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# Empirical study on Communities of Practice and E-commerce: influence of community of practice on pricing on eBay

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## ABSTRACT

Virtual communities as well as e-commerce have gained on importance in people daily life. The percentage of e-commerce sales in US retails has increase from 0.8 percent in 1<sup>st</sup> quarter of 2000 to 2.2 percent of total retail sales in 1<sup>st</sup> quarter of 2005. Most notably, eBay has become the largest person-to-person online market. At the same time increasing number of people, based on their shared interests, participate voluntarily in various virtual communities of practice. However, empirical studies regarding influences of those COPs toward e-commerce are still rare. For this reason, the purpose of our study is to find out how COP could influence e-commerce. We particularly look at empirical evidence of COP's influence on pricing on eBay. At the end we discuss how COPs could be helpful for those who involve in e-commerce.

## Keywords

Communities of practice, online community, electronic commerce, eBay, online pricing.

## INTRODUCTION

With the growth of the Internet, virtual communities have become part of our everyday life. The Internet becomes the easiest place to find information and to connect with others. Space is no longer the limiting factor in choosing which community to join. It's easy to find people sharing the same interest around the world. Furthermore, through the Internet people can find companionship, social support and a sense of belonging (Wellman and Gulia, 1996). Around 84% of Internet users in the US has come in touch in some form with a virtual community (Horrigan, 2001). Communities of practice (COP) are one type of those existing online communities.

The Internet has also opened new opportunity of conducting commerce, since it eliminated the limitation to reach a broader market and it created a new way of delivering services or products. A local player now can become a global supplier, reaching customers in other countries or other part of the world. Still, some goods are more appropriate for e-commerce than others. And some laws of traditional commerce still apply to e-commerce.

There are various studies linking virtual communities and e-commerce. Boyd (2002) argues that eBay is in fact a (virtual) community and it helps to provide a foundation to form trust between users. Other studies point out how companies could gain more information about customers through virtual communities (Schubert and Koch, 2002). However, empirical study showing significant relationships of online communities, especially COP, and e-commerce is still lacking.

Therefore, in this paper we bring empirical evidence of that relationship by showing how online COP could influence pricing in e-commerce. We also discuss on how COP helps in educating consumers. The data was collected through case study by observing one online COP and one particular product on eBay. The remainder of the paper develops the theoretical background of the study, describes the method, presents the results, and provides a discussion of implications of the results as well as avenues for future research

## CONCEPTUAL BACKGROUND

### Communities of practice

There are various types of virtual communities exist on the Internet. Hummel and Lechner (2002) differentiate five types of communities based on the business perspectives (Table 1):

Community type	Description
Gaming	offering an artificial environment for online gamers
Communities of Interest	enabling people sharing a common interest to meet and discuss
Business-to-Business	providing a forum for business people to meet and carry business transactions
Business-to-Consumer	offering a place for consumers to educate themselves before making a purchase
Consumer-to-Consumer	helping individuals exchange or trade goods without involvement of commercial intermediaries

**Table 1. Five types of communities from business perspectives**

With the new generation of game consoles, users can be part of gaming communities without the requirement of PC access (Bryce & Rutter, 2003).

Another type of communities, which is gaining on popularity in the corporate world a long with knowledge management initiative, is communities of practice (Hildreth, Kimble, & Wright, 2000). Fischer (2001) argues that communities of practice are part of a community of interest, since community of interest brings together stakeholders of different COPs to work on a particular problem. While a COP works on a specific domain, a community of interest will need expertise of different practitioners from various domains.

Wenger and Snyder (2000) define a COP as groups of people who are informally bound together by shared expertise and a passion for joint enterprise. Based on this definition, a COP doesn't have to be within an organization, but it can exist as an independent online community. The Internet lowers the barriers to form this type of communities, since finding those who shared expertise and a passion is no longer limited by space and time. Learning in COP, according to Wenger (1998), has four main characteristics: (1) it takes place in *practice*; (2) it happens as being a *member of a community*; (3) it becomes *meaningful* since it's a part of experience; and (4) it helps in developing *identity*.

### E-commerce

The growing popularity of the Internet has not only enticed people to create online communities, but it also has drawn businesses to go online. In this paper, e-commerce is defined as commercial transactions that are performed partly or entirely through the Internet. The Internet has reduced, if not eliminated, several constraints found in traditional business, e.g., the constraint of distance and the search cost (Steinfeld and Whitten, 1999).

