The Utilization of Web2.0 Functionalities on E-Commerce Web Sites

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Abstract—The advent of Web 2.0 has changed the way people utilize and interact with information. The dynamic and collaborative nature of Web2.0 has made it possible for both retailers and customers to engage in two-way communication and share valuable information about products and services offered online. Current studies have investigated users' utilization of the technology while neglecting the provider's part. This study is an attempt to integrates both the users and the providers and examines the utilization level of Web 2.0 technologies.

Retailers utilized Web 2.0 functions that help them improve their marketing strategies, increase traffic to their websites and improve their sales. Some of these functions include data gathering through personalization, product reviews and ratings. Users on the other hand preferred Web 2.0 functions that allow them to better assess product and service quality such as product reviews, ratings, referrals and recommendations that signal product quality and website reliability It is clear from the results that consumers seek knowledge about products and services through various signaling methods such as product reviews, ratings, and expert opinions. Although expert opinions shape purchasing behaviors, only 20% of surveyed retailers offer this functionality.

Index Terms—Consumers, Retailer, e-Commerce, Web 2.0, Knowledge transfer functions, Product review, Product rating, Discussion board, Customized display, Recommender system, Expert opinion, FAQs, and Online manuals

I. INTRODUCTION

Various knowledge-based functionalities such as personalized services, expert opinions and recommender systems, are made available on e-commerce websites to enable retailers and users to share information about products and services. Information and knowledge sharing capabilities on e-commerce websites are further strengthened by the advent of Web 2.0.

Web 2.0 has changed the mode of communication between retailers and customers. Instead of one-way communication where retailers push information to consumers but consumers cannot offer their opinion or input about product and services, it is now possible for consumers to participate in the information knowledge sharing activities and offer their experience to other users with regard to the quality of products and/or retailers' services. This capability empowers consumers to exert purchasing determinations over other consumers [20]. Unlike the brick and mortar model, products and services available on the e-commerce website are often difficult to examine or verify and therefore consumers need more reliable signals, such as product reviews and ratings that inform them of the quality of the products and services, which in return influence purchasing determinations [24, 25]. In addition, information and knowledge sharing capabilities benefit retailers. For example, companies such as AOL and Dell had special councils to discover customer needs and enhance profitability [29], since the introduction of Web 2.0 capabilities, companies can now economically collect information about customers ' needs and demands through Web 2.0 functionalities and process and utilize that information for profitability.

Companies also use websites as a tool to enhance customer loyalty. There is a greater chance of maintaining or enhancing customer loyalty when a company can meet customers' demands and needs through information derived from customer comments [29]. As a result, consumers who are empowered by Web 2.0 capabilities can make informed decisions about their purchases, and enable retailers to use customer knowledge to enhance products sales [e.g., 4, 6, 10, 20].

Although Web 2.0 offers value to customers and retailers, little research has been steered toward the extent which retailers and customers utilize the various knowledge functionalities. Subsequently, the purpose of this study is to investigate these features and compare the extent which online retailers and consumers are utilizing the knowledge functionalities of Web 2.0. This study also explains the benefits of functionality for both retailers and customers.

II. LITERATURE REVIEW

Social networking and social media are at the core of Web 2.0 functionalities, because it empowers consumers to engage in knowledge sharing activities and exchange information about products and services. Some features employed by retailers and popular with consumers include product reviews, product ratings, and discussion boards [e.g., 6, 7, 18, 20]. Studies have shown that consumers participate in and volunteer for information sharing about products and services for two reasons. First, consumers post reviews and rate products for emotional or practical reasons [30]. More precisely, angry or happy consumers express their emotions about products. Second, users post their comments for benevolent or altruistic reasons, with the desire to help the company to prevent others from experiencing the problems they had encountered [e.g., 12, 35]. Whether it is an emotional or benevolent reason, it is clear that both consumers and retailers benefit from those comments [e.g., 6, 10]. Specific discussions about the benefits of the three functions will be discussed as follows:

The *product review* and *product rating*-these functions evaluate a product or service, and deliver different types of information. The reviewer qualitatively assesses the products and service and then quantitatively rates the degree of satisfaction. The two functions complement each other, and the majority of online retailers deploy both functionalities simultaneously. It is important to note, that since product reviews and ratings are generated voluntarily by consumers, expert opinions, (sometimes posted by people hired by retailers,) are excluded in this category. Even though these two functions complement each other, their roles in information sharing and knowledge transfer are slightly different.

