Design of Ubiquitous Referral Marketing: A Business Model and Method

Kyoung Jun Lee and Jong Chul Lee

School of Business, Kyung Hee University
Hoegi-Dong, Dongdaemun-Ku, Seoul, Korea
{klee, mermaio}@khu.ac.kr

Abstract. This paper provides a corporation's marketing strategy under a ubiquitous computing environment: a WOM(word-of-mouth) marketing using RFID(Radio Frequency Identification) technology and a business model which facilitates the word-of-mouth marketing. To this end, we examine the word-of-mouth communication effects on consumers' life, changes in corporations' attitude toward word-of-mouth marketing, and the difficulties that corporations have in conducting word-of-mouth marketing. The business model this paper suggests makes seamless business-to-consumer and consumer-to-consumer networking possible using the RFID technology and facilitates the word-of-mouth marketing through incentive system of each economic player.

1 Introduction

Word-of-mouth Marketing is marketing a good or a service by the message spread by customers where the communication takes place voluntarily and informally between people or groups. It can also be referred to Referral Marketing in that consumers refer to the experience of other consumers in the process they start to be aware of a product or a service, form an opinion, and finally make a purchase. In under a ubiquitous computing environment, the gap of media between the real world and information system can be narrower with the emergence of various computing terminals embedded in mobile network and sensors. All the information can be delivered seamlessly among economic players who are engaged in every commercial activity [3]. The existing communication methods used in online and offline word-of-mouth can evolve into a new form of communication that uses every channel of word-of-mouth, either online or offline, so any information can be sent and received seamlessly.

In under a ubiquitous computing environment, all goods have IDs in a form of RFID, Ipv6, or color codes etc. Since digital information is embedded in goods in the first place, information can be delivered seamlessly without any cost to convert analog information into digital one. In addition, it is easy to figure out the origin of information. Using such features, a company can use a product as a source to deliver product information, and a product plays a role of a medium to link products and consumers. In the end, a company is able to establish a system that controls marketing messages and reward customers for advertising products. WOM Marketing provides an experience of a prior purchaser based on trust between consumers. No matter how

open a social boundary a consumer belongs to is, social network is formed on the basis of trust between people. The trust between consumers has a positive effect on the trust of an information receiver. But negative words of mouth spread faster than positive words and information can be distorted in the process of dissemination [1],[5]. In comparison, information spreads without distortion under a ubiquitous computing environment. In other words, there is little need for trust between consumers in this ubiquitous computing environment.

The WOM marketing under a ubiquitous computing environment creates less transaction costs, provides new efficacy to those who are involved, and make a transaction process transparent. But the use of auto-identification such as RFID could end up as infringement of privacy of the purchaser. This is a negative effect of using auto-identification. A customer can provide information about the clothes (s)he is wearing to many people and get rewarded, but what (s)he possesses and how much they are could be exposed to anyone. Therefore, a prior purchaser should have the right to decide whether the information will be provided to random potential consumers or not, and the identity of the prior purchasers should not be accessible to potential consumers who scan the information.

This paper suggests a new form of word-of-mouth communication emerging in the ubiquitous computing environment, along with a new business model and methods that facilitate the new communication.

2 WOM (Word-of-Mouth) Marketing

Words of mouth play a pivotal role in spreading a new product and have a defining effect on consumers' selection of products among various groups. Approximately 80% of the consumers are still affected by the recommendation of other people when they decide to buy something [8]. The purchasing pattern of today's consumers hinges not only upon the communication between a company and a consumer, but upon communication network of consumers based on user experience. In this section, we will explain the limit of current WOM communication.

Scenario 1

People around Jane always ask about where she bought the wardrobe she wears and how to coordinate clothes. Then Jane kindly gives tips about the brand, price, and the store information of the clothes she buys. Afterwards, people buy the same or similar clothes as Jane's at the same store Jane bought them. And they get information on clothes and how to coordinate clothes from the homepage of the brand on the Net.

