
Evaluating the effectiveness of E-Marketing Tools within the E-Marketing Mix Based on Algerian Airlines' Website/ Mobile Application Customers

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Abstract:

The purpose of this study is to evaluate and identify which e-marketing tools within their respective e-marketing mix elements are most effective according to Algerian Airlines' customers. Using a quantitative approach, primary data were collected from customers who booked flights via the airline's official website or mobile application, resulting in 128 valid responses. The findings reveal notable variations in the perceived effectiveness of e-marketing tools across different mix elements, identifying both the most effective tools and those that were less effective, with tools ranked accordingly.

Key words: E-marketing, e-marketing mix, e-marketing tools, Algerian Airlines.

Classification JEL: M31, L93.

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introduction:

The evolution of information technology (IT), particularly the internet, has transformed traditional marketing practices and given rise to electronic marketing, which refers to the use of marketing methods and practices in a virtual environment. In the airline industry, electronic marketing plays a key role in improving the customer experience through online platforms such as websites and mobile applications. These platforms allow airlines to offer various services, including online flight reservations, e-ticketing, and online check-in, making the booking process faster and more convenient.

To better understand and manage electronic marketing strategies, many researchers and practitioners rely on the e-marketing mix model, an extension of the traditional marketing mix adapted for the online environment. According to Kalyanam and McIntyre (2002), the e-marketing mix comprises eleven components (4Ps + P2C2S3) consisting of product, price, promotion, place, personalization, privacy, customer service, community, security, site design and sales promotion.

This study aims to assess the effectiveness of specific e-marketing tools within their corresponding e-marketing mix elements in the case of Algerian airlines' website/ mobile application, based on customers' perception. Understanding which tools are most effective according to customers offers insights into their perceived contribution within each element of the e-marketing mix.

Accordingly, the research seeks to answer the following key question:

- Which e-marketing tool is most effective within its corresponding e-marketing mix element according to customers who booked via Algerian Airlines' website/ mobile application?

Study hypothesis:

There are significant differences in the perceived effectiveness of e-marketing tools within their respective e-marketing mix elements according to customers who booked via Algerian Airlines' website/mobile application.

Objective of the study: This study aims to achieve the following objectives:

- Defining and contextualizing electronic marketing and the e-marketing mix within the scope of the study.
- Evaluating the perceived effectiveness of specific e-marketing tools within their corresponding e-marketing mix elements, as experienced by customers of Algerian Airlines.
- Determining which e-marketing tools customers who booked through the airline's website/mobile application consider most effective.
- Providing insights into the effectiveness of the e-marketing tools currently employed by Algerian Airlines, based on customers' perceptions.

Importance of the study:

This study examines customer perceptions of the effectiveness of e-marketing tools used by Algerian Airlines in its online booking platforms. Understanding these perceptions is essential for

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improving marketing strategies, enhancing customer interaction, and boosting service quality through electronic channels. The study provides practical guidance for the airline to enhance its electronic interfaces and engagement mechanisms, and contributes academically by applying the e-marketing mix model within the context of an Algerian service provider.

