

The Effect of Internet WOM on Box Office Revenue- an Empirical Study based on the Movie Market in Chinese Mainland

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Abstract — Under the background of the rapid development of the Internet, Internet Word-of-Mouth (WOM) gradually highlights its unique power and becomes an important factor affecting the movie market. In this paper, we study the effect of the Internet WOM on box office, and reveal the important influence of Internet WOM for the film industry. As a cultural product, movie box office is affected by many factors. We introduce the origin of the film, film types, whether a remake, sequel or adapted, movie schedule, actor appeal, and director appeal as the moderating variables between Internet WOM and box office. The results showed that film types, whether a remake, sequel or adapt and director appeal influence the volume and valence of Internet WOM, then influence the movie box office, while the origin of the film, movie schedule and actor appeal are insignificant.

Key words -- Internet WOM, Movie Market, Box Office, Volume, Valence

I. INTRODUCTION

With the rapid development of Internet, Internet WOM as a new type of word-of-mouth has deeply influence on people's purchase intention and purchase decision. In recent years, in movie industry, Internet word-of-mouth marketing gradually reveals its unique power. Especially in Weibo and WeChat era, the spread speed of WOM for one movie is faster than ever before; the "sociality" owned by human instinctively makes people refer to the online opinions of audiences before watching the movie. Therefore today, with the market costing becoming higher and higher, the spread of good WOM, especially the spread of WOM on the Internet platform, must be a shortcut for movie achieving success in the market.

From the previous studies at home and abroad, although studies on Internet word-of-mouth marketing have been relatively extensive and comprehensive, studies on applying Internet word-of-mouth marketing into movie-the new cultural industry-are relatively few; especially, the studies that takes actual box office data and Internet WOM for empirical analysis are scanty. At the same time, in the studies of Internet WOM and box office, most scholars are limited in the direct effects of Internet WOM on box office; there are few studies focusing on the effects of interaction effect of other factors and Internet WOM on box office. Therefore, more studies are needed to perfect this field and to reveal the effects of Internet WOM on box office.

This paper is trying to apply the effects of Internet WOM on the purchase decision of consumers to the movie industry from the view of Internet WOM. It takes Internet comments to represent Internet WOM to quantitatively study the effect of Internet comments on box office with considering other factors affecting the box office at the same time. It reveals the important effects of Internet word-of-mouth marketing

on today's movie industry through analyzing the effects of interaction effect of each factor and Internet WOM on box office. It is hopeful to put forward related suggestions to Chinese movie market in the concept of "Marketing is greater than movie".

II. LITERATURE REVIEW

A. Internet WOM

After entering into the 21st century, with the rapid development of modern information technology and the popularization of Internet, the content of WOM study has been changed correspondingly. The WOM of virtual community based on Internet environment has appeared in the word-of-mouth marketing area as an emerging force.

The traditional WOM limits the information spread in the face-to-face oral communication; however, the emergence of Internet provides new forms for information spread, that is, the word-of-mouth spread can complete non-face-to-face information communication in virtue of Internet; this is the so-called Internet WOM. Relevant scholars think that Internet WOM is the action that consumers spread their views and evaluations to other consumers through words, images, videos and other forms by virtue of Internet forum, chat tools, social network sites, E-mail and other Internet tools based on their consumption experiences from purchasing products or services. Hanson (2000) called this spread mode as electronic WOM or online WOM; he thought that this spread mode spreads WOM through E-mail, on-line forum, forum and other forms by taking Internet as the medium.

Compared with traditional WOM, Internet WOM mainly adopts words, pictures, sounds and other spread forms; and for the measurement of Internet WOM, adopting words form is the representative, that is the Internet comments. At present, although scholars have difference for the study on

the measurement of Internet WOM, it is mainly based on the following dimensions:

(1) Volume of comments is the volume of comments to same product or services.

Volume of comments is the important factor that affects the purchase decision of consumers in Internet WOM; it represents the popularity degree of product or service in a certain extent. From the view of psychology, people are accustomed to collecting relevant information to reduce the uncertain risks when facing with unknown things. Chevalier & Mayzlin (2006) verified the effects of volume of comments on book sales.

(2) Valence of comment is also called as comment direction; that is, measurement of the direction of comment is positive, negative or neutral.

The conclusion that comment direction can affect the purchase decision of customer has been agreed by most of scholars; however, there is large difference on how does comment direction affects the purchase decision of customer. Lee et al. (2008) proved that the losses caused by negative WOM information to enterprise are larger than earnings caused by it from the view of expectation theory. While Gershoff (2003) thought that the effect of positive comments is larger than negative comments for consumers and enterprises. However, based on the research and analysis of Cheung et al. (2009), we can find that the direction of Internet WOM information has no effect on information credibility, which has difference with the positive effect and negative effect agreed by other scholars. This shows that the study on valence of Internet comments to purchasing behavior of consumer need to be further proved.

(3) Attribute of comments, mainly refers to the subjectivity or objectivity of consumer's comment on product or service information.

The subjective information of product or service is obtained by the consumer mainly based on their own consumption experience, such as experiences on catering and traveling experience; while the objective information is mainly from the search information, including the property, usage, and price, etc. of product. Klein & Ford (2003) found that consumers are inclined to subjective information when facing with offline information and are obviously inclined to objective information when searching information; they also pointed out that the property of comment has no effect.

(4) Rating of comment refers to the scores and rating to product given by the consumer.

Rating of comment is very common in Internet rating; generally, the rating can be divided into several levels; for example the rating of 1-5 stars, they are gradients from the most positive (1) to neutral (3), and then to the most negative (5). Relevant scholars have made studies to this. Forman et al. (2008) found that the effects of two extreme Internet comments are larger than neutral comments.

(5) Length of comment refers to number of words of comments.

Based on the length of Internet comments, there are differences among scholars on the opinions of consumers' purchasing behavior. Relevant scholars think that more words of Internet comments states that the participation

degree of consumer is higher. Chevalier & Mayzlin (2006) thought that the number of words of comments has positive correlation with usefulness of information. On the contrary, Racherla & Friske (2012) thought that the number of words of comments has little effect on usefulness of comments. From the above relevant literatures concerning measurement forms of Internet WOM, scholars' viewpoints that volume of Internet comments has effect on purchase decision are basically coincident; however, studies on other dimensions and purchase decisions have differences of different levels, which need more scholars to make further explanations and verifications.

