

The Value of Competing in Virtual Communities: Use and Exchange Value Creation in Online Auctioning

Research-in-Progress

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Abstract

In this paper, we set out to examine how individual and organizational benefits are created in virtual communities characterized by competitive relationships. Drawing insights from value theory, we argue that individual benefits arise from the use value/satisfaction that users gain from their participation in such communities, whereas organizational benefits are derived from the aggregate monetary value that is created through competition among users, also understood as exchange value. Moreover, we hypothesize that the ways in which users compete and the level of rivalry among users influence the aforementioned types of value creation. We test our hypotheses in the context of a self-developed mobile application that serves as an auctioning platform for hotel rooms. A preliminary analysis grants initial support to our hypotheses. Our research contributes to the relevant literature by highlighting the diverse benefits that competitive relationships can bring and paves the way for further research on alternative community models.

Keywords: Value creation, competition, virtual community, auction

Introduction

With virtual communities (henceforth VCs) playing an increasingly important role in the production and consumption of information, it should come as no surprise that research on VCs already has significantly advanced for nearly two decades. A virtual community is an aggregation of individuals who interact around a shared interest, where the interaction is at least partially supported and/or mediated by technology (Porter 2004). The VC literature has identified a multitude of formats, such as communities that focus on advancing members' social interests or those promoting commercially oriented objectives (cf. Porter and Donthu 2008). Nonetheless, an underlying premise of most studies is that communities are formed through collaborative relationships between community members. Most studies on VCs tend to focus on how collaboration increases the individual and the collective/organizational benefits of the community and thus ensures its sustainability (Bieber et al. 2002; Sutanto et al. 2011).

While this paper is driven by the existing research on VCs, at the same time we seek to complement this line of research by arguing that community relationships need not necessarily be characterized by a collaborative format, but can also consist of competitive relationships among members. Assuming that communities of all kinds are becoming an increasingly pertinent element of social life, obtaining a better understanding of how individual and organizational benefits are derived in this context is of particular importance.

This paper attempts to achieve this, initially by drawing insights from recent advancements in value theory. Specifically, we argue that individual benefits are derived through *use* value, whereas organizational benefits are derived via the creation of *exchange* value. We elaborate on these concepts in the following section. Moreover, we argue that the extent to which such value is created in VCs is dependent on the structural characteristics of the community, namely the *form*, as well as the amount of rivalry among users.

We examine these concepts in the empirical context of a self-developed mobile application that serves as an auctioning platform for hotel rooms. Our research consists of (1) a survey that we initially conducted in order to inquire about users' attitudes towards booking hotel rooms via an online bidding platform, (2) a lab experiment where we test our main hypotheses, which we describe in the next section of the paper, and finally (3) an upcoming field experiment that will be conducted in order to overcome some of the limitations associated with the lab experiment. Our research provides an examination of a new set of relationships that can characterize competitive VCs, as well as an initial set of hypotheses that posit how such communities can be sustained.

Theoretical Framework

Prior to elaborating on our theoretical framework, it is important to establish some definitions for our study. We define the *individual benefit* of a VC member as the reward the member receives from being part of and interacting with the community. As an example, in the case of a knowledge-sharing VC, a member's direct benefit will be the answers to his/her posted questions. In contrast, the benefit of all members represents the *organizational benefit*, where 'organization' refers to the entity encapsulating the VC. In the aforementioned example, more involved collaboration between the members would increase the success of the virtual platform and the quality of questions and answers.

Expecting to identify an increase of individual benefits in a competitive setting could seem as counter-intuitive, as such a setting can only have one (or a group of) winner(s), and one's loss can hardly lead to an increase of individual benefits. For example, in the context of auctioning, there are examples of bidders who repeatedly return to the same community (Yen and Lu 2008), which in turn raises the possibility they do benefit from participating regardless of what the outcome is. Herschlag and Zwick (2008) list the following reasons for participating in online auctions: addiction to excitement, competition with rivals, and the need for belonging to a community.

