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Abstract

Purpose- High-skilled employees are crucial for sustained competitive advantage of organisations. In the "war for talent", organisations must position themselves as attractive employers. This study introduces a unified framework to systematically identify and prioritise Organisational Attractiveness (OA) components, focusing on the extreme context of the airline industry.

Design/methodology/approach- Treating OA as a Multi-Criteria Decision Making (MCDM) situation, the study employs the Fuzzy Delphi Method (FDM) to validate key OA factors and the Fuzzy Analytical Hierarchy Process (FAHP) to prioritise them based on experts' judgements.

Findings- The study identifies five criteria and 22 sub-criteria for OA, with job characteristics and person-job fit as most critical. These elements signal employment quality and skill-job alignment, reducing information asymmetry and attracting talent.

Practical implications- This research provides a practical framework for airline managers to identify and prioritise key aspects of OA to enhance their value proposition and attract and retain qualified employees. For policymakers, applying the OA framework supports informed policy decisions on employment standards and workforce development.

Originality- This research introduces a fuzzy OA index and a framework that enhances OA. By incorporating signalling theory into a fuzzy MCDM approach, it systematically addresses key OA components, offering a strategic method to boost OA.

Keywords Organisational attractiveness, Talent management, Airline industry, Fuzzy theory, Fuzzy MCDM.

1. Introduction

Highly skilled employees are essential for sustained competitive advantage of organisations (Hatch and Dyer, 2004; Kravariti *et al.*, 2022). By 2030, the global talent deficit could exceed 85.2 million workers, potentially leading to $8.5 trillion in unrealised annual revenue (Franzino *et al.*, 2023). The "labour shortage" and "war for talent" make attracting and retaining employees a critical challenge (Festing and Schäfer, 2014). For instance, in the UK, 77% of organisations struggled to attract quality candidates in 2022, up from 49% in 2021, with recruitment costs rising from £1,000 to £1,500 (CIPD, 2022). Likewise, the hospitality and tourism (H&T) industries face ongoing challenges in attracting skilled workers and managing high turnover rates (Kravariti *et al.*, 2022; Manoharan *et al.*, 2023; Sun *et al.*, 2022).

Organisations must strategically position themselves as appealing employers to attract and retain skilled employees. In this vein, Organisational Attractiveness (OA) is crucial for drawing in qualified candidates and maintaining a talented workforce (Turban and Keon, 1993). OA refers to individuals perceiving an organisation as a desirable workplace (Gomes and Neves, 2011). Despite growing interest in OA, the literature lacks a systematic approach to conceptualising it, with various indicators tested in isolation and no consensus on key components (Dassler *et al.*, 2022). This hinders organisations' ability to develop effective attraction and retention strategies, highlighting the need for a unified OA framework. This study integrates signalling theory (Spence, 2002) and Multi-Criteria Decision-Making (MCDM) methods (Lai and Ishizaka, 2020), using a hybrid approach with Delphi and Analytical Hierarchy Process (AHP) to answer the question of "What are the critical factors influencing OA in the airline industry?". Fuzzy theory (Zadeh, 1965) is applied to address the vagueness in human judgments and the complexity of OA. Fuzzy MCDM, widely used in the airline industry (Dožić, 2019), is effective in solving MCDM problems in H&T (Vatankhah *et al.*, 2023).

This study examines OA in the airline industry, an ideal context for three key reasons. First, the industry features standardised vocational training, operations, and HR policies across countries (Karatepe and Vatankhah, 2014), making the insights from Iranian airline experts relevant globally. Second, with a projected need for 480,000 technicians and 350,000 pilots by 2026, competition for skilled talents is intense (ICAO, 2023). Third, the airline industry is an extreme work environment, known for its high physical and psychological threats (Janic, 2000), which can reduce its appeal to skilled job seekers. Considering these factors, OA in the airline industry plays a crucial role in attracting and retaining employees.

This study makes two significant contributions. First, it introduces a unified OA index that integrates multiple established dimensions, addressing the gaps in existing literature where OA factors have been tested in isolation (Dassler *et al.*, 2022). Second, the fuzzy MCDM approach provides a systematic method to identify and rank key OA factors, enhancing both theoretical and practical understanding (Lai and Ishizaka, 2020). For scholars, this research fills a crucial gap in OA conceptualisation through a rigorous mixed-method approach. For practitioners, particularly in the H&T sectors, it offers strategic insights by clearly ranking OA determinants. This is especially vital in the airline industry, where intense competition for limited top talents makes effective OA strategies essential (ICAO, 2023).

2. Literature review

2.1. Signalling theory

Signalling theory, a central theory in OA research, explains how job seekers form perceptions of organisations based on the information they receive (Turban, 2001). The theory consists of three key components: signallers (organisations that possess private information), signals (deliberate information cues used to influence desired outcomes), and receivers (job seekers who have limited knowledge) (Connelly *et al.,* 2011). Based on the theory, airlines, as signallers, deliberately share specific information to showcase their value proposition (e.g., safety image)

to potential employees. These signals help job seekers, the receivers, interpret the organisation's attractiveness and decide whether to apply or accept a job offer. The theory hinges on information asymmetry, where job seekers lack complete knowledge about the organisation and rely on these signals to make informed decisions. Effective signalling is crucial, as positive signals can significantly enhance an organisation's appeal and improve its ability to attract and retain top talents (Turban, 2001).

Signalling theory has been applied in H&T management literature to study OA and talent management (e.g., Manoharan *et al.*, 2023; Sun *et al.*, 2022). Talent management which focuses on attracting, developing, and retaining a workforce aligned with organisational goals, must address industry-specific challenges (Magrizos *et al.,* 2023). Manoharan et al. (2023) highlighting "industry talent branding", suggested that effective talent management should include both organisational initiatives and broader industry collaboration. In the H&T industry, talent management is particularly difficult due to the reliance on a young, transient, and lower-skilled workforce (Kravariti *et al.*, 2023). This study builds on these insights by examining the signalling effects of OA components in the airline industry, offering new empirical evidence on how these signals impact talent management in a competitive environment.

2.2. Indicators (criteria and sub-criteria) of organisational attractiveness

This study reviewed and synthesised evidence from the existing literature on OA and identified five key criteria and 22 sub-criteria. These encompass (1) organisational characteristics containing internal resources and competencies that affect applicants' job decisions (Turban and Keon, 1993); (2) job characteristics referring to the content of jobs and tasks (Barrick *et al.*, 2013); (3) perceived fit involving perceiving alignment between personal characteristics and organisation and job attributes (Chapman *et al.*, 2005); (4) Corporate Social Responsibility (CSR) referring to organisation meeting responsibilities across economic, legal, ethical, and

philanthropic levels for multiple stakeholders (Albinger and Freeman, 2000); and, (5) corporate branding involving creating an organisation's unique characteristics (Rode and Vallaster, 2005).

Organisational characteristics, such as safety image and reputation, size, work environment, and location, play a vital role in shaping OA. (1) Safety image and reputation are crucial: job safety significantly predicts OA (Gomes and Neves, 2011), and a strong corporate reputation, coupled with innovation, psychological value, and social media presence, positively influences job application intentions (Sivertzen *et al.*, 2013). (2) The size of an organisation is another important factor. Turban and Keon (1993) found that individuals with a high need for achievement are less attracted to medium-sized organisations, while Lievens et al. (2001) noted that medium and large multinational companies are particularly attractive to prospective job seekers, especially final-year students. (3) The work environment also emerges as a strong predictor of OA, with flexible work practices and organisational justice significantly enhancing OA (Ardakani *et al.*, 2016; Chapman *et al.*, 2005). Moreover, Joo et al. (2016) added that organisational justice mediates the link between CSR and OA, particularly for candidates who perceive CSR as self-serving. (4) Location and geographical dispersion may not have a significant main effect (Turban and Keon, 1993), but Lis (2018) suggested that a more attractive location correlates with higher OA.

