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Ranking of Tourism Web Sites According to Service Performance Criteria with CRITIC and MAIRCA Methods: The Case of Turkey

Turizm Web Sitelerinin Hizmet Performansı Kriterlerine Göre CRITIC ve MAIRCA Yöntemleri ile Sıralanması: Türkiye Örneği

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Turizm Web Siteleri,

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Çok Kriterli Karar Verme (ÇKKV),

CRITIC,

MAIRCA,

ÖZET

Çok Kriterli Karar Verme (ÇKKV) yöntemleri karar alternatiflerinin birden fazla maksimum veya minimum yönlü karar kriteri ile değerlendirilerek sistematik olarak sıralanmasını sağlayan yöntemlerdir. Çok Kriterli Karar Verme yöntemleri karar vericilere karar kriterlerinin önem ağırlıklarının hesaplanması ve karar alternatiflerinin sıralanması için belirlenmiş adımlar içeren yöntemler sunmaktadır. Kriter ağırlıklarının hesaplanması amaçlı olarak kullanılan ağırlıklandırma yöntemleri subjektif ve objektif ağırlıklandırma yöntemleri olmak üzere ikiye ayrılmaktadır. Kriter ağırlıklarının verilerin yapısına göre belirlendiği objektif ağırlıklandırma yöntemlerinin en yaygın kullanılanlarından birisi CRITIC yöntemidir. Lineer vektör optimizasyonuna dayalı bir Çok Kriterli Karar Verme yöntemi olan MAIRCA yöntemi ise sıfır ve negatif değer alan kriterler için uygun olması nedeniyle özellikle son yıllarda literatürde yaygın şekilde tercih edilen bir yöntemdir. Bu çalışmada ülke turizmi bakımından önemli bir görev yapan turizm web sitelerinin belirlenen dokuz hizmet performansı kriterine göre sıralanması amaçlanmıştır. Kriterlerin önem ağırlığı değerleri CRITIC yöntemi ile web sitelerinin sıralanması ise MAIRCA yöntemi ile gerçekleştirilmiştir. Web sitelerinin sıralanmasında en belirleyici olan karar kriterleri canlı destek ve şikâyet sayısı kriterleri olarak belirlenmiştir. MAIRCA yöntemi ile web sitelerinin sıralanması sonucunda ise tripadvisor.com ve seyahatyanımda.com ilk iki sırada yer alırken etstur.com ve setur.com son iki sırada yer almıştır.

Keywords:

Tourism Websites,

Service Performance,

Multi Criteria Decision Making (MCDM),

CRITIC,

MAIRCA,

ABSTRACT

Multi-Criteria Decision-Making (MCDM) methods enable the systematic ranking of decision alternatives by evaluating them with more than one maximized or minimized decision criterion. Multi-Criteria Decision-Making methods provide decision-makers with forms that include specified steps for calculating the importance weights of decision criteria and ranking decision alternatives. Weighting methods for calculating criterion weights are divided into subjective and objective. CRITIC method is one of the most widely used objective weighting methods in which criterion weights are determined according to the structure of the data. The MAIRCA method, a Multi-Criteria Decision Making method based on linear vector optimization, is widely preferred in the literature, especially in recent years, as it is also suitable for criteria with zero and negative values. This study aims to rank tourism websites, which play an essential role in terms of national tourism, according to nine service performance criteria. The CRITIC method determined the importance and weight values of the criteria, and the ranking of the websites was carried out by the MAIRCA method. The most decisive decision criterion in the website ranking was the live support and number of complaints. As a result of the ranking of the websites with the MAIRCA method, tripadvisor.com and seyahatyanımda.com took the first two places, while etstur.com and setur.com took the last two.