Value Theory

In an attempt to better understand how such benefits can be derived in a VC setting, we draw some insights from value theory, and more specifically from the key distinction between *use* and *exchange* value. According to Lepak et al. (2007), use value refers to the specific quality of a new job, task, product, or service as perceived by users in relation to their needs, such as the speed or quality of performance on a new task or the aesthetics or performance features of a new product or service. As Bowman and Ambrosini (2000) note, such judgments are subjective and individual-specific. In contrast, exchange value is defined as either the monetary amount realized at a certain point in time, when the exchange of the new task, good, service, or product takes place, or the amount paid by the user to the seller for the use value of the focal task, job, product, or service (Lepak et al. 2007: 181-182).

We argue that the use vs. exchange value distinction can be helpful for understanding the diverse benefits that can occur in a VC setting. The concept of use value can serve as a valid proxy for individual benefits because use value is subjective and the sum of individual financial benefits in a community setting that is characterized by competitive relationships cannot be positive, in the sense that one's gain is someone else's loss. Similarly, the concept of exchange value can be seen as a proxy for the organizational benefits that can accrue in a competitive VC, meaning that the accrual of organizational benefits in a community can occur when the aggregate exchange value is higher than it would be in the case where relationships among users are not characterized by an element of competition, but rather situations where the allocation process is either cooperatively resolved or require no coordination. As a result, our first hypothesis is the following:

Hypothesis 1 (H1). Competitive relationships between users in a VC are positively related to the use and exchange value that is accrued in the community.

How Users Compete and the Amount of Rivalry Among Users

While we initially hypothesize that competition among users of a community holds benefits for individual users, as well as for the community in general, we also contend that the particular ways in which users compete will affect the value creation process. In line with studies that have shown how different exchange mechanisms can lead to diverse outcomes in terms of the tangible and intangible that users can accrue (Kersten et al. 2008), we draw our insights from the literature on continuing IS use, which refers to the concept of habitual use to explain how people react to new systems or to changes in existing systems (Ortiz de Guinea and Markus 2009). Accordingly, the argument explains how IS usage is not guided by the individual's intentions when its use has become habitual, thus leading to sub-optimal outcomes.

In this paper we also set out to contrast such habitual forms of usage with more efficient forms of usage, especially since the logic of efficiency has been conceived as a key factor for value creation (Amit and Zott 2001). The diversity between habitual and more efficient manifestations of competitive behavior can be best illustrated in the context of online auctioning, which we also adopt as our research setting. Successful online auction platforms are primarily based on the ascending bid (English) auction type (Klemperer 2002). People might more readily adopt a system (e.g. a particular auction type) if they have already used a similar system before.

The claim mentioned above is also supported by Ivanova-Stenzel and Salmon (2004) who find evidence that bidders prefer ascending-bid auctions when given a choice. However, in the case of perishable goods, descending bid (Dutch) auctions have evolved to be the auction of choice because the price model mirrors the declining value of the goods over time (Rockoff and Groves 1995). Dutch auctions are also a convenient choice for commodities auctions as successful bidders have the option to nominate divisions of the offered goods. As a result, we argue that the use of the two auction types can either be based on a logic of efficiency or a logic of habitual use/ease of use. Accordingly, we hypothesize that all forms of competition have a positive effect on value creation, we expect more efficient competing forms to provide additional benefits to their communities:

Hypothesis 2a (H2a). Forms of competing based on habitual use are positively related to the use and exchange value created in a VC.

Hypothesis 2b (H2b). Forms of competing based on a logic of efficiency are positively related to the use and exchange value created in a VC.

Hypothesis 3 (H3). When compared to habitual forms of competing, competition based on a logic of efficiency will lead to higher use and exchange value in a VC.

In a final hypothesis set, we expect that the amount of rivalry among users in a community will inversely affect the amount of use exchange value that is created in a community. More specifically:

Hypothesis 4a (H4a). The amount of rivalry among users is negatively related to the use value created in a VC.

Hypothesis 4b (H4b). The amount of rivalry among users is positively related to the exchange value created in a VC.

