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Evaluation of Leadership Styles in Multinational Corporations Using the Fuzzy TOPSIS Method

Marija Runic Ristic [1], Tijana Savic Tot [1], Igor Ristic [1,*], Vilmos Tot [2], Tanja Radosevic [1] and Dragan Marinkovic [3,4]

[1] Faculty of Management, University Union-Nikola Tesla, Njegoseva 1a, 21205 Sremski Karlovci, Serbia; runic@famns.edu.rs (M.R.R.); tijana.savictot@famns.edu.rs (T.S.T.); tanja.radosevic@famns.edu.rs (T.R.)
[2] Faculty of Business Economy, University Educons, Vojvode Putnika 87, 21208 Sremska Kamenica, Serbia; vilmos.tot@educons.edu.rs
[3] Faculty of Mechanical Engineering and Transport Systems, TU Berlin, 10623 Berlin, Germany; dragan.marinkovic@tu-berlin.de
[4] Mechanical Science Institute, Vilnius Gediminas Technical University-VILNIUS TECH, Plytinės st. 25, LT-10105 Vilnius, Lithuania
* Correspondence: risticig@famns.edu.rs

Abstract

Due to globalization, companies are exposed to a culturally diversified workforce; therefore, great emphasis is placed on identifying the most effective leadership style that would be able to manage such a workforce. Although numerous studies have attempted to identify successful leadership styles in different cultural settings, none have focused on the perceptions of top managers who work in multinational corporations (MNCs) in culturally diversified surroundings. Thus, our research attempts to identify the most preferred leadership style and characteristics from the perspective of top managers in MNCs in the United Arab Emirates (UAE). The 13 leadership characteristics analyzed in this study were generated from the 21 characteristics found by Global Leadership and Organizational Behavior Effectiveness (GLOBE) research. The participants, top managers in MNCs, needed to evaluate leadership styles by considering leadership characteristics. To ensure the objectiveness of the study, we analyzed their answers by applying the Fuzzy Technique for Order of Preference by Similarity to Ideal Solution (TOPSIS) method. The results indicated that the most preferred leadership characteristics were visionary, inspirational, collaborative team-oriented, and performance-oriented. Moreover, the transformational leadership style emerged as the most preferred leadership style. The study's findings show that top managers believe that employees in MNCs in the UAE seek a leader with a vision who will inspire, motivate, and help them fulfill their true potential.

Keywords: fuzzy TOPSIS; leadership style; leadership characteristics; GLOBE study; national culture

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1. Introduction

The intersection of management practices and leadership has been a focal point for driving innovation and operational efficiency in various industries. The influence of national culture on leadership styles and organizational performance remains a key challenge for organizations [1]. Given that national culture and leadership styles are fundamental aspects of sustainable business practices [2,3], it is unsurprising that the interconnection and impact of national culture on leadership styles have emerged as a

prominent research area within the fields of management and organizational behavior [4]. Having culturally diversified employees can be very useful to an organization because combining different behaviors, norms, and values can increase creativity and the level of innovation [5]. However, when a culturally diversified workforce is not managed correctly, and if the management is not aware of the impact of national culture on leadership, conflicts can arise and have a negative effect on an organization. Therefore, it is crucial to have leaders who understand the effects of culture and are aware of cultural differences [6].

Numerous studies have analyzed the relationship between national culture and leadership styles and have discovered that leadership behavior should be adjusted to a particular cultural environment; otherwise, leaders will not be effective [7–10]. One of the most famous studies on the influence of national culture on leadership style is GLOBE research [11]. The Global Leadership and Organizational Behavior Effectiveness (GLOBE) study was conducted in 62 countries by Robert J. House and his team. The purpose of the GLOBE study was to identify whether leadership styles and characteristics are affected by national culture or whether they are universal. This study identified leadership characteristics and styles that are both culturally specific and universal [11].

Despite extensive research on national culture's impact on leadership styles, harmonizing leadership behaviors with employee expectations remains challenging, resulting in significant organizational investment in leadership development programs [10].

Nevertheless, there remains a considerable gap in understanding how to select the most appropriate leadership style for a given company.

Our study aimed to identify the preferred leadership style and the most important leadership characteristics in multinational corporations (MNCs) in the United Arab Emirates (UAE). The research was conducted in four MNCs in the UAE, and 19 top managers participated in the study. The participants were asked to rank leadership characteristics in order of importance and then to identify how compatible their leadership styles were with those characteristics. To analyze the answers, we used the Fuzzy Technique for Order of Preference by using the Similarity to Ideal Solution (TOPSIS) method.

So far, no study has analyzed the preferred leadership style and characteristics and the impact of national culture on leadership styles and characteristics in MNCs in the UAE. The novelty of this research is that it employs fuzzy sets theory to handle the existing uncertainty and multi attributive decision-making technique. This methodological approach is chosen to provide enhanced calculations compared to traditional survey-based statistical analyses provided in the relevant literature in the field [7,9,10]. The input for the calculation is obtained by distinguished managers and leaders from the UAE. The UAE is one of the most developed countries in the Middle East and has a highly diverse society. Although the GLOBE study conducted research in the Middle East, the UAE was not included. Identifying the most effective leadership style is valuable, as this country is economically developed and attractive for foreign investments and MNCs.

2. Theoretical Framework and Literature Review

2.1. Leadership Styles

Leadership style refers to the distinctive combination of a leader's personal characteristics, traits, and behaviors that they employ in their day-to-day interactions with employees to influence and guide them [12,13].

Researchers have identified and classified a range of distinct leadership styles [14–16]. One possible classification of leadership styles is based on the following elements: leadership grounded in traits, skills theory, situational theory, contingency theory, transactional theory, and transformational leadership [17].

A dominant leadership research methodology has emerged, based on the transformational and transactional leadership model proposed by Bass and Avolio in 1995, which encompasses transformational, transactional, and laissez-faire leadership practices and styles [18]. Given the current focus on leader–follower interactions, in this paper, the authors will briefly outline the three key leadership styles: transformational, transactional, and laissez-faire.

2.2. Transformational, Transactional, and Laissez-Faire Leadership Styles

Transformational leadership is considered a highly effective leadership style in dynamic environments and is often linked to increased organizational effectiveness [19,20]. Transformational leaders inspire and motivate followers, create a vision, serve as role models, and build trust [10]. Instead of focusing on short-term goals, they foster a shared vision and empower their team to grow and develop [21]. Their key characteristics include charisma, inspiration, high expectations, intellectual stimulation, and individualized consideration [22].

