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The Impact of Electronic-Word-of-Mouth on Digital Microproducts: An Empirical Investigation of Amazon Shorts

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THE IMPACT OF ELECTRONIC-WORD-OF-MOUTH ON DIGITAL MICROPRODUCTS: AN EMPIRICAL INVESTIGATION OF AMAZON SHORTS

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Abstract

This research seeks to assess the impact of electronic Word-of-Mouth (eWOM) on sales performance of digital goods. Digital microproducts – such as Amazon.com's 49-cent short books, or Apple's 99-cent songs – are digital goods that can be sold anywhere, at any time, at a low acquisition cost and no delivery costs via Web-based electronic commerce. Set at a fixed and low price, it is expected that price elasticity no longer plays a dominant role in the purchasing decision. This research empirically measures the impact of electronic word-of-mouth, as measured by product ratings, brand ratings and ratings of complementary goods, on the microproduct buying decision. To this end, we have developed a demand model based on electronic word-of-mouth for digital microproducts. We conducted an empirical study using 551 "Shorts" from Amazon.com. Shorts are condensed versions of books in PDF formats for a fixed price of 49 cents. We tested and validated our proposed demand model. Our findings suggest that book ratings by readers – as a measure of electronic word-of-mouth – are not a good predictor of book sales. On the other hand, book sales are correlated to the number of reviews, the reputation of the brand (author), and the reputation of complementary goods. Finally, we present a number of theoretical and practical recommendations regarding the use of eWOM for online sales of digital microproducts.

Keywords: electronic word-of-mouth, eWOM, digital microproducts, online reputation, e-business.

1   INTRODUCTION

This research seeks to measure the impact of electronic word-of-mouth (hereafter, eWOM) on the sales of digital microproducts. Digital microproducts have gained in popularity in B2C e-commerce. As of February 2006, Apple's iTunes store had sold over a billion digital songs at 99 cents a piece, up from none in just over two years. The creation of a billion dollars in sales for a product with zero marginal cost (Varian, 2000) in an ultra-competitive environment signals the emergence of a truly remarkable business model.

Digital microproducts, being information goods, have three primary characteristics: they are experience goods, have a very low marginal cost of production, and are also public goods (Varian, 2001). Experience goods are defined as goods whose quality can only be determined after consumption (Nelson, 1970). For such experience goods, word-of-mouth is widely recognized in the literature as well as in B2C as a major source of information for consumers' purchasing decisions (Neelamegham & Jain, 1999; Reinstein & Snyder, 2005). Another feature of microproduct markets is the successful practice of selling goods at a single low price. Pricing at a low price seeks to reduce the

consumer's temptation to engage in piracy (Varian, 2005) while increasing sales. When the price is low and fixed, product quality is likely to play an even greater role in the purchasing decision.

As traditional price-driven micro-economic theory does not fully apply to these types of microproducts, we use eWOM as a key demand factor instead of price. eWOM is defined as a positive or negative statement made by customers (real or potential) about a product, which is made available to a multitude of people and organizations through the electronic medium of the Internet (Hennig-Thurau et al., 2004). While traditional or offline WOM is exchanged through oral communication in real time and a limited geographical space, e-WOM is propagated electronically over the internet with a disconnect in space and time (Weinberg & Davis, 2005). Word-of-mouth is articulated online in the form of reviews and ratings. Reviews consist of text that describes the good being evaluated, while ratings consist of a numerical score that evaluates the good. Ratings commonly range from a score of 0 to 5, although this varies across e-commerce websites.

Over the past few years, there has been an emerging body of literature on the impact of eWOM on sales. eWOM has become a major source of purchasing decisions for increasingly web-savvy consumers (Bounie et al., 2005; Chevalier & Mayzlin, 2003; Dellarocas et al., 2005; Duan et al., 2005; Godes & Mayzlin, 2004). Online environments are highly suitable for research on word-of-mouth, and prior research has found that WOM can be critical to the foundation of demand for a product (Eliashberg et al., 2005). The literature published to date has focused on experience goods such as books, movies and video games. No research has been found on eWOM and microproducts.

We are interested in the purchasing process of digital microproducts, and seek to understand why some seemingly similar digital microproducts are more successful than others. Specifically, we focus our research on the impact of eWOM – as measured by product ratings, brand ratings and ratings of complementary goods – on the microproduct buying decision. As shown in Table 1, the impact of WOM on sales can occur in four ways. We focus our research on the impact of eWOM on online sales and will restrict our study to such (first quadrant in Table 1).

