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Providing a Pattern to Prioritize the Branches of Service Firms

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Abstract. The purpose of this note is to show how some of the main results existing in the insurance service quality utilizing SERVQUAL scale and ANP model can be effectively used in scientifically ranking strategies instead of the traditional models, which is unfortunately more popular in ranking the branches of insurance companies. This approach is used to show how the ranking decisions changes as a function of service quality utilizing ANP model. This study evaluated the quality of services of DANA insurance company branches to measure policy holders' views toward current level and expected level of quality. The standard questionnaire "SERVQUAL", emphasizing on measuring the gap between the level of current and Expected quality was used and

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the proposed algorithm utilized the analytic network process (ANP), which allows measurement of the dependency among the quality dimensions, to rank the branches. The results showed difference between policy holders' expectations and current level of quality of services in all dimensions of quality. The most outstanding gap was for responsiveness dimension and the least one was for empathy and also according to the ANP limit super matrix it was revealed that there was a significant difference between the proposed ranking approach and the traditional one.

Keywords: ANP; insurance industry; service quality; decision making.

1. Introduction

Rational decision-making is a talent we must encourage if we want to be more effective in implementing our ideas in the real world with its risks and resistance to change. There are two types of decisions the first one is to determine what we prefer the most, known as normative decision-making in these circumstances it is easy to see why we do not wish anything to happen that can undermine the best choice we make. The second one is descriptive decision-making which is how to make a best choice given all the influences in the world around us that can affect the optimality of any choice we make thus if we choose this type as an alternative to the first one we do not want it to be influenced by the other alternative that occur to us later. The first ones are falsifiable statements that attempt to describe the real world as it is and normative ones legislate how things ought to be and can never be proven to be correct and workable, but only disproved with examples of what the recommended failing [1]. In reality how good any choice we make depends on how well we know our alternatives as compared with each other and with others outside the collection being compared so we can rank them as to how good they are. Decision-making involves prioritizing ideas according to the circumstances we face now or might face in the future. A fundamental problem is how to measure intangible criteria and how to interpret them to yield sensible. The ANP is fundamentally a way to measure intangibles factors by using pair wise comparisons with judgments that represent the dominance of one element over another with respect to a property that they share[2]. The ANP has found

useful application in decision making which involves numerous intangibles. It is a process of laying out a structure of all essential factors that influence the outcome of a decision. Numerical pair wise comparison judgments are then elicited to express peoples understanding of the importance, performance or likely influence of these elements on the final outcome obtained by synthesizing the priorities derived from different sets of pair wise comparisons and sensitivity analysis is performed in the end to determine the stability of the outcomes to wide perturbations in the judgments [3]. Undoubtedly all organizations are in search of attaining a desirable quality this issue is of greater importance in serving organizations [4]. since service quality is increasingly as a critical determinant of business performance and strategic tool tor gaining competitive advantages, measuring service quality has been a matter of grave concerns for both practitioners and researchers during the past two decades [5]. Notwithstanding the most popular measure of service quality is SERVQUAL developed by Parasuraman etal,1988 a number of applications of SERVQUAL has been reported in variety of settings [6]. The original instrument of SERVQUAL is comprised of five dimensions with 22 items and analysis of these data can take several forms such as item-by-item analysis, dimension-by-dimension analysis and computation of the single measure of overall service quality [7]. Services play an increasingly important role in the I.R.I and also in the global economy and have in fact become more important than goods. for instance services produced by insurance industry accounted for 0.1% of gross domestic product(GDP)in 2011 and it is to supposed be 1.45%in 2015 [8]. Services differ from goods in several important ways for instance while goods are tangible and can be stored services are often intangible and must be produced and consumed simultaneously [9]. To the best of our knowledge studies of utilizing of ANP to rank insurance branches based on their service quality are so far lacking. The aim of this paper is to fill this gap by examining the ANP utilization in scientifically ranking the branches of firms operating in financial service industry specifically insurance industry based on their service quality level. Our decision to study insurance industry is motivated by some factors: first the insurance industry has experienced an acceptable volume of domestic direct