This scenario depicts a situation that takes place in our daily lives where WOM communication is carried out. In this scenario, Jane plays a role of an "employee" who promotes the clothes of the company by wearing them. However, the store she bought her clothes does not pay her anything even though she played a role in increasing sales. In the same token, if Jane is dissatisfied with her clothes, people who

have been talking to her could have had a negative image about the clothes and its brand [1]. In other words, people who had a positive image about the brand could turn out to have a negative one after talking to Jane. Therefore, companies need to come up with a system to reward customers like Jane who voluntarily promotes their products as well as measures to capitalize on those good customers. Such a system should encourage current good customers to recommend their products and make potential customers to accept the recommendation positively and purchase the products.

Scenario 2

Tom went skiing in an outworn ski suit and he thought he should buy a new one. Tom was lining up for a lift and he found Jay's ski suit and liked it. So he decided to buy the same ski suit with him and remembered the color and design. He could have asked Jay its brand and price, but he shied away from asking him those things because he was a total stranger. Tom went back to his room and searched on an online shopping mall. He failed to find a ski suit he wanted and gave up.

Anyone could have experienced the situation in this scenario. One day, you see something you like on the street, but you have no one to ask where (s)he bought it and don't know the brand and the place that sells the good you like. Sometimes you cannot find it even after you search for it on the Net. In this scenario, Tom could not find the ski suit on the Internet. The emergence of the Internet gave consumers greater access to product information, and consumers' search cost has dramatically been reduced, but on the other hand, search cost remains in one way or another since consumers have to find the information that suits their needs among the overwhelming volume of information. Moreover, Tom searched only ski suits that are registered online, and if Jay's ski suit is not registered online, it is impossible for Tom to find it. The impeded flow of information between online and offline is an obstacle to seamless business activities. In addition, the seller who sold Jay a ski suit and does not provide a channel that is easily accessible to consumers lost a potential customer (Tom). Therefore, both the seller and Tom need a new word-of-mouth channel that reconnect the severed flow of information between online and offline.

3 Ubiquitous Referral Marketing

In scenario 2, if Jay's ski suit had a RFID tag on it, and Tom possessed a mobile handset embedded with a RFID module, things could have been different. Tom could have scanned the RFID tag on Jay's ski suit with his mobile handset and gained the information he wanted and known where to go to find that suit, online or offline. In the meantime, the seller can secure a potential customer without any advertisement. In scenario 1, if people around Jane had gained information on Jane's clothes via the RFID tag hidden in clothes, they would get product information no matter what

opinion Jane has about the clothes. Such a WOM communication is different from the one in the past in that information is disseminated via RFID tags, not people's mouth.

In a ubiquitous computing environment, all goods have IDs in a form of RFID, Ipv6, color codes, and since digital information is embedded in goods in the first place, information can be delivered seamlessly without any cost to convert analog information into digital one. In addition, it is easy to figure out the origin of information. Using such features, a company can use a product as a source to deliver product information, and a product plays a role of a medium to link products and consumers. In the end, a company is able to establish a system that controls marketing messages and reward customers` for advertising products.

WOM Marketing provides an experience of a prior purchaser based on trust between consumers. No matter how open a social boundary a consumer belongs to is, social network is formed on the basis of trust between people. The trust between consumers has a positive effect on the trust of an information receiver. In comparison, information spreads without distortion under a ubiquitous computing environment, the content of information can be disseminated as a company intended. In other words, there is little need for trust between consumers in this ubiquitous computing environment. A potential customer can actively receive based on what he sees and feels. The dissemination of information takes a form of "pulling" than "pushing." The "pulling" of information takes a similar form to benchmarking [4] which is a process in which a company compares its products and methods with those of experts, prior purchasers, or community members in order to try to improve its own performance. The only difference is that an information giver involves less in the formation and delivery of the information under a ubiquitous computing environment, and companies can remove variables that were out of control in the past word-of-mouth marketing.

