



The classification and strategic management of services in e-commerce: Development of service taxonomy based on customer perception

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ABSTRACT

Previous studies have failed to take into account of the service sector, which accounts for a large portion of e-commerce transactions these days. To overcome the limitation, this research focuses on online service offers and attempts to develop their taxonomy. For the purpose, online services were identified from Korean Portal Sites and classified by 11 variables representing customer perceptions about service characteristics in the e-commerce context. Data for the analysis were obtained from a survey and the data-mining techniques and statistical processes including factor analysis, clustering and ANOVA were used. As a result, online services were classified into six groups – mass, professional, intellectual, credit, supporting and facility services and the distinctive features of each group were examined and strategies for marketing and operations recommended. By understanding the unique characteristics of each service group, managers can implement more suitable strategies, foster more positive attitudes towards online transactions, and finally increase online buying intentions.

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1. Introduction

Since the late 1990s, the attractiveness of using websites as an integrated marketing communication media has increased as more users have accessed the Internet. The advancement of the information technology (IT) has enabled a variety of products and services to be displayed without consideration of the physical aspects of space and time. The development of sophisticated software has led businesses and customers to buy and sell on the Internet under secure conditions (Perry & Bodkin, 2002). As a result, the 'e-market', a virtual place for online transactions, has become a center of attention and great efforts have been put into identifying the major success factors in e-commerce, the electronic commerce of business in the e-market (Standing, Love, Stockdale, & Gengatharen, 2006). It is believed that online transactions are particularly suitable for products/services which can be characterized as having low customer involvement, high brand equity and easy distribution (Clemente, Miller, Richardson, & Gugel, 1998). The many examples of e-commerce success also include firms offering products/services that are standardized or can be delivered electronically, such as the success of software companies, information providers, or bookshops (Poon & Joseph, 2000). Services, however, are difficult to standardize and deliver through online channel because of their inherent intangibility, simultaneity, intimacy and

perishability (Metters, King-Metter, & Pullman, 2004). Consequently, e-commerce transactions of services have tended to be rather restricted (Adams, Kuras, & Low, 1977) but now these problems are greatly solved with advancements in IT and many traditional service providers are starting to provide services online. The main issues now are finding ways to identify the services to be offered online and to manage them effectively. Like tangible products, the offering of services online needs some strategic insights.

Previous studies on the above-mentioned issues, however, have certain limitations. First, with respect to e-commerce studies, the greater part of existing research focuses on tangible goods. By comparison, little attention has been given to the provision of services via e-commerce, even though they represent an increasingly large portion of e-commerce transactions (Furrer & Sollberger, 2000), and discussions on the relevant strategic issues are rare. And yet, success stories exist where service industries offer services suitable for online trading and implement appropriate strategies. Such strategies should differ according to the type of service offerings, and should be based on the unique characteristics of services in the same way that a product's physical features can facilitate or restrain its suitability for offering via e-commerce. Therefore, the development of a classification scheme for services in e-commerce is required in order to consider suitable strategies for services as grouped by such characteristics.

Secondly, in terms of such service classifications, most studies have adopted a top-down approach in presenting service typologies and general frameworks for analyzing service operations and

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marketing strategies. This means that services have been classified only conceptually, but that little effort has been made to group existing services based on actual data, even when a bottom-up approach might be more practical. In the case of e-commerce, business success depends greatly on customer recognition of transactional characteristics, and thus making a taxonomy for online service goods which utilizes a bottom-up approach on the perspective of customers would be quite useful. Actually, there is an increasing need to understand online customers (Straub & Watson, 2001). Customer has been regarded as one of the most powerful forces in today's market-place (Albrecht, 1992; Buzzell & Gale, 1987) and can be equally important in e-commerce (Chen & Dubinsky, 2003; Shun & Yunjie, 2006). Moreover, customers' expectation on online services plays a major role in the formation of satisfaction (Lankton & Wilson, 2007; Spreng & Page, 2003), and thus customer perception on online service needs to be incorporated in establishing service strategy to predict customer's choice and future purchase intentions.