The product review function is used when buyers are making a purchasing decision [e.g., 30]. It offers detailed information from consumers who evaluate different aspects of the products and services based on their experience, and product reviewers are the everyday users whose concerns and insights are likely to be similar to those of the general consumers. The Potential purchaser then uses this information as an indication of the quality of a product or service [e.g., 25]. As a result, this functionality empowers consumers to influence future purchasing behaviors by letting other consumers in the community hear about their experiences with products or services [7]. Potential purchasers appreciate long reviews and are willing to take the time to go through them [6 because, in brick and mortar stores, customers can touch and feel product as well as verify their qualities through visual inspection, yet in the virtual market, customers have to rely on quality signals through other means such as product reviews [24, 25(online reviews have become a major source of information for consumers [14], and comments from other consumers can potentially reduce quality uncertainty and increase confidence in making product purchasing decisions [4].)

Reviews also offer better insight than product ratings because they offer detailed descriptions of products', services' ,strengths and weakness. Ratings on the other hand force reviewers to choose between 4 or 5. For example ,if a reviewer likes the products , let's say a 4.5. In this case, a review system can act as a better system to communicate the quality of the products. Product ratings also have great benefits in terms of alleviating information overload, especially when one product has numerous postings. Potential purchasers will also read reviews that are positive or negative based on their needs. S Some purchasers look for negative information while others look for positive information. Ratings can be sorted as well, which also reduces information overload.

When consumers are uncertain about the quality of a product they will read product reviews and ratings before spending money [32]. The 2010 Social Shopping Study found that 57% of shoppers trust customer reviews as a research source. It also indicates that consumers trust reviews more now than in 2007,. It is not surprising to observe positive relationships between favorable online reviews and product sales [4, 5, 6, 7, 10and product ratings and product sales [5, 6, 10, 20, 21, 26, 30]. This argument applies to the relationship between negative ratings and reviews and its impact on product sales [6].

Customers are not the only ones who benefit from product reviews and ratings. Retailers have a lot to gain by engaging consumers and making use of their experience with the products and services as a marketing tool [9]. Nowadays, retailers pay close attention to customer postings. Product reviews not only give consumers a voice, but retailers can also use it to make better merchandising and marketing decisions. A recent survey by the e-tailing group Power Reviews shows that reviews are gaining more reliance among shoppers, as they strongly prefer to do their own research online rather than speaking to a sales associate in the store [8].

Discussion boards, are a more customized knowledge sharing platform ,that allow consumers to post questions for or receive answers from other customers, who are either familiar with the products and services or have encountered similar experiences. Rather than posting general opinions or insights about products and services, the discussion board allows users to address specific issues, giving t customers the chance to ask about a problem they may or have encountered with certain products or services.

Careful consumers can seek advice about the products or services before they consider buying them. Studies show that 88% of surveyed customers use discussion boards because they like to share their experiences with others and warn them of possible issues they have encountered themselves [19]. The same study showed that 13% of the respondents claimed ,they want to listen to others' opinions and/or learn more about other people's experiences. Those who contribute to the discussion and respond to inquiries do it because they enjoy helping others [12]. In contrast, there are two major concerns or reservations for participating in the discussion board [19]. The first concern is that, potential contributors might perceive their knowledge as deficient and reflective of negative personality traits because this functionality deals with a specific issue ,and contributors

have to have expertise in these areas. The second reason is ,contributors are worried about their privacy since they have to provide their email address.

Discussion forums offer benefits to both consumers and retailers because the information in the forum is usually saved for long periods of time. This allows potential purchasers and consumers to visit the site or locate it through searching the company's site or the internet. As with product reviews, retailers can learn from the discussion forum about their products and services, giving them the chance to rectify problems or improve services. They can also glean important insights from customers' conversations for improvements [19]. For example, retailers can assess whether the questions are something that they need to include in product manuals or FAQs.

