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Recommended Citation

Huang, Jinghua; Zhang, Jing; Li, Yangfan; and Lv, Zhepeng, "Business Value of Enterprise Micro-Blogs: Empirical Study from weibo.com in Sina" (2013). *PACIS 2013 Proceedings*. 62.

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BUSINESS VALUE OF ENTERPRISE MICRO-BLOGS: EMPIRICAL STUDY FROM WEIBO.COM IN SINA

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Abstract

The increasing use of micro-blogs as marketing tools has increased the research attention on the usage and performance of enterprise micro-blogs. Based on research on information system (IS) usage and the resource-based view (RBV) theory, this study develops a model to measure the business value of enterprise micro-blogs. The model consists of metrics on micro-blog usage, micro-blog operational performance, firm capability, and performance. Questionnaires were distributed to firms that use micro-blogs. This study collects 317 valid responses for empirical analysis. The result suggests that the extent of micro-blog usage improves the operational performance of enterprise micro-blogs directly and indirectly by increasing firm capability. The operational performance of enterprise micro-blogs significantly affects firm performance. This study reveals the mechanism of business value generation of enterprise micro-blogs and extends the stream of research that combines IS usage and the RBV theory.

Keywords: Micro-blog, IS usage, Resource-based view, Business value.

1 INTRODUCTION

An increasing number of firms are using micro-blogging as a tool for brand building, marketing, and customer service. According to data from 2012 Corporate Weibo White Paper, a total of 130,565 firms across 22 industries have registered micro-blog accounts in Sina (the micro-blog site is now named weibo.com, the dominant micro-blogging platform in China) by the end of February 2012. Many of these firms have already launched successful marketing activities, improved customer relations, and created brand value. For instance, the micro-blog of a company called Kuaishubao is followed by 30,000 fans, and one-third of its sales revenue comes from the micro-blog channel. Although many Chinese companies have micro-blogs, they face several problems on the effective and efficient operation of their micro-blogs. Many firms do not fully understand the potential benefits of micro-blogs, as well as the performance measurements of micro-blogs is also emerging challenges for the companies. Furthermore, they need to know how to operate micro-blogs in order to get benefits. Therefore, business value of enterprise micro-blogs is becoming an important topic in business and academic research.

Scholars have investigated micro-blog usage and its effects on the interaction on a firm's marketing, branding, and interaction with customers. Fischer and Reuber (2011) study how Twitter usage impacts entrepreneurs and entrepreneurial firms. They suggest that perceived time affordability predicts the degree of social interaction in which an entrepreneur engages customers via Twitter; furthermore, community orientation and community norm adherence moderate the consequences of social interaction through Twitter. Jansen et al. (2009) examine the micro-blog usage for electronic word-of-mouth (e-WOM) branding based on the view that brands constantly compete for the attention of potential customers (Davenport & Beck 2002). Their result implies that brand awareness and brand image are increasingly influenced by web communications and social networking services. Specifically, word of mouth (WOM) in micro-blogs could improve customer satisfaction, brand trust, and brand commitment, thus leading to positive customer behaviour. Hanna et al. (2011) suggest that social media platforms such as Twitter, Facebook, and YouTube, comprise an integrated ecosystem for social media marketing. Therefore, firms should build their integrated marketing strategy on these platforms creatively.

Despite the existence of the aforementioned studies, the business value of micro-blogs is seldom studied based on sound theories. Moreover, few indices are available for measuring the effects of enterprise micro-blogs. Given that firm capabilities have not been introduced in enterprise micro-blog research, prior studies have not correlated the usage of enterprise micro-blogs to business value. Thus, this paper attempts to develop micro-blog evaluation indices for firms based on the resource-based view (RBV) theory, marketing capability theories, and information system (IS) usage research. We surveyed a group of enterprise micro-blog managers and examined the relationship between micro-blog usage, firm capability, and performance.

The rest of the paper is organized as follows: Section 2 introduces the theoretical framework of this study. Section 3 develops the hypotheses. Section 4 describes the research methods and steps. Section 5 reports the result of empirical analysis. Section 6 concludes.

2 THEORETICAL BACKGROUND

2.1 RBV and Marketing Capabilities

The RBV theory originates from a major area of research in strategic management. The RBV theory explains what kind of organizational resources could help firms achieve better performance. A firm that exploits valuable, rare, imperfectly imitable or substitutable resources behaves in an efficient and effective manner (Barney 1991; Prahalad & Hame 1990; Wade & Hulland 2004). Wade and Hulland (2004) define resources as assets and capabilities that are available and useful in detecting and responding to market opportunities or threats. Assets here include tangible or intangible input and output elements in the design, production, and selling processes (Sanchez et al. 1996). Capabilities, which can also be classified as technical skills, management skills, and organizational processes, refer

to recurrent behavior patterns in deploying resources for value gains or enhancing productivity with the same input (Amit & Schoemaker 1993).