Therefore, to overcome the limitations of existing studies, and to satisfy the emerging needs of Internet players, this paper attempts to construct a taxonomy by adopting such a bottom-up approach based on customer perceptions on transactions of online services. The results are expected to have beneficial marketing and operational implications for online businesses. The paper is organized as follows: Section 2 discusses the relevant literature. Section 3 outlines the research framework underlying our analysis, while Section 4 describes the results of the empirical analysis with some managerial implications. Lastly, Section 5 points to directions for future research.

2. Literature review

2.1. Classification of services

Since the notion of services is considered ambiguous Hill, 1997, various typologies have been suggested to classify them. The variables used for classifying services are divided into two types in this paper: in terms of service providers, and customers. Firstly, from the point of service providers, one of the most popular variables is the nature of service delivery – whether it is continuous or discrete (Schmenner, 1986). Another popular one is the intangibility of services, which means that “they cannot be seen, felt, tasted, or touched in the same manner in which goods can be sensed” (Zeithaml, Parasuraman, & Berry, 1985) and services can be classified by looking at such degree of intangibility. As to service facilities, the availability of service outlets (Lindberg & Nordin, 2008; McDermott, Kang, & Walsh, 2001), and the focus on equipment or people (Silvestro, Fitzgerald, Johnston, & Voss, 1992) are considered. In relation to service productivity, supply constraints, labor intensity (Schmenner, 1986), and knowledge types (McDermott et al., 2001) are seen as important. For service production process, service system structure (Buzacott, 2000), service process structure (Kellogg & Nie, 1995), types of relationship between service organization and customer, and the extent to which customer contact personnel exercise judgment in meeting individual customer needs (Schmenner, 1986) are considered. Other variables include service strategy (Cohen, Cull, Lee, & Willen, 2000), the focus on product or on process (Kellogg & Nie, 1995), after-service types (Lele, 1997), the tradability of services (Araujo & Spring, 2006), etc.

Secondly, from the point of customers, a common variable is the level of customer contacts or interactions (Loveloock, 1983). Some services need close buyer–supplier relationships in nature, where the role of trust between the buyer and seller is central (Ellram, Tate, & Billington, 2004; Åhlström & Nordin, 2006). Those services

in general are preferred to be exchanged in interaction processes where buyers and sellers are closely integrated with each other (Vargo & Lusch, 2004). To reflect such interaction, Lindberg and Nordin (in press) adopt the degree of relational proximity to group services. Customization is seen in a similar vein, sometimes expressed in a more concrete way. For instance, Kellogg and Nie (1995) interpret it as a service package and the work by Buzacott (2000) provides four groups including standard service, complex service, simple diagnosis, and complex diagnosis. Further, the service recipient, demand fluctuations (Schmenner, 1986), the tangible or intangible nature of the service act (Loveloock, 1983), the criticality of the service to the customer (Cohen et al., 2000) are used as classification criteria.

2.2. Classification of online products

One of the major issues facing e-commerce is the characteristic of products for online transaction. Products in e-commerce are mainly classified based as to their tangibility (Peterson, Balasubramanian, & Bronnenberg, 1997). While a high tangibility good is one that is only usable when in a physical form (such as durable goods), a low tangibility good can exist in a kind of digital form (such as digital content). Though transactions of goods in a physical form has been dominant (Montoya-Weiss, Voss, & Grewal, 2003), information is becoming the main offering of many online service providers, and many customers now access online services primarily to use digital contents (Alba et al., 1997; Keeney, 1999; Stafford, 2003). The cost and the frequency of purchase are also commonly mentioned criteria (Kotler, Armstrong, Brown, & Adam, 1998), and the degree of differentiation and the product size are also important variables (Phau & Poon, 2000). Recently, personalization is often offered by online marketers with product personalization strategies, having grown increasingly popular in various types of businesses (Goldsmith & Freiden, 2004). Thus, the degree of personalization could be another critical factor for customers to distinguish products in e-commerce. Products can further be grouped as search goods or experience goods (Poon & Joseph, 2000). Experience goods normally require a customer to physically evaluate them before making a purchase, and thus the Internet may not be seen as a suitable method of shopping for such goods. It is known that consumers will be more likely to buy personalized search products than experience products (Moon, Chadee, & Tikoo, 2008), which means that the nature of products as search goods or experience goods might affect greatly on marketing strategy in e-commerce, and thus could be an important criteria for the classification. Based on those variables, products in e-commerce are separated into several groups, and distinctive strategies are recommended for each group.

