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Optimising Human Resources Management Process on Organizational Success: Integrating Markov Chain and Fuzzy TOPSIS

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Abstract

This study established that the optimisation of the Human Resources Management Process (HRMP) can be achieved through the use of the Markov chain (MC) and fuzzy multi-criteria decision-making (MCDM) methods. Therefore, an empirical evaluation was conducted on some companies and universities in Saudi Arabia HRMP to identify their HRMP. This is motivated by the fact that when it comes to conducting a quantitative evaluation, the majority of human resource evaluations focus on the utilisation of statistics as the primary analytical tool. The impact of HRMP on organisational success in this current study was evaluated with four adapted criteria ("hiring," "turnover," "promotion," and "demotion"), which are conceptualised in order to have the ranking and relationships among them. The findings reveal that the criteria "promotion" has the highest rank in influencing HRMP and thus impacting organisational success. The findings of this study have a number of implications, one of which is that it points to the necessity of conducting a clear and open-based promotion process in order to identify areas of the promotion process that require improvement, learning, and competency. The results suggest that this would make it possible to adopt direct or clear techniques for promoting employees, which would be a significant benefit.

Keywords

Human Resources, Promotion, Hiring, Demotion, Turnover, Organizational Success

1. Introduction

The human resource management (HRM) system, which aims to maximise employee satisfaction and organisational performance, is critical for this study.

However, implementing key HR activities can be costly and time-consuming (Boselie & van der Heijden, 2024). The HR functions (HRFs) are strategic, and there is increasing pressure to meet employee and business needs. It is necessary to assess and explore factors and solutions that can affect organisational activities, whether in production or service. This exploration is needed to understand the importance of continuity or change at the organisational level, involving an HRM process model that considers the logistics of HRM functions (Zhang & Chen, 2024). Additionally, every organisation must have a long-term common corporate mission.

Ineffective corporate policies can negatively impact the organisation, necessitating ongoing logistics for HRM functions (Ahammad, 2017; El-Dirani et al., 2020). This study aims to explore all aspects of the problem of the human resources management process (HRMP), focusing on the optimising combination of HRM processes and organisational success. The research aims to find answers to related problems. Based on the description above, the problem formulation in this study is whether and how optimising the HRM process can impact organisational success. This research provides information for personnel function staff and operational staff to better understand the importance of integrating the HRM process with organisational success in a medium-sized company that prioritises speedy service delivery. The research also provides valuable information to organisations on whether to continue integration or make necessary adjustments.

The current research established that the impact of optimising HRMP on organisational success can be conceptualised by a hybrid model integrating Markov chains and fuzzy MCDM, a research agenda that surpasses the queue of myriad other researches. That is why the research aims to explore the flow of employees from one level to another, which was initiated by the advancement of employees' satisfaction towards organisational success. Furthermore, the study attempts to discern the top influential factors that may encourage the retention of the workforce in various agencies.

Considering the previous empirical research that has shed light on the combined Markov and MCDM approaches (Nawaz et al., 2018; Ronizi et al., 2022) and their importance, the question of handling uncertainties in the data gathering in the work environment to be associated with those kinds of models. The justification of this lies in the fact that exploring the possibility from the private static state to the private dynamic situation of HRMP alongside determining the top driving forces developing these HRMP can lead to a clear path to the most successful operation of HRMP. That is why this study seeks to accomplish tracing the history of the combined MCDM methods and the Markov model and utilise it for HRMP in order to produce reliable results while minimising uncertainty (Mostafa et al., 2022).

Typically, optimising the HRMP is turning into the focal point for corporations in each sector within the world in order to implement the process best suitable for specific business needs (Rodgers et al., 2023). However, the question

stands about whether or not it's an ultimate organisational success to derive a model that streamlines the entire HRMP for any organisation. Therefore, a necessity arises to integrate HRMP to pursue the impact of procedures on organisational success depending on those specific organisational needs. Then, the model can be tested across any HRMP.