and indirect investment in recent years in IRAN, mainly due to new technological advancements governmental liberalization policies which have created many opportunities for private insurance firms to become active in financial market and more over insurance industry is one of the largest service industry in IRAN. The second one is that an insurance policy involves the payment of a premium over long period of time in order to generate a specific type of benefit for the policy holder in the future as a result policy holders are likely to have long-term relationship with their insurance firms and are likely to have a specific interest in the performance of their insurer [10]. So Together with the lack of international management research on insurance firms and their branches and specially their scientifically ranking method, make the insurance industry and ranking models an interesting service industry to study.

2. Literature Review

Different researches have presented various definitions regarding quality of services some of them believe that the quality of the perceived service is the result of the assessment of the clients' expectations and the perceived services. Service quality is a stable criterion that indicates how the presented services correspond with the clients expectations. Some of them define service quality as the presentation of services in a way much better than what the client expect [11, 12]. Despite general agreement concerning a definition it can be mentioned that the comprehensive and the mostly accepted definition belongs to parasuraman et al [13]. According to this definition service quality is related to satisfaction but not equal to that in a sense which it is attained via the difference between clients' expectations and their perceptions of service attaining. Parasuraman et al in their studies [13; 14; 15] Identified 10 dimensions for the identification of service quality: facilities, reliability, responsibility, communication, credit security, qualification, politeness, understanding of the client, and availability. Later, they summarized these into five dimensions. SERVQUAL can also be defined as a multiple-item scale composed of five dimensions and 22 items for measuring consumer perceptions of service quality [16]. Table I presents the

five dimensions of SERVQUAL. The survey instruments for SERVQUAL of include the 22 items for measuring expectations (E) and the corresponding 22 items for measuring perceptions (P). Five or seven point liker's scale from "Strongly Disagree (1) to Strongly Agree (7)" can be used for measurement. For each item, a difference score G is obtained as the difference between the ratings on perception (P) and expectation (E); that is, G=P-E [15].

Table 1: Dimensions of Servqual [15]

Dimensions	Definition	Number of item
Tangible	Physical facilities, equipment, appearance of personnel and organization accommodations	4
Reliability	Ability to perform the promised service dependably and accurately and precisely	5
Responsiveness	Willingness to help customers and provide prompt service and disposition to quickly serve the clients	4
Assurance/ Guarantee	Knowledge and courtesy of employees and their ability to inspire trust and confidence	4
Empathy/ Sympathy	Caring, individualized attention the firm provides to its customers / personal attention to each client	5

The ANP is a mathematical theory that can deal with all kinds of dependence systematically. The ANP has been successfully applied in many fields. ANP has a systematic approach to set priorities and tradeoffs among goals and criteria, and also can measure all tangible and intangible criteria in a model [17]. Many decision problems cannot be structured hierarchically because they involve the interaction and dependence of higher-level elements in a hierarchy on lower-level elements. Not only does the importance of the criteria determine the importance of the alternatives as in a hierarchy, but also the importance of the alternatives themselves determines the importance of the criteria. And also feedback enables us to factor the future into the present to determine what we have to do to attain a desired future. The Analytic Network Process is a generalization of the Analytic Hierarchy Process. The basic structures are networks. Priorities are established in the same way they are in the AHP using pair wise comparisons and judgments. The feedback structure does not have the top-to-bottom form of a hierarchy