3. Research framework

This research aims to establish a taxonomy for online service goods. First, online service goods were extracted and the variables for classifying them were reviewed. Next, factor analysis was performed on the values for selected variables as collected through a survey. The factors resulted from factor analysis were used to produce the taxonomy, and the features of each group examined to draw strategic implications. The entire process is summarized in Fig. 1.

3.1. Identification of online service goods

Though online service goods are difficult to define due to the unclear definition of service, an obvious definition was required

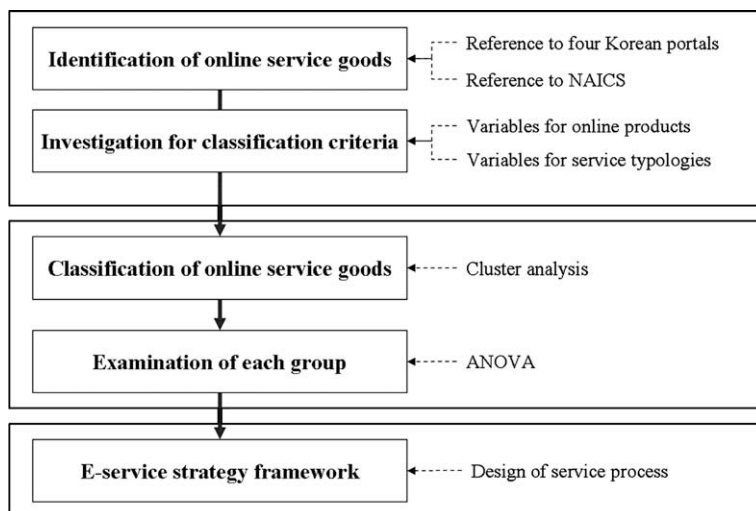


Fig. 1. Overall research process.

for this research. To this end, goods meeting the following requirements were designated as online service goods. First, an e-commerce transaction must be possible for the characteristic 'online' to apply, second, the nature of a 'service' demands intangibility of product, and finally the definition of 'goods' implies that an expense is incurred in their purchase. Hence online service goods shall be defined as "items that are paid for, that have some degree of intangibility, and where the transaction is via e-commerce". Four of the largest Korean Portal Sites (Daum, Yahoo, Empas and Naver) were analyzed to extract the service goods. This approach assumes that most e-commerce service goods are available on or through the Portal Sites: as Korea holds a dominant position in IT, and as Portal Sites are evolving toward including most products and services (Telang & Mukhopadhyay, 2004), this assumption seems to be acceptable. Nevertheless, NAICS (North American Industry Classification System) was introduced to make up for any limitations in this approach. Consequently, 45 items were derived as subjects of study.

3.2. Classification of online service goods

We investigated factors that best serve to describe the characteristics of service goods in e-commerce, looking both at offline services and e-commerce products. Then, after considering the customer's view-point, we arrived at 11 variables appropriate to be included in a classification scheme. Among them, six are specific to traditional services, three to e-commerce products, and the remaining two are common to both. Those variables are given in Table 1 and will be explained briefly in the following paragraphs.

'Criticality for the customer (CRI)' measures the degree of urgency in processing the service at the point of purchase (Cohen

et al., 2000). 'Importance of professional knowledge (PRO)' emphasizes the degree of customer concerns about levels of professional knowledge in selecting the service provider (Cho & Park, 2002). 'Degree of labor intensity (LAB)' means the relative importance of human resources in producing and supplying services (Lovelock, 1983; Schmenner, 1986). 'Degree of interaction (INT)' indicates the frequency of interactions between service provider and customer during the delivery process (Chase, 1978). 'Degree of customer contact (CON)' refers to the time per transaction a customer spends in the service system (Silvestro et al., 1992). 'Necessity of membership relation (MEM)' signifies customer expectations as to the type of relationship with the service organization, e.g. whether it involves a membership relationship or not (Schmenner, 1986). 'Degree of customization (CUS)' concerns the level of adaptation by service processes to meet individual customer needs (Kellogg & Nie, 1995; Lovelock, 1983). 'Necessity of offline contact (OFF)' tests the customer's perception as to the need for offline services, in terms of his/her convenience or trust, or because of physical characteristics in the delivery process (Cho & Park, 2002). 'Frequency of purchase (FRE)' measures customer perceptions about how often service purchases occur – it is generally accepted that frequently purchased goods are more likely to be e-commercially successful (Kotler et al., 1998). 'Feature of search goods (EXP)' focuses on the need for prior experience when obtaining a service, with regard to the search or experience characteristics of goods (Poon & Joseph, 2000). The final variable 'price (PRI)' measures customer perceptions as to the average price of online service goods. Customers tend to be highly involved in expensive services, regarded their purchase as being associated with more risks and are therefore more reluctant to buy them through Internet (Peterson et al., 1997).