The model is proposed to integrate the Markov chain (MC) with the fuzzy decision-making process and the multi-criteria approach (MCDM). While MC is an effective modeling platform for which it uses the current state to get a future state, or a future state depends only on the current state and not on the sequence of events that preceded it, this allows for analysing the HRMP future state based on the current state. Similarly, the influence of those future state criteria on each other can be determined by fuzzy MCDM. That is why this study adopted these models in order to look at the HRMP activity that is directly concerned with responding to organisational success. Typically, six dimensions are adopted from Gong et al. (2010), as follows: "selective hiring," "participation in decision-making through teams," "comparatively high pay contingent on performance," "extensive training," "career planning and advancement and regular performance appraisal for pay," and "promotion and development purposes." These dimensions are crucial to the "high-performance work systems" that focus on human resource methods that consistently result in greater individual and organisational performance. As a result of this, the current research extracts four HRMP flows, namely: Hiring, turnover, promotions, and demotions

This research, with the concept proposed above, intends to explore the impact of optimisation of HRMP on organisational success. Hence, it contributes in the following ways:

- Firstly, a Markov Chain Extension based on TOPSIS was developed, where it was identified that none of the previous studies attempted to analyse the effectiveness of HRMP for achieving organisational business success by integrating Markov Chain theory and fuzzy multi-criteria decision making (F-MCDM) techniques. This research contributes to the body of knowledge in terms of providing an effective model to capture the preferences of the decision-makers for analysing the concept of HRMP by integrating fuzzy MCDM with the Markov Chain model for organisational success in the context of developing countries.
- The findings of the study showed that the preference for the promotion exercise of HRMP should be open and clear in order to achieve organisational success. Furthermore, the hiring, turnover, and demotion probabilities by maximising organisational success were highly ranked but below "promotion," so they should be continuously optimised.
- It was also observed that the organisational success of Saudi companies is achieved if HRMP does not face degeneration (i.e., if performance in the long-term approximation will reach a certain standard). This will provide useful insight to human resource managers and leaders in the process of

identifying and implementing the HRM strategy roadmap that would lead their management processes towards organisational business success. This is the uniqueness and significant contribution of this study.

The next part of the paper, apart from this section, which provides a summary of the research, is the section that is devoted to the literature review. During the literature review, the past research studies and the research gaps that are linked with them are evaluated and discussed. This is followed by the theoretical framework section, which discusses the related theories associated with this research. After the theoretical and conceptual framework section, the next step is to discuss research methodology. A presentation of the findings and an analysis of the data collected during the research are discussed in the section that follows the section on the methodology. Lastly, the paper concludes with a discussion and a conclusion.

2. Related Work

Numerous prior research studies have been conducted on HRMP, MC, and MCDS. However, it is critical to also consider HRM from various perspectives. Stone et al. (2024) conducted a study that scrutinises various aspects of HRM ideas, methods, and trends. It highlights the vital importance of HRM's strategic role in attaining organisational objectives. It is essential to recognise that HRM plays a central role in evaluating and selecting intellectual abilities. In their study, Kolachina et al. (2024) emphasise the crucial function of talent management in accomplishing the main goals of HRM. They stress the significance of using data-driven methods to identify, nurture, and retain talented individuals. Therefore, several studies give divergent conclusions regarding HRMP from multiple perspectives.

Boselie and van der Heijden (2024) present a comprehensive framework for strategic human resource management (SHRM) that balances organisational goals with employee well-being. It emphasises the importance of harmonising HR procedures with the organisation's overarching strategy in order to achieve long-term success. Gong et al. (2010) conducted a study that found a positive relationship between high-performance work systems (HPWS) and collective organisational citizenship behavior (OCB). Collective social exchange activities influence this relationship. This suggests that implementing efficient HR processes might cultivate a culture of collaboration and reciprocal assistance among employees. Quader (2024) found that there is a direct relationship between successful HRM practices and employee happiness in the private banking sector of Bangladesh. This suggests that implementing HRM strategies properly can improve work satisfaction and commitment to the organisation. Nazeer Ahmed and Said Akaak (2024) suggested a framework for implementing integrated HRM practices to tackle the issues faced by retail organisations in the aftermath of the COVID-19 pandemic. These challenges include managing the workforce, ensuring employee well-being, and dealing with operational disruptions.

The analysis of prior work in the field of HRM has revealed several research gaps. Boselie and van der Heijden's (2024) research concentrates on the implementation of a balanced strategy across various industries and cultural contexts, yet it neglects the long-term impacts on organisational performance and employee satisfaction with HRM. Gong et al.'s (2010) work could potentially fill the study gap by examining the mechanisms of HPWS impact on collective OCB across diverse organisational contexts and cultures. Furthermore, there is a need to investigate the enduring impacts of HPWS on both organisations' overall performance and employee well-being. Quader's (2024) work specifically suffers from dependence on self-reported employee data, which could introduce bias and impact the precision of the findings. Similarly, Nazeer Ahmed and Said Akaak's (2024) work on conceptual analysis alone may not yield sufficient results, and it may also overlook the diverse effects of the pandemic on different retail industries and geographical areas.