Personalized customer service is a broad concept that includes everything from a retailer's ability to capture users' purchasing behaviors to a user's ability to modify a website according to their needs. Studies have conveyed that personalizing online interactions improved customer relationships, increased positive word-of-mouth referrals, and enhanced purchase intent [12, 36].

Although there are numerous personalized customer services available through Web 2.0, this study examines two widely used functionalities: customized function and recommender systems. For the purpose of this paper, we use the term *customized function* to mean a function that retailers or customers use to explicitly save their information for later use, which may be used for marketing strategies and/or memory trace. This function requires the user to create an account, and typically, there are privacy statements and terms of agreement with regard to using the system in which, users are notified about how their personal information is revealed to retailers.

The recommender system however, is an automated function that makes use of intelligent system techniques such as matching algorithms, data-mining techniques, and machine learning. This help capture users' purchasing behavior, needs, interests, preferences, and other information that is used for purchasing. The system then uses this information in a knowledge discovery process to provide product recommendations to other consumers who have similar buying habits. In this functionality, users who may or may not log in to the system an also may not be aware retailers are collecting their information (frequently visited sites, purchasing records, etc.). More specifics on this discussion will follow.

The Customization function refers to the capability of saving users' customized personal information according to their interests and preferences [27],creating an important marketing implication for customers. Customers who are given the ability to customize the website are five times more likely to return to the site, compared to those who do not allow customers to customize the site [3]. Customized display can be further categorized into two groups.

The first category provides the user with the ability to redesign the website and save favorite items according to their needs. This is a popular function that serves as a knowledge retention function in the library setting [17]. In t library environments, users may select databases and save database links for later use. Whenever users log into the system, the stored database links are on the website and this serves as a personalized website. Examples of this category include bookmarks and tagging, which serve as knowledge retention functionalities. Although these capabilities are more popular in the library context, using them in e-commerce can improve customer retention and enhance sales since customers are likely to revisit sites that they have customized [e.g., 3];, many retailers offer the capability to save "viewed items," so when customers come back to the site, the viewed items are available for what is called customers' memory trace. Storing customers' personal information is popular personalized e-commerce functionality. Retailers collect customers' personal information via registration or purchasing transactions and save their address, phone number, order history, etc., which provide the basis for customized marketing. Marketers can send out an advertisement based on age, gender, region, etc., or they can save previous purchasing histories and remind customers about specific events based on customers' purchasing history. This functionality has already been used by online floweriest . For consumers, a tracing function can be useful because it can serve as a reminder for important activities, such as the occasions that would be appropriate for buying flowers. Although it has a promising future, studies have shown that users are reluctant to use this function because of privacy issues [e.g., 13, 15, 36].

The second category is a *recommender system. Recommender systems* reduce information overload and offer customized products based on customers' previous purchasing records, or similar customers' purchasing behaviors. It can also offer customized products based on the site's top selling items or the customer's demographics [31]. Because the recommender system has the ability to adapt to consumers' purchasing behaviors, it constantly modifies itself according to a specific user's purchasing behaviors or navigations, as well as other users' purchasing behaviors, in order to offer better recommendations. Book and movie retailers are actively utilizing this functionality. This may be because books can be easily categorized into subject and topic areas, and it is relatively easy to offer recommendations based on such categorization. For example, if a customer purchases an e-commerce book, then the seller would recommend other books with related topics to the customer. This function can be very useful for consumers in terms of alleviating information overload ,by narrowing a large quantity of items into a small tailored set of recommendations from which consumers choose. In this case, consumers' search costs are too high to process all information [4]. As a result, this functionality has the potential to increase consumer loyalty by allowing consumers to making value-added recommendations [29].

Web 1.0 refers to the World Wide Web prior the advent of Web 2.0. Web 1.0 is characterized as a one-way communication medium. Information is static and read passively. Web 2.0, on the other hand, is characterized as a two-way communication medium. Information is dynamic and Web 2.0 websites invite participation. Despite the static and passive nature of Web 1.0, there are many features that are still popular and provide useful information about products and services. Some of these popular functions include expert opinions, FAQs, and online manuals, and are explained as follows:

Expert opinions are in the form of comments or reviews posted by someone, who has expertise and experience with the products and services offered on the website. Expertise refers to "the audience's perceptions of the source's capability for providing correct information" [37, p. 311]. If information is disclosed from an expert, credible person, or trustworthy source, the information has more convincing power [2]. Information from credible sources influences audience beliefs more than the same message from a non-expert and biased person [22, 23, 33, 34, 38]. Scholars argue that, information receivers believe that experts are able to gain access to detailed information that supports their message, while non-experts are expected to lack concrete information [37]. Book sellers and movie-related web sites use experts' opinions to persuade potential purchasers. Consumers can reduce information overload by using the expert opinions as quality signals.

