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Talent identification for revolutionizing human resource management in Saudi Arabia's logistics industry

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Abstract: The logistics industry in Saudi Arabia has seen a significant change, with national companies now focusing on hiring local talent to decrease their dependence on expatriates. Despite the increased demand for Saudization, logistics firms face difficulties in matching available local talent with industry-specific job requirements. This gap highlights the importance of connecting human resource development (HRD) with talent identification and assessment (TIA) practices. Study uses the DEMATEL technique to analyse the important factors that impact the effectiveness of Human Resources (HR) Departments in logistics firms in Saudi Arabia. A total of nineteen HR professionals from the logistics sector in the country took part in the study, offering evaluations on a Likert scale that ranged from 0 to 4 for each criterion. The research shows that the level of education has a strong impact on the potential and future development of job candidates in Saudi Arabia's logistics companies. Academic qualification, along with skills and competencies, greatly influences the evaluation of candidates. The criteria have influence values of 0.30559487, 0.007953708, and 0.628534572, respectively. In addition, the criterion of "Potential and Future Development" stands out as a significant factor that influences all others, except for "Skills and Competencies," with values exceeding the threshold of 0.926061035. Results highlight the importance of HR professionals prioritising cause criteria when selecting candidates and managing HR processes. By understanding and tackling these important factors, logistics companies can improve their methods of identifying and evaluating talent, ultimately boosting their organisational effectiveness and competitiveness in Saudi Arabia's ever-changing logistics industry.

1 Introduction

The logistics sector is considered a crucial component in Saudi Arabia's efforts to diversify its economy away from oil-based revenues and towards a more service-oriented economy. Logistics plays a crucial role in driving economic development and adding significant value by enhancing the efficiency and effectiveness of storing, handling, and transporting goods. As a result, the methods of freight and transportation would be enhanced, leading to cost reductions. It has been established that administrative innovation stands as one of the primary logistical capabilities of Logistics Service Providers [1]. Human resources is one of the key aspect of any organization [2]. Effective management of human resources is vital for the success of logistics enterprises [3]. The Kingdom of Saudi Arabia (KSA) has faced numerous challenges in its efforts to meet the increasing demands in developing its human resources. Investing in human resource development (HRD) has been a priority to enhance the skills, knowledge, and attitude of the workforce. This investment is anticipated to improve the effectiveness and efficiency of services in both the public and private sectors. Choosing competent managers is crucial for successful human resources management in logistics companies [4]. Knowledge-based HRM practices have a significant impact on the performance of logistics firms, and this impact is further enhanced by the role of logistics capability as a mediator [5]. The evolution of human resources departments in international companies, such as Kuehne+Nagel, showcases the transition towards a more strategic and consultative approach in overseeing employee motivation and commitment [6]. Strategic organisational challenges greatly influence human resources planning in SME logistics companies, underscoring the need to tackle these challenges for efficient management [7]. In the logistics industry, it is crucial to have efficient human resources management in order to retain talent, improve organisational performance, and stay competitive.

The primary objective of the Ministry of Transport and Logistics Services in Saudi Arabia is to improve the Kingdom's transport infrastructure with the aim of establishing it as a pivotal logistics centre that connects three continents. This endeavour is in accordance with the overall objectives of supporting sustainable economic development and enhancing competitiveness in keeping with the Saudi Vision 2030 programme. Saudi Arabia's advantageous geographical location, connecting three continents, makes it a crucial hub for global trade, enhanced by its plentiful natural resources. The National Industrial Development and Logistics Programme (NIDLP) takes the lead in promoting the growth of important sectors like mining, energy, industry, and logistics [8]. The rapid development has led to an increase in benefit categorization and a high demand for skilled professionals due to a shortage in the workforce [9]. Effective ability management is crucial for a business as it provides a significant competitive advantage. Effective

management of talent is crucial for a company's success and can lead to significant profits. Identification and evaluation of skills play a crucial role in developing a talented workforce [10]. However, there is a lack of literature addressing the specific circumstances in the Saudi Arabia regarding talent management of Logistic industries. It is estimated that the market size for the Saudi Arabia Freight and Logistics sector will be roughly 25.33 billion US dollars in the year 2024, and it is anticipated that this market size will expand to 32.88 billion US dollars by the year 2029 [11].

This research established that among the crucial issue associated to "Talent Identification and Assessment" for revolutionizing human resource management in Logistics Industry of Saudi Arabia, lies with the Streamlining and improving talent identification processes, that is how can Saudi Arabia's logistics industry can meet the goals of the NIDLP by successfully identifying and recruiting individuals with the right set of skills to fuel the expansion and efficacy of logistics services in the Kingdom. Another important research question that arises from the current study is whether there is a shortage of skilled workers in Saudi Arabia's logistics sector, specifically in key areas such as warehousing and storage, freight forwarding, freight transportation, and courier, express, and package services [12]. Finally, this research also delves into the challenges concern associated with assessing the effectiveness of human resource management techniques in logistics enterprises based in Saudi Arabia. This requires comprehending how these organisations are successfully attracting, keeping, and cultivating people through the use of diverse human resource management strategies and practices. Essentially, the main focus is on improving these methods in line with the goals of Saudi Vision 2030, which aims to promote sustainable growth in the logistics sector. The main inquiry is: How can different approaches be improved to completely transform logistic industry human resource management, creating a work environment that promotes the retention of talented individuals, facilitates career advancement, and enhances overall employee contentment?

