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Measuring and Explaining the  
Impact of Online Communities on  
Consumer Markets**

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**“The Emperor Has No Clothes”: Measuring and Explaining the  
Impact of Online Communities on Consumer Markets**

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# **“The Emperor Has No Clothes”: Measuring and Explaining the Impact of Online Communities on Consumer Markets**

## **Abstract**

The objective of this article is to examine how online communities affect the functioning of markets for durable goods with particular emphasis on markets that are both fragmented and diverse. Our thesis is that online communities have the potential to transform relatively inefficient fragmented markets into markets that are more efficient. This effect will manifest itself through the observed pricing for the goods in both standard commercial settings and in internet exchange institutions. A secondary effect of the online communities should be to amplify the impact of quality (as perceived by the user) on market transactions. We conclude with an analysis of the foundations of credibility for user-generated content within online communities.

**Keywords:** Product innovation, internet marketing, online communities, online commerce, user ratings, online auctions, user-assisted development.

## 1. Introduction

### 1.1 Background

The objective of this article is to demonstrate how online communities can affect the functioning of markets especially those that are fragmented and diverse. The analysis shows how online communities lead to fundamental changes in the way that information moves and is used within a marketplace. As a result of these changes, online communities can transform relatively inefficient fragmented markets into markets that are more efficient. In particular, information exchanged within the online community can have direct impact on the pricing that is observed in standard commercial settings (“bricks and mortar” retailers) and in internet exchange institutions (for example, eBay). A recent study demonstrates the impact of user ratings in an internet institution on sales through that institution (Chevalier and Mayzlin 2006); however, our objective is to analyze the impact of ratings from an online agora (or public space, that is not a marketplace) on prices observed outside the agora.<sup>1</sup>

The implications of this dynamic for commercial enterprises are that for certain categories of goods, freely available Internet user opinions may have as much or more effect on purchase decisions as information provided by manufacturers or retailers to consumers. , To underline the power of consumers to call attention to deficiencies, as well as positive qualities, that manufacturers do not (for reasons of discretion) or cannot (due to a lack of resources) evoke themselves, we call this the “emperor has no clothes” effect. This echoes the *hopes* expressed by Sullivan (2008): “As E-Commerce sites add consumer-generated review systems, marketers and consumers hope truth trumps disingenuousness”.

A second effect of the online community is to amplify the impact of quality as perceived by consumers/users on market performance. Quality perceptions clearly have an impact on the prices that manufacturers can obtain for new products. However, quality is also an important predictor of future value for buyers of durable products that depreciate over time. Not only is durability “a standard component” of quality, but the care which a manufacturer takes to build a product (and build in quality) also seems to affect the product’s ability to stand the test of time. It is well

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<sup>1</sup> This study demonstrates that user book reviews collected on book selling websites affect sales of books on each site.

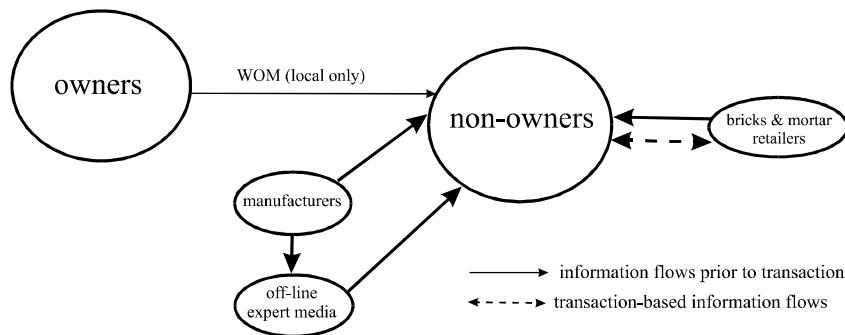
known that high quality products such as BMW's, Beneteau yachts and Rolex watches are better at retaining their value in used product markets than competitive products with inferior quality perceptions.

We will demonstrate how a particular online community has acquired significant influence on perceptions of quality in a specific durable goods market. In this market, we will show that this influence has a measurable effect on prices for used goods, as well as the prices that manufacturers command for new goods. The existence of these effects will be shown through the analysis of data from online auctions and online retailers in conjunction with user ratings generated through the online community.

The drivers of these effects reside in qualitative factors, which we have examined in the course of three years of studying this particular online community. The factors include the credibility of user ratings provided within a particular online community and the credibility of the community itself. Another decisive factor can be found in the nature of the information provided by online user ratings in this community, which encompasses not only the characteristics of the products under review, but the characteristics of the reviewer. In other words, the power of online reviews is based on a) transparency concerning the expertise, interests and character of individual reviewers and b) the collective weight of user opinions. The richness of information presented in a framework that allows for rapid assessment of the quality of products is a critical element of user ratings. In our conclusion, we will refer to examples of firms that have incorporated this power into their marketing efforts, and suggest how other firms may capitalize on this opportunity.

## **1.2 The Impact of Online Communities on Information Flows in Consumer Markets**

A key proposition of this study is that online communities are altering the dynamics of information exchange between buyers and sellers in consumer markets for durable goods. In traditional markets, the flow of key information is straightforward. This is illustrated in Figure 1.

**Figure 1****How non-owners gather information in a traditional geographically dispersed market\***

\* The chart focuses on primary flows of information and does not show secondary flows such as information sent by manufacturers to bricks and mortar retailers.

A salient aspect of this model is that prior to the appearance of an online community, buyers have several sources of information upon which to base their decisions. These include (but are not limited to) advertising and communication from sellers, help from salespeople, the actions of the sellers themselves (such as pricing), independent evaluation organizations, media reports (and PR) and word of mouth. However, aside from independent evaluation organizations, media reports and Word of Mouth (WOM), most information in this model originates from sellers. Seller-provided information is very important if a product category lacks independent evaluation organizations (e.g. *Consumer Reports*) and does not receive extensive media coverage.

In an offline world, WOM is the only buyer information source that is user generated. Not surprisingly, WOM receives significant weight in many consumer purchase decisions. However, traditional WOM is subject to important limitations:

1. WOM is only relevant when the buyer has a number of friends (acquaintances) who have had experience with the product class.
2. WOM is generally not quantitative. When you ask a friend or acquaintance about a specific product s/he owns, the reply is typically along the lines of “this product is great and works well” rather than “this product scores 5 on performance and 6 on style for an overall score of 5.5”.
3. WOM is not statistically reliable information. For example, even if the information collected is quantitative in nature, it is difficult to assess the reliability of a product based on one or two data points.

