UTILIZATION OF BIG DATA ON ELECTION POLITICS INDONESIA IN INDUSTRY 4.0

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ABSTRACT. The development of technology, information, and communication has entered all aspects of life, including politics, through big data technology. In electoral politics, the quick count method is considered superior to the manual process. However, the level of accuracy depends on industry 4.0. This study analyzed the potential for using big data in electoral politics. This research uses a descriptive method with a qualitative approach. Data obtained through literature study. Data analysis is done by collecting data, making an analysis, and concluding. This study found that big data is the right technology to facilitate electoral politics in Indonesia. The results of the significant data method have complemented and validated the old way.

Keywords: Big data; quick count methods; electoral politics

PEMANFAATAN BIG DATA TERHADAP POLITIK PEMILU INDONESIA DALAM INDUSTRI 4.0

ABSTRAK. Perkembangan teknologi, informasi, dan komunikasi telah memasuki segala aspek kehidupan, termasuk politik, melalui teknologi big data. Dalam politik elektoral, metode quick count dianggap lebih unggul dari proses manual. Namun, tingkat akurasinya tergantung pada industri 4.0. Studi ini menganalisis potensi penggunaan big data dalam politik elektoral. Penelitian ini menggunakan metode deskriptif dengan pendekatan kualitatif. Data diperoleh melalui studi literatur. Analisis data dilakukan dengan mengumpulkan data, membuat analisis, dan menyimpulkan. Studi ini menemukan bahwa big data merupakan teknologi yang tepat untuk memfasilitasi politik elektoral di Indonesia. Hasil metode data signifikan telah melengkapi dan memvalidasi cara lama.

Kata kunci: Big data; metode hitung cepat; politik elektoral

INTRODUCTION

The Industrial Age 4.0 is an era that uses technology as the primary tool in carrying out daily activities. The industrial era 4.0 is also known as the digitalization era. The presence of an intelligent system and automation in the industry can be interpreted as the fourth generation of the industrial revolution. Data drive this through machine learning and AI technology. In Industry 4.0, the world is focused on digital technology (Gajdzik, Grabowska, & Saniuk, 2021). The term that is very famous marks the industrial revolution 4.0, namely the "internet of things." The use of smartphones connected to the internet and become tools that people use every day has also become a trigger to produce new services that were not known to the community before. In the industrial revolution 4.0, artificial intelligence or better known as artificial intelligence, and machines that can learn through programming are also developing very rapidly.

In recent years, the industrial environment has undergone dynamic changes. The fourth industrial revolution brought many social, political, cultural, and economic upheavals. This fourth industrial revolution will bring systemic changes in various industries and aspects of everyday human life. From what was previously done manually, it will change to using digital, which people feel can facilitate their activities.

Industry 4.0 is a production process cycle where technology and connectivity are the main starting points (Nagy, Oláh, Erdei, Máté, & Popp, 2018). This is a new era for rebuilding Indonesian industry towards a new era of the fourth industrial revolution and revitalizing the national industry. The application of technological developments in Industry 4.0 supports the development of important sectors in the country's economy if applied optimally and by the objectives to be achieved. Especially in the political sector, which was also affected by the industrial revolution 4.0.

The digitalization era has various positive and negative impacts. One of the significant impacts of the development of information technology is the emergence of data available on the internet or also known as virtual data big data. The data available on the internet has a reasonably large volume and is complex, and with the speed it has, anyone can access information collected on the internet. This

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phenomenon is included in the development of information technology that we have today (Solihin, 2021). Big data is a term used to describe any data set that is so vast and complex that it is impossible to handle or process using conventional database management or traditional applications for data processing.

Big data ensures the processing of new and up-to-date data solution variants and provides tangible benefits for various aspects of life (Suhendar, 2019). The era of big data is making things easy because of the advancement in technology and the considerable growth rate of data.

