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SMEs' Entrepreneurship from the Perspective of Social Networks

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Abstract: Companies utilize social networks which don't entail any additional resources to promote their products, services as well as brands, build a brand image and handle customer relationships. Therefore, numerous SMEs are more likely to turn to social media when they launch a business. The current research mainly uses questionnaires or case studies to illustrate the benefits resulted from using social media by SMEs to start up a business. A large amount of information flow in social media has brought a lot of opportunities to SMEs. Still, meantime it also puts more pressure on SMEs that lack funds and technology to use such information. In the end, whether social media brings benefits or disadvantages to entrepreneurship still needs empirical data to confirm. From this perspective, this article looks for empirical data to demonstrate the role of social media in entrepreneurship for SMEs. This study obtains relevant data of sample companies from e-commerce and social media websites and applies the data envelopment model to measure the efficiency of these enterprises using social media entrepreneurship.

Keywords: Social Media, Entrepreneurship, SMEs, Data Envelopment Analysis

1. INTRODUCTION

Entrepreneurship will not be as easy as it is nowadays until the emergence of social media like Weibo, which not only has a strong impact on corporate activities ^[1], but also offers a unique marketing mode ^[2]. Social media, as a many-to-many conversation nowadays, is increasingly becoming a popular choice for business promotion because it allows communication to go beyond private one-on-one conversations ^[3]. To some extent, social commerce's input and output rates far exceed traditional marketing strategy. Modern entrepreneurs who want to sell their products need to introduce themselves and their brand first. People can even gradually build their own brands on social media without having to invest in it, acquiring audiences, fans, customers and popularity with charm ^[4]. Amy Jo Martin, founder and CEO of social media consultancy Digital Royalty, believes that social media is especially helpful to entrepreneurs with which they are more likely to gain potential customers and partners. Besides, as some previous research pointed out, free marketing, market research and efficient customer service can be facilitated by using social media, which does not require significant financial expenses. Therefore, even small and medium-sized enterprises (SMEs) can use it for everyday customer relationship management out of the low cost and the need for low-level IT skills ^[3].

However, the widespread use of social media in entrepreneurship can also bring about risks. Despite the potential benefits of social media for organizations, companies still face the challenge of managing the adoption and use of social media ^[5]. The platform of social media is built upon the "weak bond" relationship ^[6]. The Internet has helped us to greatly improve the efficiency of developing remote connectivity and has played an unparalleled role in the dissemination of innovative technologies and interdisciplinary collaboration. However, "weak bond" relationship rarely succeeds in organizing high-risk activities. Recent media coverage, e.g., Dwivedi et al. (2018) ^[4], Paniagua&Sapena (2014) ^[7], has highlighted the potential for negative or inappropriate posts that can harm business reputations. This is echoed by Gallaugher & Ransbotham(2010)^[8], who offer

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recommendations on managing risks, including dissent and negative feedback via social media. To date, the majority of social media research exploring business adoption and consumer engagement has focused on medium to large organizations (e.g., Jarvenpaa&Tuunainen,2012^[9]; Han, Xu & Chen, 2018^[10]; Senadheera, Warren & Leitch, 2015^[11]).

There is some research (e.g., Delerue& Hopkins, 2012^[13]; Hills & Cairncross, 2011^[12]), focusing on why and how small businesses are using social media at present, but there is little work exploring what small business perceives as success in terms of social media engagement. Some international work focuses on Return on Investment (ROI) (e.g., Hoffman & Fodor, 2010^[14]; Kaske et al., 2012^[15]; Gilfoi et al., 2015^[16]), business value (e.g., Delerue& Hopkins, 2012^[13]; Hills & Cairncross^[12]) and 'how-to' guides exist for businesses wanting to create a social media presence (e.g. Holzner, 2009^[16]). In the end, whether social media brings benefits or disadvantages to entrepreneurship, and it needs empirical data to confirm. From this perspective, this paper attempts to look for empirical data to illustrate the role of social media in entrepreneurship.

It is organized as follows: Section 2 reviews the relevant literature and their efforts; the methodology of the study is presented in Section 3; a description and analysis of the data and variables with their relevant results are introduced in Section 4; we then discuss our findings and finally address the study's limitations and suggestions for future research.

2. LITERATURE REVIEW

2.1 Influence factors of social media adoption behavior

The adoption of information technology has always been a hot issue in the research of information systems. In practice, the usage of information technology has become a common cognition ^[18]. With the emergence and development of social networking technologies, the usage of social networks in the context of companies has attracted more and more scholars' attention. Compared to large companies, small businesses have experienced barriers when adopting information technology systems due to a lack of resources, skills, and technologies^[19], but the emergence of social networks has changed the circumstances.