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1. INTRODUCTION

Businesses offer various services to customers through their websites. The quality of the service provided on the websites has an essential effect on customer satisfaction. Because the service offered on websites leaves a positive impression on customers. Accordingly, evaluating service performance on websites is of fundamental importance for businesses (Corigliano and Baggio, 2006; Law et al., 2010). In tourism, websites have become essential for tourists to search for information about a particular destination and plan holidays. The rising importance of tourism websites has increased expectations for the quality of both the websites and the services provided on the websites (Ghosh et al., 2022:974). As websites have become increasingly popular sources of information, tourism websites that allow visitors to search for and book accommodation with various filters have a critical role in tourists' destination selection (Bastida and Huan, 2014).

In this study, 15 tourism websites in Turkey were analyzed according to the service performance criteria, and the websites were ranked according to their performance scores. In the study, the performances of tourism websites were analyzed according to the following criteria: bounce rate (*the rate of visitors leaving the website immediately*), average visit duration (Önder and Berbekova, 2022), website onload time (So and Morrison, 2004), number of errors on the website (Bilal et al., 2019), the number of customer complaints about the website, the number of resolved complaints (Aymankuy, 2011), the number of services provided on the website (Bastida and Huan, 2014), the number of language options offered on the website (Kaygısız, 2021; Bastida and Huan, 2014) and availability of live support on the website (Cho and Sung, 2012; Kaygısız, 2021, Karabağ et al., 2010). The criteria used in the study were obtained from GTmetrix, Similarweb, WAVE (Web Accessibility Evaluation Tool), sikayetvar.com, and related tourism websites.

The criteria determined for the service performance evaluation of tourism websites were calculated with the CRITIC method, one of the objective criteria weighting methods. The websites were then analyzed using the MAIRCA method, which is widely used in the literature and has been found to provide more reliable and consistent results than other Multi-Criteria Decision-Making methods. Because the linear normalization technique is used in the MAIRCA method's standardization step, all alternatives are considered objectively and given equal chances. Also, after assessing the alternatives, this equal chance condition disappears by itself, and the alternatives become distinct from each other (Yazgan and Agamyradova, 2021:284). CRITIC and MAIRCA methods are used together and separately to solve Multi-Criteria Decision-Making problems in different fields. Since CRITIC and MAIRCA methods are integrated in this study, the literature is discussed in this direction.

Ayçin (2020) used CRITIC and MAIRCA methods to recruit personnel to work in the information systems department of an enterprise operating in the logistics sector. Belke (2020) evaluated the macroeconomic performance of G7 countries between 2010-2018 using CRITIC and MAIRCA methods. Günay and Ecer (2022) examined seventeen sub-sectors in economic and financial terms using the balance sheets published by the Central Bank of the Republic of Turkey. The related sectors were analyzed using CRITIC and MAIRCA methods. Tuğay and Temel (2022), using CRITIC and MAIRCA methods, analyzed the level of compliance of integrated reports of cement companies listed on Borsa Istanbul and published integrated reports with the principles of the International Integrated Reporting Guidelines. Solunoğlu (2022) used CRITIC and MAIRCA methods in hot air balloon pilot selection. Fidan (2021) selected an international target market using CRITIC and MAIRCA methods. Bektaş (2020) analyzed the financial performance of deposit banks in Turkey, and Yurttadur and Taşçı (2022) analyzed the financial performance of participation banks with CRITIC and MAIRCA methods. Baki (2022) analyzed the development levels of European Union countries from the perspective of inequality using CRITIC and MAIRCA methods. Akçakanat (2021) compared four large independent audit firms with six criteria using CRITIC and MAIRCA methods. Güler and Can (2020) used CRITIC and MAIRCA methods in an integrated manner in material selection. Burhan (2022) evaluated the performance of the top ten cotton-producing countries for 2017-2021 with the CRITIC and MAIRCA methods based on the criteria in the data part of the International Cotton Advisory Committee (ICAC).