The ubiquitous referral marketing under a ubiquitous computing environment creates less transaction costs, provides new efficacy to those who are involved, and make a transaction process transparent due to the features described above. But the use of RFID could end up as infringement of privacy of the purchaser. This is a negative effect of using RFID. A customer can provide information about the clothes (s)he is wearing to many people and get rewarded, but what (s)he possesses and how much they are could be exposed to anyone. Therefore, a prior purchaser has the right to decide whether the information will be provided to random potential consumers, and the identity of the prior purchasers should not be accessible to potential consumers who scan the information.

In chapter 4, we will propose a new economic player, a new business model and a method that enable companies to enhance the performance of their marketing activities and reduce the risk of privacy infringement using the characteristics of ubiquitous referral marketing.

4. Business Model

According to the business model definition by Timmers [7], the business model we propose is composed of four business entities as seen in below.

- ✓ Prior purchasers (Jane in scenario 1, Jay in scenario 2): The Consumers who purchase products online or offline. They register what they purchase by opening an account with ubiquitous referral marketing network (a new economic player this paper proposed) of a seller.
- ✓ Sellers (Shop in scenario 1): People who sell products embedded with a RFID tag whether they take an online or offline commerce form. They can secure potential customers who are interested in the products.
- ✓ Potential customers (people around Jane in scenario 1, Tom in scenario 2): They are consumers who have a mobile terminal with RFID Module and are interested in the products that prior purchasers possess. They can immediately check the information on the product they are interested in by scanning the RFID tag without any search cost. And they, using mobile network, can obtain additional information that sellers provide via RN.
- ✓ RN (ubiquitous referral marketing network): It plays a middleman who relays information between sellers and consumers. A seller provides additional information on the product in response to the request from a potential customer and gives some reward to a prior purchaser who possesses a product that the potential customer scanned information from.

Figure 1[1] shows the structure of the roles of a seller, a prior purchaser, a potential customer, and RN and the flow of information between them.

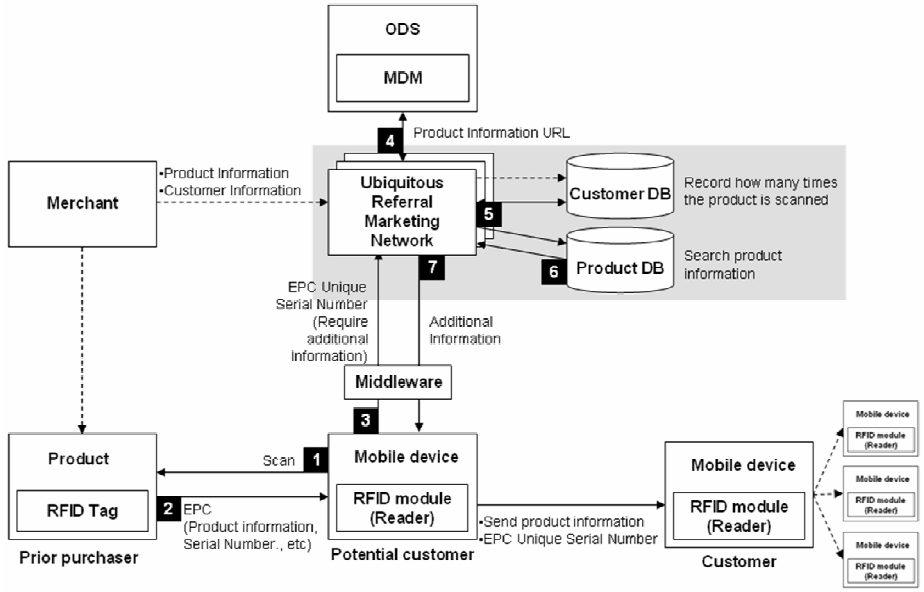

Fig. 1. Ubiquitous referral marketing service architecture

[1] This architecture is designed based on EPCglobal network and RFID ODS (Object Directory Service) of NIDA (National Internet Development Agency of Korea).