The Frequently Asked Questions (FAQs) feature is one of the most widely used communication media on retailers' websites. FAQs offer two main benefits. The first being , retailers can identify the root of problems and improve product quality. For example, AOL has been monitoring the root causes of calls to its customer support center, and through this process learned that the help menu needed to be more user friendly. Once the help function was improved, the company experienced fewer calls, which reduced its support costs [28]. Secondly, retailers identify frequently asked questions that have been extracted from their customer services or email questions ,and post the answers in advance for potential users. Retailers can save time and effort by answering the same questions through FAQs, while at the same time, customers can solve problems without contacting the customer service department.

An *Online manuals* feature ,enable users to access the most current information anywhere without the need to worry about misplacing the print manual. In the manner, online manuals could potentially reduce information overload by allowing users to search needed information online[1]. Online manuals are also very beneficial when changes need to be made or contents need to be updated. It is also less costly compare to the printed manual and thus beneficial to both the customers and retailer. Retailers not only reduce cost of printed manual but can also fix errors, and update information much faster.

III. RESEARCH METHODS

This section includes the identification of the sample websites and the sampling strategies. It also includes the operationalization of items that are discussed in the literature section.

A. The sample

Since the purpose of this study is to investigate retailers' and users' utilization of knowledge transfer functionalities, samples were collected from both retailer and consumer sides. For the retailer side, the website sample is identified based on Kim and Hawamdeh's [18] study. The ten websites that are comprised in the study are Amazon.com, Dell.com, Orbitz.com, ebay.com, Netflix.com, Hotels.com, Reel.com, 1800flowers.com, crutchfield.com, and Gamefly.com.

For the users , a questionnaire method was used. The questionnaire was developed based on the information and knowledge transfer functionalities discussed in the previous section, and then pre-tested using graduate students [16]. Based on the comments from the pre-test, a few items were added or removed. The finalized questionnaire was then sent out to knowledge management association members, knowledge management conference participants, and business school students. The response rate of the first group was 15% (16 returned out of 107), the second group was 30% (36 returned out of 120), and the third group was 95% (76 returned out of 80). A total of 128 responses were returned. The principal reason for sending out the survey to diverse user groups is to investigate whether student samples are different from the general public. The first two groups are treated as the general public and are separated from the student sample. A t-test was then run in order to investigate whether there are any systematic differences between the general public and student samples. The t-test findings show that there is no significant difference between the two groups, meaning that purchasing behaviors between the general public and students are not significantly different. This conclusion warrants one to combine these two groups for analysis and generalize the findings to general consumer groups.

B. Operationalization

As noted, knowledge transfer functionalities in e-commerce are categorized into three groups: knowledge transfer functionalities among customers, knowledge transfer through customer-personalized services, and traditional one-way communication media. Knowledge transfer functionalities include product reviews, product ratings, and discussion forums. Coding of this category is relatively straightforward. If a website has a "product review" function, it is coded as positive; or, it is coded as negative. Product ratings and discussion forums are coded in the same way. For the second category, since a customized service is a broad concept, the approach was to code the website as positive if it collects personal information upon signing into the system. This also allows the capability of allowing the user to save

information for later use. For example, Amazon.com allows users to save books or other merchandise in carts and check out whenever they are ready. , Reel.com has the same function. However, if the website is found to use intelligent algorithms, machine learning, or a data mining strategy to discover users' patterns of purchasing activities and match users with similar interests, it is coded positive for "recommender system." The third category, traditional one-way information transfer, includes expert opinions, FAQs, and online manuals. Similar to category one, if a website includes any of these features, it is coded as positive.

