



EVALUATION OF UNIVERSITY EMPLOYEES' WORK BEHAVIOURS PERFORMANCE VIA ENTROPY BASED TOPSIS METHODS

ÜNİVERSİTE ÇALIŞANLARININ İŞ DAVRANIŞI PERFORMANSLARININ ENTROPY
TABANLI TOPSIS YÖNTEMİ İLE DEĞERLENDİRİLMESİ

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Abstract

This study is aimed to measure the employees' job performance behavior via the entropy based TOPSIS methods. For this purpose, work behaviors; burnout, emotional labor, intention to leave, and job satisfaction scales are taken as assessment criteria and a questionnaire is applied on public university employees. Integrated evaluation of all criteria is vital for performance measurement. At this point multi-criteria decision-making methods present an appropriate framework. MCDM methods are very suitable decision tools for measuring employee's performance. This method is used in order to measure performance for not only the number of work but also the attitude according to business, enterprise, and people getting services. Considering the researches done via TOPSIS are few, this work contributes to the literature. Because of appropriate scales are in opposite directions, TOPSIS method accepted as a MCDM method is used to reduce all scales to only one value. As a result, applying TOPSIS method in terms of measuring employees' job performance can conduct to measure qualitative works converting into quantitative works.

Keywords: TOPSIS, Performance Management, Employee Evaluation

Öz

Bu çalışmanın amacı, entropi tabanlı TOPSIS yöntemi ile çalışanların iş davranışı performansının ölçülmesidir. Bu amaçla iş davranışlarından; tükenmişlik, duygusal emek, işten ayrılma niyeti ve iş tatmini ölçekleri değerlendirme kriteri kabul edilerek bir kamu üniversitesi çalışanlarına anket uygulanmıştır. Tüm kriterlerin bütünlük olarak değerlendirilmesi performans ölçümü için hayati öneme sahiptir. Bu açıdan bakıldığında, çok kriterli karar verme yöntemleri uygun bir çatı sunmaktadır. Çok kriterli karar verme yöntemleri insan kaynakları alanında performans değerlemede kullanılmaktadır. Performans değerlemeyi sadece yapılan iş sayısına göre değil, işletmeye karşı, işe karşı, hizmet verilen kişilere karşı tutumlara göre ölçmek amacıyla bu yöntem kullanılmıştır. TOPSIS yöntemi ile yapılan çalışmaların az olduğu dikkate alınırca, literatüre katkı sağlayacağı düşünülmektedir. Ölçeklerdeki en uygun durumlar, zıt yönlü olduğu için bu ölçekleri bir tek değere indirmek için çok kriterli karar verme yöntemlerinden biri olarak kabul edilen TOPSIS yöntemi uygulaması sonucunda, iş davranışları performans ölçümü konusunda, nitel çabaların nicel hale getirilerek ölçülmesi bağlamında katkı sağladığı düşünülmektedir.

Anahtar Kelimeler: TOPSIS, Performans Yönetimi, Çalışan Değerlendirme

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Introduction

Performance evaluation in companies is one of the important functions for Human Resources Management. Thanks to technological development and increase in competition, companies have to ideally prepare its human resources and to achieve the highest efficiency with these educated human sources in order to score over its competitors. In this aspect, Human Resource is mentioned as a strategic element of a company. In service industry, this strategic element has become more crucial (levy and Williams, 2004). Appreciate the high-performing employees and the analysis on low-performing employees will increase the employees' productivity together with companies' efficiency. This study, after outlined emotional labor, job satisfaction, burnout, and intention to resign, focuses on the methodology of the research.

From the perspective of the service sector, the satisfaction of the service recipients increases the interest on service quality; consequently, increasing importance of service quality boosts up the concern about the concept of emotional labor (Avci ve Boylu, 2010:4). In this context, emotional labor is accepted as a necessity of the employees' role, and it makes important the effort to show certain emotions claimed by the organization or the struggle to hide some emotions which is unwanted by the organization (Secer and Tinar, 2004:272). Because universities are the institutions providing educational services, it is situated in the service industry. The purpose of this study is to define the emotional performance of university employees from the highest to lowest. Hence, after the hardness level of the jobs, labour grading, wage settings and so on can be formed with a more objective approach.