Research Design

As was already noted in the introductory section, we seek to test the previously outlined hypotheses in the context of online auctioning for hotel rooms. For this purpose, we developed a mobile application and conducted a lab experiment with student subjects. In order to strengthen the validity of our results, we conducted a pre-experiment survey to identify any additional critical factors that affect user behavior when using such an application. We are also conducting a field experiment using the same mobile application in order to address some of the limitations of the design of this (and any) lab experiment. Currently, we are in a position to report the results of the pre-experiment survey and some initial results from the lab experiment. Nevertheless, we are confident that we can present the full model coming from the lab experiment, as well as some introductory results from the field experiment by September, 2014. In the rest of this paper, we elaborate on the design of the aforementioned complementary studies.

Study 1 - Pre-Experiment Survey

To answer the question of individual benefit within competitive VCs such as online auctions, we have designed a survey to measure the perceived satisfaction with the outcome of an online hotel reservation auction.

The survey was evenly distributed to the USA, Germany, and China, the countries with the highest economic power in their respective economic regions: Americas, Europe, and Asia. The entire survey was translated into the official language of each country, was distributed online in the same format to all participants, and was filled out in the period 22-23 October 2013. Table 1 lists demographic data of the survey.

Figure	Value
Total Respondents	399
From the USA	136
From Germany	132
From China	131
Male/Female	40%/60%
Average Age (approx. Gaussian distribution)	31-40
Median Education	Bachelor's Degree

Table 1. Survey Demographic Data

Dependent Variable

The dependent variables captured are the expected satisfaction of using the auctioning system (2 Likert-scale items) and the intention to use the system (2 “Yes/No” items). The satisfaction scale was adapted from Yen and Lu (2008), who have in turn developed their items from Oliver’s (1980), as well as Bhattacharjee and Premkumar’s (2004) satisfaction scales.

Independent Variables

In order to determine the variables best suited as independent variables, we analyzed the user’s experience with the circumstances presented to him: online auctions of hotel bookings. In order to examine the acceptance, use and experience of online auctions we turned to the unified theory of acceptance and use of technology (UTAUT) [Venkatesh et al. 2003] and used it as a basis for developing our constructs. We adapted these items into the context of auctioning, therefore this group of IVs includes items that relate to (1) incentives to use an auctioning system, (2) experience with auctions, (3) social influence, and, (4) habitual use of auctioning systems. In order to characterize the experience with hotel bookings, we synthesized the results of several studies in the field of tourism and conducted two focus group studies. The variables that we included in our model include (1) the cognitive distance associated with a particular destination, (2) trip duration, and, (3) date flexibility.

Control Variables

We encapsulated several types of control variables in the study that should help isolate the effects of the independent variables. Most prominently, we used a set of items developed with the intention of controlling personality and culture characteristics. The personality and culture items were derived from the work of John et al. (2008) - called the Big Five Inventory - and included a well-known set of items for determining the global personality traits of the respondents. The items include extraversion, agreeableness, conscientiousness, neuroticism, and openness to experience.

We also controlled for personality traits, which could potentially have a direct impact on the perceived satisfaction with the use of an unpredictable booking method: uncertainty avoidance and long-term orientation. Both were adapted from Yoo et al. (2011), based on Hofstede (1984). Last, we used gender and age demographic controls.

Construct Reliability

The reliability of the constructs is shown in Table 2. The reliability was measured for all items that are included in the experiment and have more than one item measuring each construct. All constructs have Composite Reliability of over 0.7 and AVE of over 0.5. Most of the constructs have a Cronbach Alpha value higher than 0.7, however three of the control variable constructs (Agreeableness, Conscientiousness and Long Term Orientation) have a value below the threshold of 0.7 (highlighted in Table 3). Given that the other two measurements, Composite Reliability and AVE are satisfactory for the variables in question, and that the Cronbach Alpha values are close to 0.7, we have decided to retain them for data analysis.