4. Empirical study

4.1. Data collection

A customer survey approach was adopted to collect the necessary data, and a questionnaire-based survey was conducted. The questionnaire was composed of three categories of questions focusing on the demographic profile, online service goods characteristics, and the preference for online as against offline. The demographic profile includes the respondent's age, gender, occupation, e-commerce purchasing experience, tendency to buy products/services through Internet, etc. The online service goods characteristics

Table 1
Variables for classification

Traditional service variables	<ul style="list-style-type: none"> • Criticality for customer (CRI) • Importance of professional knowledge (PRO) • Degree of labor intensity (LAB) • Degree of interaction (INT) • Degree of customer contact (CON) • Necessity of membership relation (MEM)
Online goods variables	<ul style="list-style-type: none"> • Frequency for purchase (FRE) • Features of search goods (EXP) • Price (PRI)
Variables relevant to both	<ul style="list-style-type: none"> • Degree of customization (CUS) • Necessity of offline (OFF)

included the customer's acknowledgement of the 11 variables for 45 online service goods. Each variable was measured with five-point Likert scale ranging from 'none' to 'much'. Finally, online/off-line preferences were measured with a question asking whether respondents would still use online services when similar services were offered offline.

The respondents were prospective customers, with people in their twenties or thirties based in Seoul, Korea selected as the sample frame. This group is mostly accustomed to using the Internet and willing to pay for purchases via e-commerce: responses from respondents with no e-market experienced were removed. A total of 164 questionnaires were collected: the average age of respondents was 25.2 years, and 73.17% were male, 26.83% female.

4.2. Classification results

The primary methodology in making our taxonomy of e-commerce services was to implement cluster analysis on the 45 online service goods using 11 variables. Before applying the approach, a correlation analysis was performed among the 11 variables to ensure their independence, as a prerequisite for cluster analysis. Since almost all of the variables are significantly correlated to each other, factor analysis was performed to combine those variables. Conducting PCA (Principal Component Analysis) with Kaiser Normalization produced three principal component (PC)s. The most frequently used criteria to determine the number of PCs is eigenvalues greater than 1, nevertheless, a degree of total variance explaining over 70% was applied in this research to minimize data loss. Two of the PCs had eigenvalues greater than 1 and one had an eigenvalue of less than 1, preserving 85.1% of the total variance. The result of factor analysis is presented in Table 2.

More than half of the variables are associated with PC1, reflecting the characteristics of the customer/provider relationship, and PC1 can therefore be referred to as "intimacy between service providers and customers". On the other hand, PC2 is related to CRI and MEM and can be referred to as "customer involvement on service goods transaction". Finally EXP and OFF have high factor loadings on PC3 and which was called "importance of offline factors in the provision of online service goods" since these two variables concerned the possibility of 'pure' online service provision. Next, online service goods were classified through a cluster analysis based on these three PCs. First, hierarchical clustering was run to determine the number of clusters. K-means clustering was then carried, which grouped 40 services into six clusters, excluding five outliers. The results are shown in Table 3 and Fig. 2.

Cluster 1 includes six service goods related to standard digital contents or medium-low priced service reservation and purchase. Cluster 2 includes 10 service goods related to consulting or expertise services. Cluster 3 is specialized around educational services or intellectual property transactions. Cluster 4 consists of four elements that stress customer's confidence in service providers, as all of them are related to medical or financial services. Cluster 5 includes only three service goods, which are usually purchased just for fun. Cluster 6, which includes 11 service goods, is centered on lending or mediation services that require offline facilities and trust.