	Online Sales	**Offline Sales**
eWOM	***Impact of eWOM on Online Sales***	Impact of eWOM on Offline Sales
Offline WOM	Impact of Offline WOM on Online Sales	Impact of Offline WOM on Offline Sales

Table 1: Interactions of WOM and Sales

The remainder of the paper is organized as follows. Section 2 reviews the literature on electronic word-of-mouth, and introduces the eWOM-based demand model. Section 3 details the empirical study. Section 4 reports the empirical results and Section 5 discusses our research findings. Section 6 concludes with recommendations based on our findings.

2   LITERATURE REVIEW

2.1   Impact of product reputation, signalled by eWOM, on product sales

While a steady research stream into the impact of eWOM on online sales has emerged in recent years, there are still many unanswered questions. Research has shown that consumers are motivated to read and write eWOM for decision making and social benefits, and this undoubtedly affects the purchasing decision (Hennig-Thurau & Walsh, 2003). However, very little is known as to how certain types of eWOM, such as online text reviews or numerical ratings, affect the purchasing decision, and by how much. Although the impact of online reviews and ratings on sales has been studied, the findings have not been conclusive. With regards to the impact of product ratings on sales, many of the published findings seem to be conflicting with one another. For example, some studies have found that the

product rating, also known as valence of eWOM, is able to significantly predict sales (Chevalier & Mayzlin, 2003), while others concluded that the product rating has no predictive powers (Duan et al., 2005; Liu, 2006). The volume of eWOM, however, has been consistently shown to be a reliable predictor of sales (Liu, 2006; Godes & Mayzlin, 2004; Duan et al., 2005). Furthermore, the impact of eWOM in the form of ratings and reviews, on digital microproducts has not been studied previously. We attempt to fill this gap in the literature by studying the impacts of the valence and volume of eWOM on sales of digital microproducts.

Hypothesis 1a: The average customer rating of a digital microproduct is correlated with sales of the digital microproduct.

Hypothesis 1b: The number of customer reviews for the digital microproduct is correlated with the sales of the digital microproduct.

2.2 Impact of brand reputation, signalled by eWOM, on product sales

A characteristic of eWOM research is its focus on eWOM as a signal of product reputation, thereby impacting product sales. Little attention has been paid to the impact of eWOM on brand reputation, although the impact of offline WOM on brand reputation has been studied (Richins, 1983; Bone, 1995; Laczniak et al., 2001). Research has shown that brand names signal higher quality to consumers (Chu & Chu, 1994; Kirmani & Rao, 2000). While choosing between competing brands, consumers are faced with uncertain product quality, and so rely on brand name, pricing, and retailer reputation to signal product quality (Kirmani & Rao, 2000; Dawar & Parker, 1994). Brand names can substitute for a consumer's personal information search on the Internet (Ward & Michael, 2000). Word-of-mouth has played an important role in consumers' perception of a particular brand name, with consumers who are especially pleased or displeased with a brand making their opinions known to other consumers through WOM communication, and also reacting by switching brands based on WOM (Richins, 1983). Although there have been many studies in the marketing literature that have clearly shown the impact of brand reputation on product sales (Dawar & Parker, 1994; Ward & Michael, 2000; Ward & Ostrom, 2003), including online product sales, no empirical studies have looked into the impact of brand reputation as signalled by eWOM, and its impact on online product sales – although survey-based studies have shown that eWOM does impact online brand trust (Ha, 2002).

Hypothesis 2: The brand rating will be correlated to sales of the digital microproduct

2.3 Impact of complementary goods reputation, signalled by eWOM, on product sales

Even less attention has been paid in academic research to the impact of the reputation of complementary goods on product sales. Studies have shown that bundling digital / information goods on the internet can be very profitable (Bakos & Brynjolfsson, 1999). It is now common a practice on electronic commerce websites for products to be bundled together, either tightly with the option to purchase multiple similar but non-identical items together for a discount, or loosely where similar but non-identical items are displayed alongside by a product recommendation system (Choi & Whinston, 1999). For example, Amazon.com lists products similar to the one being browsed, and often gives the consumer the option of buying multiple similar products in a bundle at a discounted price. Amazon has also started to offer free shipping on orders over $25, thus encouraging consumers bundle their purchases by buying multiple products in one online shopping session. Prior research has shown that consumers who consult online product recommendations are twice as likely to select these recommended products as compared to consumers who did not consult online product recommendations (Senecal & Nantel, 2004). e-WOM is sometimes considered to be a subset of online recommendation systems (Senecal & Nantel, 2004). Prior research in economics and marketing has