4. Most importantly, it is difficult to draw detailed comparisons among competing products through WOM. Most users only have experience with one or at most a few products in a given category; therefore comparisons need to be implied.

For these reasons, in markets that are geographically dispersed and fragmented, the impact of WOM is small in comparison to other sources of information.

This is not the case in online communities. Online communities have the potential to channel and format WOM information from multiple sources. We use the term “online community” to describe institutionalized Internet-based links between market participants who are geographically and socially diverse. It is only recently that these links became technically feasible due to broad penetration of high speed internet access (since the mid-to-late 1990s). Certainly, electronic communication between people who are geographically diverse has been possible for more than a century (through the telegraph, the telephone, the telex, fax, and since the 1980s, electronic bulletin boards). However, before the development of the web browser, online communication depended on the initiator of the communication having the address of the person to whom he or she wished to communicate. In contrast, forums, blogs and community posting boards visible through web browsers and search engines allow people to find and contact each other at will, based on common interests and *at minimal cost* in terms of time and money.

It is useful to highlight how online community information is largely immune from the shortcomings of traditional Word of Mouth information listed above.

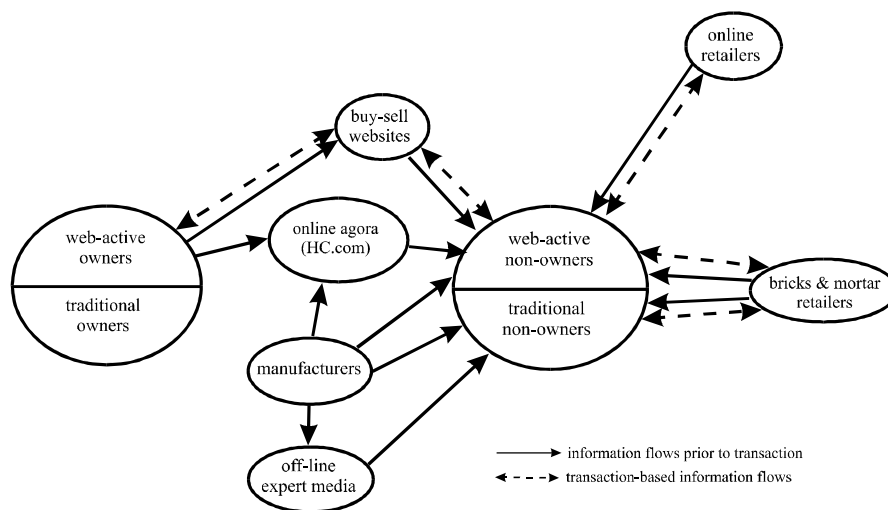
1. The online community by definition allows people to find each other who have similar interests (Hill, Provost and Volinsky 2006). As a result, for almost any product, a potential buyer can find others who have had experience with the product class, and often with specific models.
2. Online communities can create online systems that allow people to provide quantitative ratings on products. Moreover, online community information is statistically reliable because many users can provide rating information.
3. Because quantitative information is being collected, detailed comparisons between products are possible and insightful. Of course, all quantitative information collected through a survey technology is subject to errors, biases and limitations. Nevertheless, it is clearly less subject to errors, biases and

limitations than Word of Mouth information collected from one (or a few) friends.

Consequently, in a market where there is an active online community, the flow of information is richer and more diversified. In Figure 2, we propose a framework to map this flow of information. The framework represents a formalization of our observations gathered through discussions with industry participants, participation in online forums, and discussions with owners of various products.

**Figure 2**

**How non-owners gather information in a market with a web-enabled community\***



\* The chart focuses on primary flows of information and does not show secondary flows such as information sent by manufacturers to bricks and mortar retailers and offline WOM.

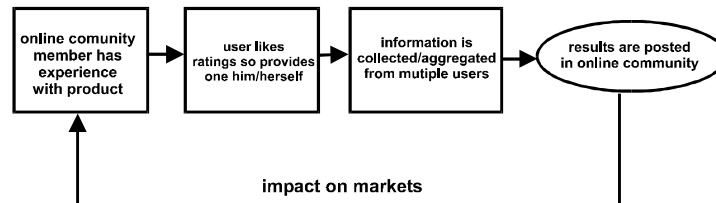
The distinction between “web-active” and “traditional” owners and non-owners in our diagram serves to underline the fact that in general, web-active individuals have access to more information, and to more sources of information, than individuals who do not enter the online agora.<sup>2</sup> This model implies that the online community allows for the creation, collection and dissemination of information that is relevant and impactful for exchanges between buyers and sellers *even when these transactions occur in the world of bricks and mortar*. We discuss this implication more fully below. The process by which information is collected and diffused within online agoras is illustrated in Figure 3.

<sup>2</sup> In our study, we analyze harmony-central.com, or “HC”, an online agora for amateur and professional musicians. The HC website also provides a comprehensive source of user ratings for musical equipment.



Figure 3

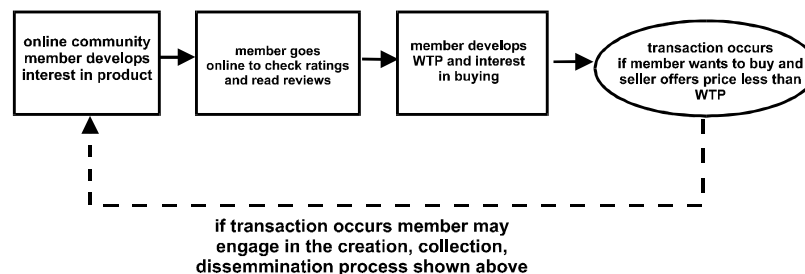
### The Creation, Collection and Dissemination of Information in Online Communities



We posit that the flows of information in Figures 2 and 3 affect the functioning of a market when the online community is relatively sophisticated. By “sophisticated”, we refer to expertise in terms of product features, quality, and price for value, as well as expressive capability. The collective knowledge of the online community is of little benefit to its members unless they are willing and able to share it. One of the most remarkable features of these communities is that a great deal of information is shared, even when sharing may affect the personal interests of a given member. (In particular, our model and data suggest that by alerting other members to the value of a particular product, a member increases the likelihood that he or she will pay a higher price for that item in the future.) We will consider possible reasons for this apparent selflessness in a later section.

A remaining question is, how does the information collected through online communities impact individual purchase decisions? In Figure 4, we provide an illustration of the process by which this information is likely to affect purchase decisions.