The RBV theory is also introduced to analyze key assets and capabilities in marketing activities and to identify a series of marketing capabilities that can generate competitive advantages. Day (1994) stresses the importance of market-sensing capability, which determines how well an organization is equipped to sense changes in the market continuously, and customer-linking capability, which comprises the skills, abilities, and processes needed to develop close relationships with customers. Hooley et al. (2005) divide resources into market-based resources, which create competitive advantages directly, and marketing-support resources, which support marketing activities and competitive advantages indirectly. Their results show that market-based resources, such as customer-linking capabilities, reputational assets, market innovation capabilities, and human resource assets, affect firm performance. Morgan et al. (2009) find that brand management capability has significant positive impacts on the growth rate of revenue but has negative impacts on the growth rate of profit margin. By contrast, customer relationship management (CRM) capability has negative impacts on revenue growth rate but has positive impacts on profit margin growth rate. Moreover, market-sensing capability can moderate the influence of brand management on revenue.

The above-mentioned research focuses on traditional marketing resources within companies. Few studies explain the influence of social media on firm performance. In this study, we combine social media research paradigm and the RBV theory to discuss the effects of enterprise micro-blog usage on firm capabilities and performance.

2.2 Enterprise IT/IS Usage

The business value of IT/IS is not in IT/IS itself, but in the way an organization uses them. Existing theories suggest that proper usage of IT assets affects firm operations and enhances firm performance (Lucas 1993; Beath et al. 1994). The process of how IT creates business value includes the following: IT conversion, in which IT expenditure is converted into IT assets; IT usage, which involves the appropriate use of IT and IT benefits; competitive advantage creation process, which converts IT impact to firm performance and decides the competitive position of a firm (Soh & Markus 1995). The impact of IT includes improvements in product/service quality, reengineering of business processes, enrichment of organizational knowledge, and changes in organization structure (Sambamurthy & Zmud 1994). IT usage may be a key factor in explaining the impact of IT on firm performance (Devaraj & Kohli 2003).

By contrast, previous studies have not shown the relationship between IS usage, firm capability, and firm performance. The usage of IS/IT not only affects firm capability but also business performance and competitive advantage. Although some scholars have studied the implementation of IT/IS and its benefits, these studies do not focus on the process of how IS/IT usage impacts companies. On the contrary, scholars who have studied enterprise capabilities focus on explaining organizational performance through IT/IS assets and capabilities; however, these studies fail to consider IS/IT usage.

Therefore, our study combines the RBV theory with IT/IS usage to discuss the effect of enterprise micro-blog usage on operational performance, firm capability, and business performance.

3 RESRAECH MODEL AND HYPOTHESES

3.1 Micro-blog Usage and Operational Performance

We define the usage of enterprise micro-blogs as the extent to which a firm utilizes all micro-blog functions to accomplish tasks. Meanwhile, the operational performance of enterprise micro-blogs, which reflects their attractiveness and social influence comprehensively, is defined as the number of fans, and the extent of fan interactions, such as the number of fans forwarding or commenting the tweets (Hoffman & Fodor 2010; Jansen et al. 2009; Larson & Watson 2011).

The extent of micro-blog usage may influence operational performance. When a company successfully adopts a new type of IS/IT, system-level impact occurs first, then the organizational-

level impact will occur (Soh & Makus 1995). In other words, the new system must be used sufficiently and appropriately before leading to any improvements in organizational performance. In this perspective, effective and appropriate usage of enterprise micro-blogs will result in system-level impact first (Zhang & Wu 2007), which corresponds to improvements in operational performance of micro-blogs. To be specific, in micro-blogging practices, an increase in frequency of tweets, activities, and fan interactions increases the number of fans, which lead to improved fan involvement and interaction with the company (Kaplan & Haenlein 2011; Jin et al. 2011).

Thus, according to studies on IS/IT usage and enterprise micro-blogging practices, the usage of enterprise micro-blogs has a positive effect on operational performance.

H1: For enterprise micro-blogs, higher extent of usage can improve their operational performance.

3.2 Micro-blog Usage and Firm Capability

Marketing research has identified a series of marketing capabilities, such as market-sensing capability and CRM capability. Market-sensing capability denotes the ability to recognize emerging needs, assess customer responses rapidly, and design rapid market-entry strategies (Day 1994). CRM capability refers to the ability to identify potential customers and opportunities, maintain relationships with customers, and convert customer relationships into business value (Morgan et al. 2009).

The usage of enterprise micro-blogs may enhance a firm's market-sensing capability and customer service capability. Researches in IT business value based on the RBV theory shows that IT resources and firm resource could interact and generate core competencies, which result in better business performance (Ravichandran & Chalermsak 2005). As an emerging IT application, enterprise micro-blogs should have similar characteristics to IT resources. In the virtual environment of business, firms can take advantage of virtual platforms to support customer service and marketing activities to attain business value (Culnan et al. 2011). Enterprise micro-blogs can be used to collect information and perform analysis on marketing environments, competitors, and customer behaviour, thus improving market-sensing capability. The use of micro-blogs to post tweets, launch activities, and interact with fans helps in creating and sustaining long-term customer relationship and enhancing customer service capability.