Research on HRM is gradually shifting towards artificial intelligence (AI) applications. Ahammad (2017) proposed the development of personnel management into HRM, highlighting the strategic significance of HRM in contemporary organisations. The core functions of HRM identified in that study include talent acquisition, performance management, and employee development. Zhang and Chen (2024), motivated by the work, analyse the process of digitalising HRM and its influence on the efficiency and effectiveness of HR activities. The research specifically focused on improving HR tasks related to recruitment, training, and performance management, underscoring the importance of digital solutions. As a result, the process of digitising and implementing AI in HRM is starting to transform the field. That is why Rodgers et al. (2023) investigate the application of AI algorithms to improve ethical decision-making in HRM operations. The research contends that AI has the potential to alleviate biases and enhance equity in HR decisions, such as recruitment and performance assessments. Similarly, Nawaz et al. (2024) emphasise the increasing utilisation of AI in HRM practices, demonstrating that AI has the potential to optimise HR procedures, enhance decision-making, and enhance overall effectiveness. In the same approach, according to Bijoria (2024), AI has the potential to greatly improve green human resource management (GHRM) practices by optimising resource utilisation, minimising waste, and encouraging sustainable behaviors inside organisations.

Some of the research gaps associated with Zhang and Chen's (2024) work pertain to the challenges and barriers to the implementation of digital transformation in HRM. These concerns encompass issues related to safeguarding data, employees' reluctance, and the integration of digital tools into existing HR processes. That was ignored in the research. Rodgers et al. (2023) explore to a great extent the practical integration of AI in different HRM procedures and its influence on organisational ethics. Regrettably, the research neglected the ethical implications and inherent biases present in AI systems. The work of Nawaz et al.

(2024) primarily addresses the research gap by addressing the uncertainty associated with the proposed approach. Because HRM involves direct human-to-human interactions, there is currently no substantial evidence to suggest that AI can effectively replace humans in this domain. Finally, there is no available theoretical or empirical evidence that supports Bijoria's (2024) argument that there are limitations in resources for processing HRMP that create problems or hurdles for an organisation's HRM. Therefore, the incorporation of AI into GHRM procedures may result in increased costs, as the implementation of AI itself incurs expenses.

Finally, it is worth discussing the applications of MC and MCDM in HRMP. Previous research papers have employed MC and MCDM in numerous fields. One notable study by Nawaz et al. (2018) introduced a novel MCDM approach that combines Markov chains with the best-worst method. Nawaz et al. specifically designed this method for selecting cloud services. This technique enables organisations to make more informed decisions by assessing different cloud service providers according to many criteria. Ronizi et al. (2022) conducted a study to assess the effects of land use changes on water quality and soil fertility in rural areas of southern Iran. They employed MCDM and CA-Markov chain models for their analysis. The findings suggest that alterations in land utilisation patterns have significant environmental consequences.

Nawaz et al.'s (2018) study may address the research gap by exploring the potential use of the MCDM method in various situations, such as the selection of different types of services or in diverse industries. Furthermore, Ronizi et al. (2022) may address the research gap by conducting a comprehensive analysis of the long-term environmental and socio-economic impacts of land use changes.

3. Theoretical and Conceptual Framework

The foundation of this study lies in the integration of Markov Chain and fuzzy MCDM. The approach combines optimisation of HRMP and performance.

3.1. Markov Chain Theory

The Markov chain is the probability mapping approach between different states of any system, and the transition probabilities from one state to the other are the functions of that particular state rather than the functions of time. In HR management, guidelines are supposed to be helpful to ensure organisational success in the process. Often, the Markov chain is known as the active state process. At that point, the state is not explicitly inactive. We select the Markov Chain to explore the performance of HRMP in an organisation, rather than considering time as a factor. We construct the Markov chain for the HR management process, employment, and placement, considering each round as a transition and calculating a transition matrix accordingly.

