



Examining the Role of Empowerment Criteria on Employee Performance: A Quantitative Analysis in the Oil Industry

Mohammad Reza Gharib^{*}, Najmeh Jamali¹, Sajjad Nikkhah Chamanabad², Masoud Goharimanesh³

Department of Mechanical Engineering, University of Torbat Heydarieh, 9516168595 Torbat Heydarieh, Iran

* Correspondence: Mohammad Reza Gharib (m.gharib@torbath.ac.ir)

Received: 04-18-2023

Revised: 05-05-2023

Accepted: 05-20-2023

Citation: M. R. Gharib, N. Jamali, S. N. Chamanabad, and M. Goharimanesh, "Examining the role of empowerment criteria on employee performance: A quantitative analysis in the oil industry," *J. Eng. Manag. Syst. Eng.*, vol. 2, no. 2, pp. 96–107, 2023. <https://doi.org/10.56578/jemse020201>.



© 2023 by the authors. Licensee Acadlore Publishing Services Limited, Hong Kong. This article can be downloaded for free, and reused and quoted with a citation of the original published version, under the CC BY 4.0 license.

Abstract: This investigation elucidates the influence of Administrative Empowerment (AEM) on employee performance within the distribution sector of petroleum products in Torbat Heydarieh, Iran, utilizing a case-study approach to examine the correlational effects of varied AEM factors. A descriptive-analytical methodology was employed, with data collected through a standardized empowerment questionnaire, administered to the entire workforce as the population of interest. The validity of the questionnaire was ensured through the application of the Kolmogorov-Smirnov (K-S) test and Cronbach's alpha, while regression correlation coefficients were used to confirm the legitimacy of the resultant data. A simple random sampling method was employed, yielding a sample size of 45 participants. The principal outcome of this research suggests a consensus regarding the positive influence of AEM on expertise-based outcomes within the Iranian petroleum product distribution sector. Further, the study identified the workplace environment, morale, organizational belongingness, access to knowledge information, and job skills as the most potent determinants influencing human resource motivation. These elements surfaced as critical, feasible, and interesting aspects of work, and were found to be of paramount importance in the empowerment process.

Keywords: Empowerment; Regression correlation coefficient; Workplace environment; Sense of belonging to an organization; Knowledge information

1 Introduction

Efficiency enhancement stands as a prevalent issue in the pursuit of goal attainment and problem resolution, necessitating the harnessing of employees' maximum potential. Empowerment as a mechanism amplifies the capacity of employees to undertake pivotal decisions without the requirement of upper management approval. Such pronounced enhancements have prompted wide-ranging alterations in the economic policies and strategies of numerous administrative entities, necessitated by escalating complexity, technological innovation, globalization, knowledge intensity, and heightened competition. A myriad of administrative organizations exhibit substantial proficiency in their goal setting and strategic planning.

Empowerment represents a pioneering approach to ensuring organizational resilience within competitive milieus. Sustained improvement is observed when employees are provided with essential information and entrusted by management to utilize their skills and abilities [1, 2]. Consequently, institutional management should prioritize the execution of concepts such as systematic quality management, competitive advantage, information management, and administrative empowerment, which primarily concentrate on human capabilities to enhance these institutions' alignment with changing parameters and adaptability to evolving needs [3].

In contemporary times, the significance and role of human resource empowerment across various sectors is self-evident, recognized as a potent factor driving societal competitiveness, growth, and economic advancement. Given that human resources are regarded as the most valuable capital and the cornerstone of any organization, skill development and employee efficiency enhancement emerge as highly effective strategies for securing a competitive edge [4, 5]. Information gathered in the literature review section and compiled in Table 1 outlines the findings of prior research on the topic under discussion.

