

# JOURNAL OF SCIENCE



SAKARYA UNIVERSITY

## Sakarya University Journal of Science

ISSN 1301-4048 | e-ISSN 2147-835X | Period Bimonthly | Founded: 1997 | Publisher Sakarya University |  
<http://www.saujs.sakarya.edu.tr/>

Title: Researching Usage of Globe Culture Dimensions In Organizational Management By Using Dematel Method

Authors: Atakan Alkan, Kamile Canbay, Gülşen Akman, Zerrin Aladağ

Received: 2018-10-23 00:00:00

Revised: 2018-11-17 12:00:00

Accepted: 2018-12-13 00:00:00

Article Type: Research Article

Volume: 23

Issue: 2

Month: April

Year: 2019

Pages: 282-290

How to cite

Atakan Alkan, Kamile Canbay, Gülşen Akman, Zerrin Aladağ; (2019), Researching Usage of Globe Culture Dimensions In Organizational Management By Using Dematel Method. Sakarya University Journal of Science, 23(2), 282-290, DOI:

10.16984/saufenbilder.473917

Access link

<http://www.saujs.sakarya.edu.tr/issue/39539/473917>

New submission to SAUJS

<http://dergipark.gov.tr/journal/1115/submission/start>

## Researching Usage of GLOBE Culture Dimensions in Organizational Management by using DEMATEL Method

Atakan Alkan<sup>1</sup>, Kamile Canbay<sup>1</sup>, Gülşen Akman<sup>1</sup>, Zerrin Aladağ<sup>\*1</sup>

### Abstract

Management of organizational culture has been increasing its importance in competitive business world rapidly. This paper is an output of the research about impact of GLOBE culture dimensions which is one of the most comprehensive research result so far on organizational culture. DEMATEL methodology determines criteria importance and interaction of criteria. In this paper; GLOBE culture dimensions, which emerged as the product of the most comprehensive work, are linked to the strategy of organizational culture management. Evaluations of 10 middle and high level managers from different sectors were collected in this experimental research. Research was performed on the basis of these evaluations, and data is analyzed in a three-phase by using the DEMATEL method. In each analysis, thresholds have been changed and outputs was examined to determine which organizational management strategy could be used with GLOBE culture dimensions.

**Keywords:** Organizational culture, GLOBE cultural dimensions, DEMATEL

### 1. INTRODUCTION

Cultural components that forms culture and shows itself in symbols such as vernacular, technology level, architecture, values, education level are various. The cultural structures of the communities vary depending on these and many other components. It is also highly researched issue to describe organizational cultures. Many models have been developed to understand cultural differences. Among them, Hofstede Model, Schwartz & Bilsky, Trompenaars and GLOBE Model are the most known.

The cultural diversity of the human resource is also very different in multinational corporations and organizations that have high circulation and in which the generation difference between manager and

employee is. Before deciding how to use the other components such as working environment, technology level and standards in organizational culture management, a research on how to use culture dimensions in successful organizational culture management can support managers and leaders.

In this paper; GLOBE culture dimensions, which emerged as the product of the most comprehensive work, are linked to the strategy of organizational culture management. The nine Globe culture dimensions used in this research are power distance, avoidance of uncertainty, intra-group collectivism, institutional collectivism, humanistic orientation, self-confidence/initiative, gender equality, future tendency and performance tendency. Research has been done on the basis of 5 men and 5 women in various sectors and analyzed in a three-phase by using the DEMATEL

\* Corresponding Author(zaladag@kocaeli.edu.tr)

<sup>1</sup> Kocaeli Üniversitesi, Mühendislik Fakültesi, Endüstri Mühendisliği Bölümü, Kocaeli, Turkey

method. In each analysis, thresholds have been changed and outputs was examined to determine which organizational management strategy could be used with GLOBE culture dimensions.

The paper is composed of five parts; introduction, GLOBE Culture Dimensions, DEMATEL Method, research and analysis, conclusion.

## 2. GLOBE CULTURE DIMENSIONS

Due to the increase in the globalization of industrial organizations and the dependence among the communities formed by this increase, the need to understand cultural influences in leadership and organizational practices has become quite high. The situations in which the leaders have to meet are very complex, constantly changing and difficult to interpret. A global research program opinion for leadership and organizational practices occurred in 1991. After this, in 1993, literature survey was conducted and a questionnaire pool consisting of 753 questions was developed by funding a grant. GLOBE is a multi-phase, multi-method project in which world-wide researchers test the relationship between social culture, organizational culture and organizational leadership. One of the main questions addressed by the GLOBE survey is dimensions that enable social and organizational cultures to be measured [7].