also shown that products can rent the reputation of other agents, in this case other products in the same bundle or pool (Andersson, 2002; Chu & Chu, 1994). However, no research has been conducted so far to study whether online reputations can be pooled or bundled together as well. Although conventional microeconomic theory would consider the recommended products as having both supplementary and complementary characteristics, in the context of reputation, the recommended products are complementary in that they lend their collective reputation to the product being evaluated for purchase.

Hypothesis 3: The rating of complementary goods will be correlated to the sales of the digital microproduct.

Based on the theoretical foundation discussed above, we derive an eWOM-based demand model for digital microproducts that incorporates the product's reputation, the brand reputation, and the reputation of complementary goods. Next, we conduct an empirical study to test the research model.
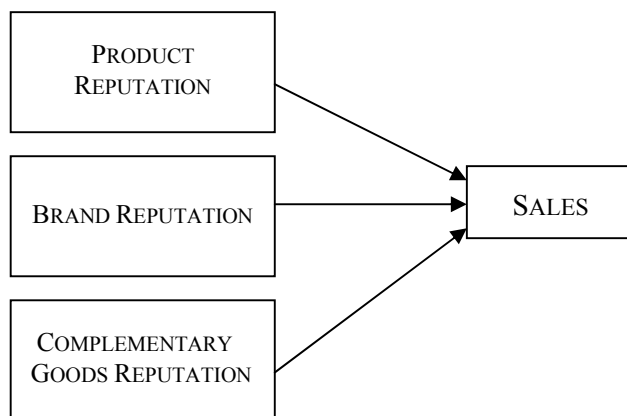

Figure 1: Modelling eWOM: A Demand Model for Digital Microproducts

3 AN EMPIRICAL STUDY: THE IMPACT OF E-WOM ON SALES OF AMAZON SHORTS

3.1 Amazon Shorts as Digital Microproducts

Amazon Shorts are e-books from Amazon.com which are available for download in PDF format. Each Amazon Short consists of a short story, help guide or other short literary work, hence the name "Shorts". Amazon made them available in August 2005, and Shorts are featured prominently on Amazon.com's website. Each Amazon Short is priced at a flat rate of 49 cents, which controls for the impact of price on preference between the Amazon Shorts (henceforth referred to as just "Shorts"). At launch, 65 Shorts were made available, with a steady stream of additions over the past 15 months. As of the end of September 2006, there were over 500 Shorts available for purchase. Since a Short is both a micro-commodity and micro-consumable, available in digital format at a low price, it is classified as a digital microproduct. The eWOM generated by consumers of Amazon Shorts can be considered to be typical eWOM since Amazon Shorts use the same platform for obtaining and displaying reviews as all other products sold on Amazon.com. Thus, findings on eWOM of Amazon Shorts can be generalized beyond a niche category of e-books to digital microproducts. The Amazon.com website provides abundant information for the purchasing decision: information about the Short, the author, similar products, customer reviews and ratings.

3.2   Research Model

Based on the general eWOM based demand model presented in the previous section, we derive a model specifically for Amazon Shorts (Figure 2).
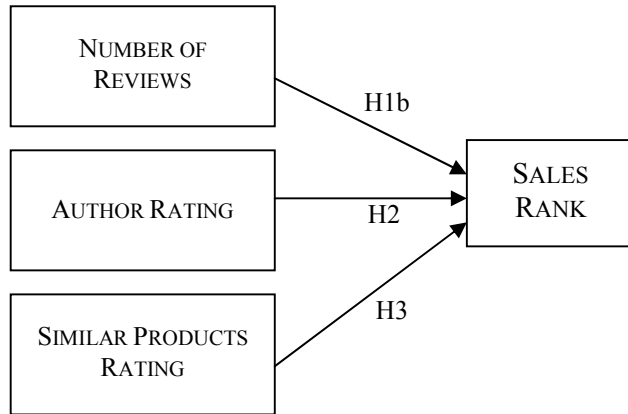

