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Using Platform-Generated Content to Stimulate User-Generated Content

Research-in-Progress

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Abstract

This work intends to study the implication of an editorial review program where a review platform starts to supplement the user-generated reviews on its website with editorial review articles that are written by the platform. Our research question is whether platform-generated content (i.e., editorial reviews) influence subsequent user-generated content (i.e., online reviews) both in terms of the quantity and quality of those reviews. We obtain the dataset through a partnership with a restaurant review platform in Asia. Our preliminary analysis suggests that platform-generated content has a positive net effect on subsequent user-generated content. Specifically, users post more reviews for restaurants that have editorial reviews and these reviews tend to be longer on average.

Keywords: online review, intrinsic motivation, user-generated content

Introduction

With the rapid growth of the Internet, online shopping has become a prevalent option for many consumers. However, when shopping online, they usually face an issue which exists only in the online channel. That is, unlike the case of offline shopping where consumers can learn more about the products they are interested in by trials before making the final purchase decision, they cannot fully evaluate the product while the cost of purchasing the product that does not suit their need (e.g., the return cost) is non-trivial (Archak et al. 2007). For this reason, a growing number of online consumers has used online reviews, which usually refer to consumers' evaluation of the product, as their primary source of information (Dellarocas 2003; Pan et al. 2007). Empirical research has also shown that online reviews can be a decisive factor in consumers' buying decisions process (Park and Lee 2009; Vermeulen and Seegers 2009). As a result, product sales can be impacted by online reviews in various ways. For example, Chevalier and Mayzlin (2006) have shown that the total number of reviews can significantly increase sales of books on Amazon.com compared to the sales of similar books on Barnes and Noble. In the same way, Luca (2016) has shown that restaurants with higher star ratings on Yelp.com significantly attain more revenue compared to the ones with lower star rating. Nevertheless, it is also worth noting the presence of online reviews may cannibalize the effort of traditional marketing

strategies such as advertisements. For instance, Lu et al. (2013) have demonstrated a substitute relationship between the volume of online reviews and online coupons. Meanwhile, the relationship between online review volume and keyword advertising is complementary.

With the importance of online reviews becoming apparent, online platforms that own and use consumergenerated reviews have constantly been trying to be innovative on how to utilize and capitalize the reviews they have. Large review platforms such as TripAdvisor, which own millions of online reviews and attain thousands of new reviews every day, have focused their effort to enhance review reading experience so that their users do not have to browse through hundreds of reviews to infer the true underlying quality of products or services they are interested in. For example, some platforms extract most frequently mentioned keywords in reviews and classifies all the reviews into three types: positive reviews, neutral reviews and negative reviews, allowing users to choose the type of the reviews they want to read more easily. However, for small and medium platforms, the problem at hand is usually the lack of reviews available to read. As a result, many of them have attempted to attract new reviewers to the platform and keep existing ones through several incentive schemes including both intrinsic rewards (such as awarding badges or experience points for posting reviews) and extrinsic rewards (such as awarding monetary incentives or loyalty points which are cash-equivalent). Previous studies have shown that the incentive program usually affects user behavior in a significantly manner but the direction and magnitude of the effect vary by context (Goes et al. 2014; Shen et al. 2015). Nevertheless, many platforms are unsuccessful in attracting reviewers through various incentive programs and are forced to consider alternative options such as replacing an online review system with a question and answer system (Khern-am-nuai et al. 2017).

In this research, we empirically investigate the implications of an alternative approach that one of a restaurant review platform in Asia utilizes to mitigate the issue of limited number of reviews available to its readers. Specifically, the platform supplements consumer-generate restaurant reviews with its own editorial reviews. These editorial reviews are the evaluations of restaurants that are written by professional writers who work with the review platform itself. On the one hand, it is possible that the editorial reviews program may work as a stipulation to encourage users on the platform to contribute more reviews with higher quality content. In that regard, the platform-generated content (i.e., editorial reviews) would be a great complement to consumer-generated content (i.e., user reviews). On the other hand, it is also plausible that editorial reviews might act as a deterrent which discourages other users to provide additional reviews to that restaurant. If it is the case, then editorial reviews would only substitute consumer-generate reviews and further drive away potential reviewers of the platform. Our research objective is to untangle the dynamic between platform- and user-generated content and offer insights regarding the implications of editorial reviews in the context of a restaurant review platform.