GLOBE researchers measured culture at different levels, at the industry level (financial services, food processing, telecommunication), at the organization level (many organizations in each industry), and at the community level (62 countries). The results are presented in a quantitative data form based on opinions and responses from 17,000 executives from 951 organizations. The cultural dimensions that GLOBE researchers define as independent variables are power distance, avoidance of uncertainty, institutional collectivism, intra-group collectivism, gender equality, self-confidence/initiative, future tendency, performance tendency and humanistic orientation [6]. Brief definitions of GLOBE culture dimensions are [7];

**Power Distance (PD):** It is defined as the level of consensus and expectation that an organization or community needs unequal sharing of power

**Avoidance of Uncertainty (AU):** It is the measure of avoidance from uncertainty for an organization or community by relying on social norms, rules and bureaucratic practices to reduce the unpredictability of future events.

**Institutional Collectivism (IC):** It is the measure of encouraging and rewarding of collective distribution of resources and collective action in organizational and social institution practices.

**Intra-group Collectivism (IGC):** It is the measure of honesty, loyalty and solidarity of individuals in organizations.

**Gender Equality (GE):** It is the degree of the lowest level of gender inequality in the organization or community.

**Self-confidence/Initiative (SCI):** The level of self-confidence, conflict, and initiative in the social relationship of individuals in the organization or community.

**Future Tendency (FT):** It is a measure of future behaviors such as planning, investing in the future and postponing daily demands in the organization or community.

**Performance Tendency (PT):** It is the degree of encouraging and rewarding of improving performance and excellence of group members in the organization or community.

**Humanistic Orientation (HO):** Is the degree of encouraging and rewarding individuals to be fair, altruistic, generous, attentive and gentle towards others in the organization or community.

## 3. DEMATEL METHOD

DEMATEL method was developed between 1972-1979 by the Battelle Memorial Institute of Geneva, by the purpose of providing to the definition of feasible solutions in a hierarchical structure to complex and intertwined problem sets [8]. This method defines the importance of the criteria and the relationship between the criteria. It is a binary diagram-based structure that divides criteria into cause and effect groups [9].

DEMATEL is a useful technique for establishing relationships among criteria, priorities of criteria by type of relationship and the effects of criteria on other criteria. Until today, DEMATEL has successfully

carried out a wide range of studies. For example; defining success factors of hospital quality service [9], evaluation of factors affecting the quality of the activity [10], evaluation of airline safety [11], development of medical tourism [12], choice of information management strategies [13], six sigma project selection [14], outsourcing provider selection [15], etc.

Based on Yu and Tseng (2006), Liou, et al., (2007), Tzeng, et al., (2007), Yang, et al., (2008), Wu and Lee (2007), Shieh et al., (2010), the procedure of DEMATEL method is presented below in Figure 1 [16]:

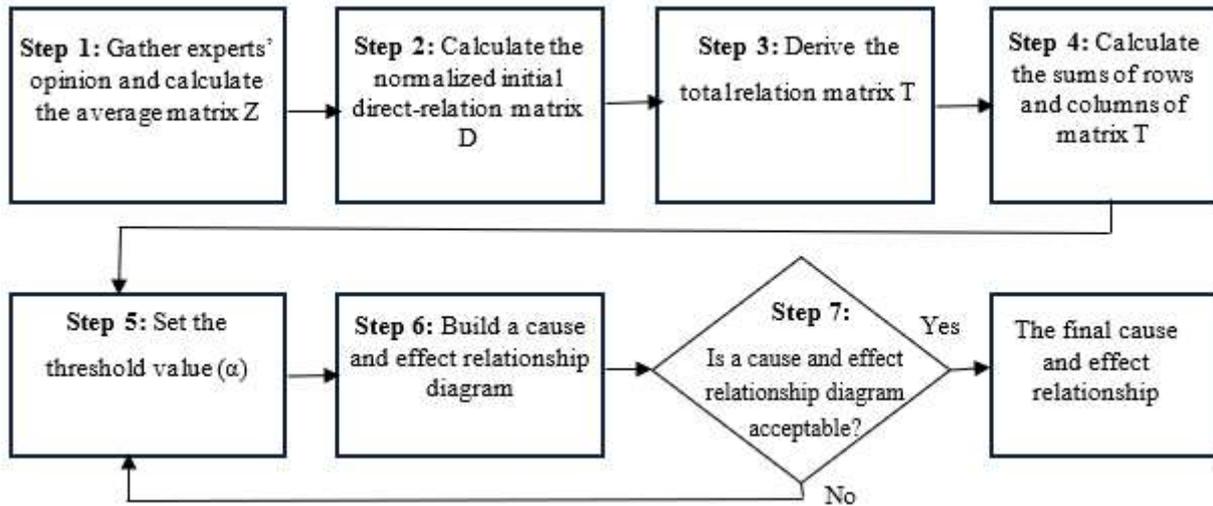


Figure 1. The process of the DEMATEL method [16]

DEMATEL application steps can be explained as follows [8];

**Step 1:** Create a direct relation matrix (A)

In this step, the relationships between the criteria are determined by the expert group using the pair-wise comparison scale. The matrix obtained by the comparison is the direct relation matrix.

**Step 2 :** Calculate the normalized direct relation matrix

Based on the direct relation matrix (A), a normalized direct relation matrix (M) is calculated by using the smallest value (k) in the rows and columns with Eq. 1 and 2 below.

$$M = k.A \tag{1}$$

$$k = \text{Min} \left( \frac{1}{\max_{1 \leq j \leq n} \sum_{1 \leq i \leq n} |a_{ij}|}, \frac{1}{\max_{1 \leq i \leq n} \sum_{1 \leq j \leq n} |a_{ij}|} \right) \tag{2}$$

$i, j \in \{1, 2, 3, \dots, n\}$

**Step 3 :** Derive the total relation matrix

Once the normalized direct relation matrix is calculated, the total correlation matrix (S) is derived using the following Eq. 3. In this equation, the identity matrix is denoted by (I).

$$S = M + M^2 + M^3 + \dots = \sum_{i=1}^{\infty} M^i \tag{3}$$

$$= M (I - M)^{-1}$$

**Step 4 :** Calculate the sums of rows and columns of total relation matrix

The sum of columns (R) in the S matrix and the sum of the rows (D) in the S matrix is calculated. Using the D - R and D + R values obtained by the calculation of Eq. 5 and 6 following the calculation of Eq. 4, the level of influence of each criteria on the others and the level of relationship with the others is determined. Criteria with positive values for D-R value have higher effect on others. In addition, criteria with positive values are considered to have higher priority. These criteria are called cause. Criteria that have a negative value for the D - R value are more affected than the other criteria. In other words, these criteria, which are considered to have lower priority, are called receiver.

$D + R$  values indicate the relationship between each criteria and other criteria. Criteria with higher  $D + R$  values are more related to other criteria, while those with lower  $D + R$  values are less related to others.

$$S = [s_{i,j}]_{n \times n}, i, j \in \{1, 2, 3, \dots, n\} \quad (4)$$

$$D = \sum_{j=1}^n s_{i,j} \quad (5)$$

$$R = \sum_{j=1}^n s_{i,j} \quad (6)$$

**Step 5 & 6:** Set a threshold value and build a cause-effect relationship diagram

Decision makers need a threshold value to achieve an appropriate cause-effect diagram. In other words, a threshold value is used to avoid the complexity of the cause-effect diagram obtained, that is to make the results interpretable. In these steps, some elements with larger effect values than the threshold value in the  $S$  matrix are selected and a new cause-effect diagram is obtained. The threshold value is determined by the decision maker or experts. The cause-effect diagram is obtained by showing the  $(D + R, D - R)$  points in a coordinate plane with the horizontal axis  $D + R$  and the vertical axis  $D - R$ . It is important that the threshold value to be used is large or small. This is because the size of the threshold value can affect the size of the relationship between the criteria and make the solution more complex or simple. In the diagram, while  $D_i + R_i$  indicates the importance of the criteria,  $D_i - R_i$  indicates the degree of relationship. If  $D_i - R_i$  is a positive value, the criteria is in the affecting group. If  $D_i - R_i$  is negative, the criteria is the affected group [17].

#### 4. EXAMINATION OF THE RELATIONAL CONCEPT OF THE GLOBE CULTURE DIMENSIONS IN ORGANIZATIONAL CULTURE MANAGEMENT

Organizational culture management is a subject that needs to be done more effectively in the highly competitive market, which is increasingly difficult in

terms of leaders in rapidly changing infrastructure and working environments. So, it is inevitable for managers and leaders to follow a strategy in culture management. A study that will answer the question "which methods or cultural dimensions should be used" in the strategy can contribute to the business. "The dimensions of GLOBE community culture can be used in the management of the organization and it can lead to a road map" is the main point of this study.