Type	Construct	Subconstruct	Cronbach Alpha	Composite Reliability	AVE
DV		Satisfaction	0.87	0.94	0.88
IV	Auctioneer Profile	Incentive	0.92	0.94	0.72
		Experience	0.87	0.94	0.88
		Social Influence	0.86	0.94	0.88
		Habit	0.81	0.92	0.84
CV	The Big Five Inventory	Extraversion	0.82	0.89	0.73
		Agreeableness	0.62	0.84	0.72
		Conscientiousness	0.66	0.82	0.71
		Neuroticism	0.78	0.77	0.64
		Openness to Experience	0.81	0.89	0.73
	Personality	Uncertainty Avoidance	0.82	0.89	0.74
		Long Term Orientation	0.53	0.81	0.68

Table 2. Construct Reliability

Results

In order to analyze the results of the survey and to address the question of what influences the perceived satisfaction with the use of an online auctioning system for booking hotel reservations, we conducted a regression analysis.

Satisfaction is the dependent variable measured with Likert scales from 1 to 5, where only the extreme choices were labeled (Strongly Disagree and Strongly Agree, respectively). As only the extremes are labeled, we assume proportional hazards, hence we used an ordinal logistic regression model. To confirm our results (Table 3), we also ran the same model with comparable results (the linear regression exhibited an R^2 of 0.46, Adjusted- R^2 of 0.44 and Root MSE of 0.74).

Expected Satisfaction	Coef.	Std. Err.	z
<i>IV Auctioneer Profile</i>			
Incentive	0.543	0.164	3.31 **
Social Influence	0.402	0.13	3.08 **
Habit	0.381	0.127	3.00 **
Experience	-0.221	0.091	-2.43 *
<i>IV Tourist Profile</i>			
Cognitive Distance	0.198	0.064	3.10 **
Duration	-0.133	0.046	-2.90 **
Date Flexibility	0.48	0.039	1.24
<i>Control Variables</i>			
Total Trips	0.057	0.027	2.08 *
Extraversion	0.284	0.157	1.81
Agreeableness	0.268	0.152	1.76
Conscientiousness	0.157	0.161	0.97
Openness to Experience	-0.126	0.175	-0.72
Neuroticism	-0.036	0.096	-0.38
Uncertainty Avoidance	0.468	0.176	2.65 **
Long Term Orientation	-0.13	0.11	-1.17
Gender	0.242	0.192	1.26
Age	-0.109	0.073	-1.48
N=399, Log Likelihood = -639.22, Pseudo R² = 0.18			
* p<0.05 ** p<0.01 *** p<0.001			

Table 3. Ordered Logistic Regression on Expected Satisfaction

Study 2 – Lab Experiment

Having completed the survey, we proceeded to conducting a lab experiment, where we test our main hypotheses. We conducted the experiment with 105 students as subjects. As part of their participation in the experiment, the subjects were also asked to complete a questionnaire that included some of the items that were used in the pre-experiment survey, specifically those relating to user satisfaction and intention to use the system, as well as the items relating to the independent variables that were deemed significant in terms of influencing the dependent variable in the pre-experiment survey.

The experiment took place between the 10th and 14th of March 2014. The 105 participants were split into smaller groups and invited to take a seat in a lecture room. Using their own smartphones they were asked to connect to the same Wi-Fi (in order to have similar network coverage and speed) and run the

experimental application. The application was web-based and was running in the browser of the participants, accessible via a link. The participants were given a short text detailing the functionalities of the application, the goal of the experiment (to book exactly one hotel room while making realistic and price-conscious bids), and a description of each type of auction. The experiment was split into 5 rounds, with each round having lasting 5 minutes. Users were given a one-minute break after each round was completed. After the first 3 rounds they were asked to fill out a survey concerning their satisfaction and their intention to use. The same survey was assigned again after the 5th round.

The items for satisfaction and intention to use served as measures for use value, whereas the aggregate amount that users spent for booking a hotel room was used as a measure for the exchange value in the IS. In order to address hypotheses 1 through 3, as our main manipulation we introduced different methods of booking a hotel room. We split subjects into three groups and used the list price method as our baseline. Accordingly, the other two groups were in the ‘ascending bid’, and ‘descending bid’ conditions. The first three rounds were conducted for training users with the system, whereas the following two rounds introduced our second manipulation, where we varied the availability of rooms according to the number of users by +30% and -30%.