2 Literature review

Revolutionizing Human Resource Management in Saudi Arabia's logistics industry involves talent identification and assessment to enhance organizational performance. Talent management practices in Saudi Arabian oil and gas organizations have highlighted the need for formal approaches in identifying talent and providing development opportunities [13]. Implementing logistics hubs (LHs) strategically can significantly impact Saudi Arabia's Logistics Performance Index (LPI) ranking, demonstrating the positive correlation between investing in logistics infrastructure and LPI ranking improvement [14]. Human Resource Management (HRM) practices in the Saudi Arabian manufacturing sector influence employee behavioral outcomes during organizational change, emphasizing the importance of organizational commitment, job performance, and employee productivity [15]. Additionally, developing e-recruitment support systems can streamline candidate selection processes, ensuring the best-fit individuals are identified for roles in the logistics industry [16].

Samarin et al. [17] explores the Saudi National Human Resources Development (NHRD) and provides viable solutions to improve NHRD within the context of a knowledge-based economy. The paper thoroughly analyses the complex interconnections between the political, economic, and socio-cultural aspects of the NHRD context. The challenges faced by different parts of the developing workforce, such as unemployed, women, and students, are thoroughly examined.

Iqbal [18] evaluates the influence of enhancing logistics on the factors of service quality (SQ) for Small and Medium Enterprises (SMEs) in Saudi Arabia. The study employed a quantitative methodology to investigate multiple industries and cities in Saudi Arabia, including Jeddah, Khobar, Dammam, and Riyadh. The study revealed three critical challenges faced by Saudi SMEs in the field of logistics: the availability of skilled logistics staff, effective inventory management, and the high costs associated with adopting advanced technologies. These factors were found to have a substantial impact on the overall improvement of logistics in these dimensions.

Alruwaili et al. [19] examine the effects of incorporating Human Resources (HR) best practices in the recruiting process of Saudi nationals, particularly those who have graduated from prestigious US and British colleges, on the performance indicators of Ma'aden Company. The performance dimensions being examined consist of technological skill, fluency in the English language, and the ability to adapt to globalisation. The study specifically examines a group of highly educated individuals who have obtained their degrees from colleges in the United States or the United Kingdom and are currently employed at Ma'aden Company. The report highlights the importance of Saudi graduates from renowned international universities in shaping human resource practices at Ma'aden Company. Moreover, it sheds light on their contribution to improving the company's performance in technological control, English proficiency, and adaption to global dynamics.

It is worth noting that there is a significant lack of research on talent management in Saudi Arabia and the wider Arab world, especially in GCC countries. That is why the Jamjoom [20] utilises quantitative analysis of survey data collected from experts and professionals across various sectors in Jeddah, KSA. The study's findings indicate that talent management practices are indeed implemented by organisations in KSA. It is worth noting that the study reveals no clear connection between the size or type of organisation and employee engagement in talent management practices. In addition, it indicates that there is no notable difference in talent identification and recruitment, whether it is during times of crisis or not. However, there is a noticeable difference in talent

development and retention between these periods. According to Aleisa et al [21], recruiters use candidate data to create metrics that help them choose the right candidates, while job seekers develop their own metrics to assess job offers and find the best opportunities. This paper explores how AI techniques can improve the Saudi labour market by connecting recruiters and job seekers. Based on the study's findings, it is clear that the proposed approach and technology have the ability to greatly assist the Saudi government in making well-informed and timely decisions. By providing a thorough understanding of the labour market dynamics, these tools offer valuable insights that can be used strategically.

Bahamdain et al. [22] examined private and public logistics customer satisfaction in Saudi Arabia during the COVID-19 epidemic. It was revealed that logistics service efficiency and quality recommendations. HR and IT managers collaborated to complete surveys, offering insights on the current status of HR systems in Saudi Arabia [23]. The results highlighted the preparedness of the Saudi market to embrace and execute novel strategies. Nevertheless, the levels of satisfaction with the existing solutions were comparatively low, which called for rapid remedial measures. Significantly, advancing, especially in adopting the SaaS model, is crucial to enhance firms' competitive edge and move them towards a more successful future.

Alotaibi [24] examined the ways in which e-commerce stores modified their business strategy to accommodate the needs of e-fulfilment clients. Furthermore, the current logistics model and the environmental responsibility associated with it will be examined. In addition, Saudi Arabia has recognised the significance of the environment in accordance with their vision for 2030. Transport has been increasingly crucial in recent years due to the rapid growth of e-commerce in the Saudi market. This has led to the need for further exploration of green logistics. In their study, Darwish et al. [25] analysed data from 157 multinational enterprises (MNEs) operating in Saudi Arabia. They discovered a strong correlation between the localization of the human resource management (HRM) function and the indigenization of the workforce. The study identified key factors that contribute to workforce localization, such as recruitment and training practices that are tailored to the needs of local employees. In their study, Alshammari [26] examines the role of knowledge management in mediating the relationship between organisational performance (OP) and human resource management (HRM) practices. The study revealed a substantial impact of HRM practices on knowledge management capacities, organisational culture, organisational performance, and organisational learning in Saudi Arabia. Almatter [27] assesses the influence of human resource management (HRM) techniques on the performance of organisations in the Kingdom of Saudi Arabia. The study aims to elucidate the primary concepts of HRM strategies and organisational performance by integrating perspectives from experts and professionals through a comprehensive examination.