Table 1. Literature review of AEM

Year	Reference	Self-control experience	Self- importance	Proficiency motivation	Power motivation	Decision- making authority
1999	[2]			✓	✓	
2000	[6]	✓	✓	✓	✓	
2006	[5]					
2006	[7]			✓		✓
2008	[8]	✓	✓	✓	✓	✓
2009	[1]			✓	✓	
2009	[3]					
2010	[9]				✓	
2012	[10]	✓			✓	
2015	[11]		✓	✓		
2016	[12]					
2016	[13]					
2016	[14]					
2018	[15]	✓	✓	✓	✓	
2019	[4]	✓			✓	
2019	[16]					
2019	[17]	✓				
2020	[18]				✓	✓
2020	[19]		✓		✓	✓
2020	[20]					✓
2020	[21]					✓
2021	[22]				✓	
2021	[23]					
2021	[24]					
2022	[25]					
2022	[26]					
2023	[27]					
2023	This study	✓	✓	✓	✓	✓

Year	Reference	Authority motivation	Sharing information	Inner strengths/ Human ability	Learning knowledge	Team-work performance
1999	[2]	✓			✓	
2000	[6]	✓				
2006	[5]			✓		
2006	[7]					
2008	[8]					✓
2009	[1]	✓			✓	
2009	[3]			✓		
2010	[9]		✓		✓	
2012	[10]					
2015	[11]			✓		✓
2016	[12]			✓		
2016	[13]			✓		
2016	[14]					✓
2018	[15]	✓				
2019	[4]			✓		
2019	[16]		✓			

2019	[17]	✓	✓	✓	
2020	[18]	✓			✓
2020	[19]			✓	
2020	[20]				
2020	[21]			✓	
2021	[22]				✓
2021	[23]		✓		
2021	[24]				
2022	[25]			✓	✓
2022	[26]			✓	✓
2023	[27]			✓	
2023	This study	✓	✓	✓	✓

Year	Reference	Enhancing their skills	Management layers reduction	Optimization	
1999	[2]	✓			
2000	[6]				
2006	[5]	✓			
2006	[7]			✓	
2008	[8]				
2009	[1]	✓			
2009	[3]				
2010	[9]				
2012	[10]				
2015	[11]				
2016	[12]		✓	✓	
2016	[13]	✓	✓		
2016	[14]				
2018	[15]				
2019	[4]				
2019	[16]				
2019	[17]		✓		
2020	[18]				
2020	[19]	✓			
2020	[20]		✓		
2020	[21]		✓	✓	
2021	[22]	✓			
2021	[23]	✓	✓		
2021	[24]		✓	✓	
2022	[25]			✓	
2022	[26]			✓	
2023	[27]			✓	
2023	This study	✓	✓	✓	

As per Table 1, a principal impediment to empowerment is administrators' apprehension of authority and prestige erosion upon the application of empowerment principles. Nevertheless, employee motivation can be bolstered through skill enhancement, empowerment with a motivation to work, delegation of expanded authority, and provision of creative liberty, leading to an uptick in organizational performance. These measures would aid employees in skill development and performance improvement, thereby augmenting the overall institutional outcomes, which aligns precisely with the objectives of administrative organizations. The appeal of employee efficiency governs the extent of organizational success. For the effective utilization of manpower, it is imperative to influence the system's performance holistically by devising appropriate strategies and establishing a congruence between the organization's

mission and the needs of its employees. Thus, an increasing number of organizations are currently channeling their focus towards the refinement of plans to empower their human resources. The bedrock of such efforts is the work performance of employees, which should be developed and enhanced to improve institutional outcomes.

A salient finding of this study is the dominant status of Iran as one of the world's leading oil exporters within OPEC, thereby establishing it as a powerful organizational entity with considerable sway over Iran's subsidiary industries. Consequently, a critical rationale for the selection of these participants as the study sample is the examination and promotion of human development and AEM among employees of oil companies and associated sectors. This study scrutinizes all factors that impact AEM, striving to bolster its effectiveness and ameliorate it within a tangible case study situated in Iran.

2 Methodology

The goal of this study is to categorize, assess, and scrutinize the elements that impact empowerment. The demographic under investigation comprises all the employees and administrative personnel of a specific Iranian oil company. A model of team performance is structured around four dimensions of empowerment, with team efficiency serving as the dependent variable. Conversely, the independent variables are represented by criticality, the impact on employees' capability, feasibility, interest, and employees' drive for improvement. Age, educational attainment, gender, tenure with the present team, and ethnicity are accounted for as control variables in the model.