Conceptual Framework

According to Kaynak and others (1998), performance is the concept that defines what extent a person can use the potential and real knowledge and ability to reach the targets and expectations. Performance evaluation is appropriated as an auxiliary tool in terms of organization and employee. Performance evaluation has two major aims. One of these aims is the obtaining information about the performance of work to help taking administrative decisions. The decisions on the wage rising, bonus, education, discipline, promotion, career planning, and other administrative activities usually depend on the information getting from performance evaluations. The management team of an organization should not take critical decisions without the information obtained from performance evaluation. As with other policies related to human resources, performance evaluations are organized in accordance with legal standards which prevent the discriminations against any groups (Micolo, 1993). Second objective of evaluating the performance is the provide feedback on the extent to which closer to standards in job description and analysis. The feedback can be beneficial when supported with positive approach and vocational training. Most employees like such constructive and confidence enhancing feedback. Employees can see how they progress in their career thanks to this kind of feedback. For instance, the feedback can help on whether an employee can be ready to take bigger responsibility or should have training to keep on current level (Palmer, 1993).

Furthermore, it is stated that two categories of job performance can be differed from many jobs. First category is to give clear directions of task and duties in job descriptions. Second category is aspects of performance occurred because of social orders of the job and work environment. Consequently, social effectiveness is an outstanding feature of social contextual performance (Murphy and Cleveland, 1995). For instance, the effectiveness can arise when employees can develop and keep pleasant relations with colleagues in job environment.

The attention on emotions has been growing in work environment, and certain studies show that the display of decent emotions cause the great success of employees and the distribution of rewards by others. Staw, Sutton, and Pelled (1994) discovered that employee's remuneration is predicted by positive effects of emotions. Also, Staw and Barsade (1993) indicated that displaying positive emotions in the workplace tended to obtain supervisors' higher performance evaluations.

Performance evaluation is an arguable emotional experience. During the evaluation, employees' jobs are directly evaluated by one or more evaluators. These evaluations have significant effects on employees' psychological welfare, social status, continuity of employment in organization (Gerald, 2008).

Emotional Labor: "Emotional labor is a form of labor exerted by the employees who are expected to have a close relationship with customers. Also, it comprises the conversion of the emotions"(Kalfa ve Topates, 2009: 425). The conception of the emotional labor is defined differently by scholars. According to Ozkaplan (2009: 19), "emotional labor is a part of pack which the companies sell". In addition, emotions workers are selling their smiles like the selling the arm strength for industrial workers or the selling the brain power for information technology workers. Ashforth and Humphrey (1993: 90) inspected the Emotional Labor with the framework of social identity theory. In the frame, emotional labor is stated as an action to demonstrate proper emotion.

Morris and Feldman (1996: 987) defines the emotional labor as effort, planning, and controlling for showing the emotion demanded by the company during interpersonal interaction process. Grandey (1999:8) states that the emotional labor is a regulation of both emotions and behaviors, which serve the company's aims by emphasizing the rules of showing the emotions. It is claimed that there is a close relationship between emotions and business performance in the workplace (Cote and Miners:2006).

Job Satisfaction: There is a mental attitude developed by employees over time about job and relations in the workplace. To form the mental attitude, the knowledge about the job, the approaches on the result of the job, the conditions of the business environment have a substantial role. These attitudes can be either positive or negative. If the attitude of the employee is a positive, the attitude can be considered as job satisfaction, or vice versa (Barutcugil, 2004:388). The satisfaction or dissatisfaction reflects a general attitude of employees to their jobs. In other words, these positive and negative attitudes can be evaluated as the products of the feelings and thoughts of employees about the jobs, colleagues, and business environments (Solmus, 2004:186). Moreover, there are considerable studies showing that there are any relations between job satisfaction and job performance (Judge and others, 2001).

Burnout: In 1970's, it had been stood out different responses to the problems of psychological, behavioral, and physical, which caused by organizational sources of stress, and these different reactions are called "**Burnout**". The burnout was revealed after frequent and intense interactions with people encountered due to the job, and this feature distinguishes burnout from the other reactions originated organizational stressors (Torun, 1997). To determine the levels of burnout, it is benefitted a burnout inventory developed by Masclah. According to Masclah, burnout is defined as a status resulted from a long time working in the places demanded the intensive emotional requests. The emotional requests always stimulate physical wear, despair, hopelessness, and disappointment. Furthermore, after these attitudes appear, employees always tend to develop negative attitudes against the job, business environment, and life (Cokluk, 2000).