III. STUDY ON INTERNET WOM OF MOVIE INDUSTRY

The studies of scholars at home and abroad on Internet WOM of movie industry are mainly focused on measuring form and functions. Internet WOM mainly refers to content generated by the Internet users, including rating, comments and other interactions to the movie. According to the different designs of different websites, the forms of the content of Internet WOM are different. But on the whole, it mainly includes volume of Internet comments, valence of internet comments and distribution of Internet rating.

The volume of Internet comments means that the attention of the movie is large; more people discussing the movie means that more people know the movie. The volume of Internet comments plays the function and effect of advertisement to a certain degree. Valence of internet comments refers to people's positive, negative or neutral comments to the movie, which means the persuasion of Internet WOM. People always express their attitudes to the movie through expressing the opinions and feelings on the Internet. Many websites related to movie have rating function, such as, Movie! Yahoo! in America, Internet Movie Database (IMDB for short), Douban Movie and Mtime in China. The appearance of rating function quantizes Internet user's evaluation to the movie. On the one hand, it can express the comments to the movie in a simpler and clearer way; on the other hand, it makes the information searcher directly obtain the Internet WOM. In addition rating function, most websites have set content comments, so users can directly write comments; therefore, people's attitudes to the movie are directly extracted from the comment contents. Nevertheless, based on the consideration of study costs, most researchers directly adopt the Internet rating of each website to take relevant research. Ye Hu (2004) proposed that some websites summarize and publish the number of rating people while providing rating function to study the variance and distribution of Internet rating.

Due to there is certain difference among the effects of each factor of Internet WOM on box office, relevant scholars have made study and analysis. The study conclusions of most researchers on the effect of volume of Internet comments on box office are coincident; they think that volume of Internet comments has significant effects on box office. Yong Liu (2006) thought that the more the volume of Internet comments, the easier that consumers contact with

relevant information. Therefore, as the information provider, volume of Internet comments has effect on the cognition of consumer. People’s opinions on the relationship between scores of Internet comments and box office are various. Because movie is a kind of experiential consumption, viewers purchase on the premises of meeting their needs instead of obeying so-called quality index. Therefore, the scores will not have synclastic effect to box office, which explains the phenomena of “receiving critical acclaim but poor sales at the box office” and “receiving good sales at box office but poor acclaim”. In addition, the effects of Internet WOM of different period on the box office are different. Hadida (2009) pointed that the effects of Internet WOM are maximum before release and the first week of release. With the passing of screening time, the effects of Internet WOM will be weakened. In addition to studying effects of Internet WOM on box office from volume of Internet comments and scores of Internet comments, some scholars also conduct relevant empirical study based on the relationship between different screening time of movie and the Internet WOM of this period. Yong Liu (2006) studies stated that the WOM before release has strong predictive ability to the box office

within five weeks after release, especially for non-sequel movies, the predictive ability to the box office is stronger.

IV. THEORETICAL MODEL

Based on the previous studies to Internet WOM and box office, as two dimensions of Internet WOM, volume and valence have separate effects on box office. Yong Liu (2006) pointed that Internet WOM affects consumers’ purchasing behavior mainly through two ways. On the one hand, the volume can affect consumers’ cognition degree to product; the higher of awareness of consumers to the product, the easier to generate purchasing behavior. On the other hand, the valence, namely positive WOM or negative WOM, can affect consumer’s attitude, and then affect purchasing behavior. In this paper, it takes volume and valence as the independent variable, box office as the dependent variable, and the producing area, type and remake, sequel or adaptation of movie, movie schedule, appeal of actor and appeal of director as the moderators to discuss the effects of each variable on box office and interaction effect between moderators and volume and valence of Internet WOM. The relationship model of this paper is shown as Figure 1:

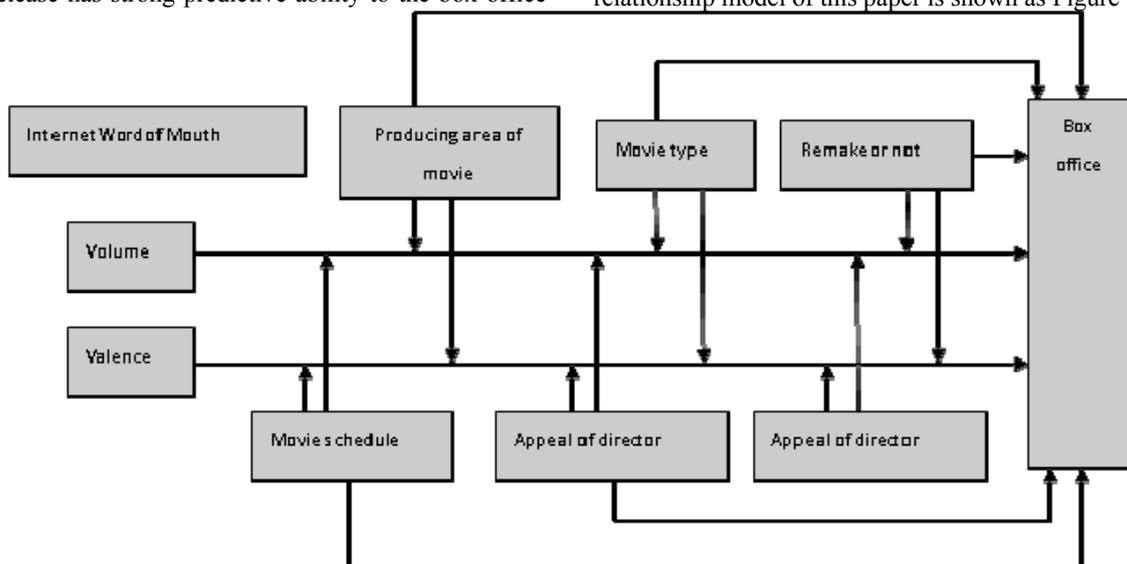


Fig.1: The Relationship Model of Internet WOM, Related Moderators and Box Office.