2.1 Data Collection

Data were collected through the deployment of a questionnaire, distributed to the pertinent administrative personnel with the request to provide responses and return the questionnaire. A questionnaire, subjected to expert development and testing, encompassing ten factors and 34 questions was employed for data collection. Four criteria – criticality, effects on employees' capability, feasibility and interest, and employees' drive for improvement – were adopted for the assessment and prioritization of these factors. Table 2 elucidates the indexes and parameters. The parameters were computed, and the weightage of each index was determined using the Analytical Hierarchy Process (AHP) for evaluating the results.

2.2 Sample Size/Population

Participants in the research were employees, managers, and immediate supervisors affiliated with an oil company in Iran. The sample size was determined by Eq. (1).

$$S_N = \frac{\chi^2 NP(1 - P)}{d^2(N - 1) + \chi^2 P(1 - P)} \quad (1)$$

where, χ^2 denotes the Chi-square value for one degree of freedom at the confidence level equating to 2.125, S_N indicates the threshold sample size, and the population size N is 100. The society adjective percentage is represented by $P = 0.5$, and the accuracy value is $d = 0.05$. On applying Eq. (1), the derived sample size is 45.

$$S_N = \frac{2.125 \times 100 \times 0.5 \times 0.5}{0.05^2 \times 100 + 2.125 \times 0.5 \times 0.5} = 45.396 \quad (2)$$

Table 2. The variables of indexes and criteria

No.	Index	Variable	No	Index	Variable
1	Participation and working group	I ₁	6	Recognition and appreciation	I ₆
2	Spirits and belonging of the organization	I ₂	7	Enrichment of jobs and career advancement of employees	I ₇
3	Information, knowledge, and job skills	I ₃	8	Workplace	I ₈
4	Definition of goals, responsibilities, and authorities	I ₄	9	Relationships	I ₉
5	Optimization of work processes and methods	I ₅	10	Trust, intimacy, and honesty	I ₁₀
The criteria					
1	Degree of feasibility				
2	The empowerment work environment				
3	The employees' interest and improvement desire				
4	Degree of critica				

2.3 Hypothesis

Empowerment is measured using four distinct criteria for human resource empowerment, along with ten prevalent indicators. The research posits several hypotheses based on the case study and each criterion, with Figure 1 presenting the proposed model. Four hypotheses were selected as a model, as they were considered appropriate criteria for the evaluation of the AEM. These hypotheses and each criterion were developed to underscore and address the research problem, based on the most influential indicators impacting the model. Figure 1 illustrates the four elements of Human Resource (HR) empowerment: work environment, feasibility, criticality, and employees' interest in and aspiration for change. Four primary hypotheses were formulated from these elements, and they are elaborated as follows:

- (1) Under the feasibility criterion, organizational indices of morale and belonging have a significant influence on HR empowerment.
- (2) Within the work environment criterion for empowerment, the work environment index exerts the greatest impact on HR empowerment.
- (3) HR empowerment is significantly influenced by employees' interest in and desire for improvement, as assessed by their information, knowledge, and work skills.
- (4) In the criticality context, the organizational indices of morale and belonging significantly impact HR empowerment.

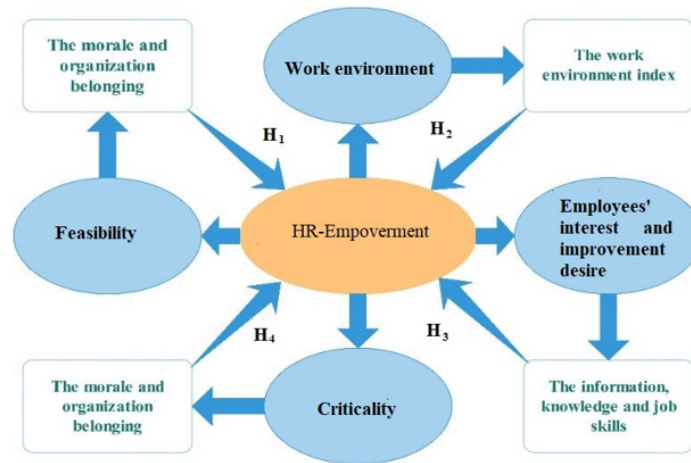


Figure 1. Hypotheses of the study

3 Data Analysis and Discussion

3.1 Criterion Related Validity Data Analysis and Discussion

The Kolmogorov-Smirnov (K-S) test, a non-parametric statistical approach, was employed for assessing the normality of data within SPSS. Although the spectrum and discontinuity of responses can suggest normality within non-parametric tests, the K-S test was utilized to confirm a normal distribution for the questions. The summarization of data involved both descriptive and inferential statistics, as presented in Table 3. The obtained values consistently exceeded the minimum benchmark of 0.7, substantiating the questionnaire's acceptable reliability. As indicated in Table 3, the significance (sig) value was consistently above 0.05, suggesting a normal distribution of data amongst respondents.