So what is the motivation for SMEs to take social media into account? Many studies have found that compatibility is a significant factor in the usage of social networks by SMEs (e.g., Wang et al., 2010^[20]; Jones et al., 2011^[21]). Cost-benefit factors are also noteworthy for companies to use social networks. Social networking is such a cost-effective technology in information technology that companies can invest directly with many customers at a small cost ^[22]. By answering customers' questions about corporate products on social networks, companies can gain their trust ^[23], which is why many SMEs choose social networks. Besides, social networking is an interactive product that is good for companies, and there is no in-depth study of the underlying driving force to decide whether SMEs use social networks or not. These factors are strategic choices for SMEs in their initial business operations but cannot make social networks become the driving force for the long-term development of enterprises. Therefore, it is necessary to conduct an empirical investigation on the motivations of the social network used by SMEs. The current research mainly focuses on the behaviors of using social media by SMEs through case studies, interviews, or questionnaire surveys on the part of a country or company. These studies' conclusions are barely representative and indirectly lead to the insufficient promotion of results.

2.2 Social media usage behavior and organizational performance improvement

Some scholars have begun to extend their vision to the relationship between social networks and corporate performance. Yong (2012)^[24]found that social networks have a positive impact on the business of SMEs. Öztamur & Karakadılar(2014)^[25]argue that social networks improve business performance by having a significant positive impact on the organization's social capital. Social media also improves sales performance by

positively influencing the customer's customer-oriented process ^[26]. In the current research, there is a relatively small quantity of research on the relationship between the usage of social networks of SMEs and corporate performance. These studies select some enterprises as research objects, while the results are not so representative that it needs further research. The number of objects is expanding on a large scale, so it is necessary to put an emphasis on the universality of the results.

It is undeniable that social networks are very beneficial to business operations. Previous research highlights the value of social networks in enterprise management from different perspectives, but few studies focus on the use of social networks in SMEs, which do not have the knowledge and skills to use social networks properly. The widespread use of social media in SMEs also poses risks. In the end, whether social media brings benefits or disadvantages to SMEs requires a large amount of empirical data to confirm. From this perspective, this study looks for empirical data to illustrate the role of social media in SMEs. Previous research combined technology-enterprise-environment theory with innovation diffusion theory as a theoretical basis to explain how SMEs improve their corporate performance by using social networks. Simply transplanting these theories into performance research brought by social media is not universal and representative enough.

At present, in the study of the application of social media in enterprises, three models are mostly used to explain this phenomenon. The first one is the traditional theory of communication, where a customer's message on social media is more credible than an enterprise's. The second model is the social exchange theory, where individuals decide how to interact with others under the framework of cost-benefit comparison, and social media is considered an ideal platform for social interaction. The third model is the theory of social capital that social costs affect firms' performance and financial capital build-up, while firms increase their social capital by using social networks.

There are two major aspects in the evaluation of entrepreneurial performance: one is associated with financial indicators, including net income, net profit, sales growth rate, sales profit rate, etc., which is the ultimate economic embodiment of organizational activities and the basis for measuring entrepreneurial performance. The other one is about non-financial indicators, including market share, market development capabilities, technological innovation, and other indicators related to operational performance, stakeholder satisfaction, customer loyalty, employee loyalty, etc., which reflects entrepreneurial performance Aspects have a deeper meaning. Some studies suggest that organizational performance of the organization, which is the main content of organizational effectiveness. The second layer is the operational performance (or non-financial performance), such as organizational product market share. Non-financial performance ultimately results in organizational financial performances. The last layer considers the interests of all stakeholders, such as customers' satisfaction.

Despite many advantages of using social media, organizational-level research on social media has not grown as rapidly as the research on its impact on organizational performance. Therefore this study investigates the various factors that influence social media usage among organizations and their impact on organizational performances. To investigate the usage of social media among organizations, the effective use of social media must be considered. It is an important indication of technology success, which in turn has an impact on organizations. Based on the IS success model, organizational performance refers to the actual benefits organizations received from using social media in terms of both financial and non-financial performances.

3. METHODOLOGY

3.1 The DEA method

Data Envelopment Analysis (DEA) is a method for evaluating the relative effectiveness of decision-making

units (DMUs) with multiple inputs and multiple outputs using DEA models to obtain corresponding production fronts based on given data. In DEA, the relative efficiency of firms is distributed within the (0, 1) interval, and the efficiency of firms at the efficiency front is 1.