I. Theoretical framework

1. Electronic marketing

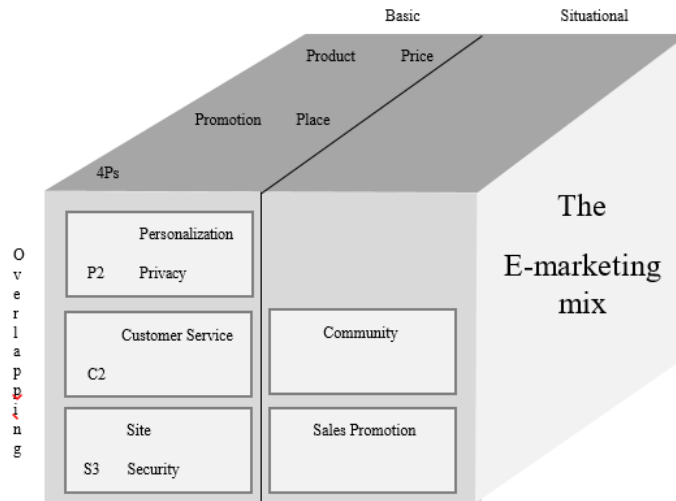
Electronic marketing (e-marketing) is the use of information technology for the marketing activity, and the processes for creating, communicating, delivering, and exchanging offerings that have value for customers, clients, partners, and society at large. In essence, it is the application of IT to traditional marketing practices (Strauss & Frost, 2016, p. 23). Its scope is not limited to internet alone, it also includes channels such as e-mail, wireless networks, mobile communication, and satellite systems (Etim, James, Nnana, & Okeowo, 2021, p. 163). E-marketing leverages these technologies to boost revenues for businesses, enhance interactivity and meet customers' needs (Denga, 2022, p. 90). According to Al-Ababneh (2025, p. 35), e-marketing facilitates exchange and product promotion within virtual environments. It enables organizations to reach targeted audiences more effectively, offer high-quality products at competitive prices, and lower operational costs through electronic means.

In summary, e-marketing can be defined as the strategic use of IT across various electronic channels to perform marketing functions, such as promoting products and services, engaging with customers, and facilitating value creation and exchange, while also enhancing customer reach, operational performance and cost efficiency.

2. Electronic marketing mix

The marketing mix is a group of integrated and mutually dependent marketing activities that support each other in carrying out the marketing function as intended (Al-Sukar & Alabboodi, 2020, p. 107). First introduced by McCarthy in 1960 and later promoted and popularized by Philip Kotler, the 4Ps framework—comprising product, price, place, and promotion—has been widely used in both academic and professional marketing circles for over five decades, following its adoption as the standard marketing mix in 1967 (Bin Abdul Lasi, 2021, p. 167). This widespread adoption can be attributed to the model's simplicity and ease of understanding, which makes it an effective tool for both marketing decision-making and educational purposes (Dominici, 2009, p. 17). With the rapid evolution of information technology and the increasing use of internet in business operations, the traditional marketing mix remained a subject of discussion in both academic literature and managerial practice. During this evolution, some researchers argued that the 4Ps can adapt to environmental changes by expanding each “P,” while others considered the model outdated and proposed alternative paradigms (Prasetya, 2024, p. 37). One such contribution is that of Kalyanam and McIntyre (2002), who developed the electronic marketing mix model, an expanded version of the traditional mix, expressed in the following acronym 4Ps + P2C2S3. This model contains the traditional 4Ps with the addition of the following elements: P2C2S3, where P stands for personalization and privacy; C stands for community and customer service; and S stands for site, security and sales promotion, all portrayed within a cube in Figure 1.

Fig n° (01) : The E-Marketing Mix =4Ps +P2C2S3



Source : (Kalyanam & McIntyre, 2002, p. 496)

As shown in Figure 1, the e-marketing mix includes eleven functions. Nine are considered basic, while seven also serve as moderators and are termed overlapping. The non-overlapping functions appear on the surface of the cube, while the overlapping ones are placed at the base to indicate that they moderate the surface functions and each other (Kalyanam & McIntyre, 2002, pp. 495-496). Due to their moderating role, overlapping functions must be carefully coordinated and integrated with the other elements of the e-marketing mix during planning and implementation. Based on this model, each e-marketing mix element is linked to a set of e-marketing tools, as presented in Table (01).

Table n°(01) : 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
	Individualisation – send notice of individual preference
	Collaborative filtering
Privacy	Privacy policy

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Customer service	FAQ & help desk
	Email response management
	Chat rooms between customers and supporting staff
	Order tracking
	Sales return policy
Community	Chat rooms
	User ratings & reviews
	Registries & wish list
Site	Home page
	Navigation & search
	Page design & layout
Security	Security tool(s)
Sales promotion	E-coupons

Source : (Sam & Chatwin, 2013)

II. Case study

1. Methodology

Primary data for this study were collected from customers of Algerian Airlines who booked their flights via the airline's official website or mobile application. A total of 157 questionnaires were collected, 139 electronically and 18 manually. Resulting in 128 valid responses usable for analysis.

