Product Rating Based on Marketing Mix Elements According to Customers’ Preference Using ANP Technique (Case Study: Market of Laptops ASUS, DELL, HP and SONY in Tehran)

1Mohammad reza Noorali, 2Abdol Hosain Karampour and 3Touran Razmavar

1M.A Student of management department, Shahed University of Tehran, Iran
2Assistant professor of management department, Maleke Ashtar University of Tehran, Iran
3M.A Student of management department, Shahid Chamran University of Ahvaz, Iran.

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ABSTRACT

Marketing mix elements are a collection of controllable marketing elements and tools by mixing of which, organizations and companies form their own marketing strategies. The concept of marketing mix was first introduced in 1950's and McCarthy (1964) proposed 4P as marketing mix which determines organization performance route by a series of controllable variables. In the present study, through library studies in the field of marketing mix and extraction of sub-criteria of these factors, the main sub-criteria in laptop market were adopted by experts’ comments and the correlation among the sub-criteria was determined. Furthermore, using Analytical Network Process (ANP), marketing mix elements of four laptop brands including ASUS, DELL, HP and SONY were prioritized based on indices and sub-indices. Based on evaluated marketing mix elements, results showed that among the laptop brands studied in the present study, ASUS was rated the first place followed by SONY, HP and DELL.

Keywords: Marketing mix, marketing mix elements, Analytical Network process.

INTRODUCTION

Among various business activities, marketing has the highest involvement with customers. In a comprehensive definition, marketing is defined as a managerial and social activity by which, one addresses his/her demands through value exchange with others. Marketing is, therefore, a process in which, company creates value for customer and establishes a firm relationship with him to get able to receive value from the customer. The dual purpose of marketing is to achieve new customers with higher value and, at the same time, retain current customers by obtaining their satisfaction. Correct marketing is critical for success of any company. Big commercial companies such as Procter & Gamble, SONY, WALMART and IBM use marketing practices. Non-profit organizations such as universities, hospitals, museums, music bands and even mosques and churches need marketing for achieving success [15].

Many companies have had bad interpretation about marketing. A not correct perception of marketing was that employees believed that quality of products and services is the only factor which determines their sale rate. The perception didn’t last long because it was not responsive to current competitive market. Production, sale and marketing should work together to result in the best results. Marketing is the process responsible for identifying, predicting and profitable supplying of customers, demands. By this method, organization will be able to prepare their products and services according to customers’ demands instead of producing something and waiting for customers’ attraction [16]. The product (good or service) should be in accordance with advantages expected by customers. Price should be relevant to buyers’ abilities. The product should be offered to customers so that the customer meets no trouble for buying and finally required enhancements should be performed so that potential customers get aware of the existence of the product. Indeed, marketing mix concept determines organization performance route using a series of controllable variables in an environment containing various uncontrollable factors (external market) [5].

In the present investigation, according to customers’ preference, rating of marketing mix in laptop market was studied to determine which elements and their sub-categories have the highest importance? Marketing agents, producers and sellers should pay attention to these preferences and offer their products according to customers’ demands and increase their sale. Ignoring this important issue in current sensitive and competitive market may inhibit the growth and profitability of the company and bring about considerable losses.

Corresponding Author: Mohammad Reza Noorali, M.A Student of management department, Shahed University of Tehran, Iran
E-mail: Noormohamad67@yahoo.com. Number: 09379756125
2. Theoretical principles:

Marketing mix indicates principal activities performed by marketing managers. After selecting a target market, marketing managers should set a systematic plan for sale to customers and for establishing a long term relationship. The marketing plan is composed of decisions regarding product, price, promotion and place. These are the main item managers should devote the resource to them to achieve profitability and sale purposes [9].

Decision making on marketing mix elements (price, product, place and promotion) and determining their relative priority which are the bases of marketing system is of great important, because organizational goals and marketing of dependent firms to complement target market demands is formed for these elements [20]. Marketing mix concept was first introduced in 1950’s by Neil Borden [10]. Marketing mix is mix of marketing tools by use of which, the company tries to achieve its goals [4]. Marketing mix proposed by Neil Borden is composed of twelve variables [7] in 1960 McCarthy classified the twelve variables introduced by Borden in to four categories as 4P. The mix was quickly accepted and identified as a necessary and appropriate factor in management and marketing theory [8].