Intention to Resign: Job satisfaction and intention to resign are located at the center of interest for many industrial and organizational psychologists, administrative scientists, and sociologists. The reason of this concern is based on the findings of empirical researches proving that intention to resign negatively affects the strength and efficiency of the organization (Samad, 2006). The intention of the employees leads to a number of such practical problems as loss of ability, employing additional staffs, and administration cost. Environmental factors affecting their intention to leave the job are organizational culture and values, working relationships with colleagues, job / role demands and expectations, career development opportunities, and autonomy (Takase, et al, 2005). When determining the performance of business behaviors of employees, some cases (emotional labor and job satisfaction) are required to be high while expecting that the certain the situations like burnout and intention to resign are low.

Research Methodology

The Universe and Sample of Research: The research is a descriptive study. First of all, the questionnaire forms are allocated to administrative staffs in Bartın University, which the forms consist of particular statements such as emotional labor, burnout, intention to quit the job, and job satisfaction. Bartın University has 180 administrative staffs, and 76 of them accepted to attend the research by filling out the survey. The universe of the research is the administrative staffs employed by Bartın University. While determining the sample, it is made the total number sampling, and rate of return the survey is 45%.

Data Collection Tool: the scales about emotional labor in questionnaire forms were prepared by benefitting from the scale of Chu and Murmann (2006). In addition, it is used the scales of emotional labor for tourism employees with 12 questions created by Pala and Tepeci (2008) and Boylu and Avcı (2010) adapted from Chu and Murmann Scale. Regarding burnout, the scale was used, which is developed by Maslach and Jackson (1981) and adapted to Turkish with 22 questions by Ergin (1992). The Minnesota Satisfaction Questionnaire developed by Weis, Dawis, England, and Lofquist (1967) and its adaptation created by Baycan (1985) with 20 questions were benefitting for evaluating the job satisfaction. The scale is widely used in order to survey the job satisfaction the employees working for hotel companies, travel agencies, information technology businesses, and other industries. The statements about intention to resign were taken from a scale of Blau and Boal (1989) which adapted to Turkish by Zayas (2006) and Yalçın (2010) with 5 questions scale.

While inputting the data to statistics software, the negative statements in the scales were inputted with reverse the coding.

Data Analysis

First, questionnaire forms obtained from administrative personnel are transferred to computer. Then, the order among workers is found by using ENTROPY weighting method and TOPSIS method.

Weighting: ENTROPY Method: Now, we give the process of assigning weighting value for criteria via entropy method (Alp, Öztel, & M. Said, 2015; Hwang & Yoon, 1981; Islamoglu, Apan, & Oztel, 2015; Öztel, Köse, & Aytekin, 2012). Let $m \times n$ dimensional D be decision matrix with m alternative and n criteria as below;

$$D = \begin{matrix} & X_1 & X_2 & \dots & X_j & \dots & X_n \\ \begin{matrix} A_1 \\ A_2 \\ \vdots \\ A_i \\ \vdots \\ A_m \end{matrix} & \begin{bmatrix} x_{11} & x_{12} & \dots & x_{1j} & \dots & x_{1n} \\ x_{21} & x_{22} & \dots & x_{2j} & \dots & x_{2n} \\ \vdots & \vdots & \vdots & \vdots & \vdots & \vdots \\ x_{i1} & x_{i2} & \dots & x_{ij} & \dots & x_{in} \\ \vdots & \vdots & \vdots & \vdots & \vdots & \vdots \\ x_{m1} & x_{m2} & \dots & x_{mj} & \dots & x_{mn} \end{bmatrix} \end{matrix} \Bigg]_{m \times n}$$

(1)

Here, x_{ij} is the success value of i . alternative with respect to j . criterion where $i = 1, 2, \dots, m$ and $j = 1, 2, \dots, n$.

Values at A_i row show the success value of i . alternative with respect to all criteria, values at X_j column show the success value of all alternative according to j . criteria.