The primary objective of the analysis was to assess the perceived effectiveness of specific e-marketing tools within their respective e-marketing mix elements. The questionnaire included 36 items that were categorized according to the components of the e-marketing mix model (4Ps + P2C2S3), based on existing literature and supported by Figure (01), Table (01), and Table (08). These items were adapted to reflect the actual online services provided by Algerian Airlines through its electronic platforms.

The questionnaire was divided into three main sections:

- Part I: General background information.
- Part II: Demographic data, including gender and age.
- Part III: Statements relating to e-marketing tools, grouped by their corresponding e-marketing mix element.

Each of the 36 items in Part III was measured using a five-point Likert scale, ranging from "Strongly disagree" (1) to "Strongly agree" (5).

For the data analysis process, Confirmatory factor analysis was employed to assess the effectiveness of each e-marketing tool in supporting its corresponding e-marketing mix element. The tools were grouped under their respective elements prior to analysis. Factor loadings were calculated using SmartPLS 4 to determine the strength of relationship between each tool and its designated mix element. These loadings were then used to derive the relative weight or perceived effectiveness of each tool.

Factor analysis is a multivariate statistical technique used to examine a single set of variables in order to identify which variables group together into meaningful subsets that are relatively independent from each other. It is generally classified into two main types: Exploratory Factor

Analysis (EFA) and Confirmatory Factor Analysis (CFA). Exploratory factor analysis is typically applied in the early phases of research to explore the underlying structure and to understand the interrelationships among variables. In contrast, confirmatory factor analysis is a more advanced technique employed to test specific hypotheses or theoretical models about the structure underlying a given set of variables (Shrestha, 2021, p. 4). (Shrestha, 2021, p. 4)

Certain items were excluded from the analysis due to their inapplicability to the airline’s actual offerings. Specifically, “Forward Auctions,” “Reverse Auctions,” and “Name Your Price” were removed from the Price element, and “Chat Rooms” was removed from the Community element, as these tools are not available on Algerian Airlines’ website or mobile application.

2. Demographic and general characteristics of the sample

- **General background information:**

Table n° (02): Have you ever booked a flight through the Algerian Airlines website/ app?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	128	81,5	81,5	81,5
	No	29	18,5	18,5	100,0
	Total	157	100,0	100,0	

Source : Researchers based on SPSS outputs.

According to the table, 81.5% of the respondents indicated that they had previously booked flights through the Algerian Airlines’ website or mobile application. In contrast, 18.5% of the total sample reported that they had never used the online booking platform. As a result, the number of valid respondents whose answers can be used in this study is 128.

This question served as a filtering criterion, ensuring that only participants with actual online booking experience with the airline’s website or app were included in the analysis to evaluate the perceptions of the e-marketing mix tools.

Table n° (03): How many times have you booked through the Algerian Airlines website/ app?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Once	29	22,7	22,7	22,7
	Twice	22	17,2	17,2	39,8
	Three – five times	29	22,7	22,7	62,5
	More than five times	48	37,5	37,5	100,0

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	Total	128	100,0	100,0	
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Source : Researchers based on SPSS outputs.

The survey results show that, regarding online flight booking frequency, 22.7% of respondents reported having booked flights with Algerian Airlines through its website or app once, 17.2% had booked twice, 22.7% had booked three to five times, and 37.5% had booked more than five times. This indicates that the majority of respondents are frequent users of the airline's online booking services.

- **Demographic data:**

Table n° (04): Gender distribution of the study sample

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	89	69,5	69,5	69,5
	Female	39	30,5	30,5	100,0
	Total	128	100,0	100,0	

Source : Researchers based on SPSS outputs.

According to the table, the study sample consisted of both genders, out of the 128 collected surveys, the majority (69.5%) were male respondents, while 30.5% were female respondents.