Transactional leadership is observed as an exchange between leaders and their subordinates [23]. The leader helps subordinates by organizing actions, delineating the situation, coordinating efforts, and paying attention. In addition, followers honor the leader by giving them respect, influence, and recognition [24]. Transactional leadership, with a more constrained scope than transformational leadership, can help create an effective, productive work environment [25]. Key types of transactional leadership include: conditional reward, active management by exception, and passive management by exception [26,27].

Laissez-faire leadership is perceived as passive, ineffective, and avoidant. The leader avoids decision-making, responsibility, and interaction with followers [28]. This style is considered the least effective, often seen as passive-aggressive [29]. However, it may be suitable for experienced staff requiring minimal oversight [30]. Laissez-faire leaders tend to avoid interaction with followers and avoid using their own authority, and are reluctant to provide assistance, resources, and feedback [31,32].

Leaders must consider their style and followers' perceptions to guide them effectively [33]. Understanding followers' strengths and weaknesses allows leaders to adapt their approach and earn trust, making them more effective [34].

2.3. National Culture and Leadership

Numerous studies have analyzed cultural differences and dimensions, with Hofstede's and GLOBE research being the most influential on leadership styles [11,35]. Hofstede conducted extensive research analyzing national differences in 66 countries and identified five cultural dimensions (power distance, individualism–collectivism, masculinity–femininity, uncertainty avoidance, and time orientation). In brief, we explain each dimension in the context of leadership.

Power distance represents the degree to which power in society is equally divided. In high-power distance cultures, power is unequally distributed, and organizations have a rigid hierarchy with the leader at the center, where employees do not participate in decision-making. Authoritarian leadership is accepted. Conversely, in low-power distance cultures, power is more equally distributed, and people seek democratic leaders who allow participation in decision-making [36,37].

In individualistic cultures, personal goals take priority over organizational goals, leading employees to seek more independence and participation in decision-making. Conversely, in collectivistic cultures, employees expect guidance from leaders, and thus an authoritarian leadership style is more effective. Studies have found transformational lead-

ership is more effective in collectivistic cultures [38], while transactional leadership is more successful in individualistic cultures [19,38,39].

Masculine cultures value achievement, power, control, competitiveness, assertiveness, and materialism, while feminine cultures emphasize gender equality, caring, emotional expression, modesty, and nurturing social relations. The task-oriented style is preferred in masculine societies, whereas leaders in feminine societies tend to adopt a people-oriented style [40].

High uncertainty-avoidance cultures have rigid norms and hierarchies, resisting change, while low uncertainty-avoidance societies are more flexible and innovative. Employees from high uncertainty-avoidance cultures prefer authoritarian, task-oriented leaders, while those in low uncertainty-avoidance cultures favor participative, people-oriented leaders. Studies show that transformational-leadership features, including idealized influence and inspirational motivation, are less effective in cultures with high uncertainty-avoidance [41].

Time orientation identifies whether a society is oriented towards long- or short-term goals. Countries with a long-term orientation are focused on the future, persistence, and the delay of pleasure, while societies with a short-term orientation emphasize the present. Thus, a leadership style oriented toward people will be more effective in short-term oriented cultures, while task-oriented leaders will be more effective in long-term oriented cultures [42].

Another extensive study on the connection between leadership style and national culture was the GLOBE study conducted in 62 countries by Robert J. House and his team [11]. The purpose of this study was to identify whether leadership style is affected by national culture or is universal. The GLOBE study identifies leadership traits that are universal and effective across cultures, as well as culturally specific leadership characteristics [11]. Building on Hofstede's research, it examined the impact of nine cultural dimensions on leadership, including power distance, humane orientation, uncertainty avoidance, institutional and in-group collectivism, assertiveness, gender egalitarianism, performance orientation, and future orientation. Since these nine dimensions are developed on the foundation of Hofstede's research, they overlap with Hofstede's dimensions to some extent. In the following text, we explain the remaining four dimensions that relate to Hofstede's model [43].

Gender egalitarianism reflects the level of gender inequality in society. In low-egalitarian contexts, leaders are expected to exhibit traits such as assertiveness, control, and competitiveness, while high-egalitarian societies value leaders with empathy, support, and social skills [42].

Human orientation reflects a society's support for altruism, fairness, and caring. In high human-orientation cultures, employees prefer participative leadership, while low orientation cultures favor authoritarian, task-oriented styles [21].

Performance orientation reflects the emphasis on results, goal achievement, and accomplishments. High-performance cultures prefer a task-oriented leadership style and select team members based on competencies, while low-performance cultures focus on personal attributes and relationships rather than accomplishments, favoring a people-oriented leadership style [37].

Assertiveness reflects the degree of directness in a culture. Low-assertiveness cultures accept milder behavior, while high-assertiveness ones prefer more assertive conduct. Employees in high-assertiveness cultures generally prefer authoritarian, task-oriented leaders, whereas those in low-assertiveness cultures favor a more democratic, people-oriented style [44].

GLOBE research also clustered 62 societies based on their cultural similarities [45]. The farther the clusters are apart, the fewer cultural similarities they have, i.e., cultural differences increase. Then, the GLOBE team created a list of 112 leader characteristics and gathered the responses of over 17,000 managers from these 62 countries. As a result of the analysis, they identified 21 primary leadership dimensions (Primary CLT dimensions) which were ranked into two categories: characteristics that are universal and those that are culturally contingent. Out of the 21 primary leadership dimensions, House and his team extracted six global dimensions (Global CLT dimensions), which represent six leadership styles [11,45–47].

So far, most cross-cultural studies have analyzed leadership styles from the aspects of Hofstede's or GLOBE theories [11,43,47–51]. Some authors have discovered that cultural values and norms significantly affect the effectiveness of transformational leaders [51,52]. While transformational leadership is a universal concept, its specific aspects and behaviors can vary across cultures [22]. Some elements of transformational leadership are more culture-specific, while others are universal [41].

One of the nine clusters described by GLOBE research is the Middle East, which analyzed six countries: Egypt, Qatar, Kuwait, Iran, Israel, and Turkey. As Kabasakal and Bodur state, these countries have the same religion and share similar cultural values, norms, and practices, but different demographic, social, and economic aspects can greatly influence cultural values and norms [53]. However, even the authors of GLOBE research believe that there should be a more in-depth analysis of this cluster because there are noteworthy differences among countries in this cluster [45]. In our research, we analyze the leadership style and characteristics in the UAE, which differ in many ways from other countries in the Middle East. Of the six countries analyzed in the GLOBE research, Qatar is the most similar to the UAE; however, there are substantial differences even between these two countries.