**Figure 4**  
**How Information Affects Market Transactions**



This model is based on interviews with people in an actual market (the North American electric guitar market) about their activity in the market both offline and online. The model represents the procedure followed by web-active guitar buyers when they wish to ascertain the value of a potential purchase, or are simply curious about a product they never encountered before. The procedure is common knowledge among community participants: in a recent exchange on the reverendguitars.com forum, one member advised another who was considering a brand of guitars to look at its user reviews on harmony-central.com. The second member replied, “I have spent an inordinate time on Harmony Central.”<sup>3</sup>

To sum up, the role previously played by individual WOM on purchase decisions may be superseded by the collective WOM of an online community when the online community offers the advantage of access to both diversified and quantitative information. In these situations, buyers become active seekers of product information and a major focus of the online community is to gather, codify, and diffuse that information. In the following section, we discuss how this activity might affect behavior in a real market.

### 1.3 Institutional Context: The Online Electric Guitar Market

Our objective is to examine the impact of the online world in a market where participants appear to be aware of and involved with an online agora. In particular, we require a setting a) that is geographically dispersed, where multiple manufacturers distribute through local retailers to end users and b) where a significant online community has developed.

<sup>3</sup> [http://reverendguitars.com/forum/forum\\_posts.asp?TID=3069&PN=1](http://reverendguitars.com/forum/forum_posts.asp?TID=3069&PN=1)

The setting we use to examine these issues is the North American market for electric guitars. This category generated approximately \$700 million in retail sales for 1.6 million units sold in the US in 2005, the latest year for which data are available. Electric guitar buyers also buy amplifiers (over \$400 million and 1.2 million units in 2005), accessories like electronic “signal processing” effects (\$222 million in 2005), and other equipment such as strings, recording software and microphones.<sup>4</sup> Brick and mortar dealers are the main outlets for this equipment. Physical stores range from small shops run by guitar enthusiasts to the cross-country Guitar Center chain which music trade insiders compare to Wal-Mart. In 2005, Guitar Center had 242 stores of up to 1800 square meters in size and was opening one to two new stores per month. That year, the top 15 music retailers had sales ranging from \$1.8 billion to \$30 million and accounted for total sales of \$3.1 billion, or nearly 40% of the total \$7.8 billion business.<sup>5</sup>

There is also a large market for used electric guitars. Daddy’s Junky Music, a chain of 21 stores specializing in second-hand instruments, sold over \$33 million of equipment in 2005, and on any given day an Ebay.com search turns up around 7500 used electric guitars, about half the total guitars on sale.

The world’s largest manufacturer of musical equipment, Japan’s Yamaha Corporation, reported sector sales of \$2.69 billion in 2006, but did not report separate figures for guitars. The dominant electric guitar manufacturers in the US, Fender and Gibson, are both privately-held and do not report sales. Each of these firms accounts for tens of thousands of instruments annually.

The diversity of models available to guitarists has exploded. As the self-defined “international music products association”, NAMM<sup>6</sup>, noted in its 2006 Global Report, “52 years ago, Fender offered two Stratocaster models [priced at \$229 and \$249]. Today, including Squier [Fender’s discount brand], Fender offers upwards of 75 variations on the ‘Strat’, ranging in price from \$129 to \$9500.”

Another driver of product diversity is a growing number of competitors. Since the 1990s, branded and OEM manufacturers from Japan, Korea, Mexico, Indonesia and

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<sup>4</sup> See NAMM, “2006 Music USA, NAMM Global Report”.

<sup>5</sup> Anon. “The Top 200”. The Music Trades, August 2006. This publication indicates a larger market for instruments than does NAMM, the industry trade association. Both indicate a US market for all musical instruments and gear of over \$7 billion.

<sup>6</sup> The original acronym stood for National Association of Music Merchandisers. This US organization has become increasingly international and no longer posts its original name anywhere on its website or publications.

China have significantly pushed down the price and pushed up the quality of entry- and intermediate-level (under \$1000) instruments.<sup>7</sup> The number of electric guitars sold in the US grew by 213% from 1996-2005, but the average unit price fell 46%, from around \$630 to \$350.<sup>8</sup> At present, it can be safely said that there are more than 20,000 different models of new and used electric guitars made by more than 1000 manufacturers that are currently bought and sold in the market.

Consumers are thus confronted with a wealth of choices, and with the opportunity to purchase increasingly well-made goods at steadily shrinking prices. Yet the relationship between the quality of electric guitars – that is, the reliability of the components, the ease of use and maintenance, the beauty of the finishes, and the richness of the sound -- and the prices that many consumers pay for them is weak. In other words, the pricing of instruments has been relatively inefficient, because there is a low correlation between pricing and quality. A number of firms (the “emperors”) have been able to charge premium prices for instruments that do not offer better quality of components, finish or sound than other, less costly products. This is largely because emotional factors have an important role in determining the products that customers purchase. Iconic guitars like the Fender Stratocaster and the Gibson Les Paul enjoy high prices as a function of their role in the history of popular music, and their use by such artists as Jimi Hendrix and Eric Clapton, though lower-priced models may offer equivalent quality. Of course, the vast majority of guitar products, regardless of their intrinsic value or quality as instruments, do not benefit from major celebrity endorsements. Nor do many manufacturers, especially smaller ones, enjoy sufficient resources to actively promote their products through online paid advertising or through print media, traditionally the primary source of product information (along with retailers) for guitarists.

#### **1.4 Harmony-central.com: The Online Agora of the Guitar World**

In the late 1990s, an online community of guitar players took shape. It included sites where players bought and sold instruments and traded performance and recording tips (such as The Gear Page), forums dedicated to specific manufacturers (like the Fender Discussion Page), and instructional newsgroups and sites (such as Wholenote). In

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<sup>7</sup> While China accounts for the largest share of guitar manufacturing, the quality of Korean and Japanese-built products is generally considered by consumers to be superior.

<sup>8</sup> Op. cit., “2006 Music USA”.

1998, a site called [harmony-central.com](http://harmony-central.com) (HC), which offered diverse content to musicians (from song transcriptions to manufacturer product announcements), began to collect, compile and post detailed user ratings on 21 categories of musical instruments, including guitars, bass guitars, keyboards, amplifiers, recording equipment, and electronic effects among others. The specific information solicited for these “user reviews” included (and still includes) details on a broad range of quality parameters, details about the reviewer’s experience, such as the length of time the reviewer has played, in which settings (professional or amateur performances, studio work, etc.) and other equipment the reviewer owns or has been able to compare firsthand.<sup>9</sup> Almost 1000 guitar makers are covered by user reviews. The number of reviews of specific models from a given manufacturer may vary from over 200 (for a firm like Fender) to one (for the French firm Fine Resophonic, which manufactures under 20 instruments per year for a discreet celebrity clientele). The number of reviewers per product may range from one to 453 (for Fender’s mid-priced Standard Stratocaster, a very popular model). Reviewers assign a score of 1 to 10 in various categories (features, sound quality, fit and finish, customer support, overall rating). Thus the reader of a HC review can judge both the instrument being rated, and also the capacity of an individual reviewer to rate fairly.

