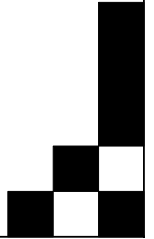


A b s t r a c t

Online communities are an integral part of the Internet. However, it is not entirely clear exactly what the value propositions of online communities are, and how firms should leverage them. This paper is an attempt to describe some of the value propositions of online communities and to suggest control structures that firms should employ to maximize community value. The general trend that emerges is that, under the conditions described in the paper, firms should take an arms-length approach to the management of online communities.

Some Value Propositions of Online Communities

ERIC WALDEN



INTRODUCTION

One of the major themes in electronic commerce is that the economic success of an electronic commerce venture is embedded in the social aspects of the Internet. Several authors have proposed that online communities are important drivers of value in electronic commerce (Armstrong and Hagel 1996, Hagel and Armstrong 1997, Downes and Mui 1998). Clarke (1998) has gone so far as to say '[M]arketers who fail to appreciate the very different psychological and sociological context involved in Internet commerce will inevitably fail in this domain...'. The stock market seems to agree with this sentiment, awarding huge market valuations to online communities such as Theglobe.com (\$293 million¹) and iVillage (\$632 million¹). The valuations for firms that provide other services, but promote community are even more impressive: Yahoo (\$47.5 billion¹) and AOL (\$164 billion¹) are outstanding examples of this. The reasons given for the importance of community in electronic commerce span a variety of disciplines, including sociology, economics, marketing, and psychology.

What is missing in business literature is a normative explanation of when and why EC firms should choose to encourage a virtual community. While many authors extol

the value of virtual communities (Armstrong and Hagel 1996, Hagel and Armstrong 1997, Downes and Mui 1998), there are examples of virtual communities that have been very costly. For example, Intel's first Pentium chips were flawed so that a relatively obscure floating-point operation would not be completed correctly. The online community quickly took note of this error and turned a relatively minor flaw into a worldwide problem for Intel, resulting in a \$1 billion recall, and severe damage to a carefully developed brand name (Hansen 1999). While this might have actually saved Intel's reputation in the long run, one can imagine scenarios in which such a quick and pervasive reaction to a relatively minor defect would not be beneficial to a firm either in the long run or in the short run. Thus, it is not clear if online community is always the correct answer.

This paper is an attempt to look at the special case of how a firm should use community to support its products. There are, of course, many communities that are built around things like babies or pension plans, which are not transactional. Thus, this paper is an attempt to explain *some* not *all* value propositions of online communities. However, when we include business communities built around the burgeoning business-to-business aspect of electronic commerce, we see

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that the ideas presented here have reasonably wide applicability. Other significant value propositions of communities exist, such as to provide individuals with a sense of social belonging. It is most likely the case that people would be willing to pay for this aspect of online communities. In fact, in a very real way, consumers pay for access to a community every time they pay for Internet access. This selling of community provides a way to study the value of communities, but it is not the focus here. Rather, this paper is concerned with how community can be used to better sell other products.

By *community*, I mean the chance to interact with *real* people. Any kind of situation in which an individual can view the opinions of others or make known her control opinions is a community, for the purposes of this paper. Thus, an online community includes mailing lists, chat rooms, Usenet groups, and other online posting mechanisms. A site like eBay, which allows members to submit reviews of other members, is included as a community, for the purposes of this paper. This is different from the standard definition, which requires the group to be long lasting (Ferrán-Urdaneta 1999: 130), but rather than invent a new word, I will use the term *community* throughout this paper.

The framework proposed here is built around the transaction of products. Online communities are divided into pre- and post-transaction communities. Within each of these two divisions are two further divisions based on the purpose of the community. The pre-transaction communities can be used to gather information on the product, or information on the firm, while the post-transaction communities can be used to provide product support, or to influence future versions of the product. This framework is displayed in Figure 1. It is important to note that the same community can serve multiple purposes, so that a consumer could collect information on a product, then after the purchase, stay in the community to receive support for that product. In fact, it is likely that the majority of communities serve multiple purposes.