Our study has a strong potential to contribute to the literature on online reviews in particular and the literature on word-of-mouth and crowdsourcing in general. We are among the first to empirically study the relationship and dynamic between platform-generated content and consumer-generated content. In addition, this work will also inform business managers regarding the potential value or adverse effect of the user of editorial reviews.

Literature review

Most researches about online reviews focus on the effect of different characteristics of online reviews on product sales. Chen et al. (2004) study the effect of reviews' volume on sales by using data collected from Amazon.com. It is found that the total number of online reviews is positively related to the product sales because online reviews can reduce consumers' uncertainty towards products and then reduce consumers' search cost. However, the overall ratings do not significantly influence sales. Different results are observed by Chevalier and Mayzlin (2006). By using public data offered by Amazon.com and BarnesandNoble.com, they figure out the impacts of online reviews on books' sales. This cross-platform study easily excludes some factors such as books' quality while making analysis. It pays more attention to the valence of online reviews. They find that higher online ratings will lead to larger book sales. Furthermore, negative reviews such as one star review have much more influence than positive reviews like 5 stars review. Mudambi and Schuff (2010) utilize 1,587 reviews from Amazon.com across

six products to take a look at the effects of reviews' length and content on sales. Surprisingly, they find that the length of review has a positive effect on the helpfulness of the review. As a result, a longer positive review is more likely to increase the sales. In addition, factual reviews could be more convincing. On the contrast, for consumers, those reviews with experiential content may not appear to be reliable and trustworthy.

Other researches pay attention to those factors that adjust the effect of online reviews. Zhu and Zhang (2010) consider product characteristics and consumer personality's moderate effect. Their study is set in the game industry. It is found that for those unpopular games, online reviews have more power while affecting sales. Interestingly, those game players with more online experience rely more on online reviews. Reinstein and Snyder (2005) argue that online reviews have various impacts on movies depending on the genre of that movie. Similar to the result shown by Zhu and Zhang (2010), it is found that online reviews have greater impact on unpopular movies. At the same time, online review is a huge factor determining the success of feature films. Other types of movies such as action movie and comedy don't rely much on reviews. Ghose and Ipeirotis (2011) believe that the type of products will have some moderate effects. Products can be classified as experience good or search good. Meanwhile, online reviews can be classified as experiential review or factual review. For those consumers who are willing to buy search goods, factual reviews have more influence. For those consumers who plan to buy experience goods, experiential reviews have more influence. Lu and Feng (2009) find price's moderate effects by using data provided by Chinese "Yelp": dianping.com. For those low-end restaurants, the volume of online reviews has a huge effect on sales. However, for those high-end restaurants, the effect of online reviews becomes smaller. Hao et al. (2009) makes use of data gathered from the film industry to analyze the moderate effect of time period. Surprisingly, online reviews have different impacts on movie's box office in different periods. She finds that the total number of online reviews has small effects on box office at first. Then, the effect increases rapidly. Finally, the effect decreases gradually. The previous study that is closely related to ours is conducted by Goh et al. (2013). Their paper mainly assesses the impacts of both user and marketer-generated content on consumers' repeat purchase behaviors. It is found out that user reviews exhibit a stronger impact than marketer-generated content on consumers.

In summary, prior research in the area of platform- and user-generated content mostly aim to investigate the effect of user reviews and platform-generated reviews on products' sales. However, given that both types of content can co-exist, it is also particularly important to understand how they interact, which is the focus of our study.

Hypothesis Development

In this section, we formally develop some preliminary hypotheses that will be tested in our study. There are a few key details that we would like to discuss related to our hypothesis development. First, the context of our work is an independent restaurant review platform (i.e., the platform provides online reviews to its visitor and do not sell any products/services related to the restaurants on the platform). We are interested in the effect that platform-generated content (i.e., editorial reviews) has on the consumer-generated content (user reviews). Second, editorial reviews are lengthy, detailed, and neutral by nature. Unlike user-generated reviews, editorial reviews do not have a star rating associated with the review. Third, with the lack of previous empirical evidence in this context and multiple potential outcomes based on different theoretical foundations, we will develop our hypotheses as a competing hypothesis and treat it as an open empirical question.