The DEMATEL method is used to describe the effect of the GLOBE culture dimensions, which defines organization culture, on each other and to understand the cause-effect relationship between them. The culture dimensions used in the pair-wise comparison are power distance, avoidance of uncertainty, intra-group collectivism, institutional collectivism, humanistic orientation, self-confidence/initiative, gender equality, future tendency and performance tendency. The results are analyzed using 3 different threshold values at the end of the method. The evaluation matrix used in pair-wise comparisons is shown in Table 1.

**Table 1.** Evaluation matrix for pair-wise comparisons

Linguistic terms	Score
No influence	0
Low influence	1
Medium influence	2
Adequate influence	3
High influence	4
Very high influence	5

The normalized direct relation matrix, total relation matrix,  $D_i$  and  $R_i$  tables, which are calculated through DEMATEL operations, are shown in Tables 2, 3 and 4, respectively;

**Table 2.** The normalized direct relation matrix

	<b>PT</b>	<b>AU</b>	<b>IGC</b>	<b>PD</b>	<b>GE</b>	<b>HO</b>	<b>IC</b>	<b>FT</b>	<b>SCI</b>
<b>PT</b>	0,0000	0,1224	0,1088	0,0918	0,0850	0,1156	0,1395	0,1190	0,1088
<b>AU</b>	0,1224	0,0000	0,0884	0,1190	0,0884	0,1088	0,1293	0,1293	0,0986
<b>IGC</b>	0,1156	0,1156	0,0000	0,1054	0,1122	0,1293	0,1395	0,1122	0,0986
<b>PD</b>	0,0918	0,0986	0,1088	0,0000	0,0782	0,1054	0,1156	0,0816	0,1054
<b>GE</b>	0,0816	0,1054	0,0986	0,0952	0,0000	0,1327	0,1020	0,0918	0,1054
<b>HO</b>	0,1122	0,1122	0,1327	0,1054	0,1361	0,0000	0,1156	0,0986	0,1122
<b>IC</b>	0,1463	0,1395	0,1259	0,1088	0,0986	0,1156	0,0000	0,1429	0,1224
<b>FT</b>	0,1224	0,1293	0,1190	0,0918	0,0782	0,1020	0,1361	0,0000	0,1190
<b>SCI</b>	0,1259	0,1122	0,1156	0,1190	0,0816	0,0884	0,1054	0,1156	0,0000

**Table 3.** The total relation matrix

	<b>PT</b>	<b>AU</b>	<b>IGC</b>	<b>PD</b>	<b>GE</b>	<b>HO</b>	<b>IC</b>	<b>FT</b>	<b>SCI</b>
<b>PT</b>	0,852	0,971	0,927	0,861	0,789	0,929	1,023	0,935	0,904
<b>AU</b>	0,951	0,852	0,901	0,874	0,783	0,914	1,005	0,933	0,886
<b>IGC</b>	0,984	0,995	0,858	0,899	0,837	0,969	1,054	0,958	0,923
<b>PD</b>	0,841	0,856	0,835	0,691	0,705	0,830	0,904	0,812	0,812
<b>GE</b>	0,854	0,883	0,848	0,798	0,651	0,873	0,915	0,841	0,832
<b>HO</b>	0,974	0,985	0,968	0,893	0,851	0,849	1,028	0,939	0,928
<b>IC</b>	1,068	1,074	1,026	0,956	0,874	1,015	0,995	1,040	0,998
<b>FT</b>	0,967	0,982	0,940	0,867	0,788	0,923	1,026	0,834	0,917
<b>SCI</b>	0,934	0,933	0,904	0,857	0,761	0,879	0,966	0,903	0,778

Table 4.  $D_i$  and  $R_i$  tables

	<b>D</b>	<b>R</b>	<b><math>D_i + R_i</math></b>	<b><math>D_i - R_i</math></b>
<b>PT</b>	8,190	8,424	16,613	-0,234
<b>AU</b>	8,099	8,534	16,632	-0,435
<b>IGC</b>	8,477	8,207	16,684	0,270
<b>PD</b>	7,287	7,697	14,984	-0,410
<b>GE</b>	7,497	7,038	14,534	0,459
<b>HO</b>	8,414	8,180	16,594	0,234
<b>IC</b>	9,047	8,916	17,962	0,131
<b>FT</b>	8,244	8,196	16,440	0,048
<b>SCI</b>	7,915	7,978	15,893	-0,063

