Algorithms are defining and are taking over our lives. An enormous efficiency operation is being conducted by taking away decision-making away from humans and handing them over to the rules and laws of the computer.

I realized in the YouTube documentary, "*Algorithms Rule Us All"*, that technology thinkers explain how algorithms are driving our lives towards polarization. Algorithms, defined briefly, are a series of instructions to solve a problem. An algorithm can process large amounts of data and it might be helpful when trying to organize waste management. The documentary takes us insights from various people who are looking into this matter, from workers on the ground, who are affected by data and algorithms, to data analysts and scientists, and investigative journalists. According to Cathy O'Neil, a mathematician, and a Data Scientist, explains that algorithm is a tool to predict success. According to the mathematician, to build an algorithm, one must need a collection of historical information, like the historical events that happened in the past, and one needs a very precise definition of success. For example, if a person decides what to wear daily, the person will care about what clothes he/she has in the wardrobe, which clothes are clean, what will be the cost of it and how comfortable were they last time when the person wore them. The person also needs to keep in mind if the clothes will fit him well, he needs to wear clothes according to the weather on a day-to-day basis and much more. The person also needs to keep in mind of the cons of wearing a bad clothing, for instance, if it is rainy outside, the person needs to wear a jacket to keep himself well protected from rain. The documentary also looks at the influence Facebook had on 2016 American election, and counter revolutions around the world.

Companies are using algorithms to automate bureaucratic processes. These algorithms are nothing but different sets of instructions and rules. They are fed by big data that are determining our lives. For example, Facebook's algorithm determines which advertisements and posts we should see and large groups of employees in the surging economy never even a boss. When a user builds an algorithm, everything must be very precise, first the user needs to have a basic idea on what he is about to create and then put all his thoughts onto the paper. The documentary mentions the example of a food delivering company called 'Deliveroo' that dispatches food with their staff, so basically it

is an algorithm that decides where to send people to deliver food. Another example examines story of an American prisoner Glenn Rodriguez, who had to sit for long period than other prisoners because the algorithm, which established a risk score, gave him a higher outcome. The mathematicians and data scientists begin to realize that the algorithms are automated decision systems, and they are not neutral and may contain errors. On one hand, they free up our time and do mundane processes on our behalf. The questions being raised now are not about algorithms, but about the way society is structured about data use and data privacy. It is also about how models are being used to predict the future.

The use of algorithms in policing is one good example of their increasing influence on human's lives. From dating websites and City trading floors, through online retailing and internet searches, algorithms are increasingly determining our future and making most of the human decisions. Bank approvals, job matches and much more, all run-on similar principles. The algorithm is the god from the machine powering them all, for the good or ill. As technology evolves, there will be mistakes, but it is important to remember they are just a tool to support people's lives on a day-to-day basis. We should not blame our tools.

Jacek, the bike courier who works for Deliveroo, mentions it was difficult for humans to decide based on a process that was complicated and hard, and now with the invention of algorithms it is easy to predict the location. He explained why he always showed up at work even though there were not enough orders to earn his daily wage. Algorithms are programmed in a way to do one thing, in this case, it is only making a profit. Algorithms are currently programmed to look for indirect, non-obvious correlations in data. For example, in the US, healthcare companies can now make assessments about a good or bad insurance risk based on the distance a person commutes to work. Over time, this creates or exacerbates societal divides.

1. **<u>Is Big Data a solution or a curse for human beings?</u>**

   A lack of effort to preserve the old internet is already well known among communities with an affinity for history. Whether we see it as a potential threat or a successful solution, Big data will undoubtedly have a significant impact on our world. Even services such as online

music sharing groups lament the loss of old music archives that once catalogued rare or unusual examples of their genres back when web groups focused on their hobbies and helped sustain its long-term health through file sharing and word of mouth. It's an issue that is unique to the internet, especially regarding less popular examples of media that haven't been catalogued and re-issued by large companies over the years. Some of the archived services use big data to preserve giant data sets. Big data allows a person to test different variations of CAD images to help determine how minor changes can affect a process. This makes big data an important attribute in the manufacturing process.