Literature research has also been conducted in the context of tourism websites. Beldona and Cai (2006) evaluated fifty tourism websites in the USA using content, interaction, and promotion parameters using content analysis. Vila et al. (2017) analyzed the official tourism websites of 210 countries in the World Tourism Organisation's report according to accessibility criteria by using the website accessibility evaluation tool (website accessible test) and Web Content Accessibility Guidelines 2.0. Bastida and Huan (2014) analyzed and compared the tourism websites of Hong Kong, Shanghai, Beijing, and Taipei according to twenty-three criteria using content analysis. Cho and Sung (2012) evaluated tourism websites in Korea, China, and the USA

according to information value, user-friendliness, design attractiveness, marketing effectiveness, availability of a trip planning assistant, frequently asked questions, and fast communication (live support) in the context of cultural differences using questionnaires. So and Morrison (2004) evaluated the websites of tourism organizations in the East Asian region regarding technical criteria, customer perspective, destination information, and marketing criteria using content analysis. Ghosh et al. (2022) analyzed 16 tourism websites in India using input-oriented data envelopment analysis, SWARA, and MABAC methods and ranked the websites according to their performance scores. Das Gupta and Utkarsh (2014) evaluated the official tourism websites of the USA, France, Spain, Italy, China, Germany, the UK, Turkey, Malaysia, and Mexico according to information quality, ease of use, security, visuality, etc. using content analysis, correspondence analysis, and weighted mean scores. Uluçay (2017) evaluated the websites of gastronomy tourism businesses according to promotion, customer relations, media relations, corporate identity, and design criteria using content analysis. Kaygısız (2021) assessed the websites of 89 travel agencies with health tourism authorization certificates using the criteria of institutional information, stakeholder information, service information, timeliness and briefing, facilitating transactions, and financial data using content analysis. Karabağ et al. (2010) analyzed the websites of 335 hotels in Turkey according to the criteria of communication (customer support), general information, related services, presentation (design), orientation, security, and off-page instant advertisements using content analysis. When the studies on hotel websites in the literature are reviewed, it is observed that the studies are analyzed mainly by the content analysis method. However, in this study, using CRITIC and MAIRCA, which are multi-criteria decision-making methods, differentiates the study. Therefore, it is thought that this study may contribute to the literature.

2. CRITIC METHOD

The CRITIC (*Criteria Importance through Intercriteria Correlation*) method, first developed by Diakoulaki et al., is used to determine the importance of criteria in Multi-Criteria Decision Making problems. In the CRITIC method, which is one of the objective criteria weighting methods, the criteria are weighted using the correlation coefficients between each other and the standard deviation values of the criteria (Zizovic et al., 2020:151; Peng et al., 2020:3817). Thus, the criteria weights can be calculated independently from the personal judgments of decision-makers (Diakoulaki, 1995:764; Pan et al., 2021:20). The CRITIC method has four stages of application (Diakoulaki, 1995; Zizovic et al., 2020).

- **Stage 1: Creation of the Initial Decision Matrix (X) and Normalization**

The decision matrix created to weight the criteria and the notation used for the normalization process are shown in Equations (1) and (2).

$$X = \begin{bmatrix} x_{01} & x_{0j} & \dots & x_{0n} \\ x_{i1} & x_{ij} & \dots & x_{in} \\ \dots & \dots & \dots & \dots \\ x_{m1} & x_{mj} & \dots & x_{mn} \end{bmatrix} \quad (1)$$

$$r_{ij} = \frac{x_{ij} - x_j^{min}}{x_j^{max} - x_j^{min}} \qquad \textit{for benefit criteria}$$

$$r_{ij} = \frac{x_j^{max} - x_{ij}}{x_j^{max} - x_j^{min}} \qquad \textit{for cost criteria} \quad (2)$$

$x_j^{max} = values\ of\ criterian\ j$

$x_j^{min} = values\ of\ criterian\ j$

r_{ij} = *Normalized values of the criteria*

- **Stage 2: Calculation of Correlation Coefficients between Criteria**

Calculated in the first stage r_{ij} using the values j. with criterion k. the correlation coefficient between the criterion p_{jk} value is calculated using Equation (3).