The impact of these reviews on guitar manufacturers seems to be important.<sup>10</sup> In a case study of Reverend Musical Instruments, a single review by a “musician’s musician” of a Reverend product at [harmonycentral.com](http://harmonycentral.com) had an immediate impact on sales of the model reviewed and played a crucial role in establishing the firm’s reputation. To give the flavor of a credible user rating, we provide a quote from the aforementioned review. Author Will Ray of the Hellecasters band concluded:

“I’ve owned probably 500 guitars over the years. (Wish I still had some of them). I also have my own signature model Fender guitar. I get a lot of instruments thrown at me every year by companies. I’m picky and hard to please. But I really like this guitar. It’s a keeper.”

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<sup>9</sup> See <http://reviews.harmony-central.com/>.

<sup>10</sup> We have identified similar rating systems in other markets, such as used cars and video cameras. The HC database is particularly interesting from a research standpoint because it has no real competition in terms of authority and comprehensiveness, and it is largely independent from manufacturer influence.

The movements of this review from the agora followed the movements shown in Figures 3 and 4 above. In essence, the review was treated like hot news by a non-official user network and it spread quickly beyond its initial posting. Reverend owner Joe Naylor told us, “People were linking to the review from the Fender Discussion Page. People were talking about it.” Another Harmony Central reviewer alluded to Ray’s influence, and how it fit with his personal search for innovative products: “Until I read some of these HC reviews, including Will Ray's, I didn't know anything about the guitar, where it was manufactured, etc..... My personal goal -- at this late date in my life -- is to get off the beaten path. I haven't found too many new ideas for [creating sound] with six strings, but this is one” (Hunter and Soberman 2007a).<sup>11</sup>

Further anecdotal evidence for the impact of HC abounds. Owners of small guitar manufacturing firms often intervene directly on HC to correct misleading or incorrect information about their products. Links to positive HC reviews are frequently posted by instrument sellers on eBay and online “flea market” sites like Craigslist, and forum members at different sites report spontaneously that they consult Harmony Central. Online music retailers (such as the industry leader, musiciansfriend.com, and its competitor music123.com) also allow instrument buyers to post reviews, but the latter are not nearly as detailed as those found on Harmony Central with regards to the instrument or the person submitting the review. Moreover, retail-sponsored reviews do not play a visible role on eBay, where they are rarely cited or linked. It seems that Harmony Central plays a unique role in the musical instrument market as the agora of the web-active musical community’s collective opinion concerning products.

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<sup>11</sup> This review and Ray’s original can be viewed at <http://reviews.harmony-central.com/reviews/Guitar/product/Reverend/SlingShot+Custom/50/1>.

### 1.5 Poisoning and Boosting: Key Threats to the Community's Credibility

An impediment to the impact of user-generated content on this or other online agoras is that it can be biased or poisoned for competitive advantage (Dellarocas 2006). When it is easy for a firm to post negative information about competitors or glowing information about its own products, the value of the information is reduced. As a result, it is important to assess the degree to which “poisoning” might be a problem on HC. The reliability of Harmony Central ratings is a function of two factors: 1) the motivation of sellers to poison or boost, and 2) the ability of sellers to poison or boost.

**The motivation** to poison or boost reflects the perspective of competitors in this market. Essentially, there are several very big firms like Yamaha, Fender and Gibson and hundreds of small businesses that manufacture guitars. For the most part, the motivation of small firms to poison the products of big companies is low. Because big companies have so many models, the vast majority of a large company's product line does not compete with the products of a small company. The motivation of small firms to poison the ratings of other small firms is also low, because competition amongst small firms in this market is largely atomistic (that is, they do not really compete with each other). Big firms do not perceive small firms as competitors; however, they do have an incentive to poison other big competitors. In sum, when a market is as fragmented as the electric guitar market, the only real motivation to “poison” exists between large firms. The motivation to boost certainly exists for most firms, but primarily for small firms since they cannot rely on advertising to the same extent as large firms.

**The ability** to poison or boost is another matter. It is important to recall that more than 20,000 different guitar models from almost 1000 manufacturers have been rated on Harmony Central. A large company like Fender might have ratings for more than 400 models. One popular model can have hundreds of ratings that are posted. Thus, the task of poisoning the ratings or boosting all ratings to a degree that would affect cumulative ratings for a given product (which are averaged according to the number of reviewers) is gargantuan if approached manually. Clearly, firms that want to poison or boost ratings would need to develop automated systems to generate and post false reports.

In this regard, there are a number of safeguards built into Harmony Central in order to prevent the automated poisoning or boosting of ratings. First, the rating pages

filled out by the user are screened by automatic robots (with skill testing questions, mathematical problems in words and visual identification tasks). Reviews submitted by an automated rating submission system are rejected by these robots. The second level of protection is a set of rules posted on the site that need to be followed in order to validate a rating. Examples of the rules are as follows:

- a. Raters are expected to provide comments in at least one field that go deeper than simply saying a product is good or bad. Reviews without detailed comments are not used.
- b. Superficial glowing or hostile reviews may not be published.
- c. Specifications for products must be included, so readers can see if the right product is being discussed.
- d. A unique e-mail address must be submitted for each review.

Moreover, Harmony Central has staff that reviews ratings before they are posted. It takes between 3 and 5 days before any submitted rating is added to the site, and only then are its numerical ratings tabulated and factored into the ratings that have already been posted on a given model. (In one instance unrelated to this study, one of the authors submitted a detailed but highly critical review of a particular product; it was not posted on HC until ten days had elapsed, an unusual delay.) Finally, manufacturers who are suspected of boosting or poisoning are banned from the community for a minimum of one year – a sanction that can have grave consequences, particularly for a small manufacturer who lacks other means of promotion.<sup>12</sup>

To conclude this discussion, the validity of online user ratings can indeed pose a problem. However, if the motivation for most industry players (small and large) to poison or boost is small, and the ability of users to poison or boost is limited by a series of electronic and manual procedures, then scores are less likely to be distorted. It is clear that HC is aware of this danger, and seeks to protect the credibility, influence and value of its ratings through such procedures.

