



Research Article

Crowd sourcing and e-Commerce: Chinese Online Reviews

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Abstract

Crowdsourcing and e-commerce provide a lot of advantages to solve problems of organizations, companies and products. With the fast growth of the Chinese e-commerce industry, it is important to develop an understanding of online reviews contents to transmit possible applications of crowdsourcing with e-commerce. This study investigates the relationship between online reviews and crowdsourcing of products in the Chinese context. For this, an analytical framework is developed and the model is tested using quantitative methods. The findings of the study show a significant influence of online reviews on the crowdsourcing-e-commerce relationship. Several suggestions are for the development of effective online review systems in the Chinese context to incorporate crowdsourcing practices with e-commerce. This study is the first study that not only shows the various perspectives of online reviews but analyses online reviews from potential crowd creativity perspective.

Keywords: Crowdsourcing, online consumer reviews, e-commerce, online services, Chinese consumer behavior

Introduction

With the advent of web 2.0, the use of e-commerce applications provides opinions about products that can benefit business by facilitating crowdsourcing practices through open innovation. Crowdsourcing, first coined by Howe (2006), is an online practice that transmits focal problems to the crowd and utilizes solutions in the form

of ideas, skills and expertise of online communities. E-commerce external ideas can be involved to achieve innovation and small businesses can take advantage of open innovation through crowdsourcing by using consumers' online reviews (Chesbrough, 2006). The characteristic of crowdsourcing in e-commerce is unique and it has two sided marketing advantages consisting of the crowd and the mediators

(Buxton & Walton, 2014). Market research can lead to innovation by involving users in online review applications that can also be advantageous for both new and existing products (von Hippel, 2006; Stoks & Wilson, 2010). Crowdsourcing practices can be used through online review systems by getting information of crowd trends and tastes for products (Sandulli & Chesbrough, 2009).

At present, China's e-commerce sector has grown rapidly and the growing proportion of e-commerce shoppers is one of the largest aspects fueling this rapid growth. China's online shopping population has reached 302 million over the course of the past five years and with such rising numbers it is not surprising that China is on pace in becoming the world's largest E-commerce market (CNNIC, 2014). Companies are reacting to negative reviews to overcome flaws in products and developing integrated online applications in e-commerce in China. Being on these sites, 40% of China's online shoppers are reading and writing online reviews about products (Stanley & Ritacca, 2014; Ching & Lam, 2014). Online reviews are very fruitful in providing useful ideas, creativity about the quality of the products and comments by consumers are of great interest for sellers which maintain direct relationship between buyers and retailers (Dellarocas, 2005; Lee et al. 2008). Online reviews have a significant impact on the worth of products in the form of compliment to the products (Lee et al, 2011).

Online reviews as a source of crowdsourcing are important where all activities are important to obtain the trustworthiness information (Nickerson & Zenger, 2004). In this paper, we aim to shed some light on the perspectives of online reviews and on how crowd contributes to the crowdsourcing of products in the Chinese context. The main research question in this study is to know the various online reviews' contribution to crowdsourcing. The present study investigates the relationship between various perspectives of online reviews and helpful ideas by exploring the online

reviews on Tmall (www.tmall.com) based on datasets collected from Huawei mobiles (<https://huawei.tmall.com> one of the largest Chinese mobile seller). Without knowing about this relationship, it is impossible to create an effective review system across consumers to increase feedback of products and source of crowdsourcing for products through creative ideas.

We begin this study with a brief overview of the literature regarding effective online reviews, and we then develop our framework that describes how online reviews can contribute to the crowdsourcing of products in and how crowd participation is influenced by various online reviews' perspectives. Further, we describe the methodology of our study and show the results of model analyses. Finally, we discuss managerial implications, limitations of the study, and further research suggestions.

Related Work

The crowdsourcing e-commerce can formulate relevant rules to increase the integrity of the crowd. In order to make the crowd participate in crowdsourcing at ease, it is the crowdsourcing e-commerce that attracts ideas of potential consumers. Crowdsourcing has become a way to problem solving holding commercial potential in collective networks (Ogawa & Piller, 2006; Afuah & Tucci, 2012). In this section, previous works are described on exploring the impact of online reviews on products market and the impact of online reviews in the Chinese context.