The UAE is one of the most developed countries in the Middle East, with a Gross National Income (GNI) of 67.52 and Gross Domestic Product (GDP) annual growth of 2.19, which are the highest in the region. Moreover, it is ranked 25th in the Human Development Index (HDI), which is higher than the ranking of other countries in the Middle East cluster [54]. The HDI indicates the standard of living, and the higher the ranking, the higher the standard of living in a country. The UAE is one of the most diversified countries in the region, with 88.13% expats [55].

According to GLOBE research, since the UAE belongs to the Middle East cluster, it is rated high in power distance, in-group and institutional collectivism, human orientation, and assertiveness, and very low in gender egalitarianism [11,45,56]. However, we should not forget that there are differences within the cluster and that the UAE is not one of the countries analyzed by GLOBE researchers.

As previously mentioned, no studies have analyzed the influence of culture on leadership style and characteristics in MNCs in a culturally diverse society, such as the UAE.

2.4. An Application of Multi-Attributive Decision-Making Techniques in Management and Leadership

Multi-attributive decision-making (MADM) techniques are essential for solving complex problems involving multiple, often conflicting criteria. These techniques facilitate a structured and systematic approach to evaluating and prioritizing various alternatives, which is essential in management and leadership, where decisions often impact numerous facets of organizational performance.

MADM methods are applied in various scientific and industrial fields, such as manufacturing [57–60], transportation [61–63], military purposes [64], mining [65], information technologies [66,67], sports management [68], and others. Several MADM methods have been extensively utilized in management and leadership contexts, including the Analytic

Hierarchy Process (AHP) [69], TOPSIS [70], VIKOR (Multicriteria Optimization and Compromise Solution) [71], and the Weighted Sum Model (WSM) and Weighted Product Model (WPM) [72].

As a structured technique for organizing and analyzing complex decisions, AHP is based on mathematics and psychology. In the domain of leadership, AHP has been used to evaluate potential leaders based on criteria such as leadership skills, experience, and cultural fit [69]. This structured approach ensures that the selection process is transparent and aligns with organizational goals.

Leadership often involves making critical decisions during crises. MADM techniques, such as TOPSIS, provide a framework for evaluating different response strategies based on criteria like urgency, impact, and feasibility [70]. This enables leaders to make well-informed decisions under pressure, thereby enhancing crisis-management capabilities. Hwang and Masud [70] were the first to present the TOPSIS and up to now it is one of the most used methods to solve MCDM problems in various fields of application. In TOPISIS, the chosen alternative must have the closest distance from the positive ideal solution (PIS), which represents the solution that minimizes the cost criteria and maximizes the benefits criteria. However, the chosen alternative must have the shortest distance from the negative ideal solution (NIS). The enhancement of the TOPSIS method can be realized by applying triangular fuzzy sets and the node method [73]. The node method calculates the distance between two triangular fuzzy numbers (TFNs).

MADM techniques also support leadership in enhancing team performance by evaluating team dynamics and individual contributions. Techniques like VIKOR and WPM help identify team members' strengths and weaknesses, facilitating better team composition and task allocation [71].

The application of MADM techniques in management and leadership has proven instrumental in enhancing decision-making processes. These techniques provide a structured framework for evaluating complex decisions involving multiple criteria, thereby improving the quality and transparency of managerial and leadership decisions. The input in calculations may be provided through the single decision-maker (DM) assessment or group assessment.

3. Materials and Methods

This study aims to identify which leadership style is the most preferred and which leadership characteristics are important to top managers in multinational corporations (MNCs) in the UAE.

Based on the objective of this study, we generated the following two research questions:

1. What leadership characteristics are important for top management in multinational corporations in the UAE?
2. Which leadership style is the most preferred among top management in multinational corporations in the UAE?

TOPSIS is used for the decision-making process. The technique is ideally suited for solving decision-making problems in an uncertain environment [73].

3.1. Identification of Leadership Characteristics and Leadership Styles

In this study, we used primary CLT (culturally endorsed implicit leadership) dimensions identified by Robert House and his team in the GLOBE project [11].

The set of leadership characteristics used for choosing the most suitable leadership should be identified by drawing on the existing literature and expert consultation. For the presented research, the total number of leadership characteristics j, j = 1, . . ., J is denoted as J. Out of the 21 dimensions discovered by House et al. [11], we selected 13 that we

used as leadership characteristics. The selected dimensions were chosen based on their relevance to the UEA context. The remaining dimensions were assessed as being of very little or no relevance. We used the following primary CLT: visionary, inspirational, self-sacrifice, integrity, collaborative team orientation, administratively competent, autocratic, procedural (bureaucratic), self-centered, face saver, participative, humane orientation, and performance-oriented.

The leadership styles that we analyzed in our survey are transformational (i = 1), transactional (i = 2), and laissez-faire (i = 3) leadership styles defined by Bass [18].

3.2. Define a Decision-Maker Team

The leadership style, according to the defined criteria, should be assessed by a team of decision-makers. This is stated as a fuzzy group decision-making problem, so the group of decision makers (DMs) is in charge of the assessment. Formally, DMs who participate in the assessment are denoted by a set $\{1, \ldots, e, \ldots, E\}$. The total number of DMs is denoted by E. The index of DM is noted by $e, e = 1, \ldots, E$. In this manuscript, there are 19 DMs who are distinguished leaders from UAE companies. It is widely recognized that expressing evaluations through linguistic terms aligns more closely with human thinking than when using precise numerical scales. Fuzzy sets theory [74,75] offers a suitable mathematical framework that enables the quantitative representation of natural language expressions.

Numerous authors in the literature advocate for the use of TFNs to model uncertainties and imprecision [76]. They argue that TFNs strike a balance by not requiring complex mathematical computations while effectively capturing the uncertainties inherent in natural language.

Typically, the granulation of linguistic terms in the literature is determined based on the subjective assessments of DMs, considering the size and complexity of the problem. According to theoretical insights [77], decision-makers can effectively use up to five linguistic expressions. These predefined linguistic expressions and their corresponding TFNs are shown in Table 1.

Table 1. Linguistics variables for the ratings and for the importance of each criterion.