Thus, based on the RBV theory, marketing capabilities, and virtual environment for consumers, we propose Hypotheses 2 and 3:

H2: The use of enterprise micro-blogs can enhance market-sensing capability.

H3: The use of enterprise micro-blogs can enhance customer service capability.

3.3 Firm Capability and Micro-blog Operational Performance

Firm capability may influence the operational performance of micro-blogs. First, according to the RBV theory, market-sensing capability and customer service capability are valuable, rare, imperfectly imitable and substitutable marketing resources that contribute to the long-term performance of a firm (Day 1994; Hooley et al. 2005; Morgan et al. 2009). A firm that has higher levels of market-sensing capability and customer service capability can satisfy customer needs better and provide improved services. Therefore, more customers will pay attention to the firm's micro-blog and micro-blog operational performance will improve. Second, studies on IT value based on business processes suggest that process performance is more suitable as a dependent variable than overall performance in measuring the organizational impact of IT resources (Ray et al. 2005). Micro-blog operational performance should be regarded as a type of process performance that is directly affected by the market-sensing capability and customer service capability of a firm.

In summary, firms can enhance their market-sensing capability and customer service capability by using micro-blogs. The enhancement of firm capabilities improves the operational performance of micro-blogs. We propose Hypotheses 4 and 5 based on the aforementioned discussions:

H4: The market-sensing capability of a firm can improve micro-blog operational performance.

H5: The customer service capability of a firm can improve micro-blog operational performance.

3.4 Micro-blog Operational Performance and Firm Performance

According to the RBV theory, the influence of certain resources on business is reflected in operational and overall performance (Melville et al. 2004; Tallon 2007). As an emerging IT application, enterprise micro-blogs are mainly used for brand promotion, marketing campaigns, and customer service to increase brand equity, customer satisfaction, and sales volume.

On one hand, the operational performance of enterprise micro-blogs may influence the valuation of brand equity. From the consumer perspective, brand equity is the value of a brand perceived by consumers, of which the differences are due to each consumer's brand knowledge. Brand knowledge is conceptualized in terms of brand awareness and brand image (Keller 1993). In micro-blog practices, product and brand information spread quickly when large numbers of active fans participate in micro-blogs by forwarding or commenting tweets, thus increasing brand awareness and image.

H6: The operational performance of enterprise micro-blogs can improve the performance of brand equity.

Improvements in a firm's brand equity may enhance the firm's sales performance (Hulland et al. 2007). A company that has higher levels of brand awareness and brand image can reduce search costs and perceived risks by differentiating its products and services through its brand (Hulland et al. 2007), thus increasing market share. Products of renowned brands can maintain higher levels of awareness in fiercely competitive markets, retain loyal customers, and increase sales volume (McAlister et al. 2007; Mela et al. 1997). In summary, advantages in brand awareness and brand image can improve a firm's sales performance by increasing market share and sales volume.

H7: The performance of brand equity can improve sales performance of a firm.

On the other hand, the operational performance of enterprise micro-blogs may influence the performance of customer service. Customer service or customer relationship performance can be represented by customer satisfaction and loyalty (Hooley et al. 2005). Customer satisfaction is the state of mind after customer needs are met, and customer loyalty is reflected by repeated purchase behaviour. Hennig-Thurau et al. (2010) show that social media affects customer relationship. If many fans comment and forward the firm's tweets actively, the firm has already established a good relationship with its fans. Improvements in the relationship between the firm and customers enhance the customer satisfaction and loyalty. Thus, better enterprise micro-blog operations correspond to higher levels of customer satisfaction and loyalty.

H8: The operational performance of enterprise micro-blogs can improve the performance of customer relationship.

Improvements in customer relationship also enhance the sales performance of a firm (Hooley et al. 2005). Customers that are satisfied and loyal to a firm can promote products by WOM, thus helping the company attract potential customers and increase market share (Reinartz et al. 2004; Maxham, 2001; Maxham & Netemeyer, 2003). Customers that are very loyal to a firm may buy the firm's products repeatedly and increase sales volume to some extent (Heskett et al. 1994; Jones & Sasser 1995). Empirical studies show that the improvement of customer relationship performance can increase sales volume (Hooley et al. 2005). Thus, the improvement of customer relationship can directly influence the sales performance of a firm.

H9: The performance of customer relationship can improve sales performance of a firm.

The whole research model is summarized in Figure 1.

