

Classification of Internet Products and Evaluation of Application Utilization Based on the Product Fulfillment Process

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Abstract: - These days, many traditional services have been moved or planning to move to the electronic environment. Therefore, it is critical for enterprises to understand the users' motivations about the applied e-service applications. Internet goods and services have been categorized on two scopes, the product type and the fulfillment process in 2*2 matrix. This main goal of this paper is to assess the e-service usage based on these four areas. In this regard, fourteen e-service applications were classified under these four dimensions and then a survey was developed and distributed among 172 e-service users. The results show that Internet products which are electronic services are mostly used.

Key-Words: - E-service, Product, Fulfillment Process, E-service Prototype, E-commerce, Classification of Service

1 Introduction

In today's intensive competitive environments the design and delivery of innovative, flexible, and effective services is of paramount importance for business success [1, 2]. The term "service" has many different meanings depending on the field of expertise and the perspective it is considered from. Different terms for e-service exist to denote differences in the type or application of service. Gartner [3] defined "e-service" as including the processes, policies, procedures, people, tools, and technologies that enable enterprises to provide assisted and unassisted customer service using the Internet as its platform.

Customers use the new technologies to produce and consume services without direct personal contact with companies. Electronic services can be utilized to deliver the products and services effectively. In other words, it can transform and mechanize the customers' relationship and marketplace. Consequently, several firms have been already begun or have plan to develop and implement the e-service to expand their performance effectiveness and efficiency [4].

E-services are nonlocational and nontemporal so they would reduce the cost of any transaction [5]. However a system can improve the job performance

but sometimes users are not eager to use the systems [6, 7].

Implementing e-services is a central strategic imperative for many consumer related businesses and while the technology protocols are developing quickly, little is known about how consumers perceive and evaluate e-services, as well as what attributes of the human computer interface e-service providers can use to encourage rapid consumer adoption [8]. Electronic method is believed to lead to better delivery of services, improved interaction with business and industry, citizen empowerment through access to information, or more efficient government management [4].

Nowadays, e-services are applied in various applications such as e-ticketing, e-government, e-commerce, e-health, e-banking, e-booking, e-education [9-13]. Francis and White [14] classified Internet goods and services on two dimensions, the products and the fulfillment process. This study is going to categorized the fourteen introduced services [4] under the 2*2 matrix to evaluate the usage of these services base on the defined classes.

2 Prototypical of E-Service

Three existent types of electronic service have been illustrated by [15] that are describe bellow:

2.1 Complements to existing offline services and goods

Complementary e-services may enable firms to add value to their existing services and goods [15]. For example, airlines' passengers are allowed to change their seats on the plane electronically. Some firms proffer technical support and after sale services to their customers through company's website like Cisco [15]. Additionally, using the electronic channels provide organization the ability to collect information about their customers, hence they would be able to improve services based on customers' knowledge [16].

2.2 Substitutes for existing offline services

Hofacker et al. [15] stated that "many firms utilize e-services as virtual substitutes for classic offline services". Retailers utilize e-services to add additional value and benefits such as adding more colours and sizes, cost reduction and capability of backordering. For example, Amazon added valuable features compare to other bookstores such as the review of books that assist customers to have a better selection. Furthermore, Netflix provides a possibility to its customers to search among the plenty of movies titles online and will deliver the selected DVDs by mail [15]. Customization [17] and recommendation [18] strategies are implemented effectively via an electronic environments than in person and these strategies may raise customers benefits and decrease cost, consequently make competitive advantage.

2.3 Uniquely new core services

Recently, enterprises develop new e-services to provide some innovative services that previously could not be offered as offline services [15]. For example, World of War Craft as an online game provider hosts a large numbers of gamers interacting in a shared virtual universe at the same time. Similarly, Google Map service with more information and superior flexibility than traditional paper maps provide many new valuable benefits to general users, governments, businesses and real estate brokers, for instance, it is available to users and assists them to simply find an address [15].

3 Categorizing of Internet Products

Lovelock's [19] identifies four service categories. On a 2*2 matrix, one axis separates services that require the customer to be present (like restaurants) from those that do not (like lawn-mowing) while the second divides relatively intangible services (like

education) from tangible services (like haircutting) [19].

The fulfillment-product classification scheme (see Figure 1) segments Internet retailing into four categories. In the offline-goods category, consumers order and pay for tangible goods through a retailing Web site then wait, essentially, while the firm dispatches the goods via offline, physical distribution channels.

Regarding offline services, the purchase is akin to making a booking or reservation and, depending on the core service, consumers may travel to the firm's offline service delivery location or the firm may travel to the consumer [14]. Where the offline categories involve a delayed payment-product exchange, the electronic categories facilitate a simultaneous payment-product exchange.