Since criteria have different scales, first we need to normalize them for evaluation. For this, below equality can be used;

$$r_{ij} = \frac{x_{ij}}{\sum_{p=1}^m x_{pj}}, \quad i = 1, 2, \dots, m, \quad j = 1, 2, \dots, n.$$

(2)

$R = [r_{ij}]_{m \times n}$ normalized matrix is obtained with this equality. Measurement of uncertainty or entropy value for all criteria is found with the equality below:

$$e_j = -k \sum_{i=1}^m r_{ij} \ln r_{ij}, \quad j = 1, 2, \dots, n.$$

(3)

Here k value is constant defined as $k = \frac{1}{\ln m}$ and $0 \leq e_j \leq 1$ is guaranteed. e_j is entropy value of j . criteria.

Now we can define degree of diversification d_j , for each criterion by using entropy value.

$$d_j = 1 - e_j, \quad j = 1, 2, \dots, n$$

(4)

Weighting values of criteria is computed by dividing degree of diversification of each criterion with total degree of diversification.

$$W_j = \frac{d_j}{\sum_{p=1}^n d_j}, \quad j = 1, 2, \dots, n. \quad (5)$$

W_j is weight of j . criterion and $\sum_{j=1}^n W_j = 1$ is obvious.

TOPSIS Method: Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) method improved by Hwang & Yoon (Hwang & Yoon, 1981) is based on to choose the alternative which is the closest to ideal solution and the farthest to anti-ideal solution. The steps of this method is given below (Hwang & Yoon, 1981; Islamoglu et al., 2015):

Step 1: Obtaining normalized decision matrix:

$R = [r_{ij}]_{m \times n}$ normalised decision matrix is obtained with the following formula.

$$r_{ij} = \frac{x_{ij}}{\sqrt{\sum_{p=1}^m (x_{pj})^2}}, \quad i = 1, 2, \dots, m, j = 1, 2, \dots, n \quad (6)$$

Step 2: Building weighted normalized decision matrix:

$V = [v_{ij}]_{m \times n}$ weighted normalized matrix is obtained via

$$v_{ij} = w_j r_{ij}, \quad i = 1, 2, \dots, m, j = 1, 2, \dots, n \quad (7)$$

where w_j is weighting value of j . criterion found by entropy method.

Step 3: Defining ideal and negative-ideal solutions:

Let two artificial A^* (ideal solution) and A^- (negative-ideal solution) be as below:

$$A^* = \{(\max_i v_{ij} | j \in J), (\min_i v_{ij} | j \in J') | i = 1, 2, \dots, m\} = \{v_1^*, v_2^*, \dots, v_j^*, \dots, v_n^*\} \quad (8)$$

$$A^- = \{(\min_i v_{ij} | j \in J), (\max_i v_{ij} | j \in J') | i = 1, 2, \dots, m\} = \{v_1^-, v_2^-, \dots, v_j^-, \dots, v_n^-\} \quad (9)$$

where

$J = \{j = 1, 2, \dots, n \mid \text{when the utility criteria}\}$

$J' = \{j = 1, 2, \dots, n \mid \text{when the cost criteria}\}$

Step 4: Computation of discrimination measure:

Discrimination measure from ideal solution and discrimination measure from anti-ideal solution for each alternative are given below:

$$S_{i^*} = \sqrt{\sum_{j=1}^n (v_{ij} - v_j^*)^2} , i = 1,2, \dots, m \tag{10}$$

$$S_{i^-} = \sqrt{\sum_{j=1}^n (v_{ij} - v_j^-)^2} , i = 1,2, \dots, m \tag{11}$$

Step 5: Computing relative proximity to ideal solution:

Relative proximity to ideal solution A^* of i . alternative is defined as:

$$C_{i^*} = S_{i^-} / (S_{i^*} + S_{i^-}) , 0 < C_{i^*} < 1 , i = 1,2, \dots, m \tag{12}$$

Step 6: Order of Preference:

Preferences are ordered by sorting C_{i^*} values from high to low.

Application

Table 1. Entropy weights for intention to leave

	1. question	2. question	3. question	4. question	5. question
Weights	0,160062	0,214923	0,202968	0,195537	0,22651

According to Table 1 above, 2th and 5th questions are the most important questions.