1. Big data is helpful in keeping data safe and secure. Data tools will help a user to point out the landscape of a company, which helps in analyzing internal threats. For example, a user will be able to know if a sensitive information has security protection or not. Another good example is when a user will be able to map out the storage of 16-digit numbers (which could be credit card numbers).
2. When running a factory, big data plays an important factor in replacing pieces of technology based on the number of days or months they have been in use, but they are also awfully expensive since different parts wear at different rates. Big data specifies users to spot failing devices and will specify when users need to replace them.
3. Big data is extremely useful in the healthcare industry. For example, if a person is suffering from cancer, the person will go through one therapy, and if it does not work, the doctor will recommend another therapy. Doctors advice patients to get medications that is developed based on their genes and it is because of big data.

2. <u>Is Big Data a solution for companies or a curse for that uses it?</u>

Big data has seeped into every business, enough so that many managers are waking up to the fact that they are already behind in developing a smart data strategy for their companies. Data has always been an important factor in businesses. But with the arrival of digital data as the latest technology—its volume, depth, and accessibility are key factors in helping companies develop sustainable competitive advantage.

Big data analytics help tech companies in harnessing their data and use it to identify new opportunities, which would help them in growing their businesses gradually. In turn, it would lead to smarter business moves, more efficient operations which would lead to happier customers. Companies value Big Data in following ways:

1. **Reducing of cost.** Big data applications such as Hadoop technology and cloud-based services bring cost effective advantages when it comes to storing data and they are more efficient ways of doing business in a company.
2. **Faster decision making.** With the introduction of Hadoop technology and data analytics combined with the ability to analyze new source of analytical data, companies can now analyze valuable information immediately and make tactical decisions based on what they have learned.
3. **New products and services**: Testing the customer's needs and satisfaction through data analytics give companies have the power to offer what the customers want. More companies are creating new products to meet customers' needs.

An American multinational financial services company called American Express has claimed that, in their Australian market, they are able to predict 24% of accounts that will close within four months. The Company uses big data to analyze and predict consumer behavior. By looking at historical transactions and incorporating more than 100 variables, companies employ sophisticated predictive models in place of traditional business intelligence models and are based on hindsight reporting. This allows a more accurate forecast of potential churn and customer loyalty. Another exceptionally good example of an application of Big Data is the entertainment streaming service 'Netflix', that has a wealth of data and analytics providing insight into the viewing habits of millions of international consumers. Netflix uses this data to commission original programming content that appeals globally as well as purchasing the rights of movies and series boxsets that they know will perform well with select audiences.

Hollywood actor Adam Sandler has proven unpopular in the US and UK markets over the recent years but Netflix green-lighted four new films with the actor in 2015, knowing about the fact his previous work had been successful in Latin America.

3. **What are the ethical issues arising from replacing human making decision-with algorithms in the company?**

Once the implications of algorithms are well understood, the design and development of algorithms take on a greater meaning. The type of accountability associated with an algorithm is framed as constructed in design as a product of both the type of decision in use and how large an individual is permitted to have in the algorithmic decision. The theory of algorithmic accountability offered pushes the boundaries of how we hold firms accountable for products that are working as designed. Previous works has focused on a type of product liability for when products or services go wrong, yet the case of algorithms forces us to revisit examples of companies being responsible for when products works as designed and still has ethical implications.

Computer scientists have also made an argument as to show how algorithms can and should be transparent to be governed including autonomous algorithms such as machine learning, artificial intelligence, and neural networks. Previous work of scientists has maintained that algorithm transparency is a precursor to holding algorithms accountable. Companies can be held accountable for the ethical implications of the algorithms when they are developed. In fact, algorithms are implemented with the hope of being more neutral, thereby suggesting that the decisions are better than those performed solely by individuals. By ignoring human decisions such as sentencing, university admissions and prioritization of news etc., algorithmic decisions are framed as less biased without the perceived irrationality, discrimination, or non-involvement of humans in the decision making.

4. **How is using technologies such as Big Data, Cloud and its services and Distributed Computer solutions differ from traditional computer-based systems and what advantages/disadvantages are they associated with the use of these relatively new technologies?**

Despite all the pro and cons, the latest computer-based systems like Big Data, cloud and distributed computing solutions offer the fastest growing part of network-based computing. It offers a great advantage to all sorts of customers such as: simple users, developers, enterprises, and all types of companies. So, the latest technology is here to stay for a long time. For example, Cloud computing is far more pertaining as a virtual hosting

solution. All servers, software, and networks are hosted in the cloud off premises. So rather than investing money into purchasing servers, one can rent the data storage space from remote cloud computing providers on a more cost-effective pay-per-use basis.

In conclusion, it is the people who need to start the fight for a human-centered approach to technology. We humans need control data. The best alternative is to get lost in the machine and make maximum use of it.