The job characteristics criterion is linked to seven key attributes: training, empowerment, rewards, pay, job security, promotion, and type of work. (1) Training and skill development are strong predictors of OA (Gomes and Neves, 2011; Story *et al.*, 2016). (2) Empowerment, particularly through formal mentoring and psychosocial support, also enhances OA (Allen and O'Brien, 2006; Spitzmüller *et al.*, 2008). (3) Merit-based rewards (Turban and Keon, 1993) and extra-salary benefits (Gomes and Neves, 2011) contribute to OA. (4) Pay significantly influences job pursuit intentions and OA (Chapman *et al.*, 2005; Gomes and Neves, 2011). Sohn et al. (2015) further emphasised the dominant role of gross salary, while Lis (2018) suggested higher

remuneration for higher OA. (5) Job security is a significant OA predictor (Gomes and Neves, 2011). (6) Promotion opportunities are crucial for attracting jobs (Chapman *et al.*, 2005). (7) The type of work, including job-related knowledge (Gomes and Neves, 2011), HRM practices (Obeidat, 2019), and intellectual challenges (Lis, 2018), is closely tied to OA.

Perceived fit includes two key sub-criteria: person-job fit and person-organisation fit. (1) Person-job fit is a strong predictor of job acceptance intentions (Chapman *et al.*, 2005) and influences attraction throughout the selection process (Carless, 2005). (2) Person-organisation fit, involving the alignment between job seekers' values and organisational values, predicts job choice intentions and work attitudes (Cable and Judge, 1996). It also affects attraction during selection stages (Carless, 2005), with congruence between applicant preferences and organisational culture enhancing OA (Judge and Cable, 1997). A strong person-organisation fit fosters OA and long-term commitment (Moynihan and Pandey, 2007).

CSR encompasses five sub-criteria: human rights, philanthropy, environmental issues, employee relations, and diversity management. (1) Promoting ethical human rights practices (Murray and Ayoun, 2010) and gender equity (Duarte *et al.*, 2014) enhances OA. (2) Philanthropy, including community outreach and charitable giving, is positively linked to OA, particularly for job seekers with high job choice levels (Albinger and Freeman, 2000; Duarte *et al.*, 2014). (3) Environmental initiatives, such as investing in environmental protection, also contribute to OA (Backhaus *et al.*, 2002; Duarte *et al.*, 2014). (4) Positive employee relations, including union relations and participation, impact OA (Albinger and Freeman, 2000; Backhaus *et al.*, 2002; Vitaliano, 2010). (5) Diversity management practices enhance attractiveness, especially for job seekers with high levels of job choice (Albinger and Freeman, 2000; Ardakani *et al.*, 2016; Backhaus *et al.*, 2002; Murray and Ayoun, 2010; Story *et al.*, 2016; Vitaliano, 2010).

Finally, corporate branding is a key criterion for OA, with image and prestige, positioning, value proposition, advertising, and public relations as its sub-criteria. (1) Image and

prestige significantly impact OA, with organisational image and external prestige being crucial (Chapman *et al.*, 2005; Highhouse *et al.*, 2003; Younis and Hammad, 2021). (2) Positioning through culture, brand name, and compensation strongly contributes to OA (Leekha Chhabra and Sharma, 2014). (3) Value proposition influences job application intentions, with psychological value increasing OA (Sivertzen *et al.*, 2013), while social and development values reduce turnover intentions (Kashyap and Verma, 2018). (4) Advertising and public relations, including website content (Cober *et al.*, 2003), recruitment ads (Van Hoye and Lievens, 2005), and social media presence (Kissel and Büttgen, 2015), are vital for OA. In addition, Lin (2015) emphasised the importance of perceived usefulness and ease of use of recruitment websites.

3. Methods

3.1. Fuzzy theory and the triangular fuzzy numbers

Fuzzy theory (Zadeh, 1965) addresses the vagueness and uncertainty inherent in human judgments by allowing objects to have a membership grade between zero and one within a fuzzy set (see Appendix 1 under supplementary materials). This approach effectively captures the complexities and ambiguities of decision-making processes, making it a valuable framework in organisational studies. For instance, Fuzzy MCDM has been widely applied across fields such as human resource management (Manoharan *et al.*, 2011) and behavioural analysis (Vatankhah and Darvishi, 2022). Additionally, fuzzy-set Qualitative Comparative Analysis (fsQCA) has been used to examine employee behaviours (Manosuthi *et al.*, 2024), employee performance (Darvishmotevali *et al.*, 2024), and organisational management (Zhang *et al.*, 2023). However, challenges such as implementation complexity, subjectivity in setting parameters, and reliance on expert knowledge (Ragin, 2009) must be considered. Despite these challenges, the application of fuzzy theory is advocated in H&T research (Kumar *et al.*, 2023; Vatankhah *et al.*, 2023) for its potential to provide nuanced insights and robust solutions.

OA as an MCDM phenomenon, and employee retention as an MCDM practice (Lai and Ishizaka, 2020), require precise decisions. This allows for the quality of decision-making outcomes and avoids possible losses associated with the imprecise decision. This is specifically the case for the H&T industries in general (Vatankhah *et al.*, 2023) and the airline industry in particular (Dožić, 2019), where substantial investments highlight the importance of understanding multiple criteria influencing the precision of decisions in the decision-making process. In line with the recent call for the application of fuzzy MCDM in H&T research (Vatankhah *et al.*, 2023), this study proposes fuzzy MCDM, encompassing Fuzzy Delphi Method (FDM) and Fuzzy AHP (FAHP), as an effective approach to navigating uncertainty and vagueness (Hsu *et al.*, 2010) associated with the concept of OA in the airline industry.

3.2.Fuzzy Delphi Method

Fuzz theory was extended to the application of the Delphi study (Ishikawa *et al.*, 1993) to overcome the drawbacks associated with the conventional Delphi method in terms of cost efficiency and declining response rates. Specifically, FDM uses fuzzy linguistic variables (i.e., Triangular Fuzzy Number: TFN) to advance the decision-making process by disabling the fuzziness in expert judgment (Hsu *et al.*, 2010). It is argued that applying fuzzy theory in the Delphi study solves the fuzziness of human judgments and facilitates the common understanding of experts' opinions (Hsu *et al.*, 2010; Ma *et al.*, 2011). This study adopts FDM to validate the initial list of identified criteria for OA in the airline industry, as described below.

The first step requires the collection of experts' opinions regarding the importance of each criterion to be included in the study. The experts are asked to indicate their responses using linguistic terms. As shown in Table 1, each linguistic term will be assigned a corresponding TFN and aggregated using the geometric mean model (Ma *et al.*, 2011) (see Appendix 2 under supplementary materials).

