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Kaunas University of Technology

Faculty of Social Sciences, Arts and Humanities

Joe Biden's Political Communication on Twitter during the 2020 United States Presidential Elections

Master's Final Degree Project

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Kaunas, 2021

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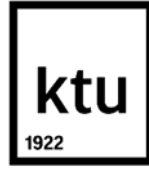
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Summary

Twitter is one of the main tools used by contemporary politicians for political communication. It has been characterized by clear and concise information, which is conducive to disseminating information and enhancing the effect of election communication. Different politicians use Twitter to communicate with the public in different ways. It is imperative to understand the effect of using Twitter for political communication under certain circumstances, which is of great significance to understand political communication from macro as well as micro levels.

The 2020 U.S. presidential election has passed, and Joe Biden, as the new president, takes Twitter as one of the primary social platforms to communicate with the people. During his campaign, his application and interaction with Twitter changed dramatically. This paper takes Joe Biden's political communication on Twitter during the 2020 U.S. presidential elections as the research object, analyzes the context of the 2020 US presidential election with secondary data analysis, and inspects all his tweets during the election by quantitative content analysis, and makes a comprehensive analysis of Joe Biden's political communication on Twitter during the 2020 United States presidential election.

The combination of professional and private aspects is the characteristic of Joe Biden's political communication on Twitter during the 2020 United States election campaign. Meanwhile, the content style of Joe Biden's tweets is diversified and inclusive. According to the results of quantitative content analysis, whether to interact with other Twitter accounts in the tweets, the communication level of the tweets, and the form of the tweets are all interactive factors that affect his political communication on Twitter. However, it should be noted that for the political communication on Twitter, using seemingly interactive methods may not achieve better interactive effects, such as two-way political communication and enriching the content of tweets, which fully shows that the form and outcome of communication depend on the application way, environment and expected goal.

Santrauka

„Twitter" yra vienas iš pagrindinių įrankių naudojamųjų šiuolaikinių politikų politiniam susisiekimui. Tai buvo charakterizuota pagal aiškią ir glaustą informaciją, kuri yra palanki informacijos skleidimui ir rinkimų komunikacijos efekto padidinimui. Skirtingi politikai naudoja „Twitter" susisiekti su viešuma skirtingais būdais. Tai yra būtina suprasti efektą „Twitter" naudojimo politiniam susisiekimui tam tikromis aplinkybėmis, kas yra ypač reikšminga supratimui politiniui susisiekimui iš makro taip pat kaip mikro lygiais.

2020 JAV prezidento rinkimai praėjo ir Džo Baidenas, kaip naujas prezidentas, ima „Twitter" kaip vieną iš pirminių socialinių platformų susisiekiant su žmonėmis. Per jo agitavimą, jo aplikacija ir interakcija su „Twitter" pasikeitė dramatiškai. Šis popierius paima Džo Baideno politinį komunikavimą per „Twitter" per 2020 JAV prezidento rinkimus kaip tyrinėjimo objektą, analizuojant kontekstą 2020 JAV prezidento rinkimo su šalutinę duomenų analize ir patikrinant visus jo „tweets" per rinkimus pagal kiekybinę turinio analizę ir darant visapusišką analizę Džo Baideno politinio komunikavimo per „Twitter" buvus 2020 Jungtinių Valstijų prezidento rinkimams.

Kombinacija profesionalių ir privačių aspektų yra Džo Baideno politinio susisiekimo charakteristika per „Twitter" buvus 2020 Jungtinių Valstijų rinkimo agitacijai. Tuo metu, turinio stilius Džo Baideno „tweets" buvo paįvairintas ir imtinas. Pagal kiekybinio turinio analizės rezultatus, kai sąveikauti su kitomis „Twitter" paskyromis per „tweets", „tweets" komunikacijos lygis ir jų forma yra visi interaktyvūs faktoriai kurie paveikia jo politinį komunikavimą per „Twitter". Vis dėlto, tai turi būt atkreipta, kad politiniam komunikavimui per „Twitter", naudojant aiškiai interaktyviais metodais gali nepasiekti gerų interakcijos efektų, tokių kaip: dvipusio politinio komunikavimo ir praturtinimo „tweets" turinio, kas pilnai parodo, kad komunikacijos forma ir rezultatas priklauso nuo aplikacijos būdo, aplinkos ir tikimosi tikslo.

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INTRODUCTION

Social media provides a powerful database of information for candidates in the campaign, and is also an ideal tool to help candidates gain community support. In addition, social media aggregates public opinions on policies and political positions, which has certain reference significance (Zeng, Chen, Lusch, & Li, 2010). Different social media operators have devised numerous ways to grasp people's attention and clutch users' time. Therefore, it is crucial to express information accurately and effectively within a limited time. Among many available social networks , Twitter, as an application of micro-blogging, can speed up information distribution due to its unique design characteristics, which require politicians to compress their ideas, political positions and responses to short-tweets. Therefore, politicians must choose wisely how to deal with controversial issues and how and when to respond to the public (K. Johnson & Goldwasser, 2016). Thus, the communication strategy on Twitter is very important.

Twitter is public and external in nature, so it is most suitable for political communication and relevant research (A Mitchell, Holcomb, & Weisel, 2016). In a sense, Twitter can be considered a tool for checking public opinion trends and important election activities (Yaqub, Chun, Atluri, & Vaidya, 2017). Politicians use Twitter to check the trends in campaigns, so as to track public opinions, respond or adjust policies promptly. Kruikemeier (2014) shows that using Twitter during the campaign can help candidates get a higher number of votes than those who do not use it. Twitter not only helps politicians obtain the benefits of online political communication, but it also extends online politics to offline activities, increasing the stickiness of the online and real-world political activities and consolidating political interests (Duncombe, 2019).

During the campaign period, candidates use Twitter to develop different political communication strategies (Enli, 2017). Colliander et al. (2017) show that if political parties provide balanced self-presentation strategies (involving professional and private aspects) instead of strict professional style on Twitter, they may attract voters' greater interest and voting intention.

After the 2020 U.S. election, Joe Biden replaced Donald Trump as the current president. Twitter is one of the main platforms for him to communicate with people on social media. In the early days of the campaign, Joe Biden's Twitter account interactions was superficial, with the election day approaching, Joe Biden's Twitter interactions showed an alarming upward (Li, 2020). It can be seen that Joe Biden attaches great importance to Twitter and has received a significant communication effect during the campaign.

There are two main types of research on Twitter and election campaign: the first type focuses on the differences between online and traditional campaigns (Bruns & Highfield, 2013; Larsson, 2015; Stier, Bleier, Lietz, & Strohmaier, 2018). These studies suggest that candidates are more likely to copy traditional communication patterns on Twitter than innovate them in conjunction with Twitter features. The second type of research focuses on the level to which candidates communicate with voters (Burgess & Bruns, 2012; Enli & Naper, 2015, 2016). The key finding of this type of research is that candidates are resistant to interact with voters and use Twitter primarily as a tool for political marketization. However, there is almost no literature on the overall analysis of political communication on Twitter during the election period in recent years. Therefore, this paper will

conduct comprehensive investigations and studies to understand Joe Biden's political communication during the 2020 United States presidential election on Twitter.

Problem. What was Joe Biden's political communication on Twitter during the 2020 U.S. presidential elections?

Object. Joe Biden's political communication on Twitter during the 2020 U.S. presidential elections.

Aim. Conduct a comprehensive analysis of Joe Biden's political communication on Twitter during the 2020 U.S. presidential elections.

Tasks:

1. To develop a theoretical framework that combines the theories of political communication, election communication and social media.

2. To design a data analysis model to determine the interactive factors of Joe Biden's tweets during the 2020 United States presidential election.

3. To analyze the context of the U.S. presidential elections in 2020.

4. To examine the Joe Biden' s political communication on Twitter during the 2020 United States presidential elections by Joe Biden' tweets.

Methods:

In order to develop a theoretical framework to demonstrate Joe Biden's political communications during the 2020 U.S. presidential election on Twitter, a review of the relevant scientific literature such as political communications, campaign communications, and the application of political communications on Twitter has been used. Data analysis methods include secondary data analysis, which analyzes the context of the 2020 U.S. presidential election; and quantitative content analysis, which analyzes 1,674 tweets from Joe Biden during the 2020 U.S. presidential election, cross-analysis and correlation analysis are performed in data analysis software R based on these samples to determine the characteristics of Joe Biden's tweets and the factors that affect the interaction of Joe Biden's tweets. Combine with the characteristics of Joe Biden's tweets and the factors that affect the interaction of Joe Biden's tweets within the context analysis results to explain Joe Biden's political communication during the 2020 U.S. presidential election on Twitter.

1. POLITICAL COMMUNICATION, ELECTIONS AND SOCIAL MEDIA: THEORETICAL BACKGROUND

The first part of this chapter will focus on the definition and role of political communication, and link it with related theories to conceptualize political communication. The second part will introduce how political communication is combined with election communication, how political communication is applied to election activities, and the application of political communication theory by contemporary politicians in election activities. The third part introduces the application of political communication in social media. To understand the performance of political parties' communication strategies on social media, evaluating communication performance is critical to measure whether a communication strategy is effective. In the end, the assessment of politicians' political communication performance on Twitter by scholars is reviewed. Merging political communication, election communication, and social media communication performance is a better foundation for Joe Biden's follow-up research on how to conduct political communication with the public on Twitter.

1.1 Theoretical conceptualization of political communication

Political communication has broadened and adapted to various circumstances, and has become a discipline of communication sciences, political sociology, psychology, sociology and marketing. It is becoming a very fruitful acknowledged field with the diversification and expansion of its social role (López-García & Pavía, 2019). Understanding the theoretical basis and development direction of political communication is essential for realizing a democratic society.

McNair (2017) pointed out that political communication is about the conscious communication of politics. Powell (2015) defined political communication as the act of spreading political opinions in the democratic process. The political communication of election campaign is short-term, with clear target groups, relying on the mass media, and based on the audience response. Once elected successfully, political communication becomes a normal behavior, focusing on the next election. During this period, political information and the legislative procedures continue to interact. Gervais (2016) believes that political communication is a kind of internal dissemination of political information, which is carried out between political aristocrats, mass media groups and the people. The process of integrating information, technology, and media into power services is called political communication. Frequently, political characters automate such process through algorithms that vague ideas and creators come into contact with huge interpersonal networks through personal contacts in friends and family relations (Howard, Woolley, & Calo, 2018).

In addition, political communication means that the communication political communicators convey political philosophy to voters. Similar to the conventional way of communication, both traditional media and the new media are used in this communication process (Oparaugo, 2021). From the above scholars' definition of political communication, political communication studies the role of communication in politics and propaganda. The research of political communication covers how media relations are applied to politics, the development of political information, the influence of political communication on the democratic system, the interpretation of public opinion, the identification and attraction of voters, and the formulation of political communication strategies.

After the Second World War, the changing world situation made the research focus of western behaviorist politics gradually shift to the study of policy formulation and implementation process. Wiener (2010) founded and developed communication theory, which was a power engineering theory that studied the process of information transmission. He believed that automatic machines have the function of automatically receiving information and then reacting. This process was not only a communication process, but also a control process (Seising, 2010). Wiener's thoughts influenced Deutsch (1963) who then applied the basic principles and methods of Wiener to analyze the policy-making process and formed a systematic political communication theory. Deutsch (1963) descried that political communication was to the political system what nerves were to the human body. The government's practical rule and management depends on effective decision-making and control, and effective decision-making and control depend on effective information communication, that is, receiving and processing relevant information rapidly, comprehensively, and accurately.

The comprehensive application of political system theory and political communication theory can help us identify problems more clearly. Scholars define the political system as an organic whole formed by the interaction of various political elements related to the policy formulation and implementation. The political system is an open system, so the change of environment requires the political system to make corresponding responses and adjustments. The complexity of the environment determines that it is impossible to solve problems through one communication, so the political system should attach importance to feedback. From the perspective of information communication, the decision-making process of political system has the following seven links: information reception, data processing, storage, decision-making, policy implementation, implementation effects and feedback (Deutsch, 1963).

In the era of traditional elections, direct communication between political parties and people seems to be a drop in the bucket. The more effective channel is obviously through the media. Therefore, a media-mediated communication has evolved in this way. McNair (2017) described the political system as a two-way communication among people, media and political organizations that can be represented by huge groups, such as political parties, governments, public organizations, pressure groups and terrorist organizations.
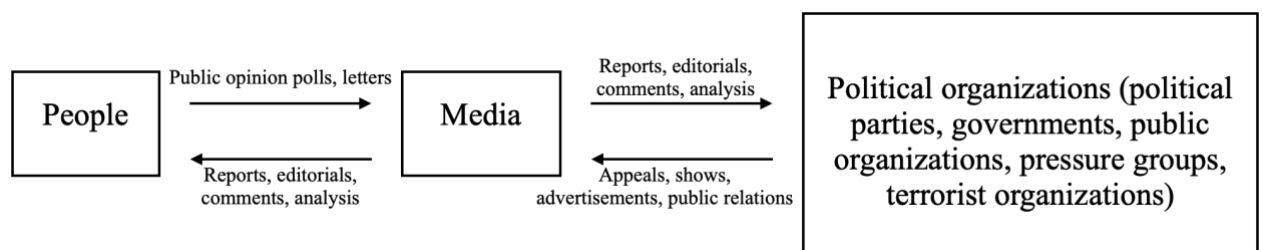
Fig. 1. Media-centric political communication system (McNair, 2017)

Calhoun (2002) has a similar understanding of the political system to McNiar's, and he thinks that political system is a subsystem of the social system, which communicates with the environment through input and output. Output decisions and actions, input requirements and support, and feedback to communicate the output and input of the political system. If taking the election website as an example, with the public as the main body, the "input" is the political information provided by political parties online, and the "output" may include browsing more pages and further offline

political participation. From the perspective of political parties, page views and possible offline political participation become "input," while political parties' "output" corresponding online information. The relevant narratives will focus on input and output behaviors, political parties, and public subjects. The interconnection between communication and politics gives our definition of "political communication", which consists of two core parts: political actors and media. There is a process of political communication in the interaction between these agents, which is aimed at the third character: public. Hence, political communication can be comprehended as a process of communication among politicians, media, and the public (López-García & Pavía, 2019).

Nowadays, the Internet and social media are popularly applied in various fields. Social media is the focus of young people's concentration, but now with the development of its field, it has begun to attract people of every age group. Besides the socialization of human beings, it also carries many individual and social necessities, such as enjoyment, communication and information, which enables social media to enter the political field effortlessly and attract a wide range of groups (DAŞLI, 2019). The role of social media as a channel of political communication is on the rise. Within the framework of certain media, social networks play an increasingly important role in the mass political mobilization and become more and more popular (Miletskiy, Cherezov, & Strogetskaya, 2019).

In recent decades, a prominent phenomenon has appeared in western capitalist society: citizens are indifferent to politics, which is mainly manifested in the decreasing number and proportion of citizens participating in elections and voting, and the increasing tendency of consumerism and entertainment subjects. According to the traditional view, this is inevitably related to the latest political communication process between the media and political parties. Norris (2000) disagreed these views and he made a comparative study on the role of news media and political parties, and came to the conclusion that traditional views mistakenly paid attention to the reporting methods of news media instead of understanding the more profound problems of western representative democracy. In his opinion, the negative reports of the news media may lead to the wrong views of the public on some specific policy issues, but the media has played an active role in the public's attention to the news media, the absorption of political knowledge and the trust in the government (Norris, 2001). The representation of citizens and journalists in democracy is facing challenges. As youthful grown-ups deny older patterns of information, political communication can regenerate itself by strengthening the current theory and changing from the early impacts rationality to a novel sensitivity of "media affect" (Barnhurst, 2011).

Political communication is accompanied by two significant frameworks of connecting. Two critical outlooks that the communication theory adapts and keeps adapting try to solve the problem of the influence of the media on the public, which have been transformed into a larger discourse, integrating the media into its political-social background (López-García, 2017).With the increasing propagation of social media, the political communication system and the digital environment have undergone fundamental changes (Vowe & Henn, 2015).If the millennium's political communication system is facing "significant changes," the subsequent development will only stimulate and amplify the changes of political communication and media environment (Blumler, 2016). The barriers between media and its types are ambiguous(Chadwick, 2017), The power of traditional media marketing models has begun to decline (Amy Mitchell, Gottfried, Barthel, & Shearer, 2016), News media and political institutions have reduced the degree of attachment to citizens, and the impact of this degree

is lower than ever (Bennett & Iyengar, 2008). New media has fundamentally changed the operation mode of government institutions, the communication mode of political leaders, the competition mode of elections and the degree of citizen participation (Kenski & Jamieson, 2017).