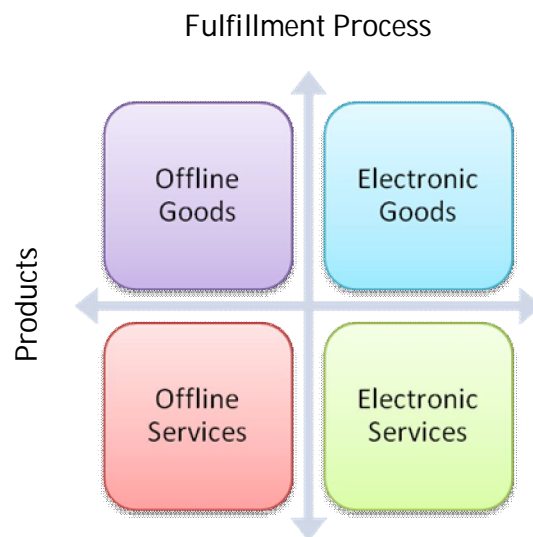


Figure 1. Fulfillment-product classification scheme

In the case of electronic goods, consumers download digital versions of desired goods via the Internet then prepare the product for consumption. With electronic services, consumers establish an account or membership with an online service provider then obtain access to, and consume, the core service offering whilst online [14].

Granted, all classification systems have limitations [19] and subdividing the categories would be possible to distinguish between high and low involvement purchases. However, the fulfillment product classification scheme has the potential to facilitate a more in-depth examination of Internet shopping value than has to date been performed [14].

Table 1 show the brief description of these classes.

Table 1. Fulfillment-product classification scheme (source: [14])

		Fulfilment process	
		<i>Offline</i>	<i>Electronic</i>
Product	<i>Goods</i>	Costumer orders and pays for product then disengages from website Retailers dispatches goods via physical delivery channels Delayed exchange completed in offline environment Such as: Groceries, CDs, Clothing, DVDs, Books and tangible	Costumer pays and downloads products from the retailers' website Costumers installs and/or prepares product for consumption Simultaneous exchange reliant on sustained interaction with website Such as: Electronic art, Digital Journals, Software and MP3s
	<i>Services</i>	Costumer books and pays via website Costumers travels to service location Core service product produced in offline environment Such as: Trades services, Travel and Hotels	Costumer established account or membership and pays online Costumers produced and consumes service offering via website Simultaneous exchange reliant on sustained interaction with website Such as: Chat sites, Banking and Share trading

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4 Methodology

The survey has been developed and distributed among the 172 e-service users to answer which of the introduced applications they are using. Afterward the mean for each of the applications are calculated. Subsequently, according to the classification of Internet Products (Offline Goods, Offline Services, Electronic Goods and Electronic Services), the geometric mean will be analyzed and compared.

5 Analysis

Table 2 shows the demographic information of the respondents.

Table 2. Demographic information of the respondents

Question	Items	Percentage
<i>Gender</i>	Male	44.2
	Female	55.8
<i>Age</i>	19 or Under	0
	20-24	48.8
	25-29	23.8
	30-34	16.9
	35 or older	10.5
<i>How frequently do you use e-services</i>	Daily	18.5
	Weekly	23.8
	Monthly	40.7
	More than once a day	14.5
	None	3.5

Table 3 shows the e-services' application usage. As it can be seen, Journals (Scientific Papers) with 75%

has the highest usage and then Using Web search engines and Downloading notes and form with respectively 73% and 64% have the top ranks. On the other hand, the lowest usage is for E-library (Downloading Books) by only 4% and after that

Buy books, CDs and DVDs, buy a concert or cinema ticket, travel services and Online TV, Radio, Game, Newspaper, Gamed, Music and Movie with 14.5% and 15% have the lowest positions.

Table 3. E-service applications usage

Class of e-service	Application (service)	Count	Percentage	Geometric Mean (Percentage)
Offline Goods	Buy clothes and shoes	30	17.5	17.18
	Buy books, CDs and DVDs	25	14.5	
	Buy any other commodities (jewellery, watches, food ...)	35	20	
Offline Services	Buy flight or train ticket	69	40	20.80
	Buy a concert or cinema ticket	26	15	
	Travel services	26	15	
Electronic Goods	Journals (Scientific Papers)	129	75	30.31
	E-library (Downloading Books)	7	4	
	Any kind of downloading (Music , Movies ..).	77	44	
	Downloading notes and form	110	64	
Electronic Services	Financial services (check exchange rates, bill payment and transfer money)	35	60	38.37
	Using Web search engines like Google	125	73	
	Communication services (Email and chat sites, forums and ...)	57	33	
	Online TV, Radio, Game, Newspaper, Gamed, Music and Movie	26	15	

Additionally, the last column shows the geometric mean of each Internet product classes which have been calculated as below:

If “a₁, a₂, ..., a_n” are non-zero positive numbers, then their G.M.(G) is given by:

$$G = (a_1 * a_2 * a_3 * \dots * a_n) * 1/n$$

Therefore, Internet products which are electronic services with 38.37% are most used, whereas, offline goods with 17.18% has the lowest level of usage.