$$p_{jk} = \frac{\sum_{i=1}^{m}(r_{ij} - \overline{r_j})\,(r_{ik} - \overline{r_k})^2}{\sqrt{\sum_{i=1}^{m}(r_{ij} - \overline{r_j})^2 (r_{ik} - \overline{r_k})^2}} \quad (j,k = 1,2,\dots,n) \qquad (3)$$

Stage 3: Calculation of C_j Values

C_j is the standard deviation of the normalized criterion values (σj) calculated using the C_j value. With the C_j value, each criterion's total amount of information is determined. The notation for calculating the C_j value is shown in Equation (4).

$\sigma_j = Standard\ deviation\ value\ of\ criterion\ j.$

$$\sigma_j = \sqrt{\sum_{i=1}^{m} \frac{\sum_{i=1}^{m}(r_{ij} - \overline{r_j})^2}{m-1}}$$

$$C_j = \sigma_j \sum_{k=1}^{n}(1 - p_{jk}) \quad (j,k = 1,2,\dots,n) \qquad (4)$$

- **Stage 4: Calculation of Criteria Weights**

In this stage, the Cj values for the criteria are ratioed to the total value of each criterion and the objective weights of the criteria (w_j) are calculated. The notation used in the calculation of criterion weights is shown in Equation (5).

$$w_j = \frac{C_j}{\sum_{k=1}^{n} C_k} \quad (j,k = 1,2,\dots,n) \qquad (5)$$

3. MAIRCA METHOD

MAIRCA (*Multi Atributive Ideal-Real Comparative Analysis*), a multi-criteria decision-making method developed by Gigovic et al. By summing the gap values obtained for each criterion, the total gap value for the decision alternatives is obtained and the alternative with the lowest total gap value is considered the best alternative (Altintaş, 2021:1842). At the end of the application process, the alternative with the values closest to the ideal ratings is determined as the alternative with the lowest total gap value (Gigovic et al., 2016:11; Pamucar et al., 2017:58). In the literature, studies are showing that the results and rankings obtained with the MAIRCA method are more reliable and consistent than other multi-criteria decision-making techniques (Yazgan and Agamyradova, 2021:284). MAIRCA method has an application process consisting of eight stages (Gigovic et al., 2016; Pamucar et al., 2018:1646-1648; Ayçin, 2020:190-192):

- **Stage 1: Creating the Initial Decision Matrix (X)**

From each alternative A_i obtained criterion (C_j) values are shown in Equation (6).

$$X = \begin{array}{c} \begin{matrix} C_1 & C_2 & \dots & C_n \end{matrix} \\ \begin{bmatrix} x_{11} & x_{12} & \dots & x_{1n} \\ x_{21} & x_{22} & \dots & x_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ x_{m1} & x_{m2} & \dots & x_{mn} \end{bmatrix} \end{array} \qquad (6)$$

- **Stage 2: Prioritization of Alternatives**

It is an assumption of the method that the decision maker does not have a priority in the alternative selection process. m total number of alternatives and i. prioritization of the alternative so, P_{Ai} is calculated as shown in Equation (7).

$$P_{Ai} = \frac{1}{m}; \qquad \sum_{i=1}^{m} P_{Ai} = 1 \qquad i = 1,2,\dots,m \qquad (7)$$

The decision maker is equidistant from each alternative. Therefore, all priorities are equal, as shown in Equation (8).

$$P_{A1} = P_{A2} = \cdots = P_{Am} \tag{8}$$

- **Stage 3: Theoretical Rating Matrix (T_p)**

Creation Elements of the theoretical rating matrix (T_{pij}) As shown in Equation (9), the priorities of the alternatives (P_{Ai}) and criterion weights with (w_j) is calculated by multiplication.