This study focuses on addressing the research gap related to the effective implementation of human resource management (HRM) methods in the logistics business in Saudi Arabia. While numerous studies have explored different aspects of HRM strategies and their impact on overall organisational success, there is a clear lack of research specifically focusing on the unique challenges and opportunities within the logistics industry.

3 Conceptual framework

This research was conducted with a focus on the resource-based view (RBV) of the firm. The Resource-Based View (RBV) is a theoretical framework that aims to clarify and forecast the reasons behind organisations' ability to attain competitive advantage and thus achieve higher profits [28]. This idea conceptualises a firm as a collection of resources that generate capabilities, which can potentially serve as a strong source of competitive advantage. It also posits that company success is primarily determined by resources that possess the qualities of value, rarity, and high imitation costs [29]. Understanding the RBV theory is crucial for recognising the significance of internal resources such as human capital, knowledge resources, and leadership. These factors play a vital role in shaping competitive strategies and ultimately achieving sustainable competitive advantages. Through the effective utilisation of internal resources, companies can strengthen their market position, performance, and long-term sustainability in ever-changing business landscapes [30]. Some of the key variables establish from the theory include: "Human Capital", "Knowledge Resources", "Leaderships", "Competitive Strategies", Competitive Advantages" (see Figure 1).

Figure 1 The RBV theoritical framework

The "Knowledge resources" include the valuable knowledge and assets that an organisation possesses, such as intellectual property, patents, proprietary technologies, and organisational know-how. The "Leadership" is a crucial internal resource that has a significant impact on shaping organisational culture, strategy formulation, and execution. The human capital is the variable that this research explores and contributes towards its application, which dwell on the people who work and their collective talents, expertise, knowledge, and experience. The "competitive strategies" is sometimes called "Strategic Alignment", and it highlights the importance of aligning internal resources and capabilities with market opportunities and competitive dynamics to gain a competitive advantage. Hence, according to RBV theory, competitive advantages arise from having resources and capabilities that are valuable, rare, inimitable, and non-substitutable [28]. Companies that effectively utilise their internal resources to meet customer demands, outperform rivals, and achieve strong financial results can gain long-lasting competitive advantages. RBV underscores the ever-changing nature of competitive advantages, stressing the importance of ongoing investment in resource development, innovation, and strategic adaptation to stay competitive in evolving markets.

RBV theory acknowledges the importance of human capital as a vital internal resource that enhances a firm's competitive advantage. Human capital encompasses the various skills, knowledge, experience, and capabilities that individuals bring to an organisation. RBV highlights the significance of investing in human capital through recruitment, training, and talent development initiatives. Understanding how to effectively utilise human capital can significantly boost a company's competitive edge by promoting innovation, creativity, and productivity within the workforce. From the RBV, this study conceptualized "Human Capital" to dwell on "High-performance human resources" which are an extremely valuable logistic industry asset and are extracted from the "talent pool" consists of a select group of "highly skilled and valuable employees" (see Figure 2). The main argument of the study is that by effectively identifying and placing talented individuals in positions that align with their skills, an organisation can establish itself as a formidable force in the market.

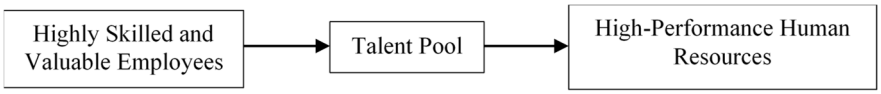

Figure 2 The RBV theoritical approach towards human capital framework

However, it is important to consider the effectiveness of talent identification practices being used in Saudi Arabia in locating the right people. Are they effectively evaluating their talent using appropriate methods? What are the noticeable differences in job performance between employees who undergo assessments and those who do not? These questions have not received much attention, so they were the primary focus of this research. As a result, this study aimed to analyse the talent identification and assessment practices in the logistics industry of Saudi Arabia.

The talent pool from the RBV theoretical approach towards human capital framework presented in Figure 2, has been conceptual in this study to be derived from "highly skilled and valuable employees", this is further conceptualized to be associate to the following: "Academic Qualification", "Skills and Competencies", "Experience and Track Records", "Cultural Fit" and "Potential and Future Development" (See Figure 3).