Our first hypothesis is regarding the volume of the user reviews. This variable is particularly important since it significantly affects consumer behavior (e.g., Chevalier and Mayzlin 2006) and is generally used as a proxy to measure consumer engagement to the restaurant (e.g., Pamuru et al. 2017). It also moderates other review variables such as star ratings (Luca 2016). Moreover, from the two-sided platform standpoint, ceteris paribus, higher review volume would attract more review readers to the platform which, in turn, would attract more review writers to the platform. As a result, most (if not all) of the independent review platforms spend great effort to increase this variable. However, in our research context, hypothesizing the potential effect of editorial reviews on review volume is not

necessarily straightforward. On the one hand, the presence of editorial reviews could have a net positive impact on review volume because of the following reasons. First, Hennig- Thurau et al. (2004) use the data from an online survey to show that desire for social interaction is one of the primary factors that motivate users to post online review. In that regard, the editorial review could work as a stage that allows users to interact by posting their own reviews (e.g., to confirm/dispute the content in the editorial reviews, to complement the content in the editorial reviews by adding additional information, etc.) Second, users in the online reviews context tend to have "herding" behavior (e.g., Lee et al. 2015). Because the nature of the editorial reviews, they could become an anchor for the users to herd toward. As a result, users may post more reviews for restaurants with editorial reviews compared to the restaurants that do not have one. If these effects are prevalent, we should expect to observe the following hypothesis:

H1a: Restaurants with an editorial review receives higher number of user-generated reviews compared to restaurants without an editorial review.

On the other hand, the effect many not necessarily be positive for the following reasons. First, Cheema and Kaikati (2010) show that many users are motivated to post reviews because the need for uniqueness. However, with the existence of editorial reviews, it is more difficult for the users to differentiate their reviews and thus could discourage them to contribute. Second, Shen et al. (2015) demonstrate that reviewers tend to compete for attention from review readers. With the presence of editorial reviews, the users may also feel discouraged because editorial reviews are more likely to grab review readers attention by nature. Third, users may perceive editorial reviews as a form of marketer-generated content and are discouraged to be associated with it (Goh et al. 2013). As a result, they are less likely to post reviews for the restaurants with an editorial review. If these effects are dominant, we should expect to observe the following hypothesis:

H1b: Restaurants with an editorial review receives lower number of user-generated reviews compared to restaurants without an editorial review.

The second hypothesis is regarding the content length of the user reviews. This variable has been shown to be a viable proxy of review quality in the context experience goods (Mudambi and Schuff 2010; Yu et al. 2018). It also generally captures the amount of effort that reviewers put into writing the review (Khern-am-nuai et al. 2018). In the context of restaurant reviews, user generally share their experience with the restaurants they visit (Luca 2016). In general, users put more effort to share the experience about the product if the product is perceived to be more popular (Shen et al. 2015). For that reason, restaurants with an editorial review could attract more attention from readers and thus inducing subsequent reviewers to spend more effort to write a review for that restaurant. In other words:

H2a: Restaurants with an editorial review receives longer user-generated reviews compared to restaurants without an editorial review.

On the other hand, users may not only be discouraged in terms of quantity of review posting but the quality as well. For instance, since the features of the restaurants available to review may be limited, editorial reviews may cover most of the aspects, thus limited the scope of the discussion for further user-generated reviews. As a result, since many users focus on differentiating themselves (Cheema and Kaikati 2010) to compete for attention (Shen et al. 2015), some of them may be less motivated to spend their effort in writing review on a restaurant when an editorial review of that restaurant exists.

H2b: Restaurants with an editorial review receives shorter user-generated reviews compared to restaurants without an editorial review.

Research Context and Data

The dataset used in this research project is obtained through a partnership with a large restaurant review platform in Asia. The review platform in this research is similar to Yelp and TripAdvisor in that it does not directly provide any products and/or services to the consumers. It works as an information gateway as it collects the reviews posted by review writers and displays them to the readers. That dataset in this study consists of online reviews of more than 10 million businesses where 90% of these restaurants are independently owned and the other 10% are chain restaurants (such as Starbucks and McDonald's).