Social media platforms provide a large amount of information to a vaster audience, reflecting the success of commercial capitals vending their products to more comprehensive customers efficiently and effectively. At present, politicians essentially change their communication strategies with potential audiences by accepting social media communication (Nulty, Theocharis, Popa, Parnet, & Benoit, 2016).

Politicians are required to attract young audiences and make sure that their beliefs can transform both sides, resembling using social media. The application of the internet and social media in each section of politics has brought opportunities and increased attractiveness (DAŞLI, 2019). Partisans in contemporary democracies crosswise the world have enthusiastically espoused social media for joining their constituents, directly communicate with citizens, and empowering lively political conversations (Hong & Nadler, 2011). Since political exercises might expand more transparency, citizens might participate more actively in the political decision-making process. The most positive aspect of social media is that it can gather many people promptly. Social media provides people with immense freedom from profiting from the advantages of the Internet (DAŞLI, 2019).

The Internet environment has led to changes of political communication research environment. Changes of information and communication technology and citizen's political consultations have multiplied the wave of political information that people and journalists must pay attention to. Van Aelst et al. (2017) pointed out six concerns closely related to the dissemination and acquisition of political knowledge based on the review of different studies on the dissemination of political information: (1) more and more political knowledge inequality; (2) the quality of news has decreased; (3) the concentration of media has increased, and the diversity of news has decreased; There are more and more division and polarization; (5) more and more relativism; (6) the deterioration in the supply of political information; The media environment is becoming more and more polarized and fragmented. People tend to prefer information with harmonious attitudes, but most people still maintain different attitudes towards different news media. It is also vital for politicians to catch the new trends, because it may form efficient political communication or gain little after consuming human resources, material resources, and financial resources.

The changes of information and communication technologies and civic political deliberations have increased the stream of political information that people and newsrooms must tame. These changes have an impact on the rethinking of what we want to measure and how we will measure them. (Andersen, H. de Vreese, & Albæk, 2016). Scholars turned to creative methods of utilizing the media environment to trace the process of political outcomes of communication (Karpf, 2016; Vraga, Bode, & Troller-Renfree, 2016). For example, Vraga and his colleagues (2016) used an underutilized method, corneal eye-tracking, to attract attention to social media content. They exposed topics to different types of Facebook content and tracked their gaze when browsing posts. They find that news and social content received equal attention, while politics lags behind both. Note that it occurs at the intersection of the topic and style of posts: posts containing images or external links will receive more attention, especially posts related to appetizing topics, for example, instead of political posts, which

highlights the importance of measuring content (social news, political posts) and its styles such as images, links, and performance status.

Karpf (2016) provides insight into how rights organizations can effectively use analytics to do things, rather than allowing analytics to change the characteristics and actions of organizations in a way far from really affecting their vision and membership. Karpf (2016) found that use digital media technologies and platforms to generate great potential (although not without trying) can do something fundamentally different for our democracy: listening. The movement organization listens to its members with unprecedented ability, which is not a symbolic gesture. The ability to listen continuously (which largely avoids unnecessary digital intervention) allows people to change the way organizations work and their identities. The hearing methods of government agencies (such as NSA) are fundamentally different from those of other non-governmental organizations that can or may listen to their internal followers. The ability to effectively use digital interception tools is limited to certain types of organizations (mainly large organizations) (Karpf, 2016).

It can be seen that scholars follow the trend of the Internet and new media and use different methods to measure the results of political communication, hoping to find the optimal solution from different communication methods.

It is true that in this new era of minimal influence, political communication scholars have not abandoned the classical theoretical model but formed an innovative paradigm. Regarding the novel data sources, Muddiman and Stroud (2017) found that hateful behaviors in party relations increased the number of comments. The news media was conniving for uncivilized behaviors and comments between political parties and the public. Some extreme comments were even promoted or accepted by the news media. The media's tolerance for these comments may cause news users to become inactive.

With regard to novel automated tools, Dietrich and Juelich (2018) collected 428,185 tweets from Hillary Clinton and Donald Trump, and extracted the audio of the three presidential debates in the first, second, and third presidential debates in 2016. Then they used Google Speech Recognition API to analyze these data: the API was used to extract what was said in each audio clip, and finally, while a Keyword searches was used to identify whether any candidate was talking about any of the twelve subject categories. They found that not only did Hillary Clinton and Donald Trump seem to have invested more emotion in party issues, but they also used a distinctive voice pattern, which showed that they have "owned" some issues more than others. Candidates invest emotions in party issues, while voters are more likely to pay attention to clues with low plasticity, such as changes in their intonation. When candidates raise their voices when talking about their own party issues, Twitter's attitude is positive, which shows that non-verbal clues are an essential part of problem control.

The study of political communication has become a vital sub-field of politics and communication in the 20th century. The Internet promotes the transformation and development of political communication. The new concepts and methods of communication do not abandon the basic theoretical ideas, but constantly evolve the models in line with the trend and explore efficient political-civil communication closer to citizens.

1.2 Political communication during elections

The primary function of elections is to make a fundamental contribution to democratic governance and strengthen a political community's stability and legitimacy. Elections connect citizens and help promote social and political integration. Elections also help to achieve the goal of self-realization and strengthen their self-esteem (Kui, 2007).

The common way to participate in politics is to vote in elections. The definition of electoral politics in "Encyclopedia Britannica" is the formal procedure for voting for public officials or accepting or rejecting political opinions through voting (Eulau, 2020). People can express their opinions and satisfy their needs for a sense of belonging by expressing partisanship through voting. Even without voting, it can meet the needs of some people to express their alienation from the political community (Turska-Kawa & Wojtasik, 2013). For these reasons, the long-term struggle for the right to vote and the requirement of equal participation in elections can be regarded as an illustration of humanity's deep desire for individual realization. Banners, posters, buttons, headlines, TV reports, and media propaganda are all part of the election campaign, constantly reminding people of the consequences of participating in political activities (Seidman, 2008).

There are four types of campaigns. (1) the partisan-centered campaigns are toward party members, and the tools of this movement are the face-to-face interactions between voters, politicians, party news, newspaper advertisements, and radio posters. When the non-partisan media and limited TV channels provided opportunities to approach the people through one-way messages, (2)the mass-centered campaigns emerged (Magin, Podschuweit, Haßler, & Russmann, 2017). When political parties use multi-channel television and later the Internet to address the problem of voters with similar interests and deal with the ever-changing voters in a more targeted manner, (3) target group-centered campaigns emerged. Finally, Web 2.0 is turning the target group orientation to (4) individual-centered election campaigns, that is, political parties can send election campaign messages to individual voters based on corresponding demographic preference data obtained through cooperation with technology companies and the campaign data saved by the parties (Magin et al., 2017).

Election communication has also changed with the popularity and penetration of the Internet. Lilleker and Jackson (2011) summarized the normalization of cyberspace in order to analyze the role of Internet in the election campaign. They summed up two types of normalization: (1) normalization of authority relations is based on observations, that is, those parties with a tremendous amount of resources have the most complicated web appearance and promote innovations. (2) The normalization of political communication as offline traditions may encourage conversation between candidates or political parties. However, it is necessary to combine two strategies for a comprehensive explanation of political campaigns. Content analysis predicated on exploring the activities of parties on social media indicates the importance of implementing multiple methods research when carrying out political campaigns (Magin et al., 2017).

Indeed, the election campaigns are nothing more than a political communication. When considering election campaigns, communication among the stakeholders is required. Communication also has to strengthen and sustain connections, and the corresponding practice and communication requirements can convince followers to support the campaign actively while considering election campaigns regarding forming unions within groups with comparable interests and goals (Strömbäck & Kiousis, 2014). LaMarre and others (2013) examined the political relationship management during the 2010

U.S. election campaign on Twitter. They said that political campaigns could use the platform to develop a strong relationship with the publics, identify essential stakeholders, and manage them effectively, helping partisans gain supports.

Study shows that more and more voters will adjust and modify to the preferences of political parties. Johann and others (2018) investigated party communication through the numerous new media data, which revealed that interpersonal party canvassing expanded the possibility of voters altering their voting preferences. It also means that the public can be persuaded and convinced by politicians in appropriate ways. The role of political communication is to develop the relationship between media, influence the agenda, new media and means, and shape and position the information environment and brand, which is intertwined with the election campaign and has a strong influence on the election campaign.

Nowadays, the election communication literature mainly expands its study field to technology and companies according to exemplar channels and technologies of political communication. There has been a large amount of reliable literature surrounding the micro-positioning of the data and political information provided by technology companies. The parties have begun to cooperate with technology companies because they have a large amount of user data for analysis. They classify the population to use different communication strategies for different groups of people. Hersh (2015) investigated how public recorded affect the views of elites, and how views in turn affected campaigns and voters. The results show that micro-targeted therapy has attracted new ethical attention. The new concern is that election campaigns use management data to obtain personal information with conflicts of interest that is susceptible to be abused. The function of election campaign is not technological innovation, but the product of government regulations. Election activities rely on the voter registration law and the public record law to perceive voters' political inclinations.

Kreiss and McGregor (2018) focused on the role of technology companies such as Twitter and Facebook, which cooperated with American politicians to shape political communication during the 2016 U.S. election, which showed that the motivation of technology companies was to engage in lobbying work such as marketing, advertising, and alliance construction in the political field. Political staffers also work closely with these technological giants. They offer digital consultation for specific political parties and help them build effective strategies, for instance, how, when and what to post. These strategies are divided into different groups and targeted at different potential voters.

The Internet and the various software applications running through computers and smart phones, which grant illustrative and practical chances for two-way communication within campaigns and followers. This kind of communication can disperse traditional campaigns, making people engaging in campaigns freely and easily. Campaign studies have exhibited the communication environment. Digital Communication Technology aims to look forward to the mutual connection between the public and supporters. They are influenced by the way they apply to incite their practices in the election campaigns. Meanwhile, the political elites become to suspect those voters and behave rudely and casually. Party actors want to mobilize the public to serve the election campaign, but they are too close, so it is dangerous, or at least harmful, to really listen and empower them. A healthy democratic system can involve the public fully, which means that political elites will think about these views

and make corresponding changes, which is the actual interaction required by a healthy democracy. (Stromer-Galley, 2019).

Overall, with the development of the digital network environment, contemporary political communication has gained various new directions in the election campaign. Firstly, it suggests the important role of the Internet. Since 1990s, almost all political organizations in high-level liberal democracies have used the Internet and other innovative knowledge as well as Information and Communication Technologies to achieve their communication objectives. The analysis of Internet-based strategies and campaigns in different groups explicates both connections and substantial diversity in selecting and ultimately implementing a wide range of Information and Communication Technologies applications that political actors can use.

 Typically, every political group operates at least one website, and uses email to communicate in various communications. If it is universally regarded as the "cutting edge", it will even apply the latest trends. The community not only follows the specific method of adopting Information and Communication Technologies based on communication needs. They put these technologies into work in different approaches, apply varying degrees of complexity, deliver distinct quality and quantity of information, and provide unique opportunities for their followers to participate   (Winter, 2018).

Specifically, the social networks based on Web 2.0 have generated requirements for modern digital strategies, aiming at realizing the fundamental democratization of information and the diversification of speeches, ideas, and sources. Therefore, reality is defined and constructed in many novel ways different from mainstream media. Related to this is the hope of democratizing global society, which has grown into a multinational public field. The election campaigns in European countries and America are changing under the Internet environment, and the election activities of Asian countries have also undergone many changes due to changes in the digital environment. Kiyohara (2017) compared the changes in election campaigns in several Asian regions (South Korea, Japan, and Taiwan)with those in the United States and European countries under the Internet environment. With the use of the Internet and social media and the changes of related legal systems, each country has an attitude towards the Internet. Their Election campaigns have unique attributes and characteristics. Although these countries have different electoral systems and legal systems, compared with the traditional electoral process and form, they have undergone tremendous changes, showing the trend of decentralization of electoral power.

Secondly, narrowcasting and microtargeting have become more critical strategies in election campaigns. The voters are divided into target groups, such as canvassing, uninterrupted mail, uninterrupted e-mail and uninterrupted telephone calls. These indicators are reflected in the degree of targeting audience and the degree of narrowcasting activities. The parties determine the number of target groups that should be specifically contacted and mobilized, and then they design some specific activities or content aimed at direct communication with the target groups.   With the development of the classification and preference of the public have increased, and the communication strategies of political campaign has become complicated accordingly. To achieve better campaign results, they must communicate with target groups more precisely, including potential voters, and continue to extend the scope of personnel (Tenscher, 2013; Tenscher et al., 2016).

The election campaign strategy has changed due to the popularization and application of big data, because predicting the turnout rate and the micro-target trend score of voting selection have become necessary means to determine key figures in the campaign (Panagopoulos, 2016). Election campaigns use personal data to convey information to voter groups. The election team is most sensitive to their announcement due to their observed political party affiliation and the observed problem positions (Endres, 2016). The parties hope to assemble and persuade potential voters and elude misusing sources on their opponents (Medvic, 2017).

It is generally believed that the tendency score of micro-goals can significantly improve voters' views on campaign activities. The accuracy of this professional knowledge is indispensable, because only when the voters' understanding is effective, geolocation strategies are inferior to campaign strategies based on individual-level decisions (Hersh, 2015). Endres and Kelly (2018) used voter profiles and survey data of the 2012 U.S. election to compare campaign contacts, while Republicans use micro-targeting propensity scores to determine whether contacts used strict geography-based methods.

Their research results show that when the election campaigns rely on micro-targeting data, older persons are more likely to be designated as contacts than younger persons according to geographic and micro-targeting strategies, which means that the tendency to rely strictly on micro-targets is improper if republicans try to target young Americans. The research of these documents is of great significance to the political party's strategic choice for professional elections during the election. The differences in the demographic structure, electoral system, and cultural background in different countries have a great impact on the target groups of political parties, resulting in different results.

Thirdly, during the election campaign, the professional campaign and communication expertise increased in the study field of political communication. A professional campaign refers to the type of campaign that uses a combination of technology and material resources to maximize election goals in the ever-changing political and media environment (Tenscher & Mykkänen, 2014). It includes specific professional consulting, business cooperation and the application of external resources, etc. The opposite of a campaign type is de-profession, which does not mean not using professional analysis in a campaign, but rather a campaign style known as amateurism, for example, tweeting sentimental intuitive tweets during the campaign (Enli, 2017).

Laurison (2019) shows that campaigns have an essential role in forming how Americans experience electoral politics. Staff or consultants who are good at helping political parties achieve their goals should be regarded as participants in cultural production, and their function is to generate communication patterns. Obtaining a respected and coveted position among industry players is the primary motivation for most of them. The quality of the information, images, and strategies they produce has a measurable impact on voters.

New technology assists parties and candidates in organizing campaigns effectively and systematically. Target groups, opinion polls, databases, voter segmentation analysis, and other various tools have expanded the possibility of attacking and targeting voters' related subgroups throughout the campaign process(Jungherr, 2016a). Professionalization is one of the distinctive features of election activities in the 21st century. It is a question for scholars whether the implementation of new technology will enhance the existing campaign structure and strategy, or whether the technology will fundamentally change the campaign conditions.

Grusell and Nord (2020) showed that digitalization and professionalization tend to be strong in two Sweden national election campaigns. Among the more prominent and grand campaigning parties, although they are small in scale, the between them is most obvious. Although the ideological positioning, party size, and budget are different, the political party campaign activities have generally become specialized in all parties. In terms of using and perceiving digital media functions, party activities can generally be characterized as highly digitized.

Lilleker and others (2015) surveyed over 60 political parties in several European countries. Their study shows a new trend of professional campaign strategy within European countries, which is reflected by the transformation to 'hypermedia' campaign style and the integration of traditional and modern campaign tactics and communication platforms.

Although campaign professionalism has become a prevalent trend, and most practices have proved to be very effective, different countries have their own development backgrounds and cultures. Campaign professionalism strategies should be adjusted closely to the characteristics of different countries, so as to minimize its side effects and to maximize the application effect of the strategies.

Elsheikh (2017) demonstrated the key role of campaign professionalism in the 2012 Egyptian presidential election. The results indicate that the professionalism of the 2012 campaign may be the main factor leading to the candidate's victory in the first round of elections. The results also pointed out that the professionalism adopted during the election had a negative impact on the democratization process in Egypt. On the contrary, it caused Egypt to continue to fall into a transitional period.