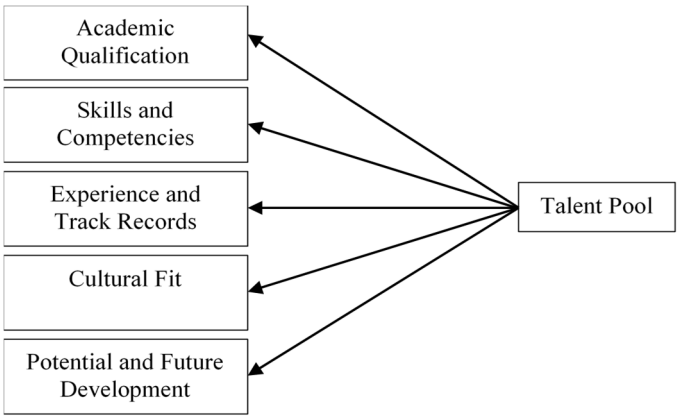

Figure 3 The proposed conceptual framework

3.1 Academic qualification

Academic qualification is operationally defined by this study to refers to the educational credentials obtained by an individual in the logistics industry, such as degrees, diplomas, certifications, and professional qualifications from accredited institutions. This criterion evaluates the extent of academic achievement and expertise in areas such as logistics management, supply chain management, transportation, and related fields. The justification of using this variable lies with the fact that, having a strong academic background is crucial for excelling in the field of logistics. It requires a diverse range of skills and competencies that are essential for achieving success in this profession. These skills encompass critical thinking, the ability to solve problems, strong interpersonal skills, creativity, the ability to work well in teams, effective management abilities, and a global mind-set. With the rise of technology and global collaboration, the logistics industry has experienced a significant change. This has resulted in a greater need for knowledge and expertise, affecting both manual and office-based roles. Modern teaching methods and information and communication technologies are now essential in educational programmes in logistics to adequately equip students for the industry.

3.2 Skills and competencies

Skills and competencies in this study pertain to the specific abilities, proficiencies, and technical knowledge required to thrive in the logistics industry. This criterion evaluates a candidate's practical skills in various areas such as inventory management, transportation planning, warehousing operations, freight forwarding, route optimisation, as well as their soft skills including communication, problem-solving, teamwork, adaptability, and attention to detail.

It is important to consider this variable because logistic companies need employees who possess a wide range of skills and competencies to effectively handle the complexities brought about by globalisation. In order to excel in the ever-changing field of logistics, it is crucial to possess a range of skills including interdisciplinary knowledge, problem-solving abilities, and effective coping skills. Human resources are essential for the success of service firms, as they have a significant impact on service quality and costs. This is particularly true in maritime logistics, where human factors continue to be crucial despite the capital-intensive nature of operations [32]. Effective logistics skills is crucial for maintaining a competitive edge. It requires a team of highly skilled employees who can navigate complex processes and possess strong social and decision-making skills. These factors have a direct impact on employee retention and overall performance. In general, there is a noticeable trend in the logistics sector towards valuing specialised critical skills rather than traditional hierarchical roles. This shift highlights the importance of being adaptable and proficient in uncertain environments.

3.3 Experience and track records

Experience and track records is operationally defined in this study as the reflection of professional background, work history, and demonstrated achievements of an individual within the logistics sector. This criterion evaluates the extent and variety of hands-on experience in positions related to logistics operations, including logistics coordination, warehouse supervision, transportation management, customs clearance expertise, and procurement responsibilities. It involves evaluating the length of employment, range of duties, noteworthy achievements, and performance reviews.

The reason for using this variable lies with the fact that, the success and efficiency of a logistic company are intricately linked to its level of expertise, past performance, and effective management strategies. Having a strong background in partnership management, collaboration, and building relationships is crucial for achieving success in logistic partnerships [33]. In addition, the development of logistic operators and their integration into the economic system is essential for optimising logistics processes for companies, resulting in higher profitability and stability in the global market. In addition, the evaluation of logistic management in various countries, based on indicators such as customs, infrastructure, and timeliness, emphasises the significance of expertise and effective management practices in the logistics industry. Implementing tracking systems in logistics and transportation operations can greatly improve fleet optimisation, cost reduction, and asset utilisation while also enhancing driver safety, because the importance of track records in logistic operations cannot be overstated.

3.4 Cultural fit refers

Cultural fit is operationally defined as the compatibility with the company culture, can be measure by the extent where the compatibility between an individual's values, work style, and behavioural traits with the organisational culture in the logistics industry in Saudi Arabia. This criterion assesses how well a candidate aligns with the company culture, including factors like work ethic, collaboration, respect for hierarchy, adaptability to cultural nuances, and dedication to organisational goals and vision.

The justification of adopting this variable lies with the fact that the compatibility of corporate culture within logistic companies is a key factor in determining their success and performance [34]. Research suggests that the culture within an organisation has a significant impact on various aspects such as knowledge sharing, communication, decision-making, and interpersonal relationships among employees. In addition, the culture of a company, specifically the adhocracy and market orientation culture, has a positive effect on the innovation of firms in the logistics sector. Implementing effective innovation management practices is crucial in cultivating an innovative organisational culture within logistics companies. This fosters a stronger commitment to

innovation and the development of core organisational values. Thus, it is crucial for logistic companies to prioritise compatibility with the company culture in order to improve knowledge sharing, decision-making, innovativeness, and overall performance.

3.5 Potential and future development

The potential and future development of an individual within the logistics industry in Saudi Arabia in this study can be determined by their inherent capabilities, aptitudes, and growth prospects, which are influenced by the changing landscape of the industry. This criterion evaluates not just the present skills and competencies, but also the ability to learn, adapt to change, demonstrate leadership potential, and be prepared for future roles and responsibilities within the organisation. It entails recognising individuals with great potential for growth and investing in their professional development through training, mentoring, and opportunities for career advancement.