Fuzzy Number	Alternative Assessment	Importance
(1,1,3)	Very Poor (VP)	Very Low (VL)
(1,3,5)	Poor (P)	Low (L)
(3,5,7)	Fair (F)	Medium (M)
(5,7,9)	Good (G)	High (H)
(7,9,9)	Very Good (VG)	Very High (VH)

The domains of the specified triangular fuzzy numbers (TFNs) are based on a uniform measurement scale [69]. On this scale, a value of one signifies that the preference for leadership characteristics is minimal, while a value of nine indicates that the preference is the most desired one.

The sample consists of 19 top managers working in four multinational corporations in the UAE. It is important to emphasize that the top managers are of different nationalities. Twelve are ex-pats (seven British, three American, and two Indian), and seven are Emiratis. The two most important criteria for selecting participants were that they should be members of senior management and have at least three years of working experience in the UAE. It is important that they have lived and worked in the UAE for a longer period because we can say that they are truly familiar with the country's customs, norms, values, and how business is conducted.

Our decision-makers, top managers in MNCs, had to complete a questionnaire consisting of two parts. They were asked to evaluate 13 leadership characteristics according

to their preferences. The decision-makers were then presented with leadership styles that represented evaluation alternatives. The top managers had to analyze leadership styles by considering leadership characteristics. The leadership styles presented to the top managers were described in detail.

We conducted a survey between 20th January and 7th February. The decision-makers evaluated leadership styles based on their opinions and experiences. The fuzzy TOPSIS method was used to analyze the data (Figure 1).

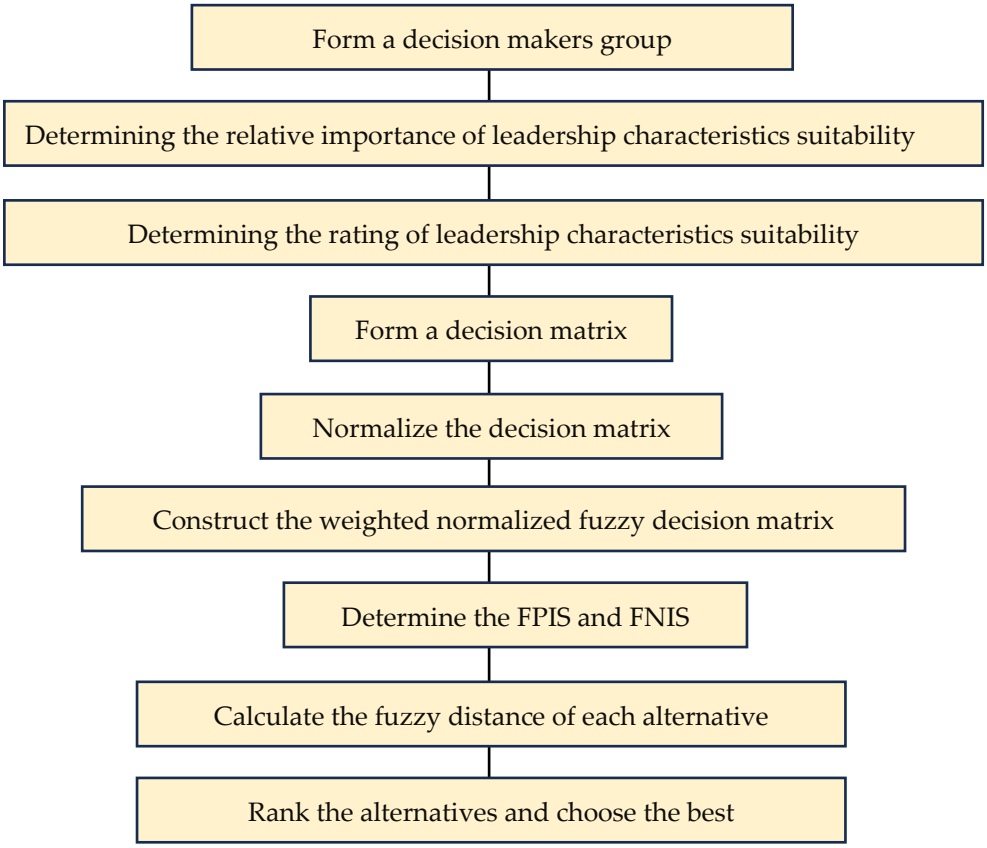


Figure 1. Methodology design.

The best alternative was chosen by analyzing the offered criteria among the given alternatives in multi-criteria decision-making (MCDM) problems [78]. However, the TOPSIS method is one of the most frequently used method because it is easy to understand and to calculate, and evaluation criteria can be weighted [79].

3.3. The Proposed Algorithm

The proposed algorithm can be realized through the steps that are further presented [73].

Step 1 comprises determining the relative importance of leadership characteristics' suitability j, $j = 1, \ldots, J$ for determining the most suitable leadership style by DMs e, $e = 1, \ldots, E$. The relative importance is described by one of the pre-defined linguistic expressions and modelled by TFN $\widetilde{x}_{em}$

where

$$\widetilde{x}_j^e = \left(a_j^e, b_j^e, c_j^e\right) \tag{1}$$

As the decision group has E persons, the weights vector of the criteria can be calculated as

$$\widetilde{w}_j = \frac{1}{E}\left[\widetilde{x}_j^1(+)\widetilde{x}_j^2(+)\ldots(+)\widetilde{x}_j^E\right] \tag{2}$$

where $\widetilde{w}_j$ is the weights vector of the leadership characteristics.

Step 2 is assessment of the leadership styles' values i, $i = 1, \ldots, I$ by the decision-makers group e, $e = 1, \ldots, E$, at the level of each leadership characteristic's suitability j, $j = 1, \ldots, J$. The rating is described by one of the pre-defined linguistic expressions and modeled by TFN $\widetilde{x}_{ij}^{e}$

where

$$\widetilde{x}_{ij}^{e} = \left(a_{ij}^{e}, b_{ij}^{e}, c_{ij}^{e}\right) \tag{3}$$

Step 3 consists of converting the linguistic expressions (Tables 2 and 3) into triangular fuzzy numbers to construct the fuzzy decision matrix and determine the fuzzy weight of each criterion.

As the decision group has E persons, the values of the aggregated decision-making matrix, $\left[\widetilde{x}_{ij}\right]_{IxJ}$, are calculated as follows:

$$a_{ij} = min\left\{a_{ij}^{e}\right\},\ b_{ij} = \frac{1}{E}\sum_{e=1}^{E} b_{ij}^{e},\ c_{ij} = max\left\{c_{ij}^{e}\right\} \tag{4}$$

where $\widetilde{x}_{ij}$ is the element of the aggregated decision-making matrix.