V. VARIABLES DESCRIPTION AND STUDY HYPOTHESIS

A. Independent variable: Internet WOM

In this paper, Internet WOM is defined as potential consumers or actual consumers’ action of spread and communication their evaluation and feelings to the product, brand and service through words, images, sounds and videos by Internet. Internet WOM reflecting movie-the cultural product-mainly takes volume and valence of Internet WOM as the measurement indexes.

The Internet WOM data of this paper is from Douban Movie (<http://movie.douban.com>) and Mtime (<http://www.mtime.com>) which are two mainstream websites

for movie WOM with higher authority and credibility in China mainland. The data for each movie is from its webpage; the volume of Internet comments represents the number of people focusing on the movie which shall be represents by the total number of people of comments. Valence of Internet comments represents audience’s recognition and preference degree to the movie, which shall be measured by the average value of Internet comment scores; the higher the score, the higher preference and evaluation of audiences to the movie. Of which, Douban Movie sets the gradient from 1 star to 5 stars, and each gradient will summarize the percentage of rating people. The comprehensive scores can be obtained through weighted average, which shall be represented by ten-point system. Mtime sets the gradient from 1 to 10, and the comprehensive

scores also can be obtained through weighted average, which shall be represented by ten-point system. Based on the calculation standard of the volume and scores of Internet comments of the above two websites, this paper synthesizes the Internet comments data of the two websites, that is, the volume of Internet comments is represented by the sum of the two websites and the scores of Internet comments can be obtained through weighted average by taking the volume of comments of each website as the weight number.

In conclusion, this paper puts forward the following Hypothesis:

H1a: Volume of Internet comments has effect on box office.

H1b: Scores of Internet comments has effect on box office.

B. *Dependent variable: Box office*

Box office is the total accumulative income of one movie during the screening period and the direct result of consumer's action purchasing movie product. This paper discusses the effects of Internet WOM on box office by taking the incomes from box office of movie as the standard for measuring consumer's purchasing behavior and from the theory of Internet WOM affecting consumer's purchasing behavior. The box office data involved in this paper is from the box office database (<http://58921.com/>). This website's statistics to box office includes daily ranking, weekly ranking and history ranking of movie; this paper mainly takes the history data to conduct empirical analysis.

C. *Moderators*

The generation of box office not only is affected by the property of movie, but also comprehensively affected by other factors in the market. Abroad scholar's studies on factors affecting box office are earlier than that of domestic scholars. The studies show that box office may be affected by movie type, producing area of movie, release schedule, whether remake or sequel, actors, director, production costs, advertising costs and other factors. Based on the particularity of movie industry, the production costs and advertising costs of movie are always the secrets of the industry. The accurate information cannot or is difficult to obtain. Generally, there is a relationship between the production and advertising costs and famous director and actors. Eliminating variables of production costs and advertising costs will not affect the robustness of other variables and can improve significance level of inspection on the contrary. Therefore, in the study of this paper, the production costs and advertising costs of movie will not be included the regression model which takes box office as the dependent variable.

In conclusion, this paper introduces the following variables to inspect their effects on box office.

(1) Movie type. Movie type reflects the preferences of audience. Therefore, studying the effects of different types of movie on box office has a certain market value. Some scholars think that the viewing decisions of consumer are deeply affected by movie types. Austin and Gordon (1987)

thought that viewers can automatically store memories about the types and characteristics of movie and store more memories about relatively familiar movie types. When making viewing decisions, the memories about movie types of viewer will affect the dependency degree to other movie information of decision. In addition, Litman (1983) studied and found that only science fiction movie has significant effect on box office incomes in all types of movies. Neelamegham and Chinatagunta (1999) pointed that horror movies are more popular with the audience and have larger market compared with romance movies.

In conclusion, this paper puts forward the following Hypothesis:

H2a: The movie type has effect on box office.

H2b: The movie type has effect on relationship between the volume of Internet WOM and box office.

H2c: The movie type has effect on relationship between the valence of Internet WOM and box office.

(2) Producing area of movie. The development of western movies is earlier than that of China; especially for the Hollywood movies in America, it has a certain degree of difference when compared with movies of other countries no matter from development degree or producing level. In fact, "Hollywood" is the synonym of high-level movie. Based on the different political and cultural backgrounds and historical inheritances of each producing areas, the products of different producing areas have different images, reputations and features. Consumers can generate fixed cognition and attitude to products of different producing areas; therefore, the producing area can affect consumer's elevation to product and purchase decision and then affect box office income.

In conclusion, this paper puts forward the following Hypothesis:

H3a: The producing area of movie has effect on box office.

H3b: The producing area of movie has effect on relationship between the volume of Internet WOM and box office.

H3c: The producing area of movie has effect on relationship between the valence of Internet WOM and box office.

(3) Whether the movie is remake, sequel or adaptation

Different with other products, movie is a kind of disposable consumer good. For audience, each movie is a new product, so this characteristic makes movie difficult to have its own brand. However, movie can promote its brand value by relying on other factors. When one movie is successful, it will generate its own brand value; and the subsequent remakes or sequels can be regarded as a kind of brand extension, which obtains high box office income by virtue of the brand value of the previous movie.

In conclusion, this paper puts forward the following Hypothesis:

H4a: Whether the movie is remake, sequel or adaptation has effect on box office.

H4b: Whether the movie is remake, sequel or adaptation has effect on relationship between the volume of internet WOM and box office.

H4c: Whether the movie is remake, sequel or adaptation has effect on relationship between the valence of Internet WOM and box office.

(4) Movie schedule.