Figure 2: eWOM-based Demand Model for Amazon Shorts

3.2.1   Testing the eWOM Demand Model:

H1a: SALES RANK = α_1 + β_{1a}*AVERAGE CUSTOMER RATING + ε

H1b: SALES RANK = α_2 + β_{1b}* NUMBER OF REVIEWS + ε

H2a: SALES RANK = α_3 + β_{1c}*AUTHOR RATING + ε

H3:   SALES RANK = α_4 + β_{1d}* SIMILAR ITEMS RATING + ε

Demand Model: SALES RANK = α_5 + β_{1e}*NUMBER OF REVIEWS + β_2*AUTHOR RATING + β_3*SIMILAR ITEMS RATING + ε

Our model differs from all other models on eWOM in that, to our knowledge, ours appears to be the only one that specifically takes the reputation of the brand through its brand rating into account. Our research is also unique in that it is to date the only "real-world" study to take the impact of complementary goods provided by an online recommendation engine into account, although other researchers have conducted an experiment in this area (Senecal & Nantel, 2004). Furthermore, we are the first to introduce an integrated eWOM-based demand model for digital microproducts.

3.3   Measures

Validated Customer's Ratings as Product Rating

Amazon.com provides detailed customer reviews to help aid in the decision making process. Consumers are also encouraged to post online reviews, in the form of text, as well as a numerical rating from 1 to 5. An "Average Customer Rating" score is provided for all Shorts with reviews. This rating ranges from 1 to 5, and is the average of all customer ratings for that particular Short. We use both this rating as well as the number of reviews that make up the rating to measure product reputation. Amazon's "average customer rating" score has been validated as a measure in previous research on eWOM (Chevalier & Mayzlin, 2003).

Author Rating as Brand Rating

The brand reputation of a particular Short is the reputation of the author who wrote the e-book. However, Amazon.com does not provide a brand rating to measure the brand reputation of a product. In order to achieve this, we have developed an "Author Rating" score for each Amazon Short. For this research, we obtained a list of up to ten of the author's works, and then averaged out the "Average Customer Rating" for those works. We then presented this score as the "Author Rating" of a particular Short. The rationale is that if an author has several books that are highly rated, he has created himself or herself a name reputation. We focus on the average rating, and not the number of reviews per work.

Similar Products Rating as Complementary Goods Rating

For each Short on Amazon.com, a list of "Similar Products" is provided by the online recommendation system. These products are perceived by the recommendation system to be complementary to the one being evaluated, since previous customers who bought the Short also bought one or more of the recommended products. As with the Brand Rating, there is no direct measure made available by Amazon.com to measure the Complementary Goods Rating of a Short. To solve this problem, we developed a "Similar Products" rating for each Amazon Short, by averaging out the "Average Customer Rating" for each of the recommended products. We refer to this derived score as the "Average SP Rating" of a Short.

Sales Rank as Proxy for Sales

Amazon.com does not make the actual sales numbers for Amazon Shorts available. Instead, we use the Sales Rank of the Short, which is made available by Amazon.com, as a proxy for sales. The Sales Rank is inversely related to sales, i.e., the lower the Sales Rank, the higher the sales. This Sales Rank is available on request from the Amazon Web Service.

3.4   Data Collection

We collected the entire population of Shorts data from Amazon.com's website to validate our demand model for digital microproducts. Shorts have several attributes that are helpful to our research, which we now describe. First, these Shorts are available exclusively on Amazon.com for a minimum of six months. Thus the sales for a Short as represented by the Amazon Sales Rank, comprises the entire domain of sales of this digital microproduct. Second, since all Shorts are equally priced at 49 cents a piece, the impact of price on sales (quantity) is mitigated and channelled into quality perception. Third, the Shorts are available online as an instant digital download (e-book) which eliminates the impact of multiple media formats such as hardcover and paperback, and eliminates shipping delays and costs. Fourth, the very low pricing of 49 cents reduces the temptation to engage in digital piracy, since 49 cents is very close to the sum of the marginal cost of replication and the cost of transaction of pirating the Short, which is the theoretical threshold for piracy prevention (Varian, 2005).

We wrote a software agent in Java to automatically retrieve data on each Amazon Short daily by accessing the Amazon Web Service, which makes large parts of Amazon's data available to the public. As of September 30, 2006, we collected data on over 500 Shorts. The data collected include the average customer rating for that Short, the number of reviews posted, and the sales rank of the Shorts within the Amazon Shorts category as well as the overall Amazon Sales Rank of each Short. The software also calculates the average customer rating for similar products (average SP rating), and the average customer rating of other works by the same author (author rating). We have been collecting data daily for the past 15 months.

