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**Abstract**—The article aims to explore the relationship between social media and productivity. It focused the productivity in two aspects: organization and individual. For the organization, previous researches about using social media in the field of education, business and government were respectively analyzed and discussed. For the individual, we analyzed the researches about the impact of social media on personal work. After summarized all the findings, we found that social media could help to improve the productivity of human in general although it also brings some negative impacts. For the organization aspect, social media could be a powerful supplement to the formal pedagogical practice in the field of education; could help to develop market, provide customer service, research marketing conditions, recruit employees, and enhance internal communications in the field of business; could be a potential powerful tool that help the government to improve the transparency, increase the public participation, and better collaborate with citizens. For the individual aspect, social media provide work related information, work opportunities, new work positions, and new work styles. But it also could cause problems such as social addiction, harassment from malicious person, and information security issues.

**Keywords**—social media, productivity, education, business, government

I. INTRODUCTION

Speaking of the social media, previous researchers have proposed many different definitions of it. The simplest explain was “the media we use to be social”, which from a book of Safko [1]. Most of the researches highlight the technology aspects. They explain social media as “communication technology”, “interactive dialogue platform”, “internet-based applications”, or “channels for communication, collaboration and creative expression” [2][3][4]. However, also some researchers focus on the collective behaviors that social media lead, for instance, Smith et al. described social media as “collective goods produced through computer-mediated collective action” [5].

There are many popular social media tools in the market, such as Facebook, Twitter, Instagram, LinkedIn, YouTube, Pinterest, WeChat etc. Based on a research from Lister,79% US internet users use Facebook, and 81% millennials check Twitter every day [6]. The usage rate is very high. This situation is similar to another country. Based on a report of China Channel in 2017, more than 800 million Chinese use WeChat monthly, which number is more than 90% of all national internet users [7]. The sweeping popularity of these social media made them almost integral parts of people's lives.

However, a question worth pondering is: does the social media increase or decrease the productivity of human?

The present article analyzed and summarized the previous researches, and try to answer the following questions: Does social media increase or decrease the productivity of human? In what ways it helped to increases or decrease the productivity? What can we learn from the previous researches? What can we do in the future?

At the beginning, the article explained the characteristics of social media, differentiate some similar terminologies. And also introduced some theories related to social media. After that, two main aspects be discussed respectively, the organization and the individual. For the former aspect, three fields of the researches were respectively analyzed, which are using social media in education, in business and in government. For the latter, the research focused on individuals. Discussed that how social media impact personal work. Followed by the conclusion, limitations and future work.

The results of the present research would give an overall impression of researches about social media and productivity. These findings can be used as the preparation for the future research.
II. SOCIAL MEDIA

A. Differentiate similar terminologies

There are two terms that people sometimes interchange with social media, which are Web 2.0 and User Generated Content (UGC). However, they are all different from each other. Carefully compare the three terms could help us deeper understand their differences.

The concept of Web 2.0 was created in 2004 to differentiate the new interaction way from the previous Web 1.0. In the early days, the internet contents were created by developers or some specific individuals. Most of users just passively received information. When developed to Web 2.0, things have changed, all of the users participated in the information production. People could interact with each other easier and more convenience. User Generated Contents, as the name suggests, represents all kinds of contents that created by people when using social media. After distinguish the two terms, we can understand that social media is closely linked with these two terms, but somewhat different. It can be described as a tool that uses Web 2.0 as foundation, and allows users to create UGC [4].

Social media makes it possible for everyone to produce and publish information. The information can be read by other people, even if some them live in remote places. At the same time, the information also be saved on the Internet and can still be found by search engines many years later. Social media democratize information, and makes people's communication break the limits of time and space.

B. Small world hypothesis and social media

Travers and Miligram conducted an experiment in 1967, in which they let some subjects to mail a letter to a particular stranger. They found that any two strangers can be linked by only six intermediate persons [43]. The result of the experiment was proved by two Microsoft researchers Jure Leskovec and Eric Horvitz in 2006. They compared and analyzed the data generated by 240 million users, and found that any user can linked with the full 1,800 billion databases by only averaging 6.6 intermediate persons [44].

The social media increased people’s connection. With the popularity of social media today, the number of intermediate persons among people has gradually decreased. One of the proofs is the research result that published by Facebook on 2016 [45]. In this research, the Facebook team analyzed the information of 1.59 billion Facebook users and found that the interval between people was 3.57 persons.