Capacity and economic development are the main links to determining power and globalization (Elyta, Almutahar & Saing, 2019). Globalization has changed income distribution in various countries (Martoyo, Elyta, Herlan & Arifin, 2020). For billions of people, digital transformation has brought tremendous benefits and convenience. However, in hindsight, policymakers and market participants will likely only understand the full economic and political implications. It is a significant challenge dealing with technological risks and opportunities for democratic institutions and processes (Korner, 2019). Digital transformation has brought many benefits and conveniences to all individuals. However, challenges arise for the institutions and methods of democratic journeys to deal with the impacts and opportunities of technology. This challenge can be caused because, in full economic and political implementation, policymakers and market participants need to fully understand the implications but only behind them. For many years, big data has been around; most companies now realize that they can implement analytics and extract tremendous value from data if they aggregate it into their business. However, organizations used simple analysis (necessary numbers in a manually checked spreadsheet) to find insights and patterns even in the 1950s, decades before anyone even uttered the word "big data" (Davenport & Dyche, 2013).

The idea of big data has been around for years. Most businesses now realize that if they collect all the information flowing into their company, they can apply analytics and extract tremendous value from that data. Big data is designed to integrate the real world, humans, and cyberspace (Chen & Chang, 2014). The whole world intersects with social reality, reflected in cyberspace through technology and the internet. Humans produce data where big data is made into cyberspace through computer technology mechanisms, internet methods, and artificial intelligence (Tufekci, 2017). Political elections, public planning, enforcement of regulations, and more are connected with Big Data.

Large and complex data sets will make it difficult or impossible to use conventional database management to process extensive and complex data. Big data ensures that new and up-to-date solutions are processed and offer real benefits to various aspects of life. Big data enables us to link transformation. We can see invisible forces with proper practice. Big data helps politicians to conduct research or surveys in three ways (Nexcheckdev.com, 2019). Data in online media and conversations on social media are valuable sources for determining campaign strategies and election predictions. Data becomes meaningless if it has yet to be processed. Artificial intelligence is a system that can process big data for electoral political purposes. This system allows us to know who is the most popular, who has a higher harmful exposure, who is talked about the most, and who dominates the discourse. Media intelligence functions to monitor issues, early detection, priority cases, actor analysis, and database profiles (UGM, 2018).

Determining the formulation of a campaign strategy is relatively easy, especially with the sophistication of technology. Politicians can use various media for their campaign purposes. They can be used to see the success rate of the technique adopted to predict the campaign's ultimate goal. To achieve electoral political interests, artificial intelligence is an essential system that must be considered where the system can process extensive data. Artificial intelligence systems can help us predict who has high popularity, who has the highest negative and positive exposure, who can influence discourse, and who argues the most. Media intelligence functions to help us see the problems that will occur in the future, the main issues, actors who play a role, and database profiles.

As described in business intelligence, information systems retrieve information from past data and display information. Several stages in the data process can be recovered: data, information, knowledge, and wisdom. Big data in the industrial 4.0 era in campaigns can play an essential role because it will be more measurable in accurately identifying the type of potential voter to produce valid data. Using big data, you can get results that take little time (Kompasiana, 2018). Several stages can be taken in data processing: data, information, knowledge, and wisdom. As explained in business intelligence, the information system itself retrieves information from past data and retrieves data.

Big data can play an important role in campaigns as it becomes more measurable in accurately identifying the types of potential voters to generate valid data. It takes little time to get results

through the use of big data. There is enormous value in broadcasting big data through social media such as Twitter, Facebook, Instagram, YouTube, TikTok, and so on (Ford., Puschmann, & Dubois, 2016). It provides in-depth insights into the connected people, their positions on political issues, what they buy, where they eat, and almost any other aspect of their lives. It is a gold mine of information for marketers. The facts show that investment in data collection and analysis is steadily increasing, and politicians' concerted efforts aim to minimize our fears through increased transparency and accountability (Korner, 2019).