According to Table 3, in all cases, the sig value is more than 0.05, so the data distribution among respondents is normal.

Internal consistency

A pilot sample comprising fifteen questionnaires was used to evaluate the questionnaire's internal accuracy by calculating the correlation coefficients for each question within a given field in relation to the entire field. Both the correlation coefficient and the p-value were computed for every field variable. p-values falling below either 0.05 or 0.01 denoted the suitability of the correlation coefficients for that field at = 0.01 or = 0.05 levels, suggesting a coherent and relevant construction of the field for its intended purpose.

Cornbrash's coefficient alpha

Cornbrash's coefficient alpha, with a customary range between 0 and 1, was employed as an indicator of internal consistency. Higher values denoted a greater degree of consistency. The overall reliability for all items across each

Table 3. K-S test results

Capability indicators	Degree of feasibility	Sig-value		Degree of criticality
		Empowerment work environment	Employees' interest /desire to improve	
I ₁	0.906	0.862	0.751	0.751
I ₂	0.767	0.837	0.551	0.551
I ₃	0.339	0.404	0.614	0.614
I ₄	0.132	0.509	0.633	0.633
I ₅	0.393	0.404	0.577	0.577
I ₆	0.861	0.765	0.199	0.199
I ₇	0.104	0.809	0.344	0.344
I ₈	0.778	0.718	0.651	0.651
I ₉	0.368	0.542	0.727	0.727
I ₁₀	0.318	0.106	0.507	0.507

section spanned between 0.70 and 0.975, a range deemed high, thus validating the questionnaire's reliability. An expert survey was undertaken to validate the questionnaire, and Cronbach's alpha method was utilized for assessing its reliability. The findings are outlined in Table 4.

Table 4. Cronbach's alpha related to the criteria of the questionnaire

Criteria	Cronbach's alpha
Degree of feasibility	0.71
Empowerment work environment	0.914
Employees' interest and desire to improve	0.921
Degree of criticality	0.974

Correlation test

Correlation coefficients for various variables relative to each other and to four pre-set criteria were calculated. To discern the relationships amongst variables and the extent of their common variance, correlation coefficients were calculated utilizing the average of the relevant data. The findings are detailed in Tables 5 - 9.

Correlation analysis results in Tables 5 and 6 revealed a positive and significant correlation between all variables and empowerment at a 1% probability level, with the highest correlation coefficient noted for the work environment variable ($r = 0.922^{**}$).

Table 5. Correlation coefficients of different variables with each other and empowerment

	I ₁	I ₂	I ₃	I ₄	I ₅	I ₆	I ₇	I ₈	I ₉	I ₁₀	Y ₁
I ₁	1	0.677**	0.811**	0.645**	0.677**	0.558**	0.828**	0.669**	0.618**	0.737**	0.843**
I ₂		1	0.754**	0.694**	0.637**	0.603**	0.647**	0.854**	0.694**	0.793**	0.867**
I ₃			1	0.668**	0.586**	0.578**	0.717**	0.708**	0.616**	0.759**	0.847**
I ₄				1	0.819**	0.509*	0.677**	0.859**	0.809**	0.688**	0.884**
I ₅					1	0.738**	0.721**	0.726**	0.669**	0.561**	0.834**
I ₆						1	0.554**	0.532*	0.390	0.547*	0.681**
I ₇							1	0.672**	0.692**	0.631**	0.842**
I ₈								1	0.894**	0.793**	0.922**
I ₉									1	0.768**	0.864**
I ₁₀										1	0.864**
Y ₁											1

** . Correlation is significant at the 0.01 level (2-tailed). * . Correlation is significant at the 0.05 level (2-tailed).