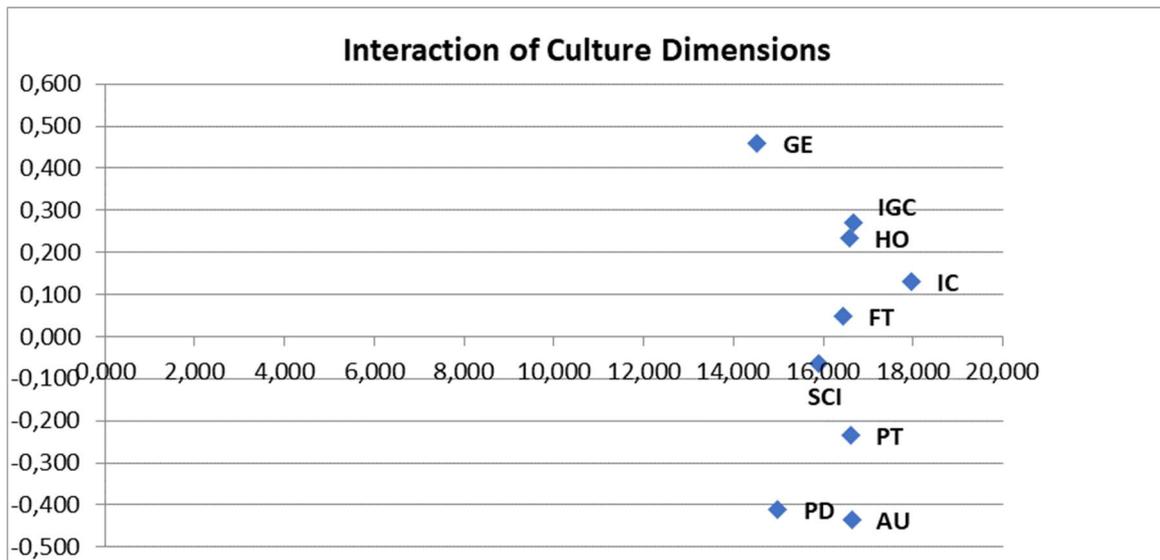


Figure 2. Interaction of culture dimensions

The graph shown in Figure 2 shows the affecting and affected locations of the GLOBE culture dimensions.

According to Figure 2, Gender Equality, Intra-Group Collectivism, Humanistic Orientation, Institutional Collectivism and Future Tendency are cultural dimensions that are affecting. The others; Avoidance of Uncertainty, Power Distance, Performance Tendency and Self-

Confidence are cultural dimensions that are affected. At the end of the study, an assessment was performed over 3 different thresholds. Threshold values used; D is the mode value, D is the moderate value between the mode value and the highest D value and D is the moderate value between the mode value and the lowest D value.

The results obtained for each threshold value are shown in Figures 3, 4 and 5, respectively.

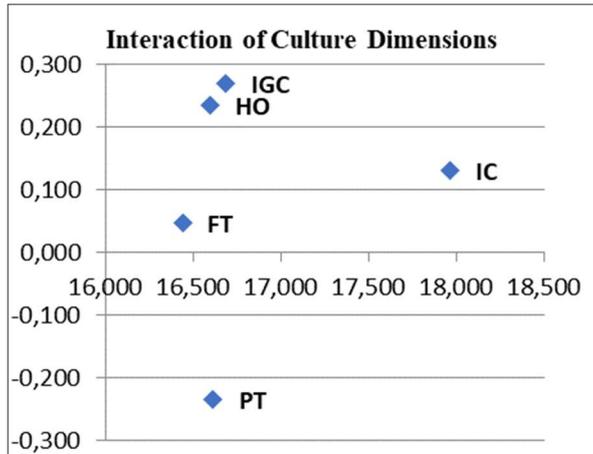


Figure 3. 1<sup>st</sup> Threshold: D is the mode value

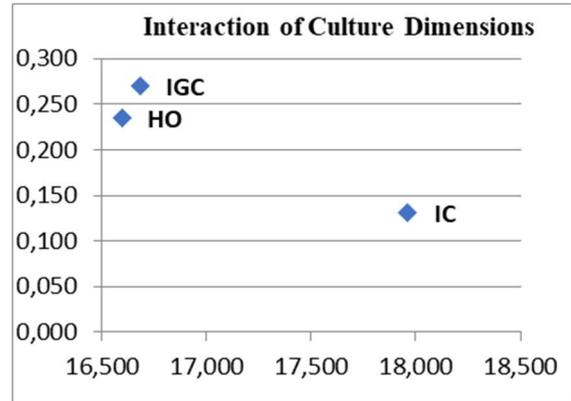


Figure 4. 2<sup>nd</sup> Threshold: D is the moderate value between the mode value and the highest D