Table n° (05): Age distribution of the study sample

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less Than 20 years old	1	,8	,8	,8
	From 20 years old to less than 30 years old.	31	24,2	24,2	25,0
	From 30 years old to less than 40 years old.	63	49,2	49,2	74,2
	From 40 years old and above.	33	25,8	25,8	100,0
	Total	128	100,0	100,0	

Source : Researchers based on SPSS outputs.

As for the age distribution, the respondents were grouped into four age categories. The majority of participants (49.2%) were between 30 and 39 years old, followed by 25.8% who were 40 years and above, and 24.2% who were between 20 and 29 years old. A very small proportion of the

sample (0.8) was under 20 years old. This suggests that, adults in their thirties and forties primarily use the Algerian Airlines' online booking platforms, which may reflect the online engagement of this age group.

3. Calculation of factor loadings

Table n° (06): The loading of each e-marketing tool corresponding to its e-marketing mix element

Factor and corresponding items:	Factor loadings
Factor 1- Service	
Variety of services	0.642
Variety of flight options	0.644
Add-on options (seat selection, excess baggage...)	0.599
Online check-in and electronic boarding pass.	0.500
Factor 2- Price	
Dynamic pricing.	0.499
Price alert.	0.369
Transparent price comparison between different classes and categories of tickets.	0.521
Factor 3- Promotion	
Online advertisements.	0.668
The relevance of the advertisements	0.744
Promotional emails	0.754
Travel influencers and brand ambassadors promotions.	0.669
Factor 4- Place	
Direct links to the website on other platforms.	0.755
Flight options on the search engines.	0.640
Tickets direct purchase through the website/ app.	0.526
Tickets booking through authorized booking agents and electronic booking platforms.	0.555
Factor 5- Personalization	
The website/ app remembers my preferences and previous bookings when logging into my account.	0.636

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Online loyalty programs.	0.608
New offers suggestions based on my preferences.	0.870
Destinations' suggestions based on other customer's preferences, which are similar to mine.	0.858
Factor 6- Privacy	
Clear information about data protection, how it will be collected and used.	0.773
Options to control privacy settings (marketing preferences, data sharing...).	0.845
Factor 7- Community	
Users' ratings and engagement on the airlines' social media	0.820
Option to register flight preferences	0.831
Factor 8- Customer service	
Frequently asked questions FAQ section.	0.353
Quick responds to emails.	0.713
Chat rooms with customer service representatives.	0.842
Real time access to flight registry situation.	0.497
Sales return policy.	0.721
Factor 9- Site design	
Easiness of navigation through different sections of the website/ app to find different flight information.	0.741
Visual appeal and organization of information on the website/ app.	0.761
Clear features and categories of services on the home page.	0.778
Tool to search for flight options.	0.756
Factor 10- Security	
Additional verification when making a payment.	0.663
Secure authentication when logging into the account.	0.516
Security indicators (Padlock, security badges, https://).	0.643
Factor 11- Sales Promotion	

E-coupons	1.00
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Source: Researchers based on SMARTPLS outputs.

The factor loading is the correlation between the item and the factor; a factor loading of more than 0.30 usually indicates a moderate correlation between the item and the factor (Tavakol & Wetzel, 2020). The loading of an item refers to the weight of the item used to contribute to the corresponding factor. As a result, the factor loadings play an important role in determining the relative weight of each item contributing to its corresponding factor (Sam & Chatwin, 2013).

4. Calculation of Relative Weights of E-Marketing Tools:

The relative weight of each e-marketing tool was calculated by dividing the item’s factor loading by the sum of the absolute factor loadings of all tools associated with the same e-marketing mix element. This approach allows for determining the proportional contribution of each tool to its respective element (Sam & Chatwin, 2013). The formula is presented as follows:

$$RW_i = \frac{Loading_i}{\sum_{j=1}^n Loading_j} \quad (01)$$

Where, RW_i is the relative weight of the i^{th} e-marketing tool with respect to a particular e-marketing mix element, and $Loading_i$ is the loading of the i^{th} e-marketing tool with respect to that element.

Based on Table (06) and Equation (01), the relative weight of each item is shown in Table (07).