(Table 1 here)

Once the fuzzy weights of criteria are calculated, the significance of each criterion based on experts' judgments will be identified. In doing so, a threshold level "$\tilde{a}$," which is the average of all criteria weights (Bouzon *et al.*, 2016), will be set to determine the significance level. The centre of gravity is used as the calculation method, defuzzification is used to accommodate, $\tilde{a}_j$ and $\tilde{an}$ as TFNs, and the fuzzy weights are transformed into crisp numbers. Therefore,

Criterion j will be selected for the study if $\tilde{a}_j \geq \tilde{a}$

Criterion j will be rejected from the study if $\tilde{a}_j < \tilde{a}$

3.3. Fuzzy Analytical Hierarchy Process

Like FDM, fuzzy theory has been extended to apply AHP (Saaty, 1997) to improve the precision of expert judgments and weight estimation. Accordingly, Chang (1996) proposed the extent analysis method to capture expert opinions in addressing fuzzy and complex MCDM problems. The extent analysis method uses fuzzy linguistic terms to allow decision-makers to express their opinion through fuzzy judgments rather than precise numbers. Chang's FAHP method follows a simple calculation and has been the most frequently applied method for weight estimation and alternative selection (Cho and Lee, 2013) (see Appendix 3 under supplementary materials).

4. **The empirical procedure**

4.1. Questionnaire preparation

An in-depth review of literature specific to the airline industry identified key OA attributes. An FDM-based questionnaire (see Appendix 4 under supplementary materials) was then designed and distributed to experts, who rated the factors using linguistic terms (see Table 1). Based on FDM results, a second questionnaire (see Appendix 5 under supplementary materials) was created to capture the relative importance of criteria and sub-criteria through pair-wise comparisons using fuzzy linguistic terms. Experts' fuzzy judgments were measured with five levels (see Table 2). Combining expert opinions with literature review enhances the understanding of OA factors through multi-source data collection. The triangulation principles

improve information accuracy (Jick, 1979) and are recommended for H&T research (Vatankhah *et al.*, 2019). Both questionnaires were piloted with five experts and translated into Farsi using back translation (Klotz *et al.*, 2023).

(Table 2 here)

4.2. Sampling and data collection

A judgmental sampling technique was used, selecting 28 experts with over ten years of experience in the airline industry in Iran. Judgmental sampling was particularly appropriate for this study as it allowed to tap into the expertise of those who have a deep understanding of the industry, thereby providing more accurate and relevant data to meet the research objectives (Carey *et al.*, 1997). Questionnaires were emailed to the experts with a cover letter explaining the study's aims and guaranteeing anonymity. Before data collection, the research methodology, including the questionnaire, was reviewed and approved by the first author's institutional ethical committee. The committee's approval confirmed that the research design, including data collection protocols, respects participant confidentiality and integrity, and complies with all relevant ethical guidelines. Informed consent was obtained through a statement at the questionnaire's start, detailing the study's purpose, participant involvement, data protection measures, and participants' rights, including the right to withdraw without penalty. Sixteen experts from four airlines participated in the data collection, representing key operational roles such as HR, marketing, operations, cabin services, training, business development, policy development, research and development, and international affairs. Questionnaires were distributed equally among them, with their expertise mapped against study criteria in Table 3. Data was collected in 2022.

(Table 3 here)

Due to the confidentiality of the data collection, the names of experts and their relative airlines are not disclosed. In the first stage of data collection, an FDM questionnaire containing

the list of criteria was sent to experts, and the experts were asked to express their opinions regarding the importance of each criterion to be included in the study. With FDM, experts provided their expertise in addressing the relevance of identified criteria to OA in the airline industry. Following FDM, an FAHP questionnaire that included several pair-wise comparisons was sent to the expert panel during the second data collection stage. Experts were asked to express their opinions regarding the relative importance of each criterion over the other. Both sets of questionnaires included all the criteria and experts were equally asked to rate their opinion using FDM and FAHP questionnaires. The survey process yielded sixteen usable questionnaires for the analysis.

To address method bias (Podsakoff *et al.*, 2012), this study utilised expert judgments in a fuzzy MCDM approach and employed judgmental sampling to select a diverse panel of experts. Anonymity was maintained during data collection to encourage unbiased assessments and provide detailed explanations of concepts and procedures. Additionally, varied linguistic scales and pairwise comparisons were incorporated to minimise response biases. These measures enhance the reliability and validity of the findings in examining OA within the airline industry.

5. Calculation procedure and results

5.1. Fuzzy Delphi Method results

According to the results of FDM (see Table 4), Location and geographical dispersion (0.777) did not meet the inclusion criteria and have been deleted from the research. All remaining criteria met the inclusion criteria (i.e., $\tilde{a}$ >0.791) and were used as the basis for the categorisation. Accordingly, OA criteria have been categorised into five main criteria and 21 sub-criteria.

(Table 4 here)

5.2. The study proposed evaluation index

As shown in Figure 1, the hierarchical structure of the airline OA index consists of three levels, with the first level concerning the goal, the second level representing proposed criteria, and the third level demonstrating associated sub-criteria.

(Figure 1 here)

5.3. Fuzzy Analytical Hierarchy Process results

Based on experts' responses, the pair-wise comparison matrix of study criteria was constructed (see Appendix 6 under supplementary materials). As previously mentioned, Chang's extent analysis involves multiple steps, with calculating fuzzy synthetic extent as the first step (i.e., eq. 3). Accordingly, the value of fuzzy synthetic extent for designated criteria with response to the goal has been calculated (see appendix 7 under supplementary materials). The next step involves the calculation of the degree of possibility of each criterion being greater than the other (eq. 6).

d'(A) = min (0.85,0.95,1.00,1.00) = 0.854
d'(B) = min (1.00, 1.00, 1.00, 1.00) = 1.00
d' (C) = min (1.000, 0.894, 1.000, 1.000) =0.894
d' (D) = min (0.73,0.58,0.67,1.000) = 0.58
d' (E) = min (0.60,0.46,0.54,0.86) = 0.46

As the next step requires (eq. 7), the fuzzy weight vector can be defined as below:
w' = (0.85,1.00,0.89,0.58,0.46)

The non-fuzzy weight vector for the proposed criteria will be (eq. 8;9):
W = (0.225, 0.263,0.235,0.155,0.122)

The local weight calculation of all sub-criteria followed the same procedure, and the results are represented in Table 5. The global weight of each sub-criterion was calculated to understand the ultimate ranking of sub-criteria. Therefore, sub-criteria local weights were multiplied by their relative criteria. The results of global weight calculations are shown in Table 5.

(Table 5 here)

6. Discussion

The critical importance of highly skilled employees for maintaining a competitive edge is well-established (Hatch and Dyer, 2004). However, the growing "labour shortage" and "war for talent" have made attracting and retaining talent increasingly challenging (Festing and Schäfer, 2014). According to signalling theory (Spence, 2002), OA plays a vital role in job seekers' application interest and employee retention (Leekha Chhabra and Sharma, 2014), making investment in OA crucial. Real-world examples include Qatar Airways' global brand expansion through high-profile sponsorships, Emirates' investment in employee training and safety innovation, and Delta's diversity initiative enhancing OA. Despite the efforts, the literature lacks a structured approach to understanding OA (Dassler *et al.*, 2022), particularly in industries like hospitality, tourism, and airlines, which struggle with employee retention (Manoharan *et al.*, 2023; Sun *et al.*, 2022). Therefore, practical tools are needed to help these industries improve their OA (Sivertzen *et al.*, 2013).