5 Conclusion

It is believed that both enterprises and costumers would like to employ the electronic services. Furthermore, in a quantity of entertainment industries like music download, if corporations do not supply electronic services it may result in less competitive thus it is expected that they also have the high level of electronic services penetration [20].

Moreover, it is clear that customers are not eager to use the offline goods because they may not trust on the firms and also the quality of the product. Instances are commodities, shoes, books that are delivered physically.

The results of this study show that most of the users are using electronic services and afterward the electronic goods. For future work, the characteristics of electronic services might be considered to find their affect on the usage of electronic services.

References:

- [1] Gounaris, S.P., V. Stathakopoulos, and A.D. Athanassopoulos, *Antecedents to perceived service quality: an exploratory study in the banking industry*. International Journal of Bank Marketing, 2003. 21(4): p. 168-190.
- [2] Jarvenpaa, S. and P. Todd, *Consumer reactions to electronic shopping on the world wide web*.

- International Journal of Electronic Commerce, 1997. 1(2): p. 59-88.
- [3] Gartner, *Expects Rapid Market Consolidation On E-Services Front*. Cc News; Yarmouth, 2001. 3(9).
- [4] Taherdoost, H., S. Sahibuddin, and N. Jalaliyoon, *Estimation of Electronic Services Usage based on the Applications' level of Digitalization and Co-Creation*. In Press.
- [5] Watson, R.P., et al., *U-Commerce: Expanding the Universe of Marketing*. Journal of the Academy of Marketing Science, 2002. 30(4): p. 333-347.
- [6] Nickerson, R.S., *Why Interactive Computer Systems Are Sometimes Not Used by People Who Might Benefit from Them*. International Journal of Man-Machine Studies, 1981. 15: p. 469-483.
- [7] Mathieson, K., *Predicting user intentions: comparing the technology acceptance model with the theory of planned behavior*. Information Systems Research, 1991. 2(3): p. 173-191.
- [8] Featherman, M. and M. Fuller. *Applying TAM to E-Services Adoption: The Moderating Role of Perceived Risk*. in the *36th Hawaii International Conference on System Sciences*. 2003. Hawaii: IEEE.
- [9] Taherdoost, H., S. Sahibuddin, and N. Jalaliyoon, *Smart Card Security; Technology and Adoption*. International Journal of Security, 2011. 5(2): p. 74-84.
- [10] Taherdoost, H. and M. Masrom. *An Examination of Smart Card Technology Acceptance Using Adoption Model*. in *31st International Conference on Information Technology Interfaces (ITI)*. 2009. Cavtat, Croatia.
- [11] Taherdoost, H., M. Zamani, and M. Namayandeh. *Study of Smart Card Technology and Probe User Awareness about It: A Case Study of Middle Eastern Students*. in *International Conference on Management Technology and Applications (ICMTA 2009)*. 2009. Beijing, China: IEEE.
- [12] Taherdoost, H., M. Masrom, and Z. Ismail, *Adoption model to assess the user acceptance of smart card technology*. Journal of US-China Public Administration, 2009. 6(3): p. 47-58.
- [13] Taherdoost, H., et al., *Smart Card Adoption Model: Social and Ethical Perspectives*. International Journal of Research and Reviews in Computer Science, 2012. 3(4): p. 1792-1796.
- [14] Francis, J.E. and L. White, *Value across fulfillment-product categories of Internet shopping*. Managing Service Quality, 2004. 14(2/3): p. 226-234.
- [15] Hofacker, C.F., et al., *E-Services: A Synthesis and Research Agenda*. Journal of Value Chain Management, 2007. 1(1/2): p. 14-44.
- [16] Iqbal, A., R. Verma, and R. Baran, *Understanding consumer choices and preferences in transaction-based e-services*. Journal of Service Research, 2003. 6(1): p. 51-65.
- [17] Rust, R.T. and P.K. Kannan, *E-Service: A New Paradigm for Business in the Electronic Environment*. Communication of the ACM, 2003. 46(6): p. 36-42.
- [18] Ansari, A., S. Essegai, and R. Kohli, *Internet Recommendation Systems*. Journal of Marketing Research, 2000. 37(3): p. 363-375.
- [19] Lovelock, C. and J. Wirtz, *Services Marketing* 6th Edition ed. 2006: Prentice Hall.
- [20] Sheth, J.N. and A. Sharma, *E-Services: A Framework for Growth*. Journal of Value Chain Management, 2007. 1(1/2): p. 8-12.