Table 2. Entropy weights for emotional labor

Questions	1	2	3	4	5	6
Weights	0,041228	0,079838	0,059972	0,068571	0,102649	0,056611
Questions	7	8	9	10	11	12
Weights	0,078519	0,134896	0,068413	0,122489	0,124629	0,062186

According to Table 2 above, 5, 8, 10 and 11th questions are outstanding.

Table 3. Entropy weights for job satisfaction

Questions	1. Question	2. Question	3. Question	4. Question	5. Question	6. Question	7. Question
Weights	0,053425	0,020866	0,049563	0,03373	0,043322	0,037093	0,05641
Questions	8. Question	9. Question	10. Question	11. Question	12. Question	13. Question	14. Question
Weights	0,071918	0,045495	0,038815	0,061741	0,070155	0,075369	0,064993
Questions	15. Question	16. Question	17. Question	18. Question	19. Question	20. Question	
Weights	0,051837	0,055335	0,042997	0,05092	0,042412	0,033603	

According to Table 3, 8, 11, 12, 13, and 14th questions are the most important ones.

Table 4. Entropy weights for job burnout

Questions	1. question	2. question	3. question	4. question	5. question	6. question	7. question	8. question
Weights	0,046233	0,036385	0,043914	0,015551	0,048415	0,039681	0,060276	0,055412
Questions	9. question	10. question	11. question	12. question	13. question	14. question	15. question	16. question
Weights	0,055889	0,066364	0,06703	0,029619	0,048769	0,034749	0,048854	1,048854
Questions	17. question	18. question	19. question	20. question	21. question	22. question		
Weights	0,043325	0,019808	0,0414	0,040157	0,041356	0,076478		

It is seen from Table 4 that 7, 10, 11, 16, and 22th questions are the most important ones.

Table 5. Weighted total success values

Survey Order No	Burnout	Job Satisfaction	Emotional Labor	Intent To Leave
1	2,727800285	2,863304458	3,908676217	1,480185432
2	3,669956538	3,247334347	3,056665147	2,054493123
3	2,180135064	3,579465772	3,789312207	1,640247243
4	2,675757656	2,992222373	2,898260953	2,695621076
5	2,072591988	3	3	3
6	1,650402892	4,167780917	4,052718641	1,640247243
7	2,186993008	3,325233379	3,936678095	1
8	3,158467284	2,385156534	2,817002796	4,405957559
9	3,507474163	3,053425036	2,659021553	3,210397629
10	2,490205563	2,964769509	3,12813716	3,066448485
11	3,070416407	3,261281187	1,936208747	2,394347686
12	2,374853653	3,856957203	4,030836375	1,160061811
13	2,445776244	3,21697998	3,487414862	2,320123621
14	2,439483511	3,819766723	3,86536493	1,480185432
15	1,468334053	2,844314231	3,012686558	1,20296754
16	2,794745702	3,36028409	3,481463581	1,933551515
17	1,535578238	3,898287547	4,274345077	1
18	2,557230183	2,453500633	3,398996285	1
19	3,07795089	2,963310839	2,739519114	3,382414803
20	3,874784187	2,04460572	2,936049093	3,968677856
21	2,533166672	3,083263173	3,533892404	1,160061811
22	3,306454178	1,39526066	2,691752447	5
23	3,287465476	1,822063043	3,162110791	4,839938189
24	1,737962313	3,520938547	3,298017776	1
25	3,262296906	3,53102296	2,767546369	2,577952253
26	2,964109647	2,736918734	3,515784473	1
27	2,256828624	2,736918734	3,233957168	1