Markov chains have a wide range of applications, including organisational studies and the analysis of HR process dynamics. HR gives the organisation a

competitive edge. Therefore, HR organisations must manage competent and hardworking individuals to ensure success. The HR management process consists of several stages: planning, recruitment, selection, training and development, compensation, and others. We analysed these stages to determine their potential for improvement and optimal operation, which would boost an organisation's performance and ultimately lead to its success. We chose the "hiring," "turnover," "promotions," and "demotions" samples from the HRMP for this particular study.

The theoretical Markov chain model associated with this study consists of conceptualising that each state of the Markov chain represents a specific set of operations required for the four HRMP selected at a given time, and the transitions between these states would reflect changes in "hiring," "turnover," "promotions," and "demotions" over time.

The first crucial step in the Markov chain is the transition matrix construction process. We construct the transition matrix by estimating the probability of an HRMP transitioning from one requirement to another over time. We accomplish this by tracking the priorities of each HRMP step over time, determining the percentage of HRMP steps related to a specific requirement that is the most crucial and intends to shift to a different requirement.

The transition probability matrix P is $\rightarrow n \times n$ transition matrix obtained by considering the total element, where P_{ij} is the probability of the transitions from state I to state j of the HRMP step that initially start the HRMP operation under a requirement i at the top of the HRMP step priority list. The Markov chain analysis uses this square matrix, representing the probabilities of transitioning from one requirement to another, to track changes in HRMP step requirements over time. It represents the count of steps in HRMP at operations that have the ability to modify their priority to a different need j within the time period k. After estimating the probabilities, they are utilised to build the transition matrix using Equation (1).

$$P_{ij} = \frac{x_{ijk}}{y_{ik}} \tag{1}$$

The next steps involve the analysis of finding the final pattern process. This can be derived by initially equating the values of this list HRMP steps to those of the initial list of the HRMP steps requirements. Subsequently, the iterative process involves the multiplication of the transpose of the vector HRMP steps by the transition matrix P.

3.2. Fuzzy TOPSIS

The "Technique for Order Preference by Similarity to Ideal Solution (TOPSIS)" under a fuzzy environment, also known as fuzzy TOPSIS, is one of the many MCDM methods that has been effectively implemented in a variety of practical, real-world issues (Palczewski & Sałabun, 2019). In the complex and uncertain real world, especially in the field of HRM, many decision-making problems are

characterised by multi-criteria, multi-stakeholders, and fuzziness. These complex uncertainties are different from ordinary random uncertainties. Fuzzy set theory can quantitatively process uncertainties in decision-making, and MCDM (multi-criteria decision-making) is an effective method. As a result, fuzzy MCDM has increasingly become a core theme in the research process for optimising HRMP.

To initiate fuzzy TOPSIS operations, it is necessary to first define the problem and then identify the criteria. Clearly, in the context of this research, the problem dwells on HRMP and its effect on organisational success. Therefore, we must gather data to gauge the suggested conceptual dimensions. This is the key aspect of the second step of fuzzy TOPSIS. "Criteria Identification" is the focus of the second step. This research conceptualised four criteria associated with the HRMP for organisational success: "hiring," "turnover," "promotions," and "demotions." The data that is required to be collected are primarily from experts assigned a numerical value to x_{ij} in order to denote the importance of each criterion's influence. The values are determined using criteria denoted by *i* and *j*, which consider cause and benefits. For each value of n, an expert's response is obtained, where a Fuzzy Decision Matrix (*D*) from Equation (2) is formed (Do et al., 2024; Ihsan et al., 2024):

$$x^{y} = \left[x_{ij}^{y} \right]_{n \times n} \tag{2}$$

Following the determination of the cost and benefit criteria from the collection of selection criteria, the subsequent stage entails the development of the normalised fuzzy decision matrix (*R*). As a result, the matrix *R* is developed as follows:

$$R = \left[r_{ij} \right]_{ij} \tag{3}$$

Then, both the cost and benefit normalised matrices can be acquired by Equations (4) and (5) respectively:

$$\tilde{r}_{ij} = \left(\frac{a_j^-}{c_{ij}}, \frac{a_j^-}{b_{ij}}, \frac{a_j^-}{a_{ij}} \right) \quad \text{and} \quad a_j^- = \min_i a_{ij} \tag{4}$$

$$\tilde{r}_{ij} = \left(\frac{a_{ij}}{c_j^*}, \frac{b_{ij}}{c_j^*}, \frac{c_{ij}}{c_j^*} \right) \quad \text{and} \quad c_j^* = \max_i c_{ij} \tag{5}$$