Table 2
Integrated factors for customer perception

PC (eigenvalue)	FRE	CRI	EXP	PRI	PRO	LAB	OFF	CUS	INT	CON	MEM
PC1 (7.394)	-0.885	0	0.321	0.776	0.798	0.827	0.406	0.848	0.748	0.830	0.528
PC2 (1.306)	0.158	0.903	0.568	0.227	0.453	0.230	0.163	0.331	0.301	0.277	0.693
PC3 (0.662)	-0.238	0.291	0.643	0.314	0.161	0.281	0.844	0.253	0.478	0.317	0

Table 3
Taxonomy of online service goods

Cluster	List of related online service goods
1	News and sports provision, internet broadcasting, entertainments including game, music, movie and VOD, concert, sports, performance ticket reservation and contract, cellular phone related contents, online books
2	Legal counseling, private banking, bonding and stocks, job consulting and employment, general management counseling, security system related services, credit standing counseling, marketing research and public opinion polling, scientific and technical consulting and R&D related service, computer programming
3	Language and computer education, virtual university, all insurance and insurance related services, online transaction of low priced software, online transaction of intellectual rights and professional technologies, web translation
4	Medical and dental counseling, database and data processing, accounting and taxation, financial information provision
5	Fortune telling, internet gambling and lottery, voice telephone
6	Hotels, wedding halls, convention centers reservation and contract, online used car sales, travel agencies and tour operators, loan, machinery and equipment rental, maintenance and repair of equipment related services, transport equipment rental, wedding counseling and marriage related services, construction and remodeling related consulting and contract, real estate related services, installation of computer hardware related services
Others	Internet folder, airline, bus, train ticket reservation and contract, moving reservation and contract, photo printing, general banking

4.3. Characteristics of each group

In light of the service types included, these six clusters were designated as: Mass Services (Cluster 1), Professional Services (Cluster 2), Intellectual Services (Cluster 3), Credit Services (Cluster 4), Support Services (Cluster 5) and Facility Services (Cluster 6). Post-hoc comparisons were run, using LSD (Least-Significant Difference) for the seven variables meeting the equal variances assumption and Tamhane's test for the others. The results of comparison analysis are shown in Table 4. For 11 variables, a higher score means higher customer expectation on each variable. The abbreviated form PRE stands for the online/offline preference, with a value range from 0 to 1: the closer to 1, the more the preference for online as against offline transactions.

Mass services exhibit some extreme features. They, including some of the most frequently purchased services, are regarded as the cheapest ones, and the least essential for customers. They are a kind of 'search' goods, and simple text or graphical information about them is enough for customers to make a buying decision. This fact is associated with the remaining results: they require the least levels of professional knowledge, labor force, interactions between service providers and customers, customer contact with website, and even need for membership relationships. Those features enable mass services to be traded in e-commerce easily, and they show the highest preference for online purchases, confirming the previous studies' results. The service delivery processes can be standardized and automated, as customers need little interaction with service providers and the degree of customer involvement in purchases is low. Therefore, cost efficiency strategies, corresponding to those suggested by Shostack (1977) or Hill and Jones (2004), would be effective. Moreover, it is necessary to expose the services to as many people as possible, as customers tend

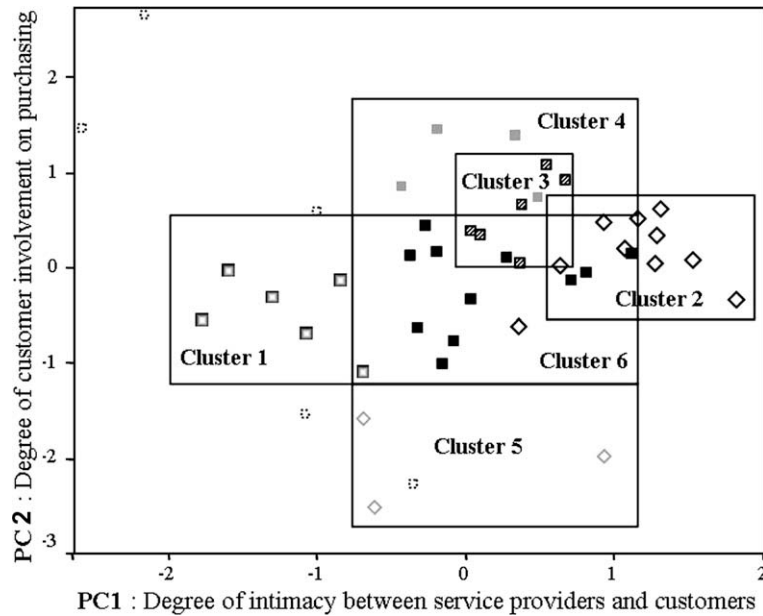


Fig. 2. Mapping by 2 PCs.

