

Explaining the Structural Model of Factors Influencing the Retention and Maintenance of Human Capital Based on Organizational Productivity

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ABSTRACT

Objective: An organization demands its employees to possess the maximum potential benefits and expects them to meet organizational needs. Therefore, in a new perspective, the creation of an appropriate environment for the retention and maintenance of human capital and its connection to increased organizational productivity has been introduced as an important step towards the realization and achievement of objectives, including organizational productivity. The aim of this paper is to explain the structural model of factors effective in retaining and maintaining human capital based on organizational productivity in the National Iranian Oil Company.

Methodology: The research method was descriptive-survey, and the statistical population consisted of senior managers and deputies in the human resources domain from the National Iranian Oil Company in headquarters and field staff (582 individuals), of whom 235 were selected as the sample using Cochran's formula. Interviews and questionnaires were used as data collection tools, validated through content and construct validity, and reliability was established using Cronbach's alpha coefficient. For data analysis, statistical methods and tests such as Pearson correlation coefficient, single variable t-test, Kolmogorov-Smirnov test, exploratory and confirmatory factor analysis were used, employing SPSS and LISREL software.

Findings: The results indicate that the investigation into creating an appropriate environment for retaining and maintaining human capital and increasing organizational productivity involves individual factors, organizational factors, and group factors, each including components that significantly impact the productivity of the organization at the National Iranian Oil Company. The research also showed that retaining and maintaining human capital is key to improving and increasing organizational productivity, with the most influential

components on productivity in the National Iranian Oil Company being organizational factors—performance management (efficiency and effectiveness) with an impact of 0.85, merit selection with an impact of 0.83, intellectual capital smartization with an impact of 0.80, talent management with an impact of 0.80, and individual factors—ability and knowledge with an impact of 0.79.

Conclusion: A comprehensive human resource retention program can play a vital role both in attracting and retaining key employees and in financial turnover and other human resource costs. These factors significantly aid organizational productivity and overall business performance. It is far more efficient to retain a competent employee than to hire, train, and guide a replacement with similar capabilities.

Keywords: *Human capital retention and maintenance, organizational productivity, individual factors, organizational factors, group factors.*

1 Introduction

In the business world, human resource management is considered a very important factor in the success of any organization. Additionally, a significant challenge faced by many organizations is the retention of their human resources, which can provide a competitive advantage. Therefore, in the modern era, human resource strategy is recognized as a fundamental pillar in improving organizational performance and addressing it is crucial for enhancing organizational productivity, especially for organizations that have reached an appropriate level of maturity in this field. The purpose of devising and implementing a human resource strategy is to align human resource policies and practices with the strategic goals of the organization (Farhadi Mahalli et al., 2017).

From the perspective of most management experts, attention to human resource retention is at the forefront of the activities of productive organizations. Human resources are one of the inputs of the organizational system. The more an organization can attract competent personnel and maintain and make effective use of them, the more successful it will be in achieving its goals and advancing beyond its competitors. The competition among organizations for greater profits and market share is not merely about financial gains; rather, all these factors are influenced by a more significant factor, namely competent human resources. This is a realization that organizations have come to, competing in the recruitment of personnel and striving to retain them to prevent them from leaving. The human resource retention system ensures that, in the long term, human resource turnover is reduced, adding to organizational productivity and improving administrative health. Indeed, in an organization with the best recruitment practices, the most suitable individuals may have been selected and employed (recruitment system), and then

various methods of evaluation and training (improvement system) may have been used to enhance the insight, skills, and knowledge of these employees. However, if these employees are not well maintained throughout their service, or if other organizations offer more and better attractions, it will cause these individuals, especially the experienced ones, to easily leave the said organization and be attracted to other organizations, putting at risk the administrative health of the organization as a whole. Consequently, the efforts, endeavors, and costs associated with hiring, training, and equipping human resources and investing in individuals are wasted (Falahati & Hashemianfar, 2020).

Given that the National Iranian Oil Company is one of the leading companies in the region and competitive with international companies, the productivity and efficiency of this company contribute to increasing Iran's competitiveness in the region and reducing dependence on the West, escaping from current economic constraints and harsh sanctions, etc. Access to advanced international technologies is possible through this company. Therefore, creating an appropriate environment for the retention and maintenance of human resources of this company is essential for productivity and competitiveness with other national and international oil companies and is necessary for the effective presence of the National Iranian Oil Company in international arenas and strategic planning to compete with rival companies. Hence, it is crucial to pay special attention to creating an appropriate environment for the preservation and maintenance of human resources and to enhance organizational productivity so that in the coming years, with the support of knowledge-based employees and the preservation and effective use of human resources, we may witness the advancement and development of the National Iranian Oil Company and its special position in the region. Given the issues discussed, the main question in this article is: How is the structural model of factors effective in retaining and maintaining human

capital based on organizational productivity in the National Iranian Oil Company?