DEA was originally proposed by Charnes, Cooper, and Rhodes (1978), as the first DEA model - the CCR model. Afterward, Banker, Charnes, and Cooper (1984) changed the assumption that the scale returns remain unchanged in the CCR model, but introduced the assumption that the scale returns vary, known as the BCC model.

Suppose that n DMUs have m inputs and s outputs, Xij represents the i-th input of the jth DMU, and Yrj represents the r-th output of the jth DMU, which is respectively recorded as the input vector (X1j, X2j,...,Xmj) T=Xj and the output vector (Y1j, Y2j,...,Ysj) T=Yj, using the main idea of the DEA method, construct the following linear programming model:

$$Min \ \theta = V_D$$

s.t. $\sum_{j=1}^{n} \lambda_{j=1} X_j \le \theta X_{j0}$
 $\sum_{j=1}^{n} \lambda_j Y_j \ge Y_{j0}$
 $\lambda_j \ge 0, j = 1, 2, ..., n$

3.2 Sample and variable selection

Now there are many entrepreneurs in China through online stores. Taobao, China's largest C2C website, where has assembled a large group of entrepreneurs. They have become samples of this study. In the research stage, 46 Taobao stores with microblogs were randomly selected as research objects, and one day in the research period was randomly selected, that is, on April 27, 2016, the sellers' credit and praise number of Taobao stores were observed. Because these Taobao stores are small businesses created by individuals, they are not listed and cannot obtain accurate financial data. However, the seller's credit and praise number are cloud statistics carried out by Taobao. They are only determined by the buyer, while the seller cannot change, which will more objectively reflect the entrepreneurial performance of entrepreneurs. This article uses the DEA approach to measure the impact of social media on entrepreneurial performance. Social media in this article takes Weibo as an example. The input is the number of start-ups' fans and the amount of tweeting. The output variables are divided into financial indicators, that is, the seller's credit of the entrepreneur's shop on Taobao. The higher the seller's credit is, the higher the sales volume of the seller are; the non-sales indicator is the customer satisfaction, that is, the more the number of praises gains, the higher the non-financial entrepreneurial performance the entrepreneurial performance the number of start-ups acquire.

4. EMPIRICAL RESULTS OBTAINED BY THE BCC MODEL

As shown in Table 1, the results of DEA indicate that four entrepreneurs' Weibo's efficiency on entrepreneurial performance is 1, and many entrepreneurs' Weibo's impact on entrepreneurial performance is more than 0.8 in 2015, a relatively high performance. Some other entrepreneurs' Weibo's impact on entrepreneurial performance is between 0.2 and 0.3, which is a very low level of performance. By 2016, four more stores were using social media effectively. But two stores closed in less than a year, which fully used on

social media in 2015. In general, 41 randomly sampled stores were less efficient at using social media.

Next, we used SPSS software to correlate the number of fans and microblogs that measured the input variables, as well as the seller credits and the number of praises who measured the output variables. According to the results shown in Table 2, the number of fans was positively correlated with credit and praise at a significant level of 0.01. That is to say, the more Weibo fans shop owns, the higher the store's credit and praise rating. The number of Weibo posts and credit rating of stores were positively correlated at 0.05 significant levels. That is, the high number of Weibo posts shops, credit rating is better. There is no correlation between the scores and the number of Weibo posts.

Table 1. Results obtained by the Dee model							
DMU	2015	2016	DMU	2015	2016		
欧美阳光屋	1.000	1.000	植木制	0.528	1.000		
蓝色鱼外贸童装	0.159	0.127	luson baby	1.000	1.000		
周小熊	0.449	0.538	快乐的芒小果	0.081	0.714		
安娜贝拉	0.097	0.264	柚子爱 kaka	0.114	0.115		
小背包	0.338	0.315	甜旅农特产	0.195	0.154		
非妮不可	0.150	0.203	TTT 快乐窝	0.277	0.255		
加拿大正品代购	0.019	0.510	sevi 家	0.222	0.475		
苹果童装店	0.087	0.167	nanaclub	0.880	0.859		
邂逅锡兰	0.112	1.000	anna it is amazing	0.380	0.561		
小新家	0.008	0.086	mali studios	0.433	0.586		
未来总统加国代购	0.012	0.328	lin 限定衣	0.708	0.478		
屿路永生花	0.098	1.000	tkstyle	0.848	1.000		
又见小夕	1.000	1.000	inking pot	0.309	0.252		
Mylitleco 童品	0.011	0.171	a-bow studio	0.204	0.622		
查摩尔	0.026	0.479	lamps	0.210	0.289		
七小格	1.000	0.000	AM 欧美高端定制	0.114	0.200		
蜕变蝶小铺	1.000	0.000	XWW	0.009	0.128		
陌陌那阁	0.139	0.110	小宜定制	1.000	1.000		
juicy cakes	0.070	0.738	fairy wang	0.038	0.399		
alu	0.372	0.174	魔幻厨房	0.010	0.048		
jilljudith	0.037	0.129					
		•			•		