If the releasing area represents the space horizontal market of movie, and then the movie schedule is the time vertical market of movie. The movie schedule emphasizes the seasonality of movie and reflects the time costs and energy costs of audience. As an important factor for affecting the box office, the industry and academic world are paying more attention to movie schedule. Litman (1983) found that Christmas has significant positive effects on box office. However, some scholars think that summer holiday is the best time for releasing movie. Radas and Shugan (1998)'s studies found that although movies released at hot schedule have shorter life cycle, the box office incomes are higher. Currently, the domestic movie schedule is mainly divided into New Year Movie Season, Summer Movie Season and National Day Movie Season. Of which, New Year Movie Season generally refers to the schedule from the middle of November to the beginning of March of next year, including Christmas, New Year's Day, winter holiday, Spring Festival, Festival of Lanterns, Saint Valentine's Day and other holidays. New Year Movie Season is regarded as movie schedule with most perfect in China, most intense competition, highest productive ability in box office and most strong consumption ability, so most movies will be released in this schedule. Summer Movie Season refers to the schedule from beginning of June to beginning of September of each year, which is mainly aimed at students. National Day Movie Season mainly refers to the schedule for seven days holidays of National Day.

In conclusion, this paper puts forward the following Hypothesis:

H5a: Movie schedule has effect on box office

H5b: Movie schedule has effect on relationship between the volume of Internet WOM and box office.

H5c: Movie schedule has effect on relationship between the valence of Internet WOM and box office.

(5) Appeal of actor

The attraction of movie depends on "Celebrity effect" to a certain extent. Acclaimed performances owned by celebrities and character traits liked by audience increase the attention and attraction of celebrities. However, celebrities' effect on box office is controversial among many scholars without achieving conformity. Taking the Hollywood movies as the research objective, Faulkner and Anderson (1987) found that celebrities have positive effect on box office. While the study of Chang *et al.* (2005) proved that celebrity effect only has positive effect on the first releasing week and has negative effect on the total box office of the movie.

In conclusion, this paper puts forward the following Hypothesis:

H6a: Appeal of actor has effect on box office.

H6b: Appeal of actor has effect on relationship between the volume of Internet WOM and box office.

H6c: Appeal of actor has effect on relationship between the valence of Internet WOM and box office.

(6) Appeal of director

Director is the leader and commander in chief of a movie. In the heart of many audiences, famous director represents the guarantee of movie quality, whose influence is larger than many celebrities.

In conclusion, this paper puts forward the following Hypothesis:

H7a: Appeal of director has effect on box office.

H7b: Appeal of director has effect on the relationship between the volume of Internet WOM and box office.

H7c: Appeal of director has effect on the relationship between the valence of Internet WOM and box office.

VI. SAMPLE SELECTION

This paper selects top 150 movies (see Appendix A for movie list) ranking in the box office and releasing at China mainland from 2011-2013 as the object of study, respectively collects the box office incomes, Internet WOM, type, producing area, whether it is sequel or remake, release time, actors and director and other relevant data of movie to conduct empirical analysis.

VII. SIGNIFICANCE TEST OF VARIABLES

Correlation test of independent variables

This paper respectively uses comments volume of Internet WOM and scores of Internet WOM as two dimensions. Firstly, it tests the correlation of the Internet WOM of independent variable and box office of dependent variable to analyze the correlation degree of each dimension of Internet WOM and box office.

In 150 sample movies, the maximum value of volume of Internet comments (thousand people) is 400.17, the minimum value of that is 1.27, and the average value of that is 111.52, which states that the differences on the volume of participating in Internet comments for different movies are larger. The maximum value of scores of Internet comments is 9.3, the minimum value of that is 2.7, and the average value of that is 6.569. Although audience's recognition degree to different movies is different, in general, the average scores of Internet comments to sample movie is about 6.5.

From the correlation, the correlation coefficients of volume of Internet comments, scores of Internet comments and the box office respectively are 0.567 and 0.326, which states that the two independent variables are positive correlation with box office with all Sig. values less than 0.05. It states that volume of Internet comments, valence of Internet comments has significant positive correlation property with box office. Therefore, Hypothesis H1a and Hypothesis H1b are accepted.

Significance test of moderators

Considering that there are many factors affecting box office, in order to accurately verify the effect degree of Internet WOM on box office, this paper takes six moderators including movie type, producing area, whether movie is remake, sequel or adaptation, movie schedule, appeal of actor and appeal of director to jointly conduct study and

analysis. However, based on the previous study, scholar’s opinions on the relationship between these variables and box office are different. Therefore, this paper conducts significance tests to each moderator firstly before establishing model to conduct data analysis.

After taking significance tests to each variable, there is significant correlation between the volume of Internet rating and scores of Internet comments as variables and box office.

In six moderators, the correlations of movie type, whether movie is remake, sequel or adaptation, appeal of director with box office are significant; There is no significant correlation between producing area and schedule of movie, appeal of actor and box office; therefore, this paper removes the three moderators and regulates the established relationship model of Internet WOM, relevant moderator and box office, and revised relationship model is shown in Figure 2:

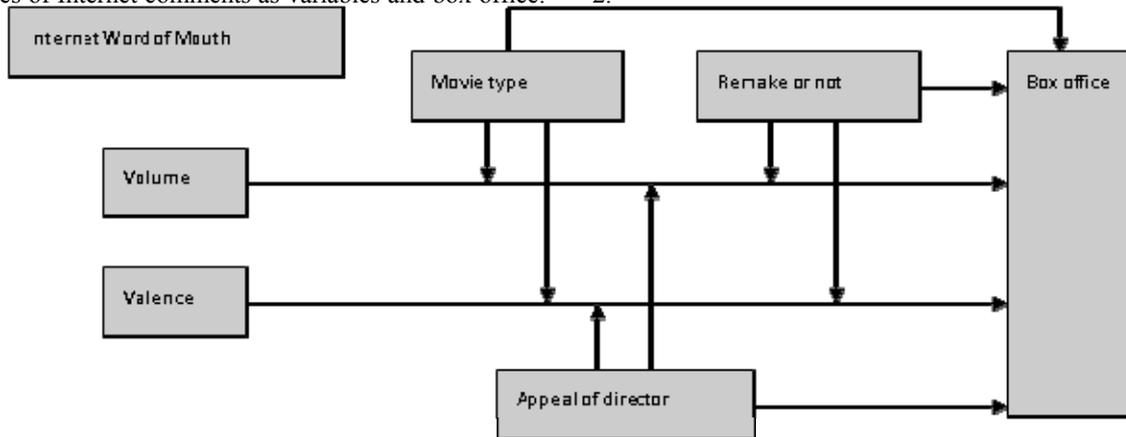


Fig.2: Relationship Model of Modified Internet WOM, Related Moderators and Box Office

VIII. DATA ANALYSIS AND RESULTS

This paper firstly conducts regression analysis to the interaction effect of independent variables including volume of Internet WOM and valence of Internet WOM and other three moderators on box office; and based on this, it takes multi-factor analysis of variance to analyze whether the interaction effect of independent variable and moderators on box office is significant under the condition of existing independent variable and moderator. It shall be stated that due to the large differences between the minimum value and maximum value of volume of Internet comments, in order to analyze the effect of moderators on Internet comments and box office better, the data of volume of Internet comments being divided into 10 horizontal groups with the difference

of 40 (thousand persons) in horizontal shall be processed when conducting multi-factor analysis of variance.