Fourthly, marketing-oriented campaign communication has increasingly become a research hotspot in contemporary political field. Political marketing refers to the process in which individuals and organizations apply marketing principles and procedures in political activities. It requires understanding the needs of voters and develop products that meet these requirements (Newman, 1994).

Political marketing and brand promotion also can be seen as notions related to elections. These concepts enhance the trust among political stakeholders (Gholipour32 & Sadegh33, 2017). Regardless of whether the campaign goes beyond the traditional election campaign period, the ultimate goal is the same: to win the next election. Political marketing can be safely regarded as a marketing management strategy to understand and satisfy voters' wishes and realize the party's common interests, candidates, voters, and society in the long-standing (Akinola & Adekunle, 2021). Social media has created new political marketing activities and provided new sounds for candidates and electors to communicate. Democracy and marketing both converge on "people". The combination of politics and market, or better adoption of marketing principles and practices is considered to be beneficial to both parties who could be seen as producers and target electors who could be seen as markets (Scammell, 2014).

25% of American grown-ups said that they knew about US election information through candidates' social media posts. Among many social networks available, Twitter is public and external in nature, so it is most suitable for this research type (A Mitchell et al., 2016).Walker and others (2016) investigated why some Twitter messages were forwarded while others were not in the context of a political marketing campaign.

The predicted message forwarding possibilities include message characteristics, tweet structural elements, tweet content, tweet sentiment and source characteristics. They suggested that developing an extensive network of influential followers was the basis for political marketers to produce high forwarding rate. If some messages contain hostile, aggressive or fearful demands., they are more likely to be forwarded. Consumer engagement should be considered when marketers are planning digital tactics. If the market has high consumer participation, they will achieve positive results in achieving business goals. People live in the virtual world, and are even enriched by the platforms in the virtual world, so that presence in the digital world is crucial (Thang, Noor, Taha, Ng, & Aziz, 2016). Quality of preparation illustrated through striving digital marketers is a critical digital marketing strategy that can successfully carry out marketing campaigns in a more interactive environment. The premise is that these strategies expose the action's inner nature and ensure that higher-quality marketing is a high potential to succeed. They firmly encourage the need to unify and establish strategies according to objectives.

This approach is performed to communicate with the exclusive digital target audiences on different digital platforms. Specifically, social media applications is one of the essential strategies in digital marketing nowadays (Chaffey & Ellis-Chadwick, 2019). For example, Donald Trump, as a business giant, has implemented and suppressed most marketing strategies. The political marketing strategies used by Donald Trump appropriated the latest media, especially digital media. He has successfully used targeted communication based on market-oriented metrics to win the 2016 election (Rahyadi & Aras, 2020).

In summary, the election campaigns provide a fertile training ground for political communication, which is fully reflected in the election campaigns. Relying on the development of new technologies under the Internet environment, politicians no longer stick to traditional communication methods, but actively embrace new technologies and professionalization to maximize the benefits of elections. Contemporary election communication has been divided into several new directions: the vital role of the Internet, the strategy of narrow broadcasting and micro-targeting, professionalism, and marketing orientation. Accordingly, research in political campaign should focus on how political parties consolidate the different campaign movements, the constraints, and the contexts of specific countries or regions, rather than how far away countries have advanced toward the American form of campaigning, which is excluded by political campaign researchers (Chen & Smith, 2010).

1.3 Election campaigns and social media

Social media is a Web-based service. Individuals, communities, and organizations can be creators, and everyone can create, modify, share, and use the generated content. Such information sharing enables individuals, organizations, and groups to connect together, build a community with a clear theme (McCay-Peet & Quan-Haase, 2017). Social media is becoming more and more influential in election campaigns. Through the Internet, politicians can connect with voters and mobilize more voters, and politicians can better improve themselves through the feedback of voters(Golbeck, Grimes, & Rogers, 2010). Simultaneously, it is imperative to clarify and estimate political communication's performance on social media, and help participants identify how to choose different social media strategies to achieve different goals based on their needs.

1. Election campaigns on social media

Compared with traditional media tools, social media has many advantages. Through convenient social media, politicians can directly communicate and connect with the public, and promptly guide public opinion to a healthy development, without worrying about the distortion or excessive interpretation of factual content by journalists or other media methods. On the other hands, the cost of social media is lower than traditional campaign mechanism, which is expensive in money and time. Social media applications also permit for the diffusion of information and response to attacks almost immediately (Auter & Fine, 2018).

In past elections, politicians mostly used campaign websites to recruit more volunteers to solicit votes. But compared with the interaction of social media, the effect of social media is obviously better. Politicians can directly communicate with new members. The superimposed effect of Facebook and Twitter attracts more potential supporters (Druckman, Kifer, & Parkin, 2010).

New media research and elections have also shown new changes with the rapid development of Internet technology. The research scope of related scholars is broader. From the perspective of the Internet, some scholars have studied the changes brought about by the improvement of media functions on election methods. Bimber and Davis (2003) observed closely the dynamics of the Internet in the 2000 election, which described the role of the campaign websites in the U.S. election systematically. Starting from the website, using the two-way interactive functions to communicate more and more closely with voters.

Williams (2006) analyzed the Internet in the 2004 presidential election. Scholars' research includes both websites and blogs, the suggestions of grassroots supporters and the remarks of the candidate's spouse. Such research effects reflect the constant changes in the political landscape and expectations for the future of elections.

Johnson and Perlmutter (2013) showed that the 2008 election in U.S. marked a new era, with candidates no longer able to control information thoroughly, and the traditional campaigns under a centralized system coexisted with unstructured digital democracy. They showed how social media has changed the way candidates vote, how the media reports about elections, and how voters get information. Social media has gradually changed the way and effect of communication among politicians, media, and people.

This trend of actively using social media to improve election effectiveness has affected American election politics and spread to all parts of the world. D. Lilleker and Jackson (2013) compared the elections in France in 2007, the United States in 2008, Germany in 2009, and the Britain in 2010, and found that the Internet, In particular, social media has been used as an election tool many times and is suitable for many different geographic environments. The researcher believes that the Internet's changes in election methods are benign and analyzed the role of social media in candidate propaganda.

During the 2008 U.S. presidential election, the booming application of the social media and similar functions on websites aroused people's voices, declaring that the Internet, especially social media applications such as Twitter, provided convincing opportunities for online campaigns and deliberations (Larsson & Moe, 2012). Social media is the newest interest of political communication strategists, especially during the campaign period (Enli, 2017).

In terms of studying social media and campaign activities, scholars divide it into three research fields. The first aspect is the development process of online selection and the role of social media in the process of mobilizing voters. For instance, Bruns and Highfield (2016) analyzed the main accounts of Obama and Romney, and gives how the top-ranked candidates use new information from social media to improve themselves, including their tweet styles, interactions with each other or recognition, connections to other sources and content, and promotional tweets for promotional advertisements. The results show that the future election campaigns will better focus on the candidates' personal account activities, thereby further consolidating the U.S. presidential election's essence. The object of competition is not the competition between the two parties and the platforms they represent, but the competition between two people.

Stromer-Galley (2019) reveals the history that the individuals and innovations of Dean's campaign team played a leading role in the selection of the first African-American presidential election in the United States. In this way, it tells the history of new media and the Democratic election campaigns for most of the past ten years, records the key moments of election innovation, and draws charts on the spread and evolution of various tools and technologies in politics and compiles them. The history of organizations that formed this phenomenon of the candidates using new media. Election campaigns will not simply exist in the social and technological environment that determines the form of online politics.

Election campaigns and political parties, consulting companies, propaganda, and social movement organizations actively form this environment through their new media work. The transformation of "American Provost" into "American Obama" for Dean is not just a metaphor of political style. Through the work during the presidential election from 2004 to 2008, the founder of BSD perfected the technology and organizational practice originally developed during the presidential election and made it stronger. Within this social technology performance, the Internet became the central organizing tool of electoral politics for the first time in the Dean election (Stromer-Galley, 2019).

The second research direction is the interactive performance on social media in the election campaign. Enli and Naper (2016) compared the current Barack Obama and challenger Mitt Romney on Twitter during the 2012 U.S. presidential election, and passed the quantitative analysis of tweets posted on candidate accounts @BarackObama and @MittRomney. There are remarkable similarities and differences between these two candidate accounts. For example, young people are more active on Twitter, while Democrats and independents are more active than Republicans. Therefore, Obama's tweets are probably a campaign to confirm the preferences of users who pay attention to tweets, rather than convincing new voters. They also pointed out that political movements use social media for marketing and branding. This means that interactive features are mainly used to publicize candidates and disseminate campaign information. Nevertheless, the campaign did not prioritize social media's potential for political debate and dialogue among users, and message control still seems to be the primary goal of candidates. An interesting finding is the current advantages of social media, which means that the current president has many advantages in Twitter hierarchy, which contributed to the Obama campaign.

Outside the United States, Graham and others (2013) investigated how candidates used social media in the British campaigns. They classified various behaviors of candidates on Twitter, including

content analysis of all Conservative, Labour, and Liberal Democratic candidates' tweets during the 2010 UK general election, focusing on four aspects: types, interactions, functions, and themes. By examining the candidates' Twitter behaviors, they found that British politicians chiefly use Twitter as a one-way communication form. In certain aspects, it is indeed as usual.

The candidates mainly used Twitter to spread their news as a platform for the guerrillas to express their gratitude and gratitude to supporters. A group of candidates has explored the potential of Twitter to promote closer connections with citizens. They believe that during the campaign, Twitter provided a communication platform for the campaign and some of the latest news to make people participate in politics. In addition, Twitter's interactivity has increased the connections between citizens and promoted democracy. Nevertheless, most of the candidates are very nostalgic. They copy the promotion points of offline advertising campaigns to style, performance and strategy, and the use of Twitter is mostly interaction with traditional media.

Study also shows that, unlike those who think that politicians are willing to engage in conversation with electors. On the contrary, they resist communicating with the public on social media (Jackson & Lilleker, 2011). Therefore, Although the role of social media is gradually being promoted in political communication, the methods and purposes of politicians seem to be different.

The third research direction focuses on the level of professionalization of campaigns (Kreiss, 2016; Stromer-Galley, 2019). The election campaigns have presented a trend of professionalization. It also combined with novel approaches to political communication.

The diversity of research used on Twitter during the campaign also led to the emergence of different methodological methods and diverse methods of data collection and data selection on Twitter. The research can be divided into three parts (Jungherr, 2016b). (1) Application of Twitter by the people with political intentions. (2) Application of Twitter by partisans. (3) Application of Twitter during media events and responses to media events.

Generally speaking, compared with the non-ruling party faction, the ruling party uses Twitter less frequently (Hemphill, Otterbacher, & Shapiro, 2013). Young politicians are more enthusiastic about Twitter than old politicians (Lassen & Brown, 2011; Straus, Glassman, Shogan, & Smelcer, 2013). Using different research methods and data collection methods, scholars have explained the different expressions of politicians on social media in elections from various angles, which provides a theoretical and practical basis for a comprehensive understanding of the application of campaign communication on social media.

2. Performance assessment of political communication on Twitter

The Internet has changed the interactions between people. In particular, social media has produced a new type of social interaction. Nowadays, interaction is no longer just established through face-to-face communication. Instead, exchanging information with text and emoticons, videos, and photos or virtually expressing likes and loves can represent social interaction. Social media has changed human life and the way they interact with each other. Twitter's communication instruments present users with the opportunity to send, read, respond and forward information directly to others, thereby facilitating online (political) conversations (Lovejoy, Waters, & Saxton, 2012).

Participation in online political conversation is related to the concept of interactivity. Interaction is not only a symbol of the existence of civil society, but also an element of forming the public sphere (Bentivegna, 2006). Simmel (2011) proposed that in sociology, individuals, groups, or organizations took actions or make specific responses to other social subjects under certain social conditions, and then influenced each other to change the process and methods of participating in the main activities. Interaction called "social interaction" is necessary to reduce communication barriers, pay attention to dynamic feedback, and realize the input and output of complete, practical, and multi-dimensional political information. Hashtags, mentions, and retweets are the three two-way communication tools for Twitter. Using the symbol @ followed the name of the Twitter user is equivalent to pushing this tweet to the mentioned user (Lovejoy et al., 2012).

The governments have realized that the spread of Twitter news may be unexpected. The use of Twitter in government is creating new online communities that ignore traditional communication and influence. Twitter has a positive impact on political candidates. Candidates who used Twitter during the campaign received higher votes than those who did not use it during the campaign (Kruikemeier, 2014). Furthermore, using Twitter interactively had a positive impact, during the campaign, the use of Twitter by political candidates increased. This shows that Twitter is actually an indispensable platform for political candidates to communicate with voters. (Kruikemeier, 2014).

Compared with the users who visit the website of political parties, the users who visit the websites of candidates are more trusting and interested in politics. These feelings of intimacy may also lead to an increase in social influence, which may lead to an increase in turnout (Kruikemeier, Van Noort, Vliegenthart, & De Vreese, 2013). Various government agencies utilize Twitter to communicate with the public and understand their views on government affairs (Wigand, 2010).

Wigand (2010) noticed that the government could influence their voters through Twitter which occupied an innovative and essential space in electronic communications. Government agencies have found Twitter is an effective, timely, and helpful instrument, that can effectively serve news, especially in the U.S. Wigand (2010) identified four different roles of Twitter in the government:

1. Develop alliances and cooperate with stakeholders.

2. Strengthen the scope of communication.

3. Update the latest information.

4. Broadcast and share information through Twitter.

Consequently, how to evaluate the communication performance of politicians with the public on Twitter is very important.

In the turmoil of Twitter, some accounts have a more substantial influence, and they are generally called opinion leaders. Their opinions and actions on Twitter can obviously affect other users, and the information will be spread faster or blocked due to their behaviors. This social influence reflects that the behavior of certain people can change the thoughts and actions of a group in different ways (McGlohon, Leskovec, Faloutsos, Hurst, & Glance, 2007; Momtaz, Aghaie, & Alizadeh, 2011).

The relationship between the measures of influence is mainly the research basis of Twitter's influence (Antoniadis, Zafiropoulos, & Vrana, 2016). Leavitt and others (2009) considered that retweets and replies are actions that exist in Twitter that can measure the actions between users. In addition, the number of followers of the Twitter account also marks the user's influence. Based on the above, they believe that the way of thinking and it is propagation mode determine the influence of Twitter.

Accounts have three different types of influence are identified by Cha and colleagues (2010). (1) The number of followers of a user, which is the degree of influence directly indicates the number of audiences of the user. (2) Forwarding influence indicates the user's ability to generate content. (3) The reference to influence indicates the user's ability to talk with others. They compared three different influence indicators and found that the users who paid the most attention might score the highest in other indicators. Therefore, the evaluation of Twitter's influence should be multifaceted.

Another study similarly analyzed different measures of the influence on Twitter: (1) page ranking, (2) followers, (3) retweets. They found that the measurement standard determines user influence. The ranking based on retweeting is different, which is not necessarily related to the social status of users. No matter how many followers a user has, the average number of tweets retweets may reach 1,000 users. Retweets are very important for the information dissemination on Twitter (Kwak, Lee, Park, & Moon, 2010).

There are some different methods in the study of what factors impact Twitter's performance. Consider the number of other users who pay attention to as an alternative to ranking Twitter users. The first type follows few other people, and the second type follows almost as many followers as they do. Studies have shown that when evaluating the influence of a user on Twitter, the number of other people a user follows is as significant as the number of followers (Saito & Masuda, 2013).

The study also considered a content-based function to evaluate roles to estimate an account's popularity, which is usually calculated by the number of followers. Asghar and others (2014) tried to find the association between celebrity's popularity and many other characteristics, such as the frequency of celebrity's tweets and tweets' relevance to their fields. There are many invisible patterns in celebrities' use of Twitter, including calculating the frequency of tweets per day and its relationship with the number of followers. The results show that there is a correlation between tweets and celebrity domains.

Zhai and others (2014) proposed a ranking method based on topic authority for Twitter. They studied how to model the potential topic features and optimize the performance improvement function, because they suspected that was based on the author's overall popularity and tweets, without considering the author's expert knowledge of existing ranking methods for general popularity. Their results show that the reputation and professionalism of their field are closely related to the influence of their Twitter. Their experimental results of topic authority have guiding significance for microblogs.