4 RESULTS

This section reports the results of our empirical study. The results of the linear regressions are reported in Table 4. Table 2 contains the summary statistics and Table 3 shows the correlation matrix for the variables in our study. The correlation between two variables, the Average Customer Rating and the Number of Reviews, was high at 0.57, implying that they measure the same effect to some extent. However, this high correlation is misleading since it can be explained by the fact that Shorts without reviews have a zero value for these variables, and thus bias the correlation. When only those Shorts with reviews are taken into account, the correlation drops considerably. For the entire population, 322 Shorts were reviewed, and 229 were not reviewed.

	SALES RANK	AVERAGE CUSTOMER RATING	NUMBER OF REVIEWS	AVERAGE SIMILAR PRODUCTS RATING	AUTHOR RATING
MINIMUM	5068	0	0	0	0
MAXIMUM	3622091	5	17	5	5
MEAN	1070461	2.70	1.38	2.46	2.64
SD	692895	5.52	4.14	4.14	1.84

Table 2: Summary statistics (N=551)

	SALES RANK	AVG CUSTOMER RATING	NUMBER OF REVIEWS	AVERAGE SP RATING	AUTHOR RATING
SALES RANK	1.00				
AVG CUSTOMER RATING	-0.23	1.00			
NUMBER OF REVIEWS	-0.32	0.57	1.00		
AVERAGE SP RATING	-0.43	0.49	0.39	1.00	
AUTHOR RATING	-0.26	0.45	0.29	0.37	1.00

Table 3: Correlation Matrix

INDEPENDENT VARIABLES	H1a	H1b	H2	H3	Full Model
CONSTANT	328036	1218481***	1425697***	1433280***	1551755***
AVERAGE CUSTOMER RATING	127065***				
NUMBER OF REVIEWS		-107598***			-54189***
AUTHOR RATING			-134807***		-46818***
AVERAGE SP RATING				-147543***	-115065***
N	322	551	551	551	551
F-ratio	7.49	60.89	40.99	127.02	51.71
R-square	0.023	0.100	0.069	0.188	0.221

Table 4: Regression Results (* $p<0.10$ ** $p<0.05$ *** $p<0.01$)

Hypothesis 1a: *The average rating of an Amazon Short will have a statistically significant correlation with sales.*

The regression results show support for Hypothesis 1b, although this is contrary to expectations. Here, an improvement in the average customer rating seems to actually decrease sales, although the constant is not statistically significant. Note that here, only those Amazon Shorts with reviews attached to them were included in the analysis (N=322). We attribute this finding to two reasons. The first is that the number of reviews was not taken into account here, and so most Shorts with a rating of 5 have just a single review, while those with a slightly lower rating, such as 4.5, have several reviews, which are more likely to influence customers (see H1b below). Second, there is very little variability in the average customer rating score. More than 68% of all reviews for Amazon Shorts have a rating of 5, while ratings between 4 and 5 account for nearly 25% of all reviews (see Figure 4). This indicates that

over 90% of all reviews are rated greater than 4, with only 10% of reviews being rated under 4. This lack of variability accounts for the insignificant predictive power of the average customer rating score.
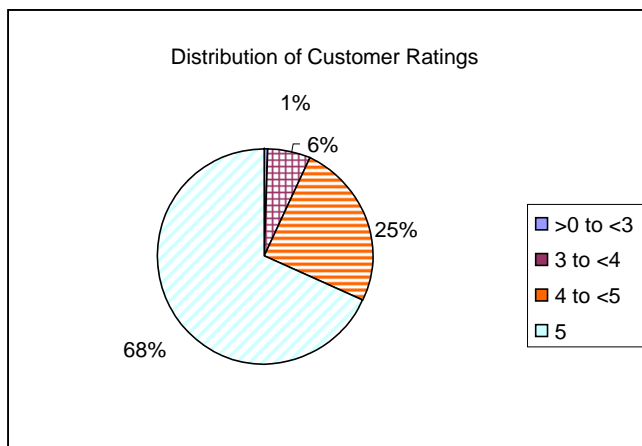

Figure 3: Distribution of Average Customer Ratings for Shorts

Hypothesis 1b: *The number of customer reviews for an Amazon Short is correlated with the sales of the Amazon Short*

The regression results show support for Hypothesis 1b, as there is a statistically significant relationship ($p<0.01$) between the number of customer reviews and the sales rank for Amazon Shorts. The total number of reviews posted for an Amazon Short can explain exactly 10% of the variance in the Sales Rank, which compares favourably to existing research on eWOM. (All Shorts were included in this analysis. N=551)

Hypothesis 2: *The author rating for the Short will be correlated to sales of the Amazon Short*

The regression results show that the relationship between the Author Rating and the Sales Rank is statistically significant ($p<0.01$). The Author Rating is able to explain nearly 7% of the variance in the Sales Rank. All Amazon Shorts were included in this data set.

