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Winter 12-1-2010

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## Measuring E-Marketing Mix Elements Based on Associated E-Marketing Tools in E-Commerce

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### Abstract

E-marketing strategy is normally based and built upon the traditional 4 P's (Product, Price, Promotion and Place) that forms the classic marketing mix. Nowadays, what gives e-marketing its uniqueness is a series of specific and relational functions that are combined with the 4P's to form the e-marketing mix elements, each of which contain associated e-marketing mix tools that are provided on business web sites to facilitate sales transactions. This paper evaluates the importance of each e-marketing tool related to its e-marketing mix element. Furthermore, the weight of each e-marketing mix element is determined. This paper concludes with a discussion of the relative weights of e-marketing tools.

widely considered in the formation of the current marketing strategy.

Before the electronic age, McCarthy introduced the 4Ps (product, price, place and promotion) standardization of the marketing mix as a core unifying construct [5]. Subsequently, several e-marketing mix models became available [1] [2] [4]. Since our research context focuses on the analysis of e-marketing tools provided on business web sites to facilitate sales transactions, only the  $4Ps+P^2C^2S^3$  model [2], developed by Kalyanam and McIntyre who mapped e-marketing tools to the  $4Ps+P^2C^2S^3$  model, illustrated in Table 1, is suitable for this research.

### Introduction

As a result of the increased utility and bandwidth of Internet communications, the usage of web browsers has increased dramatically over the last ten years. Many users make use of browsers to get different types of information in different media such as text, graphic, animation, audio and video. Thousands of businesses have exploited this great opportunity to create their own web sites that allow customers to purchase products directly from their browsers. Most commercial companies believe that they can generate a large amount of profit from the web.

Although many web businesses terminated operations or ceased to exist from April 2000 to December 2001, those e-retailers that developed and introduced new internet-based marketing techniques (e-marketing) have prospered. Successful strategies have been

### $4Ps+P^2C^2S^3$ Model

Waterschoot and Van den Bulte (1992) pointed out that the components of "communication" address "barriers to wanting", whereas the sales promotion function addresses "barriers to acting". They observed that "triggers to customer action" seem necessary in certain situations to induce the exchange. Hence, they termed sales promotion a "situational" function. On the basis of these distinctions, the marketing mix can be reclassified into the "basic mix" and the "situational mix". In addition, since the sales promotion mix can apply across the full spectrum of the basic mix (the rest of the traditional marketing mix), it is considered by Waterschoot and Van den Bulte to be overlapping. The concepts developed by Waterschoot and Van den Bulte (1992) can be summarized in the form of the following axioms:

Axiom 1: Marketing functions are the appropriate properties for the classification of marketing tools.

Axiom 2: Some functions are essential and others are situational in nature.

Axiom 3: Some functions have a moderating effect across other marketing functions and are called overlapping functions.

Axiom 4: Functions are accomplished by marketing tools.

Axiom 5: A tool can serve one or several functions.

Based on the above axioms, Kalyanam & McIntyre created a new E-marketing mix model [2] as illustrated in Figure 1 and mapped the marketing tools to the new e-marketing mix model, as illustrated in Table 1.

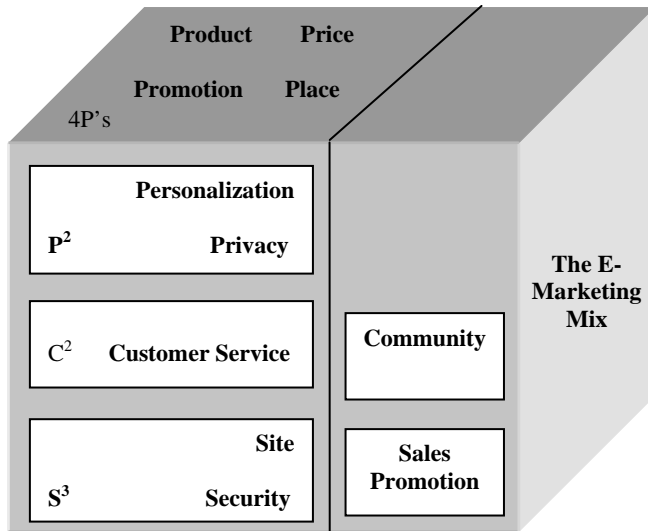


Figure 1: E-Marketing Mix Model: 4Ps + P<sup>2</sup>C<sup>2</sup>S<sup>3</sup> (Kalyanam & McIntyre, 2002)