Step 4 is constructing the normalized fuzzy decision matrix, $\left[\widetilde{p}_{ij}\right]_{IxJ}$.

For benefit criteria

$$\widetilde{p}_{ij} = \left(\frac{a_{ij}}{c_j^*}, \frac{b_{ij}}{c_j^*}, \frac{c_{ij}}{c_j^*}\right) \tag{5}$$

For cost criteria

$$\widetilde{p}_{ij} = \left(\frac{a_j^-}{c_{ij}}, \frac{a_j^-}{b_{ij}}, \frac{a_j^-}{a_{ij}}\right) \tag{6}$$

where $a_j^- = \min_i\{a_{ij}\}$.

Step 5 comprises computing the weighted normalized fuzzy decision matrix and normalized fuzzy decision matrix:

$$\widetilde{v}_{ij} = \widetilde{p}_{ij} \times \widetilde{w}_j \tag{7}$$

Step 6 is defining the fuzzy positive ideal solution (FPIS) and the fuzzy negative ideal solution (FNIS):

$$A^* = \left(\widetilde{v}_1^*, \widetilde{v}_2^*, \ldots, \widetilde{v}_n^*\right) \tag{8}$$

where $\widetilde{v}_j^* = \max_i \{v_{ij}\}$.

$$A^- = \left(\widetilde{v}_1^-, \widetilde{v}_2^-, \ldots, \widetilde{v}_n^-\right) \tag{9}$$

where $\widetilde{v}_j^- = \min_i\{v_{ij}\}$.

Step 7 is determining the distance of each alternative of FPIS and FNIS, which can be calculated using fuzzy TOPSIS.

$$d_i^+ = \sum_{j=1}^{n} d(\widetilde{v}_{ij}, \widetilde{v}_j^*) \tag{10}$$

$$d_i^- = \sum_{j=1}^{n} d(\widetilde{v}_{ij}, \widetilde{v}_j^-) \tag{11}$$

Step 8 consists of calculating the closeness coefficient of each alternative and the defuzzification of each criterion.

$$CC_i = \frac{d_i^-}{d_i^- + d_i^+} \tag{12}$$

Step 9: According to the closeness coefficient, the ranking order of the alternatives is calculated.

Step 10 comprises the validation of the model's robustness and the obtained results through the application of other fuzzy MCDM methods.

4. The Case Study

The hierarchical structure of this decision problem is illustrated in Figure 2. The proposed technique is applied to solve this problem, and the computational procedure is further explained.

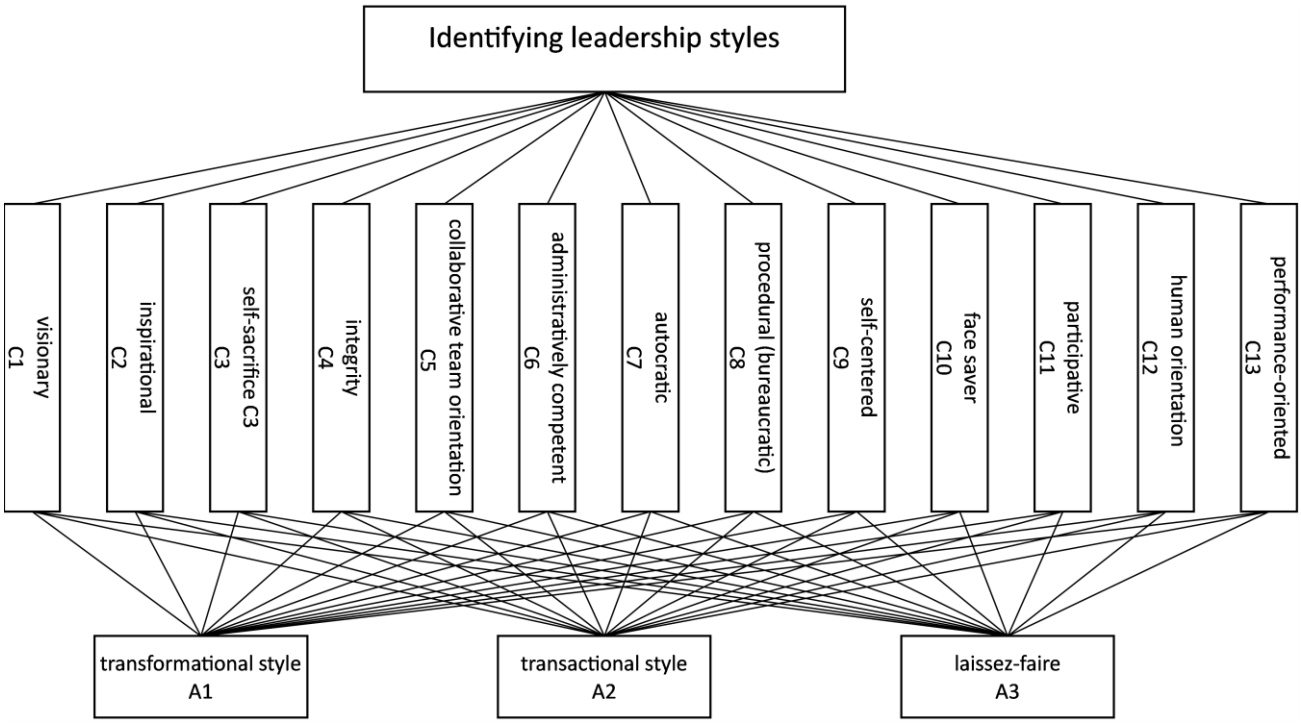


Figure 2. The hierarchical structure of leadership characteristics affecting leadership styles.

Step 1: Decision makers evaluate the decision criteria by using linguistic variables. The relative criteria importance (Table 2) is considered as linguistic variables. These linguistic variables can be expressed as positive triangular fuzzy numbers, as listed in Table 1.

Table 2. The relative criteria importance by decision makers' group.