The following explains how information spread from a prior purchaser to an interested person or a potential customer and to another potential customer in turn.
A prior purchaser buys a product embedded with an RFID tag from a merchant and open an account with the advertising server the merchant is operating and registers the product (s)he bought on the server. The RFID Tag contains basic product information as well as EPC with which a potential customer can obtain additional information.

① A potential customer scans the RFID tag hidden in the product with a mobile RFID module-embedded handset.
② RFID tag scanned by the potential customer gives him or her basic product information.
③ If the potential customer needs more information, (s)he requests additional information with filtered EPC unique serial number to the RN through mobile networks.
④ The RN requests the product information URL to ODS[2] server. Decoding RFID tag through MDM[3], ODS server provides the location of server containing product information such as price, store location, and users' review related to RFID tag.
⑤ Set up standardized incentives granted to the prior purchaser who has registered a product depending on the number of times the EPC unique serial number is transmitted in response to an information request.
⑥ The RN searches for product information requested by the potential customer in a product database using the EPC unique serial number they referred to.
⑦ The RN transmits the findings to the potential customer who requested information and their mobile handset displays the received product information.

A potential customer is able to transmit the information to other consumers with a proper mobile handset and they can obtain additional information in the same way.

In this business model proposed above, a prior purchaser can be a potential customer of another seller at the same time. In other words, a consumer can play a role of both a prior purchaser and a potential customer. When an individual register as a seller on RN, a consumer can play three roles at once. RN, as a middleman between sellers and consumers, provides incentives to prior purchasers for advertising a specific good. In this way, the aversion to the RFID tag can be subsided. It is sellers who give out such incentives. Sellers can have easier access to consumers, especially potential customers who are interested in their products. Therefore, the cost is worth it.

This system has a similar cost/profit structure to CPC(Cost-Per-Click) search commercial model of Overture(http://www.overture.com) which offers money depending on the number of visitors to the commercial websites registered on the search engine. In addition, RN can provide a variety of services besides mediating between sellers and customers. Upon the permission of customers, it can detect their tastes and interest based on the collected data on their purchase and information

[2] RFID ODS(Object Directory Service) provides the location of server containing product information related to RFID Tag using DNS Technology.

[3] MDM(Multi-code Decoding Module) is decoding module for promoting interoperability among several RFID codes such as EPC of VeriSign, ISO/IEC code and U-code of uID center.

requests. In other words, “pushing” type of advertising using customer profiles is possible as well as “pulling” types in response to information requests from customers. Besides, RN can offer numerous services including comparison shopping, price search, and display of relevant products. Accordingly, sellers can carry out various marketing activities targeting their potential customers along with word-of-mouth marketing, capitalizing on the RN.

The first element of the business model proposed in this paper is described above and the second and third ones can be explained as in Table 1.

Table 1. Sources of potential benefits and profits for each economic player

	Potential benefits	Source of revenues
Prior purchaser	- Stock management with RFID Tag. - Better services from sellers through RN.	-Incentive
Seller	-Reduction in marketing cost -Get more potential customers.	-Increasing profits
Potential customer	-Reducing search cost by networking with RFID.	-Incentive
Ubiquitous referral marketing network	-New business opportunities	-Registration fee -Cost-Per-Purchase revenue

5. Working Condition for the Business Model

In this section, we will find some conditions, for RN-registered sellers competing with RN-unregistered sellers. RN-registered sellers are those who register the ubiquitous referral marketing network (RN) and RN-unregistered sellers are the online sellers who do not have the ubiquitous referral marketing network membership.