but it looks more like a network, with cycles connecting its components of elements, and we can no longer call them levels, with loops that connect a component to it [18]. Traditional MCDM methods are based on the additive concept along with the independence assumption, but individual criterion is not always completely independent. For solving the interactions among elements, the analytic network process (ANP) as a relatively new MCDM method was proposed by professor Saaty [19]. This study involves numbers of pair wise comparisons for deriving the priorities of branches of insurance companies' evaluation and ranking. Synthesizing experts' opinions is in compliance with the geometric mean method Buckley [20]. The valuation scales used in the study are those recommended by Saaty (3, 19), where 1 is equal importance, 3 moderate importance, 5 is strong importance, 7 is very strong or demonstrated importance, and 9 is extreme importance. Even numbered values will fall in between importance levels. Reciprocal values (e.g. 1/3, 1/5, etc.) mean less importance, even less importance, etc. Saaty 1980 proved that for consistent reciprocal matrix, the λ max value is equal to the number of comparisons, or $\lambda\ max = n$. A measure of consistency was given, called Consistency Index as deviation or degree of consistency using the following formula. If the value of I.I. Ratio $[I.I. = (\lambda\ max - n)/(n-1)]$ is smaller or equal to 10%, the inconsistency is acceptable. If the I.I. ratio is greater than 10%, the subjective judgment needs to be revised. n in the formula denotes the number of elements that have been compared. When $\lambda\ max = 0$, the complete consistency exists within judgment procedures and then $\lambda\ max = n$. The consistency ratio (I.R.) of I.I. to the mean random consistency index (I.I.R) is expressed as I.R. (I.R.=I.I./I.I.R) less than 0.1. The outcome of the process above is able to compose an un-weighted super matrix. Its columns contain the priorities derived from the pair wise comparisons of the elements. In an un-weighted super matrix, its columns may not be column stochastic. To obtain a stochastic matrix, i.e., each column sums to one, the blocks of the un-weighted super matrix should be multiplied by the corresponding cluster priority. To derive the overall priorities of elements, this method involves multiplying sub-matrices numerous times in turn, until the columns stabilize and become identical in each block

of sub-matrices [3]. The weighted super matrix can then be raised to limiting powers to calculate the overall priority weights. The ANP employs the limiting process method $lim\ k \longrightarrow \infty\ Wk$ of the powers of the super matrix [19,21,23]. For synthesizing overall priorities for the alternatives, the un-weighted super matrix requires adjusting in order to keep it column stochastic [24].

3. Methodology

Applying ANP to matrix operations in order to determine the overall priorities of the criteria identified with SERVQUAL analysis and to rank the insurance companies' branches (alternatives) the proposed algorithm is as the figure follows:

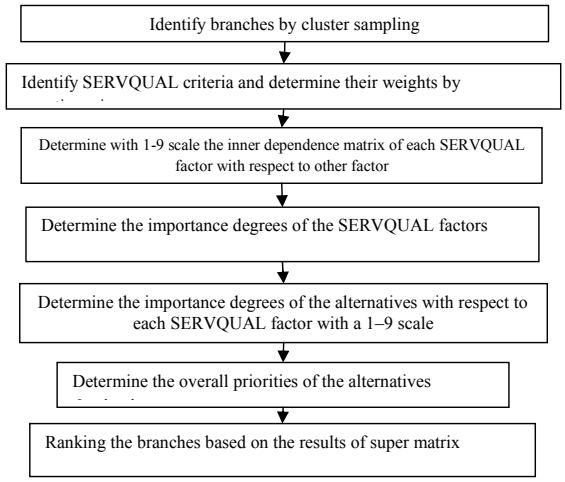

Figure 1. Algorithm of branches ranking by ANP.

The research method is descriptive-survey which has been selected on the basis of the nature of this research. The population of this research includes all the policy holders who were living in zone 2(this zone contains the policy holders who are in Tehran and will be described later in this paper) from 2013 to 2014. 276 policy holders were sampled based on volume assessment sample formula. The instrument was the standard SERVQUAL-PARASURAMAN questionnaire which was designed

on the basis of lickers' seven scales and distributed among the participants [15]. To analyze the data, SPSS software was used at the two levels of descriptive and analytical statistics. At the level of descriptive statistics, frequency, percentage, mean and standard deviation were used and at the level of analytical statistics dependent t-test, were used to investigate the policy holders' opinions. Sample volume was calculated according to the following formula [25].