<table>
<thead>
<tr>
<th>Mix models</th>
<th>Author(s)</th>
<th>Elements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marketing mix 4P</td>
<td>McCarthy (1964)</td>
<td>Product, price, place, promotion</td>
</tr>
<tr>
<td>Marketing mix 7P</td>
<td>Booms and Bitner (1981)</td>
<td>Product, price, place, promotion, physical assets, personnel, process</td>
</tr>
<tr>
<td>Marketing mix 8P</td>
<td>-</td>
<td>Product, price, place, promotion, physical assets, personnel, process</td>
</tr>
<tr>
<td>Marketing mix 4c</td>
<td>Latternbern (1990)</td>
<td>Customer value, Cost to the Customer, convenience, communication</td>
</tr>
<tr>
<td>Marketing mix 5v</td>
<td>Bent (1997)</td>
<td>Virtue, variety, volume, viability, value</td>
</tr>
<tr>
<td>Marketing mix SIVA</td>
<td>Spalter (1996)</td>
<td>Solution, information, value, access</td>
</tr>
<tr>
<td>Social Marketing mix</td>
<td>Kotler and Anderson (2004)</td>
<td>Product, price, place, promotion, public groups, partnership, policy, pure stings</td>
</tr>
<tr>
<td>Marketing mix 4s</td>
<td>Konstan and Tindes (2006)</td>
<td>Scope, site, synergy, system</td>
</tr>
</tbody>
</table>

3. Literature review:

Many investigations have been conducted both within and out of the country on topic of prioritization of marketing mix elements. In an article entitled “Criteria Weighting and 4-P Planning in Marketing Using Analytic Network Process”, Alaybeyoglu et al [1] investigated strategies and marketing decisions in product development process and identified the most effective elements of marketing mix for the process. According to the results obtained in this study, for a new product the company should devote 37% of all of its investment to the product, 27% to price strategy, 19% to promotion and 16% to advertisement [1]. Huang and Sarigöllü [12] investigated the relationship between awareness about brand and market results and the relation between awareness about brand and brand special value. Moreover, effect of marketing mix elements on brand reputation was investigated. Results showed that customers’ experience in application of brand influences their awareness about brand. Positive relationship between awareness about brand and brand special value was confirmed. Finally, results showed that place and promotion play critical role in creating awareness about brand in classification of packed products [12]. Clow et al [6] in a paper entitled “The relationship of the visual element of an advertisement to service quality expectations and source credibility” indicated that proper visual factors of an advertisement plays important role in evaluation of product quality by customers [6].

The concept 4P is accepted as a principle in marketing literature. 4P stands for four words: product, price, promotion, and place. Marketing mix dominated traditional models and methods of market management such as Alderson’s dynamic performance-oriented method along with systemic methods and parameter theory developed by Copenhagen University in Europe. New methods such as product vision, duty vision and geographical vision were also encountered by the same fate. Only a few models have survived against 4P [11]. Relationship between marketing mix and brand formation and creating superior brand in market is an important field in modern marketing. All steps in brand formation depend on marketing mix and there is huge interrelation between the two issues. To form a brand, companies should design the marketing mix in such a way that a positive image is created in customer’s mind [17]. Today companies have understood that even firm performance is dependent on marketing mix [13]. Through the years, scholars and marketing analysts, inspired by 4P, have searched for new marketing mixes and developed new mixes as presented in table (1) [3]. In this investigation, evaluating and rating of 4P marketing mix is studied.

Table 1: Marketing mix models.
In an investigation entitled “Prioritization of Marketing Mix with Use of AHP Technique with Marketing Strategic Planning Approach”, Tehrani et al [20] studied strategy setting based on weakness and strength points, threats and opportunity and prioritization of marketing mix indices for four companies (SONY, Panasonic, LG, and Samsung) regarding LED products. In this investigation, importance of each marketing mix component was identified; then selection criteria for effective marketing mix were extracted using questionnaire and pairwise comparison; hierarchical analysis was then performed and finally the required strategies based on SWOT matrix and marketing mix for each firm was formulated [20].

In an article entitled “Study of preference the marketing mix Effective for Consumption of foreign goods”, Vahdati [21] maintained that quality is the most important factor from customer viewpoint in consuming foreign products; the author introduced quality as an important factor which characterizes the product from those of competitive firms [21]. In their study entitled “investigating different marketing mix models to identify and prioritize elements of marketing mix in Pegah dairy products”, Atafar et al [3] identified the most important factors effective in promotion of product sale as price, packaging, sale prediction, availability and advertisement, respectively [3].

4. Methodology:

Among various multiple criteria-decision-making (MCDM) methods which are widely used in all scientific fields and include two groups as “multiple purposes” and “multiple-indices”, analytical hierarchy process (AHP) has gained much attention as a Multi Attribute Decision Making (MADM) method. A major limitation of AHP is that the method does not consider interdependencies of decision elements namely criteria, sub-criteria and items and consider the interrelations of the decision elements as hierarchical and one-way. Analytical network process (ANP), one of MADM methods, considers inter- and intra-relations of decision elements through replacing hierarchical structure with network one. Therefore application of ANP instead of AHP has been increased in recent years [22]. Indeed, ANP is a generalized and extended version of AHP [19] in which interrelated issues and their feedback is also considered.