Twitter is a platform to share important political development information, attract the public, exchange opinions, increase participation, and stimulate political debate under the background e-government (Boyd, 2008). The role played in the decision-making phase is to provide information, consult and actively participate. Information flows from the government to citizens. The government

releases decision-making information on its own initiative, or citizens access information as needed. Deliberation is an insufficient two-way relationship between government and citizens, which refers to the government solicits citizens' opinions, questions, and criticisms on administrative agencies and accepts citizens' feedback on policymaking. Finally, based on the partnership principle, active participation is a high-level two-way relationship between government and citizens. Citizens themselves play a role in decision-making communications. Meantime, the responsibility of policy formulation and the final decision lies with the government (Caddy, Gramberger, & Vergez, 2001).

Based on the above background, Antoniadis and others (2016) questioned the previous researches on measuring the impact on Twitter, which lacked a way to consider all crucial features in terms of the perspective of Twitter function. They also believe that a measure can help provide essential information in social networks. They started from the websites of the Ministry of Foreign Affairs, Development, Health, Education, Environment, and Finance of EU countries and found links to their Twitter accounts. They ranked each account by using the activities and popularity of followers on Twitter and the characteristics of the community, and recorded the following:

1. The number of followers of this account.

2. The number of followers per day (calculated on a three-month average).

3. The number of tweets.

4. The Tweets per day (calculated on a three-month average).

5. The total effective reach of well-known words.

Their analysis methods include most scholars' research on measuring Twitter's communication performance and adding supplementary approaches, primarily focusing on the research background of political communication, which is especially useful for studying the performance of political communication on Twitter.

At present, social media has undoubtedly become one of the primary communication methods for election communication. It breaks traditional communication and communication barriers and provides a bridge for politicians who are closer to the people, so that the people can better provide effective feedback on policies and related activities. The application of political communication in social media has penetrated into every corner of the world, and Twitter has become the preferred communication tool for politicians. Furthermore, to explore which communication method is the most effective on Twitter, it is necessary to understand how to correctly and comprehensively measure the influence performance of Twitter.

2. METHODOLOGY

This chapter introduces two data methods that are applied to the research of this paper. Secondary data analysis was used to analyze the context of the 2020 U.S. presidential election. Quantitative data analysis was used to analyze the tweets of Joe Biden during the 2020 U.S. presidential election, including determining Twitter's interactions impact indicators, designing content classification variables for Joe Biden's tweets, and a model for cross-analyzing Twitter's interactions impact indicators with content classification variables of Joe Biden's tweets. The aim was to identify the characteristics of Joe Biden's tweets and the factors that affect Joe Biden's tweets interactions during the 2020 presidential election. A combination of secondary data analysis and quantitative content analysis provides a comprehensive account of Joe Biden's political communications on Twitter during the 2020 presidential election.

2.1 Methods

Secondary data includes different data sources and data collected by other researchers or different forms of files. These sources of information include reports from government departments, research from the industry and commerce, documentary databases, corporate organization materials, etc. Secondary data can provide a reasonably convenient and economical way to answer different questions. The secondary data also contains a significant meaning: to analyze the data collected by the original research in a new direction (Cheng & Phillips, 2014; Johnston, 2017). Therefore, this paper obtained relevant information during the 2020 U.S. presidential election from the professional data agencies such as Pew Research Center, Statista, the mainstream media such as the New York Times, BBC, the official websites such as usa.gov, Twitter, which included the US presidential election process, election results, Twitter demographics, the basic situation of Joe Biden's Twitter account to form the context of the 2020 US presidential election.

Quantitative content analysis is a systematic and repeatable investigation of communication symbols, that is, assigning values according to effective measurement rules and using statistical methods to analyze the relationship between those values to describe the communication and make inferences about its meaning (Riffe, Lacy, Watson, & Fico, 2019). Through a large number of sample collections, this paper cross-analyzes the samples in the professional data analysis software R, examines the interrelationship between variables, explores the profound relationship between interactive indicators and Twitter text. In this part, programming language JavaScript will be used to crawl the samples (Joe Biden's tweets). Classify the interactive indicators that meet the functions of Twitter. Design Joe Biden's tweets content analysis category and variables, then find out the relationship between Twitter's influence indicators and Joe Biden's tweets content. The characteristics of Joe Biden's tweets and the interactive influential factors of his tweets are screened through the results.

Eventually, the theory framework is combined with the characteristics, the factors that affect the interactions of Joe Biden's tweets and the context during the 2020 U.S. presidential election to explain Joe Biden's political communication during the 2020 U.S. presidential election on Twitter.

2.2 Statistical analysis design

This section will introduce samples used for quantitative content analysis, determine Twitter interaction indicators, and design a content analysis table to analyze Joe Biden's tweets. The data model will be created to cross-analyze interactive indicators and variables in the content analysis table. Ultimately propose six hypotheses about the interactive factors that affect Joe Biden's political communication on Twitter during the 2020 U.S. presidential election.

1. Samples

Since the 2020 US presidential election day is November 3, all tweets by Joe Biden between January 1, 2020 and November 3, 2020 are taken as the total sample (crawled on March 20, 2021). The sample size is 1674, and the collected samples include the number of likes, the number of comments, the number of retweets, text of tweets and post time for each tweet. In order to distinguish the form of tweet content to design the content analysis model, this paper uses code to mark the text, images, links and whether retweeted others tweet of each tweet.

2. Classification of interaction indicators

Based on the previous research on Twitter and the settings of Twitter interaction functions, focusing on the ease of operation, this paper takes the number of likes, the number of comments, and the number of retweets as the impact indicators to measure the effect of tweets interaction (shown in **Table 1** blow)**,** which are important indicators to measure the performance of Twitter accounts (Antoniadis et al., 2016; Cha et al., 2010).

Table 1. Twitter's interactions impact indicators

	Likes	The number of likes of Joe Biden's tweets
Interactions	Comments	The number of comments of Joe Biden's tweets
	Retweets	The number of retweets of Joe Biden's tweets

3. Content analysis category and variables

From the perspective of Joe Biden's Twitter account as the subject of interaction, this paper excludes force majeure factors, starts with some operability and relatively controllable variables, formulate the following categories (Kwak et al., 2010; Zhai et al., 2014) , which includes 6 content categories and their respective categorical variables (**Table 2**).

Table 2. Joe Biden's tweets content analysis category and variables

Category	Variables	Description
Mention other accounts on Twitter	None; Mention other accounts;	Mention other Twitter accounts by use symbol @ (account name) in tweets
Communicational level	One-way communication	Direct one-way message
	Two-way communication	Two-way interaction, initiatively initiate topics to discuss with the public

Post time	00:01 – 08:00 08:01 – 12:00 12:01 – 16:00 16:01 – 20:00 20:01 – 24:00	Divide the time zone according to the usual work and rest time
Information sources	Original; Forward;	Whether he retweets other tweets, or he writes tweets himself
Forms of content	Words; Words + links; More than three forms;	More than three forms such as image, links, words.
Topics of tweets	Education; Economy; Humanity; Health; Policy; Suggestions and knowledge sharing; COVID-19; More than 2 topics;	Each topic is distinguished by topic-related keyword search and secondary screening.

4. Data analysis model

After clarifying the interactive indicators of Twitter and designing a content analysis model of Joe Biden's tweets. This paper uses a cross-analysis between 3 continuous variables (the number of Likes, the number of Retweets, the number of Comments) which represent the interactions of tweets, and 6 categorical variables and (or) ordinal variables (mention other accounts on Twitter, communicational level, post time, information sources, forms of content and topics of tweets). Kendall rank correlation will be used to test the correlation between the variables in the cross-analysis since it is suitable for categorical and ordinal variables. If the correlation coefficient is positive, it means that there is a positive correlation between the variables. If the correlation coefficient is negative, it means that there is a negative correlation between the variables. If the correlation coefficient is zero indicates that there is no correlation between the two variables. When the P-value is less than 0.05, the correlation between the variables is statistically significant (shown in **Fig. 2** below).
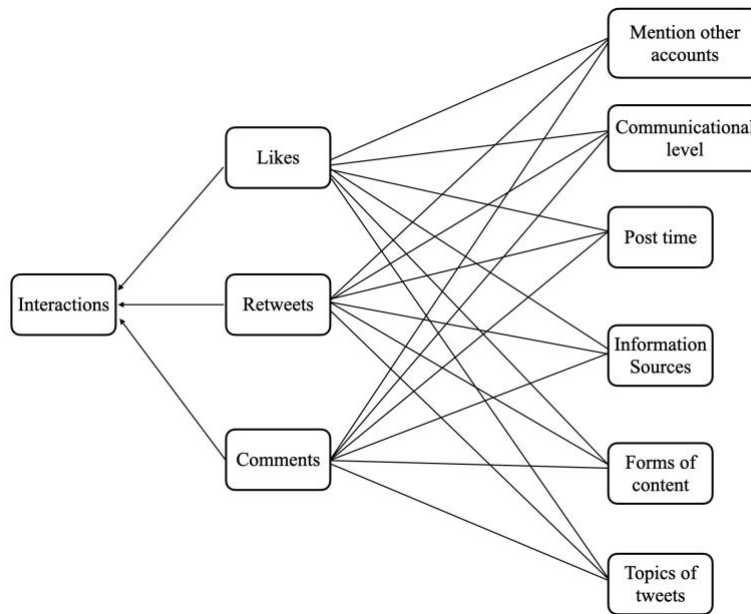
Fig. 2. Variable cross analysis model

5. Propose hypothesis

Mention is one of the important interactive functions of Twitter. Whether to mention other Twitter accounts is an essential manifestation of the interaction among Twitter users (Anger & Kittl, 2011). Therefore, this paper proposes hypothesis 1 based on the above arguments:

H1: The interactions of Joe Biden's tweets are related to whether mention other Twitter accounts in tweets.

The traditional election communication mode is party-centered communication. The main feature of party-centered communication is a one-way transmission of information, while two-way communication embodies the public-centered election communication mode with feedback. The level of communication is one of the factors to distinguish different types of political communication (Magin et al., 2017). Based on the above arguments, this paper proposes hypothesis 2:

H2: The interactions of Joe Biden's tweets are related to its communicational level.

The time of information communication has a particular impact on the efficiency of information dissemination (Burton, Tanner, Giraud-Carrier, West, & Barnes, 2012). The amount of information during the presidential election is much denser than usual. Twitter is one of the leading platforms for most Americans to browse political information (A Mitchell et al., 2016), publish information at different periods to reduce the possibility of information being submerged, and increase the effectiveness of information dissemination is essential. Based on the above arguments, this paper proposes hypothesis 3:

H3: The interactions of Joe Biden's tweets are related to its post time.

The source of information, that is, the originality of the information is a crucial consideration in distinguishing whether the publisher master the information in the relevant field, and the authority of

the field has a specific impact on the influence of Twitter (Zhai et al., 2014). Based on the above arguments, this paper proposes hypothesis 4:

H4: The interactions of Joe Biden's tweets are related to its information sources.

Different ways of presenting content are the main reason why social media is different from traditional media in terms of communication. Twitter has given various ways of presenting content such as images, links, etc., which significantly improves information display (Anastasopoulos & Williams, 2019). Based on the above arguments, this paper proposes hypothesis 5:

H5: The interactions of Joe Biden's tweets are related to its forms of content.

The traditional way of political communication is hierarchical, which has caused politicians to choose only a few political-related topics to interact with the people, while social media has broken the barriers between the people and politicians. They tend to use various topics to communicate with the public to increase the comprehensiveness of communication (Bene, 2021). Based on the above arguments, this paper proposes hypothesis 6:

H6: The interactions of Joe Biden's tweets are related to its topics of tweets.

3. RESEARCH RESULTS

This chapter will divide Joe Biden's political communication during the 2020 U.S. presidential election on Twitter into three parts based on the results of data analysis. The first part will introduce the context of the 2020 US presidential election. It includes the US presidential election process, the results of the 2020 presidential election, the demographic structure and behavioral characteristics of Twitter users, and the basic situation of Joe Biden's Twitter account. The second part will reveal his political communication characteristics according to the results of content analysis of his tweets during the 2020 presidential election. The third part will expose the interactive factors that affect Joe Biden's political communication on Twitter during the 2020 presidential election under the results of cross-analysis. The analysis in the second and third parts includes all the sample sizes obtained (1674 tweets).

3.1 Context of the 2020 U.S. Presidential Elections

This section will exhibit the process of the U.S. presidential election, the results of the 2020 U.S. presidential election, the demographic structure and characteristics of Twitter, and the introduction of Joe Biden's Twitter account, which together constitute the context of the 2020 U.S. presidential election.

1. Presidential Election Process of the USA and the election results

In general, the U.S. presidential election process includes three premises and four steps. The U.S. Constitution has three requirements for people who want to run for president: First, the candidate must be at least 35 years old. Second, the candidate must be a natural citizen of the United States (children born in the United States, children of U.S. citizens born abroad). Finally, the candidate must have lived in the United States for at least 14 years as a US resident. If people who want to run for president pass the above requirements, they can proceed with the following election steps:

Step one: Primaries and Caucuses

At this stage, different states choose potential presidential candidates based on these two methods (Primaries and Caucuses). The differences between the two election methods are how to organize and the proportional distribution of participants (USA.gov, 2021).In 2020, this stage was lasting from February to June (BBC, 2020).
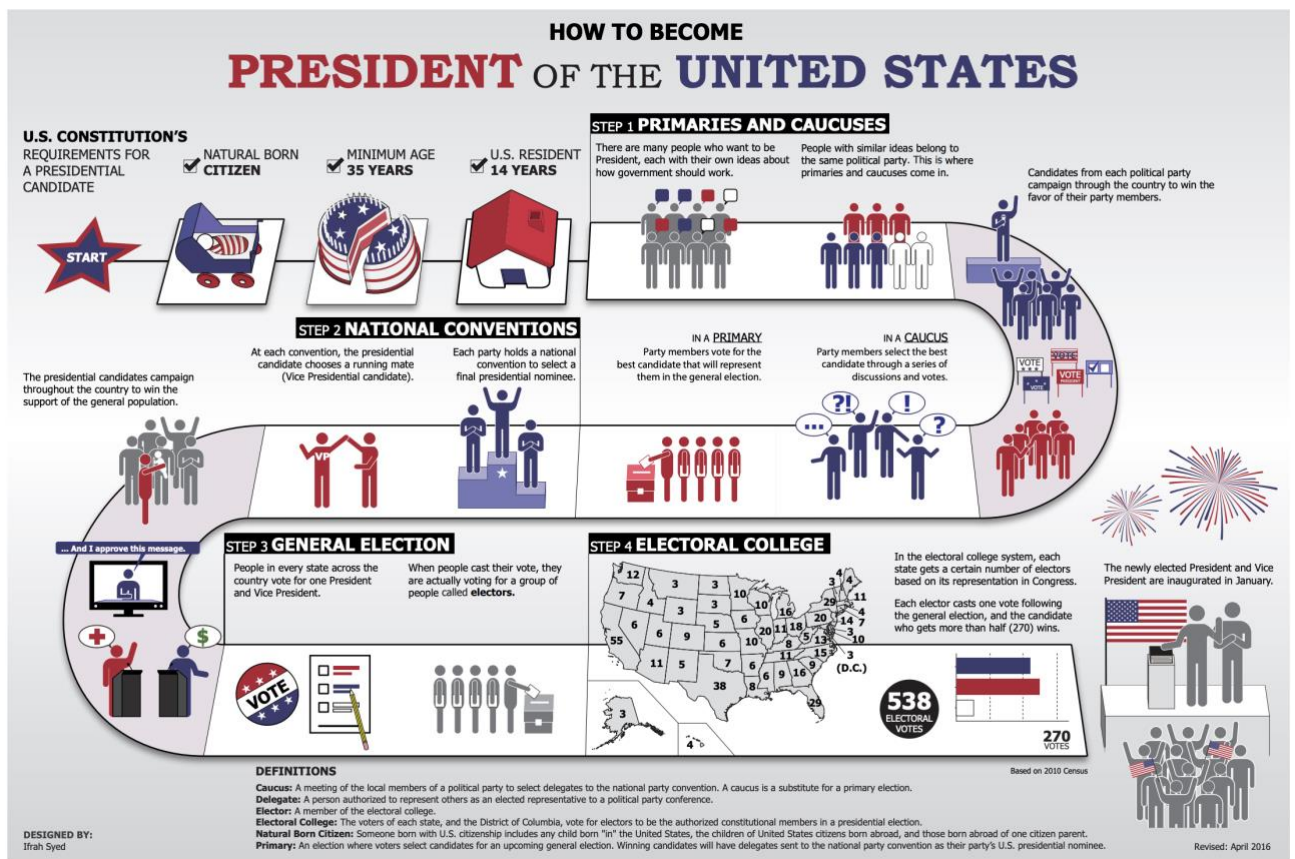
Step two: National Conventions

At this stage, different political parties complete the election of presidential candidates in the national convention, and each presidential candidate selects a vice-presidential candidate at the same time (USA.gov, 2021). In 2020, the four-day national convention was initially scheduled to be held in July. Due to the ongoing coronavirus pandemic in the United States, the convention was postponed to August 2020. The convention was eventually scaled-down, and most conventions were displayed at remote sites across the United States (The New York Times, 2021).