$$n = \frac{z^2\sigma^2}{d^2} \tag{1}$$

D=desired precision (or maximum error)
σ^2=assumed population variance
$Z_{\alpha/2}$=critical normal deviate for specified reliability $1-\alpha$

To calculate the variance and reliability 40 questionnaires were distributed among policy holders the variance was equal to .5789 and previous studies indicate that desired precision of d=0.077, with reliability probability of $1-\alpha$=0.95 and from critical normal deviate values table we know that $Z_{/025} = 1/96$ thus the required sample size is 276 (rounded) and the reliability was estimated via Cronbach's alpha (perceptions 82% and expectations 95%) by SPSS software.

Our ANP model for SERVQUAL is shown in figure 2 which contains 4 alternatives (four branches of DANA insurance co.) and five criteria (SERVQUAL factors) and the goal of the model was to find the superior branch among the others according to policy holders' opinions.

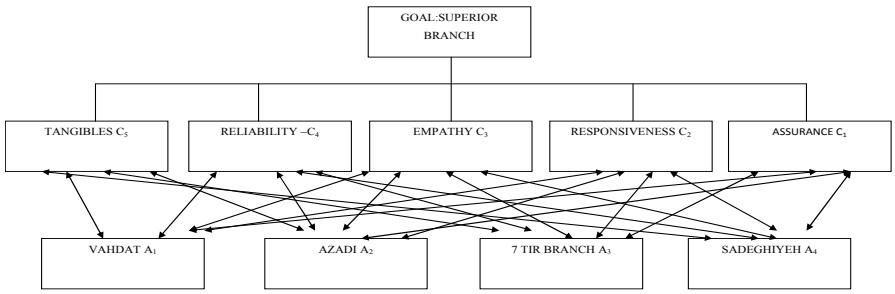

Figure 2. ANP model for SERVQUAL

The ANP is composed of four major steps:

Step 1: Model construction and problem structuring: The problem should be stated clearly and be decomposed into a rational system, like a network. This network structure can be obtained by decision-makers through brainstorming or other appropriate methods.

Step 2: Pair wise comparison matrices and priority vectors: Similar to the comparisons performed in AHP, pairs of decision elements at each cluster are compared with respect to their importance towards their control criteria. The clusters themselves are also compared with respect to their contribution to the objective. Decision-makers are asked to respond to a series of pair wise comparisons of two elements or two clusters to be evaluated in terms of their contribution to their particular upper level criteria. In addition, interdependencies among elements of a cluster must also be examined pair wise; the influence of each element on other elements can be represented by an eigenvector. The relative importance values are determined with Saaty's 1-9 scale (Table 2), where a score of 1 represents equal importance between the two elements and a score of 9 indicates the extreme importance of one element (row cluster in the matrix) compared to the other one (column cluster in the matrix) [26].A reciprocal value is assigned to the inverse comparison, that is, $a_{ij}\frac{1}{4}1 = a_{ji}$, where $a_{ij}(a_{ji})$ denotes the importance of the $i_{th}(j_{th})$ element. Like with AHP, pair wise comparison in ANP is performed in the framework of a matrix, and a local priority vector can be derived as an estimate of the relative importance associated with the elements (or clusters) being compared by solving the following equation:

$$A \times W = \lambda_{MAX}.W \tag{2}$$

Where A is the matrix of pair-wise comparison, w is the eigenvector, and λ_{max} is the largest eigenvector value of Saaty [1980] proposes several algorithms to approximate w. In this paper, super decision is used to compute the eigenvectors from the pair-wise comparison matrices and to determine the consistency ratios.