## **1.6 Preview of Findings: Online User Ratings and the Market**

We initially wondered if HC reviews could have an impact on the sale prices of used instruments on the eBay internet auction site. We deduced that positive reviews would be associated with higher prices for specific used products. More specifically, our

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<sup>12</sup> HC states these rules on its review filing form at [http://reviews.harmony-central.com/user\\_reviews/form/Guitar/23222](http://reviews.harmony-central.com/user_reviews/form/Guitar/23222).



objective was to test the statistical significance of some of the hypothesized links shown in Figures 2, 3 and 4.

Our results show, first, that information exchanged and posted within the online community has a significant impact on prices that are observed in the online environment. In particular, the findings show that second-hand instruments that are highly rated by users within the community do enjoy superior pricing on the eBay. These effects are found at the brand-model level. In other words, the effect of the quality information applies to individual models of guitars within a brand-family.

Moreover, online community quality ratings appear to have a significant effect on street pricing (at brick and mortar music stores). These effects are found regardless of brand investments (advertising and endorsements) by the manufacturers. Specific models appear to enjoy a “HC premium”, or to suffer from a discount, based on their user ratings.

Finally, we also find that user ratings do not just have an impact on selling prices *but also on whether or not transactions occur* in the online environment. Specifically, relatively low ratings on HC Central for a given product, compared to competing similar products, reduce the likelihood of an eBay transaction occurring. This follows from the reasoning that there will be greater range in the expected quality of a poorly rated product. According to Akerlof (1970), the greater the variance in the expected quality of a product when the seller is informed about the product’s quality and the buyer is not, the higher the likelihood of market failure (or no exchanges occurring). If marketing can be effectively counteracted by Internet user reviews, quality or its lack becomes even more critical in purchase decisions.

## **2. Data collection and analysis**

### **2.1 Methodology**

We collected information on a representative sample of more than 100 different instruments that were on sale on eBay over an eight-week period starting in mid-February 2008 and ending in April 2008. Each model in the sample met the following criteria:

1. All models were manufactured in Korea, generally considered one of the best sources of imported quality guitars by US buyers. Purchasers of Korean-made instruments are often “value buyers”, who seek the intrinsic quality of a guitar

rather than simply purchasing a leading brand. Indeed, HC reviewers often justify purchases of off-brand models for this reason.

2. The retail prices for models selected are in the same range. Street prices were taken from new guitar prices at leading online retailers (including eBay “stores” selling new instruments). These prices reflect the prices at leading “brick and mortar retailers” who compete with online sources.
3. There are a minimum of three HC user reviews per model in the database.
4. The models chosen are widely available via eBay (new and used) and at brick and mortar retailers. Thus, at some point buyers can examine physical samples at traditional retailers if they wish to compare before buying online.

Through these criteria we have, in effect, “leveled” the differences between the instrument models, with the significant exception of advertising. The smaller manufacturers in our sample, such as Reverend Musical Instruments, engage in limited advertising for the models in our sample (for example, music show attendance and occasional endorsements by non-star musicians); others, such as Epiphone, can afford full-page color ads in popular guitar magazines and can point to star-level endorsers. Thus Harmony Central reviews have the potential to act as an “equalizer” among similarly priced products.

## 2.2 Key Hypotheses

Our analysis will endeavor to test the following hypotheses:

*H1: The relative difference between manufacturer list prices and street prices for brand/models depends primarily on the specific brand due to unique manufacturer-based discounts and differences in brand equity.*

Each manufacturer targets a specific retail price in the market for each model. This then determines the recommended discount from list prices needed such that retailers post prices that are consistent with the manufacturer’s objective. Due to a) the idiosyncratic nature of each manufacturer policy with regards to its distribution network and b) differences in brand equity, we hypothesize that the primary factor that affects the difference between manufacturer list prices and observed street prices is a manufacturer effect.

*H2: The HC Score will have a significant effect on the relative difference between manufacturer list prices and street pricing observed for each model of guitar after accounting for brand effects.*

In accord with the flow of information modeled in Figure 4, we hypothesize that “HC” ratings will have a significant effect on street pricing of new models (at brick and mortar and online music stores). In other words, the impact of “online community” quality ratings should make it more difficult to sell poorly performing new products at high prices. Conversely, quality products should enjoy a “HC premium” based on their user ratings. We will evaluate this hypothesis by examining how HC scores affect the relative difference between the manufacturer’s list price and observed street price after accounting for brand differences.

*H3: The HC Score for each model will have a significant effect on the percentage difference between the street price (the price for a new guitar) and the observed selling price for the model in the online auction environment.*

Consistent with the flow of information shown in Figure 2, we hypothesize that “HC” ratings will have a significant effect on used guitar pricing (on eBay). In other words, the impact of a weak “online community” quality rating is to make it significantly more difficult to sell a used product at a price that is close to the price for a new guitar.

*H4: The HC Score for each model will have a significant effect on the likelihood that a successful transaction for a listed guitar occurs.*

We hypothesize that the HC ratings will have an impact on selling prices and on whether or not transactions occur. Sellers on eBay typically set “reserve” or minimum prices for their goods. Thus low ratings on HC Central should reduce the likelihood of a transaction occurring. This follows from the idea that there will be greater range in the expected quality of a poorly rated product quality. In a market where the seller is informed about the product’s quality and the buyer is not, an increase in variance of expected quality will increase the likelihood of market failure (or no exchanges occurring).

### 2.3 Data Specifics

Each model in the dataset is identified by a brand and model. We denote the brand as  $b$  and the model as  $i$ . For each guitar  $bi$ , we collected a complete brand model description, the “overall” rating score from Harmony Central ( $HCS_{bi}$ ), the number of users who submitted ratings, the manufacturer list price ( $MSL_{bi}$ , which we collected from online retail sites) and the street price ( $SP_{bi}$ ). The street price for each model is the selling price on musiciansfriend.com; though lower or higher spot prices can be found in the marketplace, this site’s prices are closely linked to storefront retail prices of Guitar Center (which owns musiciansfriend.com). Guitar Center is the primary benchmark for the pricing of instruments in the bricks and mortar market.