$$Y_1 = 0.115 + (0.268)I_8 + (0.223)I_5 + (0.177)I_{10} + (0.142)I_3 + (0.144)I_7 \quad (3)$$

The variables in Eq. (3) include I3 (information, knowledge, and job skills), I5 (optimization of work processes and methods), I7 (job enrichment and career advancement of employees), I8 (work environment), I10 (trust, intimacy, and honesty), and Y1 (empowerment). Based on Eq. (3), these variables can explain approximately 99.2% of the

Table 6. The analysis of the coefficients

	Model	Unstandardized coefficients		Standardized coefficients Beta	t	Sig.
		B	Std. Error			
1	(Constant)	0.537	0.193		2.775	0.012
	X8	0.779	0.075	0.922	10.390	0.000
2	(Constant)	-0.019	0.160		-.118	0.907
	X8	0.548	0.064	0.649	8.560	0.000
	X1	0.456	0.084	0.409	5.398	0.000
3	(Constant)	-0.067	0.134		-.497	0.626
	X8	0.455	0.062	0.538	7.366	0.000
	X1	0.376	0.075	0.337	4.999	0.000
	X5	0.202	0.067	0.219	2.999	0.008
	(Constant)	-0.035	0.105	-	-0.337	0.741
4	X8	0.324	0.061	0.384	5.304	0.000
	X1	0.258	0.068	0.231	3.805	0.002
	X5	0.247	0.054	0.267	4.562	0.000
	X10	0.187	0.054	0.240	3.465	0.003
	(Constant)	0.013	0.084		0.156	0.878
5	X8	0.293	0.049	0.347	5.982	0.000
	X1	0.149	0.063	0.134	2.371	0.032
	X5	0.255	0.043	0.275	5.971	0.000
	X10	0.155	0.044	0.199	3.550	0.003
	X3	0.144	0.044	0.180	3.282	0.005
	(Constant)	0.086	0.061		1.428	0.175
	X8	0.274	0.034	0.324	8.014	0.000
6	X1	0.041	0.050	0.037	.816	0.428
	X5	0.218	0.031	0.236	7.123	0.000
	X10	0.169	0.030	0.218	5.605	0.000
	X3	0.132	0.030	0.166	4.366	0.001
	X7	0.131	0.031	0.165	4.193	0.001
	(Constant)	0.115	0.049		2.367	0.032
	X8	0.268	0.033	0.317	8.105	0.000
7	X5	0.223	0.030	0.241	7.458	0.000
	X10	0.177	0.028	0.228	6.243	0.000
	X3	0.142	0.027	0.179	5.197	0.000
	X7	0.144	0.027	0.181	5.423	0.000

a. Dependent Variable: X11

changes in empowerment, with the work environment variable alone accounting for about 84.2% of the changes in empowerment.

Table 7 elucidates the correlation analysis results, which highlight a positive and significant correlation at a 1% level between all variables, excluding diagnosis and appreciation, and the critical variable. This correlation was at its most pronounced in the case of the variable for morale and organizational affiliation ($r = 0.880^{**}$).

$$Y_2 = 0.035 + (0.277)I_2 + (0.314)I_9 + (0.131)I_5 + (0.133)I_3 + (0.1)I_6 \quad (4)$$

In Eq. (4), the variables encompass I2 (Organizational Spirits and Belonging), I3 (Information, Job Knowledge and Skills), I5 (Optimization of Work Processes and Methods), I6 (Recognition and Appreciation), I9 (Communication), and Y2 (Criticality). The variables identified in Eq. (4) account for approximately 98.9% of critical changes. The variable of organizational morale and belonging was found to have the most significant impact, explaining approximately 76.2% of the critical changes.

