Analytic Hierarchy Process to Evaluate Corporate Image, Trust, and Switching Cost of GSM Operators: A Case of Kurdistan Region of Iraq

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Abstract: Aim of the research is to select best GSM service provider in Kurdistan Region of Iraq. For this purpose, 515 data from GSM service users have been collected via a survey questionnaire, which contains trust, corporate image, and switching cost impacts on customers' satisfaction. The results were evaluated initially by AMOS 23 and according to these results, the importance of each dimension have been determined. Secondly, the importance levels of the dimensions were evaluated through analytic hierarchy process to understand the best brand in the market. Finally, the managerial impacts of the study were defined for the market.

Keywords: AHP, Trust, Corporate Image, Switching Cost, Telecommunciation Service

1. Introduction

Attracting new customers and retaining existing ones and having them as loyal customers is important in the field of marketing. Scholars claim that keeping present customers is more profitable for a company (Santouridis & Trivellas, 2010). However, fast-paced technological developments force companies to be up to date with newer technologies to increase their market share or to catch a competitive advantage.

Scholars maintain that good quality service, which comprises good handling of customers, solving problems in a satisfactory manner, and committed and educated staff members increase customers' level of satisfaction. Thus, these customers continue to buy the company's new products and even bring new buyers to the organization (Budur et al., 2018; Kim, Park, & Jeong, 2004; Negi & Ketema, 2013).

GSM is a vital sector all over the world. It is also attracting businesses in the Kurdistan Region of Iraq. At the moment, there are three main GSM operators in Iraq; Zain Telecom, AsiaCell and Korek Telecom. They provide 3G, 4G and mobile internet services and the pricing is based on pre-paid cards.

The aim of this study is to find out the market leader based on customer preferences. To do this, a questionnaire among GSM service users in Sulaymaniyah was distributed, which contained questions for evaluating the impact of network quality, pricing strategy, conflict handling, promotions on corporate image, trust and switching costs. According to literature, trust, corporate image and switching costs affect satisfaction and consequently customer loyalty. Based on this model, we have initially gathered data from 550 GSM service users. Further, we have proposed a structural equation modeling to understand the importance of each dimension for the satisfaction and loyalty of the customers. The results of the questionnaire have been analyzed by ANOVA statistics. In order to understand the

convenience of each brand from others, based on those three dimensions the structural equation modeling has been implied. According to the results, it was decided which brand has been leader and better performing than others at each dimension (corporate image, trust, and switching costs). The results were entered and rated by the analytic hierarchy process software Expert Choice (2000 2nd edition).

2. Literature Review

2.1 Trust

Trust begins after an interaction between buyer and seller. When seller affects buyer's perception positively, it is expected that the buyer will continue to use the company's products or services in the future (Aydin & Özer, 2005; de Reuver et al., 2015; Khan, 2010).

Aydin and Özer (2005) maintain that the quality of service has a continually positive effect on trust. They found service quality affects trust and in turn, trust drive customer loyalty. In addition, they also assert that trust is the most important predictor of loyalty. Negi and Ketema (2013) studied the relationship between trust, communication and commitment in an organization. They concluded that trust was the main reason for commitment and establishing a strong relationship between a company and its customers. This relationship can be improved through communication. Similarly, Demir's surveys found a significant relation between service quality and loyalty because of satisfaction (Demir & Eray, 2015a; Demir et al., 2015b).

2.2 Switching Costs

Switching is the behavior of customers to change their present GSM provider with another (Nwakanma et al., 2018). Switching cost occurs by this action and encompasses, entrance and Sim-Card price, psychological costs like using a new GSM operator, a change in number, and the need to share this number with others. Earlier studies found that the decision to switch was affected by: lower quality of the service, high prices, unethical behavior and low satisfaction (Nwakanma et al., 2018; Oyeniyi & Joachim, 2008).

In our literature review we found a sufficient number of studies that explain the relationship between better service quality and satisfaction with decisions for not switching, which led to a higher level of loyalty. However, these studies do not discuss whether the cost of switching changes consumers' decisions and affects their loyalty. Hence, one of the aims of this study is to investigate this relationship. Further, as the switching cost effects the loyalty positively, we have elaborated the customers of brand in which the switching cost is higher.