For the user part of the study, the questionnaire included questions about the three categories. While the questionnaire asks about the extent to which users utilized those functions, the answers were not coded as "yes" or "no" because customers to a certain extent use all or most of these functions. The question then becomes a measure of the extent to which customers perceive those knowledge functionalities to be helpful for their purchasing decisions; subsequently, a 7-point Likert scale is used. The respondents are asked to what extent a specific system is useful for their purchasing decisions (1= Strongly disagree 2 = Moderately disagree 3 = Slightly disagree 4 = Neutral 5 = Slightly agree 6 = Moderately agree 7 = Strongly agree). For the purpose of analysis, 1 and 2 are categorized into very useful; 3 is treated as useful; 4 is neutral; and 5, 6 and 7 are grouped as "not useful" for purchasing decisions. The mean value is calculated in order to create a portrait of the overall perception of a specific function.

IV. FINDINGS

This section reports the findings of both retailers' and consumers' adoption of the three knowledge transfer categories. As noted earlier, the first two categories are part of the dynamic and collaborative nature of Web 2.0, while the third category is part of the traditional static and passive nature of Web 1.0. Table 1 shows the results of the utilization of knowledge transfer functions by both retailers (retailer equipped) and customers (customers' preferences).

It is clear from Table 1 that most preferred knowledge transfer functions by retailers and users are not consistent. While retailers utilize functions that can help them improve their marketing strategies and cost savings, users prefer functions that allow them to better assess product and service quality.

First, customers prefer knowledge transfer functionalities more than retailers. This study shows that the product review function is the customers' number one preferred knowledge source when it comes to purchasing decisions, and 80% of surveyed retailers offer this functionality. The customers' second preferred knowledge source for their purchasing decision was the product rating function, which 90% of retailers offer. For discussion forums, the finding shows that customers do not leverage this functionality as much as other functions which only 50% of retailers offer.

Table 1 Utilization of Knowledge Transfer Tools by Retailer and Users

Category	Sub-category	Retailer equipped	User preference
Knowledge transfer among customers	Product review	4 (80%)	1 (5.90)
	Product rating	3 (90%)	2 (5.78)
	Discussion board	5 (50%)	8 (4.55)
Customized knowledge function	Customized display	1 (100%)	5 (5.10)
	Recommender system	6 (20%)	7 (4.83)
Knowledge transfer by provider	Expert opinion	6 (20%)	3 (5.40)
	FAQs	1 (100%)	4 (5.37)
	Online manuals	6 (20%)	6 (5.03)

The second category of knowledge transfer functionalities is the customized knowledge function, which includes customized displays and recommender systems. This category also shows disparity between retailers and users in terms of utilization. Additionally, customized displays, (which includes collecting customers' personal information), are most widely utilized by retailers. In fact all surveyed retailers have this functionality. As a consequence of this, consumers did not actively adopt this function compared to other knowledge transfer functionalities. In spite of the fact that there is a lot of information written about the advantages of recommender systems, its usage by retailers and customers is considered low.

The third and final category encompasses static information transfer through one-way communication media, such as FAQs, expert opinions, and products manuals. The finding shows that while customers rely on expert opinions for their purchasing decisions, only 20% of retailers provide this service. The FAQs function also shows an unbalanced utilization between retailers and customers. All surveyed retailers have this functionality, while respondents moderately appreciate this information transfer function. Although online manuals offer benefits to retailers and customers, its utilization levels are not high for either parties.

In conclusion, the most utilized functions by customers are product reviews and rating systems, and the least utilized knowledge functionalities are online manuals and customized displays. In contrast, the most adopted knowledge functionalities by retailers are customized displays and FAQs, and the least adopted knowledge functionalities are recommender systems, expert opinions, and online manuals.

A.   Knowledge Transfer Functionalities

This section discusses the three knowledge transfer functionalities (i.e., knowledge transfer functions among users, personalization functions, and one-way knowledge transfer functions from retailer to users) and provides detailed information of how users rated different functionalities.

B. Knowledge transfer functionalities among users

As discussed in the previous section, users highly utilize this functionality when making purchasing decisions. Table 2 shows more detailed information with regard to the extent to which users evaluate these functionalities.