The results of correlation analysis presented in Table 8 demonstrate that all indicators (variables) are positively and significantly related to feasibility at the 1% level. The highest value of this correlation is associated with the variable of morale and organizational affiliation ($r = 0.901^{**}$).

$$Y_3 = 0.032 + (0.264)I_2 + (0.133)I_5 + (0.141)I_6 + (0.214)I_9 + (0.178)I_7 \quad (5)$$

In Eq. (5), the variables include I2 (morale and organizational affiliation), I5 (optimization of work processes and methods), I6 (recognition and appreciation), I9 (communication), I7 (job enrichment and promotion of employees), and Y3 (feasibility). According to Eq. (5) these variables account for about 97.8% of the changes in feasibility, with

Table 7. Correlation coefficients of different variables with each other and the critically

	I ₁	I ₂	I ₃	I ₄	I ₅	I ₆	I ₇	I ₈	I ₉	I ₁₀	Y ₁
I ₁	1	0.869**	0.678**	0.581**	0.539*	0.240	0.754**	0.588**	0.688**	0.748**	0.844**
I ₂		1	0.739**	0.666**	0.504*	0.323	0.747**	0.632**	0.664**	0.796**	0.880**
I ₃			1	0.478*	0.512*	0.277	0.689**	0.610**	0.506*	0.539*	0.767**
I ₄				1	0.671**	0.161	0.498*	0.717**	0.842**	0.802**	0.826**
I ₅					1	0.374	0.575**	0.663**	0.646**	0.435*	0.759**
I ₆						1	0.147	0.408	0.142	0.176	0.407
I ₇							1	0.528*	0.668**	0.539**	0.784**
I ₈								1	0.799**	0.733**	0.852**
I ₉									1	0.862**	0.875**
I ₁₀										1	0.846**
Y ₂											1

** . Correlation is significant at the 0.01 level (2-tailed).* . Correlation is significant at the 0.05 level (2-tailed).

Table 8. Correlation coefficients of different variables with feasibility

	I ₁	I ₂	I ₃	I ₄	I ₅	I ₆	I ₇	I ₈	I ₉	I ₁₀	Y ₁
I ₁	1	0.859**	0.671**	0.538*	0.694**	0.596**	0.687**	0.769**	0.678**	0.755**	0.875*
I ₂		1	0.695**	0.498*	0.711**	0.533*	0.782**	0.794**	0.749**	0.826**	0.901**
I ₃			1	0.252	0.765**	0.596**	0.732**	0.665**	0.634**	0.474*	0.798**
I ₄				1	0.565**	0.340	0.602**	0.528**	0.664**	0.502*	0.654**
I ₅					1	0.610**	0.783**	0.771**	0.785**	0.556*	0.879**
I ₆						1	0.624**	0.633**	0.388	0.404*	0.715**
I ₇							1	0.749**	0.676**	0.687**	0.893**
I ₈								1	0.730**	0.621**	0.879**
I ₉									1	0.701**	0.843**
I ₁₀										1	0.787**
Y ₃											1

Table 9. Correlation coefficients of variables with employees' interest and desire to improve

	I ₁	I ₂	I ₃	I ₄	I ₅	I ₆	I ₇	I ₈	I ₉	I ₁₀	Y ₁
I ₁	1	0.809**	0.869**	0.720**	0.462*	0.652**	0.802**	0.627**	0.792**	0.790**	0.907**
I ₂		1	0.716**	0.695**	0.463*	0.587**	0.588**	0.843*	0.529*	0.739**	0.791**
I ₃			1	0.852**	0.534**	0.802**	0.790**	0.722**	0.756**	0.720**	0.936**
I ₄				1	0.692**	0.719**	0.687**	0.504*	0.681**	0.496*	0.861**
I ₅					1	0.352*	0.467*	0.295*	0.586**	0.344*	0.652**
I ₆						1	0.805**	0.774**	0.687**	0.635**	0.832**
I ₇							1	0.675**	0.811**	0.592**	0.877**
I ₈								1	0.756**	0.659**	0.772**
I ₉									1	0.655**	0.881**
I ₁₀										1	0.779**
Y ₄											1

the most significant impact attributed to the variable of morale and organizational affiliation, which alone accounts for about 80.2% of the changes in feasibility.

Table 9 show cases the results of the correlation analysis, which demonstrate a positive and significant relationship at the 1% level between all indicators and the variable of employees' interest and desire to improve.

$$Y_3 = 0.016 + (0.285)I_3 + (0.270)I_9 + (0.274)I_2 + (0.274)I_7 \quad (6)$$

In Eq. (6), the variables identified are I3 (information, knowledge, and job skills), I9 (communication), I2 (organizational morale and affiliation), I7 (job enrichment and promotion of employees), and Y4 (employee interest and desire to improve). Based on Eq. (6), these variables explain about 98.3% of the changes in employees' interest and desire to improve, with the most substantial impact attributed to the variable of information, knowledge, and job skills, which alone accounts for about 87% of the changes in employees' interest and desire to improve.