2.3 Corporate Image

Corporate image is a company's identity in the public. It is the result of the firm's actions like the quality of its services and products and customers' experience with the company (Amin et al., 2012; Aydin & Özer, 2005; Lai et al., 2009). Corporate image is also an assessment of the company's actions through experience or through research like collecting information from internet or the media (Aydin & Özer, 2005). Various studies have used surveys which cover corporate image and customer loyalty. However,

we found very few studies that examined the relationship between corporate image and both satisfaction and switching costs.

In this context, Aydin and Özer (2005) found that corporate image positively affected customer loyalty. Some other studies showed the same results (see Gray and Balmer 1998; Lee et al., 2001). In addition, they emphasized corporate image, trust, service quality and switching costs as important factors in customer loyalty which also help in reducing sensitivity to cost. As pointed out earlier, we proposed to test the relationship between corporate image and both customer satisfaction and loyalty, while similar researches have found the effect of service quality on customer loyalty (Aydin & Ozer, 2005; Aydinli & Demir, 2015; Demir et al., 2015).

3. Analytic Hierarchy Process

The analytic hierarchy process (AHP) is a multi-criteria decision-making analysis which is based on more than one criterion for solving problems. Some of the other analyses used in literature include Fuzzy AHP, Electra, Factor Point Method and the Weighted Criteria Method.

AHP was developed by Thomas L. Saaty in 1977. In its most general definition this technique helps in determining multiple criteria and importance levels. AHP provides both qualitative and quantitative approach to groups via powerful and easy to use methodology for comparing two competitive brand with each other (Saaty, 1989, pp. 24-27).

AHP's objectives are defining the decision criteria / sub-criteria and the importance levels of the criteria for each problem. It uses a hierarchical model of matrices and it is based on three basic principles:

- The creation of hierarchies,
- Determination of superiority,
- Providing logical and numerical consistency.
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The AHP method can be summarized as; (Saaty, 1989; Ulucan, 2004, pp. 332-333):

- Identifying the problem,
- Determining the criteria,
- Introducing the alternatives,
- Drawing a hierarchical tree diagram,
- Determining the criteria's importance levels,
- Scoring alternatives according to each criterion,
- Obtaining multi-criteria scores for each alternative,
- Comparing overall scores and selecting the best alternative by ranking.

Table 1: Saaty's 1-9 scale for AHP (Saaty, 1980)

Intensity of Importance	Definition	Explanation
1	Equal importance	Two activities contribute equally to the objective
3	Moderate importance	Experience and judgment slightly favor one over another
5	Strong importance	Experience and judgment strongly favor one over another
7	Very strong importance	Activity is strongly favored and its dominance is demonstrated in practice
9	Absolute importance	Importance of one over another affirmed on the highest possible order
2, 4, 6,8	Intermediate values	Used to represent compromise between the priorities listed above
Reciprocal of above non-zero numbers	If activity i has one of the above non-zero numbers assigned to it when compared with activity j, then j has the reciprocal value when compared with i	

Binary comparisons of different criteria are given in Table 2. Where n criteria are rows and columns up to i = 1,2, ..., n, and j = 1, 2, …, n are arranged in columns to form the comparison matrix. Matrix wi/wj in the comparison matrix of importance in order to reach the aim by comparing i. criterion with j.

Table 2: Comparison Matrix for AHP

	Criteria-1	Criteria-2	Criteria ...	Criteria-n
Criteria-1	w1 / w1	w1 / w2	……..	w1 / wn
Criteria-2	W2 / w1	W2 / w2	……..	W2 / wn
Criterion…	……	……	……..	……..
Criteria-n	Wn / w1	Wn / w2	…….	Wn / wn

The properties of the binary comparison matrix are: (Saaty, 1980, p. 212);
• The diagonal of the matrix equals 1 (one).
• The comparison matrix with all elements are positive numbers.
• If the matrix is completely consistent (CR = 0), aij. aijk = open equality is achieved.
• If the matrix is completely consistent, then all other factors of the matrix can be reached from any row.
• The eigenvector corresponds to the largest eigenvalue of the matrix, significance level or relative importance vector.
• The evaluation can be done as a combination of the two numbers n.