One of the most popular types of e-commerce is an online auction, where an item will be sold to the highest bidder. And the most popular site for online auction is eBay. eBay is one of the shining stars in online business. Started in 1995, e-Bay has become the major player in person-to-person online business. In recent years, this company has acquired several online businesses to consolidate its position as leader in its field. The online payment service, Paypal, was acquired for \$1.5B in 2002, since most of the eBay transactions were paid via Paypal. Other significant acquisitions include Half.com, a site for listing 2<sup>nd</sup> hand items, in 2000, Shopping.com, an online comparison site, in 2005, and Skype, a VoIP provider, also in 2005. At the same time, eBay expanded its presence to other parts of the world, mainly through acquiring existing local online auction companies or e-commerce companies in different countries, such as Netherlands, South Korea, China and India. The uniqueness of eBay is that it empowers anybody to start her own business immediately and to reach global audience instantly. At the same time, it increases the risks of fraudulent activities either from buyers or sellers. Those activities include misrepresenting an item by seller; not sending an item after receiving payment, paying an item with fake money orders or false credit card. Furthermore, spoof emails claiming to be sent by eBay have become increasingly popular to gain other people identities or passwords. A report indicated that in the year 2005 fraudsters would take up to \$2.8 Billion out of e-commerce (CyberSource, 2005).

Many researches related to e-commerce, especially about eBay, have been done. Those researches include reputation (Dellarocas, 2001; Resnick, Zeckhauser, Friedman and Kuwabara, 2000), price shilling (Kauffman and Wood, 2003), price and feedbacks (Lee, Im and Lee, 2000; Standifird, 2001). Other studies are dealing with specific features available on eBay, such as Buy-it-now (Standifird, Roelofs and Durham, 2004) or dispute resolution (Katsh, Rifkin and Gaitenby, 2000).

**Hypothesis**

To show a significant relationship between online COP and e-commerce, i.e., eBay, we argue that an event, such as posting, in a COP would have a significant impact on eBay. One of the obvious impacts would be on prices. Therefore, we state the following hypothesis:

*H1: a posting about a product in a COP would change the price of that product on eBay significantly*

Since some products could experience price decline in short period of time, we should make sure that the price change doesn't come mainly from price decline of the product. Therefore, we should also test whether the price of the product stays unchanged after the posting for a long period of time (in our case: four weeks). The second hypothesis we need to test:

*H2: after the posting, the price of the product on eBay won't change for a long period of time (four weeks)*

**METHOD**

A quite popular online community (pseudo name: HOTDEALS) was observed. This community can be classified as COP since it meets four learning characteristics as defined by Wenger (1998). The following Table 2 shows those characteristics:

Characteristics	HOTDEALS community
(1) learning takes place in practice;	Members learn and practice how to get a good deal of a merchandise, and report their success or failure to the community
(2) learning happens as being a member of a community;	Only registered members can have the full access to this site and take advantage of all features.
(3) learning becomes meaningful since it's a part of experience;	Members learn and practice what they just learn from this community almost instantly. This makes their learn experience more meaningful to them.
(4) learning helps in developing identity.	Members develop their identities in this learning. Some members become advanced and are well known for particular expertise.

**Table 2. Characteristics of HOTDEALS community according to Wenger (1998)**

The data was collected by looking at particular post about certain deals. The time when this deal was posted was recorded, as well as the number of replies and lurkers after certain period of time.

Next, we collected the sample data from eBay for the same product posted in the HOTDEALS community. In this initial study we collected data for two different products as posted on the community. The first product was an EPSON all-in-one printer. For this product, we observed its selling prices in three different time frames: (i) before the deal was posted (those listings that ended between 1/7/06 and 1/21/06); (ii) immediately after the deal was posted (those listings that ended between 1/27/06 and 1/31/06); and (iii) three weeks after the deal was posted (those listings that ended between 2/14/06 and 2/18/06). We chose deliberately the starting point of the first time frame, January 7<sup>th</sup>, in order to minimize the effect of Christmas shopping period that could have a significant impact on prices. The third time frame, i.e., three weeks after the posting, is important in order to exclude price fall in technology as the source of price change. If the price changes on eBay are due to rapid price fall of the technology, then the differences of mean prices in those three time frames should be significant. Otherwise, that factor is not the main source for price change on eBay. We also recorded how the items were represented by sellers, sellers' reputations, initial prices, shipping costs, bonus, and number of bidders. An analysis of variance (ANOVA) is performed to see whether there is a significant difference in eBay prices for those three time frames. If the ANOVA shows price differences as significant, a Fishers LSD is performed to compare each of the time frames. The second product was a 19" LCD Monitor from ACER. Its selling prices in two time frames were recorded: (i) before the deal was posted (those listings that ended before 4/20/06); and (ii) immediately after the deal was posted (those listings that ended between 4/23/06 and 4/30/06). Unfortunately, we couldn't collect the data for the third time frame, since the posting was relative new.