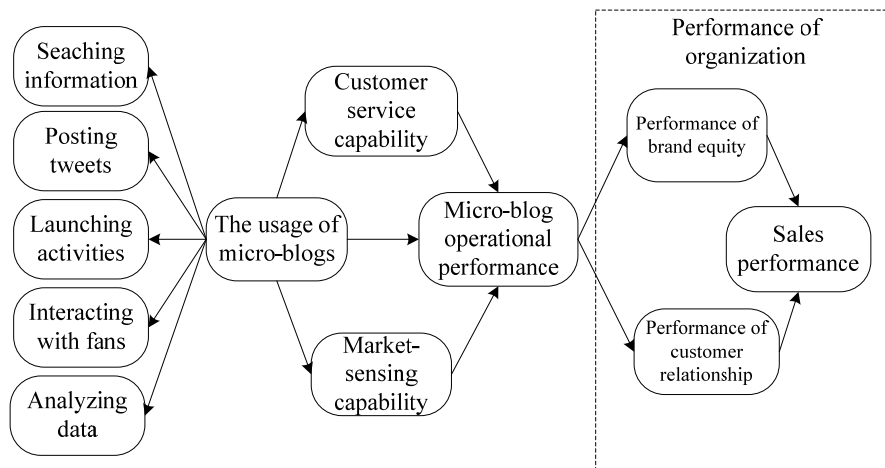


Figure 1. Research Model

4 RESEARCH MEYHODOLOGY

4.1 Construct Measurement and Test

4.1.1 New Construct Measurement

As this study is the first to explore the usage and operational performance of enterprise micro-blogs, we need to build their indicators. We proposed initial indicators by literature reviews, case studies, study of the functions of enterprise micro-blogs of Sina.com, interviews, and expert discussions. Then, we conducted validation by pilot tests and retests. We follow the procedure of Mackenzie et al. (2011) in designing the indicators and conducting the validation.

The first step involves defining the usage of enterprise micro-blogs. Scholars always choose range, frequency, and duration to measure the usage of IT. Burton-Jones and Straub (2006) propose “extent of use”, which unifies the different aspects, to describe the usage of IS/IT. Therefore, we define enterprise micro-blog usage as the extent to which a firm utilizes all micro-blog functions to accomplish tasks. The operational performance of enterprise micro-blogs is defined as the number of fans and extent of fan interactions.

The second step is the identification of all the functions of enterprise micro-blogs and their measurements. Enterprise micro-blog is a new tool for customer service, so it can also be treated as a CRM system (or regarded as "social CRM"). The functions of CRM can be classified into two categories. One is routine functions, such as marketing activities and communicating with customers. The other is making use of customers' information to support business decisions. With regard to enterprise micro-blogs, the routine functions are posting tweets, interacting with fans and launching activities, and the decision-support functions involve searching information and analyzing data. Therefore we propose the five factors in the measurement of enterprise micro-blog usage (Sina Weibo and CIC Corporate, 2012; Teevan et al. 2011; Ruiz et al. 2012; Kaplan & Haenlein 2011). We use the frequency of accomplishing a concrete task to measure the usage of corresponding functions (Table 1). The usage of micro-blogs is a second-order construct that takes five constructs (i.e., five functions) together formatively. Each function construct is measured by several reflective indicators. When one or more functions of micro-blogs are used frequently, we say that the use of micro-blogs is frequent. Based on the indicators proposed by Hoffman and Fodor (2010), the operational performance of micro-blogs includes two aspects: the level of attention and the level of participation. We use the number of micro-blog fans and the number of active fans as the metrics for the level of attention and the number of forwarded tweets and comments as the metrics for the level of participation (Table 1). The items have convincing content validity because they are derived from

literature review (seen in Table 1), discussed and confirmed by enterprise micro-blog operators (Lennon 1956; Yao et al. 2008), and modified by panellists.

Construct	Item	Definition	References
Searching information	SCR1	The frequency of searching a popular topic	Teevan et al. 2011; Sina Weibo and CIC Corporate 2012
	SCR2	The frequency of searching own brand and product information	
	SCR3	The frequency of searching competitors' micro-blog contents	
	SCR4	The frequency of searching industry news	
Posting tweets	POS1	The frequency of posting tweets about brand and products	Kaplan & Haenlein 2011; Sina Weibo and CIC Corporate 2012
	POS2	The frequency of posting tweets about new products	
	POS3	The frequency of posting tweets about the industry	
	POS4	The frequency of posting fun jokes	
Launching activities	ACT1	The frequency of launching promotion activities	Ataman et al. 2010;
	ACT2	The frequency of launching lottery activity	
	ACT3	The frequency of launching marketing activity	
	ACT4	The frequency of launching voting activity	
Interacting with fans	INT1	The frequency of replying to fan comments.	Zhang et al. 2010; Kaplan & Haenlein 2011
	INT2	The frequency of using "@" function	
	INT3	The frequency of communicating with fans through private letters	
	INT4	The frequency of interacting with fans in micro-groups	
Analyzing data	ANA1	The frequency of monitoring brand reputation by analyzing fan comments	Zhang et al. 2010; Kumar et al. 2011; Kaplan & Haenlein 2011
	ANA2	The frequency of analyzing the number and quality of fans	
	ANA3	The frequency of discussing fan requirements	
	ANA4	The frequency of analyzing the contents of competitor micro-blogs	
Operational performance of enterprise micro-blogs	WBP1	The number of fans	Jin et al. 2011; Sina Weibo and CIC Corporate 2012
	WBP2	The number of active fans	
	WBP3	The average number of comments on tweets	
	WBP4	The average number of forwarded tweets	
	WBP5	The extent of fan participation in activities	