This study addresses the research gap by proposing a fuzzy OA index to create a unified framework for enhancing airlines' attractiveness to current employees and potential applicants. Treating OA as an MCDM situation, the study establishes a systematic procedure for identifying and ranking the most appealing attributes. The approach, grounded in FDM and FAHP, follows three key steps. First, a thorough review of OA literature identified five main criteria and 22 sub-criteria. Second, these attributes were validated by airline experts who rated their importance using fuzzy linguistic terms, which better capture subjective opinions than numerical values. Finally, FAHP was used to assess the relative importance of each attribute, providing a structured and prioritised framework for airline OA.

The FAHP results revealed that job characteristics (0.263) are the most critical factor in determining an airline's attractiveness, reaffirming the significance of this factor as debated in academic literature (e.g., Chapman *et al.*, 2005; Gomes and Neves, 2011; Turban and Keon, 1993). Consistent with extant literature (e.g., Cable and Judge, 1996), perceived fit emerged as

the second most important component of OA in the airline. Organisational characteristics ranked third, supporting the view that these attributes serve as reliable signals to the job market (e.g., Lievens *et al.*, 2001; Sivertzen *et al.*, 2013). Additionally, CSR (0.155) and corporate branding (0.122) were identified as significant contributors to OA, underscoring their roles in shaping an airline's appeal.

In terms of sub-criteria, the global weight calculation revealed that person-job fit (0.172) under the perceived fit criterion is the most critical attribute in the OA index, aligning with existing research (Carless, 2005; Chapman *et al.*, 2005). Additionally, safety image and reputation, with a weight of 0.124, are crucial in the airline industry, where safety concerns are paramount due to the unique challenges faced by professionals such as cockpit crew and flight engineers. These challenges include disruptive passengers, recovery from night flights, and jet lag, all of which contribute to a spectrum of detrimental outcomes, ranging from mental health issues, such as depression, anxiety (Ribeiro-Silva *et al.*, 2016), and fatigue (Bourgeois-Bougrine *et al.*, 2017), to physical health issues (Miura *et al.*, 2019). A strong safety image not only appeals to employees but also enhances an airline's attractiveness to job seekers and passengers alike, making it a key factor in OA (Ringle *et al.*, 2011).

This study identifies key factors influencing OA in the airline industry through the lens of signalling theory (Spence, 2002). By emphasising factors like job characteristics (Chapman *et al.*, 2005), perceived fit (Cable and Judge, 1996), and CSR (Albinger and Freeman, 2000), airlines can send clear signals that reduce information asymmetry, conveying employment quality and alignment with job seekers' skills and values. Organisational characteristics such as safety image and corporate branding further enhance positive perceptions, attracting top talents (Chapman *et al.*, 2005; Gomes and Neves, 2011). Leveraging these signals through the fuzzy OA index (Lai and Ishizaka, 2020), airlines can strategically position themselves in the competitive talent market, enhancing their attractiveness and effectively communicating their

strengths and value proposition. Despite its importance, the impact of these factors on employee attraction and retention in the airline industry has been under-researched.

6.1. Theoretical implications

This study makes several significant theoretical contributions. First, this study addresses the gap in applying advanced analytical methods to systematically explore OA factors (Dassler *et al.*, 2022). It demonstrates the effectiveness of treating OA as an MCDM situation and using fuzzy MCDM techniques (FDM and FAHP) to identify and prioritise key factors in the airline industry. The ranking of the five main criteria—job characteristics, perceived fit, organisational characteristics, CSR, and corporate branding—along with their sub-criteria, aligns with existing research (e..g., Albinger and Freeman, 2000; Barrick *et al.*, 2015; Chapman *et al.*, 2005; Rode and Vallaster, 2005; Turban and Keon, 1993). This approach offers a nuanced understanding of the relative importance of these factors in shaping OA, providing a more precise framework for future research and practical application.

Second, this study advances signalling theory (Spence, 2002) by examining how organisations communicate their attractiveness. The findings reveal that job characteristics (e.g., Gomes and Neves, 2011) and perceived person-job fit (e.g., Carless, 2005; Chapman *et al.,* 2005) are the most critical factors in determining an airline's attractiveness. This supports signalling theory's premise that job seekers interpret organisational information as signals of its attributes, with positive signals enhancing OA. Third, the study broadens OA understanding by identifying industry-specific factors like safety image and reputation and comparing them with traditional OA factors. The results underscore the critical role of safety image and reputation within organisational characteristics (Sivertzen *et al.,* 2013), particularly in the high-risk environment of the airline industry. These insights enrich the existing literature and offer vital, sector-specific strategies for enhancing OA in the airline industry.

6.2. Practical implications

This research provides airline managers with a practical, unified framework for identifying and ranking the key components of OA. As such, the fuzzy OA index offers a strategic tool to counteract the transportation industry's negative image in the job market (Sohn *et al.*, 2015). By ranking criteria and sub-criteria based on their relative weights, the index guides managers on which dimensions to prioritise in attracting and retaining qualified employees. Integrating these OA elements into marketing and communication strategies can enhance an airline's value proposition for current and prospective employees. Managers should focus on job characteristics, perceived fit, organisational characteristics, CSR, and corporate branding, with particular emphasis on pay, job security, promotion, rewards, empowerment, and training (Chapman *et al.*, 2005; Sohn *et al.*, 2015; Spitzmüller *et al.*, 2008; Story *et al.*, 2016). Incorporating these factors into corporate communications—such as reports, recruitment ads, and brochures—can increase transparency and appeal to potential hires (Kissel and Büttgen, 2015). For example, featuring employee testimonials on the company website can effectively highlight key benefits, attracting and retaining talent (Yu, 2014).

To strengthen perceived fit, airline managers should cultivate perceptions of person-job and person-organisation fit through tailored recruitment campaigns and job descriptions. Customising job descriptions to align with individual skills and organisational values is crucial for attracting candidates who are both technically qualified and culturally compatible. This involves highlighting the organisation's core values, role-specific responsibilities, and key behaviours that reflect the company culture. Using inclusive language and emphasising growth opportunities can attract a diverse pool of candidates who share these values. Additionally, clear success metrics in job descriptions help candidates understand their potential impact, fostering alignment and increasing their attraction to the organisation.

Airline managers should strategically highlight key organisational characteristics—such as safety image, reputation, working environment, and company size—when communicating

with job seekers (Lievens *et al.*, 2001; Sivertzen *et al.*, 2013). Emphasising a strong safety image and reputation is particularly crucial, as these factors significantly enhance an airline's appeal in a competitive job market, especially amid growing demand for air travel and heightened scrutiny on safety practices (Liou *et al.*, 2007). Moreover, incorporating the Competency-Based Training (CBT) methodology recommended by the ICAO (2010) is vital. CBT, already used in commercial pilot training, has proven to improve performance and safety proficiency (Gibbs *et al.*, 2017; Liou *et al.*, 2007). This focus on safety and employee development not only boosts attraction but also strengthens retention by ensuring ongoing skill enhancement and operational excellence.

Airlines should proactively communicate their commitment to CSR by integrating strong positions on employee relations (Vitaliano, 2010), equality, diversity, and inclusion (Duarte *et al.*, 2014), environmental sustainability (Backhaus *et al.*, 2002), philanthropy (Albinger and Freeman, 2000), and human rights (Murray and Ayoun, 2010) into their corporate messaging. This involves not just adopting policies but actively implementing practices that prioritise employee well-being, champion diversity and inclusion, reduce environmental impact, engage in meaningful community philanthropy, and uphold rigorous human rights standards. By transparently showcasing their CSR initiatives, airlines can significantly enhance their attractiveness to prospective applicants, clearly demonstrating a genuine commitment to social responsibility and sustainability.