1. The movie type can affect the regression analysis and variance analysis of volume of Internet comments as a moderator.

The correlation coefficient of volume of Internet comments and box office is 0.567 with Sig.=0.000<0.01, which states that there is significant positive correlation between volume of Internet comments and box office; The correlation coefficient of movie type and box office is 0.307 with Sig. =0.000<0.01, which states that there is significant positive correlation between movie type and box office; The correlation coefficient of volume of Internet comments and box office is 0.111 with Sig.=0.000<0.01, which states that there is low correlation between volume of Internet comments and box office.

TABLE 1. COEFFICIENTS A TABLE OF MOVIE TYPE, VOLUME OF INTERNET COMMENTS AND BOX OFFICE

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	7.290	2.274		3.206	.002	
	Volume*Type	.027	.002	.664	10.810	.000	1.000
a. Dependent Variable: Box Office							

Table 1 shows that in the regression equation that takes movie types as the moderator, the constant term is 7.290; and the coefficient of the arithmetic product of volume of

Internet comments and movie type is 0.027; the β (standard regression coefficient) is 0.664 with the significance probability of β of 0.000<0.01. Therefore, it will find that

movie type as the moderator affects the volume of Internet comments, and then significantly affects the box office when separately analyzing the interaction effect of volume of Internet comments and movie type. As a result, Hypothesis H2b is accepted.

Next, to further verify whether interaction effect of the movie type and volume of Internet comments on box office is still significant through multi-factor analysis of variance when movie type and volume of Internet comments existing at the same time.

TABLE 2. MAIN EFFECT TABLE (DEPENDENT VARIABLE: BOX OFFICE)

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	47722.334 ^a	46	1037.442	3.897	.000
	53549.106	1	53549.106	201.150	.000
(Volume (volume of comments))	23395.609	9	2599.512	9.765	.000
(Type (movie type))	5093.906	8	636.738	2.392	.021
Volume * Type	11697.951	29	403.378	1.515	.067
Error	27420.164	103	266.215		
Total	183434.616	150			
Corrected Total	75142.497	149			

Table 2 shows that F value of the volume of Internet comments and movie types is respectively 9.765 and 2.392 with the sig. value of significance level of 0.000 and 0.021, and both values are less than 0.05, which states that there is significant difference between the effects of different level of volume of internet comments and different level of movie types on box office; The joint F value of different level of volume of Internet comments and different level of movie types (Valence * Type) to box office is 1.515 with the sig. value of significance level of 0.067>0.05. Due to the many types of movies, the interaction effect of the two factors on box office is not significant in multi-factor analysis of variance.

2. The movie type as a moderator affects the regression analysis and variance analysis of scores of Internet comments.

The correlation coefficient of scores of Internet comments and box office is 0.326 with Sig.=0.000<0.01, which states that there is significant positive correlation between scores of Internet comments and box office; The correlation coefficient of movie type and box office is 0.307 with Sig. =0.000<0.01, which states that there is significant positive correlation between movie type and box office; The correlation coefficient of scores of Internet comments and movie type is 0.021 with Sig.=0.801>0.01, so there is low correlation between scores of Internet comments and movie type.

TABLE 3. COEFFICIENTS A TABLE OF MOVIE TYPE, SCORES OF INTERNET COMMENTS AND BOX OFFICE

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-2.209	5.005		-.441	.660	
	Valence*Type	.688	.112	.451	6.150	.000	1.000 1.000
a. Dependent Variable: Box Office							

Table 3 shows that in the regression equation that takes movie types as the moderator, the constant term is -2.209, and the coefficient for the arithmetic product of scores of Internet comments and movie types is 0.668; the β (standard regression coefficient) is 0.451 with the significance probability of β of 0.000<0.01. Therefore, it will find that movie type as the moderators affects the scores of Internet comments, and then significantly affects the box office when

separately analyzing the interaction effect of scores of Internet comments and movie type. As a result, Hypothesis H2c is accepted.

Next, to further verify whether interaction effect of the movie type and scores of Internet comments on box office is still significant through multi-factor analysis of variance when movie type and scores of Internet comments existing at the same time.

TABLE 4. MAIN EFFECT TABLE

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	54699.915 ^a	105	520.952	1.121	.341
	35108.327	1	35108.327	75.566	.000
Valence (comments valence)	32378.125	45	719.514	1.549	.075
Type (movie type)	11549.024	8	1443.628	3.107	.007
Valence * Type (Valence * Type)	15309.945	52	294.422	.634	.943
Error	20442.583	44	464.604		
Total	183434.616	150			
Corrected Total	75142.497	149			

Table 4 shows that the F value of the scores of Internet comments and movie type is respectively 1.549 and 3.107 with the sig. value of significance level of 0.075 and 0.007; The joint F value of different level of scores of Internet comments and different level of movie types (Valence * Type) to box office is 0.634 with the sig. value of significance level of 0.943>0.05; so the interaction effect of the two factors on box office is not significant.

3. Whether the movie is sequel, remake or adaptation as a moderator affects the regression analysis and variance analysis of volume of Internet comments

The correlation coefficient of volume of Internet comments and box office is 0.567 with Sig. =0.000<0.01,

which states that there is significant positive correlation between volume of Internet comments and box office; The correlation coefficient of whether the movie is sequel, remake or adaptation and box office is 0.293 with Sig. =0.000<0.01, which states that there is significant positive correlation between whether the movie is sequel, remake or adaptation and box office. The correlation coefficient of volume of Internet comments and whether the movie is sequel, remake or adaptation is 0.100 with Sig. =0.223>0.01, so there is low correlation between volume of Internet comments and whether the movie is sequel, remake or adaptation.