Step three: General Election

At this stage, the presidential candidates and vice-presidential candidates selected in the previous stage began to campaign in the country's total population. Every citizen who meets the voting criteria (American citizens 18 years of age or older) can vote for the presidential election. The number of votes cast by citizens is actually for the electors, who voted in the next stage of the presidential election (step four below). In 2020, the general election day was held on November 3 (USA.gov, 2021).

Step four: Electoral College

At this stage, Electoral College is composed of 538 electors and each elector holds 1 electoral vote. They will vote for presidential and vice-presidential candidates based on popular voting (step three). The final result of the general election is subject to electors' votes. If one of a presidential candidate's electoral votes exceeds 270, this presidential candidate will be elected to this term of the presidency, and the corresponding vice president also became the current vice president (The Office of the Federal Register, 2021).


Fig. 3. U.S. Presidential Election Process (USA.gov, 2021)

From the above presidential election process, it can be seen that the presidential candidates of each party are selected at the stage of National Conventions. After 12 rounds of internal party debates, Joe Biden became the party's presidential nominee on August 20, 2020 (Berg-Andersson, 2021). There were 7 candidates from different states in the late election of the presidential candidate within the party, Joe Biden's votes far exceeded the rest of the candidates and eventually became the party's presidential nominee entered the stage of popular voting.
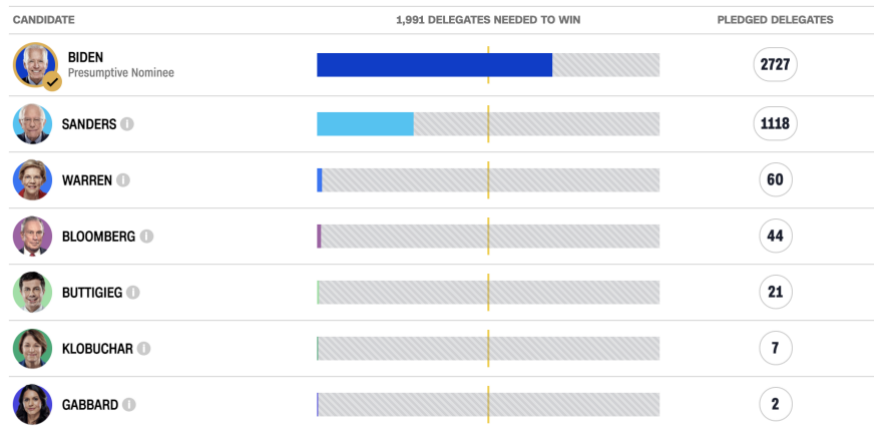
**Fig. 4.** Democratic Pledged Delegates (CNN Politics, 2021)

In the 2020 U.S. presidential election results, the candidates were Joe Biden and Donald Trump. Their electoral votes were 306 and 232, and the popular votes were 81,284,666 and 74,224,319, Joe Biden won the presidential election and replaced the 45th U.S. President Donald Trump became the 46th President of the United States (The New York Times, 2021).
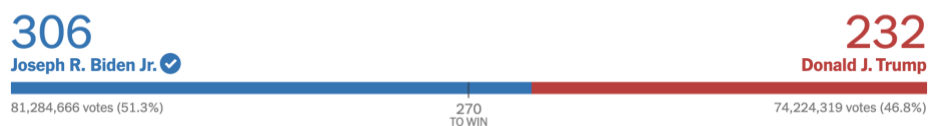
**Fig. 5.** 2020 U.S. Presidential Election Results (The New York Times, 2021)

2. Voters and Twitter

The demographic of voters participating in the presidential election in 2020 is shown in **Fig. 6**. Among them, the proportions of Joe Biden and Donald Trump's supporters in the 18-29 age group were 61% and 36%. Between the ages of 30 and 44, 54% of voters supported Joe Biden, and 43% of voters supported Donald Trump. 48% of voters between the ages of 45 and 64 voted for Joe Biden, while 51% voted for Donald Trump. For voters over 65, 48% voted for Joe Biden, and 51% voted for Donald Trump (CIRCLE analysis of AP VoteCast by the Associated Press, 2020). Younger voters were more divided in their support for Joe Biden and Donald Trump, with more young voters backing Joe Biden.
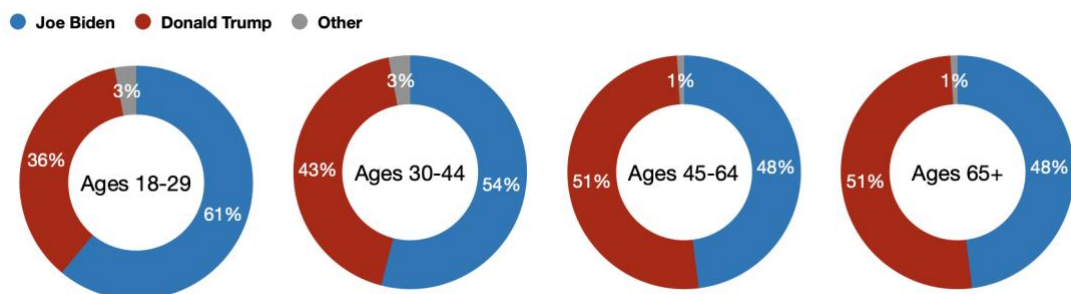

Fig. 6. Demographic of voters in the 2020 U.S. presidential election (CIRCLE analysis of AP VoteCast by the Associated Press, 2020)

The proportion of Americans who use Twitter is extremely high globally (Brian Dean, 2021), and Twitter also has its unique political features (Gottfried, 2014), which is very important for political candidates especially in the United States. It can be seen from **Fig. 7** that since it was officially released in the United States in 2006, Twitter has become a popular social platform around the world. Although Twitter continues to penetrate the world, as of 2021, the United States with about 70 million Twitter users on the top of list (Brian Dean, 2021).
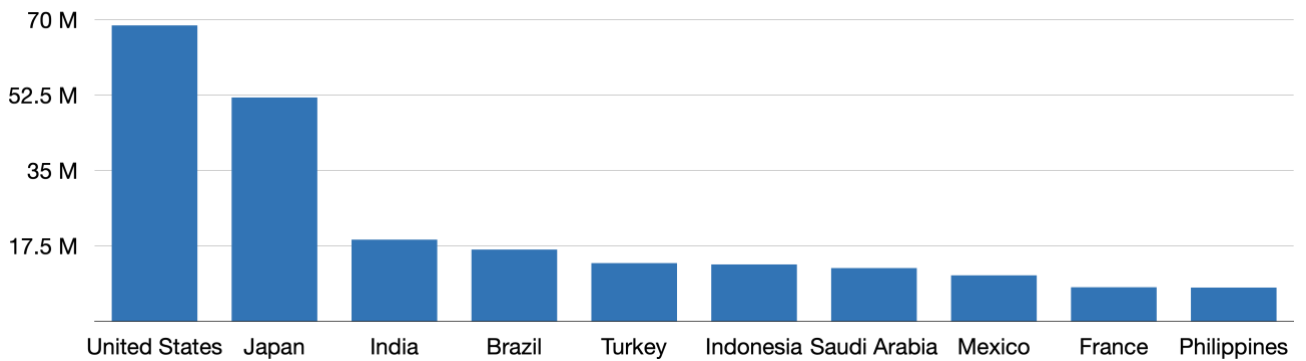
Fig. 7. Countries ranked by the number of Twitter users as of 2021(Brian Dean, 2021)

As of 2021, the demographic of Twitter users in the United States is shown in **Fig. 8**. Among them, users aged 18 to 29 accounted for 42%, users aged 30-49 accounted for 27%, 18% of users are between 50-64 years old, and 7% of users are over 65 years old. In the age group of Twitter users, young people make up the majority (statista.com, 2021).
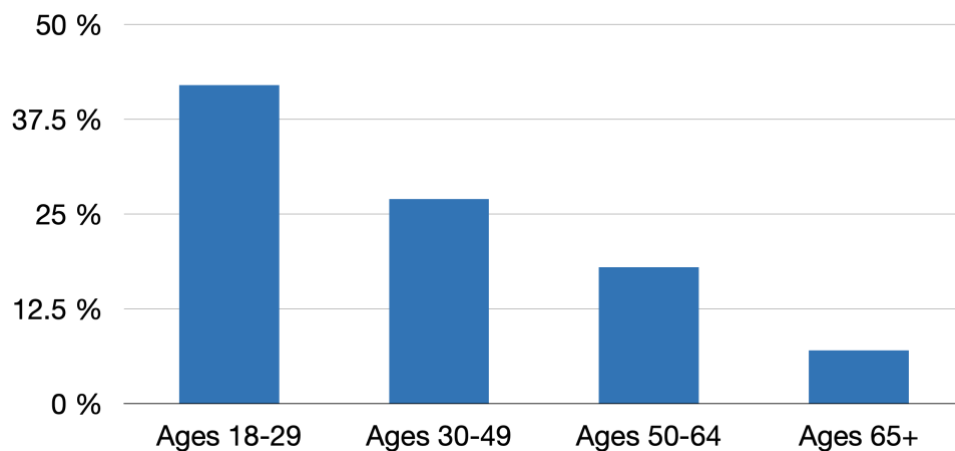
Fig. 8. Percentage of U.S. adults using Twitter by age as of February 2021 (statista.com, 2021)

Twitter is very important for political communication. The biggest difference between Twitter and other social platforms is its unique design features: (1) The maximum word limit of Twitter is 280 words. The brief information description makes the conversation clear and easy to track. (2) The public accessibility of Twitter can be seen by all users who enter the platform, which is very important for disseminating information. These make Twitter very attractive to politicians, who can communicate with individuals and use Twitter as information broadcast for efficient political communication to a broader audience (Duncombe, 2019).

Joe Biden registered to use Twitter in 2007. So far, he has 30 M followers. Twitter users have an average of 707 followers (MacCarthy, 2016), and Joe Biden's followers far exceed the average. An account of this magnitude can be regarded as a popular account. The background picture of Joe Biden's Twitter account is him with Vice President Kamala Harris, in which they both wear masks, which conveys the message that he attached great importance to COVID -19 in 2020. He indicated 4 identities in his profile, husband, father, grandfather, and president. He describes the presidential identity as "Ready to build back better for all American." The above information conveys a variety of personal messages to the public, and his Twitter account homepage presents a positive and approachable atmosphere, the old hierarchical system of party-centric political communication is eliminated


Fig. 9. Joe Biden's Twitter account (Twitter, 2021)

As of September 2020, Donald Trump and Joe Biden have 87 million and 11 million followers on Twitter. The gap in the number of their followers is quite large. Comparing the tweets' interactions on Twitter would seem unfair, but as the 2020 presidential election day approaches, the interactions of Joe Biden's Twitter account has shown remarkable changes. In February 2020, the average interactions per tweet of Joe Biden were 10.7 K, and the average interactions per tweet of Donald Trump were 100 K. By September 2020, the average interactions per tweet of Joe Biden reached 104 K, and the average interactions per tweet of Donald Trump were 103 K. From June to September, Donald Trump's average interaction rate showed an apparent and steep decline, while Joe Biden's average interactions rose slightly (Li, 2020). It can be seen that Joe Biden's communication strategy for Twitter has received outstanding results during the campaign. Even though Donald Trump's unprecedented application of Twitter during the 2016 election and has used it steadfastly since taking office, Joe Biden's Twitter account achieved explosive growth in 2020, even surpassing Donald Trump's account in many key participation indicators (Li, 2020).
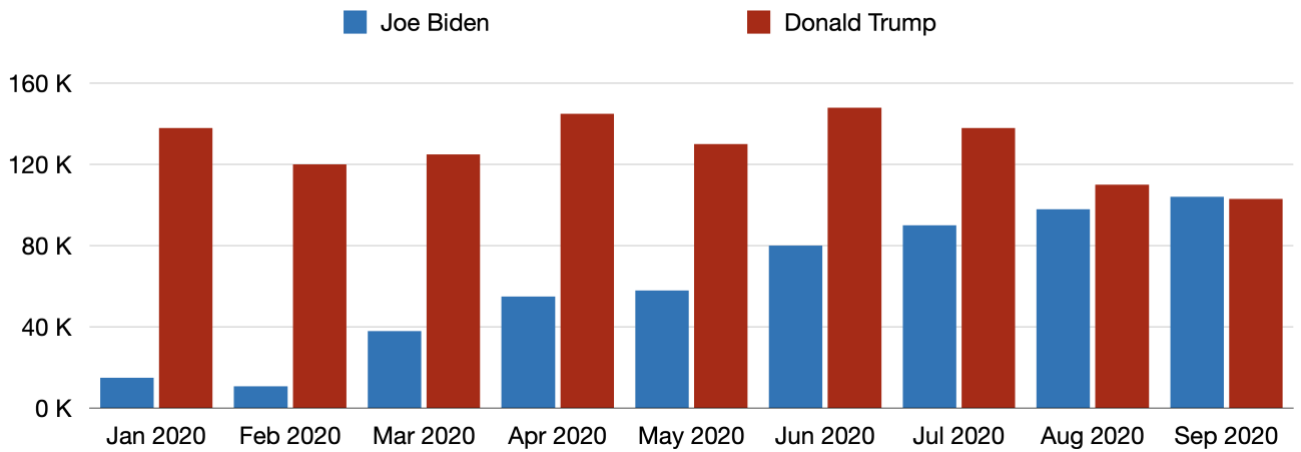
Fig. 10. Average interaction per tweet by Joe Biden and Donald Trump during the 2020 U.S. presidential election (Li, 2020)

Fig. 11 shows the comparison of the degree of party identity between American adults and American Twitter adult users. Compared with American adults (30%), 36% of American Twitter adult users identify with Democratic Party (the party represented by Joe Biden). Compared with 26% of American adults who identify with the Republican Party (the party represented by Donald Trump), only 21% of adult Twitter users identify with the Republican Party. In terms of the preference of samples of these two major parties, 52% of American adults are lean toward the Democratic Party, and 60% of American adult Twitter users are lean toward the Democratic Party. 43% of American adults prefer the Republican Party, while only 35% of American Twitter adult users prefer the Republican Party (Pew Research Center, 2019). Regardless of identity or preference, Twitter adult users have relatively high favorites for the Democratic Party.
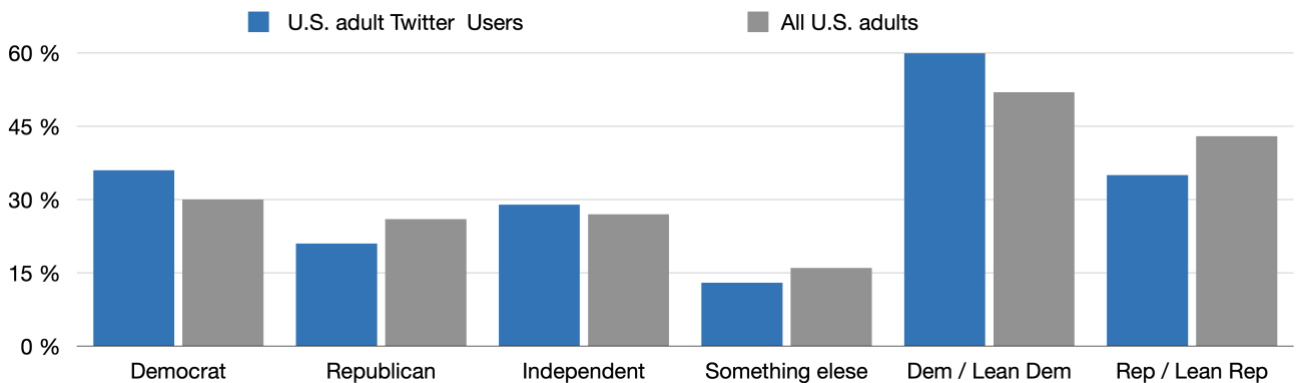