In the mathematical model of the AHP, the relative importance of the alternatives / criteria was being assessed and found the matrix consistency. For the consistency of comparison matrix, the eigenvalue

(λmax) must be equal to the matrix size (n) (Saaty, 1980/1985). To calculate the relative importance of the criteria, the average of each row and a 'column vector' is created. The constructed column vector is normalized to obtain the 'relative significance vector'. Each line in the math weighted significance vector is obtained by multiplying it by the relative significance vector. As a result, this vector is mathematical while the average yields the largest eigenvalue 'λmax'. The consistency indicator and the consistency rate are calculated as follows for checking the accuracy:

Consistency Indicator (CI) = $\frac{\lambda_{max} - n}{n-1}$

Let Random Indicator be "RI";

Consistency Ratio (CR) = $\frac{CI}{RI}$

The consistency rate is based on each criterion of the decision maker and it in terms of the quality and validity of the final decision is an important concept. The AHP method is more reliable than other multi-criteria decision-making methods when it comes to testing the consistency of the answers (Ozmen et al., 2013).

4. Methodology

The aim of this study is to understand the leader of the market based on the preferences of the customers. To do this, we distributed a questionnaire among GSM service users in Sulaymaniyah. The survey questionnaire contained questions to evaluate impact of network quality, pricing strategy, conflict handling, and promotions on corporate image, trust, and switching costs. It was seen based on the literature that trust, corporate image, and switching cost affect satisfaction and consequently loyalty of the customers.

We initially gathered data from 550 GSM service users. Further, we proposed a structural equation modeling to understand the importance of each dimension for the satisfaction and loyalty of the customers. We analyzed the answers using the ANOVA statistics to understand the differences between the brands based on three dimensions (corporate image, trust and switching costs). According to the results, the leader in the GSM market in each dimension (corporate image, trust and switching costs) was found out. Moreover, results were entered and rated in the analytic hierarchy process software, Expert Choice (2000 2nd edition). The results were evaluated and the leader was determined (Figure 1).

Figure 1: Model of the study

5. Findings

Initially structural equation modeling results show that trust was the most important parameter that affected satisfaction. Secondly, corporate image and switching costs have been important parameters those impact the satisfaction of the customers respectively. The initial results were shown in the table below;

Table 3: Results of structural equation modeling

Model Fit					
CMIN/DF			1.663		
RMR			0.062		
CFI			0.906		
AGFI			0.893		
RMSEA			0.035		
Impacts			Standardized Estimates	C.R.	P
satisfaction	<---	Corporate image	0.347	3.158	0.002
satisfaction	<---	Trust	0.491	4.250	***
satisfaction	<---	Switching costs	0.135	1.991	0.048
loyalty	<---	Satisfaction	0.953	9.486	***

The table above shows that trust had the biggest impact on satisfaction with a coefficient of 0.491. Corporate image and switching costs came next with impact coefficients of 0.347 and 0.135 respectively. According to the model fit values like CMIN/DF, RMR, CFI, AGFI and RMSEA, these results are reliable as they are 1.663 (less than 5), 0.062 (less than 1), 0.906 (above 0.90), 0.893 (above 0.85) and 0.035 (less than 1) respectively.

The analytic hierarchy process' results also show that trust was slightly more important than corporate image and strongly more important than switching costs. Corporate image was moderately less important than trust, and moderately more important than switching costs. Finally, switching costs were very strongly less important than trust and moderately less important than corporate image (Table 3).

Table 4: Importance level of each parameter

	Trust	Corporate Image	Switching Cost
Trust	----------	3	5
Corporate Image	1/3	----------	3
Switching Costs	1/5	1/3	----------

The table above includes dimensions such as trust, corporate image, and switching costs which impact the satisfaction and consequently loyalty of the customers. The dimensions have been constructed by a questionnaire which includes questions from studies of Aydin and Ozer (2005). Secondly, those questions have been asked to the GSM service users in Sulaimani, Kurdistan Region of Iraq. The results have been analyzed by structural equation modeling and the importance of those dimensions have been sequenced based on the results of that analysis. Further, The data obtained from respondents were analyzed to calculate group priority, factor priority, and overall priority of the factor within trust, corporate image, and switching cost dimensions. The overall priority of factor was calculated by multiplying the group priority by the factor priority within the concerning group (Table 5).