Hypothesis 3: *The average customer rating of similar items recommended by the system taken together will be correlated to sales of the Amazon Short.*

The results of the regression show that there is indeed a significant correlation between the average customer ratings of similar products recommended by the online recommendation system ($p<0.01$), and the Sales Rank. The average SP rating score is the strongest predictor of demand, explaining over 18% of the variance in the Sales Rank. All Amazon Shorts were included in this data set.

eWOM-based Demand Model for Amazon Shorts: To test our demand model for Amazon Shorts, we ran a linear regression to estimate the impact of the product ratings (as measured by the number of reviews), author ratings and similar product ratings on the sales of Amazon Shorts.

SALES RANK = α + $\beta1$*NUMBER OF REVIEWS + $\beta2$*AUTHOR RATING + $\beta3$*SIMILAR ITEMS RATING + ε

The equation of the fitted model is: SALES RANK = 1551755 - 54189*NUMBER OF REVIEWS - 46818*AUTHOR RATING - 115065*AVERAGE SP RATING + ε

The demand model is statistical significant (p<0.01). The F-ratio of 51.71 is also quite high. The individual independent variables are also statistically significant, with p-values under 0.01 for all three independent variables. The model is able to explain over 22% of the variance in the Sales Rank. The standardized beta scores for Number of Reviews, Author Rating and Complementary Goods are -0.32, -0.12 and -0.69 respectively. This means that a one percent increase in the "Number of Reviews" reduces the Sales Rank by 0.32 percent, a one percent increase in the "Author Rating" scores reduce the Sales Rank by 0.12 percent, and a one percent increase in the "Similar Products Rating" score decreases the Sales Rank by 0.69 percent. Note that the constant implies that the absence of ratings of any kind for an Amazon Short will give it a Sales Rank of approximately one and a half million.
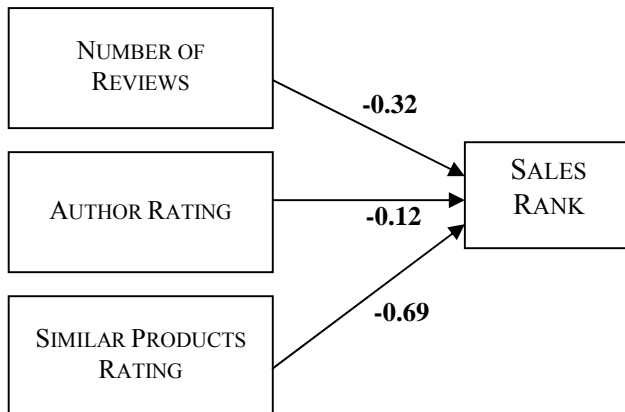

Figure 4: eWOM-based Demand Model with standardized estimated coefficients

5 DISCUSSION

All the hypotheses were supported by the data (See Table 5). The high value of the constant in all results suggests that without eWOM, sales are very poor - since a high constant for the Sales Rank implies low sales. It is clear from the results that eWOM does indeed play a significant role.

5.1   Impact of individual eWOM signals on sales

Product Rating through Customer Reviews

We find that the number of reviews posted for each digital microproduct can help predict its sales, although the average customer rating is not a reliable predictor. This confirms earlier work by other researchers that volume matters and is more important than the valence (Duan et al., 2005; Liu, 2006). We attribute the lack of predictive power of the valence (rating) to the fact that there is very little variability within the ratings, with almost all ratings having values of "five stars".

Author's Brand Value

We developed the "author rating" score in order to quantify the author's brand reputation. Amazon.com did not offer such a score or rating. The "author rating" is able to predict the sales of a digital microproduct, although not to the same extent as the number of reviews. The impact of the author rating has not been studied before, and we believe this finding to be a significant contribution to the existing body of research on eWOM.