Table 2: Saaty's 1-9 scale for AHP preference [19]

Intensity of importance	Definition
1	Equal importance
3	Moderate importance
5	Strong importance
7	Very strong importance
9	Absolute importance
2,4,6,8	Intermediate importance
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

Each matrix should be normalized by the following formula: (3)

$$a_{ij} = \frac{\frac{1}{a_{ij}}}{\sum_{i=1}^{m} \frac{1}{a_{ij}}} \tag{3}$$

The consistency index we chose is as below [18]

$$I.I. = \frac{\lambda_{MAX} - n}{n - 1} \tag{4}$$

And the rate of inconsistency is calculated according to the following formula 5:

$$I.R. = \frac{I.I}{I.I.R} \tag{5}$$

Where I.I.R random index is chosen from random index table, is shown in table 3.

Table 3: Random index table

Order	1	2	3	4	5	6	7	8	9
I.I.R	0	0	0.58	0.9	1.12	1.24	1.32	1.41	1.45

Step 3: Super matrix formation: The super matrix concept is similar to the Markov chain process [19]. To obtain global priorities in a system with interdependent influences, the local priority vectors are entered in

the appropriate columns of a matrix. As a result, a super matrix is actually a partitioned matrix, where each matrix segment represents a relationship between two clusters in a system. The local priority vectors obtained in Step 2 are grouped and placed in the appropriate positions in a super matrix based on the flow of influence from one cluster to another, or from a cluster to itself, as in the loop. A standard form for a super matrix is as shown below.

$$w_{ij} = \begin{bmatrix} w_{11} & w_{1k}\ldots\ldots & w_{1n} \\ w_{k2} & w_{kk}\ldots\ldots & w_{kn} \\ & & \\ w_{n1} & w_{nk}\ldots\ldots & w_{nn} \end{bmatrix}$$

Note that any zero value in the super matrix can be replaced by a matrix if there is an interrelationship of the elements within a cluster or between two clusters. Since there usually is interdependence among clusters in a network, the columns of a super matrix may sum to more than one. However, the super matrix must be modified so that each column of the matrix sums to unity.

An approach recommended by Saaty, 1996 involves determining the relative importance of the clusters in the super matrix, using the column cluster as the controlling cluster. That is, row clusters with non-zero entries in a given column cluster are compared according to their impact on the cluster of that column cluster. An eigenvector is obtained from the pair wise comparison matrix of the row clusters with respect to the column cluster, which in turn yields an eigenvector for each column cluster. The first entry of the respective eigenvector for each column cluster, is multiplied by all the elements in the first cluster of that column, the second by all the elements in the second cluster of that column and so on. In this way, the cluster in each column of the super matrix is weighted, and the result, known as the weighted super matrix, is stochastic. Raising a matrix to exponential powers gives the long-term relative influences of the elements on each other. To achieve convergence on the

importance weights, the weighted super matrix is raised to the power of $2k+1, (W = LimW^{2k+1})$ where k is an arbitrarily large number; the new matrix is called the limit super matrix[19]. The limit super matrix has the same form as the weighted super matrix, but all the columns of the limit super matrix are the same. The final priorities of all elements in the matrix can be obtained by normalizing each cluster of this super matrix. Additionally, the final priorities can be calculated using matrix operations, especially where the number of elements in the model is relatively few. Matrix operations are used in order to easily convey the steps of the methodology and how the dependencies are worked out.

Step 4: Selection of the best alternatives: If the super matrix formed in Step 3 covers the whole network, the priority weights of the alternatives can be found in the column of alternatives in the normalized super matrix. On the other hand, if a super matrix only comprises clusters that are interrelated; additional calculations must be made to obtain the overall priorities of the alternatives. The alternative with the largest overall priority should be selected, as it is the best alternative as determined by the calculations made using matrix operations.