$$T_p = \begin{bmatrix} P_{A1}.w_1 & P_{A1}.w_2 & \cdots & P_{A1}.w_n \\ P_{A2}.w_1 & P_{A2}.w_2 & \cdots & P_{A2}.w_n \\ \vdots & \vdots & \ddots & \vdots \\ P_{Am}.w_1 & P_{Am}.w_2 & \cdots & P_{Am}.w_n \end{bmatrix} \tag{9}$$

- **Stage 4: Actual Rating Matrix (T_r)**

The elements of T_r matrix should be calculated using Equation (10) for maximization criteria and Equation (11) for minimization criteria.

$$t_{rij} = t_{pij} \cdot \left(\frac{x_{ij} - x_{ij}^{-}}{x_{ij}^{+} - x_{ij}^{-}} \right) \tag{10}$$

$$t_{rij} = t_{pij} \cdot \left(\frac{x_{ij} - x_{ij}^{+}}{x_{ij}^{-} - x_{ij}^{+}} \right) \tag{11}$$

x_{ij}^{+} the maximum value that the criterion receives from the alternative (x_{ij}^{+} = max ($x1, x2, \ldots, xm$)), x_{ij}^{-} is the smallest value of the criterion from the alternative (x_{ij}^{-} = min ($x1, x2, \ldots, xm$)) expresses.

The actual rating matrix to be obtained as a result of the calculations is shown in Equation (12).

$$T_r = \begin{array}{c} \begin{matrix} C_1 & C_2 & \cdots & C_n \end{matrix} \\ \begin{bmatrix} t_{r11} & t_{r12} & \cdots & t_{r1n} \\ t_{r21} & t_{r22} & \cdots & t_{r2n} \\ \vdots & \vdots & \ddots & \vdots \\ t_{rm1} & t_{rm2} & \cdots & t_{rmn} \end{bmatrix} \end{array} \tag{12}$$

- **Stage 5: Total Gap Matrix (G)**

Calculation Space Matrix (G) With the help of Equation (13), the theoretical rating matrix (T_p) of the actual rating matrix with (T_r) is obtained as shown in Equation (14) by taking the difference.

$$g_{ij} = t_{pij} - t_{rij} \qquad g_{ij} \in [0, \infty) \tag{13}$$

$$G = T_p - T_r = \begin{bmatrix} g_{11} & g_{12} & \cdots & g_{1n} \\ g_{21} & g_{22} & \cdots & g_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ g_{m1} & g_{m2} & \cdots & g_{mn} \end{bmatrix} \tag{14}$$

- **Stage 6: Identification of the Total Gap with Alternatives**

If a criterion (C_j) of an alternative (A_i) for theoretical degree (t_{pij}) with actual degree (t_{rij}) takes a value equal to and different from zero, the gap will be zero (g_{ij} = 0). In this case, this criterion (C_j) for this alternative (A_i) will be ideal alternative (A_i^{+}). If a criterion (C_j) of an alternative (A_i) for theoretical degree (t_{pij}) with actual degree (t_{rij}) is equal to zero ($t_{pij} = t_{rij} = g_{ij} = 0$). In this case, this criterion (C_j) for this alternative (A_i) will be worst alternative (A_i^{-}).

- **Stage 7: Determination of the Value of the Final Criterion Functions of the Alternatives (Q_i)**

The value of the criterion functions is calculated for each alternative by using Equation (15).

$$Q_i = \sum_{j=1}^{n} g_{ij} \quad , \quad i = 1, 2, \dots, m \tag{15}$$

The rankings of the alternatives are obtained by ranking the values from small to large.