From the research of Travers and Miligram to the research of Facebook teams, almost fifty years have passed. The main way people communicate slowly changes from offline letter to online social media. The transformation of communication ways brought more than just makes people closer to each other, it further changed people’s behaviors and lifestyle.

C. Dunbar’s number and social media

British anthropologists Dunbar have found that due to the physical limitations of the human brain, the maximum number of maintain close personal relationships with others is about 150 for most of people [46]. When the number of people in a group is less than 150 people, the group members can be well-acquainted with each other. Many teams have a scale of 150 or less because of this theory.

However, things changed when the internet and social media became popular. Most of social networks such as Facebook does not limit the number of people's friends. In contrast, they always recommend new friends to people. If you are a Facebook user, you may often receive emails for recommend new friends. A study from Walther et al. found that students have average 246 friends on Facebook [47].

Many studies have found that people tend to have more friends online. The reason for the difference between online and offline could be the mechanism of different social media. For a Facebook user, every friend can see the new information s/he posted, which means one post can keep in touch with all friends. As long as the user often posts information, the friends can often know her/his current status. On the Internet, people could spend less time and effort to maintain social relationships. Sometimes the cost of communication is just to use a finger to like a post. On the contrary, if a person wants to maintain relationships with her/his friends offline, s/he must spend more time and energy, such as meeting and chatting with friends frequently.

D. The classification of social media

Social media covers a wide range of software and applications, such as the video sharing website YouTube, image posting website Instagram, micro blog website Twitter, and even role-playing game World of Warcraft. Researchers categorized social media based on different dimensions. These categories are important for the analysis of social medias.

Figure 1 is a conversation prism created by Brian Solis and JESS3[42], which divided social media into
different groups based on the different functions. The groups included: social networks, blog/microblog, expert Q & A, comments, social commerce, social streams, location, nicheworking, enterprise messaging, wiki, discussion & forums, business networking, service networking, reviews & ratings, social curation, video, content networking, events, music, livestreaming, imagery/album, social bookmarking, influence, quantified self, messaging, crowdfunding, travel & hospitality, and connecting IRL.

Kaplan and Haenlein came up with a classification scheme of social media [4]. It based on two dimensions: the first dimension is media research, manifested as social presence or media richness; the second dimension is social processes, manifested as self-presentation or self-disclosure. Details can be found in Figure 2.

Smith et al. created another classification scheme [5]. They divided social media according to different granularity and rate of exchange. Figure 3 shows the details.

In the present study, to analyze the relationship between social media and productivity, we differentiated social medias according to two dimensions: the purpose people use the social media and the focus range of the social media. The details can be found in Figure 4.

According to our category standards, the social media like Canvas and GitHub are focus narrow and more related to work; Linkedin and Slack are focus wide and related to work; YouTebu, Pinterest and Spotify are focus narrow and related to leisure; Facebook and Google+ are focus wide and related to leisure.

But it should be note that this category is not immutable. Because people always use tools the way they like. For example, some teachers use Google Form to collect information from students. Google Form is not a social media, but at this circumstance, it does what social media should to do.
E. The connection between social medias

Although there are many different types of social media. But instead of isolated from each other, most of the social media connected to each other, especially when many social media were published by the same company. Users can use one account to log in both Facebook and Instagram. Actually, one software would recommend some friends based on the friends on the other software.

For many people, some of the friends on different social media are the same.

Many users do not use only one social media. Instead, they could use several social media at the same time and use them on different scenarios. Such as one communication tool for work matters, another one for life trivia. Or they use different social media at deterrent time. For example a person using a social media in his/her own country and change to another social media when go abroad. This makes things more complexed.

III. SOCIAL MEDIA AND PRODUCTIVITY: THE RESEARCH PATH OF THE PRESENT ARTICLE

Productivity is an abstract concept. To research productivity, the best way is to visualize it as some specific objects. The present literature researched productivity from two main perspectives: organization and individual. The aspect of organization mainly focused on three research fields: using social media in education, in business and in government. The aspect of individual analyzed the researches about the influences that social media bring to personal work.

IV. SOCIAL MEDIA AND PRODUCTIVITY OF ORGNIZATION

A. Using social media in Education

How to improve the quality of teaching and learning is a question that has always been thinking in education. From the social learning theory point of view, collaboration is a very important aspect. It treats study as a social collaboration rather than an individual acquisition activity. Previous researches proved that collaborative learning is more effective than traditional learning [9].