These reviews span from December 2010 to May 2017. The review-level information includes review date, associated star ratings, number of review helpfulness vote, review content, etc. Meanwhile, the data also contain reviewer-level information such as reviewer ID, gender, birthdate, and user-report location. Similarly, the restaurant-level information such as restaurant ID, restaurant address, and restaurant category is also available. In this research, we construct the dependent variables and independent variables from this dataset as follows:

(1) Dependent Variables

At this stage, we are interested in two primary dependent variables based on our hypotheses: total number of user reviews, and the length of the review. Moving forward, we intend to examine additional variables such as the average star ratings and the variance of those star ratings. Note that all of these variables are aggregated on a monthly basis to construct a panel data model.

(2) Independent Variables

The main independent variable, editorial review, is the appearance of editorial reviews and the number of editorial reviews for each restaurant. If there is no editorial review for this business, then the number of editorial review is 0. If there are two editorial reviews for this business, then the number of editorial review is 2. The construct of this independent variable can be considered as analyzing the direct implications of editorial reviews on the dependent variables of interest.

The summary statistics of the variables of interest are reported in Table 1. Note that the dataset contains data for all restaurant reviews from December 2010 to May 2017. Then, we aggregate the variables on a monthly basis. In this dataset, there are 1,244 chain restaurants where 300 chains have at least one editorial review. Under these 300 chains, there are 5,676 locations where some of them have editorial reviews while the rest do not. In the meantime, no locations of the rest 944 chains have any editorial reviews. The total number of observations is 12,191,848.

Variable	Mean	Std. Dev.	Min	Max
Total number of user reviews	0.072	0.525	0	532
Average content length	19.25	132.107	0	41,600
Editorial review	0.009	0.109	0	9

Preliminary Research Methodology and Results

In this section, we develop our preliminary econometric model to test our hypotheses. As editorial reviews for each business are written in different time, we utilize the panel data model to take advantage of the nature of our data. As discussed in the hypothesis development section, the dependent variables of our interest are: 1) the total number of reviews (i.e., the quantity of the review); and 2) content length of the reviews (which is a proxy to measure the quality of the review). The main independent variables are the existence of editorial reviews. This can be considered as analyzing the direct effect of editorial reviews on user reviews. Also, to ensure that our model captures the heterogeneity of restaurants (i.e., each restaurant may have its own characteristics that could lead to different amount/length of reviews being posted) and the time period (i.e., each time period may also have it owns characteristics that could lead to different amount/length of reviews being posted), we include the restaurant fixed-effect and time fixed-effect to control for such heterogeneity. Particularly, the specification of our preliminary econometric model is:

$$DV_{it} = \alpha_i + \delta_t + \beta E ditorial Reviews + \varepsilon_{it}$$

where subscript *i* denotes each restaurant and subscript *t* denotes the time period corresponds to each observation. α_i captures the restaurant fixed effect, which varies across restaurants in the dataset but remain the same across time. Meanwhile, δ_t captures the time fixed effect that varies across time but remain constant across restaurants. *EditorialReview* is a dummy variable which indicates whether a

restaurant has an editorial review or not. It takes the value 1 if restaurant *i* has an editorial review at time *t* and 0 otherwise. Lastly, β is the coefficient that we are interested in this study.

	Review Volume	Review Length		
Editorial Reviews	5.1944***	153.966***		
	(0.023)	(0.868)		
Restaurant Fixed Effect	Yes	Yes		
Time Fixed Effect	Yes	Yes		
Number of Observations	12,191,844	12,191,844		
Adjusted R-Squared	0.151	0.066		
Notes. Standard errors are reported in parentheses.				
*** p<0.01, ** p<0.05, * p<0.1				

Table 2. Preliminary Results

The results of our preliminary model are reported in Table 1 above. The coefficients of editorial reviews are all positive and statistically significant at p-value < 0.01. Therefore, on average, restaurants that have an editorial review receives about 5.2 more user-generated reviews compared to the restaurants that do not have an editorial review article. Similarly, reviews written for restaurants that have an editorial review are about 154 characters longer than reviews written for restaurants that do not have an editorial review article. Hence, our hypothesis 1a and hypothesis 2a are statistically supported while hypothesis 1b and 2b are not. Therefore, it appears that the editorial review program is a great addition to the restaurant review platform. It encourages users not only to contribute more reviews to the platform but also to spend more effort in writing those reviews, resulting in longer reviews and potentially more helpful reviews.