Table 1. Initial metrics for the usage and performance of enterprise micro-blogs

The third step involves a preliminary survey among some enterprise micro-blog employees to adjust metrics that cannot be identified clearly. Exploratory factor analysis is also conducted to eliminate items with factor loadings lower than 0.4, including "searching a popular topic", "posting fun jokes", and "analyzing the contents of competitor micro-blogs".

The fourth step involves the random distribution of questionnaires to enterprise micro-blogs. The questionnaires yield 317 valid responses. Thereafter, we use SPSS to conduct exploratory factor analysis, Bartlett's test with $\chi^2 = 3557.524$, $df = 231$, P value < 0.001 , and Kaiser–Meyer–Olkin test with a value of 0.845. The exploratory factor analysis shows that the eigenvalues of first six principal components are larger than one, which explains the 70% total variances. Items with factor loading less than 0.4 are also eliminated, including “voting activity” and “interacting with fans in micro-groups”.

We also conduct a reliability test for the six factors. Results reveal that the Cronbach's alpha of all factors is larger than 0.7, thus suggesting that the metrics for the usage and operational performance of micro-blogs have high reliability.

Finally, we use both Lisrel 8.7 and partial least squares (PLS) in the validation test to analyze the remaining 20 items in the questionnaire. Lisrel is used to test the goodness of fit of five factors, whereas PLS is used to perform confirmative factor analysis. Lisrel shows the following results: RMSEA = 0.05, RMR = 0.06, CFI = 0.97, AGFI = 0.88, NNFI = 0.96, NFI = 0.94, PNFI = 0.75, $\chi^2/df = 143.54/80 = 1.79$. The Lisrel results indicate a high level of fit. The test by PLS shows that all factor loadings are larger than 0.7 with significant T-value (P -value < 0.001) and the AVE value of every factor is larger than 0.5.

4.1.2 Other Constructs

Other metrics are derived from previous empirical studies and modified to fit the enterprise micro-blogs (Table 2). The metrics for measuring market-sensing capability and customer service capability are obtained from Morgan et al. (2009), metrics for the performance of customer relationship are obtained from Hooley et al. (2005), metrics for the performance of brand equity are from Srivastava and Shocker (1991) and Keller (1993), metrics for sales performance are from Kirca et al. (2005).

Construct	Definition and Sources	Item	Definition
Market-sensing capability	Ability to assess customer needs, competitors, and market channels (Day 1994; Morgan et al. 2009).	MSC1	Understanding customer needs
		MSC2	Discovering competitors' strategy
		MSC3	Gaining insight on micro-blog channel
Customer service capability	Ability to create customer value by recognizing potential customers, and building and maintaining relationships (Morgan et al. 2009).	CSC1	Identifying target customers
		CSC2	Establishing “dialogue” with customers
		CSC3	Getting potential customers to try our products/service
Performance of customer relationship	Relationship between firms and customers (Hooley et al. 2005).	CRP1	Level of customer satisfaction
		CRP2	Level of customer loyalty
Performance of brand equity	Performance of branding (Srivastava & Shocker 1991; Keller 1993).	BRP1	Brand awareness
		BRP2	Brand image
Sales performance	Sales performance of the firm (Kirca et al. 2005).	FIP1	Sales volume
		FIP2	Market share

Table 2. Definition and source of other metrics

4.2 Data Collection

We tested and edited the questionnaire above repeatedly before the formal survey. We measure each item on a five-point Likert scale ranging from five (very consistent) to one (very inconsistent). Our research group organizes a survey with rewards, which lasted from April 2012 to May 2012, with the help of the Enterprise Micro-blog Department of Sina. Sina publicizes our activity before the survey

and promises to draw a lottery among firms being surveyed. After deleting invalid responses, we obtain 317 effective samples from the 418 questionnaires returned.

The companies surveyed cover more than 20 industries such as e-commerce, transportation, apparel, and IT services. Many companies are in the service sector, in which marketing and customer services are key operations. People who completed the questionnaires are almost full-time micro-blog operators or managers (Figure 2), which ensure the quality and effectiveness of questionnaires. Table 3 shows that more than half of the surveyed companies have operated micro-blogs for more than six months. The main objectives of using micro-blogs are brand building, customer service, and marketing. Most companies implement one or two of these strategic objectives. Most of the surveyed companies operate micro-blogs by themselves.