Table 2 Users' perceptions of the knowledge transfer functionalities

Functionality	Mean	Very useful	Useful	Not useful
Product review	5.90	65%	28%	7%
Product rating	5.78	66%	26%	8%
Discussion board	4.55	28%	25%	47%

With mean values (5.90 and 5.78) product reviews and product ratings are the most popularly utilized features by online consumers. Users also rated these functions to be very useful. More specifically, 65% and 66% of respondents reported that these two functions are very useful for purchasing decisions, and 28% and 26% of users indicated that these two functions are useful. Only 7% and 8% rated that these two functions are not useful.

The mean value for discussion boards is 4.55, which means that consumers do not greatly consider information on discussion boards for their purchasing decisions. Looking at the breakdown responses, only 28% reported it to be very useful, one quarter rated it useful, and about half of respondents rated that this function is not that useful for their purchasing decisions.

C. Customer personalized services

In responding to the question about the extent to which customers perceive the customized services as a factor in decisions, the findings show that a customized display is favored more (5.10) than a recommender system (4.83) by the consumers.

Table 3 Users' perception of customized services

Functionality	Mean	Very useful	Useful	Not useful
Customized display	5.10	40%	25%	35%
Recommender system	4.83	34%	25%	41%

Table 3 shows that 40% of those surveyed perceived the customized display features as very useful for their purchasing decisions. Only a quarter of the respondents rated the functionality as useful, and 35% respondents responded that customized services are not that valuable for their purchasing decisions. For the recommender

system, which is widely discussed among academics and practitioners, only 34% of respondents responded that this functionality impacts their purchasing decisions, a quarter of the respondents perceived it as useful, and the majority (41%) perceived that this function does not play an important role in their purchasing behaviors.

D. Traditional one-way knowledge transfer functionalities

The traditional Web 1.0 features such as expert opinions, FAQs, and online manuals are still popular with both consumers and retailers (Table 4). Over half (56%) of consumers value expert opinions and those opinions shape their purchasing behaviors. Only 19% responded that expert opinions are useful; 25% of the respondents responded that it is not useful. The FAQs function is also very appreciated by consumers. Over half (51%) responded that the function is very useful, 29% perceived it as useful, and only 20% of respondents rated it as not useful in obtaining knowledge about products or services.

Table 4: Users' perception of the traditional one-way knowledge transfer functions

Functionality	Mean	Very useful	Useful	Not useful
Expert opinions	5.40	56%	19%	25%
FAQs	5.37	51%	29%	20%
Online manuals	5.03	42%	24%	34%

All three categories add value to consumers' purchasing behaviors, which range somewhere between slightly valuable to moderately valuable. Among them, expert opinions and FAQs are especially appreciated by consumers. For online manuals, the majority of the respondents (42%) rated that it is very useful, 24% reported that it is somewhat useful and a significant number (34%) of the respondents rated it as not so useful in delivering product information.

V. DISCUSSION OF FINDINGS

The findings reveal interesting insights into factors that influence consumers' purchasing decisions. While it is natural to speculate that retailers will meet customers' needs in order to enhance sales, it is also logical for retailers to consider cost-efficient marketing strategies. In that regard, it may be natural to observe incongruent utilization between retailers' and consumers' preferred functionalities, as we found in the study.

A. Comparison between retailers' and customers' preferred knowledge transfer functionalities

The first part of the findings deals with the comparison between retailers' and customers' preferred knowledge transfer functionalities. It is clear from the results that consumers seek knowledge about products and services

through various signaling methods such as product reviews, ratings, and expert opinions, collectively referred to as word-of-mouth methods [e.g., 6]. The finding is consistent are with beliefs about e-commerce such as unlike brick and mortar physical structures, customers cannot examine products or services directly, and therefore, are likely to rely on information that signals the quality of products or services. These findings clearly show the important roles these functionalities play in consumers' purchasing behaviors, which also support the notion that consumers can exercise, strong powers to shape future sales.

In response to the needs of customers, 90% and 80% of retailers offered product rating and review functions, respectively. Although expert opinions shape purchasing behaviors, only 20% of surveyed retailers offer this knowledge transfer functionality. Conversely, all surveyed retailers offer customized display, which leads us to speculate that customized display features enable retailers to collect personal information, which can be used for marketing. While all surveyed retailers offer this functionality, not that many users utilize customized displays and this may be something to do with privacy concerns.