Each guitar in the dataset was also the subject of at least one internet auction on eBay. Through the eBay tracking facility, we followed auctions for every guitar in the dataset and collected: the Buy it Now price ( $BIN_{bi}$ ), the initial bid ( $IB_{bi}$ ) and the Sale Price ( $SP_{bi}$ ).<sup>13</sup>

### 2.4 Results of the Analysis

Our first interest is to understand the factors that affect the relative difference between the manufacturer’s list price and the street price for each model. We therefore define a variable  $FN_{bi}$  as the percentage decrease in manufacturer’s selling price for product  $bi$  that is associated with the observed street price. To evaluate Hypotheses 1 and 2, we estimate the following linear regression:

$$FN_{bi} = \beta_0 + \beta_1 HCS_{bi} + \beta_2 Rev_{bi} + \beta_3 Dil_{bi} + \beta_4 Epi_{bi} + \beta_5 Prs_{bi} + \beta_6 Was_{bi} + \beta_7 Gnl_{ib} + \varepsilon_{bi} \quad (1)$$

The variables  $Rev_{bi}$ ,  $Dil_{bi}$ ,  $Epi_{bi}$ ,  $Prs_{bi}$ ,  $Was_{bi}$  and  $Gnl_{ib}$  are dummy variables to allow for brand specific effects for Reverend, Dillion, Epiphone, Paul Reed Smith, Washburn and G&L respectively (Ibanez is the base brand, so it does not have a dummy variable). The following are the results of the estimation. The model is based on 108 observations and the R-square and adjusted R-square for the estimation are 0.912 and 0.906 respectively.

<sup>13</sup> The column on eBay containing current bid shows the selling price once the auction is completed. If the auction does not result in a sale, then the column is blank (indicating no sale).

**Table 1**

<b>Parameter</b>	<b>Estimate</b>	<b>T-stat</b>	<b>Significance</b>
$\beta_0$	54.8692	7.9579	p < .01
$\beta_1$	-3.2875	-4.3717	p < .01
$\beta_2$	4.5289	4.0636	p < .01
$\beta_3$	15.1249	14.0449	p < .01
$\beta_4$	13.3766	11.5308	p < .01
$\beta_5$	0.2776	0.2553	n.s.
$\beta_6$	24.1633	18.3759	p < .01
$\beta_7$	8.1475	6.3228	p < .01

The independent variables included in the estimation explain more than 90% of the variance in the percentage difference between the manufacturer list price and the street price as evidenced by the high R-square values. Moreover, all of the variables except  $\beta_5$  are significant. (The insignificant coefficient for Paul Reed Smith simply means that the average reduction in manufacturer list price for Paul Reed Smith guitars,  $Prs_{bi}$ , is almost identical to those observed for the base brand, Ibanez).

Most importantly, we find that the effect of HCS on FN is highly significant. The negative sign implies that higher HC scores lead to lower percentage reductions from manufacturer list price. It is important to note that this variable captures significant variation in markdown that exists with the seven brands for different models. These results confirm both H1 and H2.

In order to evaluate Hypothesis 3, we examine the impact of HC Scores by model on the percentage reduction observed from the street price to the selling price that occurred on eBay for a used version of the same instrument.<sup>14</sup> Brand effects are not included in this estimation because brand equity is already reflected in the observed street price.<sup>15</sup> Note that the number of data points is reduced in this analysis because

<sup>14</sup> Auction information from Ebay has been used in a number of studies to understand the distribution of prices and potential bidders (see Adams 2007 for example). Our approach however, entails treating the eBay winning bid as a dependent variable.

<sup>15</sup> When brand effects are included in the model, the adjusted R-square is lower than for the model with HCS alone; moreover, all but one of the coefficients is insignificant.

34 of the 108 guitar auctions resulted in no trade. Here we define  $FU_{bi}$  are the percentage reduction in street price that is observed for the used product that is auctioned on eBay. To evaluate these effects, we estimate the following linear regression.

$$FU_{bi} = \beta_0 + \beta_1 HCS_{bi} + \varepsilon_{bi} \quad (2)$$

There were 76 data points in the estimation and the R Square and the Adjusted R Square were .491 and .437 respectively.

**Table 2**

Parameter	Estimate	T-stat	Significance
$\beta_0$	0.8719	3.1722	p<.01
$\beta_1$	-0.0633	-2.1189	p<.05

In this estimation, less variance of the dependent variable is explained. Nevertheless, the Harmony Central score has a significant effect on the percentage reduction in street price for products that are exchanged on eBay. This result confirms H3.

To evaluate H4, we estimate a binary logit to see if the likelihood of a product being exchanged after it is listed in an auction is affected by the corresponding score found on Harmony Central. For this we define a binary variable  $NS_{bi}$  which equals 1 if a product was sold and zero if it was not. Thus, we estimate the following model:

$$P_{NS} = \frac{\exp(\beta_0 + \beta_1 HCS_{bi} + \varepsilon_{bi})}{1 + \exp(\beta_0 + \beta_1 HCS_{bi} + \varepsilon_{bi})} \quad (3)$$

The error term  $\varepsilon_{bi}$  is assumed to be distributed according to the extreme value distribution (double exponential). There were 109 data points in the estimation. The following are the estimation results. With a logit estimation, the significance of the parameters is evaluated according to the Wald test.

**Table 3**

<b>Parameter</b>	<b>Estimate</b>	<b>S.E.</b>	<b>Wald</b>	<b>Sig.</b>
$\beta_0$	-7.545	3.967	3.618	.057
$\beta_1$	.913	.438	4.352	.037

Table 3 shows that HC Score coefficient is significant as a predictor of the probability of a sale occurring. That is, when HC Score is higher for a model listed in an auction, the likelihood of a sale occurring is higher. On the other hand, the naïve model (without HC Score included in the model) achieves a correct classification of 67.9%, whereas the model that includes HC Score achieves a correct classification of 66.1% (based on a cut value of 0.5).

Our findings suggest that HC Score does indeed have an effect on the likelihood that a seller and buyer find a mutually acceptable price to exchange a used electric guitar offered through Bay. On the other hand, perhaps because of a lack of data, the model does not result in improved prediction of whether a sale will occur. We believe that other factors such as the Buy It Now price and/or the Initial Bid may also have an effect on the likelihood of a sale occurring; however, limitations of our dataset prevent us from investigating those possibilities here. Accordingly, there is limited support for H4. We believe this is definitely an issue in need of further study.

### **3. Discussion**

The impact of the online music community on the marketplace for new and used instruments can be quantified. What cannot be quantified, at least within the framework of this study, is the basis for this impact. At the individual level, we argue that, the influence of the user-generated content in this agora is rooted in the richness of information that a given member provides and on the transparency of the member's relation to the information in terms of expertise and motivation. At the collective level, we believe that the influence of such agoras will continue to increase, for structural reasons. Finally, we will propose means by which organizations may increase their own influence in such agoras.