TABLE 5. COEFFICIENTS A TABLE OF WHETHER THE MOVIE IS SEQUEL, REMAKE OR ADAPTATION AND BOX OFFICE

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	10.419	2.206		4.724	.000	
	Volume*Sequel	.098	.010	.628	9.807	.000	1.000
	Volume*Sequel						1.000
a. Dependent Variable: Box Office							

Table 5 shows that in the regression equation that takes whether the movie is sequel, remake or adaptation as the moderator, the constant term is 10.419; and the coefficient for the arithmetic product of volume of Internet comments and whether the movie is sequel, remake or adaptation is 0.098; the β (standard regression coefficient) is 0.628 with the significance probability of β of 0.000<0.01. Therefore, it will find that whether the movie is sequel, remake or adaptation as the moderators affects the volume of Internet comments, and then significantly affects the box office when

separately analyzing the interaction effect of volume of Internet comments and movie type. As a result, Hypothesis H4b is accepted.

Next, to further verify whether interaction effect of whether the movie is sequel, remake or adaptation and volume of Internet comments on box office is still significant through multi-factor analysis of variance when whether the movie is sequel, remake or adaptation and volume of Internet comments existing at the same time.

TABLE 6. MAIN EFFECT TABLE (DEPENDENT VARIABLE: BOX OFFICE)

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	41284.396 ^a	17	2428.494	9.468	.000
	86715.820	1	86715.820	338.072	.000
Volume (volume of comments)	30429.683	9	3381.076	13.182	.000
Sequel (sequel or not)	7299.576	1	7299.576	28.458	.000
Volume * Sequel (Volume*Sequel)	6139.766	7	877.109	3.420	.002
Error	33858.102	132	256.501		
Total	183434.616	150			
Corrected Total	75142.497	149			

Table 6 shows that the F value of volume of Internet comments and whether the movie is sequel, remake or adaptation is respectively 13.182 and 28.458 with the sig. value of significance level of 0.000 and 0.000, and both of them are less than 0.05; The joint F value of different level of volume of Internet comments and whether the movie is sequel, remake or adaptation (Valence * Type) to box office is 3.420 with the sig. value of significance level of 0.002<0.05. When volume of Internet comments and sequel exist at the same time, the interaction effect of the two factors on box office is significant.

4. Whether the movie is sequel, remake or adaptation as a moderator affects the regression analysis and variance analysis of the scores of Internet comments.

The correlation coefficient of scores of Internet comments and box office is 0.326 with Sig. =0.000<0.01, which states that there is significant positive correlation between the scores of Internet comments and box office; The correlation coefficient of whether the movie is sequel, remake or adaptation and box office is 0.293 with Sig. =0.000<0.01, which states that there is significant positive correlation between whether the movie is sequel, remake or adaptation and box office. The correlation coefficient of scores of Internet comments and whether the movie is sequel, remake or adaptation is 0.153 with Sig. =0.062>0.01, so there is low correlation between scores of Internet comments and whether the movie is sequel, remake or adaptation.

TABLE 7. COEFFICIENTS A TABLE OF WHETHER THE MOVIE IS SEQUEL, REMAKE OR ADAPTATION, SCORES OF INTERNET COMMENTS AND BOX OFFICE

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	5.089	4.386		1.160	.248		
	Valence*Sequel (Valence *Sequel)	2.228	.414	.404	5.377	.000	1.000	1.000
a. Dependent Variable: Box Office								

Table 7 shows that in the regression equation that takes whether the movie is sequel, remake or adaptation as the moderator, the constant term is 5.098; and the coefficient for the arithmetic product of scores of Internet comments and whether the movie is sequel, remake or adaptation is 2.228; the β (standard regression coefficient) is 0.404 with the significance probability of β of 0.000<0.01. Therefore, it will find that whether the movie is sequel, remake or adaptation as the moderator affects the scores of Internet comments, and then significantly affects the box office when separately

analyzing the interaction effect of valence of Internet comments and whether the movie is sequel, remake or adaptation. As a result, Hypothesis H4c is accepted.

Next, to further verify whether interaction effect of whether the movie is sequel, remake or adaptation and scores of Internet comments on box office is still significant through multi-factor analysis of variance when whether the movie is sequel, remake or adaptation and scores of Internet comments existing at the same time.

TABLE 8. MAIN EFFECT TABLE (DEPENDENT VARIABLE: BOX OFFICE)

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	51979.859 ^a	78	666.408	2.043	.001
	73188.183	1	73188.183	224.342	.000
Valence (comments valence)	29324.363	45	651.653	1.997	.004
Sequel (sequel or not)	3272.404	1	3272.404	10.031	.002

Valence * Sequel (Valence * Sequel)	18551.888	32	579.747	1.777	.023
Error	23162.638	71	326.234		
Total	183434.616	150			
Corrected Total	75142.497	149			

Table 8 shows that the F values of scores of Internet comments and whether the movie is sequel, remake or adaptation are respectively 1.997 and 10.031 with the sig. value of significance level of 0.004 and 0.002, and both of them are less than 0.05; The joint F value of different level of scores of Internet comments and whether the movie is sequel, remake or adaptation (Valence * Sequel) to box office is 1.777 with the sig. value of significance level of 0.023<0.05. When scores of Internet comments and whether the movie is sequel, remake or adaptation existing at the same time, the interaction effect of the two factors on box office is significant.

5. The appeal of director as a moderator affects the regression analysis and variance analysis of volume of Internet comments

The correlation coefficient of volume of Internet comments and box office is 0.567 with Sig.=0.000<0.01, which states that there is significant positive correlation between volume of Internet comments and box office; The correlation coefficient of appeal of director and box office is 0.210 with Sig. =0.010<=0.01, which states that there is significant positive correlation between appeal of director and box office; The correlation coefficient of volume of Internet comments and appeal of director is 0.324 with Sig. =0.000<0.01, which states that there is significant positive correlation between volume of Internet comments and appeal of director.