	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13
DM1	VH	VH	H	H	VH	H	L	M	VL	L	VH	H	H
DM2	VH	VH	VH	VH	VH	VH	L	H	L	M	VH	VH	H
DM3	VH	H	M	H	H	H	VL	H	VL	M	H	H	H
DM4	VH	VH	M	L	VH	VH	M	M	VL	VL	H	L	VH
DM5	VH	VH	M	M	VH	H	VL	VH	L	VL	H	H	VH

Table 2. *Cont.*

	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13
DM6	VH	H	H	L	M	H	L	H	VL	L	H	M	H
DM7	VH	VH	H	H	H	M	VL	L	L	VL	VH	H	M
DM8	VH	VH	H	H	M	H	L	M	L	L	H	H	VH
DM9	VH	VH	H	VH	H	H	H	M	L	L	VH	VH	H
DM10	VH	VH	VH	VH	VH	H	L	VL	VL	VL	VH	VH	H
DM11	VH	VH	H	H	VH	H	VL	VH	L	VL	M	H	VH
DM12	VH	VH	H	VH	H	L	VL	L	VL	VL	H	H	H
DM13	VH	VH	VH	H	H	H	M	M	VL	VL	H	M	VH
DM14	VH	VH	VH	VH	VH	H	M	H	M	H	H	H	VH
DM15	VH	VH	M	H	H	M	VL	M	VL	L	H	H	M
DM16	VH	VH	H	VH	H	H	M	M	L	VL	H	H	H
DM17	VH	VH	M	H	VH	H	L	H	M	L	VH	H	VH
DM18	H	H	VH	VH	VH	H	VL	L	VL	VL	H	H	H
DM19	VH	M	L	H	H	M	L	H	L	VH	H	H	VH

Step 2: Decision makers evaluate alternatives using linguistic variables (Table 3). As in Step 1, the linguistic variables can be expressed as positive triangular fuzzy numbers, as listed in Table 1.

Table 3. Alternatives ratings by decision makers.

							A1						
	c1	**c2**	**c3**	**c4**	**c5**	**c6**	**c7**	**c8**	**c9**	**c10**	**c11**	**c12**	**c13**
DM1	VG	VG	G	G	VG	G	VP	P	VP	P	VG	G	VG
DM2	VG	VG	VG	VG	VG	VG	VP	G	VP	VP	VG	VG	G
DM3	G	VG	P	G	VG	G	VP	VG	VP	VP	VG	VG	G
DM4	VG	VG	VP	VG	VG	VG	VG	G	VP	VP	VG	VG	G
DM5	VG	VG	F	F	VG	G	VP	VG	P	P	VG	G	VG
DM6	VG	VG	G	P	VG	VG	G	VG	VP	F	VG	G	G
DM7	VG	VG	G	G	G	F	VP	P	P	VP	VG	G	F
DM8	G	VG	G	F	VG	G	VP	P	VP	F	F	VG	F
DM9	VG	VG	VG	VG	VG	G	VG	G	F	P	VG	VG	G
DM10	VG	VG	VG	VG	VG	VG	VP	VP	F	P	VG	VG	VG
DM11	VG	VG	G	G	VG	G	F	VG	F	VP	F	G	VG
DM12	VG	VG	G	G	VG	F	VP	F	VP	VP	VG	VG	G
DM13	VG	VG	VG	VG	VG	VG	VG	G	VP	F	VG	VG	G
DM14	VG	VG	G	VG	VG	G	VP	G	VP	VG	VG	G	VG
DM15	VG	VG	F	G	VG	F	VP	P	VP	P	VG	VG	G
DM16	VG	VG	G	G	G	G	F	P	P	VP	F	VG	VG
DM17	VG	VG	G	G	VG	F	VP	P	P	VP	G	G	VG
DM18	VG	VG	VG	VG	VG	G	VP	P	P	VP	G	G	G
DM19	VG	VG	G	G	VG	G	P	F	F	G	G	G	VG
							A2						
	c1	**c2**	**c3**	**c4**	**c5**	**c6**	**c7**	**c8**	**c9**	**c10**	**c11**	**c12**	**c13**
DM1	F	F	P	G	P	G	G	VG	G	VG	P	P	G
DM2	P	P	P	G	P	G	VG	VG	VG	VG	VP	P	VG
DM3	P	P	VG	P	P	VG	VG	VG	VG	VG	P	VP	VG
DM4	G	G	P	P	P	F	VG	G	G	G	VP	VP	VG
DM5	F	VP	VG	P	F	P	VG	VP	P	G	F	P	G
DM6	F	P	G	VG	VP	G	F	VG	G	VP	VP	F	G
DM7	VP	P	F	F	P	G	P	VG	G	F	VP	P	VG
DM8	P	VP	F	G	F	VG	VG	VG	F	F	P	VP	G
DM9	VG	VG	G	VG	G	G	G	F	F	P	VG	VG	G
DM10	VG	F	VG	G	P	VG	F	VG	VG	G	VP	VP	VG

Table 3. *Cont.*

						A2							
	c1	**c2**	**c3**	**c4**	**c5**	**c6**	**c7**	**c8**	**c9**	**c10**	**c11**	**c12**	**c13**
DM11	P	VG	G	P	F	G	G	F	VG	VG	VP	VP	VG
DM12	VP	VP	F	F	VP	VG	F	G	F	P	VP	VP	G
DM13	G	VG	VP	F	VP	G	F	VG	F	VG	VP	VP	VG
DM14	VG	VG	F	G	VG	F	G	G	P	VG	F	G	VG
DM15	F	G	F	F	G	G	P	P	P	G	F	F	VG
DM16	F	G	G	G	F	G	F	G	P	F	F	G	VG
DM17	P	P	P	G	P	VG	VG	VG	P	F	VP	P	G
DM18	P	F	P	F	P	VG	G	VG	G	VG	P	F	VG
DM19	VG	P	P	F	P	G	G	VG	F	G	P	VP	VG
						A3							
	c1	**c2**	**c3**	**c4**	**c5**	**c6**	**c7**	**c8**	**c9**	**c10**	**c11**	**c12**	**c13**
DM1	P	P	VP	F	VP	P	F	F	F	VG	P	P	F
DM2	P	P	P	P	VP	P	G	P	P	P	VP	VP	P
DM3	P	P	VP	P	VP	F	G	G	G	VG	F	P	P
DM4	P	VG	VP	P	VG	VG	G	F	VP	VP	VG	VG	P
DM5	F	F	F	F	G	VG	F	F	P	F	F	F	G
DM6	VP	P	F	F	VP	P	F	F	F	VG	VP	F	G
DM7	VP	VP	VP	F	P	P	F	P	VP	G	G	VP	F
DM8	P	VP	P	F	P	P	F	F	G	VG	F	P	G
DM9	VG	F	G	F	F	F	F	F	VG	VG	P	F	F
DM10	F	VP	VP	F	VP	F	F	F	F	VG	P	VP	F
DM11	P	P	VP	P	P	VP	P	F	P	P	P	VP	P
DM12	VP	VP	VP	VP	VP	VP	G	G	VG	VG	VP	VP	VP
DM13	VG	VP	VP	VP	VP	F	VP	G	VP	VG	VP	VP	VG
DM14	F	F	F	P	G	P	F	F	P	G	F	F	F
DM15	F	VP	VP	VP	P	P	G	G	F	VG	VP	VP	VG
DM16	G	F	P	G	F	G	F	G	P	G	P	F	VG
DM17	VP	VP	VP	F	F	G	F	F	VP	VG	P	G	P
DM18	VG	VG	VG	VG	P	G	VP	VP	VP	P	G	VG	VG
DM19	G	VP	P	P	VP	G	VP	VG	G	F	G	P	F

By applying Step 3, the linguistic variables should be transformed into triangular fuzzy numbers to construct the fuzzy decision matrix and determine the fuzzy weights of each criterion, using Table 1.