Table 1: E-marketing tools mapped to the e-marketing mix model

E-Marketing Mix Elements	Supporting E-Marketing Tools
Product	Assortment
	Configuration Engine – configure products
	Planning and Layout Tools
Promotion	Online Advertisements
	Outbound Email
	Viral Marketing
	Recommendation
Place	Affiliates
	Remote Hosting
Price	Dynamic Pricing
	Forward Auctions
	Reverse Auctions
	Name your price
Personalization	Customization

	Individualization – send notice of individual preference
	Collaborative Filtering
Privacy	Privacy policy
Customer Service	FAQ & Help Desk
	Email Response Mgmt.
	Chat rooms between customers and supporting staff
	Order tracking
	Sales return policy
Community	Chat Rooms
	User Ratings & Reviews
	Registries & Wish Lists
Site	Home Page
	Navigation & Search
	Page Design & Layout
Security	Security tool(s)
Sales Promotion	E-Coupons

The emergence of the Internet has caused consumer markets to evolve into the highly interactive and global shop fronts of today. The marketers have shifted their focus towards satisfying personalized needs rather than aggregate needs in order to obtain higher market share on the global market. The e-marketing tools provided by online businesses can influence consumer retention on the Internet [6]. Marketing plans can hardly be complete without a blending of the e-marketing tools into the e-marketing mix to form an effective marketing strategy [2] [3].

However, there has not yet been significant research on the analysis of the importance of e-marketing tools relative to their associated e-marketing mix

elements. The purpose is to evaluate how successful a business web site implements its e-marketing mix in a B2C environment.

### Methodology

Based on Table 1, there are two e-marketing tools (Forward Auctions and Reverse Auctions) omitted from our research as they are not used in a B2C environment. As a result, the e-marketing tools are converted to the following items as shown in Table 2 which will be analyzed in a survey.

Table 2: Twenty-eight items about e-marketing tools

1. Different categories of product items available
2. Tool that can allow me to configure preferred product components
3. Tool that can allow me to view a product image closely from different angles
4. Online advertisement
5. Newsletter e-mail sent to me
6. The business web site contains messages or video clips about some products that are so attractive that I will inform others about that.
7. Suggestions regarding complementary items for my interested item

8. The link to the business web site can be accessed from some web sites
9. The product items of the business web site can be available through the shopping page of search engines such as Yahoo
10. The price of product items in the business web site can be changed in response to changing supply and demand conditions
11. I can enter my target price of my preferred product so that the business web site can list out suitable items
12. When I return to the business web site, it can show all those items that I visited before.
13. When I log into the business web site, it will send notice to me about new items based on my interest.
14. Based on my interested items, there are some suggested items already purchased by those customers who have the same interest.
15. Messages about privacy such as “we will not sell your personal data...”
16. Frequently asked questions / Help page
17. Quick response from e-mail enquiry
18. Chat rooms between customers and supporting staff
19. Order status tracking
20. Sales return policy
21. Chat rooms available for customers to discuss different product items
22. User rating and review at the product web page
23. Registry and wish list
24. The homepage of the business web site defines its features and the product categories clearly.
25. The contents of the business web site should be well organized and the background format is matched with the text style and color.
26. Tool that can allow me to search product items easily in the business web site.
27. Security techniques such as data encryption and secure socket layer (SSL)
28. Electronic coupon

Based on the items shown in Table 2, an analysis of importance levels for e-marketing tools supporting the corresponding e-marketing mix elements was performed. According to Sam and Chatwin (2005), there is a strong correlation between e-marketing mix of online business and internet consumers' decision making styles. In order to analyze the e-marketing tools, a survey is conducted. Each item was measured by a scale from one to five, starting from “strongly agree” to “strongly disagree”. The survey data for the analysis were obtained from 263 consumers, some of whom were students and some were in employment.

The sample data had a mean age of 32.5 years and was evenly divided by sex.

For the data analysis process, we adopted factor analysis as a tool to design and analyze the importance levels of e-marketing tools supporting the corresponding e-marketing mix elements. Table 3 shows the results of factor analysis which categorize the 28 items into factors (elements of e-marketing mix) and shows the loading of each item (over 0.4).