Regression test

Stepwise regression was utilized to nullify the influence of ineffective or ineffective variables or indices within the regression model on the empowerment index. The prediction model under seven different scenarios is summarized in Tables 9 - 11.

Table 10. The different scenarios prediction model-1

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.922 ^a	0.850	0.842	0.15969
2	0.971 ^b	0.943	0.936	0.10139
3	0.981 ^c	0.963	0.956	0.08437
4	0.989 ^d	0.979	0.973	0.06573
5	0.994 ^e	0.988	0.983	0.05179
6	0.997 ^f	0.994	0.992	0.03570
7	0.997 ^g	0.994	0.992	0.03530

a. Predictors: (Constant), X8
 b. Predictors: (Constant), X8, X1
 c. Predictors: (Constant), X8, X1, X5
 d. Predictors: (Constant), X8, X1, X5, X10
 e. Predictors: (Constant), X8, X1, X5, X10, X3
 f. Predictors: (Constant), X8, X1, X5, X10, X3, X7
 g. Predictors: (Constant), X8, X5, X10, X3, X7

Table 11. The different scenarios prediction model-2

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.922 ^a	0.851	0.843	0.18876
2	0.968 ^b	0.938	0.931	0.12521
3	0.989 ^c	0.979	0.975	0.07494
4	1.000 ^d	1.000	1.000	0.00000

a. Predictors: (Constant), X4
 b. Predictors: (Constant), X4, X5
 c. Predictors: (Constant), X4, X5, X2
 d. Predictors: (Constant), X4, X5, X2, X3

Table 12. The different scenarios prediction model-3

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.901 ^a	0.812	0.802	0.03118
2	0.963 ^b	0.927	0.918	0.01999
3	0.976 ^c	0.952	0.943	0.01667
4	0.985 ^d	0.970	0.963	0.01346
5	0.992 ^e	0.984	0.978	0.01029
6	0.997 ^f	0.993	0.991	0.00676

a. Predictors: (Constant), X2
 b. Predictors: (Constant), X2, X5
 c. Predictors: (Constant), X2, X5, X6
 d. Predictors: (Constant), X2, X5, X6, X9
 e. Predictors: (Constant), X2, X5, X6, X9, X7
 f. Predictors: (Constant), X2, X5, X6, X9, X7, X1

Table 13. The correlation analysis

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.936 ^a	0.877	0.870	0.01005
2	0.973 ^b	0.947	0.941	0.00677
3	0.989 ^c	0.979	0.975	0.00439
4	0.993 ^d	0.986	0.983	0.00368

a. Predictors: (Constant), X3
 b. Predictors: (Constant), X3, X9
 c. Predictors: (Constant), X3, X9, X2
 d. Predictors: (Constant), X3, X9, X2, X7

Table 14. ANOVA results test

	Model	Sum of Squares	d _f	Mean Square	F	Sig.
1	Regression	2.753	1	2.753	107.954	0.000 ^a
	Residual	0.485	19	0.026		
	Total	3.238	20			
2	Regression	3.053	2	1.526	148.472	0.000 ^b
	Residual	0.185	18	0.010		
	Total	3.238	20			
3	Regression	3.117	3	1.039	145.942	0.000 ^c
	Residual	0.121	17	0.007		
	Total	3.238	20			
4	Regression	3.169	4	0.792	183.328	0.000 ^d
	Residual	0.069	16	0.004		
	Total	3.238	20			
5	Regression	3.197	5	0.639	238.373	0.000 ^e
	Residual	0.040	15	0.003		
	Total	3.238	20			
6	Regression	3.220	6	0.537	421.165	0.000 ^f
	Residual	0.018	14	0.001		
	Total	3.238	20			
7	Regression	3.219	5	0.644	516.756	0.000 ^g
	Residual	0.019	15	0.001		
	Total	3.238	20			

a. Predictors: (Constant), X8
b. Predictors: (Constant), X8, X1
c. Predictors: (Constant), X8, X1, X5
d. Predictors: (Constant), X8, X1, X5, X10
e. Predictors: (Constant), X8, X1, X5, X10, X3
f. Predictors: (Constant), X8, X1, X5, X10, X3, X7
g. Predictors: (Constant), X8, X5, X10, X3, X7
h. Dependent Variable: X11

ANOVA Test

The correlation analysis and stepwise regression results presented in the aforementioned Tables 12 - 14 indicate that job security in employees and assurance of their job position (X4) exert the most significant influence on the work environment.