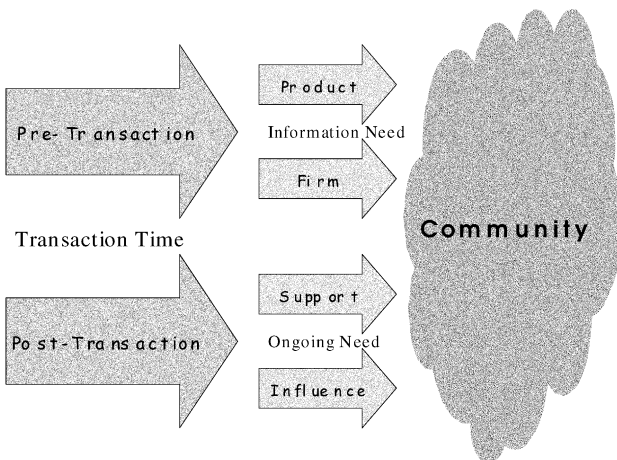


Figure 1. Framework for understanding online communities

However, it is important to examine each driver independently to establish a firm theoretical underpinning. An examination of interactions among purposes is left for future research.

Within this framework, one can see that the pre-transaction needs are informational while the focus of post-transaction needs is ongoing support. From this it follows that two different sets of theories are needed to examine the online communities.

PRE-TRANSACTION (PROVIDING FOR INFORMATIONAL NEEDS)

The fundamental need in the pre-transaction level of analysis is a need to provide for trust in the product and firm. The underlying idea is that of asymmetric information, where the consumer needs information from a credible source. However, it is my conjecture that there will never be complete information, so the consumer will always have to rely, to some degree, on trust. Further, there are different types of information and trust needs. Specifically, an individual needs to collect information to engender trust in both the product and the firm. The information received interacts with the purchasing discussion by influencing the level of trust the individual has in either the product or the firm. Throughout this analysis, I assume that the purchase is the correct purchase, thus additional information will help the consumer to realize that the purchase is a good one.² It may be that the product is not actually a good match for the consumer, in which case the firm may want to restrict information. Such a direction is not considered in this paper, but might make interesting material for future research, especially in the field of ethics.

A Model of Trust

The model I chose to use is based on the model of Bhattacharya *et al.* (1998, 1999). These authors construct a mathematical model of trust based on previous literature in sociology, psychology and economics. The basic idea of the model is that trust is based on the probability of good outcomes and the probability that others will choose actions, which produce good outcomes. The advantage of a mathematical model over a verbal model, in this context, is that it forces one to be very clear about how social control enters the formation of trust. The specific form of the model is written as:

$$T_{i,f}|a_i^* = \Pr(U_i > 0|a_i^*) = \sum_{x_i \in \gamma_i} \sum_{a_f \in A_f} F_i(x_i|a_i^*, a_f) c_i(a_f) \quad (1)$$

Where,

- i denotes the individual or consumer

- f denotes the firm
- U_i is the individual's utility
- i is the set of outcomes that yield positive utility
- a_i^* is the action chosen by the individual
- a_f is the action the firm takes from the set of all possible actions A_f
- $c_i(a_f)$ is the individual's conjecture about the actions the firm will take
- $F(x_i|a_i^*, a_f)$ is the probability of the specific outcome x_i given actions a_i^* and a_f

This definition has some properties that are noteworthy. First is the idea that trust is made up of two components; the F function, which characterizes outcomes, and the c function, which characterizes the conjectures that the individual has about the firm. Note that the F function is a random function, which is dependent upon the actions of both the firm and the individual. Thus, even if both parties undertake known actions, the outcome is uncertain.

An example may be illustrated here. Consider an individual trying to decide on the purchase of a Sony Minidisk player. The F function captures all the environmental uncertainty of the purchase. Even if Sony behaves well, in that they guarantee the product against defects, they produce a superior product, and they thoroughly test it for other dangers, a new technology may render the Minidisk player obsolete before the customer derives the full value, or musicians may not choose to produce Minidisks. These factors capture the environmental uncertainty, which is independent of the actions taken by the two parties.