**DATA ANALYSIS**

The initial information about the first product was posted on January 21<sup>st</sup>, 2006 at 9:42 PM on HOTDEALS community. The posting was about All-in-One printer from EPSON. The original poster told the community how to get this product for \$30, sold elsewhere for \$299. The following Table 3 shows the mean of total end prices of the product on eBay, including the shipping cost, for those three time frames:

	Numbers of items	Mean total price	Standard Deviation
Before posting	10	\$218.56	19.10
Immediately after posting	25	\$147.45	15.68
Three weeks after posting	17	\$154.82	16.97

**Table 3. The mean total prices for printer in the three time frame**

The analysis of variance shows a p-value closed to zero, which is definitely significant at  $\alpha=.001$ . Therefore the average prices in those three periods are not the same. Pairwise comparison among means using FISHER'S LSD procedure delivers the following results:

		Mean difference	p-value
Before posting	Immediately after	\$71.10	.000
Before posting	Three weeks after	\$63.74	.000
Three weeks after	Immediately after	\$7.37	.169

**Table 4. FISHER'S LSD analysis**

It shows that the mean prices between before posting and after posting (either immediately after or three weeks after) are significantly different at  $\alpha=.05$ . Therefore, our first hypothesis (H1) is supported by this finding. On the other hand, the mean prices are not significantly different (p-value = .169) for those two periods after the posting at  $\alpha=.05$ . Once again, this finding supports our second hypothesis (H2). Figure 1 below shows total end prices of the first product sold on eBay during the observed period:

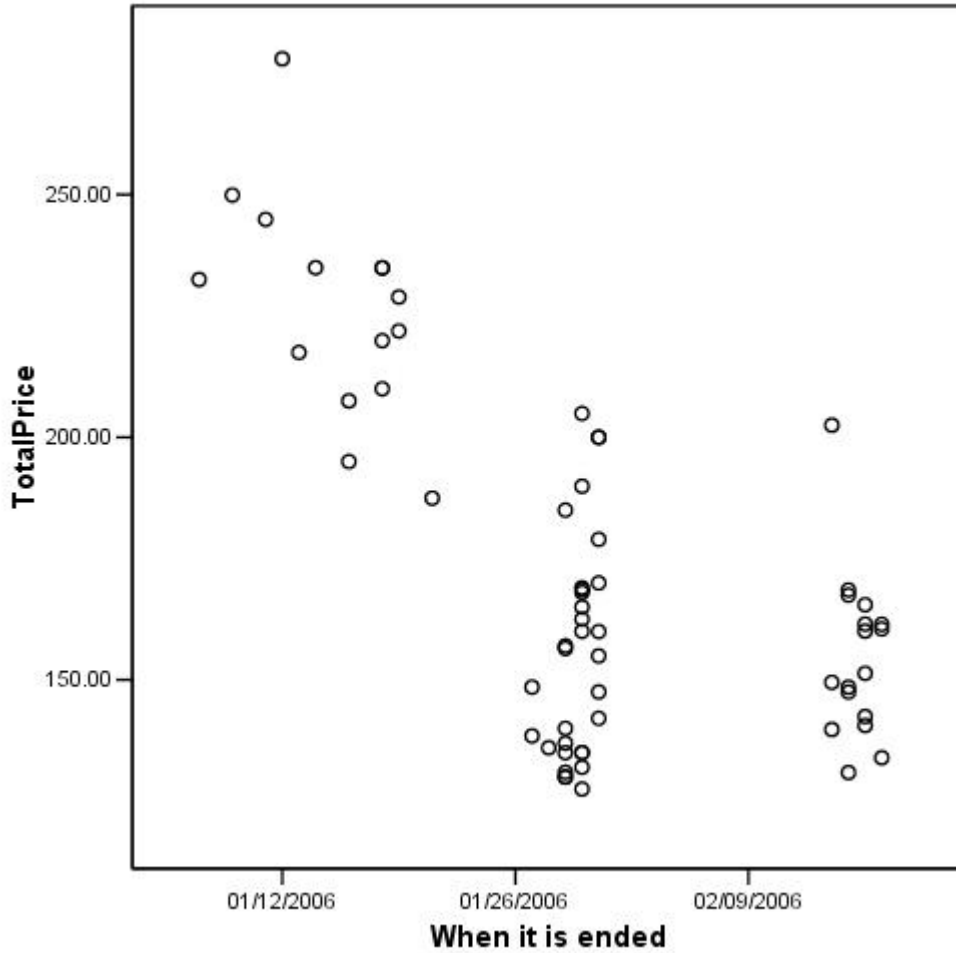


Figure 1. Total end prices in US\$ of the items sold on eBay during the study period

The second observed product was a 19” LCD Monitor from ACER. The information about this product was posted on the forum on April 20<sup>th</sup> at 2:49 pm, telling the audience that starting 4/23/06 they could get this monitor for \$149 or lower. The lower prices were depending whether they had the correct coupons that could be applied to bring the price down. The current selling prices of this product at well-known online retail stores were \$215 or more. The following table shows the mean of total end prices of the product on eBay, including the shipping cost, for those two time frames, i.e., before the posting and after the posting:

	Numbers of items	Mean total price	Standard Deviation
Before posting	9	\$260.85	0
Immediately after posting	25	\$230.38	2.87

Table 5. The mean total prices for LCD Monitor in the two time frame

A t-test shows a p-value closed to zero, which is definitely significant at  $\alpha=.001$ . For this reason, the average prices in those two periods are not the same. There is a significant difference between prices of the product before the posting and the prices after the posting. As with the first product, this result supports our first hypothesis (H1). However, we haven’t established the

support for the second hypothesis (H2) through this particular product due to time constraint. The following figure 2 shows total end prices of the second product sold on eBay during the observed period:

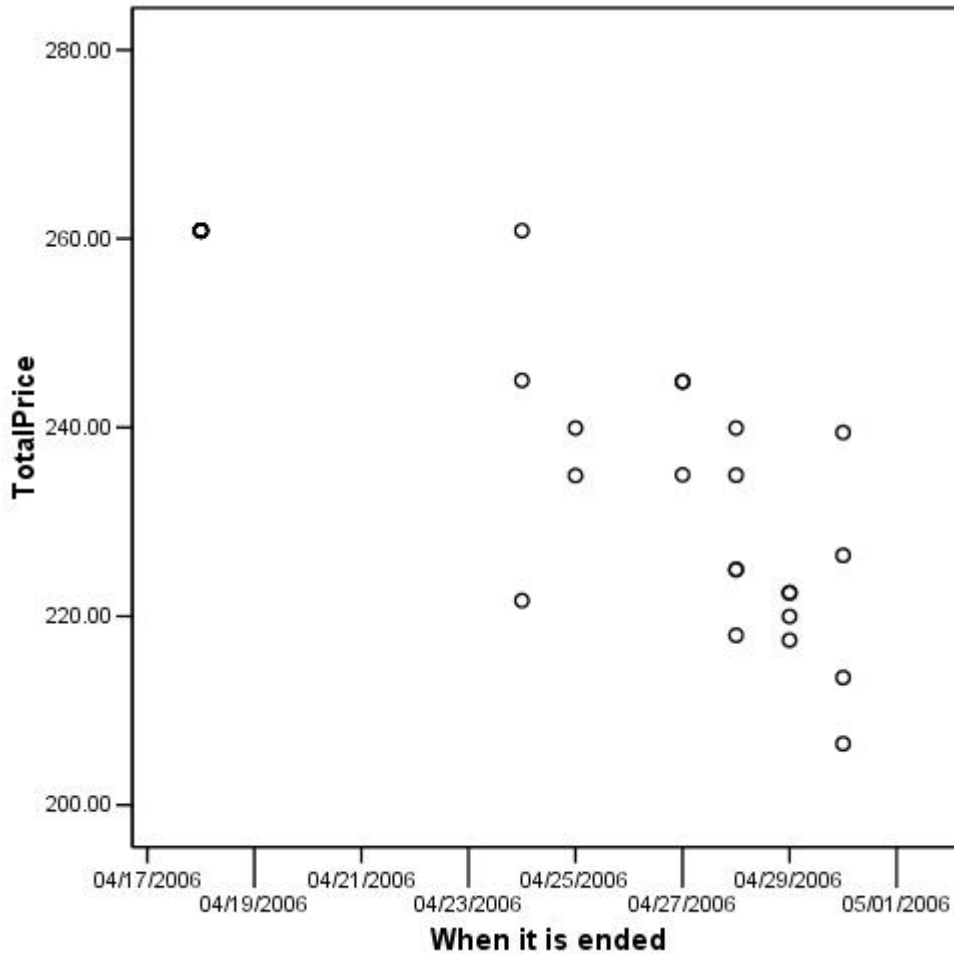


Figure 2. Total end prices in US\$ of the items sold on eBay during the study period

**DISCUSSION**

The preliminary data showed that the posting on the HOTDEALS community has a significant influence on the pricing of a particular product online, i.e., on eBay. This COP has attracted a great numbers of Internet users. For the first product, within 12 hours of the original posting, 372 replies and more than 7,000 viewers were recorded. The replies are ranging from suggestions, reports of success or failure to get the deal, and discussions of compatibility of this product to certain computer operating systems. The second product recorded a fewer number of replies, i.e., 156 within 24 hours of the original posting. One explanation for these fewer replies is that the saving for LCD monitor was not as high as saving for the All-in-One Printer.

We found a significant impact of a posting on this COP toward the selling prices on eBay. The average selling prices of the observed items dropped significantly after the deal was posted on the COP. The original posters detailed the practice a member needs to do to get this incredible deal. The practice includes: (i) finding and applying coupons to bring the prices down; and (ii) eventually getting the mail-in rebate form, which was not listed on the merchant website. Furthermore, for the printer, the poster also provided a link to another site where member can do a price comparison. Posters under the same threads suggested additional practices that could potentially lower the prices even more. Those practices include: (i) applying for reward program from the merchant to get additional cash back; (ii) writing a review on a Business-to-Consumer website about the product to get additional reward; and (iii) taking advantage of ‘price match’ policy of other merchants. Some posters detailed the steps needed to get this ‘price match’ to work.

Although, as some posters mentioned, that merchant already set the price of the product for several days, probably only handful of people were aware of this excellent price until somebody posted it on the community. Again, only few people was aware about the existence of mail-in rebate for the printer, before it was posted on the community. All these show that a COP can plays a significant role in e-commerce, including for:

- (i) raising awareness;
- (ii) educating users about a product
- (iii) advising buyers in dealing with merchants
- (iv) learning of others success or failure.

Merchants could also take benefit of this type of COP. Besides using this COP as place for advertisement, they can also use this community for:

- (i) getting feedback from consumers
- (ii) learning consumers behaviors
- (iii) building consumer relationship
- (iv) learning what their competitors are doing via members' postings
- (v) placing information about their discontinued merchandises to get ride of their inventory more quickly.

Still, some merchants are less friendly toward this COP. Several COP members reported how they were treated badly or even harassed by merchants' employees for practicing some of advices given in the community, although those practices were legitimate. Those bad experiences would surely be spread among COP members and other online communities, which in turn could form a negative attitude toward that particular merchant. This would potentially give a bad name and image for that merchant.

## CONCLUSION

Our initial study has showed that COP has significant relationship to e-commerce. For this reason, online merchants or retailers should consider online COPs as partners and information resources, instead of ignoring them or even mistrust them. For e-commerce practitioners, a well functioning COP could help in educating customers and makes them more confident in doing an online transaction. For marketing researchers, the same COP could help them in understanding consumer behavior.

This study has some limitations, including: (i) observing only one particular community; (ii) considering only two products or items instead of several products; and (iii) using only eBay as an example of e-commerce business instead of considering additional online retailers. Therefore, in our future study, we will observe additional communities that serve similar purpose, and look at a larger number of products. Furthermore, we are planning to include additional online retailers, such as Amazon.com and Yahoo! Auction to see whether similar relationship exists. Since in this initial study our data collection was done manually, we are considering writing a program that can help us with future data collection process. Automatization of data collection process can help us in speeding up the analysis of a larger number of products, and in establishing the generalization of the observed relationship.

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