Broadcasting via social media is a massive advantage of big data. Most of it is published by those who share it on other social media such as Twitter, Facebook, Instagram, Tik Tok and so on, making the data available for anyone to analyze. So, it provides more understanding of political issues people can connect to, to see all the essential aspects of their lives as a goldmine of marketers' information. Investment data collection and analysis continue to accelerate with concerted efforts by policymakers to address our concerns by demonstrating increased transparency and accountability so that incidents like this become a reality and do exist. In Indonesia, Sharing Vision surveyed 74% of 35 respondents who said they could practice big data in 2016. These respondents also noted the success of big data in making political decisions. The quick count method is considered superior to the manual process in electoral politics. However, the level of precision of this method depends on the consistency of the data obtained (Marella, 2018). Sharing Vision was surveyed in Indonesia in 2016, which concluded that most people could use big data, so the success of Big Data in recording and determining political choices is enormous. In electoral politics, the quick count method is considered superior to the manual process. The level of process accuracy depends on the consistency of the data obtained.

In addition, the use of big data in politics has been widely applied in various parts of the world, one of which was in the United States presidential election during the Obama era.

Obama's election campaign reportedly employed 100 staff members who worked with social media such as Twitter to ensure success (Hegelich, 2016). Until Donald Trump used big data from social media to forecast his chances of winning the US presidential election (Cnnindonesia,2016). Based on this, this paper aims to look at the Utilization of Big Data for Indonesian election politics in Industry 4.0, which uses digitalization technology.

METHOD

This study uses descriptive qualitative research to find in-depth information about the research focus, namely analyzing the potential use of big data in electoral politics in Indonesia. The data in this study were obtained through a literature study. The literature review conducted in this study provides information about the research being conducted. Sources of literature come from documents, books, journals, and news. The data analysis technique uses descriptive and qualitative analysis. This is done by analyzing the data through steps: collecting data and information, identifying problems, analyzing the depth of the research results, and drawing conclusions, including suggestions or recommendations.

RESULTS AND DISCUSSION

Potential Utilization of Big Data for Indonesian Election Politics in Industry 4.0

Utilization of the Use of Big Data through Social Media

In Indonesia, the use of big data has begun to be seen, although it has yet to be massive. The main obstacle is the relatively high operational costs of building extensive data systems. The higher the number of internet users in a region or country, the higher the accuracy. Referring to the 2018 Global Digital Report data compiled by WeAreSocial and Hootsuite, it is known that internet users in Indonesia have reached 132 million people, or half of Indonesia's population. Based on a survey, the average Indonesian takes 9 hours and 33 minutes daily to access the internet (Baskoroadi, 2018).

The population internet penetration in Indonesia is 64%. The number of people actively using social media is 160 million, or 59% (Darareportal, 2020). The data can be seen in the following figure 1.

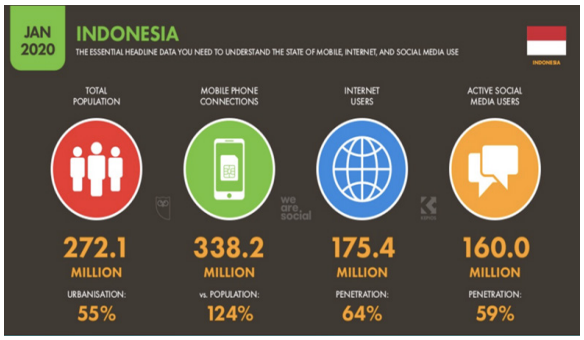


Figure 1. Indonesian Internet Users

Penetration of social networking media in Indonesia is also very high, even though it is a developing country with a digital divide. Indonesia ranks fourth globally for Facebook users - with a total of 60.3 million accounts after the United States, India, and Brazil ± and is projected to increase to 97.5