2 Methods and Materials

Given that the objective of this research is to determine the causal relationships among the variables of the structural model of factors influencing the retention and maintenance of human capital based on organizational productivity at the National Iranian Oil Company using the Structural Equation Modeling (SEM) approach, which was previously developed using theoretical and technical Delphi literature, effective factors from the qualitative section have been extracted. This study aims to explain the conceptual model through structural equation methods. The research is applied in objective and descriptive-correlative in terms of data collection method, specifically based on the structural equation model. In the analytical model of the research, three main factors—individual, group, and organizational—are considered as independent variables, and 12 components based on the conceptual model have been considered. The main tool for data collection in this study was a questionnaire, which consisted of 96 questions. To assess the validity of the questionnaire, the Content Validity Ratio (CVR) and the Content Validity Index (CVI) were used; according to Lawshe's formula, it was distributed among 9 human resources experts in both the field and headquarters of the National Iranian Oil Company, and the results calculated about the questionnaire according to the formula selected the necessary options by 9 people. The results according to the formula are equal to 0.9, which is above the minimum threshold and has been validated. The Content Validity Index: in this research, according to the Waltz formula, it has turned out to be 0.89, which is higher than the acceptable minimum value (0.79), and the questionnaire has adequate content validity. To assess the validity of the questions, factorial validity was also used. In this research, using first-order exploratory factor analysis, the initial components of these variables were extracted, and subsequently, the reliability of the questionnaire was tested with a pilot sample of 60 questionnaires, and the reliability coefficient was calculated using Cronbach's alpha method. These coefficients for three main factors and 12 main components of the conceptual model, which are the main factors of individual, group, and organizational, respectively, are 91.9%, 80.3%, 93.3%, 89, and also for all questions 89.3% were obtained. These figures indicate that

the questionnaire is reliable or, in other words, has the necessary reliability.

In this study, to explain the structural model of factors influencing the retention and maintenance of human capital based on organizational productivity in the National Iranian Oil Company, considering that in this research the National Iranian Oil Company has 582 employees. Considering the population size, Cochran's formula for a limited population sample size was used, assuming a population success rate of $p=0.5$ and an estimation precision of 0.05. The sample size is approximately equal to 232 people. To achieve this sample size, a total of 250 questionnaires will be distributed, and a random sampling method will be used, and 240 questionnaires will be collected and finally, after reviewing and eliminating incomplete questionnaires, 235 complete questionnaires were categorized and analyzed. For determining the sample size, employees were selected as the research sample, and stratified random sampling proportional to the volume of each stratum was used.

3 Findings and Results

At the outset, the Kolmogorov-Smirnov test was used to select the type of statistical tests. The results for all dimensions of the conceptual model were significant beyond the error threshold of 0.05, making the null hypothesis at the 0.05 level acceptable. Consequently, the data are normally distributed, and parametric statistics will be utilized for data analysis. Further, to fit the model using the Structural Equation Modeling (SEM) approach, the suitability of the sample size for factor analysis was tested using the KMO test (through SPSS software). Results for all variables exceeded 0.70, indicating sufficient sample size for factor analysis. To explain the conceptual model, measurement model equations for construct validity of each of the main constructs were calculated using Confirmatory Factor Analysis (CFA) in LISREL software, followed by fitting the conceptual model using structural equation modeling, which combines path analysis and confirmatory factor analysis. The structural equation modeling results are described below:

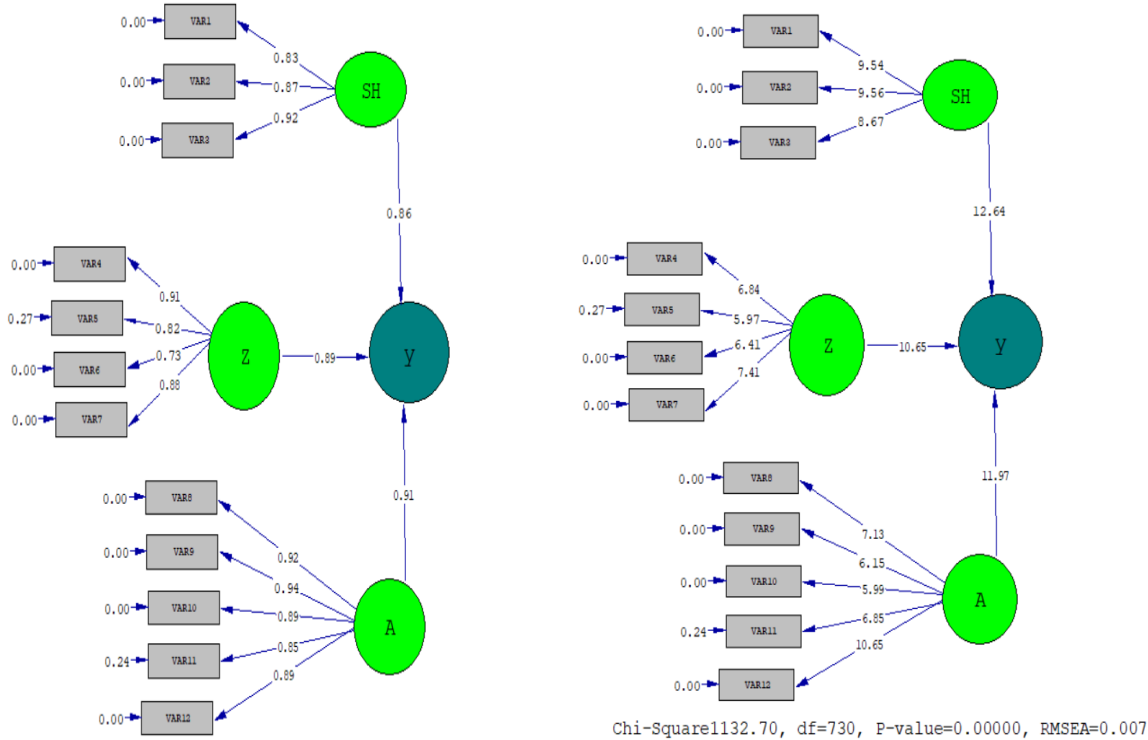
The conceptual model based on quantitative data in the structural model of factors influencing the retention and maintenance of human capital based on organizational productivity in the National Iranian Oil Company has been measured using structural equations. The software output indicates that the fitted structural model is suitable for hypothesis testing. The χ^2/df ratio is less than 3, and the

RMSEA of 0.070 indicates an appropriate model fit. The summary of fit indices is discussed as follows, derived from

LISREL software outputs, based on Standard Estimate and Significant T-Values:

Figure 1

Structural Model (Left: Beta Coefficients; Right: T-Values)



The results of the unstandardized estimate section of the LISREL output indicate that the measurement model is suitable for the research conceptual model because the chi-square value and RMSEA value are low, and the GFI and AGFI values are above 90%. Therefore, the results demonstrate that causal factors, through the index that creates situations, discussions, and issues related to the phenomenon, reveal the effective factors for the occurrence of retaining and maintaining human capital based on

organizational productivity in the National Iranian Oil Company, and the fitted conceptual model confirms that the researcher's conceptual model is valid:

- RMSEA = 0.007
- P-value = 0.000
- df = 730
- $\chi^2 = 1132.70$
- Goodness of Fit Index (GFI) = 0.91
- Adjusted Goodness of Fit Index (AGFI) = 0.93

Table 1

Values of Significance Coefficients of Model Relations and Status Between Variables

Path	R ²	T-Value	Test Result
Individual Factor - HRM Model with Increased Productivity	0.86	12.64	Confirmed
Group Factor - HRM Model with Increased Productivity	0.67	10.65	Confirmed
Organizational Factor - HRM Model with Increased Productivity	0.78	11.97	Confirmed
Motivation - HRM Model with Increased Productivity	0.92	9.54	Confirmed
Individual Learning - HRM Model with Increased Productivity	0.87	9.56	Confirmed
Ability and Knowledge - HRM Model with Increased Productivity	0.88	8.67	Confirmed
Equal Job Opportunities - HRM Model with Increased Productivity	0.86	6.84	Confirmed
Creating a Creative Environment - HRM Model with Increased Productivity	0.82	5.97	Confirmed
Communication and Participation - HRM Model with Increased Productivity	0.79	6.41	Confirmed
Leadership and Trust - HRM Model with Increased Productivity	0.77	7.41	Confirmed