The Reputation of Complementary Goods

The most intriguing findings come from our study of the impact of the reputation of complementary goods, on sales of digital microproducts. As with the "author rating" score, we developed a score for "similar products" to measure the reputation of complementary goods. We find that the reputation of complementary goods does indeed have an impact on sales of a digital microproduct. The degree of this impact is higher than the degree of impact of the author's reputation. Surprisingly, this score is the strongest predictor of the Sales Rank, implying that the pooling of reputations between complementary goods is quite strong.

5.2   eWOM based Demand Model

We developed an integrated eWOM based demand model, which has not been done before. Our demand model was able to explain over 22% of the variance in the Sales Rank, which compares very favourably to similar research on the impact of eWOM on sales. Zhang et al., (2004) presented a model to measure the impact of eWOM on box office sales, and their model was able to explain 9 percent of sales. Chevalier et al., (2003) presented an eWOM model that used the difference in the sales ranks of a book on Amazon.com and Barnes and Noble.com, and found that their model was able to explain 13.9% the variance in the difference between the sales ranks (non-reviewed books were included in their sample). However, our model is unique in several aspects. We were able to quantity the impact of brand-related eWOM on sales through the "author rating" score. We were also able to quantify the impact of eWOM of complementary goods on sales through the "average similar products rating" score. Finally ours is the first integrated eWOM-based demand model for digital microproducts.

HYPOTHESIS		FINDINGS
H1a	The average customer rating of a digital microproduct will be correlated with sales.	SUPPORTED
H1b	The number of customer reviews for the digital microproduct is correlated with the sales of the digital microproduct	SUPPORTED
H2a	The average customer ratings of the author's works will be correlated to sales of the digital microproduct	SUPPORTED
H3	The average customer rating of similar items recommended by the system taken together will be correlated to the sales of the digital microproduct.	SUPPORTED

Table 5: Summary of Findings

6   CONCLUSION: RECOMMENDATIONS & LIMITATIONS

This research proposes a demand model based on electronic word-of-mouth, and empirically measures the impact of electronic word-of-mouth, as measured by product ratings, brand ratings and ratings of complementary goods, on the microproduct buying decision. We conducted an empirical study using the entire population of "Shorts" from Amazon.com. Our findings suggest that book ratings by readers – as a measure of eWOM – are not a good predictor of book sales. Instead, book sales are correlated to the number of reviews, the reputation of the author, and the reputation of complementary goods. This research is thus original in its focus on microproducts and its demand model. There are a number of limitations to this research. First, reviews and ratings might not be accurate or truthful. Dellarocas (2004) argues, however, that in the long run, when enough reviews are posted, manipulation of eWOM can actually hurt firms. Another limitation is the causality of the demand model. Although there appears to have solid theoretical ground to argue that demand is a function of eWOM where price is low and fixed, we limited our study on prediction rather than on explanation. There is also the

possibility of more complex relationships between the independent variables in our study. We intend to address these issues in future research.

The findings in this paper lead us to make several recommendations. First, we recommend that e-commerce platform operators such as Amazon.com encourage customers to post reviews online, in line with our finding that the number of reviews is linked to increased sales. A financial incentive to those who purchased the digital microproduct in the form of a small credit on future sales could dramatically increase the number of reviews, leading to improved sales by boosting the consumer's confidence in the digital microproduct, which is an experience good.

Second, we propose a better scoring system than the current "1-to-5 stars" rating system, allowing for more variability. This could be achieved through multiple scores for writing style, content, ease of use for digital microproducts, etc. This multiple criteria evaluation method is often used for reviews on video-gaming websites. Alternatively, we suggest that a weighted-mean scoring system that takes the number of reviews into account be used, as opposed to the current method where all reviews are just averaged out to obtain an average customer rating. However, readers might find such a scoring system too cumbersome.

Third, we also recommend that platform operators such as Amazon.com develop a brand rating score such as the one we devised for the purpose of this study. This is more important when a customer rating does not as yet exist for the good in question. The lack of both product information through a customer review, and brand reputation through author rating could potentially lead to a loss of a sale, especially if the consumer's choice of good is narrowly focused. For digital microproducts other than e-books, such as music and video clips, the "author" can be replaced with artist, actors, or director, as is appropriate. Finally, we also recommend that platform operators such as Amazon.com develop a complementary goods score such as the one we devised for the purpose of this study (in the form of average SP rating). Since our findings show that this is the strongest predictor of demand, the prominent display of such a score is expected to lead to more effective decision making.

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