used to track urban growth, land degradation and water usage by providing data to address these environmental issues (Allen et al., 2021).

Another important goal is to improve decision making by giving the government with accurate and actionable analysis and insights. Governments, NGOs, and businesses can deal with crises and allocate resources accordingly by using predictive models which are developed using Big data. For instance, big data can identify high risk areas for infectious diseases by analyzing social media data, environmental factors, and health records allowing healthcare officials to be prepared (Danubianu, 2020).

Problems:
The usage of big data for Sustainable Development has a lot of problems mainly related to the availability of good data. The biggest issue is the uneven distribution and accessibility of data. The major problem is that not all countries have access to the same good quality of data. In many developing countries, there is no infrastructure to collect and manage Big Data. Due to this uneven distribution of data, the low income countries lag behind in the data driven development process. Nearly half of the indicators used to monitor progress toward the sustainable development goals are not produced regularly in many developing countries (Allen et al., 2021).

Another problem is that even though there is enough good data, it requires a lot of technological resources and infrastructure to convert raw data into actionable insights. Important big data tools like AI and machine learning require a lot of computing power, Graphical Processing Units, cloud storage solutions and a skilled Machine Learning professional to actually build predictive

models. Due to which, countries with poor technological infrastructure cannot take full advantage of big data's powerful features (Huadong Guo et al., 2020).

With the availability of data and infrastructure, we face new issues related to privacy and security. Privacy concerns arise when we start collecting data from social media and mobile phones related to public services. This personal data can be misused in countries with weak legal frameworks and governance related to data protection which can be misused by the government for surveillance purposes by invading the privacy of the people. Moreover, there is also an issue of "data bias" where marginalized communities are left out of datasets which leads to biased analysis by big data tools.

Another major problem is the standardization and proper maintenance of the datasets. This basically means that the collected data should be properly stored in a structured and standardized manner to actually make big data work on a global level. Different nations and organizations use different methods and systems to collect data and store the data which makes it extremely hard to integrate all the datasets from multiple sources which in turn acts as a big problem (Huadong Guo et al., 2021).

Solutions:
There are some solutions which the people and the government can take to solve the problems of big data. Firstly, the government and private organizations needs to invest in building the proper technological infrastructure. This can be achieved by building highspeed broadband networks, data centers, cloud computing server farms in different parts of the country. However, this should be done smartly in such a way that all of the low income regions are able to access these computing resources. Many programs like the Big Earth Data Science Engineering Program (CASEarth) and the International Research Center of Big Data are providing training, tools and technologies to help different countries in improving their data capabilities (Huadong Guo et al., 2021). Additionally, governments and private institutions should offer educational programs in data science and machine learning which will also lead to the investment in the people by training people to be data scientists and analysts in developing countries.

Artificial intelligence and machine learning go hand-in-hand with big data as these technologies can help us in analyzing huge datasets by automating data processing tasks. Furthermore, this technology can also be used to build predictive models. For instance, AI can help in predicting weather patterns, help farmers by analyzing soil conditions, and optimizing irrigation schedules. This not only improves agricultural yields but also reduces environmental impact (S. A. Bhat & Huang, 2021) by integrating AI and agriculture.

The government should implement a stronger ethical and legal framework for data protection and usage. The new frameworks must regulate how the data is collected, stored and used by ensuring that there is transparency and accountability in the usage of the data. Additionally, the data governance should also include strict rules related to the consent and data ownership of the public and vulnerable communities. The government and international organizations should clearly specify the purpose and motive behind accessing the data of the public for any kind of analysis. This will ensure that the data is being used in an ethical way and builds public trust which is essential for collecting more data in the future (MacFeely, 2019).

The issue of data standardization can be solved only with the help of international collaboration where the countries need to work together to create a standardized system for data collection and data sharing. For instance, the Global Partnership for Sustainable Development Data initiative always aims for international cooperation, in terms of data standardization and accessibility, to help other countries improve their data abilities. Lastly, only by countries working together, we can create a more effective global system for big data tools to fight sustainable development challenges.

Metacognitive Reflection on A.I.

I used A.I like ChatGPT to understand more about big data and sustainable development. But, when I used ChatGPT to research about how big data is being used in sustainable development, it was useless because A.I. like ChatGPT was simply giving me general ideas and information about how they can be related. I wasn't satisfied with the research results and I had to shift my focus to google scholar and ASU library to research more about the involvement of big data in sustainable development. This research led me to some academic papers in Springer and Semantic Scholar. I have written the entire analytical brief on my own after studying from different research papers. I have not used any A.I. tools like ChatGPT in writing the contents of the paper. I have only used ChatGPT to check for grammatical errors and improving readability.

References

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