Table n° (07): Relative weight of each item

Factor and corresponding items:	Relative weights
Factor 1- Service	
Variety of services	0,269
Variety of flight options	0,270
Add-on options (seat selection, excess baggage...)	0,251
Online check-in and electronic boarding pass.	0,210
Factor 2- Price	
Dynamic pricing.	0,359
Price alert.	0,266
Transparent price comparison between different classes and categories of tickets.	0,375
Factor 3- Promotion	
Online advertisements.	0,236
The relevance of the advertisements	0,262

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Promotional emails	0,266
Travel influencers and brand ambassadors promotions.	0,236
Factor 4- Place	
Direct links to the website on other platforms.	0,305
Flight options on the search engines.	0,258
Tickets direct purchase through the website/ app.	0,212
Tickets booking through authorized booking agents and electronic booking platforms.	0,224
Factor 5- Personalization	
The website/ app remembers my preferences and previous bookings when logging into my account.	0,214
Online loyalty programs.	0,205
New offers suggestions based on my preferences.	0,293
Destinations' suggestions based on other customer's preferences, which are similar to mine.	0,289
Factor 6- Privacy	
Clear information about data protection, how it will be collected and used.	0,478
Options to control privacy settings (marketing preferences, data sharing...).	0,522
Factor 7- Community	
Users' ratings and engagement on the airlines' social media	0,497
Option to register flight preferences	0,503
Factor 8- Customer service	
Frequently asked questions FAQ section.	0,113
Quick responds to emails.	0,228
Chat rooms with customer service representatives	0,269
Real time access to flight registry situation.	0,159
Sales return policy.	0,231
Factor 9- Site design	

Easiness of navigation through different sections of the website/ app to find different flight information.	0,244
Visual appeal and organization of information on the website/ app.	0,251
Clear features and categories of services on the home page.	0,256
Tool to search for flight options.	0,249
Factor 10- Security	
Additional verification when making a payment.	0,364
Secure authentication when logging into the account.	0,283
Security indicators (Padlock, security badges, https ://).	0,353
Factor 11- Sales Promotion	
E-coupons	1,000

Source : Researchers based on Excel outputs.

5. Discussion of the relative weights of e-marketing tools:

Based on Table (07), both tools, variety of flight options and variety of services have the highest relative weight (0.270 and 0.69 respectively), thus making them the most effective tools within the service element. Providing add-on options was more effective (0.251) than providing online check-in and electronic boarding passes (0.210).

Regarding the price element, transparent price comparison between different classes and categories of tickets (0.375) was the most effective tool, followed by dynamic pricing (0.359) and price alerts or tracking features (0.266).

For the promotion element, promotional emails (0.266) were the most effective tool, followed by the relevance of online advertisements to customers' travel needs (0.262), travel influencers' or brand ambassadors' online promotions and the airline's online advertisements (0.236).

In terms of the place element, the most effective tool was the provision of direct links to the airline's website on partner websites and platforms (0.305), followed by the availability of flight options through search engines (0.258). Booking through authorized online travel agents and electronic booking platforms (0.224), and purchasing tickets directly through the airline's website or app (0.212), was less effective.

With regard to personalization, the suggestion of new offers based on customers' preferences (0.293) and suggestions based on other customers' preferences (0.289) were more effective than remembering users' preferences and previous bookings (0.214) and offering online loyalty programs (0.205).

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For the privacy element, privacy control options (0.522) was the most effective tool, followed by the availability of clear information about data protection, collection, and use (0.478).

Within the community element, the option to register flight preferences (0.503) was the most effective tool, followed by the users' ratings and engagement on social media (0.497).

For the customer service element, chat rooms between customers and service representatives (0.269) were the most effective tool. Other tools, such as the sales return policy (0.231), quick response to emails (0.228), real-time access to flight status (0.159), and the frequently asked questions (FAQ) section (0.113), were less effective.

Concerning the site design element, having a homepage that clearly defines features and service categories (0.256) was the most effective element, followed by the visual appeal and organization of information (0.251), flight search tool (0.249) and ease of navigation (0.244).