### **3.1 Sources of Information in Online Agoras**

In observing Harmony Central and the Reverend forum, we note that content-creating participants contributed information in at least three ways:

- a) They add new information, based on personal observation and objective data (such as technical specifications) from other sources, to begin or continue a discussion “thread”;
- b) They support, discount or critique existing information within a thread;
- c) They offer independent critical opinions (positive/negative).

Sources of information and products cited in user forums include: online retailers such as Musiciansfriend.com and music123.com, the mega-store retail chain Guitar Center, enthusiast websites, various guitar brand forums, print guitar magazines and their product reviews, friends who play and own instruments, or observations gleaned from watching videos (of artists and equipment demonstrations provided by guitar magazines or manufacturers or record companies or individuals) on youtube.com, and manufacturer product manuals.

The key point here is that while each of the actors in the agora generates content, a key function of the user community is to collect, collate, judge, and redistribute the information. In fact, the power of the user community lies in its ability to provide participants access to more valuable information than any other single source. In other words, people enter the agora because it is the best place to learn about something they care about.

### **3.2 The Influence of Expertise Among Agora Participants**

Participation of agora members is unequal in terms of frequency, and also in terms of influence. On the Reverend forum and others, contributors are ranked quantitatively by the number of their postings (at Reverend, ranks range from “newbie” to “senior members”). They are also ranked, implicitly, by other members of the forum, according to the value of their opinions. The value of a given opinion for other members appears directly related to a member’s expertise concerning particular aspects of musicianship and equipment. This information constitutes a “frame” through which participants view and consider the value of other participants’ contributions.

We note that contrary to the adolescent image of guitarists created by pop media such as MTV, and despite the fact that forum participation is highest among Internet



users aged 13-17 (Riegner 2007), the most influential members of the online guitar community appear to be considerably older. Dick Boak, then-director of artist relations for the leading acoustic guitar manufacturer C.F. Martin, was quoted in 1999 as saying that “40% of the 2 million active guitarists in the US are over 50.”<sup>16</sup> It is impossible to say what fraction of them participates in online communities. However, older musicians are clearly present among frequent content contributors on HC and in the Reverend forum. The users of brands like Reverend, whose HC reviews impact eBay and street prices, frequently state that they have been playing 40 years or more. This is significant in light of the fact that “opinion leaders in computer-mediated environments possess significantly higher levels of enduring involvement... exploratory behaviour and self-perceived knowledge than non-leaders” (Lyons and Henderson 2005). Older musicians have had more time to be involved and explore the field than younger ones, and they not infrequently remind younger participants in the agora of the greater knowledge they have thus accumulated.

Recall that when posting Harmony Central user reviews, contributors are asked to be explicit about their status as musicians (professional, part-time, hobbyist, etc.), how long they have been playing, and to list other equipment they own or have owned. Similar features have been adopted in summary form in buyer review templates provided by online retailers like musiciansfriend.com. On the Reverend forum and The Gear Page, members often refer questions to another member they think is an expert on the matter. In short, equipment buyers want to know the expertise of whoever is recommending instruments to them because that information influences the weight they give to a given opinion (Hovland et. al. 1953, Lyons and Henderson 2005). Influence seems related to the following aspects of expertise:

- 1) The professional experience of the member – in particular, the frequency with which they use their equipment before a live audience.
- 2) How well the member plays. On the Reverend forum this is shown by posting “clips” -- recordings of the member playing the guitar.
- 3) How much equipment the member owns; on the Reverend forum and The Gear Page, members frequently post pictures of their collections.

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<sup>16</sup> Hunter, Mark “Rock Around the Clock: Woodstock’s Children Strap on their Guitars”. *Modern Maturity*, Nov. –Dec. 2000.

- 4) Another vector of influence is whether or not the member has modified his or her own equipment, by changing electronic components or its appearance. Here again, photos are frequently posted.

Professional experience seems particularly influential. Most community members are amateur musicians, and they admire performing artists (as the above-cited impact of Will Ray's HC review on Reverend's fortunes demonstrates). On the Reverend forum a "newbie" member gained instant influence due to the obvious expertise he applied to guitars and amplifiers and the professional clips he posted of his working bands. In addition, this "newbie" member gained credibility as a result of his recent purchase of three different Reverend guitars. Members were delighted and excited that a skilled professional liked their brand well enough to buy it; this, of course, confirmed their own pride of ownership.

Access to this expertise is clearly an attraction for new participants. However, experts also like to encourage the engagement of new members (experts derive their prestige from the respect that other members accord to them). Experts are observed to personally counsel new members on product choices and advise them on how to maintain or modify their purchases.

### **3.3 Character as an Interpretative Frame in the Agora**

The character (visible traits of personality and preferences of opinion) of a contributor is also an important factor that affects the influence of that contributor on other community members, at least in forums where contributions are regular. Traits such as enthusiasm, seriousness or humor become part of a member's reputation, and are taken into account by others when interpreting posts. Members are also expected to argue for their preferences, and those preferences are swiftly known.

### **3.4 Transparency and Trust Within the Agora**

Member disclosures concerning their expertise and character provide a frame that enables other members to evaluate their contributions. So does selflessness (such as advising others to purchase a product that one also hopes to purchase, thereby raising its market value), which demonstrates that a given member can be trusted. However, self-interested motivations may also be tolerated on condition that they are rendered transparent. An example of this appeared in our case study of Reverend Musical Instruments. Company owner Joe Naylor told us that in the early days of his

company, he frequently offered counsel in the forums of other manufacturers, especially the Fender Discussion Page, where owners of his instruments began a subsection called The Reverend Congregation. Explained Naylor:

“It’s a PR move, obviously. If I can go in there and tell a guy what’s wrong with his guitar, he’ll like me. I still pop in from time to time to straighten them out. It’s my demographic – 40-50 years old, people who started out with classic rock. And I *like* posting.”

Elsewhere in the online agora, participants were neither naïve nor offended by Naylor’s behaviour. One Harmony Central reviewer very accurately analyzed that Naylor wanted to be seen as “fast friendly and concerned... because he wants the right things said about his product, which is only natural.” He then added: “Joe Naylor has a right to promote a lower priced product that competes with guitars that are more than twice the price.” In short, Naylor’s motivations were understood and accepted (Hunter and Soberman 2007a).