By applying Step 4, the aggregated fuzzy decision matrix for the criteria fuzzy weights is obtained (Table 4).

Table 4. Aggregated fuzzy decision matrix for the criteria weights.

Criteria	Weight	Criteria	Weight
c1	(5,8.89,9)	c8	(1,5.52,9)
c2	(3,8.47,9)	c9	(1,2.26,7)
c3	(1,6.78,9)	c10	(1,2.78,9)
c4	(1,7.21,9)	c11	(3,7.52,9)
c5	(3,7.73,9)	c12	(1,6.89,9)
c6	(1,6.68,9)	c13	(3,7.63,9)
c7	(1,2.89,9)		

Through the calculation defined in Step 5, the weighted normalized fuzzy decision matrix and normalized fuzzy decision matrix are obtained (Table 5).

Table 5. Weighted normalized fuzzy decision matrix.

	A1	A2	A3
c1	(2.77,8.68,9)	(0.55,4.94,9)	(0.55,4.31,9)
c2	(2.33,8.47,9)	(0.33,4.6,9)	(0.33,3.02,9)
c3	(0.11,5.12,9)	(0.11,3.93,9)	(0.11,2.1,9)
c4	(0.11,5.86,9)	(0.11,4.59,9)	(0.11,3.24,9)
c5	(1.66,7.55,9)	(0.33,3.3,9)	(0.33,2.75,9)
c6	(0.33,5.27,9)	(0.11,5.35,9)	(0.11,3.47,9)
c7	(0.11,0.99,9)	(0.11,2.14,9)	(0.11,1.54,9)
c8	(0.11,3.32,9)	(0.11,4.55,9)	(0.11,3.26,9)
c9	(0.11,0.59,5.44)	(0.11,1.46,7)	(0.11,1.04,7)
c10	(0.11,0.89,9)	(0.11,2.03,9)	(0.11,2.13,9)
c11	(1,6.73,9)	(0.33,2.33,9)	(0.33,3.21,9)
c12	(0.55,6.16,9)	(0.11,2.45,9)	(0.11,2.78,9)
c13	(1,6.47,9)	(1,6.67,9)	(0.33,4.59,9)

By applying the calculations defined in Step 6 until Step 9, the rank of the treated alternatives is obtained (Table 6).

Table 6. Distances from a fuzzy positive and negative ideal solution, the closeness coefficient, and ranking.

	d_i^+	d_i^-	CC_i	Rank
A1	3.749	19.23	0.837	1
A2	13.8	9.159	0.399	2
A3	20.37	2.695	0.117	3

Our research shows that the most preferred leadership characteristics identified by top managers in MNCs in the UAE are visionary, inspirational, collaborative team-oriented, performance-orientated, and participative, whereas the least preferred are self-centered, face-saver, autocratic, and bureaucratic. In this way, Research Question 1 has been answered.

To examine the robustness of the proposed model and validate the obtained results, two additional MCDM methods were applied to determine the ranking of leadership styles (Step 10). The methods used were RAnking based on Distance And Range (RADAR) [80,81] and Simple Additive Weighting (SAW) [82]. The procedure for applying the fuzzy RADAR method was carried out as described in [68,83], while the fuzzy SAW method was implemented according to the procedure developed in [84]. The results of the application of these methods are presented in Table 7.

Table 7. Application of the fuzzy RADAR and fuzzy SAW methods for ranking leadership styles.

	Aggregated Ranking Index	Rank—Fuzzy RADAR	Final Ranking Index	Rank—Fuzzy SAW
A1	1.00	1	4.73	1
A2	0.83	2	4.27	2
A3	0.76	3	3.99	3

The application of both methods resulted in an identical ranking of the considered leadership styles, thereby confirming that the proposed methodology is sufficiently robust and reliable. Moreover, when comparing the coefficients (closeness coefficient for fuzzy TOPSIS, aggregated ranking index for Fuzzy RADAR, and final ranking index for fuzzy SAW) using the Pearson correlation coefficient, values greater than 0.99 were obtained in

all three comparative cases. This means that not only the rankings but also the obtained coefficients are highly consistent and compatible.

5. Discussion of the Research Results

Our results correspond to some extent to the results reached by GLOBE research, where integrity, inspirational, visionary, performance-oriented, and team-oriented are some of the most important leadership characteristics in the Middle East cluster, while the least effective leadership characteristics are self-centered, autocratic, and face-saver [56]. However, when we compared our results to those from the Qatar sub-cluster identified by Kabasakal et al. [56], we noticed some differences. According to the Qatar sample, the most important characteristics are human orientation, inspirational, integrity, conflict inducer, and administratively competent; the least important characteristics are self-centered, face-saver, and autocratic. As we already said, in cultures with a high level of collectivism and uncertainty avoidance, it is expected from a leader to be people-oriented; therefore, we are not surprised that human orientation is classified as the most important leadership characteristic in Qatar, but we did not expect that performance orientation would be the characteristic that is ranked so highly in the UAE since it is also a highly collectivistic and uncertainty avoidant society. However, we need to bear in mind that our research was conducted in MNCs and that, out of 19 respondents, eight come from Western societies that are more individualistic and have a lower level of uncertainty avoidance. It has been discovered that under exposure to another culture for a longer period, people can change their cultural beliefs, values, and behaviors [35,85]. The author Khelifa says that although a sense of collectivism is still present among Emiratis, younger generations strive towards autonomy and individualism under the influence of Western culture [86]. Although the dimension long-term orientation is rated low on the Hofstede scale and future orientation is rated low in the Middle East cluster according to GLOBE research, UAE top managers prefer a leader who inspires followers, has a vision, and is oriented towards the future. This result is unsurprising because rapid economic growth has forced the UAE government to become more future-oriented. As a result, the UAE government developed a set of strategies for future development, modernization, and innovative growth [87]. Therefore, Emiratis who participate in the UAE economy realize the need for a future-oriented leader with a vision.