TABLE 9. COEFFICIENTS A TABLE OF APPEAL OF DIRECTOR, VOLUME OF INTERNET COMMENTS AND BOX OFFICE

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	23.939	1.895		12.635	.000	
	Volume*Director	.005	.001	.313	4.004	.000	1.000
a. Dependent Variable: Box Office							

Table 9 shows that in the regression equation that takes the appeal of director as the moderator, the constant term is 23.939; and the coefficient for the arithmetic product of volume of Internet comments and the appeal of director is 0.005; the β (standard regression coefficient) is 0.313 with the significance probability of β of 0.000<0.01. Therefore, it will find that the appeal of director as the moderator affects the volume of Internet comments, and then significantly affects the box office when separately analyzing the interaction effect of volume of Internet comments and movie type. As a result, Hypothesis H6b is accepted.

Next, to further verify whether interaction effect of the appeal of director and volume of Internet comments on box office is still significant through multi-factor analysis of variance when the appeal of director and volume of Internet comments existing at the same time. In order to analyze the effects of appeal of director on the volume of Internet comments and box office better, appeal of director is divided into 4 horizontal groups (1 for directors without awarding with nomination, 10 for directors awarding with prizes for 1-10 times, 20 for directors awarding with prizes for 10-20 times and 30 for directors awarding with prizes for 20-30 times) when conducting multi-factor analysis of variance.

TABLE 10. MAIN EFFECT TABLE (DEPENDENT VARIABLE: BOX OFFICE)

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Mode	41857.445 ^a	27	1550.276	5.682	.000
	70846.429	1	70846.429	259.674	.000
Volume (volume of comments)	23984.733	9	2664.970	9.768	.000
Director (appeal of director)	4468.152	3	1489.384	5.459	.001
Volume * Director (volume*director)	9618.554	15	641.237	2.350	.005
Error	33285.052	122	272.828		
Total	183434.616	150			

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	41857.445 ^a	27	1550.276	5.682	.000
	70846.429	1	70846.429	259.674	.000
Volume (volume of comments)	23984.733	9	2664.970	9.768	.000
Director (appeal of director)	4468.152	3	1489.384	5.459	.001
Volume * Director (volume*director)	9618.554	15	641.237	2.350	.005
Error	33285.052	122	272.828		
Total	183434.616	150			
Corrected Total	75142.497	149			

Table 10 shows that the F value of volume of Internet comments and the appeal of direct is respectively 9.768 and 5.459 with the sig. value of significance level of 0.000 and 0.000, and both of them are less than 0.05; The joint F value of different level of volume of Internet comments and different level of appeal of director (Volume * Director) to box office is 2.350 with the sig. value of significance level of 0.005<0.05. When volume of Internet comments and the appeal of director exist at the same time, the interaction effect of the two factors on box office is significant.

6. The appeal of director as moderator affects the regression analysis and variance analysis of scores of Internet comments.

The correlation coefficient of scores of Internet comments and box office is 0.326 with Sig.=0.000<0.01, which states that there is significant positive correlation between scores of Internet comments and box office; The correlation coefficient of appeal of director and box office is 0.210 with Sig. =0.010<=0.01, which states that there is significant positive correlation between appeal of director and box office; The correlation coefficient of scores of Internet comments and appeal of director is 0.214 with Sig. =0.009<0.01, which states that there is significant positive correlation between scores of Internet comments and appeal of director.

TABLE 11. COEFFICIENTS A TABLE OF THE APPEAL OF DIRECTOR, SCORES OF INTERNET COMMENTS AND BOX OFFICE

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	24.127	2.024		11.921	.000	
	Valence*Director (Valence *Director)	.100	.035	.232	2.900	.004	1.000
a. Dependent Variable: Box Office							

Table 11 shows that in the regression equation that takes appeal of director as the moderator, the constant term is 24.127; and the coefficient for the arithmetic product of scores of Internet comments and appeal of director is 0.100; the β (standard regression coefficient) is 0.232 with the significance probability of β of 0.004<0.01. Therefore, it will find that appeal of director as moderator affects the scores of Internet comments, and then significantly affects the box

office when separately analyzing the interaction effect of scores of Internet comments and appeal of director. As a result, Hypothesis H6c is accepted.

Next, to further verify whether interaction effect of the appeal of director and the scores of Internet comments on box office is still significant through multi-factor analysis of variance when the appeal of director and the scores of Internet comments existing at the same time.

TABLE 12. MAIN EFFECT TABLE (DEPENDENT VARIABLE: BOX OFFICE)

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	52803.738 ^a	83	636.190	1.880	.004
	50569.870	1	50569.870	149.409	.000
Valence (comments valence)	30933.592	45	687.413	2.031	.004
Director (appeal of director)	2581.866	3	860.622	2.543	.064
Valence * Director (Valence*Director)	23488.707	35	671.106	1.983	.008
Error	22338.760	66	338.466		

Total	183434.616	150			
Corrected Total	75142.497	149			

Table 12 shows that the F value of scores of Internet comments and appeal of director is respectively 2.031 and 2.543 with the sig. value of significance level of 0.004 and 0.064; The joint F value of different level of scores of Internet comments and different level of appeal of director (Valence * Director) to box office is 1.983 with the sig. value of significance level of 0.008 < 0.05. When scores of Internet

comments and appeal of director exist at the same time, the interaction effect of the two factors on box office is significant.