Airlines should prioritise enhancing their corporate branding by refining their value proposition (Kashyap and Verma, 2018), strengthening their image and prestige (Younis and Hammad, 2021), improving their market positioning (Leekha Chhabra and Sharma, 2014), and investing in robust public relations strategies (Kissel and Büttgen, 2015). This requires consistently delivering on customer promises, cultivating a strong and reputable brand image, strategically positioning themselves to stand out from competitors, and actively managing public

relations to maintain a positive perception among stakeholders. By doing so, airlines can solidify their brand identity, attract top industry talent, and build enduring customer loyalty and trust.

This study's findings from the airline industry have practical implications across various sectors, demonstrating the value of applying fuzzy MCDM to enhance recruitment and retention strategies beyond airlines. Industries like healthcare, technology, and manufacturing, where attracting and retaining talent is crucial (e.g., Moses and Sharma, 2020), can adapt the OA framework to their specific needs, such as prioritising innovation in tech or patient care in healthcare. The framework's flexibility allows it to be tailored to other extreme contexts like shipping, mining, or healthcare, to validate its robustness. Additionally, integrating fuzzy MCDM into OA offers valuable insights for public policy in sectors like healthcare, education, and technology, helping to improve job security, work-life balance, and career development opportunities, which are vital in sectors with high turnover and skilled labour demands (Hatch and Dyer, 2004). Enhancing OA can boost job satisfaction, retention rates, and overall employee well-being (Turban and Greening, 1997), while also informing policy decisions on employment standards and workforce development (Festing and Schäfer, 2014).

6.3. Limitations and research directions

Despite its valuable contributions, this study has limitations that future research should address. First, the reliance on a panel of experts from the airline industry may limit the generalisability of the OA index to other sectors. To broaden the applicability of OA insights, future studies should replicate this research across various industries with distinct characteristics. Comparative analyses could uncover universal versus industry-specific factors, enriching the literature on talent management and organisational strategy. Additionally, this study focused solely on using FAHP to establish the hierarchical structure of the OA index without exploring potential associations among variables. Incorporating methods like Fuzzy Analytic Network Process (ANP) and Fuzzy Decision-making Trial and Evaluation Laboratory (DEMATEL) could provide

a deeper understanding of the network relationships among OA indicators. Furthermore, applying fsQCA could identify combinations of conditions that influence OA, revealing how attributes like job characteristics, perceived fit, and corporate branding interact to enhance organisational attractiveness (Rasoolimanesh *et al.*, 2021). Future research should employ fsQCA to pinpoint strategic configurations that organisations can leverage to attract top talents. Given the competitive "war for talent" and the ongoing "retention dilemma," applying the fuzzy OA index could offer an optimal configuration of key components, boosting organisational appeal to high-performing talent. Future research should also examine contemporary factors affecting OA, such as technology (Guo *et al.*, 2023), equity, diversity and inclusion (EDI) (Jin *et al.*, 2024), and resilient organisations (Hall *et al.*, 2023). According to Jin et al. (2024), EDI policies signal a commitment to CSR, making organisations more attractive to those valuing inclusivity. Hall et al. (2023) argue that resilient building programmes that help employees adapt to changes serve as strong attraction signals for prospective talents.

7. Conclusion

In the current competitive landscape, securing high-skilled employees is crucial for sustained competitive advantage. Recognising the importance of OA, this study applied signalling theory to develop a framework for identifying and prioritising OA components using fuzzy MCDM. By employing the FDM and FAHP, critical factors were validated and ranked based on experts' judgments, with the framework tested in the airline industry. Five key criteria—organisational characteristics, job characteristics, perceived fit, CSR, and corporate branding—along with 22 sub-criteria were identified, with job characteristics and person-job fit emerging as the most influential. These elements, grounded in signalling theory, effectively convey employment quality and skill alignment, reducing information asymmetry and significantly enhancing OA in the competitive job market.

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Tables

Table 1. Linguistic terms and triangular fuzzy numbers for FDM

Linguistic scales	TFNs	Description
Very low	(0,0,0.1)	The importance of the criteria to be included in the list is very low
Low	(0,0.1,0.3)	The importance of the criteria to be included in the list is low
Medium-low	(0.1,0.3,0.5)	The importance of the criteria to be included in the list is medium-low
Medium	(0.3,0.5,0.7)	The importance of the criteria to be included in the list is medium
Medium-high	(0.5,0.7,0.9)	The importance of the criteria to be included in the list is medium-high
High	(0.7,0.9,1)	The importance of the criteria to be included in the list is high
Very high	(0.9,1,1)	The importance of the criteria to be included in the list is very high.

Table 2. Linguistic terms and triangular fuzzy numbers for fuzzy AHP

Linguistic scale	Triangular fuzzy numbers	Reciprocal fuzzy numbers
Just equal	(1, 1, 1)	(1, 1, 1)
Moderately more important	(2, 3, 4)	(0.25, 0.33, 0.5)
Strongly more important	(4, 5, 6)	(0.16, 0.2, 0.25)
Very strongly more important	(6, 7, 8)	(0.12, 0.14, 0.16)
Absolutely more important	(9, 9, 9)	(0.11, 0.11, 0.11)

Table 3. Mapping experts' knowledge and expertise against criteria and sub-criteria

Expert Role	**Criteria**	**Sub-Criteria**
Executive HR manager	Organizational characteristics	Work environment, size
	Job characteristics	Job security, promotion, rewards and compensation
	Perceived fit	Person-organization fit
General marketing manager	Corporate branding	Image and prestige, advertisement and public relations
	Organizational characteristics	Safety image and reputation
Head of operations department	Organizational characteristics	Work environment
	Job characteristics	Type of work
Head of cabin services	Job characteristics	Training, empowerment
	Perceived fit	Person-job fit
Marketing and business development director	Corporate branding	Positioning, value proposition
	Organizational characteristics	Safety image and reputation

Senior HR executive officer	Job characteristics	Job security, promotion, rewards and compensation
	Perceived fit	Person-organisation fit
Head of the training department	Job characteristics	Training, empowerment
Head of business and policy development unit	Corporate social responsibility	Human rights, environmental issues
International affairs director	Corporate branding	Positioning, advertisement and public relations
	Corporate social responsibility	Diversity management
Executive research and development officer	Job characteristics	Type of work, innovation aspects
	Corporate social responsibility	Environmental issues

Table 4. Results of FDM

Criteria	Aggregated TFNs	Defuzzified weights	Condition
Safety image and reputation	(0.5,0.856,1)	0.785	Accepted
Size	(0.5,0.856,1)	0.785	Accepted
Work environment	(0.5,0.856,1)	0.785	Accepted
Location and geographical dispersion	(0.5,0.831,1)	0.777	*Rejected*
Training	(0.5,0.874,1)	0.791	Accepted
Empowerment	(0.5,0.856,1)	0.785	Accepted
Rewards and compensation	(0.5,0.856,1)	0.785	Accepted
Pay	(0.5,0.856,1)	0.785	Accepted
Job security	(0.5,0.856,1)	0.785	Accepted
Promotion	(0.5,0.856,1)	0.785	Accepted
Type of work	(0.5,0.856,1)	0.785	Accepted
Person-job fit	(0.5,0.856,1)	0.785	Accepted
Person-organisation fit	(0.5,0.856,1)	0.785	Accepted
Human rights	(0.5,0.856,1)	0.785	Accepted
Philanthropy	(0.5,0.856,1)	0.785	Accepted
Environmental issues	(0.5,0.856,1)	0.785	Accepted
Employee relations	(0.5,0.856,1)	0.785	Accepted
Diversity management	(0.5,0.856,1)	0.785	Accepted
Image and prestige	(0.5,0.856,1)	0.785	Accepted
Positioning	(0.5,0.856,1)	0.785	Accepted
Value proposition	(0.5,0.856,1)	0.785	Accepted
Advertisement and public relations	(0.5,0.856,1)	0.785	Accepted
Threshold	**(0.5,0.856,1)**	**0.785**	