Social media has the potential to rebuild the learning environment. It could help to break the limitations of the traditional classroom teaching, give students and teachers more opportunities for interaction or collaboration, and link the theory in book with the real life [10].

Many researchers found that using social media as learning aid could bring positive impacts [11] [12] [13] [14], and enhance students’ learning experiences [15]. However, a suitable way need to be found. For example, although the research affirmed the positive effect the Facebook will have on education, scholars also found that the receptivity of students is not so high. They tend to treat Facebook as a social app rather than a learning app. If a student and a teacher become friends, the student will more curious about the teacher’s personal information [15]. Based on previous studies, students use Facebook about 10 to 60 minutes every day. However, 85% students use it for communicate with their friends. Rarely students use it for academic use [15] [16] [17] [18].

A research from Manasijevic et al. also suggested that only 23.1% of students said that Facebook give positive impact to their study[19]. More than three quarters students still think Facebook is for social purpose.

In addition, Chen & Bryer suggested that it is possible the social media would cause the reduction of the students’ achievements, because of the distracted by use of the social media [10].

The overuse of the social media indeed worth people’s attention. A research from new port academy found that about 59% parents feel their children addicted to mobile phones, and about 50% young people think so, too [20]. The term of “Facebook addict” already added into the Urban Dictionary, a slang dictionary for English language [4].

For the relationship between Facebook and learning performance, there are many scholars conducted studies. However, the research results are not so same. Junco [21] and Kirschner et al. [22] found that the time using...
Facebook and the GPA have significant negative correlation. Whilst, Lambic did not found obvious correlation between normal usage of Facebook and academic performance [13]. The reason for this difference could be caused by the differences of the researches samples or the methods. In addition, it is possible that there are individual differences when using Facebook, such as the variety personal purpose or habits.

Most of the researchers tend to agree that social media is a good supplement to the traditional education, although there are still some complicated factors. Some researches indeed found that more and more teachers start to use social media in their pedagogical practice, and for some students, social media is an informal way to study [3] [10]. Different from the formal classroom education, the social media will drive students by interest, and use a different assessment system, which will give students a different learning experience.

Apart from the teaching and learning, we cannot ignore other benefits aspects that social media bring. For example, there are many internship and job opportunities on Facebook, LinkedIn or other social media. Students especially graduate students could benefit from them [10].

B. Using social media in Business

As the development of the social media, most companies treat it as an important channel for marketing, customer service, recruitment and products innovations. The emphasis on social media has also spawned new occupations, for instance, social media manager, architect and analyst [23].

Many companies use social media as a way to promote the company’s image and enhance its influence. According to a statistic report by Smith [24], there are over 60 million active business pages on Facebook. These business pages have earned them a lot of followers. Coca-Cola have more than 100 million followers, and McDonald’s have more than 76 million. These are incredible numbers; no companies will ignore such a large user base. To engage the users, the companies often posts new information and hold interesting activities.

Social media activities are great way to enhance the Company’s reputation. A research from Dijkmans et al. found that there is a positive correlation between the engagement in the company’s social media activities and the company’s reputation [25]. It is an important aspect of maintaining corporate reputation.

The impact of social media is more than information aspect, they can even help companies to get real profit. Dell stated that they benefit 1 million dollars by sale alerts on Twitter, although this micro blog can only send 140 words at a time [4].

Social media also bring higher satisfactions to the sales services. the research from Agnihotri et al. [26] found that salespersons use social media could increase their overall information exchange. Customers also attach great importance to this communication, and the salespersons’ response have a positive correlation with the customers’ satisfaction.

On the other hand, due to the large number of user base on the social media. It is possible that market researchers conduct researches via this platform. Kozinets [27] mentioned a research method called “netnography”, which evolved from the traditional ethnography. By using the online community instead of the traditional ways, it is easier, faster, more flexible and cost less. Cooke and Buckley describe the future ways of market research, include new types of “participatory panels” and “research communities” [28].

In addition to serving as a conduit for customer services and marketing research, social media can also serve as a way to recruit new employees. Companies found that social media is an effective way to recruitment. It also could bring positive impact to the employer brand [29] [30]. People tend to believe that hiring and job seeking via social media will be more common in the future.