So far, the summaries of the statistical analysis on sample data and verification to study hypothesis in this paper are as followed:

TABLE 13. RESULTS OF STUDY HYPOTHESES

Research hypothesis	Verification result
H1 _a : The volume of Internet comments has effect on box office.	Accepted
H1 _b : The scores of Internet comments have effect on box office.	Accepted
H2 _a : The movie type has effect on box office.	Accepted
H2 _b : The movie type has effect on relationship between the volume of Internet WOM and box office.	Accepted
H2 _c : The movie type has effect on relationship between the valence of internet WOM and box office.	Accepted
H3 _a : The producing area of movie has effect on box office.	False
H3 _b : The producing area of movie has effect on relationship between the volume of Internet WOM and box office.	—
H3 _c : The producing area of movie has effect on relationship between the valence of Internet WOM and box office.	—
H4 _a : Whether the movie is remake, sequel or adaptation has effect on box office.	Accepted
H4 _b : Whether the movie is remake, sequel or adaptation has effect on relationship between the volume of Internet WOM and box office.	Accepted
H4 _c : Whether the movie is remake, sequel or adaptation has effect on relationship between the valence of Internet WOM and box office.	Accepted
H5 _a : Movie schedule has effect on box office.	FALSE
H5 _b : Movie schedule has effect on relationship between the volume of Internet WOM and box office.	—
H5 _c : Movie schedule has effect on relationship between the valence of Internet WOM and box office.	—
H6 _a : Appeal of actor has effect on box office.	FALSE
H6 _b : Appeal of actor has effect on relationship between the volume of Internet WOM and box office.	—
H6 _c : Appeal of actor has effect on relationship between the valence of Internet WOM and box office.	—
H6 _d : Appeal of director has effect on box office.	Accepted
H6 _e : Appeal of director has effect on the relationship between the volume of Internet WOM and box office.	Accepted
H6 _f : Appeal of director has effect on the relationship between the valence of Internet WOM and box office.	Accepted

IX. CONCLUSIONS

This paper reviews relevant literatures and theories about Internet WOM, the effects on purchase decision and Internet WOM marketing of movie industry and combines the features of movie-the new cultural industry-on the basis to discuss Internet WOM by dividing it into volume and valence and to respectively analyze how do volume and valence affect box office. In addition, this paper also introduces six factors including producing area of movie, movie type and whether movie is remake, sequel or adaptation, movie schedule appeal of actor and appeal of director. The following conclusions are obtained by taking 150 movies released at China mainland from 2011-2013 as the sample and utilizing SPSS statistical software to analyze relevant data and verify study hypothesis:

(1) This Volume of Internet comments has significant positive correlation to box office. This paper selects Internet WOM data from Douban Movie and Mtime to respectively analyze the comprehensive volume and valence obtained from summing volume of the two websites and weighted average of scores of Internet comments to draw the conclusion same with previous conclusions—there is positive correlation between volume and box office. The more the volume of one movie, the more the attentions obtained by the movie; more people participating into the discussion and elevation of the movie will have positive effects on cognition awareness of audience; that is, consumer will generate more cognitions to the movie for more volume of Internet WOM of one movie; for products or services, it is obvious that more cognitions can produce more sales volume.

(2) Scores of Internet comments also has positive correlation to box office. The result from analyzing the scores of Internet comments and box office shows that the higher the scores are, namely the more the positive WOM is, the higher the box office is. Douban Movie and Mtime provide audience with functions of evaluating and marking every movie, which is equivalent to integrate and quantize the WOM of every movie. While the comprehensive score is audience's direct feedback and comprehensive assessment to the movie, which reflects the quality level of movie and audience's acceptance level and recognition level to a movie. When audiences are not familiar to the movie and have doubts to the propagandizing information of movies, they always seek for WOM to guide them make the decision of seeing movie or not. Therefore, the higher the scores of Internet comments of movie are, the larger the attraction to audience is. And then, the possibility of prompting audiences to make watching decision is higher, so it will make more box offices income.

(3) The effect of producing area, movie schedule and appeal of actor on box office is not significant. Firstly, two movie producing areas of China and America have no significant effect on box office. Secondly, the effect of movie schedule on box office is also not significant. This paper selects the history data of box office to study and analyze without conducting correspondence analysis to box office and Internet WOM according to the different release time. So the effect of movie schedule on history data of box office is not significant to a certain extent. In addition, with the end of the holiday, people's viewing will reduce due to purely considering time cost. People's viewing will be mainly affected by relevant other information of movie. Therefore, the box office after releasing and the history data of box office are not significantly affected by movie schedule. Finally, the effect of appeal of actor on box office is not significant. Currently, the definition to whether actors are famous and whether actors have certain appeal is not unified. Although this paper takes the sum of number of nominations of important awards and numbers of winning awards of actors as the measuring standard, it is not difficult to find that, by making a general survey of many Chinese actors and aboard actors, although some actors awarded little or never awarded important process in movie industry, they also can obtain audiences' favor and praise, own large amount of fans by virtue of higher presence, higher popularity and even higher achievement obtained in other fields, and then they have great effect on box office. As a result of it, appeal of actor doesn't have significant effect on box office.

(4) Through data analysis, we find that movie type, whether movie is remake, sequel or adaptation and appeal of director have effect on box office income to a certain extent. Movie type reflects audience's preference and favor to movie; different types of movie have different degrees of attraction to audiences; as a result, movie type affects audience's viewing decision, and then affects box office. Next, sequel, remake and adaptation are a kind of brand extension which attracts more attention to produce more box office income by virtue of the brand value and WOM base of the previous movie or novel. Finally, director can be called

as the one of most important factors of the movie. In the heart of many audiences, famous director is the guarantee of movie quality; therefore, director is one of the most important factors that attract audience into the cinema.

(5) Through data analysis, this paper draws a conclusion that movie type, whether the movie is remake, sequel or adaptation and appeal of director respectively affect volume of Internet WOM and valence of Internet WOM. Based on this, volume and valence have significant effect on box office. Due to audience's preference and favor to movie, different movie types, remake, sequel, adaptation and director will have different attractions to audiences; therefore, the generation of Internet WOM will have certain effect to spread. For example, the Harry Potter series novels are best sellers all over the world. These series movies are much-anticipated before release, so this movie spontaneously can obtain more discussions and comments to produce more Internet WOM information which has a certain effect on the volume and valence. In addition, famous directors, such as Feng Xiaogang, Zhang Yimou and Ang Lee, every movie directed by them is the hot topic discussed by audiences from period from before the shooting to shooting process to release. Relevant information of these movies is the object of audience discussion. As a result, these movies can also obtain more discussions and elevations which affect their volume of Internet WOM and valence of Internet WOM and then affect the box office.

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