4. Findings

This section presents an illustration of the proposed approach summarized in the previous sections. In the following case study, SERVQUAL method utilizing the ANP analysis is performed on DANA Insurance CO. which is one of the largest Iranian insurance co. and is centralized administration in Tehran with more than 40 branches throughout the country which are divided in to 8 zones and this co. makes use of traditional ranking system. It has tree type of branches, superior branch, level 1 branch and level 2branch which are annually assessed by their annual portfolio (annual sale level) then ranked by this criterion. The higher the portfolio, the higher ranking level will be allocated to. In this paper we want to test if there is a difference between the traditionally assessment and the proposed model which is a scientific approach. the following example is presented for the purpose of illustration of the pro-

posed approach. The data for the five dimensions of SERVQUAL for service quality units were generated for both perceptions and expectations in four branches as our alternatives. Then, ANP was conducted with the data set of SERVQUAL. Table4 presents the generated data and results of SERVQUAL.

The statistical analysis revealed that the mean for expectations was 22.056 and for perceptions was 19.203 and t result was 23.22 at p .001 so the data analysis of the policy holders' expectations and perceptions in all dimensions of service quality showed that they were significant at $p < 0.05$, and there was a gap between their expectations and their perceptions which showed that the insurer could not satisfy the policy holders with their expectations.

Table 4. Generated data of SERVQUAL.

criteria / alternatives	c_1	c_2	c_3	c_4	c_5	Total
A_1	0.5025	0.7475	0.7046	0.9488	0.5268	3.4312
A_2	0.541	1.1375	0.6474	0.6928	0.60825	3.627
A_3	0.7075	0.7225	0.5666	0.832	0.725	3.554
A_4	0.8875	1.1925	0.284	0.926	0.4	3.69

This section consists of 2 parts. a: comparison of criteria with all alternatives and b; comparison of alternatives with all criteria. The results of these comparisons are shown in table 5 as super matrix and table 6 as the limit super matrix.

6-a-criteria comparison with alternatives

6-a-1-assurance criterion (c_1) comparison with alternatives:

Table 5: The super matrix:

	C_1	C_2	C_3	C_4	C_5	A_1	A_2	A_3	A_4
C_1	0	0	0	0	0	0.146	0.149	0.199	0.241
C_2	0	0	0	0	0	0.218	0.313	0.203	0.323
C_3	0	0	0	0	0	0.205	0.179	0.159	0.077
C_4	0	0	0	0	0	0.277	0.191	0.234	0.251
C_5	0	0	0	0	0	0.154	0.168	0.204	0.108
A_1	0.312	0.301	0.172	0.221	0.256	0	0	0	0
A_2	0.289	0.198	0.187	0.302	0.221	0	0	0	0
A_3	0.223	0.312	0.214	0.251	0.186	0	0	0	0
A_4	0.176	0.189	0.427	0.226	0.337	0	0	0	0

$$w=\begin{bmatrix}.312\\.289\\.223\\.176\end{bmatrix}\rightarrow I.I=\frac{4.0045-4}{3}=0.0015\rightarrow I.I.R=\frac{0.0015}{0.9}=0.0017\langle 0.1$$

6-a-2- responsiveness criterion (c_2) comparison with alternatives:

$$w=\begin{bmatrix}.301\\.198\\.312\\.189\end{bmatrix}\rightarrow I.I=\frac{4.0015-4}{3}=0.0005\rightarrow I.I.R=\frac{0.0005}{0.9}=0.0055\langle 0.1$$

6-a-3- empathy criterion (c_3) comparison with alternatives:

$$w=\begin{bmatrix}.172\\.187\\.214\\.427\end{bmatrix}\rightarrow I.I=\frac{4.0075-4}{3}=0.0025\rightarrow I.I.R=\frac{0.0025}{0.9}=0.0003\langle 0.1$$

6-a-4- reliability criterion (c_4) comparison with alternatives:

$$w=\begin{bmatrix}.221\\.302\\.251\\.226\end{bmatrix}\rightarrow I.I=\frac{4.0000-4}{3}=0.0000\rightarrow I.I.R=\frac{0.0000}{0.9}=0.0000\langle 0.1$$