Social media not only can be used to communicated with outside people, but also can serve as an internal communication tool. A typical example is Cognizant, which is an US company provided IT services. There is an internal social media platform in the company. Every employee has an account, from which other colleagues can know his/her work-related information such as job roles or professional field and personal information such as hobbies. Employees share their knowledge and work experiences on the platform. There are more than 1 million blogs created by the employees, and about 80% employees read and communicate via this platform [31].

However, not everyone appreciates the social media embedded in the work environment. Some employees worried about the work will invade their personal life [32] [33]. It is also need to pay attention that the use of social media in the workplace could cause potential information security risk [34].

C. Using social media in government

Many scholars believe that the social media and the internet technologies are potential powerful tools to help
improve the transparency of the government, increase the public participation, and strengthen the collaboration between the government and citizens. The term of Democracy 2.0 and Government 2.0 have been put forward [35] [36].

Figure 5 shows the theoretical model of e-government (Web 1.0) and social media (Web 2.0) when using in government affairs. In e-government model, citizens can only passively receive information. Whilst, in social media model, the government, business and citizens can communicate with each other.

![Figure 5: Theoretical Implications of Social Media](image)

It was found that there is a positive relationship between the citizens’ trust in government and good interact experience when use government website[37] [38]. The impact of interaction with the government website is greater than the impact of the government itself [38].

Although many government have updated their website, the results did not very satisfactory. The communication between the government and citizen still tend to be traditional one-way communication rather than positive interaction.

The research conducted by Brainard and McNutt [39] analyze the relations between polices and citizens when using social media (Yahoo) as communication tool. They found that the relations are more likely one-way, police-led type rather than interactive with each other. They describe it: a new tool was being used to implement an old system. The research result shows that administrative innovation is not a simple update; it takes time.

Greitens and Strachan held a research about the US state government website [40]. They would like to understand whether they use this technology increase the citizens’ participation in politics. They found that much of the government’s information is presented in the form of “billboards”. It cannot effectively arouse the interaction and participation of the citizens. The information is not symmetrical, so most of the citizens just passively accept the information. It seems that the government is not very positive about this. One explanation is: there is a possibility that the government don’t want to give up the control [36].

V. SOCIAL MEDIA AND PRODUCTIVITY OF INDIVIDUAL

A. Get more work-related information

Social media provide new work chance for people. The most obvious aspect is the expansion of work contacts and the acquisition of recruitment information. By social media, people can keep in touch with more people, which could bring good impact to their career. For business social media website such as LinkedIn, it is an attractive feature for users.

In addition, social media provide many opportunities for people to learn knowledge and work skills. There are many free and paid courses on YouTube and Facebook. For individuals, these methods can help people improve their work efficiency indirectly.

B. New work style: gig economy

Social media influences work far beyond provide work-related information, and it also provides new job types and positions.

With the rise of social media and platforms, a new term begins to become active: the gig economy [48]. It means the people’s working hours are more flexible and even not directly affiliated with a company. This type of work is more common in the Internet or creative industry. Gig workers usually only sign short-term contracts with the company and receive compensation based on the output of the work project or based on the work hours. Gig economy platforms such as Fiverr and Upwork provide more work opportunities for people.

Gig work style could be more spread in the future. Several researches predict that there will be more than 40% of US workforce will be freelancers in 2020 [53] [54].
C. Personal media as a form of work

Furthermore, social media itself also serves as a new platform for work. The characteristic of social media is to allows every person become a media publisher. One of the phenomena that this situation produces is some people become very popular online. These people are internet celebrities or internet stars. The successful internet celebrities could have millions of fans. Their influence has caught the attention of many companies, especially the clothing and beauty industry. Many internet celebrities began to use social networking sites as the main profit-making method. They put advertising information on their social media accounts to earn income from product manufacturers. At the same time, they share their lives online and interact with their fans to maintain their popularity.

However, some people thought that social media reduces their productivity or make them unhappy. Social addiction prevents people from doing their job well. Even for the internet celebrities who use social media as their main working tool, there are also such problems. Essena O’Neill is a 18 years old Australian who has more than half a million fans on Instagram. She could earned more than $2000AUD a year. But she deleted more than 2000 pictures and quits from Instagram on 27 October 2015. Because she thinks her real life is being deprived of virtual life [49]. Some celebrities also could endure harassment from the malicious person on social media. In addition, as a public celebrities, how to protect their information is always important.