Table 3: The loadings of each e-marketing tool corresponding to its e-marketing mix element

<i>Factor and corresponding items:</i>	<i>Loadings</i>
<b>Factor 1 – Product</b>	
Different categories of product items available	0.773
Tool that can allow me to configure preferred product components	0.810
Tool that can allow me to view a product image closely from different angles	0.423
<b>Factor 2 – Promotion</b>	
Online advertisement	0.748
Newsletter e-mail sent to me	0.761
The business web site contains messages or video clips about some products that are so attractive that I will inform others about them.	0.578

Suggestions regarding complementary items for my interested item	0.500
<b>Factor 3 – Place</b>	
The link to the business web site can be accessed from some web sites	0.719
The product items of the business web site can be available through the shopping page of search engines such as Yahoo	0.472
<b>Factor 4 – Price</b>	
The price of product items in the business web site can be changed in response to changing supply and demand conditions	0.642
I can enter any target price of the preferred product so that the business web site can list out suitable items	0.603
<b>Factor 5 – Personalization</b>	
When I return to the business web site, it can show all those items that I visited before.	0.400
When I log into the business web site, it will send notice to me about new items based on my interest.	0.819
Based on my interested items, there are some suggested items already purchased by those customers who have the same interest.	0.685
<b>Factor 6 – Privacy</b>	
Messages about privacy such as “we will not sell your personal data...”	0.600
<b>Factor 7 – Customer Service</b>	
Frequently asked questions / Help page	0.596
Quick response from e-mail enquiry	0.753
Chat rooms between customers and supporting staff	0.410
Order status tracking	0.721
Sales return policy	0.700
<b>Factor 8 – Community</b>	
Chat rooms available for customers to discuss different product items	0.796
User rating and review at the product web page	0.423
Registry and wish list	0.679
<b>Factor 9 – Site</b>	
The homepage of the business web site defines its features and the product categories clearly.	0.740
The contents of the business web site should be well organized so that the background format is matched with the text style and color.	0.763
Tool that can allow me to search product items easily in the business web site.	0.752
<b>Factor 10 – Security</b>	
Security techniques such as data encryption and secure socket layer (SSL)	0.791
<b>Factor 11 – Sales Promotion</b>	
Electronic coupon	0.620

Since factor loadings shown in Table 3 represent the correlation coefficients between the variables and the factors, they play an important role in determining the relative weight of each item contributing to its corresponding factor.

### Calculation of Relative Weights of E-Marketing Tools

The calculation of the relative weights of items (e-marketing tools) is based on the loadings of each item relative to its associated factor. The loading of an item refers to the weight of the item used to contribute to the corresponding factor. The formula is summarized as follows:

$$RW_i = \frac{Loading_i}{\sum_{j=1}^n Loading_j} \quad (1)$$

where  $RW_i$  is the relative weight of the  $i^{\text{th}}$  e-marketing tool with respect to a particular e-marketing mix element and  $Loading_i$  this is the loading of the  $i^{\text{th}}$  e-marketing tool with respect to a particular e-marketing mix element.

Based on Table 3 and Equation (1), the relative weight of each item is shown in Table 4.

Table 4: Relative weight of each item

<b>Factor and corresponding items:</b>	<b>Weight</b>
<b>Factor 1 – Product</b>	
Different categories of product items available	0.385
Tool that can allow me to configure preferred product components	0.404
Tool that can allow me to view a product image closely from different angles	0.211
<b>Factor 2 – Promotion</b>	
Online advertisement	0.289
Newsletter e-mail sent to me	0.294
The business web site contains messages or video clips about some products that are so attractive that I will inform others about them.	0.223
Suggestions regarding complementary items for my interested item	0.194
<b>Factor 3 – Place</b>	
The link to the business web site can be accessed from some web sites	0.604
The product items of the business web site can be available through the shopping page of search engines such as Yahoo	0.396
<b>Factor 4 – Price</b>	
The price of product items in the business web site can be changed in response to changing supply and demand conditions	0.516
I can enter any target price of the preferred product so that the business web site can list out suitable items	0.484
<b>Factor 5 – Personalization</b>	
When I return to the business web site, it can show all those items that I visited before.	0.21
When I log into the business web site, it will send notice to me about new items based on my interest.	0.43
Based on my interested items, there are some suggested items already purchased by those customers who have the same interest.	0.36
<b>Factor 6 – Privacy</b>	
Messages about privacy such as “we will not sell your personal data...”	1.0
<b>Factor 7 – Customer Service</b>	
Frequently asked questions / Help page	0.187
Quick response from e-mail enquiry	0.237