Table 4 presents the descriptive statistics of satisfaction, measured after the first three rounds. The satisfaction level for the Ascending bid auction as compared to the List Price approach is higher, as is the satisfaction in the case of the Descending bid auction. This finding suggests support for hypotheses H2a and H2b. Additionally, the satisfaction for the Descending bid auction is higher than the one for the Ascending bid auction, indicating support for hypothesis H3.

Type of Auction/Pricing	Respondents	Satisfaction	St.dev.
List Price Approach	35	2.41	1.27
Ascending Bid Auction	35	2.53	1.15
Descending Bid Auction	35	2.71	1.05

Table 4. Satisfaction by type of auction or pricing method

Exchange value is examined in Table 5, which lists the average amount spent per room by auction/pricing method. The average amount paid in both the Ascending and Descending bid auctions is greater than the average amount spent in the List Price approach. The average amount spent in the Descending bid auction is around 60% greater than in the case of the Ascending bid auction. These findings suggest support for hypothesis H2.

Type of Auction/Pricing	Respondents	Avg. Amount Spent	St.dev.
List Price Approach	35	54.24	9.38
Ascending Bid Auction	35	58.07	11.89
Descending Bid Auction	35	95.46	34.27

Table 5. Amount spent by type of auction or pricing method

Another interesting observation is the effect of the different type of auctions or pricing methods on the intention to use such a method. In Table 6 we see that both Ascending bid and Descending bid auctions perform better than the List Price approach, and that Ascending bid underperforms Descending bid.

Type of Auction/Pricing	Respondents	Intention to use	St.dev.
List Price Approach	35	2.23	1.21
Ascending Bid Auction	35	2.43	1.31
Descending Bid Auction	35	2.63	1.29

Table 6. Intention to use by type of auction or pricing method

When analyzing the effect of occupancy rate, as measured after the last two rounds, we observe that satisfaction drops after the manipulation mainly for the First high, then low type of manipulation (Table 7). The “First low, then high supply” manipulation refers to the fact that in round 4 the participants faced inadequate supply (more participants than rooms) and in round 5 they had abundant supply (more rooms than participants). The “First high, then low supply” manipulation is the reversed order.

Occupancy rate	Satisfaction	Respondents	Satisfaction	St.dev.
First low, then high supply	Before manipulation	53	2.76	1.22
	After manipulation	53	2.53	1.17
First high, then low supply	Before manipulation	52	2.34	1.06
	After manipulation	52	2.33	1.20

Table 7. Effect of supply rate on satisfaction

When measuring the effect of occupancy rate on the exchange value, we notice that the descending bid auction has higher average amounts in the case of high occupancy (Table 8), suggesting support for hypothesis H4b.

Type of Auction/Pricing	Low Supply	High Supply
List Price Approach	60.61	60.12
Ascending Bid Auction	64.71	64.3
Descending Bid Auction	104.22	82.11

Table 8. Average amount paid by type of auction/pricing approach and occupancy rate

Study 3 – Field Experiment

While the complete analysis of Study 2 is still pending, at the same time we are currently conducting an additional field experiment with the same manipulations and number of repetitions in order to increase the validity of the results of in the lab experiment while overcoming some of the potential limitations of the lab experiment setting. In particular, during the lab experiment we discovered that in some instances the system was slow and error-prone, and we were able to fix the respective bugs for the field study. Second, during the lab experiment, subjects were able to see their competitors and could potentially assess their competition by counting the number of users against whom they were bidding. Finally, a field experiment was deemed more realistic, as each repetition lasted for 12 hours (from 8am to 8 pm). In contrast, subjects in the lab experiments had a time span of 3 minutes to complete their bidding, which could also act as a source of potential bias, given that in real instances of online auctions, all users do not necessarily overlap at the same point in time.

Conclusion

The studies appear to be promising in providing empirical support for the concepts of use and exchange value in a competitive, rather than collaborative community. Full hypothesis testing results will be available by the time the conference in New Zealand is held, but so far the results appear to indicate that both types of value are enhanced by making use of auctions rather than list pricing. Therefore, collaboration has perhaps been over-rated in its impact and usefulness for all forms of VCs, and further research should be undertaken to (1) compare a wider array of auction types and (2) discover other community models that should be considered when choosing models of cooperation and competition.

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