Merit Selection - HRM Model with Increased Productivity	0.83	7.13	Confirmed
Performance Management - HRM Model with Increased Productivity	0.90	6.15	Confirmed
Talent Management - HRM Model with Increased Productivity	0.76	5.99	Confirmed
Organizational Culture - HRM Model with Increased Productivity	0.87	6.85	Confirmed
Intellectual Capital Smartization - HRM Model with Increased Productivity	0.95	10.65	Confirmed

As shown in Table 1, T-Values for all model relations are greater than 1.96, indicating that the model fit is in an appropriate state. According to the results of the above-mentioned criterion, which based on this criterion will consider values of 0.19, 0.32, and 0.67 as criteria for weak, moderate, and strong respectively, the results indicate a strong impact among the internal latent variables.

The structural model, unlike measurement models, does not consider observable indicators (variables) and solely examines latent variables and their relationships. To assess the fit of the structural model in structural equation modeling, criteria such as T-values, R^2 , and effect size are used. T-values need to be greater than 1.96 to confirm their significance at the 95% confidence level. Although these values only demonstrate the correctness of the relationship,

they do not measure the strength of the relationship. The R^2 value measures the amount of variance explained in a latent variable by the total variance, indicating the effect of an exogenous variable on an endogenous dependent (latent internal) model variable and showing how much of the dependent variable is explained by the independent variable. The results for the R^2 of the endogenous variable are presented below.

Table 2 presents the effect size results, introduced by Cohen, which determine the strength of the relationships between the latent internal variables of the model. The effect size uses the R^2 index to analyze the relationships between the latent variables. Using the Bootstrapping command, the effect size values for six latent factors of the study were obtained and are displayed in the following:

Table 2

Effect Size Results

Latent Variables of the Model	Cohen Effect Size	Effect Size
Individual Factor - HRM Model with Increased Productivity	0.34	Large
Group Factor - HRM Model with Increased Productivity	0.94	Large
Organizational Factor - HRM Model with Increased Productivity	0.92	Large
Motivation - HRM Model with Increased Productivity	0.91	Large
Individual Learning - HRM Model with Increased Productivity	0.78	Large
Ability and Knowledge - HRM Model with Increased Productivity	0.85	Large
Equal Job Opportunities - HRM Model with Increased Productivity	0.77	Large
Creating a Creative Environment - HRM Model with Increased Productivity	0.79	Large
Communication and Participation - HRM Model with Increased Productivity	0.80	Large
Leadership and Trust - HRM Model with Increased Productivity	0.81	Large
Merit Selection - HRM Model with Increased Productivity	0.91	Large
Performance Management - HRM Model with Increased Productivity	0.99	Large
Talent Management - HRM Model with Increased Productivity	0.75	Large
Organizational Culture - HRM Model with Increased Productivity	0.74	Large
Intellectual Capital Smartization - HRM Model with Increased Productivity	0.83	Large

Based on the results, with effect size values ranging from 0.02, 0.15, and 0.35, indicating small, medium, and large effects respectively, it is evident that the relationships among the latent variables of retaining and maintaining human capital based on organizational productivity are large according to standard values. The evaluation of indices and criteria of structural equations both overall model fit and the impact of model dimensions on internal latent variables has been calculated, showing that the conceptual model of the study is suitable.

After identifying the impact of causal factors on the model of retaining and maintaining human capital based on organizational productivity using factor analysis, structural equation modeling was employed to confirm the factors and determine the relationship strength. The impact of various factors and components on maintaining and enhancing organizational productivity through human capital retention has been quantified and presented in Table 3. The impacts are calculated as the product of the factor scores, demonstrating a direct and positive effect on organizational productivity. The T-value for each factor was derived at a

95% confidence level and found to be greater than 1.96, confirming the effectiveness of the identified components at this confidence level. The effectiveness of the components

corresponds to the multiplication of the path coefficients and components, indicative of their significant impact.