4. ANALYSIS AND FINDINGS OF THE RESEARCH

This study ranked 15 tourism websites operating in Turkey according to the performance criteria. In the study, the performances of tourism websites were evaluated according to the number of customer complaints about the website, the number of resolved complaints (Aymankuy, 2011), the number of services offered (accommodation, car hire, ticket sales, etc.) (Bastida and Huan, 2014), the number of language options offered on the website (Kaygısız, 2021; Bastida and Huan, 2014), providing live support on the website (Cho and Sung, 2012; Kaygısız, 2021; Karabağ et al., 2010), the number of errors on the website (Bilal et al., 2019), the onload time of the website (So and Morrison, 2004), the average visit duration, and the bounce rate (*the rate of visitors leaving the website immediately)* (Önder and Berbekova, 2022). The main reason for choosing these criteria is that they are frequently used in the literature for website performance evaluation. Among these criteria, bounce rate, the onload time of the website, the number of errors on the website, and the number of complaints about the website are negative criteria to be minimized, while the other criteria are positive criteria to be maximized. The website's criterion of providing live support was evaluated with the logic of (0-1). The value of the websites that provide live support is 1, and the value of the websites that do not provide live support is 0. The weight values of the criteria determined in the study were calculated with the CRITIC method, which is accepted as one of the objective weighting methods that calculate weight values based on data in the literature. The ranking of the websites according to the performance criteria was done by the MAIRCA method. The service performance criteria of the websites are presented in Table 1.

Table 1. Service Performance Criteria of Tourism Websites

K1	Bounce Rate
K2	Onload Time
K3	Number of Errors
K4	Number of Complaints
K5	Number of Solutions (Complaints)
K6	Average Visit Duration
K7	Number of Language Options
K8	Number of Services Offered
K9	Live Support (Available or not)

The decision matrix containing the data related to the criteria is presented in Table 2.

Table 2. Decision Matrix

	K1	**K2**	**K3**	**K4**	**K5**	**K6**	**K7**	**K8**	**K9**
airbnb.com	31,44%	7,5	1	473	48	8,05	90	2	0
booking.com	32,28%	6,3	15	392	25	8,5	45	5	0
enuygun.com	33,77%	3,3	10	3389	798	4,14	7	9	0
etstur.com	46,33%	15,7	4	1248	271	5,22	2	3	1
hotels.com	39,50%	6,7	0	671	73	5,08	45	1	0
odamax.com	52,19%	19,3	57	134	47	4,52	4	1	1
otelz.com	40,23%	6,8	44	532	148	4,45	14	2	1
setur.com	44,46%	13,9	1	230	52	5	1	5	1
seyahatyanimda.com	49,81%	4	0	89	5	1,53	1	6	0
skyscanner.com	35,33%	7,1	1	30	1	5,2	36	4	0
tatil.com	57,67%	31,9	5	164	111	1,39	1	3	1
tatilbudur.com	50,82%	29,7	4	2698	573	6,19	1	3	1

tatilsepeti.com	48,27%	11,5	6	1199	446	4,2	1	5	0
tribadvisor.com	57,72%	16,6	2	18	2	2,59	22	7	0
trivago.com	25,52%	12,4	1	57	4	6,14	1	2	0

In the first stage of the application, weight values for the decision criteria were calculated. The criteria weight values obtained by CRITIC method based on the data in the decision matrix are given in Table 3.

Table 3. Criteria Weight Values Obtained by CRITIC Method

Criteria	Weight Values
Bounce Rate	0,087
Onload Time	0,090
Number of Errors	0,098
Number of Complaints	0,118
Number of Solutions (Complaints)	0,114
Average Visit Duration	0,083
Number of Language Options	0,087
Number of Services Offered	0,100
Live Support (Available or not)	0,223

After the calculation of the criterion weights, the ranking process for tourism websites was carried out by MAIRCA method according to the determined criteria. The ranking results obtained by MAIRCA method are given in Table 4.