The c term captures the individual's uncertainty about the firm's actions. An example here would be an online brokerage, like E*trade. There is no uncertainty about the product purchased. A hundred shares of Microsoft is the same at E*trade as it is at Merrill Lynch. The uncertainty arises because the individual does not know how E*trade will service his account. Will orders be executed in a timely fashion? Will the information provided online be as valuable as that of a human stockbroker? Will the year-end summaries be easy or difficult to use? All of these questions concern the brokerage firm, but not the equities purchased through the firm.

With such an overview in mind, I make some simplifying assumptions. First, there is only one action of consequence (a_i^*) for the potential customer, and that is purchasing the item. If the customer chooses not to purchase the product in question, then the outcomes are trivial. The second simplifying assumption is that the firm has only two possible actions (a_f), labeled *Honest* and *Deceive*. A firm that behaves honestly is doing what one would expect a good firm to do. This includes things like delivering the product on time, delivering the correct product, insuring personal privacy, accepting reasonable returns, and other socially acceptable behaviors, depending on the nature of the transaction. To deceive is simply to

not be honest, and can encompass violations of one or many of the honesty behaviors. Future work will have to expand the range of possible firm actions, but for our purposes, these two actions will suffice. The final simplifying assumption is that there are two possible outcomes (x_i) for the customer labeled *good* and *bad*. The good outcome is one that yields positive utility, and is the only one that factors into the model. Plugging these assumptions into (1) yields,

$$T_{i,f}|buy = \Pr(U_i > 0|buy) \\ = \sum_{x_i = Good} \sum_{a_f \in \{Honest, Deceive\}} F_i(x_i|buy, a_f)c_i(a_f). \quad (2)$$

Performing the summations and removing the buy labels gives us:

$$T_{i,f} = F_i(good|honest)c_i(honest) \\ + F_i(good|deceive)c_i(deceive). \quad (3)$$

Finally, noting that the conjectures are probabilities (3) can be rewritten as:

$$T_{i,f} = F_i(good|honest)c_i(honest) \\ + F_i(good|deceive)(1 - c_i(honest)). \quad (4)$$

To examine the control structure, some assumption must be made about how individuals perceive firm control vs. community control. The assumption made here is that the impact of information from a self-controlled community is greater than the impact of information from a firm-controlled community. Returning to the E*trade example, what this says is that an independent community will generate more confidence in E*trade than a community controlled by E*trade. The mathematical conjecture can be stated as:

$$c_i(honest)_{Community} > c_i(honest)_{Firm}. \quad (5)$$

There are several reasons for this conjecture. One reason is that the firm cannot credibly commit to a free community. As (Troeksen 1997) observes, even if the current regime can somehow commit, their successors are not bound by their decisions. Thus, as management is replaced, the freedom of the community is jeopardized. Worse still, the firm has an incentive to remove any derogatory content. This incentive, combined with the lack of credible commitment, makes the firm a poor choice for being the controller of a community whose purpose is to reduce uncertainty about the firm.

On the other hand, a self-controlled community can make a credible commitment because its goals will, by definition, be the goals of the community. Further, the community has the ability to punish members who work against its goals, in the same way a labor union has the ability to punish picket line crossers. Because membership in the community is the reward for participation, the community can punish bad members with ostracization. This social enforcement is so powerful, that often there is

no need of formal governance in such situations (Ellickson 1989). This argument should not be taken to mean that online communities are perfectly unbiased. That is not required. All that is required is that the bias of the online community toward the firm is less than the bias of the firm toward the firm. Accepting the arguments leads to Proposition 1.

Proposition 1: The optimal control structure for an online community, whose purpose is to provide credible information about the focal firm, is community control.