The justification of selecting this variable lies with the fact that the growth and advancement of a logistics organisation encompass multiple factors, including sustainable development, the provision of value-added services, and the incorporation of innovative ways in the market. Sustainable development involves achieving internal stability through the use of management techniques and ensuring external stability at the global, regional, and national levels [35]. The production of value-added services in logistics is essential for efficiently meeting client demands and growing the range of services provided, so contributing to the overall success of the firm. The development of logistics potential is influenced by various factors, such as the implementation of new technologies, the extensive utilisation of information systems, and the incorporation of environmental considerations to ensure sustainable business practices. Moreover, the use of cutting-edge logistical strategies, such as fourth-party logistics, can prompt changes in the geographical distribution of global production networks and improve service offerings by forming partnerships with multinational corporations.

4 Methodology

This study employs the Multi-criteria decision making (MCDM) technique, which is a methodical strategy utilised to assess and rank alternatives or courses of action in situations where many, frequently competing, criteria must be simultaneously taken into account. MCDM approaches are designed to assist decision-makers in choosing the most appropriate option from a group of possibilities, considering multiple criteria or objectives that may vary in priority or preference. MCDM provides a methodical and organised approach to handling intricate decision-making situations, allowing decision-makers to take into account many viewpoints, goals, and limitations in a clear and logical way. MCDM approaches facilitate organisations in making well-informed and resilient decisions that are in line with their aims and objectives by considering a wide range of criteria and preferences.

The justification of using this method for this study lies with the fact that "Experts" who have a deep understanding of the Saudi Arabian logistics industry can offer valuable insights into the specific skills, competencies, and attributes required for success. MCDM requires expert evalaution, with a deep understanding of the industry's changing dynamics. Similarly, professionals who possess a strong understanding of different cultures and are well-versed in the business practices of Saudi Arabia can skillfully evaluate compatibility of local culture and HRM operations. This is also associted to having a strong grasp of the intricacies of the logistics industry. The final justification lies wth the fact that Karahan et al. [4] established that "Multi-criteria decision-making methods" are commonly used for the manager selection problem, and that it why the study identified ten criteria for selecting a human resources manager in logistics companies and applied the intuitionistic fuzzy weighted averaging (IFWA) method for weighting criteria in order to determine the most important key criteria among them. The finding of the analysis revealed that the "experience criterion" was determined as the most important for selecting a logistics human resources manager. Furthermore, Decision-Making Trial and Evaluation Laboratory (DEMATEL) technique which belong to the MCDM is used to understand the influential characteristics of the challenges to Human Resource (HR) Practices in start-up companie.

4.1 DEMATEL process

The DEMATEL approach is a sophisticated analytical tool that is utilised in the process of decision-making to gain an understanding of the intricate correlations that exist between the many components. The ability to visualise the cause-and-effect linkages between various criteria or elements is beneficial to decision-makers because it enables them to discover significant drivers and dependencies within a system. DEMATEL is especially helpful in circumstances in which numerous criteria or variables interact with one another, making it difficult to establish the relative relevance or influence of each of these factors.

The purpose of the activity was to have experts evaluate the criteria by considering the different components of each criterion. These components were designed to empower the expatriate and give them more control over their personal experience. Experts assign a value to $\boldsymbol{x_{ij}}$to indicate the significance of each criterion's impact. The values are determined based on the cause and effect criteria, denoted by *i* and *j*. Therefore, an expert's response is obtained for each value of $n = 1,2,3\ldots, n$. This results in a non-negative $n \times n$ direct relation matrix, formed by equation (1):

$$\boldsymbol{x^y} = \left[\boldsymbol{x_{ij}^y}\right]_{n \times n} \quad (1)$$

The variable y denotes the number of representations for each expert, with a range of $\mathbf{1} \leq \boldsymbol{y} \leq q$. The equation generates a matrix q for x^1, x^2,… x^q where q is the total number of experts. Equation 2 presents the average aggregated decision matrix for all the expert Z=,$\left[\boldsymbol{z_{ij}}\right]$ (2).

$$\boldsymbol{Z_{ij}} = \frac{\mathbf{1}}{\boldsymbol{q}}\sum_{\boldsymbol{i=1}}^{\boldsymbol{q}} \boldsymbol{x_{ij}^{y}} \quad (2)$$

Step 2: Generating the normalised direct relation matrix: The matrix D, which represents the direct relations, is created using equation (3).

$$D = max\left(\max_{1\leq i\leq n}\sum_{j=1}^{n} z_{ij}, \max_{1\leq j\leq n}\sum_{i=1}^{n} z_{ij},\right) \quad (3)$$

Consequently, every individual cell within matrix Z will possess a value that lies within the numerical interval of 0 to 1.

Step 3: Generating the total relation matrix involves exponentiating the normalised initial direct-relation matrix D to the power of m, where m indicates the indirect impact D^m. The resulting matrix, denoted as T, shows the cumulative influence generated by the participant's response. The total relation matrix T may be obtained by summing up the direct-relation matrices $D+D^2+...+D^m$. As D^m converges to zero, we can conclude that T is identical to the initial direct-relation matrix D. Therefore, the total relation matrix T can be expressed as $T = D + D^2 + ... + D^\infty$, which can be further simplified as $T= D+D^2+…+D^\infty$ *is* $T=\boldsymbol{\lim_{m\to\infty}(D + D^2 + D^3 ... + D^m) = D(I - D)^{-1}}$. Therefore (4):

$$\boldsymbol{T = D(I - D)^{-1}} \quad (4)$$

where I represents an identity matrix with dimensions $n \times n$.