6-a-5- tangibles criterion (c_5) comparison with alternatives:

$$w=\begin{bmatrix}.256\\.221\\.186\\.337\end{bmatrix}\rightarrow I.I=\frac{4.00125-4}{3}=0.0042\rightarrow I.I.R=\frac{0.00042}{0.9}=0.00046\langle 0.1$$

6-b-alternatives comparison with criteria:

6-b-1-vahdat branch (A_1) comparison with all SERVQUAL criteria:

$$w=\begin{bmatrix}.146\\.218\\.205\\.277\\.154\end{bmatrix}\rightarrow I.I=\frac{5.0004-5}{4}=0.0001\rightarrow I.I.R=\frac{0.0001}{1.12}=0.00009\langle 0.1$$

6-b-2-azadi branch (A_2) comparison with all SERVQUAL criteria:

$$w=\begin{bmatrix}.149\\.313\\.179\\.191\\.168\end{bmatrix}\rightarrow I.I=\frac{5.045-5}{4}=0.1125\rightarrow I.I.R=\frac{0.1125}{1.12}=0.01\langle 0.1$$

6-b-3-7tir branch (A_3) comparison with all SERVQUAL criteria:

$$w=\begin{bmatrix}.199\\.203\\.159\\.234\\.204\end{bmatrix}\rightarrow I.I=\frac{5.0146-5}{4}=0.00365\rightarrow I.I.R=\frac{0.0365}{1.12}=0.0033\langle 0.1$$

6-b-4-sadeghiyeh branch (A_3) comparison with all SERVQUAL criteria:

$$w=\begin{bmatrix}.241\\.323\\.077\\.251\\.108\end{bmatrix}\rightarrow I.I=\frac{5.0008-5}{4}=0.0002\rightarrow I.I.R=\frac{0.0002}{1.12}=0.00018\langle 0.1$$

Table 6: The limit super matrix:

	C_1	C_2	C_3	C_4	C_5	A_1	A_2	A_3	A_4
C_1	0	0	0	0	0	0.183964317	0.183985235	0.183801168	0.184074242
C_2	0	0	0	0	0	0.222924826	0.222833677	0.222043687	0.222245302
C_3	0	0	0	0	0	0.174698925	0.174663932	0.174518175	0.174540533
C_4	0	0	0	0	0	0.238944804	0.238939172	0.238707585	0.238948024
$w^5 = C_5$	0	0	0	0	0	0.177914046	0.177891411	0.177743204	0.177818801
A_1	0.256763133	0.256736739	0.256607967	0.256714	0.2566763	0	0	0	0
A_2	0.241457809	0.241424701	0.241387689	0.241436	0.2414222	0	0	0	0
A_3	0.245708829	0.245688855	0.245625035	0.245676	0.2456764	0	0	0	0
A_4	0.255427991	0.255416433	0.25575823	.0255504	0.2556396	0	0	0	0

The aim of this research was to assess the service quality of the branches of insurance companies by applying SERVQUAL model and combining the results by ANP in order to propose a scientific ranking model. The participants included policy holders who were randomly selected by cluster sampling method and the instrument was the standard SERVQUAL questionnaire with five dimensions (assurance, empathy, tangibles, responsibility and reliance). The reliability of the instrument was measured by Cronbach's alpha (perceptions 0.92 and expectations 0.90). Data analysis was conducted and revealed that there was gap in the policy holders' expectations ($\mu = 22.056$) and perceptions ($\mu = 19.203$) in the all dimensions of SERVQUAL it was significant at $p < 0.05$. Results showed that alternatives ranked in this order1-VAHDAT 2-SADEGHIEH. 3-7TIR 4-AZADI where in accordance with traditional assessment ranking system they were ranked as: 1-AZADI 2-7TIR 3-SADEGHIEH 4-VAHDAT. The traditional ranking model is based on annual portfolio of each branch shown in figure 3 and table 7 shows the priorities of criteria and table 8 shows the ranking of alternatives based on mathematically proposed model which proved that there was a significant difference between the traditional ranking model and the engineering proposed model.