Product uncertainty is the other community function within the pre-transaction area. In this case, the analysis about firm control is different. By assumption, the conjecture about the firm is that it is trustworthy. The question here is whether or not the product is the correct choice. That is, does a firm-controlled community misrepresent the product? In this situation, the firm is more able to make a credible commitment because being opportunistic on one product may ruin chances for other product sales. In this case, the lure of opportunistic behavior is offset by the possibility of loss, whereas in the case above, there was no offsetting possibility of loss because the choice was all or nothing.

Mathematically, this situation can be expressed with two equations:

$$c_i(\text{honest}) = 1 \quad (6)$$

and

$$F_i(\text{good}|\text{honest})_{\text{Community}} = F_i(\text{good}|\text{honest})_{\text{Firm}}. \quad (7)$$

Another consideration in this circumstance is that many consumer firms do not sell products they manufactured directly. What they actually sell is a value added to the product. Thus, the consumer question is not whether all of the value was added, but what the value was when it got to the reseller. For example, eBay does not sell items *per se*, but rather, they rent the meeting space. If the uncertainty is in the quality of product, then eBay does not have an incentive to misconstrue information because their business is to match the right buyers with the right sellers.

It seems then that other considerations will have to govern the choice of community control if the uncertainty is about the product. Good candidates are cost and persistence structures. For example, Amazon.com controls the community that provides book reviews. This is because there is no persistence in the community. It is not likely that enough individuals would be interested in every book that Amazon.com sells to start multiple communities. Amazon.com can take advantage of economies of scale in technology to allow thousands of small, transient communities to exist in one place.³ Thus, Proposition 2 is:

Proposition 2: *Ceteris paribus*, no control structure is superior when the uncertainty is purely about the product.

Note that hypothesis 2 and the preceding discussion concerns a situation in which the only uncertainty is around the product. The discussion around hypothesis 1 concerns a situation in which the only uncertainty is around the firm. Both of these are extreme examples, and the situations, which are likely to be observed in reality, are ones in which there is uncertainty in both the firm and the product. In this case, the optimal control type is a weighted average, depending on where the uncertainty is highest. This produces a continuum with strong predictions of strong community control on one end and predictions for weak community control on the other end. This suggests that community control is the default value. Firm control only makes sense when firm uncertainty is low and there are exceptional reasons why community control is not likely, such as in the Amazon.com example above.

Mathematically, the only additional assumption that is needed to make this work is that the probability of a good outcome is higher if the firm behaves honestly, which is expressed:

$$F_i(\text{good}|\text{honest}) > F_i(\text{good}|\text{deceive}). \quad (8)$$

This brings up an interesting issue. In situations where firm behavior does not effect outcomes, trust is not important. This is an intuitive result, and it is satisfying that the model yields such a result. Applying the restrictions in (5), (7), and (8) to (4) reveals that community control results in higher trust than firm control, as shown below.

$$T_{i,f} = \underbrace{F_i(\text{good}|\text{honest})}_{\text{Large Prob}} \underbrace{c_i(\text{honest})}_{\text{Greater if Community}} + \underbrace{F_i(\text{good}|\text{deceive})}_{\text{Small Prob}} \underbrace{(1-c_i(\text{honest}))}_{\text{Lesser if Community}}.$$

This leads to Proposition 3.

Proposition 3: In the absence of extenuating circumstances, self-control is the better control structure for trust/information providing communities.

POST-TRANSACTION (MAXIMIZING WELFARE)

After the transaction is made, trust is no longer an issue. The goal, instead, is to make the best of the ongoing relationship. In the case of a community designed to provide service, the goal for the firm is to provide service at a low cost, while the goals of the individuals are to get quality service. The mechanism for this is the community. To explain control in this case, I appeal to the theory of incomplete contracts (Grossman and Hart 1986). One of the main results of incomplete contract theory is that the control of an asset should belong to the entity whose

investment is more important to that asset (Grossman and Hart 1986, Hart and Moore 1988, Bakos and Brynjolfsson 1993, Bakos and Nault 1997). While it may be the case that the firm can provide service, I assume that the value of the community is in its service provision to its members. Thus, it is the community that is more important to the asset, which implies that the community should control the asset. This leads to Proposition 4.