Researchers in marketing and retailing fields have paid their efforts on several aspects of consumers' online reviews which may help firms to implement cross selling and up selling campaigns (Raymond et.al. 2005; Shu et.al. 2011). Market basket analysis or association rule is a main technique for the prediction. The impact of online reviews on product creativity and sales are explored by several researchers on various aspects of consumers' comments such as purchasing behavior (Poel et.al. 2005), management of online

reviews (Hennig-Thurau et al. 2004), motivational factors of online reviews (Picazo-Vela et al. 2010), effective online reviews (Chen et al. 2007; Park & Kim, 2008; Utz et al. 2011), contents of online reviews (Korfiatis et al. 2011), and individual behaviors in online reviews (Chen, 2008; Hu et al. 2011). Despite the popularity in the retailing research, we find little empirical research focusing on the exploration of the impact of Chinese online reviews on the creativity of ideas for product value. Hoa et al. (2008) have done research on the emotional aspect of online reviews in Chinese context and Zhang et al. (2010) have conducted research on the impact of online reviews on purchasing intentions.

With e-commerce and crowdsourcing practices, retailers have a new way of marketing and product personalization. Companies are aware of these new challenges and the crucial role of review comments facilitating e-commerce. Some studies conducted in non-Chinese context lead to the inconsistent conclusions with those in the Chinese context. Previous research studies mainly explore why and when crowdsourcing is a feasible option for retailers (Marc, Ashford & Andrea, 2012) and research on awareness from consumer perspectives is done by Duan et al. (2013). Most research has only limited outputs to guide e-commerce and crowdsourcing practices market in China. This study provides the impact of online reviews on product creativity crowdsourcing ideas in the Chinese context.

Analytical Framework

Considering the concept of crowdsourcing and e-commerce, we developed a framework based on consumer engagement (Brodie et al., 2011). In this study, basic approach is used describing how different perspectives of Chinese online reviews might create creative ideas and value to products. For this, online reviews are divided in three perspectives: reviews' quality, number of reviews and emotional tendency of reviews. The basic idea of this analytical framework is that, if the consumer is satisfied with the product,

this will lead to the popularity of the product and the potential crowd will eagerly include creative reviews to upgrade the product.

Validity, consistency and significance of reviews indicate the quality of their content. The quality comments in reviews can enhance the usefulness for potential consumers and favorable vote for such reviews also indicate quality of reviews (Chen et al. 2007). The length of review also indicates the quality of a review because it provides more information on the product. The contents of reviews having unique perspectives and insightfulness are called interesting reviews that are more important for sellers (Smith & Brynjolfsson, 2001). Therefore, we propose the following hypotheses:

H1a. The favorable votes for potential reviews are positively correlated with product improvement.

H1b. The length of review is positively correlated with product improvement.

H1c. The interesting reviews are positively correlated with product improvement.

For one particular product the number of reviews adds worth to product, and lot of studies are done on the impact of records of reviews on the product value in terms of reputation. The large records of reviews can provide more information of the product and the potential consumers can add suggestions to improve product reputation (Wei & Chunling, 2012).

H2. Large records of reviews for products have a positive impact on product information.

Different options are provided online. Review systems for crown ratings and reviews are rated on the basis of different stars. These ratings are the expressions of likeness and dislikes of crowd for particular product reflecting influential effect. All reviews either negative or positive are the experiences of consumers about the characteristics of products (Chevalier & Mayzlin, 2006). Based on the

provided information, the responsive inclination of the product can predict the product evaluation and more innovation in product improvement.

H3a. Influential inclination of online reviews influences product value and input.

H3b. Higher star rating of product has significant influence on product input.

Based on the above mentioned hypotheses, the analytical framework is shown in Figure 1.