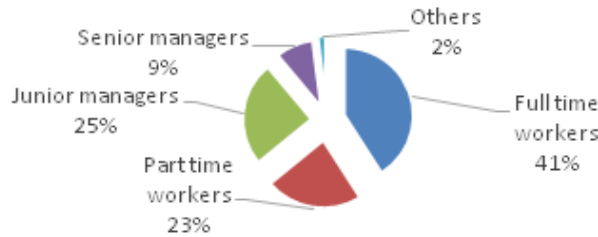


Figure 2. Job positions of people who filled out questionnaires

Features	Choice	Numbers	Percentage (%) (317 companies)
Operation history of micro-blog	Less than 3 mos	76	23.97
	3 mos to 6 mos	85	26.82
	6 mos to 12 mos	96	30.28
	More than 1 yr	60	18.93
Sales channel (multiple choice)	Only online	176	55.52
	Also offline	274	86.44
Goals of micro-blog (multiple choice)	Marketing	277	87.38
	Customer service	209	65.93
	Brand building	295	93.06
	Others	23	7.26
Operation pattern of micro-blog	Individually operated	305	96.21
	Operated by an agency	2	0.6
	Operated with an agency	10	3.15

Table 3. Descriptive statistics

5 DATA ANALYSIS

5.1 Reliability and Validity Test

The value of KMO is 0.857 and Bartlett's test of sphericity is significant, so the factor analysis can be conducted. Exploratory factor analysis find out 12 factors that explain 74.75 percent of total variance, and the load of all the items are larger than 0.5 (Detailed results are omitted). Therefore the model has high level of dimension validity.

In the reliability test, both the Cronbach's alpha coefficient and composite reliability exceed 0.7, thus good reliability. Discriminant validity tests are shown in Tables 4 and 5. The results indicate a high level of reliability. We also conduct variance inflation factors test, which indicates that multicollinearity is not severe.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
SCR2	0.8116	0.3331	0.2382	0.251	0.3705	0.3033	0.2683	0.236	0.1308	0.1848	0.1878
SCR3	0.8224	0.2546	0.2617	0.2423	0.3317	0.2449	0.0996	0.2004	0.0442	0.0815	0.0988
SCR4	0.7869	0.2156	0.0819	0.1748	0.344	0.2354	0.079	0.0815	0.0041	0.1426	-0.0026
POS1	0.2581	0.9153	0.2444	0.235	0.3588	0.2132	0.3012	0.1677	0.0833	0.341	0.1471
POS2	0.2715	0.8974	0.3242	0.2495	0.3565	0.1771	0.2586	0.1762	0.1096	0.2742	0.1304
POS3	0.3436	0.7413	0.165	0.1814	0.3472	0.1368	0.0459	0.1491	0.1106	0.1609	0.0769
ACT1	0.1844	0.3517	0.8224	0.2752	0.2722	0.1807	0.2786	0.1493	0.1152	0.1766	0.075
ACT2	0.1907	0.2372	0.8445	0.2266	0.2535	0.2033	0.2417	0.242	0.0627	0.1713	0.1119
ACT3	0.223	0.0674	0.7002	0.1849	0.262	0.2161	0.3026	0.2101	0.0082	0.1041	0.1382
INT1	0.2122	0.2497	0.2011	0.8049	0.3536	0.2362	0.2436	0.2121	0.1329	0.2132	0.0464
INT2	0.2723	0.2036	0.2494	0.9055	0.4494	0.308	0.3019	0.3319	0.2043	0.3041	0.1364
INT3	0.235	0.2269	0.3007	0.8702	0.4358	0.271	0.3384	0.3562	0.1791	0.3222	0.1469
ANA1	0.3805	0.3749	0.2902	0.4294	0.8672	0.3005	0.3065	0.3169	0.1784	0.3045	0.1452
ANA2	0.3305	0.3002	0.2571	0.3783	0.8306	0.35	0.2989	0.3291	0.146	0.2759	0.1685
ANA3	0.385	0.3721	0.2913	0.4139	0.8421	0.3512	0.3501	0.2434	0.1546	0.2249	0.1555
MSC1	0.3108	0.2061	0.2424	0.305	0.386	0.8753	0.6222	0.476	0.2518	0.4979	0.3259
MSC2	0.321	0.1197	0.1832	0.2215	0.2652	0.8147	0.4062	0.2851	0.1355	0.3521	0.1842
MSC3	0.16	0.1706	0.1773	0.2388	0.2954	0.7679	0.5084	0.3117	0.23	0.531	0.2082
CSC1	0.1795	0.2449	0.3206	0.292	0.3355	0.5734	0.8261	0.3425	0.3	0.5324	0.269
CSC2	0.1514	0.2057	0.2892	0.3019	0.3141	0.5575	0.9036	0.4556	0.2958	0.5961	0.28
CSC3	0.1778	0.1955	0.2964	0.3123	0.3436	0.5515	0.9014	0.3792	0.2743	0.6247	0.2992
WBP1	0.1601	0.2364	0.1412	0.188	0.1826	0.33	0.2962	0.8017	0.2201	0.2963	0.3349
WBP2	0.232	0.1714	0.1865	0.2891	0.3044	0.3964	0.4065	0.8153	0.2682	0.2992	0.3217
WBP3	0.2106	0.0848	0.225	0.3442	0.3178	0.3987	0.404	0.9	0.2375	0.2717	0.345
WBP4	0.1805	0.1255	0.2092	0.3434	0.327	0.3818	0.3595	0.8945	0.2201	0.2736	0.3415
WBP5	0.166	0.2077	0.2887	0.3308	0.346	0.4197	0.4404	0.8695	0.2472	0.3841	0.4023
CRP1	0.0812	0.1293	0.1196	0.212	0.1935	0.2384	0.3227	0.2724	0.956	0.3366	0.4414
CRP2	0.0719	0.0977	0.0438	0.176	0.1699	0.2539	0.3113	0.2638	0.9622	0.3375	0.4919
BRP1	0.16	0.2803	0.1839	0.3175	0.2937	0.5524	0.6514	0.3549	0.368	0.979	0.3621
BRP2	0.1722	0.3218	0.1952	0.3234	0.3269	0.5501	0.6514	0.3467	0.3172	0.9759	0.3238
FIP1	0.1114	0.1315	0.1018	0.0875	0.164	0.2906	0.3126	0.3824	0.4429	0.332	0.9355
FIP2	0.1252	0.1314	0.1468	0.1564	0.181	0.2796	0.2917	0.3854	0.4708	0.3273	0.9399