Transparency of motive is a recurrent concern for HC contributors, especially where suspicion of boosting may occur. Authors of glowing reviews often specify that they do not work for or profit from the company whose product they have lauded. Thus while participants do not insist that contributors adopt a position of neutrality toward the information they provide, they do expect that reasons for providing it will be implicitly or explicitly clear. It is worth noting that this approach corresponds to recent developments in journalism, where the “strategic ritual” of objectivity (Tuchman 1972) is increasingly being supplanted by explicitly assumed bias (for example, in the films of Michael Moore), and target audiences are shifting from the general public to specific communities (Beckett 2008 and Hunter 2008). Here too, the participant demands to know the frame within which information is delivered, the authority (or expertise) underlying the information, and the character of the individual that delivers it. In the context of our study, the outcome is trust, demonstrated by the fact that individuals rely and act on information from the agora in making purchase decisions.

### **3.6 The Dynamics of Community Growth and Influence**

We believe that in markets where online agora form, their scope and influence will expand over time, for the following reasons.

#### **Rationale 1**

The first is that web-active individuals have greater knowledge of the market and its offerings (not least because many online offerings are not visible offline) and have an advantage over non-active individuals, in terms of opportunistic buying, because they know more about which products are available and at which prices. They are also exposed to more products than non-active buyers. This, in turn, reinforces their expertise, and thus increases their stature within the community. In sum, web-active individuals become attractive role models and information sources for new or potential participants. This dynamic is implicit in Figures 2 and 3.

#### **Rationale 2**

The number of web-active individuals in the marketplace tends to grow, not only because online access is still growing, but because the advantages of entering the online agora are obvious to those who encounter it. From this perspective, the role and nature of WOM is changing. It serves not only to attract or advise information seekers concerning particular products, but to initiate them into online communities where a wider choice of information is available. This dynamic is also captured in Figures 2 and 3.

#### **Rationale 3**

Members protect their communities, and with it their influence. As shown above in our analysis of Harmony Central, a community can take formal steps to reduce the dangers of poisoning or boosting, and to preserve its credibility and attractiveness for members, via both formal and informal measures. Another way that individual members, too, seek to protect their agoras is through self-policing. In one case in which we participated, a new arrival to the Reverend forum half-jokingly accused other members of having joined a “cult”, because of their enthusiasm for the products. Appalled responses from some participants led to personal conflicts, and those conflicts were resolved when the new arrival left the forum (or at least, ceased posting). In another instance we observed, participants on the alt.fashion forum,

visited mainly by young women comparing their cosmetic purchases or “freebies”, questioned the motives of a new member who consistently attacked a particular brand. Once again, the result was that the new member left the forum, at least under that user name.

Thus on the one hand, members seek to expand their agoras through making them attractive and essential resources. On the other, they seek to exclude negative influences.

## **4. Conclusion**

### **4.0 Implications for Organizations**

Let us begin this section with an anecdote: In 1999 we called the research director of a major cosmetics firm to ask her opinion of the hundreds of user comments on her firm’s products that appeared on alt.fashion. She replied: “What is alt.fashion?” A near-decade has elapsed and we still encounter executives in different industries (from consumer electronics and automobiles to fresh foods) who are unaware of the influential opinions concerning their products that are emerging from online agoras. Large organizations may consider the impact of these agoras to be marginal; indeed, one extensive recent study found that “less than 1 in 10 purchases is influenced by online WOM” (Riegner 2007). But their market is nonetheless changing. New companies with limited resources but good products can both survive and prosper. This was the case for Reverend Musical Instruments, which was saved from failure by the existence of an online community that first shifted its purchases from a disintegrating dealer network to the manufacturer’s website, then actively supported the launch of a new product line and dealer network (Hunter and Soberman 2007a, 2007b, 2007c). It is worth noting that such cases support the postulate of Morse et. al. (2007) that “virtual embeddedness positively affects new venture survival,” notably by palliating the typical new venture’s “lack of extant trust relationships [and] lack of social capital.”

An increasingly influential vector of opinion and action is taking shape, and there are signs that it will have growing impact on product reputations for all firms. The impact of online opinion on the Corporate Social Responsibility reputation of firms is already well-established. Closer to our subject, a leading global toy firm, Lego, was

able to reverse the steady decline of its sales partly by engaging the relevant online agora in the development and promotion of new products.<sup>17</sup> (Reverend, too, used HC reviews to understand the needs and biases of users, in creating its successful new product line.) Conversely, the growth of web-active consumers in activities that were formerly the exclusive province of firms (such as marketing and development), coupled with their capacity to change loyalties and support new entrants, has led some observers to ask whether customers are “partners or competitors... in the generation of economic value” (Schultze et. al. 2007). At the very least, web-active consumers confer competitive advantage on firms that attract their approval and engagement.

#### 4.1 Effective Strategies to Capitalize on the Change

How can organizations, large or small, participate in this movement? Further research will be needed, beyond the best practice examples cited above, to conceptualize and validate such strategies. But several factors are already clear.

- 1) First, organizations *per se* cannot participate in an online agora. The medium is tailored to individuals and not organizations. Moreover, character and expertise are critical aspects required for an individual’s participation to have impact. Accordingly, the only possibility is for an organization to engage indirectly through individuals who have both the desire and the requisite expertise to participate.<sup>18</sup>
- 2) Further, organizations must be prepared to respond to information that falls far outside the criteria to which they have become accustomed through classic media relations work. While members of the online agora possess deep expertise in given areas, they may also express opinions or biases that might be considered defamatory or outrageous in media that conform to journalistic or merely polite conventions of discourse. Media professionals within organizations will find their previous experience useful, but hardly sufficient, in this world. They will not start from scratch, but they will have some things to learn, and they can only learn through online participation.
- 3) Most important, online communities accelerate the rate at which information pertaining to the performance and quality of products becomes broadly known.

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<sup>17</sup> For an insightful interview with a Lego employee who is a member of this community, see

<http://redcouch.typepad.com/weblog/2008/06/1-what-years-we.html> .

<sup>18</sup> Ibid.

This implies that firms who consider the option of “winging it” for a year or two with sub-standard products can no longer regard it as a viable strategy. Moreover, any individual model offered by a company can have an adverse effect a firm’s reputation due to the reach, credibility and persistence associated with online ratings.

Harmony Central demonstrates that when a credible online agora exists, quality is king and “the emperor has no clothes”. Harmony Central may be a unique agora in the sense that it offers unmatched resources to purchasers of musical equipment. But it is not unique in the online world. Virtually every industry offering products to a large consumer base has a number of online agoras that may influence purchase decisions. Eventually, some of these agoras will acquire the scope and credibility needed to impact their markets in a manner analogous to Harmony Central’s effect on the market for electric guitars. Dealing with those agoras will be a necessity for any manufacturer whose products attracts the interest of agora participants. But the agoras can only be effectively engaged by manufacturers through expert, transparent and committed participation by individuals who believe in the mission and quality of their organization and its products.

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