VI. FUTURE OF SOCIAL MEDIA

A. Mobile devices will be more used

In recent years, the ownership and usage of mobile phones have grown very fast, especially in developing countries [8]. Some people there might not be able to afford a computer, but most of them can afford a smartphone. The portable and easy of using mobile devices made more and more people to use the phone rather than computer [4].

The popular use of smartphone had made some changes to social media applications. Most of the social medias actively developed themselves to meet the mobile market.

A new term, mobile web 2.0 also be mentioned, which characteristic is open standards and flat-rate systems [4]. In the future, all the items could connect the phone automatically and sent their URL to the users. Manually entering the URL will no longer be needed. The development mobile also points the way for future innovations of social media.

B. Chatbots as friends

Chatbots are the bots that can chat with people by using natural language. Many companies are taking efforts to improve the artificial intelligence and semantic understanding technology. The giant companies such as Google, Apple, Microsoft are all developed their own Chatbots, which are respectively Google assistant, Siri, and Cortana. At present, the Chatbots can only do some simple tasks for example search some things on the search engines, manage the calendars or reminders, answer some simple questions. According to a report by Verto Analytics in 2017, there are 41.4 million users in US use Siri every month [51].

Facebook also put the bots into its social communication application messenger. The chief of Facebook Messenger said that their application provide more than 34,000 Chatbots[52]. In the future, there could be more Chatbots on social media to help people do more tasks.

VII. CONCLUSION

The purpose of the present research is to understand the relationship between social media and productivity. From the above analysis and discussion, we can conclude that social media could help to improve the productivity of human in general.

For the organization perspective, three aspects were analyzed, education, business, and government.

For the education aspect, social media could be a powerful supplement to the formal pedagogical practice. Some social media also provide internship or job opportunities for students. Many researches have showed the positive impacts of using social media as leaning aid. However, suitable ways need to be found for students and teachers to accept it and get used to it. Meanwhile, it is need to consider that how to prevent students from being addicted to the social media.

For the business aspect, social media could help to develop market, provide customer service, research marketing conditions, recruit employees, and enhance internal communications. Companies can raise their reputation or earn money on social media platform. The Large user base of social media also made it a great channel for marketing research and employee
recruitment. When serve as internal communication, social media let the company staff linked more closely. Nevertheless, two problems need to be aware when using it internally: how to balance the work and life of the employees and how to keep information security.

For the government aspect, social media could be a potential powerful tool that help the government to improve the transparency, increase the public participation, and better collaborate with citizens. Several researches have showed that the trust of the citizens have positive correlation with the great interaction experiences of they use government website. However, the communication between the government and citizens still follow the traditional one-way style, even if many governments already updated their websites to new technology. It takes time and effort to make a totally change.

For the individual in perspective, social media could bring three positive impact for people. First is to help people get more work-related information. Second is to provide platforms to gig economy. Third is make it possible to take personal media as a job. However, social media could also bring negative impacts, such as social addiction, harassment from the malicious person, and information security issues.

VIII. LIMITATIONS

It should be noted that the present research has limitations. At first, most of the literature used qualitative method. This kind of method indeed could help to dig deeper, but it is inevitable that the sample size is not too large, which make the sample not necessarily very representative. Secondly, most of the researches were completed in the US or European countries, lack of researches from other countries. It is possible that different culture will cause different results. Thirdly, mobile internet and application market are growing faster and faster. The social media markets changed dramatically in short time. Everyday could have new social media appears. However, the publication of the paper takes long time. The results of the research could be lagging behind the actual situation.

For the education aspect, two other limitations need to note. Most samples of the literatures were university students, lack of samples for younger students. It weakened the representative of the present research. Many scholars choose Facebook as the main research target. Based on the previous classifications of the social media, we can see that there are wide variety of social media on the market, and each of them has own unique characteristics. Facebook can only express one of many aspects of the social media.

IX. FUTURE WORK

For the question of social media and productivity, the present study only touched on the surface. The perspective of the present study is very wide. It analyzed the social media and the productivity respectively from the perspectives of organization and individuals. Analyzed the social media using in the field of education, business, government and personal works. Correspondingly, the research for every field cannot so in-depth.

In the future, more in-depth study will be conducted to better understand the social media and productivity. We will collect first-hand data for the research if condition permits. At the same time, we will try to avoid the limitations of the present study.

REFERENCES