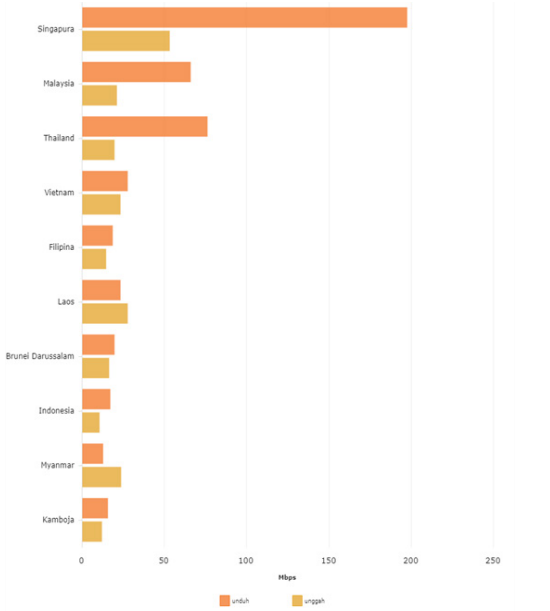
million users (Statista, 2015). While the number of active Twitter accounts in Indonesia reached 14.7 million in 2015, this number continues to increase to 22.8 million active Twitter accounts in 2019. (Satista,2016). Furthermore, with the development of the digital era, not only the use of Twitter and Facebook but other social media have begun to emerge and have a more significant impact on the formation of big data, especially in the use of the political field. The use of social media is rapidly increasing every year. Based on the We Are Social report, the number of active social media users in Indonesia was 191 million people in January 2022. That number has increased by 12.35% compared to the previous year of 170 million people. Seeing the trend, the number of social media users in Indonesia continues to increase every year. Which can be seen based on existing images.

Source:(Dararepportal, 2020)

Figure 2. Number of Active Social Media Users in Indonesia

With this high number of social media usage, the data that is also bigger and more detailed means that when using social media, users will provide their personal information indirectly, from what interests them to what they do not like, including in the determination of regional and state leadership candidates. Even though the use of big data in Indonesia is small, the use of big data has started to be seen in Indonesia. In line with the existing potential, the use of big data also has a significant obstacle, namely the relatively high operational costs of building an extensive data system. Big data primarily uses significant data sources and Internet usage and can measure the effectiveness of these methods by the level of public accessibility to the Internet in a region or country.

The greater the number of internet users, the higher the accuracy of the analysis, while in Indonesia, the quality of the Internet owned still needs improvement. 02 Mbps as of May 2019. For an average file upload speed of 10.44 Mbps, Indonesia is ranked 123 worldwide. Compared to neighboring countries in ASEAN, Indonesia is only ahead of Cambodia and Myanmar, which have download speeds of 15.81 Mbps and 12.81 Mbps. Cambodia is ranked 117th worldwide for download speed, while Myanmar is ranked 127th. This is homework that the government must complete in supporting the use of big data in the industrial era 4.0.



Source: dataindonesia.id, 2022

Figure 3 Internet Connection Speed in 10 ASEAN Countries

Quick Count and Manual Method

Big data is used to calculate the quick count process in general elections. Paper-based voting in the election process in Indonesia, which has been carried out so far, has several areas for improvement, including inaccurate vote counting and delays in the announcement of election results (Qadah & Taha, 2007). Elections in Indonesia adhere to a democratic system where every citizen with an identity card has the right to vote. If there is fraud in the calculations, it is very detrimental to the people. People in Indonesia also have to wait a long time to know the election results, so there are always allegations of fraud. The solution to this problem is to create a vote-counting system where everyone can access the system by being connected to the internet. In this system, the selection results will be displayed using the quick count method, a fast calculation method using stratified sampling data calculations.

Big data technology is utilized in this quick count method to manage data on the number of votes received to present calculation and analysis results that are more accurate, efficient, and fast compared to the manual method. This table shows the difference between the quick count method and the manual or proper count method in Indonesia. (Table 1)

Quick counts, or what is commonly referred to as the inheritance method, are usually carried out in Indonesia as general elections (especially in the regions). An inheritance that is still used today is a form of heritage. However, in practice, this is no longer the case. Therefore, the method being

developed at this time is the process of political computation (quantification of political behavior) or Computational Political Science (Marella, 2018). Thus, the advantages of the quick count method make it easier for the Indonesian people to know who their leaders are. This system involves the public directly reporting election results at their residence. The accuracy of this system depends on public reports. This system would generate fake graphs if the information provided false data. Thus, using a powerful data method will complement and validate the old way through the quick count method. As technology advances, consequential data methods are undoubtedly faster and cheaper.