Table 4
Comparison among six service groups

	Mass services	Professional services	Intellectual services	Credit services	Support services	Facility services	Comparison
FRE	3.851	2.060	2.706	2.843	2.724	2.406	2, 6, 3, 5, 4 < 1
CRI	2.961	3.403	3.534	3.935	2.216	3.415	1 < 3, 4
EXP	3.567	3.824	3.807	4.089	2.831	3.923	1 < 6, 4
PRI	2.603	3.490	3.184	3.298	2.589	3.281	5, 1 < 3 < 4, 2 5, 1 < 6
PRO	2.482	4.419	4.062	4.489	2.481	3.666	1, 5 < 6 < 4, 2, 3
LAB	2.564	3.929	3.519	3.548	2.228	3.385	5, 1 < 6, 3 < 2 5, 1 < 4
OFF	2.382	3.357	3.104	3.426	1.859	4.022	5, 1 < 3, 2, 4 < 6
CUS	2.605	4.247	3.728	3.946	2.589	3.775	5, 1 < 3, 6, 4, 2
INT	2.568	3.738	3.295	3.564	2.198	3.663	5, 1 < 3 < 6, 2 5, 1, < 4
CON	2.139	3.603	3.421	3.261	1.907	3.388	5, 1 < 6, 3 1 < 4, 2
MEM	2.652	3.855	3.784	3.630	2.546	3.537	5, 1 < 3, 2 1 < 6
PRE	0.891	0.500	0.652	0.599	0.480	0.568	2 < 3 < 1 5, 6, 4 < 1

to select the provider most convenient to them, there being no great differences between different providers.

Professional services indicate other extreme features, with exactly the opposite characteristics to those of mass services. Service goods in this category are purchased rarely, and are generally expensive, probably on account of the requirement for professional knowledge, a costly labor force, and highly customized delivery processes. Customers therefore have greater interactions with providers, both in terms of frequency and their contact time with the service system. For these services, offline delivery is preferred to online, because it is difficult to meet such customer needs via online channels. For these services to succeed in an e-commerce context, advertising should focus on the quality of the service providers. Such services can be customized by increasing the frequency of customer–provider interaction, and a membership system may be helpful.

Intellectual services can be placed in the middle of these two extremes. They are medium-priced, but critical to customers, and some degree of professional knowledge and customization are required. These services are mainly related to transactions of intellectual property and educational contents, and thus customer will stay a relatively long time in service systems to achieve a satisfactory purchase, appreciates being managed via a membership relationship. Also, since these kinds of intangible properties or digital contents can be delivered without great effort through online

channel, but depend on trust between customer and provider being guaranteed, online preference is the second highest among the six groups. For services in this category, the functional quality strategy as proposed by Shostack (1977) seems applicable, which focuses on high service process quality, such as user friendly interfaces, or instant and satisfactory responses to customers during service delivery. The superior quality of contents is of major concern to customers selecting a service provider, and should therefore be emphasized by marketers.

Services falling within *credit services* are similar to professional services but are restricted to medical or financial areas, which tend to be critical to customers. Customers therefore take a cautious attitude both to selecting service providers and to purchasing such services through online channels. For e-commerce credit services to succeed, successful customer relationship management (CRM) is essential, through designing customer-oriented service processes and improving communications ability in order to gain and retain customer confidence. Not losing the customer is the key to success, and building customer loyalty to develop the relationship long-term will be a significant aim: here, loyalty programs could be helpful.