Fig. 11. Percentages of people who identify with parties or others (Pew Research Center, 2019)

There were also differences in the activity of Twitter users with different political preferences. Democrats (people who support the party that Joe Biden represents) accounted for most of active population on Twitter. The activity of Twitter users who support different parties shown in **Fig. 12**. American adults use Twitter to post articles only once a month. Although everyone rarely sends tweets on social platforms, the Democratic Party is more active in other areas (such as the number of accounts). The median number of Democrats on Twitter follows the other 126 accounts and is 1.8 times the median number of Republicans (71). In terms of tweeting, Democrats in the top 10% of

tweeters generated more than 1,600 tweets on average, while typical Republicans generated more than 800 tweets in the top 10% of tweeters (Pew Research Center, 2020).
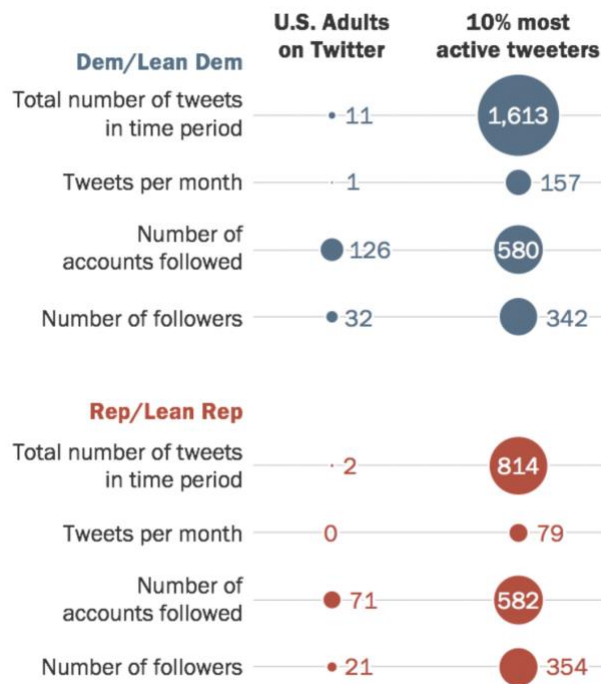
Fig. 12. Medians among all U.S adults with public Twitter accounts (Pew Research Center, 2020)

In general, Americans account for the highest proportion of Twitter users, with young Americans accounting for the majority. The political orientation of Twitter users means that the proportions of support for different parties are different, and Twitter users have a higher preference for the Democratic Party (the party that Joe Biden represents). Furthermore, Twitter users who support the Democratic Party are the most active. These indicators are enough to make Joe Biden pay attention to Twitter and use Twitter as the main battlefield to win the election.

3.2 Characteristics of Joe Biden's tweets in the context of the 2020 U.S. presidential elections

This section will reveal the characteristics of Joe Biden's tweets during the 2020 U.S. presidential election. According to the content classification table, Joe Biden's tweets are divided into whether to mention other accounts on Twitter, the level of communication, and the post time of the tweets, the sources of the information, the forms of the tweets, and the topics of the tweets.

(1) Mention other accounts on Twitter

Among the tweets in the samples, 87% (1456) were from Joe Biden's tweets that did not mention other Twitter accounts, the number of tweets that mention other accounts was 13% (218), suggesting that Joe Biden did not interact much with other Twitter accounts during the 2020 US presidential election.
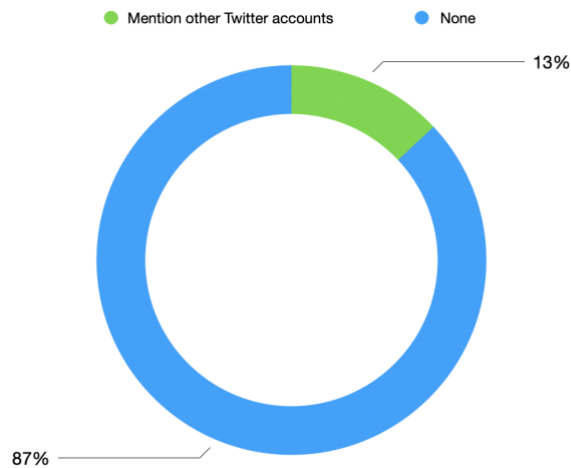
Fig. 13. The number of Joe Biden's tweets that mention other Twitter accounts

The types of Twitter accounts mentioned in Joe Biden's tweets are individuals, politicians, and official media accounts on Twitter. When he mentioned personal accounts, it was mainly to share his personal life, such as mentioning his wife's birthday (@Dr. Jill Biden). For communicating with politicians on Twitter, he mainly mentioned and commented on the work-related situations of his party members. At the same time, he also frequently mentioned Donald Trump's Twitter account (@realDonaldTrump), expressed Donald Trump's dereliction of duty as president in 2020, and respond to Donald Trump's doubts.

Twitter provides users with various interaction methods, and the mentioned functions are one of the main ways that tweeters actively communicate with other people. As one of Joe Biden's primary social media during the 2020 U.S. presidential election, Twitter allowed him to communicate directly with most people on Twitter. When he mentioned his family on Twitter, this kind of political communication is often in the form of de-professionalism. When he mentioned the Twitter accounts of other politicians, this communication method often reflects professionalism (using authoritative data and arguments to describe the tweets). When he mentioned mainstream media's Twitter accounts were essentially related to the propaganda of information (forward or comment on media reports on him or his party).

(2) Communicational level

Two-way communication is the main product of the combination of contemporary political communication and social media. Twitter has given people the opportunity to give feedback to politicians, and at the same time, it also gives politicians the opportunity to absorb the opinions of the people and make timely adjustments to policies. This two-way form of communication is the source of feedback in the political communication system.

According to the statistical results, Joe Biden has 89% (1490) of tweets for one-way communication, while only 11% (184) of tweets for two-way communication. It shows that most of Joe Biden's tweets were one-way communication during the 2020 U.S. presidential elections and the initiative to initiate topics to communicate with the public was low.
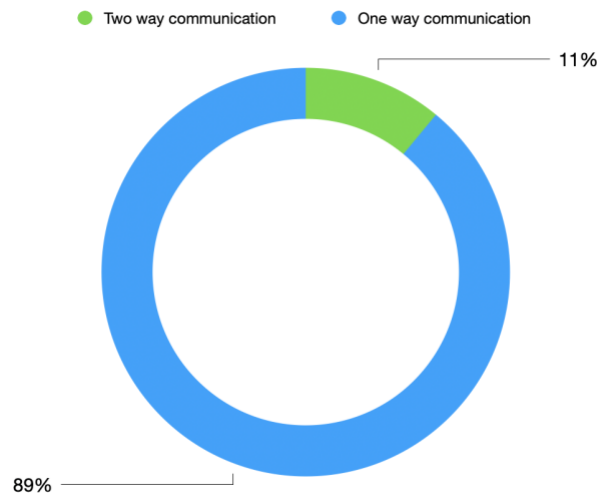
Fig. 14. Communication level of Joe Biden's tweets

Among the tweets that used two-way political communication, Joe Biden mainly initiated discussions on the rationality of Donald Trump's work, whether the American people are satisfied with the status quo, and a small amount of daily trivial discussions. Among them, the use of satirical and non-hostile narratives to initiate discussions on Donald Trump-related topics accounted for the majority, which shows that Biden has mastered the public's psychology of the public's anger towards Donald Trump in 2020, and has continuously amplified it to increase the effect of expression. At the same time, he is also committed to a suitable combination of tone and words, showing a decent personal image. The understanding of the people is also closely related to the collection and analysis of the people's social media data by the election team. With the help of professional analysis teams and cooperation with social media companies, the positioning of individuals and groups is realized, different communication methods are applied in different target groups, which is also a noticeable trend in election communication.

(3) Post time

The variables in this category are divided into five time periods, which are divided according to the usual schedule of the day. According to the statistics, only 2% (33) of Joe Biden's tweets were posted between 00:01 and 08:00,15% (251) between 08:01 and 12:00, and 27% (452) between 12:01 and 16:00, 30% (502) of tweets were posted between 16:01 and 20:00, and 26% (436) were posted between 20:01 and 24:00. As can be seen above, the frequency of Joe Biden's tweets gradually increased from 8 am to 8 pm to its peak, while the frequency of his tweets gradually decreased from 8 pm to 8 am the next day. It suggests that the timing of Joe Biden's tweets in the 2020 US presidential election is in keeping with the normal daily routine.
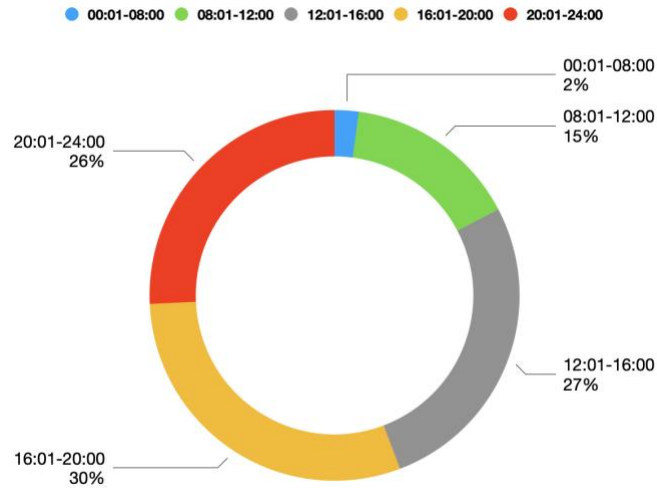
Fig. 15. Post time of Joe Biden's tweets

According to the analysis of Twitter's demographic structure, most Twitter users are aged 18-40. Most people in this age group are in the school or work stage. The daily idle time is allocated to a short period for wake-up after getting up in the morning, lunch break, and the time between coming home from getting off work and going to bed. To not affect the next day's work and study, most people choose to go to bed as early as possible when there are no particular circumstances (Gulia & Kumar, 2018). Choosing to publish messages in different periods has different effects on the communication and dissemination of information. Joe Biden followed the behavioral characteristics of most Twitter users when publishing tweets and started to add information when they were free. With the advent of night, the frequency of pushing information was reduced.

(4) Information sources

Statistics show that Joe Biden wrote 89% (1490) of his own tweets, while only 11% (184) of them were retweeted. This suggests that Joe Biden, as an experienced and highly placed politician, has firsthand knowledge of how to be original with his tweets during the 2020 presidential campaign.
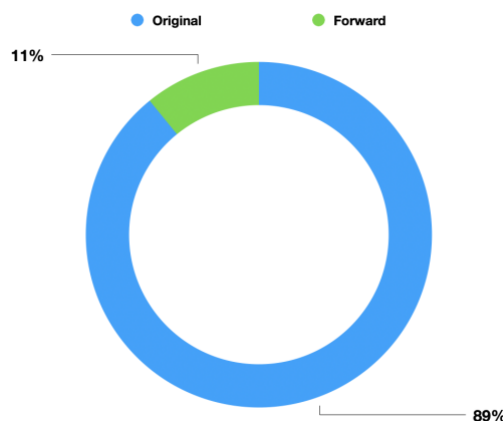

Fig. 16. The originality of Joe Biden's tweets

To some extent, the originality of information reflects the authority of the information publisher in a particular field. For politicians, it is indispensable to grasp the dynamics of national policies, the process and outcomes of policy issuance, and the fermentation of social events on time. Authority is conducive to increase the people's confidence in politicians and their parties and establish a reliable image of characters. Original information also has a certain degree of influence on the reposting efficiency of Twitter users. Joe Biden has an absolute information advantage in political stance, which has also help him in perceiving information on all aspects of the country. He mainly reposted party information, election information, and information about some socially controversial groups such as transgender groups for some retweeted tweets and expressed his support and understanding of such groups. It can be seen from the above that Joe Biden considers originality and pays extensive attention to various social dynamics to strengthen and expand the group of supporters.

(5) Forms of content

During the 2020 US presidential election, according to the form of tweets. Joe Biden's words-only tweets accounted for 38% (636) , tweets that included links accounted for 28% (469), and tweets that contained more than three forms accounted for 34% (569). This shows that Joe Biden is actively using the advantages of social platforms to combine different forms to display information to maximize communication.
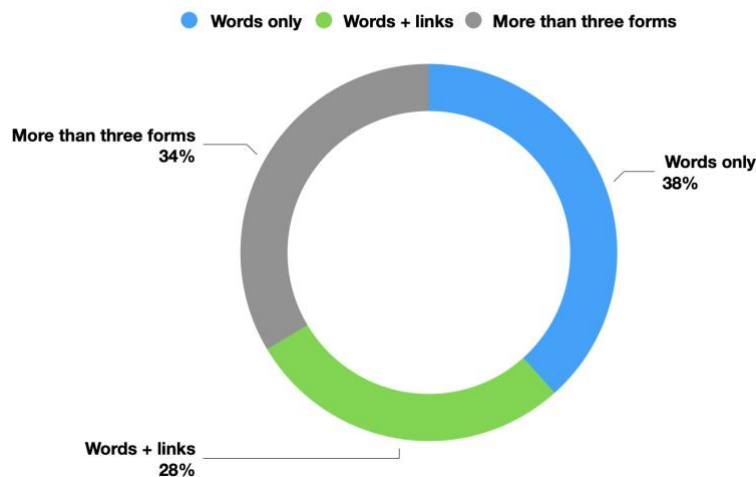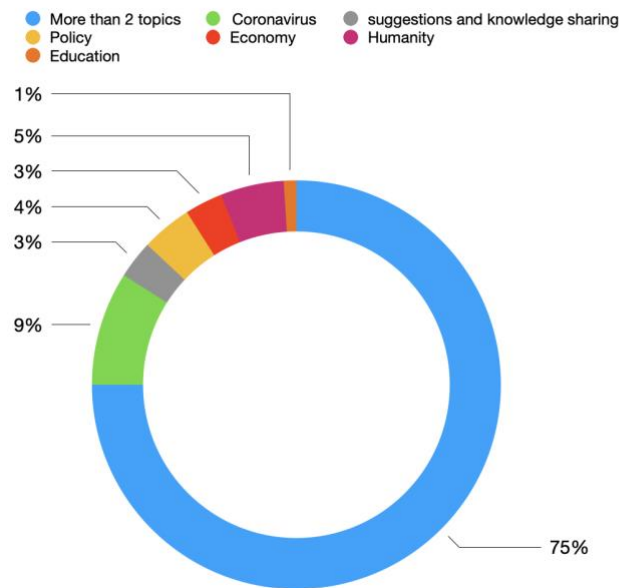

Fig. 17. The content forms of Joe Biden's tweets

The unique features of Twitter endow the information while keeping it concise without losing richness. The diversification of the forms of tweets has increased the effectiveness and distance of information transmission. Joe Biden used many content forms in his tweets, such as text, links, pictures, videos, etc., to show the accuracy and attractiveness of the information. The brief text description and vivid images can effectively attract people's attention and convey more effective messages in a short time. Most of the links in the tweets point to Joe Biden's other social networking platforms, such as personal websites, website live broadcasts, indicating that links can be used as a means of supplementing and extending information for Joe Biden. For political parties, the effectiveness of political communication is reflected in the extensibility and continuity of communication. If the people can be guided from one platform to another, it will help achieve political goals, such as campaign fundraising, stimulating voting.

(6) Topics of tweets

According to statistics, Joe Biden's tweets during the 2020 US presidential campaign were Education-related accounted for 1% (17), Humanity-related tweets accounted for 5% (84), Economy-related tweets accounted for 3% (50), and Policy-related tweets accounted for 4% (67), suggestions and knowledge sharing topics accounted for 3% (50), and Coronavirus topics accounted for 9% (151). In addition to the above 7 types of topics, various mixed types of topics accounted for 75% (1255). As can be seen from the above, Joe Biden's tweets covered a wide range of topics, covering almost the topics most people are concerned.