After the normalisation of the raw data, the next step involves construction of the weighted normalised fuzzy decision matrix by first assigning weights to the criteria according to their relative importance and then multiplying each element in the normalised fuzzy decision matrix by the corresponding weight of the criterion to get the weighted normalised fuzzy decision matrix. This follows by determining the Fuzzy Positive Ideal Solution (FPIS) and Fuzzy Negative Ideal Solution (FNIS) using Equation (6).

$$A^{+} = \left(v_1^{+}, v_2^{+}, \cdots, v_n^{+} \right) \tag{6}$$

$$A^{-} = \left(v_1^{-}, v_2^{-}, \cdots, v_n^{-}\right) \tag{7}$$

FPIS represents the optimal solution that maximises the benefit criterion and minimises the cost criteria. Whereas FNIS is an extremely unfavorable solution, characterised by the lowest possible benefit and the highest possible cost. This follows by calculating the distance between each alternative and the FPIS and FNIS using a distance metric presented in Equations (8) and (9) respectively.

$$d_i^{+} = \left\{ \sum_{j=1}^{n} \left(v_{ij} - v_{ij}^{+} \right)^2 \right\}^{\frac{1}{2}} \tag{8}$$

$$d_i^{-} = \left\{ \sum_{j=1}^{n} \left(v_{ij} - v_{ij}^{-} \right)^2 \right\}^{\frac{1}{2}} \tag{9}$$

Immediately after this step, the research calculates the closeness coefficient that is used to rank the alternatives using Equation (10):

$$CC_i = \frac{d_i^{-}}{d_i^{-} + d_i^{+}} \tag{10}$$

where d_i^{+} is the distance from FPIS, while d_i^{-} is the distance from FNIS. The closeness coefficient quantifies the proximity of an alternative to the optimal solution. The alternative with the highest closeness coefficient is regarded as the optimal selection.

Based on the obtained result, the research "Rank the Alternatives" ranks the alternatives using closeness coefficients. The alternative with the highest closeness coefficient is given the top rank, while the remaining alternatives are sorted in descending order. Next, the study "Make the Final Decision" selects the alternative with the highest rank as the ideal solution to the problem.

3.3. Conceptual Model

The proposed research conceptual framework is presented in **Figure 1**. The study that was carried out by Gong et al. (2010) defined six dimensions aimed at comprehending the "high performance work systems" that place emphasis on human resource strategies in connection to organisational performance. This was covered in the "Introduction" section of this current paper. "Hiring," "turnover," "promotions," and "demotions" are the individual components conceptualised from Gong et al. (2010).

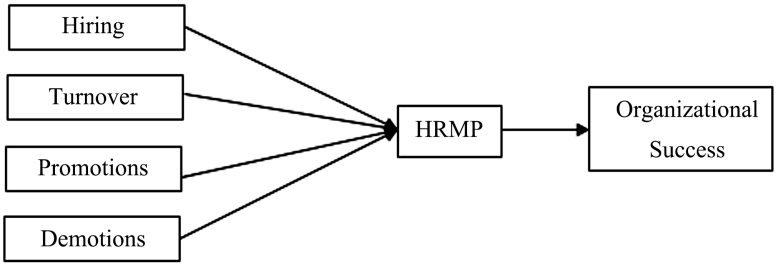

Figure 1. The proposed conceptual framework.

The operational definition of the dimension "Hiring" involves the process that an organisation goes through in order to locate, attract, evaluate, and choose individuals who are qualified for open positions in the organisation. This is described in Gong et al. (2010) as "selective hiring".

The operational definition of a dimension "Turnover" involves the process that comprises all of the actions that take place from the moment an employee makes the decision to leave or to be terminated, all the way through the exit procedures, and culminating with the analysis of turnover data to influence future HR initiatives. This represents "Comparatively high pay contingent on performance" in Gong et al. (2010).

The operational definition of the dimension "Promotion" encompasses the process of selecting individuals who are qualified for the position, assessing their performance and potential, deciding whether to promote them, and enabling a seamless transfer into the new capacity. To keep staff morale high and ensure that the organisation continues to function effectively, this procedure is intended to be impartial, open, and consistent. This is described in Gong et al. (2010) as "Promotion and development purposes".