Support services are similar to mass services, but are not purchased as frequently and do not depend so much on prior experience or offline contact. They are also not essential to the customer, though that factor is not statistically significant, and

Table 5
Generic strategies for six service groups in e-commerce

	Operational strategy	Marketing strategy
Mass services	<ul style="list-style-type: none"> • Cost efficiency <ul style="list-style-type: none"> – Standardization/automation 	<ul style="list-style-type: none"> • Advertising widely <ul style="list-style-type: none"> – Let many potential customers know
Professional services	<ul style="list-style-type: none"> • Individualization <ul style="list-style-type: none"> – Interaction based – Communication ability 	<ul style="list-style-type: none"> • Advertising on specialty <ul style="list-style-type: none"> – Give customers confidence in labour force
Intellectual services	<ul style="list-style-type: none"> • Functional quality <ul style="list-style-type: none"> – Membership based – Service processes 	<ul style="list-style-type: none"> • Advertising on intellectual property <ul style="list-style-type: none"> – Offer service superiority + security
Credit services	<ul style="list-style-type: none"> • CRM <ul style="list-style-type: none"> – Customer oriented – Communication ability 	<ul style="list-style-type: none"> • Building customer loyalty <ul style="list-style-type: none"> – Loyalty programs/long-term relations
Supporting services	<ul style="list-style-type: none"> • Cost efficiency and differentiation <ul style="list-style-type: none"> – Standardization/automation – Focused differentiation 	<ul style="list-style-type: none"> • Arising customer's interest <ul style="list-style-type: none"> – Appeal to curiosity/instant promotion
Facility services	<ul style="list-style-type: none"> • Technical quality <ul style="list-style-type: none"> – Superior facilities – Service results 	<ul style="list-style-type: none"> • Advertising on offline facilities <ul style="list-style-type: none"> – Build trust in service provider

mostly are used just for fun. As with mass services, there is little customer involvement in the purchasing process, which can therefore be standardized, and standardized/automated systems should be introduced to pursue cost efficiency strategies, where possible. However, such strategies alone cannot guarantee success, since customer purchases these services to receive an extraordinary experience, and such needs are hard to satisfy through a purely online channel. Indeed, in comparison with mass services, online is preferred less to offline for these services, despite the fact that the two groups show similar results against most variables. For these services to succeed in e-commerce, various differentiation strategies offering excitement should be employed together. More attention should be given to increase customers' temporary interest in the service, since inducing them to purchase is more important than building their loyalty. Marketing events that appeal to customer curiosity, or which offer chances in instant promotions, would be a great help.

Finally, *facility services* are rarely purchased and rather expensive. They can be classed as experience goods, meaning that not only information but also physical experience of the services are important to enable the customer to make a purchase decision. Facility services require greater offline contact, which means that offline facilities are needed to complete the service sale or delivery process. Nevertheless, there is little need for interaction, customization, customer contact or professional knowledge, and thus online service may be preferred to offline, if not yet. In this case, the technical quality strategy suggested by Shostack (1977) can be applied, which focuses on improving service results by investing in specialized facilities, high-tech instruments and so forth. It is recommended that such investments should be specialized to a particular area, and the process made more complex using superior offline facilities. For facility services to succeed, it is important to advertise the offline facilities well, including offering full graphic descriptions, explanations of superiority over competitors' products, etc, as these are important elements of the service process. (The strategic implications noted here are summarized in Table 5.)

5. Conclusions

This study attempts to generate taxonomies for service goods traded by e-commerce. Contrary to previous studies which have mostly emphasized tangible goods, it highlights intangible goods or services. 45 online service goods were extracted from Korean Portal Sites and classified into six groups – mass, professional, intellectual, credit, support and facility services. Each group presents distinctive characteristics, which can be used to develop

operational and marketing strategies to avoid losing sales because of poor customer perceptions. These research findings are advantageous for service firms considering applying e-commerce channels to their current business model. Our introduction of a taxonomy rather than a typology, considering customer perception, has been designed to yield more practical insights.

Despite what we feel are meaningful contributions, there are certain limitations. One has to do with the survey method and the bias relating to sample selection. The sample frame is restricted to the Korean context, and cultural/racial factors may bias the study results. Also, all the survey items developed for this research require a validity test. Another limitation relates to the extraction method for online service goods, in that the objects of study depend on services only available from the Korean Portal Sites. An extension for further research should encompass all possible types of service goods in e-commerce. Lastly, there is the issue related to the preference for using online or offline channels for service delivery. The same data could have analyzed to understand more about the factors influencing this preference, and the mechanism behind this influence. A better appreciation as to the mechanism would help service firms to a better understanding of drivers of e-commerce.

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