Fig. 18. The topics of Joe Biden's tweets

Traditional political communication schemes are limited by the shortage of communication channels and the structured hierarchy. The content and themes that politicians choose to convey are minimal, mainly in topics related to policies and laws (Gastil, 2008). With the popularization of Twitter and the transformation of communication ideology, partisans have begun to break the old stereotypes of political communication and embrace various themes to meet people's needs. It is worth noting that most of Joe Biden's tweets have mixed topics, such as a combination of personal life sharing and education-related topics, a combination of economic-related and policy-related topics etc. This form of mixing multiple topics displays the diversified aggregation of political communication on Twitter. In addition to the rest of the topics, Joe Biden paid more attention to Coronavirus than other topics in 2020. In his tweets, he has repeatedly reminded the public to protect themselves and others and insists on wearing masks. This was in sharp contrast to Donald Trump's contempt for Coronavirus. Joe Biden has a relatively large number of human rights tweets, including black lives, women, the Middle East, transgender groups, etc., revealing Joe Biden's diverse and inclusive political stance. This is also in line with the young and diverse demographic characteristics of Twitter users. It can be seen that Joe Biden's classification of the Twitter user demographic structure is unambiguous, which might laid the foundation for him to win more votes from young people during the 2020 U.S. presidential election.

3.3 Interactive influential factors of Joe Biden' s tweets in the context of the 2020 U.S. presidential elections

This section will illustrate Joe Biden's tweets' interactive influencing factors during the 2020 U.S. presidential election based on the cross-analysis model diagram. According to the results of the cross-analysis and Kendall rank correlation coefficient, 6 hypothesizes will be tested. Furthermore, the interactive influencing factors of Biden's political communication on Twitter during the 2020 presidential election will be revealed.

Table 3. The correlation coefficient of the interactive influencing factors

	Comments	Retweets	Likes
Mention other accounts	-0.1043864 **	-0.09009 **	-0.067595 **
Communication level	0.0682538 **	0.07619 **	0.063541 **
Post time	-0.0003898	-0.02303	-0.001372
Information sources	-0.0568573 **	0.02436	0.020386
Forms of content	-0.1625723 **	-0.192901 **	-0.228109 **
Topics of posts	-0.0110794	-0.01062	-0.043512 **

*P < .1. **P < .05.

(1) Mention other accounts on Twitter

Whether to mention other Twitter accounts in tweets has a significant correlation with comments, retweets, and likes. Hypothesis 1 holds, the interactions of Joe Biden's tweets are related to whether mention other Twitter accounts, which shows that whether to mention other Twitter accounts is a factor that affects Joe Biden's political communication interaction Twitter during the 2020 US presidential election.
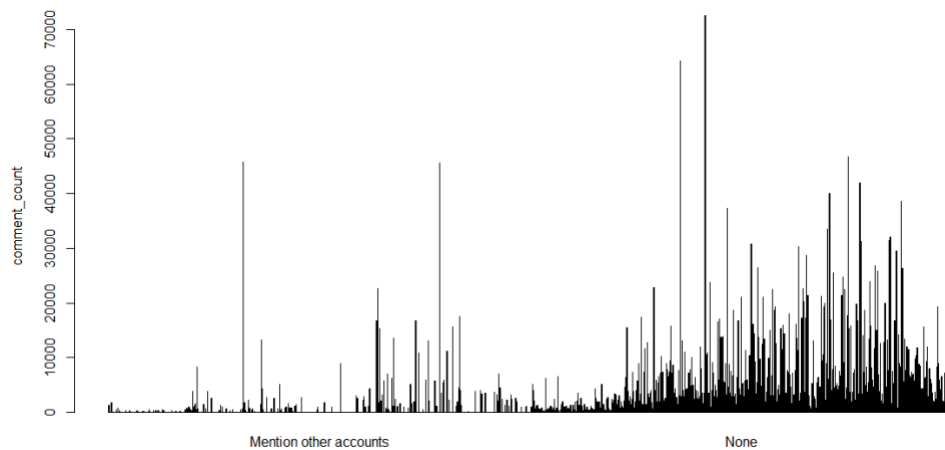
Fig. 19. Cross analysis of mention other accounts on Twitter and comments
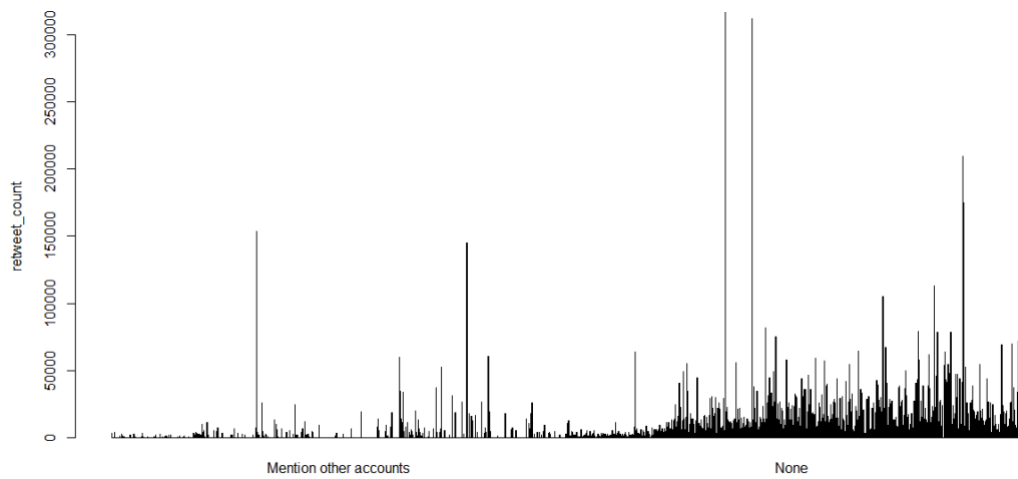
Fig. 20. Cross analysis of mention other accounts on Twitter and retweets
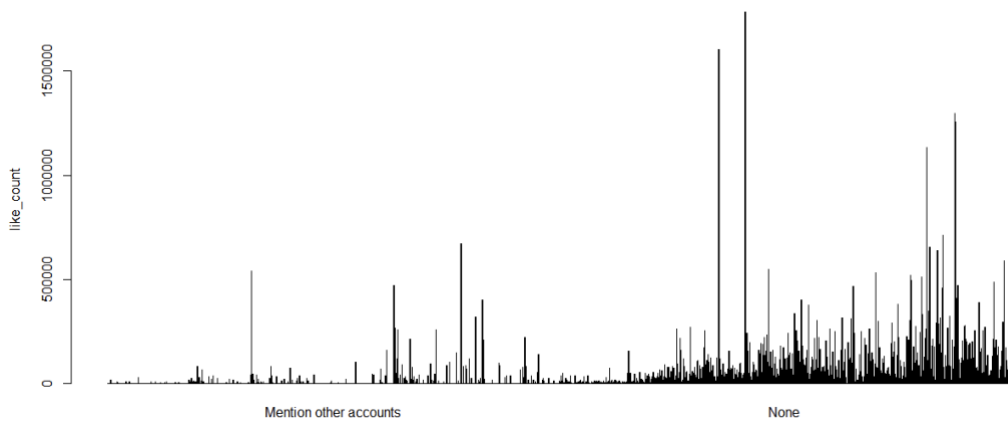
Fig. 21. Cross analysis of mention other accounts on Twitter and likes

It can be seen from the cross-analysis figures that when Joe Biden did not mention other Twitter accounts in his tweets, people have a higher interaction with his tweets. This is different from conventional thinking. That is, the mention function of Twitter is a crucial function of communicating with other people. When users use this function, they should get more interactions. However, the data analysis results did show the opposite direction. The reason may be related to Joe Biden's setting of the tweet content and the user's performance of the mention function. When Joe Biden mentioned other accounts in his tweets, he often has links to other pages, and once the users click on the links in the tweet, they randomly jump from this page to other pages without leaving a trace in this tweet. Another reason is that when he mentioned other accounts, the uses clicked on the mentioned username and jumped to the mentioned user's Twitter homepage. Hence, they did not like, comment, and retweet the current tweet. There are a few tweets that contain other people's Twitter accounts that have higher interactions. For example, when Joe Biden mentioned Donald Trump's Twitter account, the interactions for this tweet were very high. This shows that although the mention function is an effective way of political communication, it is necessary to reasonably arrange the form of the content and the focus of the content in order to obtain high interactions. This may also be related to the fact that Joe Biden only used the mention function in a small number of tweets, and he put more emphasis on his tweets to reduce the loss of interaction rate.
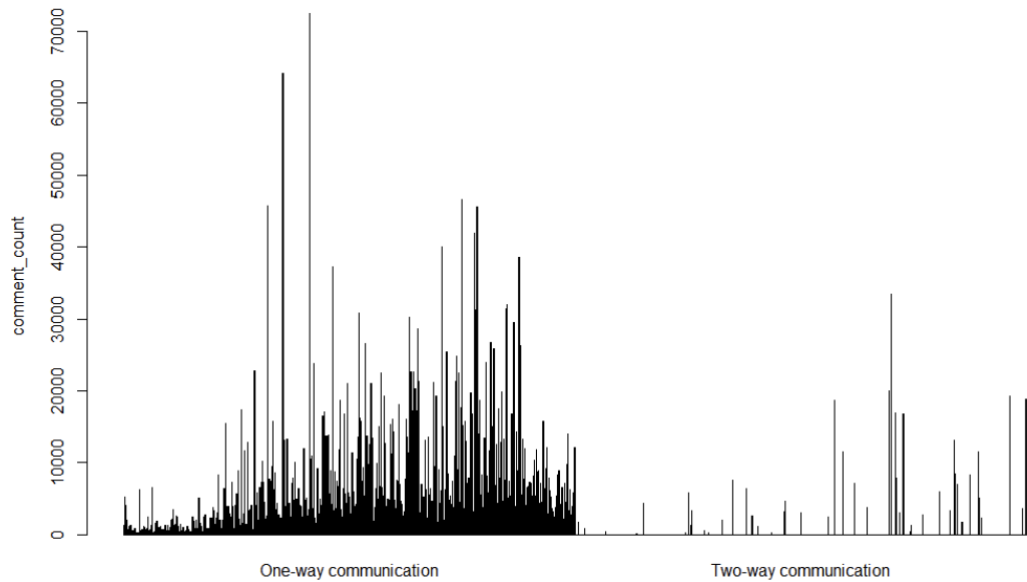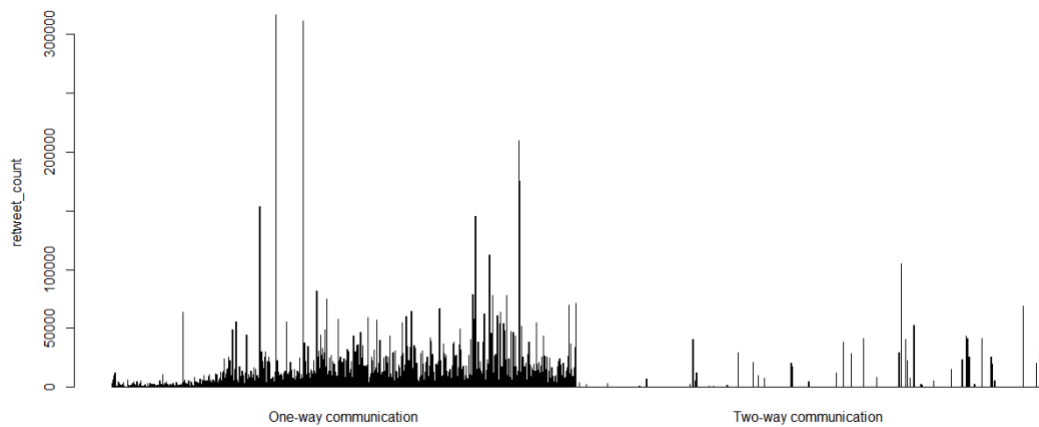
(2) Communicational level

The communicational level is significantly correlated with the comments, retweets, and likes. Hypothesis 2 holds, the interactions of Joe Biden's tweets are related to its communicational level. This shows that the level of communication is an interactive factor that affects Joe Biden's political communication on Twitter during the 2020 US presidential election.
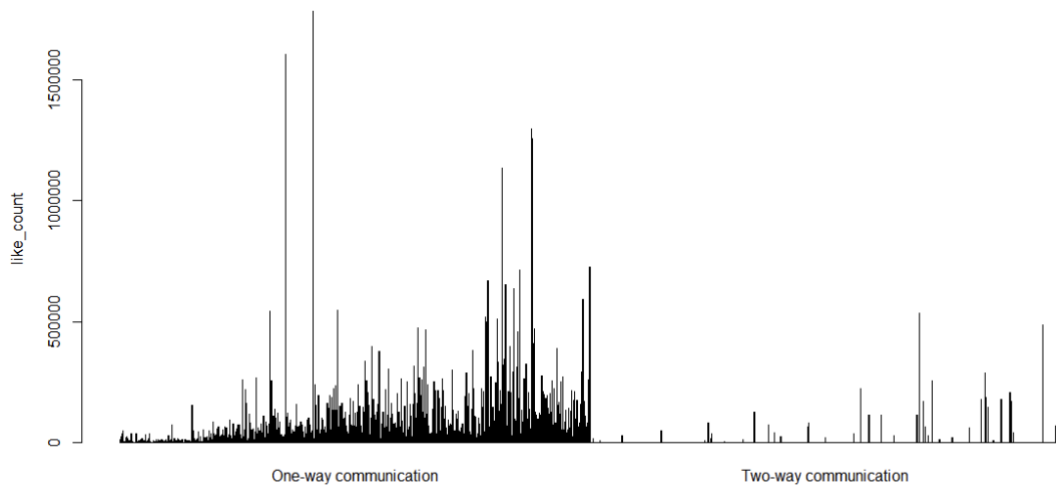

Fig. 22. Cross analysis of Communicational level and comments

Fig. 23. Cross analysis of Communicational level and retweets

Fig. 24. Cross analysis of Communicational level and likes

It can be seen from the cross-analysis figures that when Joe Biden engaged in two-way communication with users, the interaction was actually less than one-way communication. According to an analysis of two-way communications tweets, it is likely that most of the two-way communications were on the early stages of the 2020 U.S. presidential election while Joe Biden did not start much engagement on Twitter. Joe Biden has frequently been tweeting since the middle of the presidential election and is beginning to get higher interactions. Two-way communication is an essential aspect of modern political communication. In order to get high political and civic interactions on Twitter, it is necessary to manage the Twitter account effectively, increase the frequency of tweets and enrich the quality of the content. Whether it is one-way communication or two-way communication, it can reflect the effectiveness, which depends on the communicator's reasonable use of the environment, content and goals.

(3) Post time

There is no correlation between post time and comments, retweets, and likes. Hypothesis 3 does not hold, the interactions of Joe Biden's tweets are not related to its posted time. This shows that no matter when Joe Biden tweeted during the 2020 US presidential campaign, it will not affect the interactive factors of his political communication on Twitter.

(4) Information sources

Information sources only have a significant correlation with comments and no correlation between retweets and likes. Hypothesis 4 does not hold, the interactions of Joe Biden's tweets are not related to its information sources. This shows that the public has no interactive difference in whether Joe Biden retweeted others' tweets as his own tweets.