The operational definition of the dimension "Promotion" includes determining whether the employee should be demoted, assessing the individual's performance and the reasons surrounding the demotion, deciding whether to demote the employee, and facilitating a smooth transfer to the new role. The entire four variables are conceptualised to have an influence on HRMP and consequently determine organisational success as presented in **Figure 1**. Therefore, in order to test and proof that, this study proposes a hybrid model that integrates the Markov chain approach with fuzzy multi-criteria decision-making (MCDM) to investigate the dynamic process of utilising the impacts of capitalising on the progress of human resource management.

4. Research Methodology

The proposed model combines a systematic analysis of the Markov chain with the application of a fuzzy multiple-criteria decision-making (MCDM) method. We distributed an empirical survey among industry experts to closely examine the influence of HRMP on various performance levels. The transition probabilities were finally summarised in one sequence to comprehend the whole effect. Data were collected using a questionnaire, analysed, and utilised to develop a hybrid model after some preprocessing.

The questionnaire in this study has been newly constructed to assess the four criteria/factors ("Promotion, Hiring, Demotion, Turnover"). The rankings in the questionnaire are prioritised, which is typical of MCDM rules. Participants will respond directly to questions that express the relevance of criteria based on their rank. The response is determined by the significance of the criteria as previously outlined. Respondents have the ability to provide weights to each criterion if the criteria have varying levels of value. We categorise the importance levels as "Very Low," "Low," "Medium," "High," and "Very High," allowing respondents

to express their judgments and convert them into fuzzy numbers.

The rules of "fuzzy theory" are used to examine the validity of the questionnaire. The "face validity" approach is employed, using two senior professors as validators. They submit their remarks, which are then altered based on their feedback. The rationale for employing face validity is based on the limited number of questions and responses.

Research Design

We have adopted a mixed-method research design to conduct this study. The advantages of the mixed methods research design are that its flexibility, when compared to using qualitative or quantitative methods alone, allows the study to reveal a broad range of perspectives. In order to find out how possible changes to HR processes could lead to better results, an original hybrid model was used to perform an elliptical analysis of the MC system using triangular fuzzy set techniques on both employees and employers.

Primarily, a two-step approach was pursued. Initially, we reviewed the related literature to design the criteria for HR processes and dimensions affecting success indicators. After that, we distributed questionnaires to HR staff and managers, asking them to rate the impact of HR processes on organisational success on a scale of one to seven, with one being the least effective and seven being the most effective. We used the output from our criterion metrics to construct a fuzzy TOPSIS matrix, which in turn constructed a transition probability matrix to investigate the periodic chain status of organisational success. We anticipate that the framework will enable those who have access to it to investigate the potential impact of enhancing HR processes on organisational success. In particular, an organisation will be able to explore the specific route from one terminal stage to another and the frequency of each transition state through the outputs.

5. Analysis and Presentation of the Result

This study employed various data collection and analysis procedures to evaluate the relative significance of the criteria. In order to evaluate the applicability and effectiveness of the approach that we provided, the researchers conducted a real-world case study within a sample of five Saudi enterprises and some universities HRM. We selected a representative sample of human resources personnel from these companies and universities. Two participants from each company responded to the prepared structured questions. When compared to other universities, ours has a minimum of two participants and a maximum of five participants. Seven different universities make use of HRM. Ten participants from the enterprises and thirty-three individuals from the universities participated in the study. As a result, a total of 43 participants participated in the process of ranking the criteria according to the HRMP of their respective institutions. The justification for this lie in the fact that 5 to 10 randomly selected experts are fit enough for MCDM studies (Wang & Elhag, 2006). Afterwards, we derived an

average transition matrix, represented by the letter D, from the replies we received from the experts.

The average results of the 43 responses to "Hiring (CR1)", "Turnover (CR2)", "Promotion (CR3)", and "Demotion (CR4)" questions from the questionnaire developed for the 43 participants. Hence, the initial list of priorities is calculated to "Promotion (CR1) 0.41", "Turnover (CR2) 0.17", "Hiring (CR3) 0.19" and "Demotion (CR4) 0.15". Whereas the initial transition matrix is calculated and presented in the matrix below:

$$\begin{bmatrix} & CR1 & CR2 & CR3 & CR4 \\ CR1 & 0.37 & 0.24 & 0.11 & 013 \\ CR2 & 0.32 & 0.31 & 0.3 & 0.11 \\ CR3 & 0.19 & 0.13 & 0.34 & 0.18 \\ CR4 & 0.28 & 0.16 & 0.15 & 0.36 \end{bmatrix}$$