Table 5: Priority weights of each dimension

Factor Name	Weight	Based on Brand
Trust	0.637	Korek = 0.149 AsiaCell = 0.474 Zain Telecom = 0.376 Inconsistency = 0.050
Corporate Image	0.258	Korek = 0.210 AsiaCell = 0.240 Zain Telecom = 0.550 Inconsistency = 0.020
Switching Costs	0.105	Korek = 0.149 AsiaCell = 0.474 Zain Telecom = 0.376 Inconsistency = 0.050
Overall Inconsistency		0.040

Table 5 shows the priority or importance of each dimension for customer satisfaction based on the AHP criteria. It shows that trust was more important (0.637) as compared to switching costs and corporate image for satisfaction. Further, corporate image (0.258) and switching costs support the model secondarily. Taking trust into account, Asia Cell was the leader with a coefficient of 0.474, Zain

Telecom was second with a coefficient of 0.376 and Korek Telecom was last with 0.149. When it comes to corporate image, Zain Telecom was the leader with 0.550 followed by Asia Cell with 0.240 and Korek Telecom with 0.210. Lastly, considering switching costs to another operator, Asia Cell had the advantage at 0.474, followed by Zain Telecom with 0.376 and Korek Telecom with 0.149 (Figure 2).

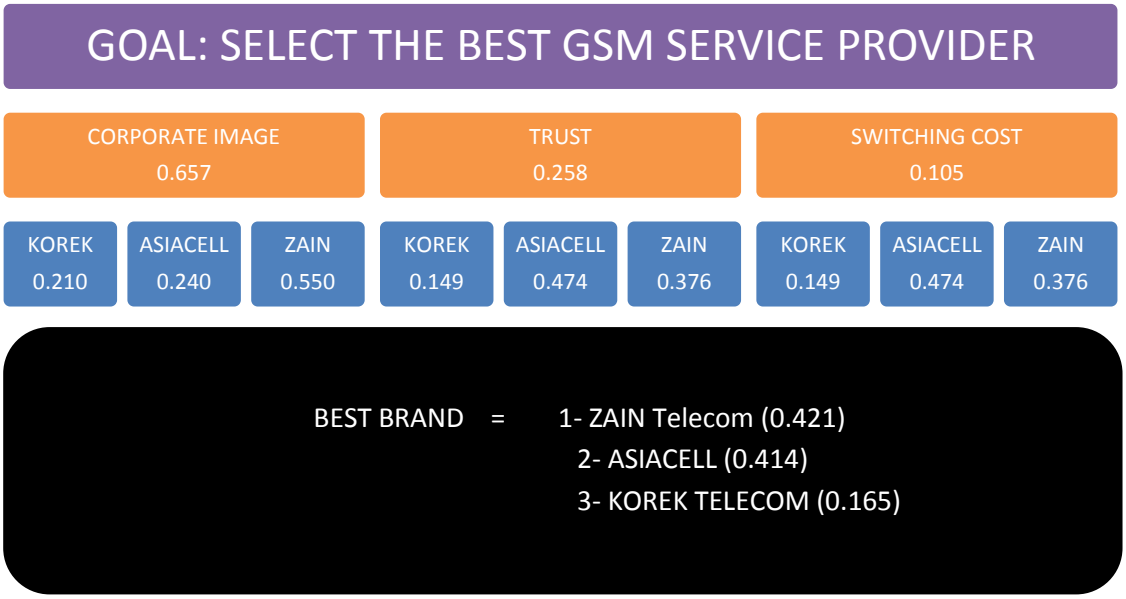

Figure 2

The figure above represents the best brand of the region acccording to the evaluations of users; Zain Telecom has the best result. Secondly AsiaCell, which has a close evaluation result to Zain Telecom and the last brand of the region in the survey is Korek Telecom.

6. Conclusion

The aim of the current paper was to elaborate the sequence of the brands based on the satisfaction of the users. To do this, initially, data has been obtained from the users of each GSM service providers. Structural equation modeling have been proposed to understand the most important criteria for satisfaction of the customers. After that, the importance of those criteria has been converted into the analytic hierarchy process. Based on the importance of each dimension, the leader at each criteria has been determined. Finally, the best satisfying brand has been selected among three GSM service providers in Kurdistan Region of Iraq. The results show that the best brand in the market was Zain Telecom, which was followed by AsiaCell, and Korek Telecom. Based on these results, it is recommended that Korek Telecom try and increase trust among its users to reach a higher rank in the market. To do this, Korek Telecom should focus on the atcedents of trust, which are conflict handling and the pricing policy of its brand. To increase trust levels among customers, it is important to increase the quality of the conflict handling processes, decide on better pricing policy. Besides, the companies can undertake promotions for prospective and current customers.

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