Chat rooms between customers and supporting staff	0.129
Order status tracking	0.227
Sales return policy	0.220
<b>Factor 8 – Community</b>	
Chat rooms available for customers to discuss different product items	0.419
User rating and review at the product web page	0.423
Wish list	0.679
<b>Factor 9 – Site</b>	
The homepage of the business web site defines its features and the product categories clearly.	0.328
The contents of the business web site should be well organized and the background format is matched with the text style and color.	0.338
Tool that can allow me to search product items easily in the business web site.	0.334
<b>Factor 10 – Security</b>	
Security techniques such as data encryption and secure socket layer (SSL)	1.0
<b>Factor 11 – Sales Promotion</b>	
Electronic coupon	1.0

### Measuring the weight of e-marketing mix element

The relative weights of e-marketing tools play a very important role in measuring their corresponding e-marketing mix element. Suppose there are  $n$  e-marketing tools inside an e-marketing mix element  $e$ . The formula for measuring the weight of e-marketing mix element is shown below:

$$W_e = \sum_{j=1}^n \begin{cases} RW_j \cdot X_j, & X_j = 1, \\ 0, & X_j = 0. \end{cases} \quad (2)$$

where  $W_e$  is the weight of an e-marketing mix element  $e$  and  $RW_j$  is the relative weight of the  $j^{\text{th}}$  e-marketing tool with respect to a particular e-marketing mix element  $e$ .  $X_j$  is the Boolean value

indicating whether the  $j^{\text{th}}$  e-marketing tool is supported. If  $X_j = 1$ , it means the  $j^{\text{th}}$  e-marketing tool is supported. If  $X_j = 0$ , it means the  $j^{\text{th}}$  e-marketing tool is not supported.

### Case Study

The measurement equation of the e-marketing mix elements shown in Equation (2) can be applied to a case study which involves two fictitious companies (Company A and B) showing their current status of supporting e-marketing tools. Table 5 shows part of the e-marketing tools supported by Company A and B.

Table 5: Weights of Product, Promotion and Customer Service elements for Company A and B

<i>Factor and corresponding items:</i>	<i>Company A</i>	<i>Company B</i>
<b>Factor 1 – Product</b>		
Different categories of product items available	1	1
Tool that can allow me to configure preferred product components	0	0
Tool that can allow me to view product image closely from different angles	1	0
<b>Weight of Product element:</b>	<b>0.596</b>	<b>0.385</b>
<b>Factor 2 – Promotion</b>		



Online advertisement	1	1
Newsletter e-mail sent to me	0	1
The business web site contains messages or video clips about some products that are so attractive that I will inform others about them.	0	0
Suggestions regarding complementary items for my interested item	1	1
<b>Weight of Promotion element:</b>	<b>0.483</b>	<b>0.777</b>
<b>Factor 7 – Customer Service</b>		
Frequently asked questions / Help page	1	0
Quick response from e-mail enquiry	1	1
Chat rooms between customers and supporting staff	0	0
Order status tracking	1	1
Sales return policy	1	0
<b>Weight of Customer Service element:</b>	<b>0.871</b>	<b>0.464</b>

Based on Table 5, Company A does not get enough support for Promotion element (weight:  $0.483 < 0.5$ ) while Company B does not get enough support for Product element (weight:  $0.385 < 0.5$ ) and Customer Service element (weight:  $0.464 < 0.5$ ).

### Conclusion

By evaluating the relative weight of each e-marketing tool with respect to its e-marketing mix element, the importance level of each e-marketing tool corresponding to its e-marketing mix element can be ranked. For Product element, the most important e-marketing tool is the configuration tool; while the online advertisement and newsletter are very important for the Promotion element. This guideline is very important for online stores when they are developing e-marketing plans. Furthermore, the weight of each e-marketing mix element plays a very important role for evaluating the overall performance of the e-marketing mix based on the supporting e-marketing tools. One of the future enhancements of this research is to develop an e-marketing mix analyzer tool to provide analysis capabilities to support e-marketing tools for online stores. The purpose is to allow online stores to develop more effective e-marketing plans based on the analysis of their e-marketing tools.

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