Notations

- ✓ $Price_{reg}$ = The product unit price of RN-registered seller.
- ✓ $Price_{unreg}$ = The product unit price of an online RN-unregistered seller.
- ✓ $Cost_{reg}$ = The product unit cost of the RN-registered seller reflecting the prime cost, shop operating cost(including RFID system), delivery cost, etc.
- ✓ $Cost_{unreg}$ = The product unit cost of a online RN-unregistered seller reflecting prime cost, shop operating cost, delivery cost, etc.
- ✓ CAC_{reg} = A unit customer acquisition cost of the RN-registered seller including advertising cost and RN membership fee.
- ✓ CAC_{unreg} = A unit customer acquisition cost of an online RN-registered seller.
- ✓ SC_{reg} = Shopping cost incurred to the customer when (s)he purchases a product from the RN-registered seller through the RN including delivery cost, seller trust cost, and search cost etc.
- ✓ SC_{unreg} = Shopping cost incurred to the customer when (s)he purchases a product from a online RN-unregistered seller including delivery cost, seller trust cost, and search cost etc.
- ✓ RN_{Fee} = The cost that the RN-registered seller pays to the RN when a transaction occurs through the RN. There are a variety of methods to calculate RN_{Fee} such as

CPC(Cost Per Click), CPM(Cost Per Mile) and CPA(Cost Per Action) in online advertising.

- ✓ INCEN = The money (incentive) that the RN-registered seller pays to a prior customer when a potential customer purchases a product by using RFID Tag through the RN. There are also a variety of methods to calculate INCEN.

5.1 The condition for the RN-registered seller

In this section, we try to find the working condition for the ubiquitous referral marketing business model by comparing the RN-registered seller with a RN-unregistered seller who sells products through eBay Korea(www.auction.co.kr). The RN-registered seller should have profits through the ubiquitous referral marketing program (Condition 1). If the RN-registered seller and the RN-unregistered seller sell the same product at the same price, ubiquitous referral marketing is available when the total customer acquisition cost of RN-registered seller, i.e. including INCEN and RN_{Fee} and is less than that of RN-unregistered seller (Condition 2). If the both sellers sell the same product at different prices, ubiquitous referral marketing is available when the total cost is less than that of the online seller (Condition 3). Table 2 summarizes the costs and prices of the two kinds of sellers.

Table 2. Comparison between sellers

	RN-registered Seller	**RN-unregistered Seller**
Original Cost	$Cost_{reg}$	$Cost_{unreg}$
Cost after ad	$Cost_{reg} + CAC_{reg}$	$Cost_{unreg} + CAC_{unreg}$
Cost after sales	$Cost_{reg} + CAC_{reg} + INCEN + RN_{fee}$	$Cost_{unreg} + CAC_{unreg}$
Profit	$Price_{reg} - Cost_{reg} - CAC_{reg} - INCEN - RN_{fee}$	$Price_{unreg} - Cost_{unreg} - CAC_{unreg}$

$$Profit = Price_{reg} - Cost_{reg} - CAC_{reg} - INCEN - RN_{fee} > 0 \quad (1)$$

$$\text{if } Price_{reg} = Price_{unreg},\ INCEN + RN_{fee} + CAC_{reg} < CAC_{unreg} \quad (2)$$

$$\text{if } Price_{reg} \neq Price_{unreg},\ \ Cost_{reg} + INCEN + RN_{fee} + CAC_{reg} < Cost_{unreg} + CAC_{unreg} \quad (3)$$

5.2 The condition for the prior customer to join

To join this business model, customers have to get more benefit than the costs for offering personal information and joining ubiquitous referral marketing. There are two kinds of benefit that customers can get: potential benefit and practical benefit. The potential benefit is the monetary interest, that is, the incentive that customers can get by handing over RFID Tag information to others. This monetary interest can be divided into several kinds by the ways of giving incentive. For example, incentive can

be given whenever a potential customer asks for additional information to RN using RFID Tag or by purchasing results. In addition, the practical interest comes from purchasing a product with RFID Tag. The customer can do the stock management of the product and get information service that is similar to the ones from online shopping malls. Besides, the potential benefit of the prior customer gets bigger by 'network effect', as the diffusion rate of mobile device with RFID Module gets higher and it becomes a cultural code to get information of product by scanning its RFID Tag so that more and more people use it. The incentive that the prior customer gets can greatly increase when the potential customer hands over the Tag information to others after using it to get information of the product.