(5) Forms of content

Forms of content has a significant correlation with the comments, retweets, and likes. Therefore, Hypothesis 5 holds, the interactions of Joe Biden's tweets are related to its Forms of content. This shows that the form of tweets is an interactive factor that affects Joe Biden's political communication on Twitter in the 2020 US presidential election.
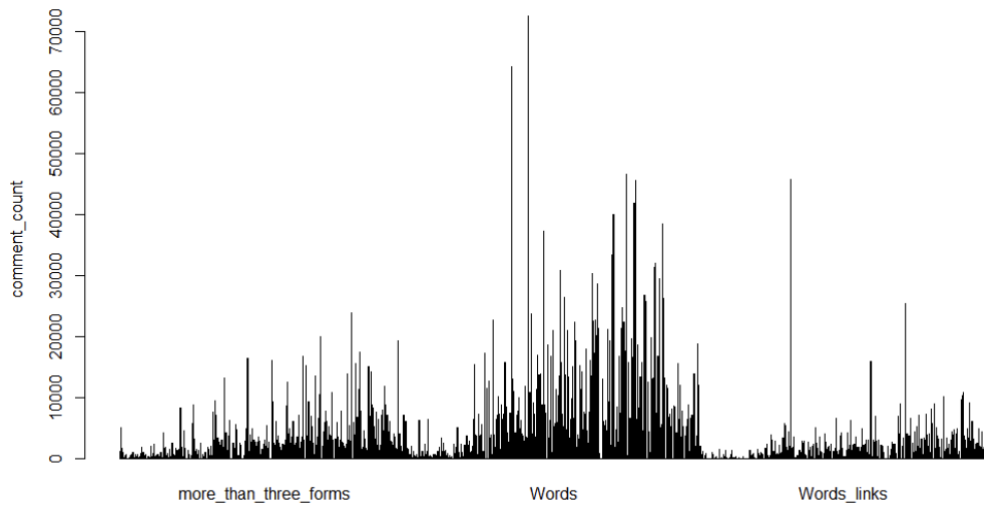
Fig. 25. Cross analysis of Forms of content and comments
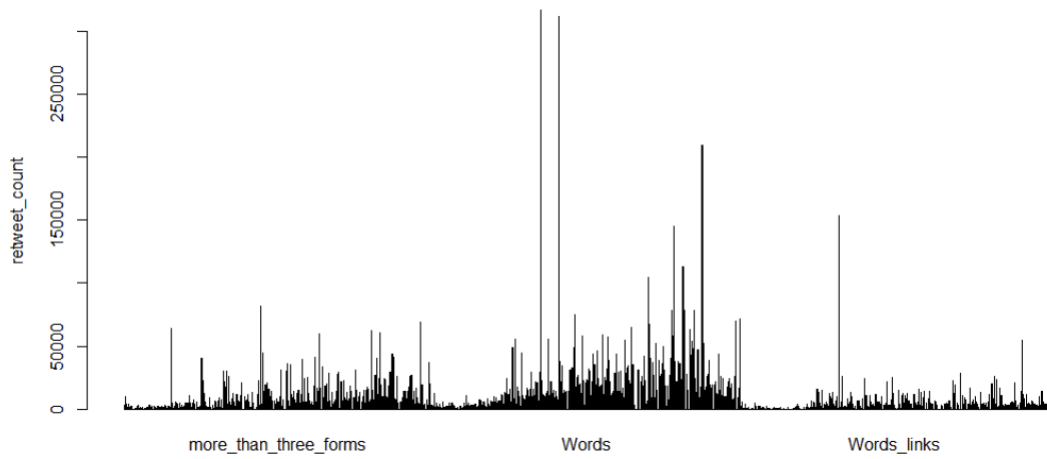
Fig. 26. Cross analysis of Forms of content and retweets
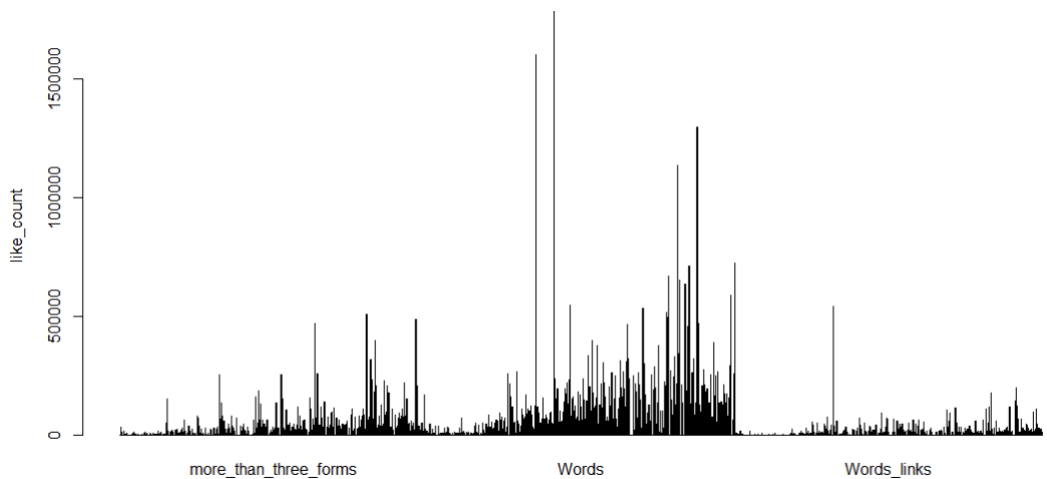
Fig. 27. Cross analysis of Forms of content and likes

It can be seen from the cross-analysis figures that tweets that only contain words get higher interactions, while tweets that combined with words and links and contained multiple content forms get fewer interactions. This may be related to links and videos as a form of content. As mentioned

above, the link acts as a bridge to connect Joe Biden's tweets and the target website, and user interaction will be lost because users have already jumped to another platform. Another reason is that Twitter can currently embed videos, and video, as a more attention-consuming form of content, will affect the user's interaction with the content of Twitter itself to a certain extent. People tend to play videos to see if it is something they are interested in, and if it is, they keep watching, rather than just turning off and browsing for more information. The cultivation of this coherent behavioral operation habit is significantly related to the development of short video applications (Deng, Yan, Sang, & Xu, 2015; Zhou, 2019). Twitter has furnished political communication to communicate with the public in numerous forms of content. The tweet itself is not that the more content forms a tweet contains, the more users can be attracted to achieve a high interaction rate. It usually requires an understanding of the target group and audience's usage habits on Twitter. Many candidates and their teams have begun to use communication marketing and micro-positioning methods to maximize their campaign goals (Stromer-Galley, 2019). By analyzing Joe Biden's tweets, we also can discover the application of the above methods by Joe Biden and the campaign team in the 2020 US presidential election.

(6) Topics of tweets

The topics of tweets are only related to likes and are not related to the comments and retweets. Hypothesis 6 does not hold, the interactions of Joe Biden's tweets are not related to its Topics of tweets. This shows the type and breadth of the topic do not affect Joe Biden's communication on Twitter during the 2020 US presidential election.

The results of data analysis show that hypotheses 1, 2, 5 are all valid, while hypotheses 3, 4 and 6 are not. In other words, the interactive factors that affect Joe Biden's political communication during the 2020 U.S. presidential election on Twitter are whether mention other accounts on Twitter, the communicational level and the forms of content.

CONCLUSION

Political communication has gradually evolved from a political party-centered communication model to a current social media-centered communication model, which emphasizes the media as a medium of communication between politicians and the public. This kind of communication process is bidirectional, interactive and always needs feedback. Contemporary political communication is equipped with social media to maximize its effectiveness. In this process, the central institutions that communicate with both sides are constantly actively adjusted and improved to achieve the goal of continuous progress.

In the context of the 2020 U.S. presidential election, Joe Biden's political communication on Twitter can be reflected in the characteristics of the tweets and the interactive factors affecting the tweets. The former reflects Joe Biden as the main body of political communication, the characteristics of the content and form of his tweets, and the law of posting; while the latter indicates that Twitter users, as the object of political communication, interact with the subject, which reflects that the effectiveness of political communication must be comprehensively analyzed in combination with the form and effect of subject-object communication.

First of all, Joe Biden's political communication on Twitter is characterized by a combination of professional and private aspects, which is embodied in the following aspects (1) The content of tweets contains personal life and political information. In other words, this is a way of combining the strategies of professional elections and de-professional elections, which is also the trend of election communication in recent years. (2) The frequency features of tweets follow the demographic attributes of Twitter users, which reflects the communication strategy of narrowcasting and microtargeting . (3) The tweets are very original. (4) Tweets cover a wide range of topics with high diversity and inclusiveness, which may be one of the main reasons why Joe Biden won the support of more young voters. It also unveils the application of political marketing strategy in Joe Biden's political communication on Twitter, that is, to understand and satisfy the wishes of voters and achieve common interests.

Secondly, in order to explore the interactive factors that affect Joe Biden's political communication during the 2020 U.S. presidential election on Twitter, this paper finds some different conclusions from mainstream viewpoints. (1) Joe Biden's interaction on Twitter is related to whether he mentioned other Twitter accounts in his tweets. When he mentions other Twitter accounts in his tweets, he gets lower interaction. (2) The level of communication is an interactive factor that affects Joe Biden's political communication on Twitter. When he uses the two-way communication model in his tweets, the interactive effect is not obvious. (3) The form of tweets also affects the interactive effect of his political communication on Twitter. When he combines links, videos, images and other content forms, the interaction effect can be ignored. The above conclusions indicate that for political communication, the choice of communication channels and the application of communication mode affect its communication. Whether it is a communication mode with interactive features or a communication mode that seems to have no solid interactive effect, it has distinctive consequences under different environments and application methods. Twitter is one of the main social platforms for political communication, and its functions in the form of rich content require thoughtful integration and utilization in order to accomplish the expected outcomes of different communication goals.

This paper conducts a comprehensive analysis of Biden's political communication on Twitter during the 2020 U.S. presidential election. The analysis method in the paper can be used as a reference analysis model for research in related fields. However, this study is limited by the sample extraction method and the limited research time, so there are the following shortcomings. (1) The variables need to be divided in more detail, such as the discourse position contained in the tweets, the analysis of the use of emoticons and modal particles. These elements play an important role in social media, being able to show subtle changes in different scenes and lead to varying results. (2) Comparison of multiple candidates. Individual communication patterns are relatively limited. If the same analytical approach can be used to compare the performance of multiple candidates on Twitter simultaneously, it will increase the diversity of communication patterns and make the analytical models used more widely applicable. (3) More data about interactive functions should be obtained on Twitter. For example, hashtag-related data on Twitter is one of the most popular interactive functions on Twitter, which is able to make information spread "virus-like" within a short period, being of great significance for studying communication modes.

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APPENDIX 1. JAVASCRIPT CODE FOR CRAWLING JOE BIDEN'S TWEETS

This code was written by me and was only used for study and research purposes (it is prohibited for commercial use).

```js
const fs = require('fs')
const path = require('path')
const https = require('https')
const dayjs = require('dayjs')

// complete headers
const headers = {}

function get(url) {
  return new Promise(resolve => {
    https.get(
      url,
      {
        headers
      },
      res => {
        let bufs = []
        res.on('data', chunk => bufs.push(chunk))
        res.on('end', () => {
          let str = Buffer.concat(bufs).toString('utf-8')
          try {
            resolve(JSON.parse(str))
          } catch (error) {
            resolve(str)
          }
        })
      }
    )
  })
}
```

```javascript
function sleep() {
  return new Promise(resolve => {
    setTimeout(resolve, 1000)
  })
}

let rows = []
let from = 'JoeBiden'
let start = '2020-01-01'
let end = '2020-12-31'
async function run() {
  let cursor = ''
  let index = 0
  while(true) {
    let since = dayjs(start).add(index++, 'd').format('YYYY-MM-DD')
    let until = dayjs(start).add(index++, 'd').format('YYYY-MM-DD')
    while(true) {
      let url = `https://twitter.com/i/api/2/search/adaptive.json?include_profile_interstitial_type=1&include_blocking=
      1&include_blocked_by=1&include_followed_by=1&include_want_retweets=1&include_mute_edge=1&include_can_dm=
      1&include_can_media_tag=1&skip_status=1&cards_platform=Web-12&include_cards=1&include_ext_alt_text=
      true&include_quote_count=true&include_reply_count=1&tweet_mode=extended&include_entities=
      true&include_user_entities=true&include_ext_media_color=true&include_ext_media_availability=true&send_error_codes=
      true&simple_quoted_tweet=true&q=
      (from%3A${from})%20until%3A${until}%20since%3A${since}&tweet_search_mode=
      live&count=20&query_source=typed_query&pc=1&spelling_corrections=1&ext=mediaStats%2ChighlightedLabel`
      if (cursor !== '') url += `&cursor=${encodeURIComponent(cursor)}`
      console.log(since, until, 'start')
      let result = await get(url)
      fs.writeFileSync('./test.json', JSON.stringify(result, null, 2))
      if (
        result.globalObjects &&
        result.globalObjects.tweets &&
        Object.keys(result.globalObjects.tweets).length > 0
      ) {
        for (let key in result.globalObjects.tweets) {
          let tweet = result.globalObjects.tweets[key]
          let created_at = dayjs(tweet.created_at).format('YYYY-MM-DD HH:mm:ss')
          let obj = {
            id_str: tweet.id_str,
            quote_count: tweet.quote_count,
            reply_count: tweet.reply_count,
            retweet_count: tweet.retweet_count,
            favorite_count: tweet.favorite_count,
            full_text: tweet.full_text,
            is_quote_status: tweet.is_quote_status || false,
            photo: '',
            created_at
          }
          if (tweet.entities && tweet.entities.media &&
            tweet.entities.media.length && tweet.entities.media[0].type === 'photo') {
            obj.photo = tweet.entities.media[0].media_url_https
          }
          rows.push(obj)
        }
      } else {
        cursor = ''
        console.log(since, until, 'finished')
        break
      }
      if (
        result.timeline &&
        result.timeline.instructions &&
        result.timeline.instructions.length
      ) {
        let entries = result.timeline.instructions[0].addEntries.entries
        for (let item of entries) {
```

```
 98            let entries = result.timeline.instructions[0].addEntries.entries
 99            for (let item of entries) {
100              if (item.entryId === 'sq-cursor-bottom') {
101                cursor = item.content.operation.cursor.value
102              }
103            }
104          }
105          if (
106            result.timeline &&
107            result.timeline.instructions &&
108            result.timeline.instructions.length
109          ) {
110            let items = result.timeline.instructions
111            for (let item of items) {
112              if (
113                item.replaceEntry &&
114                item.replaceEntry.entryIdToReplace === 'sq-cursor-bottom'
115              ) {
116                cursor = item.replaceEntry.entry.content.operation.cursor.value
117              }
118            }
119          }
120          console.log(since, until, 'end', Object.keys(result.globalObjects.tweets).length, rows.length)
121          await sleep()
122        }
123        if (until > end) break
124      }
125
126      rows = rows.sort((a, b) => {
127        if (a.created_at > b.created_at) return 1
128        else return -1
129      })
130    }
```

```
132  process.on('exit', () => {
133    fs.writeFileSync(path.join(__dirname, `../data/tweets-${start}-${end}.json`), JSON.stringify(rows, null, 2))
134  })
135
136  run()
```

APPENDIX 2. CODE USED TO DISTINGUISH TOPICS OF JOE BIDEN'S TWEETS IN DATA ANALYSIS SOFTWARE R

The code used for keyword search in data analysis software R, which was used to distinguish different topic types in tweets. When the results are obtained, in order to ensure the accuracy of the data, the obtained data can be manually screened twice.

```
138    #06TopicsOfPosts
139    full_text_row=Biden_tweets[i,"full_text"]
140    Biden_tweets[i,"TopicsOfPosts"]="Others"
141    if(grepl("teach", full_text_row )||grepl("teacher", full_text_row )||
142    grepl("school", full_text_row )||grepl("education", full_text_row )){
143      #1.teach, teacher, school, education
144      Biden_tweets[i,"TopicsOfPosts"]="Education"
145    }
146
147    if(grepl("economy", full_text_row )||grepl("tax", full_text_row )||
148    grepl("tariff", full_text_row )||grepl("bank", full_text_row )||
149    grepl("trade", full_text_row )||grepl("$", full_text_row )){
150      #2.economy, tax, tariff, bank, trade, $
151      Biden_tweets[i,"TopicsOfPosts"]="Economy"
152    }
153
154    if(grepl("Humanity", full_text_row )||grepl("human", full_text_row )||
155    grepl("women", full_text_row )||grepl("black", full_text_row )||
156    grepl("Asian", full_text_row )||grepl("middle east", full_text_row )||grepl("family", full_text_row ||
157    grepl("transgender", full_text_row
158     )){
159      #3.Humanity, human, women, black, Asian, middle east, family, transgender
160      Biden_tweets[i,"TopicsOfPosts"]="Humanity"
161    }
162
163    if(grepl("Health,", full_text_row )||grepl("healthy", full_text_row )||
164    grepl("health care", full_text_row )||grepl("health insurance", full_text_row )||
165    grepl("hospital", full_text_row )){
166      #4.Health, healthy, health care, health insurance, hospital
167      Biden_tweets[i,"TopicsOfPosts"]="Health"
168    }
```

```
167
168    if(grepl("Policy", full_text_row )||grepl("policies", full_text_row )||
169    grepl("law", full_text_row )||grepl("laws", full_text_row )||grepl("ban", full_text_row )){
170      #5.Policy, policies, law, laws, ban
171      Biden_tweets[i,"TopicsOfPosts"]="Policy"
172    }
173
174    if(grepl("please", full_text_row )||grepl("make sure", full_text_row )||
175    grepl("follow", full_text_row )){
176      #6.please, make sure,  follow
177      Biden_tweets[i,"TopicsOfPosts"]="Suggetions"
178    }
179    if(grepl("COVID", full_text_row )||grepl("corona", full_text_row )){
180      #7.COVID, corona
181      Biden_tweets[i,"TopicsOfPosts"]="Coronavirus"
182    }
183  }
184
```