Table 1. Results obtained by the BCC model

Table 2 Variables correlation

	fans	credit	praise	posts number
fans	1			
credit	0.428**	1		
praise	0.627***	0.878***	1	
posts number	-0.013ns	0.354*	0.297ns	1

Note: *, *p* < 0.05; **, *p* < 0.01; ***, *p* <0.001; ns, not significant; N = 39

5. DISCUSSION

From the results of DEA, some entrepreneurs' social media has an impact on entrepreneurial performance, and some have not reached 1. This shows that social media is helpful for entrepreneurs' entrepreneurship, but this is not for all entrepreneurs. From the practical point of view, the usage of social media by small and medium-sized enterprises only stays in the tool stage and does not realize the value of the social network. Although social networks can help small and medium-sized enterprises to start, but it hasn't become an inexhaustible driving force in the development of small and medium-sized enterprises. This is the case, so we must pay attention to the impact of social media on entrepreneurship, but not overestimate the impact of social media. So, what aspects of social media do affect entrepreneurial performance?

Through correlation and dependence, we can know that the number of fans has a major impact on the entrepreneurial performance of entrepreneurs. This shows how the store's sales performance depends entirely on the owner's own fans' full support. This means that if the fans' admiration or support collapsed, the store's sales would run into problems. The influence of entrepreneurs' microblogging on fans and buyers is not very strong. This is the initial stage of entrepreneurship called the personal social network, where personal charisma has a positive impact on their entrepreneurship. On the condition that these companies' operation on Weibo is not frequent, the amount of microblogging has not had a big impact on fans. In terms of correlation analysis, social media is mainly used by small and medium-sized enterprises to communicate with fans and conduct customer relationship services. In fact, the lack of funds and technical training to take full advantage of social media means that the use of social media by small and medium-sized enterprises is no different from that of individual users.

6. CONCLUSION

Through a variety of platforms, social media enables companies to communicate with customers in a more personalized way. The key is not just advertising. The best way to increase your followers is to share valuable content and increase the efficiency of your social media. To maintain a good balance of content is to share education, information, inspiration, exclusive news and entertainment. Storytelling is also a good choice. For example, instead of posting a product photo on Weibo for publicity, it would be better to share a real video of a real customer using the product to demonstrate its usefulness. Plus, we must respond actively to others and contribute to the dialogue and exchange in the community.

This study makes theoretical and empirical contributions to the literature on social media efficiency measurement. Most previous research on the usage of social media in small and medium-sized enterprises is a questionnaire survey, while this study provides a reference framework for objective evaluation. This study confirms from an empirical view that social media can indeed help SMEs start their businesses. It theoretically proves the feasibility of SMEs using social media marketing. Research shows that the current use of social media by SME owners is still in the early stages of attracting fans. Although social networks can help small and medium-sized enterprises to start, they have not become an inexhaustible motive force for the development of small and medium-sized enterprises. That is to say, it is easy for SMEs to use social media has brought a lot of opportunities to SMEs, but it also lacks funds and technology to utilize information. SMEs have put more pressure on them. Although most SMEs use social media for marketing, they also face many problems in actual operation. Therefore, researchers should find out the solution to the social marketing of SMEs different from the marketing for small and medium-sized business owners and help them make better use of social media tools. At the same time, it is also important to remind small and medium-sized business owners that they should focus

more on product quality; otherwise, if fans do not support them, their enterprises will face great risks.

The main limitation of this study is its liability for the estimated results, which is not tested by longitudinal studies. This study did not obtain relevant performance data of related companies after a while. Therefore, it can only reflect the social media usage of these sample companies during the research period, and it does not indicate whether the efficiency of the usage of social media has been improved after the development of these sample companies for some time. In future research, it is necessary to collect panel data for some time to study the development of social media use efficiency of SMEs. The two variables used in the study to measure the performance of small and medium-sized enterprises were obtained from the Taobao store statistics. Due to the relevant restrictions, this data cannot be downloaded and can only be recorded by the research team at a certain time, which makes our research data very insufficient. Besides, Taobao's statistics on shop praise and credit data in the research period have changed in different forms, which also caused the later statistics cannot be used to compare. In future research, we will look for a way to combine big data mining with large-scale interviews to make more accurate measurements of social media usage efficiency in small and medium-sized enterprises.

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