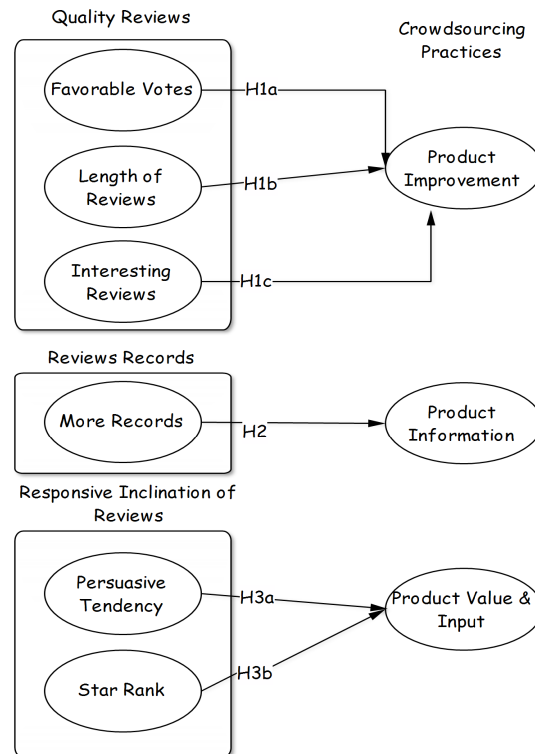


Figure 1: Analytical Framework

Methodology

To test our framework, we applied a multi-step approach incorporating a series of quantitative analyses. First, we conducted a netnographic analysis (Kozinets, 2002) to understand consumers' participation in online reviews. For this, we analyzed all reviews posts during one year on Tmall of Huawei mobile brand. Tmall is Alibaba Group's business-to-consumer e-commerce platform, which acts as a virtual mall with branded storefronts offering a wide range of consumer products and Huawei is probably the most technically innovative firm in telecommunication of China (Stanley & Ritacca, 2014). Overall, we categorized 250 different reviews for the

Huawei mobile products. Crowdsourcing in this study is related to product improvement, product information, product value and input. Here crowdsourcing practices are taken as dependent variables and review related perspectives (reviews' quality, number of reviews and emotional tendency of reviews) are taken as independent variables.

Data collection and Measurements

Online review data about Huawei mobile phones are collected from Tmall.com in China. Tmall has become Asia's largest B2C platform in regards to revenue and holds over 50% share of the China's online B2C

market (Millward, 2013). The site possesses huge amounts of traffic, has more than 70 000 Chinese and international brands, and more than 50 000 unique stores (Meng, 2014). We collected all the review information of mobile phones of Huawei and 250 potential reviews are viewed posted in last one year having positive effect on product innovation and credibility. We also collected concrete review data posted date, the number of starts of the review, review length, spotlight of review, review text and votes. The data were processed to the need of research format.

Crowdsourcing practices. This construct is used as dependent variable and measures the extent to which the crowd participates (product improvement (PI), product information (PI_n), product value and input (PV&I)). We chose the number of crowdsourcing contributions in data from Huawei online reviews to reflect the CP. The higher number of reviews depicting creativity and crowdsourcing practices; it means the more crowds contributed to the innovative ideas.

Quality Reviews. Integrity refers to favorable votes for reviews, reviews length and interesting reviews, and to measure the review quality, the average number of all principles is used to measure the overall

quality of reviews. In this construct, each variable is measured individually as favorable votes for reviews (FV), length of reviews (RL) and interesting reviews (IR) which are more visible, location significant and time-saving. The more the reviews carry these qualities in contents, the integrity of quality of reviews and effect on product improvement suggestions is much higher.

Reviews Records (RR). This construct refers to the number of reviews for each product category. To measure the effect of the number of reviews on creativity, the more reviews for product will have more creativity and more information on the product.

Responsive Inclination of Reviews. Influential inclination in contents of reviews refers to expressions of likeness and dislikes of crowd that shows influential inclination (IR) and star ratings (SR) for particular product which are rated by the crowd. If likeness and rank is high, then product value and input will be high.

We summarize the constructs discussed above, as well as their respectively abbreviations.