Proposition 4: The optimal control structure for an online community with the purpose of providing ongoing product support is self-control.

This is a particularly appealing result of electronic commerce. Proposition 4 indicates that the best way to put the burden of support onto a community of users is to do nothing. The firm is required to make no investment, because the optimal structure is hands-off regulation. This can be thought of as the *invisible hand* of cyberculture. This is not to say that the firm might not want to make investments in the community. It may be very beneficial for the firm to plant the seeds of the community and to provide aid to the community, but in an arm's length way, without trying to appropriate the community. For example, if General Electric wants to build a community around its MRI machines, it would be better for GE to give a grant to an interested technician, rather than to set up and host the community itself.

The analysis of communities, which are established to promote influence over future products, is more complex. Transaction cost economics suggests that the firm should internalize the asset as it is specific to the firm. However, the asset here is a community of individuals that cannot be forcibly internalized. Incomplete contract theory suggests that firm control would reduce investment by the community. However, this may not be a bad thing. There is evidence that too many close ties reduce competitiveness (Uzzi 1996). This could be an especially damaging problem in the fast paced world of electronic commerce. Further, there is evidence that suggests that a small core of focused individuals can have significant impact on new product offerings (Rozanski *et al.* 1999). This may require firms to invest too heavily to please one small segment. Even without a small core, a particularly strong community may appropriate the firm. Thus, for strategic reasons, Proposition 5 is:

Proposition 5: Due to the sensitive nature of new product offerings, the optimal control of an online community dedicated to influencing future products is firm.

What emerges from this discussion is a model like that in Figure 2. Community control is a choice that impacts the uncertainty that consumers feel in the firm, the effort the community exerts servicing its own needs, and the amount of influence that the community has over future decisions. These factors, in turn, effect the level of trust, the cost

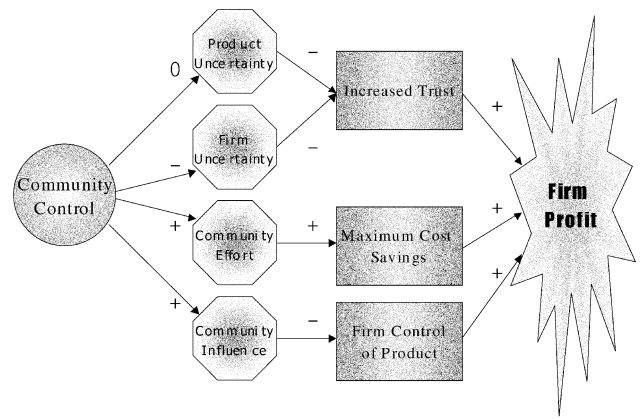


Figure 2. Proposed model for optimal control structure of online communities

savings, and the level of firm control over the product. One additional item not presented in the figure is the interaction between product uncertainty and firm uncertainty. This arises because the argument for product uncertainty having no effect was partially founded on the assumption that the firm was well trusted. If this is not the case, then community control may influence product uncertainty. Such second order effects are not considered here, but future research should address them.

CONCLUSION

This paper develops a model for examining how firms should behave toward online communities. Specifically, the examination focused on optimal control structures to facilitate the firm enhancing value of online communities. While the work here is incomplete, and ignores many value drivers of online communities, it does represent a significant contribution. The contribution is a value-based way of viewing online communities. To the best of my knowledge, it represents the first such work focusing on optimal control structures for building specific value propositions. Further, because there are so many other aspects of online communities that remain to be examined, this work builds the starting point for a long stream of relevant research in electronic commerce.

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Notes

1. Source: <http://www.Bigcharts.com>, accessed November 19, 1999.
2. One can think of the probability of making a purchase as the probability of making the purchase under

complete information times the probability of trusting the firm ($P = F \cdot T$). For this paper, I assume the full information probability of purchase to be 1.

3. These transient communities are where my definition of community is different from a traditional definition of community, which requires persistence.

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