5.3 The condition for the potential customers to join

The condition for the potential customers to join this business model is $Price_{reg} + SC_{reg} < Price_{unreg} + SC_{unreg}$. As the price of RFID Tag gets lower and the reader diffusion rate gets higher, the difference in search cost will decide whether a customer joins ubiquitous referral marketing or not. As we can see in the two scenarios mentioned above (Jane's friends and Tom used RFID Tag to solve the problem that could not be solved in traditional commerce environment), ubiquitous referral marketing with RFID technologies brings convenience and lower search cost at the same time.

5. Conclusion

The ubiquitous computing environment is expected to provide a contact point for companies to have access to more customers [2]. RFID technology has been introduced into the process of manufacturing and logistics very quickly, but it needs to anticipate the process after a purchase is made. The ubiquitous referral marketing delivers advertising messages via products people are carrying with them as described above and at the same time it can use a thing that doesn't belong to anyone. For example, consumers can get information about a book such as synopsis, a list of relevant books, and review of other readers by scanning the RFID tag of the book you are interested in. Street advertising banners or school boards can go beyond simply putting advertising message and extract immediate reactions from consumers by offering an opportunity to get additional information. The ubiquitous referral marketing will offer goods and services that fit consumers' needs by analyzing changes of emotions consumers feel in a situation as well as tastes and preferences.

This paper proposes a business model that is designed to use RFID technology from the perspective of marketing in the process after a purchase. However, there are many technical difficulties for every seller to carry out ubiquitous referral marketing independently, and the cost-efficiency is unpredictable. Moreover, consumer information is hard to get especially when they react very sensitively to the exposure of their privacy [6]. Therefore, a new business player will emerge to support sellers with technology and connect them with consumers through marketing activities, and in the meantime to protect consumers' privacy while rewarding them for their

contribution to sales. Furthermore this business model can create value from both ways by helping consumers in searching, comparing, and selecting products based on their taste and assisting companies in making decisions on manufacturing and logistics. To make this business model a success, it is important to make consumers to perceive the whole process of gaining information by scanning RFID tags and incentives being granted to the information providers as one of the purchasing patterns and have no aversion to the system.

Acknowledgments

This research is supported by the Ubiquitous Autonomic Computing and Network Project, the Ministry of Information and Communication (MIC) 21st Century Frontier R&D Program in Korea.

References

1. Chatterjee, Patrali, “Online Reviews – Do Consumers Use Them?" ACR 2001 Proceedings, eds. M. C. Gilly and J. Myers-Levy, Provo, UT: Association for Consumer Research, 129-134, 2001.
2. Fleisch, E., & Tellkamp, C., “The Challenge of Identifying Value-Creating Ubiquitous Computing Applications”, Workshop on Ubiquitous Commerce, UbiComp 2003.
3. Holtjona, G. & Fiona, F.. “U-Commerce: emerging trends and research issues,” Industrial Management & Data Systems, Vol. 104. No. 9, pp. 744-755, 2004.
4. Hisao, N, "Marketing strategy in the era of ubiquitous networks", NRI Papers, No.44 March 1, 2002.
5. Richins, M. & Marsha, L., “Negative word of mouth by dissatisfied consumers: A pilot study”, Journal of Marketing, 47(1), pp. 68-78, 1983.
6. Roussos, G. & Moussouri, T. “Consumer perceptions of privacy, security and trust in ubiquitous commerce”, Pervasive and Ubiquitous Computing, Vol. 8. pp. 416–429, 2004.
7. Timmers, P., “Business Model for Electronic Markets, Electronic Markets”, Vol. 8, No. 2, pp. 3-8, 1998.
8. Chung, J. & Kim, Y., “An Analysis of WOM Effects on the Consumer Product Choice by Using a hierarchical Bayesian Probit Model”, Korean Marketing Research, Vol. 19, No. 3, pp.1-20, 2003.