Tabel 1. The difference between the Quick Count and Manual Methods

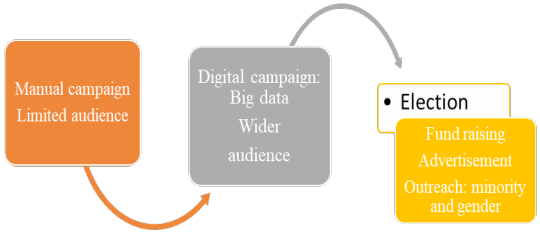
Indicator	Quick Count	Manual (Real Count)
Definition	Vote counting was carried out directly from the TPS where the samples were taken.	Votes were counted from all polling stations.
Method	TPS which is used as a sample is chosen randomly and by calculating stratified sampling data.	Count all ballots in all voter locations
Data source	The percentage of vote counting results came from all polling stations that were sampled.	The ballots came from all polling stations in Indonesia.
Objective	Shows quick vote acquisition and detects indications of fraud	The results of the official vote count come from the General Election Commission
Organizer	Survey agencies such as Poltracking, Indobarometer, CSIS, LSI Deny JA, and others.	Election Organizers, namely through the General Election Commission

Source: Processed by Authors, 2020

Big Data Analysis Determines Campaign Strategy

The political marketing campaign approach uses records to build predictive models focusing on campaign conversations to be more environmentally friendly and assist the broader marketing campaign approach. With big data, current campaigns can be carried out using data creatively. Big data is also a solution to the shortcomings of previous campaign systems, where volunteers worked manually to collect, manage, and integrate data on support areas, fundraising, telephone calls, recruiting volunteers, and so on (Nickerson & Rogger, 2014). The link between big data and political campaign strategy is explained in the following diagram.

In supporting the campaign, both in terms of communication and broader strategy, it is the target of a political strategy process that uses big data, thereby making targeting campaign goals more effective and efficient. Big data is a way out of the shortcomings of the previous campaign system, which still used manual mode. Extensive data analysis is starting to be used to raise funds, improve and optimize advertising strategies, and create more accurate and targeted voter outreach models, including those targeting minority groups and gender-based. Using various applications and technologies for extensive data analysis, the Obama campaign team leveraged big data to determine accurate and targeted target voters for Obama, their hobbies, interests, habits, responses to campaign issues, and advertising demographics (Pratama, 2014). Fundraising, improving and maximizing advertising strategies, and creating a more appropriate voter outreach model, including targeting gender-based minority groups. Indeed, previous research has demonstrated that social media performs a critical function in the movement of thought and policy conversations. Political issues use an artificial combination of humans and bots (Woolley & Guilbeault, 2017). Many people believe that digital campaigns or propaganda campaigns are either fully manual or fully automated.



Source: Processed by Authors, 2020

Figure 4. Big Data and Political Campaigns

The influence of various people becomes inaccurate due to increased volume, fake accounts, and automation. Ravello's latest research findings show that political news only controls the stock index by 3.79 percent compared to other news topics throughout April 2020. The number of comments from social media users, especially Facebook, on news politics is also relatively small, compared to only 11.5 percent. On to another topic (Rudianto, 2020). As of July 7, 2014, Prabowo Subianto's Facebook page has a fan base of 7,839,525 users, with 2.7 million users actively talking about him on Facebook, pushing Facebook and Twitter in the 2014 election. Joko Widodo, with 2.1 million contacts, has 3,533,648 fans.

Joko Widodo's official Twitter account netted one million seven hundred and twelve thousand one hundred and twenty-seven followers and 984,486 followers of Prabowo Subianto's official account. Telkomsel, XL, and Indosat are some of Indonesia's largest communications service providers, reporting significant increases in data services due to the election. Indosat reported an increase in data service

traffic of 18.37 percent, an increase of 210 terabytes, during the legislative election on April 9, 2014.