Based on the average criteria matrix obtained, the next step involves finding a pattern of shifting preferences among HRMPs with the use of Markov Chain method. Hence, in order to predict the future HRMP preferences, an initial preferences and transition matrix as the starting point are created. Following the completion of four multiplications, the matrix became stable and continued to provide the same values at all subsequent times. Specifically, this stabilisation serves as an illustration of the model's convergence. The final pattern of preferences for HRMPs can be summarised as follows: CR1 0.342, CR2 0.309, CR3 0.216, CR4 0.312.

Fuzzy TOPSIS will be utilised in the subsequent stage, which entails linking the requirements of HRMP with the selection criterion. For this purpose, an analysis of the final pattern of HRMP priorities is required, which is obtained through the use of the Markov Chain. As a result, this final list of priorities is then utilised as input to the Fuzzy TOPSIS method in order to establish a connection between the requirements of the HRMP and the selection criteria. In order to determine which HRMP Requirement is the best and which is the worst, pairwise comparisons are carried out for each of the selected HRMP Requirements. After that, the weights of the selection criteria are computed, and the result is compared to the values of the pairwise comparisons. The ideal weights for the selection criteria connected with the HRMP requirement are then determined for all the other HRMP requirements, and the weights of the criteria are kept for each iteration. Consequently, the weights that were obtained are arranged in a methodical manner and given in the fuzzy matrix that is as follows:

$$\begin{bmatrix} (0.086,0.171,0.301) & (0.197,0.227,0.281) & (0.040,0.051,0.061) & (0.051,0.076,0.088) \\ (0.323,0.398,0.412) & (0.097,0.173,0.199) & (0.098,0.142,0.197) & (0.037,0.048,0.053) \\ (0.037,0.039,0.042) & (0.061,0.091,0.138) & (0.041,0.063,0.089) & (0.072,0.095,0.163) \\ (0.096.0.141.0.213) & (0.142.0.173.0.261) & (0.299.0.352.0.391) & (0.046.0.048.0.052) \end{bmatrix}$$

The subsequent calculation is employed to ascertain the ultimate fuzzy

weighting of the selection criterion, while considering the HRMP requirements, where the research obtained: C1 (0.209, 0.361, 0.401), C2 (0.234, 0.314, 0.372), C3 (0.239, 0.291, 0.326), C4 (0.052, 0.072, 0.092). The closeness coefficient is calculated by considering both FPIS and FNIS, which determines the final ranking of HRMP. The outcome indicates that "Promotion (CR1)" is ranked first, followed by "Turnover (CR2)", "Hiring (CR3)", and "Demotion (CR4)" respectively.

6. Discussion

This study has established that MC and MCDM can optimise HRMP. That is why it conducts an empirical evaluation of some HRM, determines their HRMP, and then evaluates their impact on organisational success based on the key criteria conceptualised in the study. The analysis and testing of the data led to the following conclusions: Estimations. The models used to estimate HRMP structures show that the most important part of an organisation's success is the process of "promotion," which takes into account the academic background and work experience of the experts who participated in this study. It is indisputably proved that the four dimensions of HRMP utilised in this study—"hiring," "turnover study—hiring," "turnover study—hiring," "turnover," "promotion, and area demotion"—are associated with the success of organisations. The Markov chain analysis backs this up; the study finds that the steady-state probability of an employee's performance level in the low, medium, and high HRM categories is 0.05, 0.3, 0.2, and 0.45 in that order. So, public organisations should strive to ensure that their HRMP level is mid-range, which can accommodate more employees with moderate skills. When promoting employees, public organisations should aim to raise their HRMP level to a high level. To expedite the adaptive evolution of the HRM system, public organisations must first suboptimize the overall HRM system in relation to their promotion strategies and processes. If organisations want to have a successful promotion process, then they should utilise MC and MCDM.

The study's findings suggest that managers should conduct additional research to pinpoint competency, learning, and improvement areas in the promotion process, thereby enabling indirect or incremental strategies for employee advancement. However, it is evident that managers could also use direct and abrupt strategies to introduce technological and structural advancements immediately. The current study aims to explore this potential scenario. The physical model's results represent a direct investigation of the impact of a hidden process, such as HRM optimisation, on the system's emergent/global feature, organisational success. This paper makes a significant contribution by formulating an analytical structure based on documented scientific facts.