Table 5. Global weight calculation

Criteria	Sub-criteria	Local weights	Global weights

OC (0.225)	Safety image and reputation	**0.553**	**0.124**
	Size	0.188	0.042
	Work environment	0.258	**0.058**
JC **(0.263)**	Training	0.099	0.026
	Empowerment	0.112	0.029
	Rewards and compensation	0.127	0.033
	Pay	**0.182**	0.048
	Job security	0.174	0.046
	Promotion	0.153	0.040
	Type of work	0.150	0.039
Perceived fit (0.235)	Person-job fit	**0.734**	**0.172**
	Person-organisation fit	0.266	**0.063**
CSR (0.155)	Human rights	0.112	0.017
	Philanthropy	0.119	0.018
	Environmental issues	0.249	0.039
	Employee relations	**0.263**	0.041
	Diversity management	0.255	0.040
Corporate branding (0.122)	Image and prestige	0.262	0.032
	Positioning	0.244	0.030
	Value proposition	**0.317**	0.039
	Advertisement and public relations	0.177	0.022

Figure

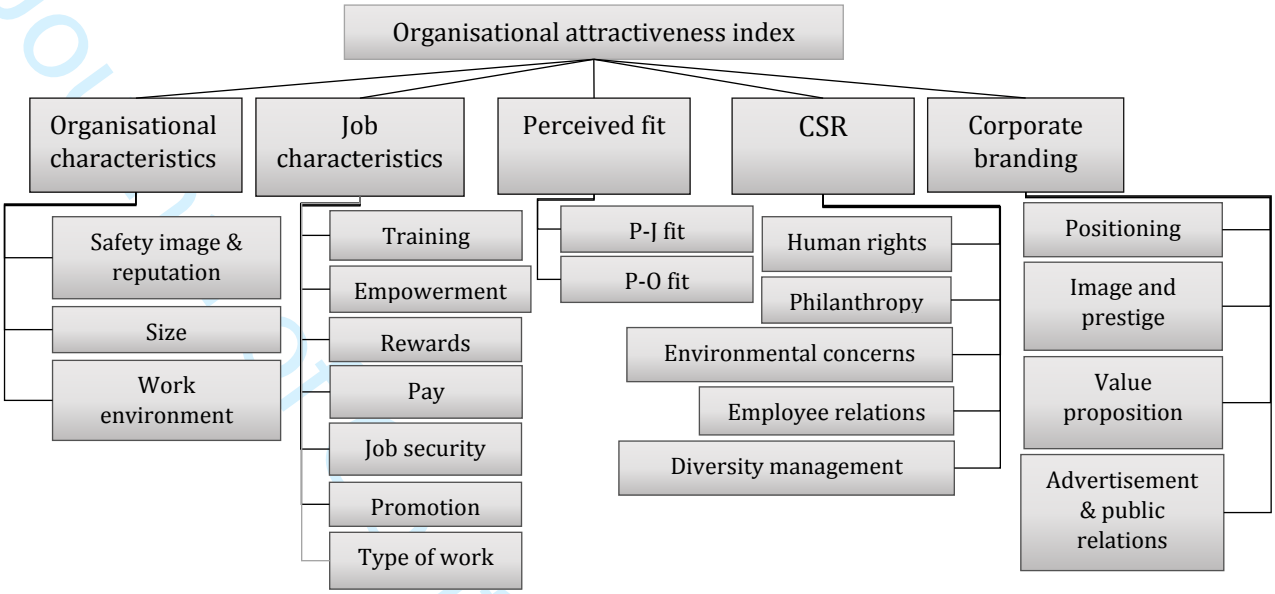

Figure 1. Graphical representation of the hierarchy of evaluation index

Appendices

Appendix 1: Triangular fuzzy numbers

Triangular fuzzy numbers (TFN) are a type of fuzzy numbers described as follows.

$\tilde{M}$ is used to show a TFN:

$\tilde{M} = (l, m, u)$

The symbol "~" is used to denote a fuzzy set, and l, m, and u are the parameters used to indicate the lowest possible value, the most promising value, and the largest possible value, respectively. Triangular membership function for $\tilde{M}$ can be obtained using equation 1:

$$\mu_{\tilde{M}}(x) = \begin{cases} 0, & x < l \\ \frac{x-l}{m-l}, & l \le x \le m \\ \frac{u-x}{u-m}, & m \le x \le u \\ 0, & x > u \end{cases} \qquad \text{(eq. 1)}$$

Fuzzy operational laws guide the calculation of TFNs as follows. Considering $\tilde{M}_1 = (l_1, m_1, u_1)$ and $\tilde{M}_2 = (l_2, m_2, u_2)$, then:

Addition ($\oplus$) is calculated as: $(l_1 + l_2, m_1 + m_2, u_1 - u_2)$

Subtraction of a TFN $\ominus$ is calculated as: $(l_1 - u_2, m_1 - m_2, u_1 - l_2)$

Multiplication ($\odot$) is calculated as: $(l_1 \times l_2, m_1 \times m_2, u_1 \times u_2)$

Division ($\oslash$) is calculated as: $(l_1, m_1, u_1)^{-1} = \left(\frac{1}{u_1}, \frac{1}{m_1}, \frac{1}{l_1}\right)$

Appendix 2: Geometric mean model

According to Ma *et al.* (2011), the geometric mean model can be captured using the following equation:

If $\tilde{a}_{ij}$ is a fuzzy number that represents the significance of *i*th criteria by *j*th expert, then: $\tilde{a}_{ij}= (a_{ij}, b_{ij}, c_{ij})$ for *i*=1,2,3,. . ..*n*; *j*=1,2,3,..., *m*.

The fuzzy weights of criteria shown as $\tilde{a}_j = (a_j, b_j, c_j)$, can be obtained as follows:

a_j=min $\{a_{ij}\}$ $b_j=(\prod_{i=1}^{n} b_{ij})^{1/n}$ c_j=max $\{c_{ij}\}$ (eq. 2)

Appendix 3: Extent analysis

Extent analysis (Chang, 1992) initiates the weight estimation by calculating the value of fuzzy synthetic extent. If X= $\{x_1, x_2, ..., x_n\}$ is the object set and U = $(u_1, u_2, ..., u_m)$ is the goal set, there can be *m* extent analysis values for each object as follows:

$U_{gi}^{1}, U_{gi}^{2}, \ldots, U_{gi}^{m}$, $i = 1, 2, \ldots, n$

Using TFNs for the U_{gi}^{j} with $j = 1, 2, \ldots, m$, the value of fuzzy synthetic extent of the i_{th} object for "m" goals can be calculated using equation 3:

$$S_i = \sum_{j=1}^{m} U_{gi}^{j} \otimes \left[\sum_{i=1}^{n} \sum_{j=1}^{m} U_{gi}^{j}\right]^{-1} \quad \text{(eq. 3)}$$