The study also identifies that the transformational leadership style is the most preferred among top managers in MNCs in the UAE. In this way, Research Question 2 has also been answered. To some extent, our results correspond to those of previous studies. For example, Shao and Webber found that transformational leadership would be less successful in high-power distance cultures and more traditional societies, such as the UAE, compared to Western countries that are not high-power distance and traditional [88]. On the other hand, Dorfman et al. (2012) explained that transformational-leadership characteristics, such as charisma and involving employees in the decision-making process, are effective in organizations with high-performance and human-orientation values and a high degree of gender egalitarianism, but these characteristics are ineffective in organizations where a high level of power distance is present [45]. Another study comparing two nations (the USA and Korea) found that transformational leaders are more effective in collectivistic cultures than individualistic ones [89]. Moreover, employees from collectivistic cultures can more easily identify and support the vision and goals of their leaders because they have a stronger connection with their leader and organization [90].

Although the UAE belongs to the Middle East cluster in the GLOBE study, which has high performance and human orientation, and according to Hofstede, is a highly collectivistic society, it also has a high level of power distance, and, according to previous studies,

transformational leaders are not successful in high-power distance societies. However, we should not forget that the UAE is a culturally diversified society and that our sample does not only consist of Emiratis. Also, Alteneiji's study has shown that younger generations of Emiratis are not expressing a high level of power distance, and unequal distribution of power is becoming less acceptable [91]. The reason for reducing the level of power distance is that the UAE has become a rich country with an excellent welfare system that benefits its nationals. Even Hofstede said that the richer a society, the more negatively it will correlate with power distance [35].

Our results are also supported by Bass's explanation that transformational leadership is universally acceptable, regardless of culture [22]. The Bass theory [22] of the universality of transformational leadership styles is also supported by Muenjohn and Armstrong's research [92]. They found that cultural differences in Thai MNCs did not significantly influence Australian managers' transformational, transactional, and laissez-faire styles. It has been discovered that inspirational motivation, an element of transformational leadership, leads to higher commitment and engagement of followers, regardless of country and culture.

Based on the results of this research, it is recommended that MNCs operating in the UAE design leadership-development programs grounded in the characteristics of the transformational-leadership style, particularly those related to vision, inspiration, and team collaboration. Considering that the UAE is a multicultural environment with a large number of employees of foreign origin, such training should include courses in intercultural communication and even culturally sensitive leadership practices. However, room should be left for variations in leadership styles depending on whether a specific activity requires innovation, development, working with larger groups of people, certain social circumstances, and so on.

6. Conclusions

In this study, we analyzed the most preferred leadership style and characteristics in MNCs using the fuzzy TOPSIS method. The decision-makers in our study were 19 top managers in MNCs in the UAE, and they were asked to evaluate 14 leadership characteristics according to their preferences. For this study, we selected 13 out of 21 dimensions discovered by House et al. [11] and used them as leadership characteristics. In the next step, decision makers were presented with leadership styles that represented evaluation alternatives. Top managers need to evaluate these alternatives (leadership style) based on their adequacy in relation to decision criteria (leadership characteristics).

This study addresses the underexplored context of leadership in the UAE, particularly within MNCs. As a country with a large number of expatriates and, consequently, significant cultural diversity in its workforce, the UAE presents a highly relevant setting for this type of research. Unlike previous studies, which have primarily focused on the national level or on specific sectors, this study integrates the GLOBE leadership framework with the fuzzy TOPSIS method to identify leadership preferences in this multicultural environment. In addition to its contribution through a geographical and cultural focus, the study proposes a model based on subjective managerial assessments combined with a MCDM methodology.

While writing this study, we identified several limitations. The first limitation is that the sample is small, including only 19 top managers in four MNCs. It cannot represent all MNCs in the UAE, but it can initiate further studies in this field.

The second limitation is related to the sample. It consisted of top managers from different nationalities (seven Emirates, seven British, three American, and two Indian). However, their responses were not analyzed separately to identify similarities and differ-

ences across the four nations. According to Hofstede, the UAE and India have similar cultural dimensions, while the UK and the USA share almost the same cultural values. Due to the limited number of respondents, it was not possible to conduct a comparative analysis among different nationalities, although it is clear that different cultural patterns may influence the characteristics of the leader. Therefore, future research should also conduct a comparative study by analyzing their answers separately and using a larger sample.

A third limitation is that we measured cultural dimensions indirectly at the national level, neglecting individual differences within cultures [93,94]. Future research should assess culture at the individual level to identify how individual cultural differences correlate with leadership characteristics and styles.

Despite limitations, our study contributes novel insights. First, very few studies have analyzed topics in the field of organizational behavior using the fuzzy TOPSIS method. In particular, this method has never been used to analyze the most preferred leadership style and characteristics in MNCs in the UAE. To our knowledge, no prior research has examined preferred leadership characteristics in the UAE context using GLOBE research. Even the GLOBE researchers have not conducted their study on UAE society, which differs from other countries in the Middle East cluster.

Our results can also contribute to MNCs' business practices, especially those operating in diverse societies like the UAE. Cultural values and norms can significantly impact employees' preferred leadership styles and characteristics. The insights from our study can be valuable to MNCs when preparing leadership-development programs, particularly for overseas subsidiaries.

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Abbreviations

The following abbreviations are used in this manuscript:

AHP	Analytic Hierarchy Process
DMs	decision-makers
FNIS	fuzzy negative ideal solution
FPIS	fuzzy positive ideal solution
GDP	Gross Domestic Product
GLOBE	Global Leadership and Organizational Behavior Effectiveness
GNI	Gross National Income
HDI	Human Development Index
MADM	Multi-attributive decision-making
MNCs	multinational corporations
NIS	negative ideal solution
PIS	positive ideal solution
RADAR	RAnking based on Distance And Range
SAW	Simple Additive Weighting

TFNs	triangular fuzzy numbers
TOPSIS	Technique for Order of Preference by Similarity to Ideal Solution
UAE	United Arab Emirates
VIKOR	Multicriteria Optimization and Compromise Solution
WPM	Weighted Product Model
WSM	Weighted Sum Model

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