Table 4. Confirmatory factor analysis of the sample

For common method biases test, we build a new model based on the PLS model in which the common method factor variable and the items corresponding to the original observations are added (Liang et al. 2007). $L1^2$ refers to the percentage of bias that can be interpreted by the corresponding item, whereas $L2^2$ refers to the percentage of bias interpreted by the common method bias. If $L2^2$ is not significant and $L1^2$ is significantly larger than $L2^2$, the common method bias can be neglected. The test result shows that $L2^2$ is not significant, and the average value of $L1^2$ is 0.583. The average value of $L2^2$ is merely 0.0115, thus suggesting that the common method bias is insignificant.

Factors	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1)	0.8070*											
(2)	0.3380	0.8549*										
(3)	0.2862	0.2908	0.7916*									
(4)	0.3170	0.2627	0.3170	0.8612*								
(5)	0.4321	0.4137	0.3757	0.5239	0.8468*							
(6)	0.6241	0.6002	0.6678	0.7684	0.8049	---						
(7)	0.2944	0.2338	0.4505	0.5100	0.4458	0.5204	0.7415*					
(8)	0.2139	0.2259	0.3250	0.3443	0.3511	0.4322	0.4643	0.8207*				
(9)	0.3270	0.2061	0.2809	0.3170	0.3930	0.4404	0.4700	0.6561	0.7403*			
(10)	0.1697	0.3065	0.1924	0.3144	0.3170	0.3773	0.3615	0.6200	0.5625	0.9774*		
(11)	0.0801	0.1182	0.1069	0.2049	0.1889	0.2106	0.2879	0.3201	0.2559	0.3513	0.9591*	
(12)	0.1271	0.1399	0.3031	0.1345	0.1843	0.2144	0.3953	0.3264	0.3031	0.3514	0.4873	0.9377*

* the number in the diagonal is the square root of AVE

** (1) searching information, (2) posting tweets, (3) launching activities, (4) interacting with fans, (5) data analysis, (6) usage of micro-blogs, (7) operational performance, (8) customer service capability, (9) market-sensing capability, (10) performance of brand equity, (11) performance of customer relationship, and (12) sales performance

Note: the usage of micro-blogs has no AVE because it is a second-order variable composed of five constructs.

Table 5. Correlation matrix of the constructs

5.2 Hypothesis Testing

The results of path analysis and model test are shown in Figure 3. Bootstrapping is used to generate a sample of 500 with the same scale of the original sample, and all the generated data are used to test the significance of path coefficient. The results show that all the path coefficients for the hypotheses are positive. The usage of micro-blogs has significantly positive influence on the micro-blog operational performance ($p < 0.01$). The usage will also influence micro-blogs directly by affecting brand equity and customer relationship ($p < 0.1$). Brand equity performance and customer relationship performance are also positively affected by micro-blog operational performance ($p < 0.01$). Brand equity performance and customer relationship performance have significantly positive influence on sales performance ($p < 0.01$). Hence, all the hypotheses are verified (Table 6).