Analytical network process (ANP) provides a powerful and comprehensive method for accurate decision making using experimental information and personal judgment of every decision maker and facilitates decision making procedure by providing a structure for organizing different criteria and evaluating importance and preference of each item in relation to other ones. This method uses pairwise comparison matrix to achieve relative measures and exploits all the three qualitative, quantitative and comparative methods simultaneously for data gathering and analyzing.

In this investigation, prioritization of marketing mix elements in laptop market regarding four brand as HP, SONY, DELL and ASUS is studied using analytical network process (ANP); the four brands were then rated based on mix elements and its subdivisions. Investigation steps are as follows:

In the first step, mix elements subdivisions were extracted by reviewing reliable references and standardized subdivisions were extracted from marketing books compiled by “Rousta et al” and “Kotler” as:

- **Product mix**: quality, design, properties, size, reputation, packaging, etc.
- **Price mix**: discount, price list, repayment period, credits, etc.
- **Promotion mix**: advertisement, in place sale, communication, direct marketing.
- **Place mix**: distribution channel, market coverage, transportation, etc [14,18].

In the second step, via interviewing with experts and specialists in the field of laptop, the main indices of laptop market were selected to obtain a correlation matrix table (table 2).

In the third step, correlation matrix table was offered to twelve experts in the field of laptop sale to elucidate the relationships among the variables. Standard form is between ten to twelve persons [2]. By evaluation of experts’ comments, all the common relationships confirmed by the experts were applied to draw the network and prepare final questionnaire. The confirmed relationships are presented in table (2).

Network structure of ANP was drawn based on the relations among clusters elements, relations among clusters and relations among laptop brands and indices as presented in figure (1).

Then, primary (Non-weighted) super matrix, weighted super matrix and limited super matrix, from which final priorities and weight of criteria and items were extracted, were obtained. In the figure below, final weights of criteria and items in limited super matrix is presented.

Figure (2) shows the weight of each component of marketing mix. Based on this, laptop brands were rated as presented in figure (3).

As can be seen from super matrices outputs and presented in total results of network analysis, rating of laptop producers is as follows:
Fig. 1: ANP model, network structure and the relationships between its constituent elements.

Fig. 2: The final weights of criteria and alternatives.

Fig. 3: The overall results across the network.
Table 2: The final correlation matrix.

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<thead>
<tr>
<th></th>
<th>Product</th>
<th>Price</th>
<th>Place</th>
<th>Promotion</th>
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<tbody>
<tr>
<td>Quality</td>
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<tr>
<td>Design</td>
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<td>Warranty</td>
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<td>Discounts</td>
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<td>Repayment period and conditions</td>
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<td>Distribution channels</td>
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<td>Advertisement</td>
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<tr>
<td>In place sale</td>
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<tr>
<td>DELL</td>
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<td>HP</td>
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<td>SONY</td>
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<tr>
<td>ASUS</td>
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Table 3: Ranking of Companies producing laptop by using network analysis.

<table>
<thead>
<tr>
<th></th>
<th>DELL</th>
<th>HP</th>
<th>ASUS</th>
<th>SONY</th>
<th>A_i</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.022618</td>
<td>0.027382</td>
<td>0.073792</td>
<td>0.050907</td>
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</tbody>
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5. Conclusion:

In this study, after designing ANP network and determining the relationships in correlation matrix set by experts’ comments, a final questionnaire was prepared whose data were analyzed by Super Decision software. Results obtained in this investigation present rating of laptop brands according to 4P criteria (Product, Price, Place and Promotion) and the most important sub criteria which have the highest influence (including quality, reputation, design, size and weight, warranty, discounts, repayment, market coverage, distribution channels, advertisement and in place sale). Results obtained by network analysis are considered as utility of each brand according to all the variables used in the network. The results showed that SONY brand has the higher priority over other ones followed by SONY, HP and DELL.

6. Limitations and suggestions for future studies:

Based on library studies and field investigations, some notes are suggested to other investigators.
1. Considering existing limitations, only four laptop brands were investigated. It is suggested to conduct further investigations for comparing and rating of other laptop brands.
2. It is recommended to authors to carry out similar investigations in other markets and thereby help customers in selection of better brands or items.
3. It is recommended to investigators to become more oriented toward quantitative methods such as analytical network analysis to get able to achieve more desirable and more comprehensive results in their investigations.

References