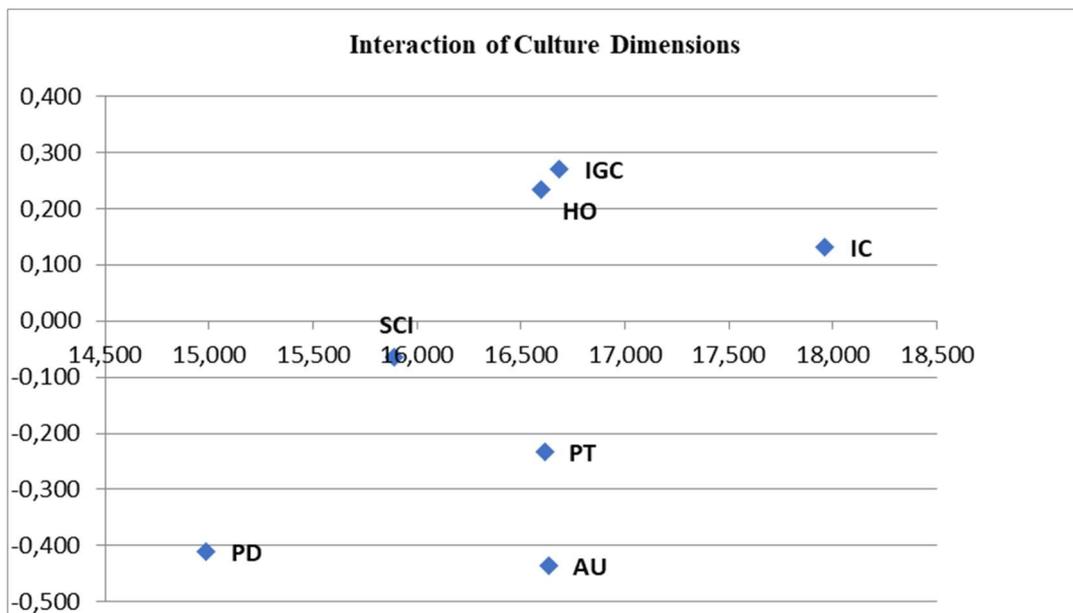


Figure 5. 3<sup>rd</sup> Threshold: D is the moderate value between the mode value and the lowest D

## 5. CONCLUSION

Explaining the above evaluation results at Threshold Value 2, Threshold Value 1 and Threshold Value 3 will provide a clearer picture of how cultural dimensions are used in the management of the organization.

According to the threshold value 2 (the moderate value between the mode D and the highest D value), which is the highest threshold in the study, Intra-Group Collectivism, Humanistic Orientation and Institutional Collectivism are the dimensions of culture that are used as the main leverage in organizational culture and / or management of organizational culture.

According to the threshold value 1 (the mode D value), Future Tendency is added to Intra-Group Collectivism, Humanistic Orientation and Institutional Collectivism. These four dimensions make a clear impact on the Performance Tendency. When these cultural dimensions in the affecting position are well managed, a strong Performance Tendency culture emerges.

Threshold Value 3 (the moderate value between the mode value and the lowest D) is the lowest used in the study and in this case the frame is slightly wider. Accordingly, the dimensions of Intra-Group Collectivism, Humanistic Orientation and Institutional Collectivism affect not only the Performance Tendency but also the cultures of Avoidance of Uncertainty, Power Distance and Self-Confidence/ Initiative.

Thresholds have progressively demonstrated how GLOBE cultural dimensions can be used in organizational culture management. In this regard, this study is once again proven the need for leaders to be successful in the human resource management process in order to make their organizations successful. According to the study result, Intra-Group Collectivism and Humanistic Orientation with the highest D - R values are the dimensions of culture directly touching human. According to the results, leaders can provide other cultural dimensions to be shaped by taking the cultural dimensions of Intra-Group Collectivism, Humanistic Orientation and Institutional

Collectiveism in order to carry the organizational culture to the future. In addition, they may aim to capture the achievement of strategic objectives.

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