Another implication of the study is the changes in the level, variability, and depiction of the temporal progression in the overall HRMP. These findings provide a rational understanding of the ramifications of optimising HRM for the

organisation and assist in empirically investigating the chronological progression of success through HR integration. We conduct the assessment of the impact of optimising human resource management (HRM) on organisational success by taking into account the perspectives of HRM experts and the methodology employed in this study. Attaining the performance quality of the HRMP will need a significant amount of time and effort. Although the initial impression may seem broad, a detailed analysis of the results indicates that the "promotion exercise" is a critical procedure that can significantly influence the performance of the organisation. The organisation will undoubtedly thrive if it promotes individuals who possess the necessary qualifications and adhere to transparent criteria. That is why only the final framework of this research is included. "Promotion" has a direct impact on HRMP, which in turn influences the organisation's success (see Figure 2).

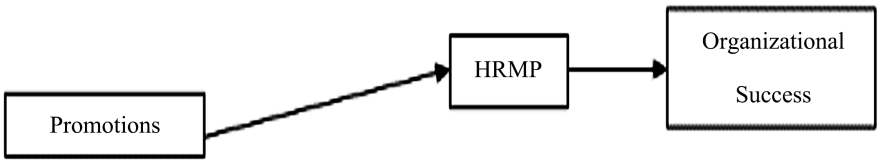

Figure 2. The final research model.

This study employs a hybrid model that combines the fuzzy set theory and the Markov chain to investigate how the HRMP influences organisational success. The research demonstrated the applicability and effectiveness of the presented approach through a case study of some Saudi companies and universities. From a theoretical perspective, this study stands out as unique and original due to its combination of various approaches. Despite the abundance of human resources studies in the literature, the relationship between human resources and organisational success remains inadequate due to statistical challenges. With the proposed method, it is possible to present more reliable results and correlate HR processes with organisational success in any company. The researchers believe that this approach will provide practical benefits to field researchers.

The result's impact on the business obviously stands out. This is because the results remind employers that companies can mitigate the risk of poor use of employee recruitment, resulting in an inefficient HRM process, failure to recruit potential employees, and failure to retain applicants through appropriate intervention in the process. However, this research does not view recruitment as the primary criterion, suggesting that the organisation's success may truly hinge on "promotion" following hiring. In other words, if an organisation hires the incorrect individual, they will not be eligible for promotion. This research ranks "demotion" at the lowest level, indicating that the basic HRMP stands between promotion and hiring.

From a practitioner's perspective, this study confirms the importance of considering an effective human resource management procedure within the agency

in parallel with promotion and development. This study could be helpful to guide employers in improving their HRM practices in order to attract more qualified candidates. Furthermore, this study offers valuable insights for examining the promotion system and assisting managers in enhancing the HRM process. We estimate that the creation of the Markov Chain and fuzzy MCDM could serve as valuable tools for analysing a company's human resources management and achieving organisational success. Evidence demonstrates that it is important for organisations to continue upgrading their promotion systems by merging Markov Chain Simulation and Fuzzy MCDM to optimise the HRM process in an attempt to maintain progress in meeting the market demand for the worker.

7. Conclusion

This study aimed to explore the effect of optimising HRM processes on organisational success. The study proposed a new hybrid Markov Chain (MC) and fuzzy Multi-Criteria Decision Making (MCDM) model to empirically investigate the interdependencies between the HRM performance criteria and the stages of the HRM process. The model determined the efficiency ratio of HRM process optimisation by identifying the optimal transitioning effect of evaluation criteria in HRM, as well as the necessary movements among the stages of the HRM process towards the ultimate success of the organisation. These movements form the managerial targets of HRM in every organisation. We collected data from a sample of 43 Saudi HRM experts from both companies and universities, aiming to capture the diverse perspectives on the evaluation of the HRM process and the correlation between the stages of the HRM process and the companies' success. The conducted empirical analysis presents the results of the employees as model outputs, providing guidance to HRM professionals on how HRM, and the HRM process in particular, should function to generate positive outcomes and, ultimately, a successful organisational process. Despite the intriguing findings and practical implications in the field of HRM, the key outcome of the empirical study is the identification of "promotion processes and strategies" in HRMP that enhance organisations' HRM practices and ultimately impact organisational success.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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