Table 1: Constructs and abbreviations

Constructs	Abbreviations
Crowdsourcing	
Product Improvement	PI
Product Information	PI _n
Product Value & Input	PV&I
Quality Reviews	
Favorable Votes	FV
Review Length	RL
Interesting Reviews	IR
Records of Reviews	RR
Responsive Inclination of Reviews	
Influential Inclination	IR
Star Rank	SR

Analysis Model

To examine the impacts of online reviews of products on crowdsourcing creativity for the product or the main effects, we use the estimated equation to explore how reviews in quality, reviews records and influential inclination may play a role; we use the equation (1), (2) and (3).

$$(1) PI = c + \beta_1 FV + \beta_2 RL + \beta_3 IR + \varepsilon$$

$$(2) PIn = c + \beta RR + \varepsilon$$

$$(3) PV\&I = c + \beta_1 IR + \beta_2 SR + \varepsilon$$

Where c is the constant; β_i ($i=1 \sim 5$) and β_1' , β_2' , β_3' are regression coefficients; ε is the residual error. Crowdsourcing practices (PI, PIn, PV&I) are taken as dependent variables and review related perspectives (reviews quality FV, _RL, _IR, reviews records RR and influential inclination of reviews IR, SR) are taken as independent variables.

Table 2: Regression Coefficients

	<i>Model 1</i>		<i>Model 2</i>		<i>Model 3</i>	
PI	Coefficient	t-values	Coefficient	t-values	Coefficient	t-values
<i>FV</i>	-.11	1.09				
<i>RL</i>	-.05	-0.03				
<i>IR</i>	.45	2.20*				
PIn						
RR			.18	1.35**		
PV&I						
<i>IR</i>					.17	1.53**
<i>SR</i>					.21	1.72*

*** Significant at the 1% level (one-sided test). ** Significant at the 5% level (one-sided test).

* Significant at the 10% level (one-sided test).

Data Analysis and Results

According to our proposed analytical model, we conducted the regression analysis of our sample data and the results are shown in Table 2. By viewing the corresponding values, we find that all the independent variables are significantly correlated with the dependent variables. Crowdsourcing practices (PI, PIn, PV&I) are taken as dependent variables.

To know the correlation between reviews quality and product improvement suggestions, we add three independent variables, favorable votes for reviews (FV), review length (RL) and interesting reviews (IR) in Table 2, model 1. Favorable votes of reviews are not significantly correlated with product improvement (PI), which can be concluded that H1a is not supported ($\beta = -.11$, $p = 1.09$). It means that the review voting mechanism does not show its value on Huawei online review system. After

viewing our sample data, we find that few people have voted for the reviews quality, and commenting on existing reviews is much rarer. According to review length (RL) in model 1, we find that H1b is not supported ($\beta = -.05$, $p = -0.03$), and length of reviews is negatively correlated with product improvement (PI). The reason is this that potential consumers can gain more useful information from longer reviews. H1c is supported ($\beta = .45$, $p = 2.20$) because interesting reviews (IR) is positively correlated with product improvement (PI) suggestions. Spotlight reviews are more visible to potential consumers and it can have greater contribution for creative ideas to improve the product.

In model 2, H2 is supported ($\beta = .17$, $p = 1.53$) as the reviews records (RR) has a significantly positive effect on product information (PI_n) regarding different mobile models of Huawei. As the number of reviews increases, it will be more possible for consumers to obtain helpful information on the products.

As shown in model 3, H3a is supported ($\beta = .17$, $p = 1.53$) and the result indicates that influential inclination (IR) reviews are having influence on product creativity and value (PV&I). Chinese consumers are conscious about positive reviews containing influential inclinations. The review star ranking (SR) is having influence on product input. So H3b is supported ($\beta = .21$, $p = 1.72$) and review stars have significant effect on product value and input. The reviews having one star to five-star reflect the emotional tendency of consumers towards particular Huawei mobile model.

Discussion, Implications and direction to future research

In this study, online reviews are analyzed with relation to crowdsourcing practices and identified various influential reviews perspectives for potential crowd. Considering these results, we can infer multiple suggestions and implications for the management of e-commerce for crowdsourcing work.