Nevertheless, it is important to acknowledge the limitation of our preliminary model. For one, the current model is unable to capture factors that are both time- and restaurant-varying. As the research progress, we will collect additional data to control for those factors (such as crime rate, extreme weather condition, housing price, etc.) In addition, we can also treat the existence of editorial reviews as a natural experiment and employ the propensity score matching and difference-in-differences analysis to eliminate unobservable factors that correlate to both the increase of the volume and length of the reviews of a restaurant and the presence of editorial reviews. The combination of propensity score matching and difference-in-differences is commonly used in prior literature that studies natural experiment such as ours (e.g., Qiao et al. 2017; Rishika et al. 2013; Ye et al. 2014). By incorporating both extensions, we plan to have the following specification as our primary model:

$$DV_{ite} = \alpha_i + \delta_t + \theta_e + \beta X_{ite} + \gamma Editorial Reviews + \varepsilon_{ite}$$

where subscript *i* denotes each restaurant, subscript *t* denotes the time period corresponds to each observation, and subscript *e* denotes if the restaurant has an editorial review. α_i captures the restaurant fixed effect, δ_t captures the time fixed effect, θ_e captures the editorial review fixed effect (e.g., some characteristics that exist only for restaurants that receive editorial reviews). $X_{i,t}$ is the set of control variables that varies across both restaurant and time. *EditorialReview* is a dummy variable that takes the value 1 if restaurant *i* has an editorial review at time *t* and 0 otherwise.

Concluding Remarks and Future Directions

Online review platforms, especially small and medium ones, have been struggling with policies to encourage user contribution. Previous research has shown that monetary incentives usually backfire while non-monetary ones are not always reliable in nudging and shaping user behavior. In this study, we aim to comprehensively examine the implications of a practice used by the owner of a restaurant

review platform in Asia, where reviews written by the platform called "editorial reviews" are posted to supplement user-generated reviews. The theoretical prediction regarding potential implications of this editorial review program is not ex-ante clear. On the one hand, the presence of editorial reviews may crowd the users out of the platform since reviews written by the platform tend to me lengthy and details thus limited the discussion points available to other users. On the other hand, editorial reviews could stimulate user contribution and act as an initial point of discussion thus encourage more users to contribute reviews to the platform. Our preliminary results demonstrate that the editorial review program could be a promising method to encourage user contribution both in terms of quantity and quality. Interestingly, restaurants that have at least one editorial review article receives more reviews in the subsequent period and these reviews are significantly longer than reviews written for restaurants without an editorial review article. These findings indicate that the platform may use editorial reviews to improve user contribution and could also leverage this program as a "premium" features for supporting restaurants as well.

Although our preliminary results show some interesting results, we plan to extend our research in several directions. First, we will develop formal hypotheses of other variables of interest such as the review valence (i.e., the average review rating) and the variation of those ratings (i.e., the review variance). Also, we will incorporate additional analysis such as mechanical analysis to enhance our hypothesis development attempt. Mechanical analysis would allow us to understand more about the editorial review articles and may shed some light regarding the potential direction of the effect of editorial reviews on user behavior. Second, as mentioned in the methodology section, we will add additional variables that are both time- and restaurant-varying as control variables to the model. Doing so would enhance our model to be more robust toward variables that our current preliminary model is unable to capture. Third, we will also treat this arrangement as a natural experiment and leverage the propensity score matching and difference-in-differences analysis to examine the data. Propensity score matching allows us to pair two restaurants that are similar together where one has at least one editorial review articles while another does not. Once each restaurant with editorial reviews are matched, then we can use difference-in-differences regression framework to uncover the impact of editorial reviews on user behavior while controlling for unobservable factors that correlate to both the change in our variables of interest (e.g., the increase of review volume and the increase of content length) and the presence of editorial reviews. These enhancements will make our analysis more robust and strengthen the validity of our findings.

The overall vision of this research project is to provide insights into a practice that could enhance the contribution level and quality of user-generated content. We will be among the first to empirically uncover the dynamic and interplay between platform-generated content and user-generated content in the context of online reviews. Our work contributes to the literature in crowdsourcing in general and user-generated content and online reviews in particular regarding how the platform can use its own content to stimulate user content generation behavior. This study also yields significant managerial insights into the implications of platform's content creation policies and how platform content affects subsequent user-generated content.

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