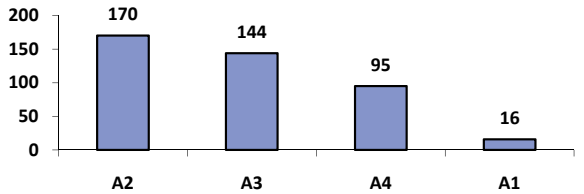

Figure 3. traditional assessment and ranking system of insurance branches (portfolio billion of RIALS)

Table 7: Prioritization of criteria (SERVQUAL dimensions) by the proposed engineering model from the limit super matrix

Ranking	Element
1	C4
2	C2
3	C1
4	C5
5	C3

Table 8: Ranking of alternatives (branches) by the proposed engineering model from the limit super matrix

Ranking	Element
1	A1
2	A4
3	A3
4	A2

5. Conclusion

Successful management starts with a proper assessment system that is chosen through a robust evaluation method. Akhlaghi et al in 2012 assessed the quality of educational services in AHVAZ technical college via SERVQUAL model and concluded that the gap between perceptions and conceptions in responsiveness was of great importance [26]. In 2012 Hakyeon et al proposed a data envelopment analysis (DEA) approach to computation of a measure of overall service quality and benchmarking when measuring service quality with SERVQUAL[16]. In 2011 yazgan et al proposed a model for selecting of the global supplier by analytical hierarchy process (AHP) and analytical network process (ANP) based on linguistic variable weight then fuzzy AHP and fuzzy ANP results were compared. Yazgan in 2011 developed an analytical network process model based on benefit, opportunity, cost, and risk in order to eradicate the weaknesses of traditional methods of Selection of a best dispatching rule based on one or two criteria such as processing time, due date, or manufacturing system information in traditional methods such as

mathematical programming, simulation ,and heuristic algorithms weakness such as dispatching rules do not allow the use of multiple criteria for evaluating process, second one is related with not considering most of the manufacturing system information, and the last one deals with selection decision not being a dynamic structure[27]. Ramon et al in 2012 explored the problem of integrating semantically heterogeneous data (natural language included) from various websites with opinions about e-financial services. They developed an extension of the fuzzy model based on semantic translation (FMST) under the perspective of the service quality (SERVQUAL) stream of research [28]. In 2014 Miri et al provided an engineering pattern in order to gain market advantage in property-liability insurance marketing and they concluded that in a property insurance the managers should focus on service quality if they want to penetrate sufficiently and effectively in market and the cost of coverage was of the lowest importance degree [29]. The ANP is a relatively new MCDM method which can deal with many interactions systematically, unlike traditional MCDM methods which are based on the independence assumption. the ANP can be used not only as a way to handle the inner dependences within a set of criteria, but also as a way of producing more valuable information for decision-making this paper proposes a solution based on a combined ANP and the SERVQUAL in a management assessment system This approach helps the decision-making team to have a proper solution in management and ranking system. The results of this study showed that there was a significant difference between traditional assessment of branches and the mathematically proposed model. So after conducting the SERVQUAL model, it was revealed that service quality functioning of branches in the five dimensions was slightly below the mean and that there was a gap between the perception of the present situation and expectations from the viewpoints of the policy holders and the method of evaluating the branches is not an efficient method which should be converted to a scientific model if the insurance companies want to be efficient and effective in order not to lose their market shares. Fuzzy numbers can be introduced in the ANP method to more effectively analyze cases having greater uncertainty in the pair wise comparison matrices for future researches. Based on the

general findings of the research and in order to continuously improve the process of service quality it is necessary to repeat this research every year to examine the changes in expectations and perceptions of the policy holders and identify new needs and trends. Concerning all dimensions of the expectations and perceptions of them, benchmarking can be a useful tool in this industry. And decision-makers should give up and leave the traditional methods of assessment and move to the scientific approaches such as the engineering model which proposed in this paper to cope with future.

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