First of all, H1a and H1b demonstrate that favorable votes for review and reviews length are negatively correlated with product improvement on Huawei. Therefore, there is a need to strengthen and promote review voting mechanism on Tmall in Chinese reviews. Reviews of large records can have significant effect on product improvement as studied by Chen (2008). However, this mechanism does not work on Huawei because favorable votes of reviews are not significantly correlated with product improvement in Chinese reviews. Online consumers in China are not interested in providing longer online reviews. The number of reviews provided by Chinese consumers is much smaller and Chinese consumers are likely to provide short reviews. It was also observed in reviews that Chinese consumers use short sentences and expressions that are not very open. Regarding interesting reviews, H1c shows that interesting reviews have more positive effect on product improvement. It indicates that Chinese consumers are more interested in following interesting reviews. Chinese online review systems should put more efforts on the psychological aspects of crowd behaviors to improve effective online reviews system and to encourage potential consumers to favorably vote for reviews. Incentive mechanisms can also create encouragement in reviews coting and product feedback participation for improvement (Zhang et al. 2010).

In this study, H2 proves that reviews records are having a positive impact on product information. This indicates that the online review system of Tmall with those other e-commerce websites can be improved on the basis of reviewer rank and quality of reviews. H3a and H3b demonstrate that responsive inclination of online reviews has a significant influence on product value. Reviews stars and ranking can also influence potential consumers' creative input for the product. It suggests that Chinese online review systems should pay more attention to improving their reviewer ranking mechanism and the content of reviews should be considered when ranking reviewers (Ye et al, 2007). The

purpose of improving the online review system is to enhance the possibility of creative input of potential crowd in problem solving and more crowdsourcing practices. Through e-commerce retailing, standardized virtual communities can constantly give input to online products for improvement.

In this paper, the perspectives of Chinese online reviews are studied in relation to crowdsourcing practices. The impact of online reviews on product input and value is considered through crowd feedback, and hypotheses about the correlations between different aspects of online reviews and crowdsourcing practices are proposed. In this study, the perspectives of online reviews include: quality reviews, reviews records and responsive inclination of reviews. To test analytical framework, regression analysis is done on data taken from Huawei (<https://huawei.tmall.com>) of smart phones in China. Results show that number of reviews and responsive inclination of reviews and interesting reviews are all important for product information and product input, while reviewer rank and length of reviews are not correlated with product improvement. All these perspectives of online reviews produce potential crowd feedback that can improve better e-commerce online retailing. Based on the findings, several suggestions are made in the Chinese reviews system. The system to rank reviewers in e-commerce platforms should be managed in a more reasonable manner so that consumers could express their emotional tendency, and online retailing websites should be designed in a way to enhance the effectiveness of review voting mechanisms and improve the quality of spotlight reviews so that online consumers can give potential input for product improvement. The truthfulness of reviews should also be taken into account for reviewer rank evaluation, review voting mechanism and spotlight reviewers selection. This study has contributed while exploring the perspective of online reviews in crowdsourcing practices as innovative input for product improvement. The extent of innovative ideas is considered rather than the sale of product in this study. The

analytical framework is designed on relationships between online reviews and crowdsourcing practices and several suggestions are made in Chinese reviews in this study.

This study only focuses on one particular product – smart phones and future work can be done on the effects of reviews of different products. Specifically, the study can be conducted in different categories of products with different levels of popularity in China. In this study, regression analysis is done to know the effect of reviews but in future research econometrics can be considered in other products.

The contribution of this study is in relation to the culture of a specific country and gives input for Chinese review systems to be upgraded. Crowdsourcing and e-commerce are the merging phenomenon in online business strategy. Managers can use these criteria to understand the impact, that is, with the point of view of these common variables to be the basis for determining whether a particular innovation can achieve the expected results from consumers. E-commerce researchers can then assist in this task by providing theoretical perspectives on how crowdsourcing should proceed, and also by documenting case studies from companies leading this work in connection to e-commerce.

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