Table 3

Impact of Factors and Components on Organizational Productivity

Impact Variable	Impact Level
Individual Factor - Motivation on HRM with Increased Organizational Productivity	$0.71 = 0.83 * 0.86$
Individual Factor - Individual Learning on HRM with Increased Organizational Productivity	$0.74 = 0.87 * 0.86$
Individual Factor - Ability and Knowledge on HRM with Increased Organizational Productivity	$0.79 = 0.92 * 0.86$
Group Factor - Equal Job Opportunities on HRM with Increased Productivity	$0.70 = 0.91 * 0.89$
Group Factor - Creating a Creative Environment on HRM with Increased Organizational Productivity	$0.72 = 0.82 * 0.89$
Group Factor - Communication and Participation on HRM with Increased Productivity	$0.64 = 0.73 * 0.89$
Group Factor - Leadership and Trust on HRM with Increased Organizational Productivity	$0.78 = 0.88 * 0.89$
Organizational Factor - Merit Selection on HRM with Increased Productivity	$0.83 = 0.92 * 0.91$
Organizational Factor - Performance Management on HRM with Increased Productivity	$0.85 = 0.94 * 0.91$
Organizational Factor - Talent Management on HRM with Increased Organizational Productivity	$0.80 = 0.89 * 0.91$
Organizational Factor - Organizational Culture on HRM with Increased Productivity	$0.77 = 0.85 * 0.91$
Organizational Factor - Intellectual Capital Smartization on HRM with Increased Productivity	$0.80 = 0.89 * 0.91$

Based on the results from [Table 3](#), it is confirmed at a 95% confidence level that the identified components have a significant impact, with organizational factors having the most substantial effect. The most influential components are ranked as follows based on their impact levels:

Organizational Factor (Performance Management: Efficiency and Effectiveness) (Impact Level: 0.85)

Organizational Factor (Merit Selection) (Impact Level: 0.83)

Organizational Factor (Intellectual Capital Smartization) (Impact Level: 0.80)

Organizational Factor (Talent Management) (Impact Level: 0.80)

Individual Factor (Ability and Knowledge) (Impact Level: 0.79)

4 Discussion and Conclusion

The success of any organization is largely influenced by human behavior. Effective organizational resource strategies in offices create an environment that enhances employee motivation, leading to creativity and productivity. One such strategy is the use of compensation systems; organizations use these systems both to encourage personnel to strive towards administrative goals and to attract skilled employees to continue working in the organization. Adequate and satisfying compensation ensures that employees are content with the organization, and satisfied employees do not need guidance to achieve goals as they are inherently motivated to work for the organization ([Ashourpour & Najafi, 2015](#);

[Ghabezi, 2013](#); [Golmeymi et al., 2023](#)). An organization, whether small or large, considers reward systems for all its employees; although the methods of rewards and bonuses may vary depending on the job type, organizations strive to motivate all employees, although the level of encouragement may vary based on organizational needs. In today's era, where there is significant competition between work management and business, every organization and business is striving for success and aims to achieve a consistent level of employee performance. Therefore, organizations utilize all available methods to compete with the best technology, production, and efficient workforce available in the market. Under such circumstances, it can be said that employee performance is directly related to the level of compensation ([Norouzzadeh, 2023](#); [Ranjbar, 2022](#); [Rezaeian et al., 2018](#)).

Iran is also among these countries. If the importance of human resources in the development of the country's oil industry and its impact on Iran's economy is acknowledged, it is essential to examine the key issues facing human resource management in the oil industry in line with reducing deficiencies and enhancing the efficiency of existing human resources, which are the future source of dedicated, expert, and competent managers. A comprehensive human resource retention program can play a vital role both in attracting and retaining key employees and in financial turnover and other human resource costs. These factors significantly aid organizational productivity and overall business performance. It is far more efficient to retain a competent employee than to hire, train, and guide a replacement with similar capabilities. Studies show that the

loss of an employee can cost an organization an average of six to nine months of that employee's salary. Therefore, special attention to issues related to the preservation and maintenance of human capital, especially in the expert sector, is crucial for reasons such as the necessity to compete in international arenas, facing serious international sanctions; confronting human capital challenges in the global oil industry to achieve the goals set in the vision document of the National Iranian Oil Company. Moreover, enhancing organizational productivity from various aspects, the goals of the National Iranian Oil Company, and the need for special attention to expert human resources of the National Iranian Oil Company according to the superior programs of the Islamic Republic system, have set qualitative and quantitative goals reflected in the vision document of Iran's oil industry. Therefore, creating a suitable environment for the preservation and maintenance of human capital to increase productivity in the Iran Oil Company is one of the necessities that must be seriously considered, which itself can demonstrate the necessity and importance of conducting the present research from both theoretical and practical aspects. Nowadays, governments, organizations, and institutions make significant efforts in this regard. Without reviewing and gaining awareness of the progress and achievement of goals, without identifying the challenges facing the organization, obtaining feedback, and being informed about the level of implementation of formulated policies and identifying areas that need serious improvement, continuous organizational improvement and productivity will not be feasible. Scholars in the field of human resource management believe that various actions in the domain of human resource management should complement each other because compatibility between these actions can lead to improved employee performance and assist the organization in achieving sustainable productivity (Amjadi et al., 2018; Ghabezi, 2013). In the modern age, no organization can survive the severe turmoil of business without retaining its employees. Having hard-working and committed employees is a necessary condition for achieving organizational goals, one of which is increasing productivity at all levels. Therefore, focusing on these forces and preserving and maintaining human resources is very important and vital, and the future of all organizations, especially the oil company, is shown in today's complex economic conditions and the harsh existing conditions of increasing sanctions (Shateri et al., 2016). In most advanced countries of the world, especially in countries lacking rich natural resources including fossil fuels, the economy is