28	2,812276163	2,959906164	4,121784285	1,640247243
29	3,685865831	2,013082277	3,847718883	2,702906393
30	2,69340004	3,095192683	2,875906078	3,441433199
31	1,588793755	4,232375378	2,997983375	1
32	2,752648348	2,475421115	2,536586929	1
33	2,869341635	2,553552822	2,497651074	1
34	2,150843666	3,388808723	2,642749486	1,718628612
35	3,35022852	2,062802939	3,12678782	4,18812984
36	2,309525485	3,517463072	3,068765452	1
37	1,989699242	4,00908301	3,086511609	1,640247243
38	1,989699242	4,00908301	3,086511609	1,640247243
39	2,061183771	2,583662002	4,419188967	1,320123621
40	2,072607195	3,31070861	3,277202415	1
41	2,948839561	2,769675021	2,355487313	1,374984713
42	3,090787907	2,776186005	3,127780648	3,09688611
43	2,12544686	2,706118882	3,402829998	1,160061811
44	3,033860192	3,790325665	3,340480317	2,285015951
45	2,226671122	3,234461667	4,821945358	1,855170145
46	2,895480053	2,796297979	2,926509025	4,804462549
47	2,608529193	3,616571834	3,218098264	2,019753421
48	2,02146903	4,256774758	3,065382826	1
50	2,931789797	1,984974018	3,771078389	4,191380146
52	1,80747647	2,731252358	2,972784874	3,320123621
53	2,586584059	2,302196618	2,899733112	1,620857982
54	2,574386452	3,519548481	3,322965497	1,320123621
55	3,601622473	1,6923927	2,890418458	1
57	2,035164791	2,550482122	3,179741677	1,160061811
58	2,393371625	2,768207213	3,584760716	1
59	3,21938535	2,302956709	3	1,640247243
60	1,629897976	4,012616346	3,390085326	1
61	2,02018399	2,561309395	4,155410991	1,480185432
62	3,231742894	2,741070089	2,920161728	2,53088922
64	2,66071225	2,757086011	2,160806244	1
65	2,074084606	3,697581068	3,289442504	1,160061811
66	2,754538441	2,684164099	3,156854279	2,210765598
67	2,994980792	2,634601276	3,4682976	2,210765598
68	1,900489939	4,529269876	4,151114243	1
69	2,126951265	3,72306329	3,835583795	1,160061811
70	2,110089402	2,443257098	2,951733441	4,160061811
71	3,544462228	2,320510425	4,065368244	4,367186655
72	2,875188299	1,637913225	2,996424131	3,773835194

73	2,858674963	2,491342376	3,101200603	3,160061811
74	3,310468656	2,006371925	3,333381845	3,320491591
75	2,782247106	2,709947799	1,564490766	4,351441957
76	2,06621623	2,6540566	3,622567549	1

Weighted average of participants' statements about feelings is shown in Table 5.

Table 6. The Performance Ranking Calculated by TOPSIS

Survey Order No	Ranking	Survey Order No	Ranking
1	31	37	33
2	43	38	34
3	35	39	26
4	51	40	8
5	53	41	29
6	32	42	55
7	7	43	17
8	69	44	46
9	57	45	40
10	54	46	70
11	48	47	42
12	11	48	5
13	47	50	65
14	28	52	58
15	18	53	37
16	41	54	25
17	2	55	27
18	19	57	21
19	60	58	14
20	63	59	39
21	16	60	3
22	72	61	30
23	71	62	49
24	6	64	22
25	50	65	12
26	20	66	44
27	15	67	45
28	36	68	1
29	52	69	10
30	61	70	64

31	4	71	68
32	23	72	62
33	24	73	56
34	38	74	59
35	66	75	67
36	9	76	13

Conclusions

The productivity of human resources is measured only by observing the job-related performance of employees. The one of the best way to measure is to set up a regular performance evaluation system. Performance evaluation in businesses has been seen as an important issue. In this study, it is aimed to numerically measure a qualitative concept as the performance of job behaviors of employees.

By using weighting method, the importance level of questions is determined, and scale values for each scale are separately and objectively defined. Since the most proper situations in the scales are in opposite directions, TOPSIS methods accepted as multi-criteria decisions making methods is used to reduce all scales to one value. Which criteria would be used to evaluate the performance and what rate of the criteria's impact on the performance are decision points. TOPSIS is a widely known and benefitted technique in multi-criteria decision making. Together with, when the system is objective and self-consistent, a trusted application is occurred. TOPSIS can find the best option by evaluating multiple alternatives in terms of multi-criteria. To measure emotions numerically is a tough deal. So, this research offers an alternative way to measure emotions of employees. In the future studies, more comprehensive scale can be used by including the other concepts of job behaviors.

As the result of analysis, the employee showing highly emotional performance is number 68 who is 38 years old male, married, and graduated from a University. Second high performance person is number 17. Third one is number 60 who is male, computer operator, and institute employee. Fourth high one is number 31 who is 41 years old male, married, graduate, and a branch manager at Health Culture Sport Department. Fifth one can be observed as number 48.

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