Developing the rows and columns of the matrix is the fourth step. The vectors that are used to represent the rows and columns that are included in the total relation matrix. If the vectors r and c, respectively, are used to represent the total of the rows of matrix T and the total of the columns of matrix T, then the following is true if the following is true (5):

$$\boldsymbol{r} = [\boldsymbol{r_i}]_{n\times 1}=\left[\sum_{j=1}^{n} \boldsymbol{t_{ij}}\right]_{n\times 1} \text{ and } \boldsymbol{c} = \left[\boldsymbol{c_j}\right]_{1\times n}=\left[\sum_{j=1}^{n} \boldsymbol{t_{ij}}\right]_{1\times n} \quad (5)$$

If j is equal to i, then the sum of r_i and c_j will represent the influence that criterion i has on j. If j is not equal to i, the sum will reveal the overall effects experienced by criterion i, while the difference will show the net impact that criterion i contributes to the system. Conversely, if the value is positive, criteria i functions as a primary cause, and if it is negative, it functions as a primary effect. If the difference between $\boldsymbol{r_j - c_j}$ is positive, then the criteria have a significant influence on the other criteria, and they can be classified as part of the cause group. Conversely, if the difference between $\boldsymbol{r_j - c_j}$ is negative, it indicates that the criteria in question are being influenced by the other criteria collectively and should be classified as the "effect." Hence, the sum of r and c is referred to as the "Prominence," whilst the difference between r and c is referred to as the "Relation."

Step 5: Establishing a threshold value (α) for the purpose of generating an interaction diagram. Equation 7 is derived to determine the threshold value for the impact connection (6).

$$\boldsymbol{\alpha} = \sum_{\boldsymbol{i=1}}^{\boldsymbol{n}}\sum_{\boldsymbol{j=1}}^{\boldsymbol{n}} \boldsymbol{t_{ij}/N} \quad (6)$$

The variable N represents the total number of matrix elements that will be obtained by calculating the average of the members of the matrix T. This calculation is done to identify and remove any impacts that are judged to be minor. This implies that the impact connections will not encompass any impacts that are less severe than the threshold value, as there will be none.

Step 6: Generating the relational diagram illustrating the causal relationship between factors and their effects: The results obtained from the calculations carried out in the previous steps will be used as the foundation for the relationship diagram. Therefore, the correlation between the cause and effect has been assigned to each of the coordinate sets that make up the full array of rows and columns. The rows and columns in this illustration depict the interactions between the criteria and provide valuable information for determining the relative importance of each criterion and how they interact with one another.

5 Analysis and presentation of the result

The DEMATEL technique was employed to investigate the key parameters influencing the effectiveness of competitive intelligence. To obtain the outcome of the analysis, the initial step is to code the criteria and input the data into an MS Excel sheet labelled "Academic Qualification" (AQ), "Skills and Competencies" (SC), "Experience and Track Records" (ET), "Cultural Fit" (CF), and "Potential and Future Development" (PF). Once the data collection process is over, this step marks the initial stage of collecting the analysis results. Hence, the viewpoints of the 19 specialists who took part in this study and shared their feedback on a Likert scale with whole number values ranging from 0 to 4, have been gathered and incorporated into an initial individual matrix. This matrix is presented in the form of an n×n non-negative direct relation matrix, as per equation 1. The presented matrix displays the mean total of decision matrices (Z) derived from the input of 19 experts from the Human Resources Department of logistics organisations in Saudi Arabia.

$$Z = \begin{bmatrix} 0 & 2 & 3 & 2 & 4 \\ 1 & 0 & 4 & 3 & 1 \\ 4 & 1 & 0 & 2 & 4 \\ 1 & 4 & 2 & 0 & 2 \\ 4 & 2 & 4 & 3 & 0 \end{bmatrix}$$

These experts have more than 10 years' record of evaluating logistic companies job-seeking candidates based on five criteria: (AQ, SC, ET, CF, and PF). The descriptive analysis of this total decision matrices suggest that the experts assessed the impact of "Academic Qualification" on itself as 0, indicating no direct influence., whereas, it has the greatest impact on "Potential and Future Development", as indicated by an average score of 4. This implies that experts firmly believe that a candidate's academic qualifications significantly contribute to their potential and future growth. It was also revealed that the greatest impact on "Experience and Track Records" comes from "Skills and Competencies" (with a score of 4), indicating that experts consider a candidate's skills and competencies to be highly indicative of their previous experiences and performance.

Experts assign equal weightage (score of 4) to "Academic Qualification" and "Potential and Future Development" when considering "Experience and Track Records". This suggests that a candidate's experience and track record are deemed equally significant in evaluating their academic qualifications and future potential. However, the most significant impact of "Cultural Fit" is on "Skills and Competencies", as indicated by a score of 4. This implies that experts prioritise a candidate's alignment with the "organization's culture" when assessing their abilities and qualifications. On the other aspect of the greatest impact from "Potential and Future Development", it was revealed that it is evenly divided between "Academic Qualification" and "Experience and Track Records" (both with a score of 4), suggesting that experts view a candidate's potential and future growth as being equally affected by their educational background and previous accomplishments.