According to Chang (1996), obtaining a weight vector for each criterion is associated with the principles of comparison for fuzzy numbers. Chang (1996) suggests the degree of possibility of one TFN being greater than the other TFN (i.e., $S_i = (l_i, m_i, u_i) \geq S_k = (l_k, m_k, u_k)$) should be calculated using equation 4 and expressed using equation 5:

$$V(S_i \geq S_k) = sup_{y \geq x} \left[(\mu_{S_i}(x), \mu_{S_k}(x))\right] \quad \text{(eq. 4)}$$

$$V(S_i \geq S_k) = \mu_{Si}(d) =$$

$$\begin{Bmatrix} 1, & if\ m_2 \geq m_1 \\ 0, & if\ l_1 \geq u_2, \\ \frac{l_1 - u_2}{(m_2 - u_2) - (m_1 - l_1)}, & otherwise \end{Bmatrix} \quad \text{(eq. 5)}$$

The possibility degree for a convex fuzzy number to be greater than *k* convex fuzzy numbers S_i with $i = 1, 2, \ldots, k$ can be obtained using equation 6:

$$V(S \geq S_1, S_2, \ldots, S_k) \quad \text{(eq. 6)}$$

$$= V[(S \geq S_1) and\ (S \geq S_2) and ... and\ (S \geq S_k)]$$

$$= \min V(S \geq S_i), i = 1, 2, 3, \ldots, k$$

Assuming $d'(A_i) = \min V(S_i \geq S_k)$, for $k = 1,2,\ldots,n;\ k \neq i$, then the weight vector is given by equation 7:

$$w' = (d'(A_1), d'(A_2), \ldots, d'(A_n))' \quad \text{(eq. 7)}$$

The weight vector calculated using equation 7 represents fuzzy weights. Via normalisation (equation 8), normalised weight vectors with "W" as a non-fuzzy number (equation 9) can be achieved:

$$w_i = \frac{w'_i}{\sum w'_i} \quad \text{(eq. 8)}$$

$$w = = ((d(A_1), d(A_2), \dots, d(A_n)) \quad \text{(eq. 9)}$$

Appendix 4: Fuzzy Delphi study-Sample questionnaire

Airline Industry Organizational Attractiveness Survey

((By completing this questionnaire, you agree to participate in the data collection))

Dear Respondent,

We are conducting a study aimed at identifying key factors that contribute to the attractiveness of airlines as employers. This survey seeks to understand the optimal configuration of attributes that make airlines appealing workplaces from an organizational perspective.

The goal of this survey is to gather insights on the relative importance of various factors and sub-factors that influence the desirability of airlines as employers for both current and prospective employees. Your expert opinions will help shape a better understanding of what makes an airline a preferred employer in the industry.

Please be assured that all information collected during this research will be kept confidential and used solely for academic purposes. Your participation in this survey is entirely voluntary. You are free to withdraw at any point during the survey without any consequences. There are no right or wrong answers; we value your honest and professional insights.

Should you have any questions or require further clarification about this research, please do not hesitate to contact **********

You will find a table below listing various criteria and sub-criteria. Please evaluate each according to its importance in contributing to the attractiveness of the airline industry. We deeply appreciate your time and input into this significant study. Your responses are invaluable to us.

Thank you for your participation.

Instructions: Please use the following 7-point scale to indicate the importance of each criterion to be added to the list of all criteria. Use the value number ranging from 1 to 7 in front of each criterion in the table.

1) Very low (The importance of the criterion to be included in the list is very low)
2) Low (The importance of the criterion to be included in the list is low)
3) Medium-low (The importance of the criterion to be included in the list is medium-low)
4) Medium (The importance of the criterion to be included in the list is medium)
5) Medium-high (The importance of the criterion to be included in the list is medium-high)
6) High (The importance of the criterion to be included in the list is high)
7) Very high (The importance of the criterion to be included in the list is very high)

Please assess each of the following criteria based on your professional judgment and experience.

Criteria	Value
Safety image and reputation	
Size	
Work environment	

Location and geographical dispersion	
Training	
Empowerment	
Rewards and compensation	
Pay	
Job security	
Promotion	
Type of work	
Person-job fit	
Person-organisation fit	
Human rights	
Philanthropy	
Environmental issues	
Employee relations	
Diversity management	
Image and prestige	
Positioning	
Value proposition	
Advertisement and public relations	

Appendix 5: Fuzzy AHP-Sample questionnaire

Airline Industry Organizational Attractiveness Survey

((By completing this questionnaire, you agree to participate in the data collection))

Dear Respondent,

We are conducting a study aimed at identifying key factors that contribute to the attractiveness of airlines as employers. This survey seeks to understand the optimal configuration of attributes that make airlines appealing workplaces from an organizational perspective.

The goal of this survey is to gather insights on the relative importance of various factors and sub-factors that influence the desirability of airlines as employers for both current and prospective employees. Your expert opinions will help shape a better understanding of what makes an airline a preferred employer in the industry.

Please be assured that all information collected during this research will be kept confidential and used solely for academic purposes. Your participation in this survey is entirely voluntary. You are free to withdraw at any point during the survey without any consequences. There are no right or wrong answers; we value your honest and professional insights.

Should you have any questions or require further clarification about this research, please do not hesitate to contact **********

You will find a table below listing various criteria and sub-criteria. Please evaluate each according to its importance in contributing to the attractiveness of the airline industry. We deeply appreciate your time and input into this significant study. Your responses are invaluable to us.

Thank you for your participation.

Table 1. List of criteria used in the study

Criteria	Sub-criteria
Organisational Attractiveness	Safety image and reputation
	Size
	Work environment
Job Characteristics	Training
	Empowerment
	Rewards and compensation
	Pay
	Job security
	Promotion
	Type of work
Perceived fit	Person-job fit
	Person-organisation fit
Corporate Social Responsibility	Human rights
	Philanthropy

	Environmental issues
	Employee relations
	Diversity management
Corporate branding	Image and prestige
	Positioning
	Value proposition
	Advertisement and public relations

Section I.

Please use the following 5-point scale to indicate the relative importance of each criteria and sub-criteria outlined in the table 1. Please assess each of the following criteria based on your professional judgment and experience.

values	Linguistic values	Explanation
1	Just equal	Two element contribute equally to the objective
3	Moderately more important	Experience and judgment slightly favor one element over another
5	Strongly more important	Experience and judgment strongly favor one element over another
7	Very strongly more important	One element is favored very strongly over another
9	Absolutely more important	The evidence favoring one element over another is of the highest possible order of affirmation
2,4,6,8	Intermediate values	Can be used to express intermediate values such that intensity of 2 corresponds to an element more favored than 1 and less favored than 3.

Hint: comparing criterion A with criterion B, if they share the same importance please choose 1. If the criterion on the right possessed more importance, please choose the relative score on the right side and vice versa.