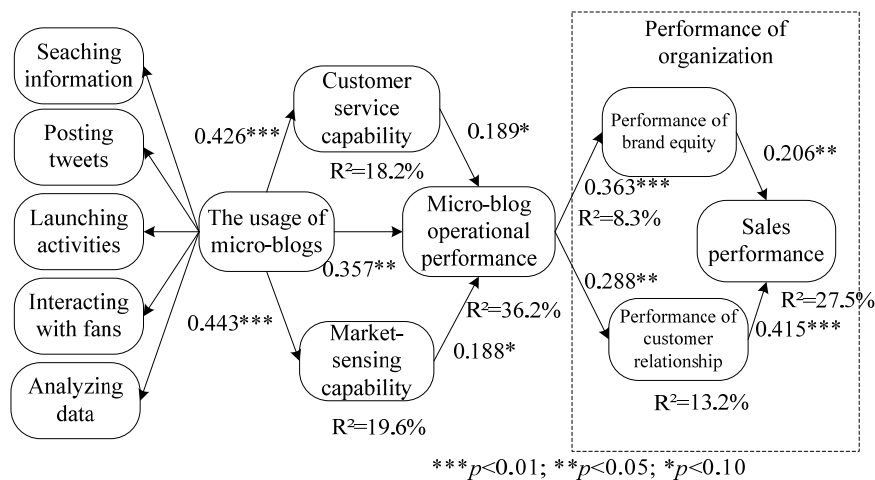


Figure 3. Results of path testing

Hypotheses	Yes/No	Significant or not?
H1: The usage of enterprise micro-blogs can improve its operational performance.	Yes	Yes
H2: The use of enterprise micro-blogs can enhance market-sensing capability.	Yes	Yes
H3: The use of enterprise micro-blogs can enhance customer service capability.	Yes	Yes
H4: The market-sensing capability of a firm can improve micro-blog operational performance.	Yes	Yes
H5: The customer service capability of a firm can improve micro-blog operational performance.	Yes	Yes
H6: The operational performance of enterprise micro-blogs can improve the performance of brand equity.	Yes	Yes
H7: The performance of brand equity can improve firm sales performance.	Yes	Yes
H8: The performance of micro-blogs can improve the performance of customer relationship.	Yes	Yes
H9: The performance of customer relationship can improve firm sales performance.	Yes	Yes

Table 6. Summary of hypothesis tests

6 CONCLUSION

6.1 Findings and Contributions

In the data analysis and hypotheses tests, we reach the following conclusions:

The usage of enterprise micro-blogs, which includes searching information, posting tweets, launching activities, interacting with fans, and analyzing data, can help improve operational performance, such as number of active fans, forwarded tweets, and comments. The appropriate usage of micro-blogs can also indirectly improve operational performance by enhancing core capabilities, such as market-sensing capability and customer service capability. The operational performance of micro-blogs also affects firm brand equity and customer service, and the influence of micro-blogs is reflected by improved sales performance. Thus, enterprise micro-blogs can be treated as a channel for organizing marketing campaigns, serving customers, and building the brand to gain competitive advantage.

The theoretical contribution of this study includes the following. First, the constructs of the usage of enterprise micro-blogs and their operational performance are set up and tested for the first time in this study. Validated items can be used in future studies or introduced to evaluate the extent of usage and operational performance of enterprise micro-blogs. Second, from the perspective of IS/IT usage, this study extends two branches of studies, namely, IS usage and IT value in the RBV theory into the context of micro-blogs, and further explain the impact of IS usage on the firm's core capability. Third, this study confirms that the operations of enterprise micro-blogs can result in improvements in brand equity and customer service, thus resulting in improvements in sales performance of firms. Our findings reveal the mechanisms of business value creation of enterprise micro-blogs.

6.2 Managerial Implications

First, we propose that the extent of enterprise micro-blog usage has an impact on its performance. Different firms have different virtues and styles in operating their micro-blogs. Some firms are good at posting tweets, some like analyzing data, and some prefer launching activities. Our research results show that every operating method is feasible.

Second, to obtain better performance from enterprise micro-blogs, firms should not only reinforce their operational capability but also enhance their internal core capabilities. This strategy is particularly useful for small companies because they can improve their core capabilities by using micro-blogs intensely and properly.

6.3 Limitations and Directions for Future Studies

Although our study has collected more than 300 valid responses, the number is small compared with thousands of companies registered on the platform of weibo.com. The shortage of sample makes conducting analyses across different industries difficult. If more companies participate in the survey, more interesting results could be obtained and different patterns of enterprise micro-blog usage could also provide more useful guidance for managerial practices.

In the empirical analysis, all performance measurements come from subjective judgments in the survey. These judgments may contain biases from real situations. The objective data of the companies such as financial data are more accurate in reflecting the performance of enterprise micro-blogs. In future studies, an analysis that combines survey data, micro-blog contents, and firm financial data may generate more convincing and substantial conclusions.

Acknowledgement

This research was supported by the National Natural Science Foundation of China (70831003 and 71272028).

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