Telkomsel estimates that data service traffic increased by 15-25 percent and 27.59 percent reaching 665 terabytes on presidential election day. At the same time, XL reported an increase in data traffic, reaching 425 terabytes, 27.7 percent from the previous day (IndoTelko, 2014).

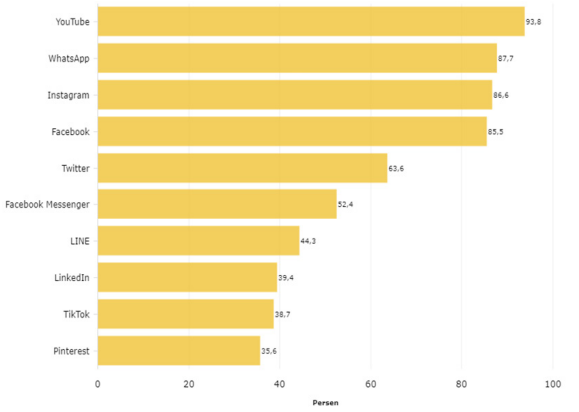
The pursuit of an all-encompassing political marketing campaign to maximize the chances of victory. Campaigns a decade ago have been traditionally based entirely on what they have collected directly from volunteers, donors, and hand-drawn polls. However, modern or (today's) political campaigns are achieved by compiling extensive private population databases and employing statistical analysts to create models that predict residents' behavior, dispositions, and responses to marketing campaign contacts (Nickerson & Rogger, 2014). Maximizing the chances of victory is the goal of an all-encompassing political campaign to plan election strategies.

Big Data Increases Electability and Political Branding Through Social Media

Big data has opened up excellent opportunities for social and political scientists because traditional study methods, both qualitative and quantitative (survey), have limited understanding of narrow social trends or solving social problems that significantly impact society. Big data is a trend popularized by exclusive circles, but it can be understood that it marks a paradigm shift in understanding social processes. A small part of the avalanche of snowballs in this significant data era is data on social media (Rumata, 2016). Big Data has opened up great opportunities for social and political scientists because traditional study methods, both qualitatively and quantitatively, limit their understanding of social problems or solve them and impact society.

In Indonesia, social media plays a significant role in building democracy. Social media campaigns are a powerful form of political literacy for political parties and candidates because they can change people's attitudes and mindsets toward voting. Like increasing political electability, social media can influence advertising and individual image. Meanwhile, all groups see social media as a political space. To help political elites who have interests, political contacts on social media place the population as a goal that must be affected. This resulted in an intensification of internet-based fights between members of political parties and opposing candidates (Asih, 2011).

Social media users in Indonesia are diverse, with an age range that has the potential to become active voters based on existing data. Social media that Indonesian people use today are Youtube, WhatsApp, and Instagram, which can be potential platforms for seeing users' views in the political field.