These scores represent the combined viewpoint of the 19 HR experts on the importance of each criterion when assessing candidates for positions in logistics companies in Saudi Arabia. However, the interactions as well as the causes and effect of these outcome are not yet revealed at this point.

Following the descriptive analysis of the total decision matrices, a normalized direct influence matrix was derived by utilizing equation 3, and the result is the normalized matrix *D* displayed below:

$$D = \begin{bmatrix} 0 & 0.153846154 & 0.230769231 & 0.153846154 & 0.307692308 \\ 0.076923077 & 0 & 0.307692308 & 0.230769231 & 0.076923077 \\ 0.307692308 & 0.076923077 & 0 & 0.153846154 & 0.307692308 \\ 0.076923077 & 0.307692308 & 0.153846154 & 0 & 0.153846154 \\ 0.307692308 & 0.153846154 & 0.307692308 & 0.230769231 & 0 \end{bmatrix}$$

The expert's response is used to get the normalised initial direct-relation matrix, and equation 4 is used to determine the total relation matrix, which refers to the total influence generated by the expert's response. This matrix is valuable for decision-making processes.

$$T = \begin{bmatrix} 0.841906236 & 0.829006339 & 1.169003391 & 0.915538847 & 1.13105558 \\ 0.736819991 & 0.561897391 & 1.016828837 & 0.811278195 & 0.784542238 \\ 1.098474126 & 0.783200649 & 0.9910143 & 0.922055138 & 1.152712664 \\ 0.719570986 & 0.806774289 & 0.915251364 & 0.625814536 & 0.815207135 \\ 1.184144184 & 0.922534277 & 1.339960195 & 1.065413534 & 1.011521451 \end{bmatrix}$$

By computing the sums of the rows and columns of the matrix that generates the total relation matrix, also known as the rows matrix vectors and columns matrix vectors of the total relation matrix, one can establish the causes and effects based on the study. The solution of equations 5 yields these outcomes. In other words, "cause" and "effect" can be determined if the vectors *r* and *c* represent the sum of the rows and the sum of the columns of the entire relation matrix. This enables the identification of "cause" and "effect." As a result, the result of the computation is displayed in the matrix Table 1.

Table 1 Direct influenced of the criteria among themselves

Criteria	r_i	c_i	r_i+c_i	r_i-c_i	***identity***
AQ	4.886510394	4.580915524	9.467425918	0.30559487	*cause*
SC	3.911366652	3.903412944	7.814779596	0.007953708	*cause*
ET	4.947456877	5.432058086	10.37951496	-0.484601209	*effect*
CF	3.88261831	4.340100251	8.222718561	-0.45748194	*effect*
PF	5.52357364	4.895039068	10.41861271	0.628534572	*cause*

Criteria such as "Academic Qualification", "Skills and Competencies", and "Potential and Future Development" are recognized as determinants that significantly influence the assessment of candidates in several aspects. The HR department may prioritize cause criteria when evaluating recruits or creating training and development programs. These factors are essential for success in employment within the logistics business and therefore attract significant consideration during the selection process. Criteria categorized as "effect" are those that are impacted by other criteria. Secondary factors are influenced by the major drivers that have been recognized as the causes. Within the HR department of logistics firms in Saudi Arabia, the term "effect" criteria refers to traits or qualifications that are the result of other elements. For instance, Experience, Track Records, and Cultural Fit are categorized as effects, implying that they are influenced by other factors such as Academic Qualification and Skills and Competencies.

The next essential step is constructing an interaction diagram, this is established by a threshold value, obtained from the full relation matrix using Equation 7. As a result, the threshold value is estimated to be 0.926061035. This value signifies that any value in the total relation matrix that above the threshold has an impact on the relationships diagram, whereas any value in the total relation matrix that is below the threshold value does not impact the relationships diagram. Consequently, the values that are being scrutinised have been emphasised in bold inside the matrix provided in Table 2.

Table 2 The values that determine the relationships impact

	AQ	SC	ET	CF	PF
AQ	0.841906	0.829006	**1.169003**	0.915539	**1.131056**
SC	0.73682	0.561897	**1.016829**	0.811278	0.784542
ET	**1.098474**	0.783201	**0.991014**	0.922055	**1.152713**
CF	0.719571	0.806774	0.915251	0.625815	0.815207
PF	**1.184144**	0.922534	**1.33996**	**1.065414**	**1.011521**

Table 2 displays the values that define the impact of relationships between various criteria. The values are utilised to depict arrows in a diagram (See Diagraph in Figure 4) in order to graphically illustrate the connections between the criteria. AQ has a direct influence on ET as well as PF. This implies that when evaluating AQ, HRM should also take into account ET as well as PF. Two arrows are depicted in the diagraph, originating from AQ and pointing towards ET and PF, respectively. SC solely influence ET. When assessing SC, it is important to thoroughly examine ET. A directional arrow is depicted, originating from the source node SC and pointing towards the target node ET in the diagraph. ET have a direct influence on both AQ and PF. ET significantly influence both AQ and PF. The diagraph includes two arrows originating from ET and pointing towards AQ and PF, respectively. Additionally, there is a looping arrow that represents the impact of ET on itself. CF appears to have no influence on any other criteria. Consequently, there are no arrows originating from CF in the diagraph.