Unexpectedly, the use of recommender systems by both users and retailers was very low. This functionality has received a lot of attention in academia and practice. Literature dealing with the advantages of this function is also abundant. Considering the attention given to this functionality, it is somewhat surprising that users do not value this function (rating it at 4.83) as much as others for purchasing decisions.

One of the unmatched areas appears in expert opinions. While this function shapes consumers' purchasing behaviors, surprisingly only 20% of retailers offer this function. This function is expected to be valuable when the quality of products and services are difficult to verify.

B. Knowledge Transfer Functionalities among Customers

The knowledge transfer functionalities among users affirmed the belief that users do utilize user-generated information about products and services. Attributed by the fact that unlike brick and mortar stores, the quality of products available online are not easily verifiable, and accordingly, customers are likely to make an effort to verify product qualities through product reviews and ratings posted by other users. Most retailers offer both product review and rating functions. While these two functions serve the same purpose (signaling quality of product), they deliver different values to customers. Essentially, product reviews provide detailed information that cannot be delivered through a numeric rating system (while numerical ratings may not offer detailed descriptions of a product, it can alleviate information overload.) As shown in Table 2, customers expressed strong preferences for both product reviews and product ratings as a way of assessing quality. At the same time, this offers great benefits to retailers by enabling them to

assess customers' needs and inquiries. Retailers can use the information to fix problems, enhance services, and promote popular products and merchandise. This could be the reason why both retailers and consumers actively utilize these functionalities.

Discussion forums are another knowledge transfer function among customers. While 50% of surveyed retailers offer this functionality, the study findings show that users did not indicate strong preferences for this functionality. In fact, around 50% of users did not seem to care about this functionality. This could be attributed to the fact that product reviews and product ratings relate to customers' feelings or opinions, whereas discussion forum participation requires a certain level of expertise in the area; subsequently, customers might not feel passionate about it in the same way they do with reviews and ratings.

C. Knowledge Transfer and Retention through Personalization

One of the benefits of personalization is reducing information overload and offering customized services based on customer preferences. This function has received a lot of attention among scholars and practitioners [e.g., 4], and yet, its usage is not as high as the promoted benefits. In the case of customized display, as discussed earlier, this could be an issue of privacy [13, 15, 36] as users are somewhat reluctant to provide their personal information.

The last area includes one-way knowledge transfer functions. These functions are considered a cost-effective way for retailers to communicate with consumers, and all the surveyed websites provide FAQs. Only 20% of surveyed retailers were found to offer expert opinions and online manuals; we speculate that this could be attributed to the nature of the types of surveyed websites. Some of the sites that sell flowers, for example, may not have both of these functions. Other sites, such as movie and travel websites, may not have online manuals. However, it is somewhat surprising that only 20% of the surveyed retailers offer the "expert opinion" function. Retailers such as bookstores, movies, and hotel sites could have utilized this function to enhance their marketing strategy since findings show that users highly regard the experts' opinions as a way of assessing quality. This function is especially important when the quality of online products is difficult to assess [11].

VI. CONCLUSION

This study investigated the extent to which retailers adopt knowledge transfer functions such as product reviews, product ratings, and expert opinions, as well as the extent to which consumers utilize those functions. The approach used in this study is different from existing studies in that most of these studies focused on the consumer side with little consideration given to the retailer's role in the utilization and deployment of these functionalities. Some of the common questions raised in

existing studies dealt with the relationships between product reviews and sales, product ratings and sales, and how recommender systems impact consumer behavior. This study adopted a different approach that takes into consideration the role of retailers in offering such functionalities and the extent to which these functionalities impact consumers' purchasing decisions. There are potential benefits for retailers in adopting and leveraging knowledge transfer functionalities. For example, expert opinions are highly valued by consumers, and yet, retailers do not fully leverage this capability.

This study does however have some limitations in terms of data collection. Although attempts were made to investigate retailers and consumers from a holistic approach, the websites investigated did not fully correspond to users' responses. For future research, there is a need to identify selected websites and ask the users to assess the knowledge transfer functionalities. This method will provide a more accurate view of how users perceive different functions across diverse e-commerce websites (e.g., bookstore, movie store, hardware store, etc.).

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