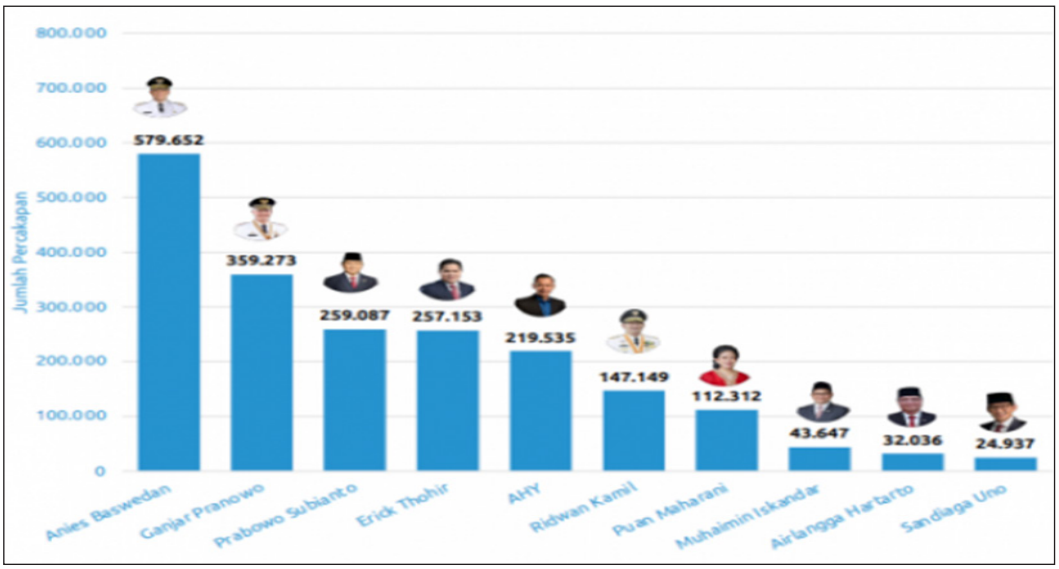
Source: databoks.katadata.co.id,2021

Figure 5. Percentage of Access to Social Media by Internet Users Aged 16-64 in Indonesia (2020)

Through a progressive information evaluation approach, the view becomes a position cabin to see the various social media accounts owned by the person as an essential variable (Dubois, 2018). Political campaigns, candidates, and supporters have used bots to manipulate public opinion in the United States for nearly a decade. The role of bots during the 2016 election as a tool to spread disinformation, attack users, and strengthen perspectives, has been widely discussed in various news media. It is not surprising that many bots are used as tools to spread computational propaganda and are defined (Woolley & Guilbeault, 2017).

This is a challenge for political parties in the 4.0 revolution era, which must be able to adapt to developments in information technology and be able to bring the face of political parties as modern organizations, besides that the domination of generation Z, or what is known as the millennial generation is a big market for political parties in this era. Front. If you cannot adapt, political parties may gradually be eliminated from political circulation (Asih, 2011). In the era of revolution 4.0, it is challenging for political parties to adapt to existing technological developments and present the face of political parties as modern organizations.

At present, political party elites have used social media, which is predicted to be a pretty efficient approach to society and does not require much money. Utilization of social media big data can also see the electability of political candidates in society, which is a reference for politicians in forming their political strategy. One example of the use of big data in the political field is to see the popularity of a candidate or candidates who will advance in general elections, which can be seen in the following figure.



Source: lampost.co, 2023

Figure 6. Comparison of Candidate Digital Popularity

Furthermore, the election campaign becomes the battle arena for the candidates' ideas. Each individual who runs for office will convey his ideas to the public regarding what plans they will make when elected later. Meanwhile, for the public, a campaign is a stimulation that opens their perspective to understand more deeply who the candidate they will vote for in the general election. One way of campaigning now is by conducting social media campaigns. Candidates and political parties can spend little money conducting political campaigns when elections are about to take place. Another advantage of the campaign model using social media is that it can reduce the practice of money politics in elections.

Indirectly, campaigns on social media will also provide political education for the public, especially for lineal children or first-time voters. If the people's political education is good, then the resulting elections will be of good quality, and democracy will develop to be healthier. Social media should be part of political education tools so that the quality of democracy transformed to digital continues to improve.

CONCLUSION

Through big data technology, progress has entered all aspects of life in technology, information, and communication, including politics. In addition, the Industrial Age 4.0 will enable equipment automation with a combined system that can work together. The technology will also help solve problems and track processes while increasing productivity in business and manufacturing at scale. Of course, the application of this industry is expected to increase productivity for the welfare of the people at large.

Big data is socially constructed and influenced by evolving social, political, and technological forces. The results of the findings and discussion can be concluded that the use of big data in electoral political life in Indonesia is essential considering there are four potential supporters, namely the urgency of using big data through strategic factors in the use of social media, the application of big data to the quick count method, extensive data analysis to determine campaign strategies, increasing electability and political branding through social media. This study recommends that Indonesian politics can continue to adapt to the latest developments in digital technology by making the most of big data in electoral political life.

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