PF is the sole determinant that influences all other criteria, with the exception of SC. This indicates that PF has a pivotal role in exerting influence on other criteria. The diagraph illustrates the influence of PF on three criteria: ET, CF, and PF itself. This is shown by three arrows drawn from PF to each of these criteria. The diagraph interconnects mutual influence of the variables in the decision-making process of HRM in logistics organisations in Saudi Arabia. This research serves to illuminate the correlations between criteria and underscores the need of taking into account several elements when assessing applicants or making HR-related choices (Figure 4).

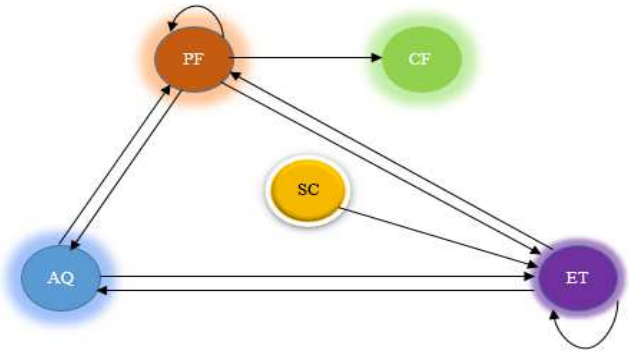

Figure 4 The interrelationship diagraph

6 Discussion and implication of the study

The study utilises the DEMATEL technique to examine the crucial factors that impact the efficiency of competitive intelligence in the Human Resources Department of logistics companies in Saudi Arabia. By employing this method, the study seeks to reveal the cause-and-effect connections among various criteria. Within logistics companies, the assessment of Saudi Arabia logistic companies job-seeking candidates is significantly influenced by parameters such as Academic Qualification, Skills and Competencies, and Potential and Future Development, according to the study. These parameters are considered significant factors and are given high priority in

the evaluation process, highlighting their crucial role in candidate selection and HR decision-making.

Through a thorough examination of the connections between various factors, this study uncovers the intricate web of cause and effect relationships. Identifying primary drivers that influence other criteria includes factors such as academic qualifications and skills and competencies. However, the outcomes of effect criteria, such as Experience and Track Records and Cultural Fit, are influenced by the cause criteria. Having a clear understanding of these relationships is essential in order to develop recruitment strategies and training programmes that are specifically tailored to meet the organization's needs. The study underscores the importance of Potential and Future Development in candidate assessment, highlighting its significant impact on other criteria. It is crucial to take into account a candidate's potential for growth and development when making HR decisions in logistics companies. The study's findings provide valuable insights for HR management in logistics companies in Saudi Arabia. Through a deep understanding of the connections between various factors, HR professionals can create evaluation methods that are more comprehensive and impactful when it comes to selecting, training, and developing candidates. By focusing on key factors like Academic Qualification and Skills and Competencies, you can easily identify top talent. Additionally, considering factors like Experience and Cultural Fit can greatly contribute to building a strong and high-performing workforce.

This study makes a valuable contribution by utilising the DEMATEL technique to analyse the intricate relationships between various criteria. This approach offers a well-organized framework for comprehending cause-and-effect relationships and their impact on HR decision-making processes. Utilising quantitative data analysis and visualisation techniques can greatly improve the understandability of the results and support well-informed decision-making. Although the study has made valuable contributions, it does have some limitations. For example, the sample size of 19 HR experts may not provide a comprehensive representation of the various perspectives within logistics companies in Saudi Arabia. Future research may consider addressing this limitation by increasing the sample size and conducting comparisons across different industries.

Similarly, studies should focus on the relevance of the results in various sectors and areas within Saudi Arabia in order to provide a comprehensive explanation of "Saudization" since they may not be universally comprehended. In addition, it would be beneficial to conduct a more in-depth analysis to examine how various factors impact employee performance and the overall success of the organisation in the long run. The study offers valuable insights into the factors that impact the effectiveness of competitive intelligence in the HR department of logistics companies in Saudi Arabia. Through a deep understanding of the cause-and-effect connections between various factors, HR professionals can create customised recruitment and HR management strategies that meet the specific needs of the organisation. This, in turn, leads to improved performance and competitiveness within the logistics industry.

7 Conclusion

Ultimately, this study employs the DEMATEL technique to examine the crucial criteria that impact the Talent pool of HR of logistics companies in Saudi Arabia. By thoroughly examining the criteria, this study provides valuable insights into the connections between these criteria and their impact on HR decision-making processes. The study's findings emphasise the crucial significance of specific factors, including Academic Qualification, Skills and Competencies, and Potential and Future Development, when evaluating job applicants in the logistics industry. These criteria are crucial factors that are carefully considered during the evaluation process, highlighting their significant role in candidate selection and HR management. In addition, the study explores the relationships between different criteria, shedding light on both the causes and effects and offering a holistic understanding of their interconnections. Having a deep understanding of these relationships is crucial in order to develop recruitment strategies, training programmes, and HR management practices that are customised to meet the unique needs of logistics companies in Saudi Arabia. The study's findings have practical implications for HR professionals, providing valuable insights to improve candidate selection, training, and development processes. By focusing on cause criteria and effectively addressing effect criteria, HR departments can enhance their recruitment efforts and cultivate a unified and high-performing workforce. The study makes a valuable contribution by utilising the DEMATEL technique to analyse intricate relationships between criteria in a systematic manner.

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