Criteria	Priorities																	Criteria
A	9	8	7	6	5	4	3	2	1	2	3 √	4	5	6	7	8	9	B
A	9	8	7	6	5	4 √	3	2	1	2	3	4	5	6	7	8	9	C
B	9	8	7	6	5	4	3	2	1	2	3	4	5	6 √	7	8	9	C

Section II: Main criteria evaluation

1. Organizational characteristics
2. Job characteristics
3. Perceived fit
4. Corporate social responsibility
5. Branding

Criteria	Priorities																	Criteria
Organizational characteristics	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Job characteristics
Organizational characteristics	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Perceived fit
Organizational characteristics	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Corporate social responsibility
Organizational characteristics	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Branding
Job characteristics	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Perceived fit
Job characteristics	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Corporate social responsibility
Job characteristics	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Branding
Perceived fit	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Corporate social responsibility
Perceived fit	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Branding
Corporate social responsibility	9	8	7	6	5	4	3	2	1	2	3	4	5	6	7	8	9	Branding

Appendix 6: Results of pairwise comparisons

Table 1. Pair-wise comparison among main criteria

	OC(A)	JC(B)	Perceived fit(C)	CSR(D)	Corporate branding(E)	Weights
A	(1.00,1.00,1.00)	(0.52,0.68,0.92)	(0.80,1.00,1.25)	(1.09,1.54,2.05)	(1.04,1.42,1.87)	0.225
B	(1.09,1.47,1.91)	(1.00,1.00,1.00)	(0.60,0.73,0.92)	(0.98,1.35,1.81)	(1.33,1.90,2.50)	***0.263***
C	(0.80,1.00,1.25)	(1.09,1.36,1.67)	(1.00,1.00,1.00)	(0.69,0.86,1.07)	(1.30,1.67,2.09)	0.235
D	(0.49,0.65,0.92)	(0.55,0.74,1.02)	(0.93,1.16,1.46)	(1.00,1.00,1.00)	(0.66,0.89,1.16)	0.155
E	(0.54,0.70,0.96)	(0.40,0.53,0.75)	(0.48,0.60,0.77)	(0.86,1.12,1.51)	(1.00,1.00,1.00)	0.122

**CRm=0.02; CRg=0.07*

Table 2. Pair-wise comparison among OC sub-criteria

	Safety image & reputation(A_1)	Size(A_2)	Work environment(A_3)	Weights
A_1	(1.00,1.00,1.00)	(1.01,1.42,1.93)	(1.42,1.98,2.58)	**0.553**
A_2	(0.52,0.70,0.99)	(1.00,1.00,1.00)	(0.58,0.79,1.07)	0.188
A_3	(0.39,0.50,0.70)	(0.93,1.27,1.71)	(1.00,1.00,1.00)	0.258

* *CRm=0.03; CRg=0.09*

Table 3. Pair-wise comparison among JC sub-criteria

	Training(B_1)	Empowerment(B_2)	Rewards(B_3)	Pay(B_4)	Job security(B_5)	Promotion(B_6)	Type of work(B_7)	Weights
B_1	(1.00,1.00,1.00)	(1.04,1.42,1.87)	(0.43,0.58,0.86)	(0.49,0.62,0.86)	(0.35,0.45,0.64)	(0.53,0.69,0.93)	(0.67,0.96,1.38)	0.099
B_2	(0.54,0.70,0.96)	(1.00,1.00,1.00)	(0.75,1.07,1.51)	(0.40,0.53,0.72)	(0.54,0.74,1.03)	(0.54,0.73,1.03)	(0.96,1.39,1.91)	0.112
B_3	(1.17,1.70,2.33)	(0.66,0.93,1.32)	(1.00,1.00,1.00)	(0.46,0.60,0.82)	(0.38,0.50,0.75)	(0.90,1.22,1.60)	(0.55,0.73,1.03)	0.127
B_4	(1.16,1.60,2.03)	(1.39,1.90,2.47)	(1.22,1.66,2.15)	(1.00,1.00,1.00)	(0.93,1.27,1.71)	(0.87,1.08,1.37)	(0.64,0.86,1.20)	**0.182**
B_5	(1.57,2.20,2.87)	(0.97,1.35,1.87)	(1.33,1.99,2.66)	(0.58,0.79,1.07)	(1.00,1.00,1.00)	(0.70,0.97,1.35)	(0.44,0.60,0.86)	0.174
B_6	(1.07,1.40,1.89)	(0.97,1.36,1.87)	(0.63,0.82,1.11)	(0.73,0.93,1.15)	(0.74,1.03,1.44)	(1.00,1.00,1.00)	(0.97,1.33,1.77)	0.153
B_7	(0.72,1.00,1.48)	(0.52,0.72,1.04)	(0.97,1.36,1.81)	(0.83,1.17,1.57)	(1.17,1.66,2.25)	(0.57,0.75,1.03)	(1.00,1.00,1.00)	0.150

CRm: 0.03; CRg: 0.09

Table 4. Pair-wise comparison among perceived fit sub-criteria

	P-J fit (C_1)	P-O fit (C_2)	Weights
C_1	(1.00,1.00,1.00)	(1.09,1.59,2.18)	**0.734**
C_2	(0.46,0.63,0.92)	(1.00,1.00,1.00)	0.266

Table 5. Pair-wise comparison among CSR sub-criteria

	Human rights (D_1)	Philanthropy (D_2)	Environmental concerns (D_3)	Employee relations (D_4)	Diversity management (D_5)	Weights
D_1	(1.00,1.00,1.00)	(0.67,0.88,1.17)	(0.38,0.51,0.74)	(0.39,0.50,0.70)	(0.58,0.82,1.20)	0.112
D_2	(0.86,1.14,1.48)	(1.00,1.00,1.00)	(0.43,0.58,0.82)	(0.50,0.66,0.95)	(0.35,0.46,0.66)	0.119
D_3	(1.35,1.95,2.61)	(1.22,1.72,2.31)	(1.00,1.00,1.00)	(0.57,0.81,1.14)	(0.66,0.89,1.20)	0.249
D_4	(1.42,1.98,2.58)	(1.05,1.51,2.00)	(0.88,1.24,1.77)	(1.00,1.00,1.00)	(0.75,1.00,1.34)	**0.263**
D_5	(0.83,1.22,1.73)	(1.53,2.17,2.83)	(0.83,1.12,1.51)	(0.75,1.00,1.34)	(1.00,1.00,1.00)	0.255

**CRm: 0.01; CRg: 0.03*

Table 6. Pair-wise comparison among corporate branding sub-criteria

	Positioning (E_1)	Image and prestige(E_2)	Value proposition(E_3)	Advertisement and PR(E_4)	Weights
E_1	(1.00,1.00,1.00)	(0.73,0.97,1.28)	(0.45,0.65,0.96)	(1.17,1.66,2.25)	0.262
E_2	(0.78,1.03,1.36)	(1.00,1.00,1.00)	(0.48,0.66,0.94)	(0.94,1.36,1.87)	0.244

E_3	(1.04,1.54,2.21)	(1.06,1.51,2.09)	(1.00,1.00,1.00)	(0.77,1.09,1.48)	**0.317**
E_4	(0.44,0.60,0.86)	(0.54,0.73,1.06)	(0.670.92,1.29)	(1.00,1.00,1.00)	0.177

** CRm: 0.03; CRg: 0.09*

Appendix 7: Value of fuzzy synthetic extent calculation

The value of fuzzy synthetic extent for designated criteria with response to the goal:

SA = (4.456, 5.640, 7.083) ⊗ (132.847, 126.384, 121.243) = (0.135,0.213,0.333)
SB= (5.002, 6.458, 8.143) ⊗ (132.847, 126.384, 121.243) = (0.152,0.244,0.383)
SC= (4.873,5.892,7.077) ⊗ (132.847, 126.384, 121.243) = (0.148,0.223,0.333)
SD= (3.636,4.443,5.553) ⊗ (132.847, 126.384, 121.243) = (0.110,0.168,0.261)
SE= (3.274,3.949,4.989) ⊗ (132.847, 126.384, 121.243) = (0.099,0.149,0.234)