Finally, in terms of the security element, requiring additional verification during payment via the website or app (0.364) was the most effective tool, followed by security indicators (0.353) and secure authentication when logging into the account (0.283).

In light of these findings, the results support the hypothesis that there are significant differences in the perceived effectiveness of e-marketing tools within their respective e-marketing mix elements according to customers who booked via Algerian Airlines' website or mobile application.

Conclusion:

The findings of this study highlight clear variations in the perceived effectiveness of e-marketing tools across the different elements of the e-marketing mix, as experienced by customers of Algerian Airlines who booked via the website or mobile application.

The study ranked the perceived effectiveness level of each tool. Within the service element, variety of flight options emerged as the most effective tool. In the price element, transparent comparisons between ticket classes and categories ranked highest. For promotion, promotional emails were perceived as most effective.

In terms of place, the most effective tool was providing direct links to the airline's website through partner platforms. Regarding personalization, suggesting new offers based on customers' preferences was rated highest. In the privacy element, privacy control options were most effective.

Within the community element, registering flight preferences was a well-rated tool. However, there remains a lack of dedicated spaces for customers to share their ratings and reviews directly on the platform. For customer service, chat rooms between customers and service representatives were considered the most effective.

Regarding site design, a homepage that clearly defines features and service categories ranked highest. Finally, in the security element, additional verification during online payment was perceived as the most effective tool.

These results support the hypothesis that the effectiveness of e-marketing tools differs significantly within their respective e-marketing mix elements. The findings suggest that Algerian Airlines can enhance its electronic marketing strategy by focusing on the tools that customers find most effective. For instance, reinforcing clear pricing options, expanding personalization features, and maintaining strong privacy protections could improve user experience and customer satisfaction.

On the other hand, some tools showed relatively low perceived effectiveness, such as FAQs, real-time flight updates, and certain aspects of site navigation, indicating areas for improvement. Furthermore, within the community element, while some interactive tools were rated positively, there remains a lack of dedicated spaces for customers to communicate their ratings and reviews directly on the platform.

To address these gaps, Algerian Airlines is encouraged to invest in improving less effective tools while maintaining and further enhancing the most effective ones to sustain their impact. The airline could also consider adding interactive community features that allow customers to share their experiences. By leveraging these insights, it can make informed decisions to optimize its online presence, improve customer interaction, and contribute to the broader digital transformation in Algeria.

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6. Appendices

Table n° (08): Twenty-eight items about e-marketing tools within their e-marketing elements

Factor and corresponding items:
Factor 1- Product
Different categories of product items available
Tool that can allow me to configure preferred product components
Tool that can allow me to view a product image closely from different angles
Factor 2- Promotion
Online advertisement
Newsletter e-mail sent to me
The business web site contains messages or video clips about some products that are so attractive that I will inform others about them.
Suggestions regarding complementary items for my interested item
Factor 4- Place
The price of product items in the business web site can be changed in response to changing supply and demand conditions

The product items of the business web site can be available through the shopping page of search engines such as Yahoo
I can enter any target price of the preferred product so that the business web site can list out suitable items
Factor 5- Personalization
When I return to the business web site, it can show all those items that I visited before.
When I log into the business web site, it will send notice to me about new items based on my interest.
Based on my interested items, there are some suggested items already purchased by those customers who have the same interest.
Factor 6- Privacy
Messages about privacy such as “we will not sell your personal data...”
Factor 7 – Customer Service
Frequently asked questions / Help page
Quick response from e-mail enquiry
Chat rooms between customers and supporting staff
Order status tracking
Sales return policy
Factor 8- Community
Online product discussions among customers
User rating and review at the product web page
Registry and wish list
Factor 9- Site
The homepage of the business web site defines its features and the product categories clearly.
The contents of the business web site should be well organized so that the background format is matched with the text style and colour.
Tool that can allow me to search product items easily in the business web site.
Factor 10- Security
Security techniques such as data encryption and secure socket layer (SSL)
Factor 11- Sales Promotion
Electronic coupons

Source : Researchers based on (Sam & Chatwin, 2013)