Table 4. Ranking Results Obtained by MAIRCA Method

Web Site	Ranking Values	Ranking
tribadvisor.com	0,04197	1
seyahatyanimda.com	0,04084	2
tatilsepeti.com	0,03996	3
hotels.com	0,03880	4
trivago.com	0,03802	5
odamax.com	0,03749	6
tatil.com	0,03559	7
skyscanner.com	0,03543	8
enuygun.com	0,03417	9
booking.com	0,03294	10
tatilbudur.com	0,03155	11
airbnb.com	0,03133	12
otelz.com	0,02976	13
etstur.com	0,02799	14
setur.com	0,02522	15

5. CONCLUSION

Multi-criteria decision-making methods are defined as methods that provide systematic approaches for solving multiple and conflicting decision-making problems. In the literature, some MCDM methods are used to calculate the importance weights of the decision criteria, and some are used to rank the decision alternatives. In the literature, the CRITIC method is one of the objective weight calculation methods in which the importance weights of the criteria are calculated based on data. MAIRCA method, the other method, is a multi-criteria decision method based on linear vector optimization that has been widely used in the literature in recent years for ranking decision alternatives. This study aims to rank the tourism websites serving in Turkey according to nine service performance criteria. The number of customer complaints about the website, the number of resolved complaints, the number of services offered (accommodation, car rental, ticket sales, etc.), the number of language options offered on the website, the status of providing live support on the website, the number of

errors on the website, the website onload time, the average duration of stay on the website and the rate of visitors leaving the website immediately were accepted as the service performance criteria based on the ranking. Criteria weights were calculated by the CRITIC method, and the MAIRCA method was used to rank the websites.

As a result of the calculations made with the CRITIC method, the highest importance weight values were calculated for the live support and the number of complaints, respectively. As a result of the ranking of the websites with the MAIRCA method, tripadvisor.com and seyahatyanımda.com took the first two places, while etstur.com and setur.com were ranked last. When the data in the decision matrix were analyzed, it was concluded that the most determinant criterion in the ranking was the number of services offered, errors, and customer complaints. In addition, with the CRITIC method, the live support criterion, which has the highest importance weight, is determined as 1 if there is live support and 0 if there is no live support, and since it takes very close values, it is less determinative in the ranking of websites.

As in many studies, this study also has limitations. The most fundamental limitation is the use of nine criteria in the study. In future studies, criteria such as page size, speed index, total number of visitors, information quality, design, etc. can be used. Another limitation is that the data was obtained from GTmetrix, Similarweb, WAVE, and şikayetvar.com. Future studies can obtain data from different web performance and complaint platforms. Besides that, the analysis methods used in the study are also a significant limitation. The presence of many criteria and the fact that the criteria weights were calculated quite close to each other due to the data structure caused the criteria with higher differences between their numerical values to be more determinative in the ranking. In future studies, criteria can be weighted and ranked with different Multi-Criteria Decision-Making methods. In conclusion, the study results are valid in the context of the criteria and methods of analysis. They will differ from other methods and criteria.

YAZAR BEYANI / AUTHORS' DECLARATION:

Bu makale Araştırma ve Yayın Etiğine uygundur. Beyan edilecek herhangi bir çıkar çatışması yoktur. Araştırmanın ortaya konulmasında herhangi bir mali destek alınmamıştır. Makalede kullanılan ölçek için yazar(lar) tarafından ölçeğin orjinal sahibinden izin alındığı beyan edilmiştir. Yazar(lar), dergiye imzalı "*Telif Devir Formu*" belgesi göndermişlerdir. Mevcut çalışma için mevzuat gereği etik izni alınmaya ihtiyaç yoktur. Bu konuda yazarlar tarafından dergiye "*Etik İznine Gerek Olmadığına Dair Beyan Formu*" gönderilmiştir. / This paper complies with Research and Publication Ethics, has no conflict of interest to declare, and has received no financial support. For the scale used in the article, it is declared by the authors that permission was optained from the original owner of the scale. The author(s) sent a signed "*Copyright Transfer Form*" to the journal. There is no need to obtain ethical permission for the current study as per the legislation. The "*Declaration Form Regarding No Ethics Permission Required*" was sent to the journal by the authors on this subject.

YAZAR KATKILARI / AUTHORS' CONTRIBUTIONS:

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