based on preserving and developing human resources, and human resource productivity is considered the most important issue. However, in countries rich in natural resources, especially countries with vast oil and gas resources, the major financial resources needed rely on the sale of fossil fuels, and less attention is paid to human resources, such that in these countries, the phenomenon of elite migration and the flight of efficient human resources is a serious challenge (Ghabezi, 2013).

The results of this research are consistent with similar prior studies (Abbaspour & Badri, 2016; Ashourpour & Najafi, 2015; Avolio, 2018; Bredin & Söderlund, 2011; Brewster & Mayrhofer, 2012; Davila & Elvira, 2012; Falahati & Hashemianfar, 2020; Farahani Majid et al., 2023; Farhadi Mahalli et al., 2017; Ghabezi, 2013; Jahangiri & Mehrali, 2008; Long & bin Wan Ismail, 2008; Ranjbar, 2022; Rezaeian et al., 2018; Sarfarazi et al., 2019; Shateri et al., 2016; Sutherland, 2019; Tabouli et al., 2016; Taleghani et al., 2016; Teimouri et al., 2018; Ziaee & Nargesian, 2023). These studies have identified indicators such as active colleagues, enthusiastic and persistent spirit, adaptable colleagues, intelligent behavior, selection of top managers from among elites, meritocracy in management, training and transfer of experiences to newcomers, vocational training, meritocratic systems, easy commuting, availability of opportunities for growth and development, proper promotion processes, addressing needs (responding to individual demands), supporting talented individuals, developing the competencies of knowledge workers, and esteem (acknowledging and valuing); flexible democracy, flexible performance of work by employees, teamwork, providing opportunities for expression, developing team learning, high coordination among knowledge workers, creating consensus for the transfer of experiences, work independence, and limited control as key indicators for maintaining and enhancing human capital based on organizational productivity.

Given the vital importance of human capital maintenance and productivity increase, the managers of the Iran Oil Company are advised to consider the organization's economic conditions, including annual operational plans and budgets, when hiring employees. They should prioritize local workforce from the region due to their geographical familiarity and also focus on consolidating the population around the organization. The managers of the Iran Oil Company are advised to institutionalize risk-taking ability and proactive innovations in their employees through constructive programs and by creating technological

conditions in their organization to develop technology and productivity and make optimal use of resources for organizational development. They are also advised to instill creativity, independence, learning, self-motivation, professional loyalty, and job mobility in their employees so that through this, they can achieve greater productivity, develop competencies and job and organizational capabilities, and ultimately improve their knowledge and experience for sincere service to the organization and job duties.

Furthermore, the managers of the Iran Oil Company are advised to establish and launch a think tank and use mechanisms such as establishing a suggestion system, creating an idea bank, and a knowledge repository to involve knowledge-based employees in organizational decision-making and utilize their knowledge and experiences for organizational development. They should allocate part of the work time for exchanging ideas and provide opportunities for study and education to their employees. Considering that layoffs are recognized as the most impactful method of implementing human resource downsizing plans and that this method is among the harshest, it is recommended that other methods that rank lower such as buyouts, job elimination, early retirement, etc., be used for workforce adjustment to help reduce job injuries and organizational trauma. The managers of the Iran Oil Company are advised, considering the compulsory implementation of the human resource downsizing plan, to devise measures to mitigate the execution of the said method. For example, surplus employees from one organization can be trained and prepared to serve in other departments of the organization facing workforce shortages, making it feasible to transfer employees from one organization to another.

Authors' Contributions

All authors have contributed significantly to the research process and the development of the manuscript.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

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Declaration of Interest

The authors report no conflict of interest.

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Ethical Considerations

In this research, ethical standards including obtaining informed consent, ensuring privacy and confidentiality were observed.

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