4 Conclusion and Future Works

The findings of the Kolmogorov-Smirnov (K-S) test ascertained a normal distribution of data among respondents. Further analysis, specifically correlation coefficients and regression tests, demonstrated the distinct influence of each empowerment criterion on the employee empowerment at the Torbat Heydarieh Oil Company.

The analysis reveals key factors that predominantly impact each empowerment criterion. For instance, indicators like the work environment, optimization of processes and working methods, trust and honesty, knowledge and job skills information, and job enrichment and promotion account for an estimated 99.2 percent of changes in empowerment. Notably, the work environment indicator alone signifies approximately 84.2 percent of these changes.

Criticality criteria encompass morale and organizational belonging, knowledge and job skills, optimization of work processes and methods, recognition and appreciation, and communication. These factors cumulatively account for roughly 98.9 percent of critical improvements. Of these, morale and organizational belonging is the most influential, accounting for 76.2 percent.

Feasibility criteria include organizational measures of morale and belonging, process optimization, acknowledgment and appreciation, connectivity, and career enrichment, which together explain 97.8 percent of potential adjustments. Again, the organizational morale and belonging index is particularly salient, constituting approximately 80.2 percent.

In relation to the interest and desire for development among employees, factors such as job awareness and skills development, communication, organizational morale, belonging, job enrichment, and job promotion account for 98.3 percent. Here, the information, knowledge, and job skills index is the most impactful, explaining about 87 percent of the changes.

The most influential indicators on empowerment, as evidenced by the regression analysis, include workplace environment, process optimization, trust and honesty, job knowledge and skills, and employee enrichment and promotion for the empowerment criteria. The work environment index has the most significant impact. For the criticality criteria, the organizational morale and belonging index is paramount. As for the feasibility criteria, the organizational morale and belonging index is the most influential. Lastly, the information, knowledge, and job skills index is dominant for the criteria of employee interest and desire to improve.

In terms of future work, there is a need to examine the implications of these findings further, potentially through longitudinal studies and application in other organizational contexts. This would serve to both validate and extend these findings, enhancing their potential applicability in a broader context.

Data Availability

The data used to support the findings of this study are available from the corresponding author upon request.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

References

- [1] S. B. Yang and S. O. Choi, "Employee empowerment and team performance: Autonomy, responsibility, information, and creativity," *Team Perform. Manag.*, vol. 15, no. 5/6, pp. 289–301, 2009. <https://doi.org/10.1080/13527590910983549>
- [2] N. Page and C. E. Czuba, "Empowerment: What is it," *J. Ext.*, vol. 37, no. 5, pp. 1–5, 1999.
- [3] M. M. Butts, R. J. Vandenberg, D. M. DeJoy, B. S. Schaffer, and M. G. Wilson, "Individual reactions to high involvement work processes: investigating the role of empowerment and perceived organizational support," *J. Occup. Health Psychol.*, vol. 14, no. 2, pp. 122–136, 2009. <https://psycnet.apa.org/doi/10.1037/a0014114>
- [4] W. T. Wang, Y. D. Wang, and W. T. Chang, "Investigating the effects of psychological empowerment and interpersonal conflicts on employees' knowledge sharing intentions," *J. Knowl. Manag.*, vol. 23, no. 6, pp. 1039–1076, 2019. <https://doi.org/10.1108/JKM-07-2018-0423>
- [5] D. R. Brown and D. Harvey, *An Experiential Approach to Organization Development*. New Delhi: Pearson Education, 2006.
- [6] M. A. Zimmerman, "Empowerment theory," in *Handbook of Community Psychology*, J. Rappaport and E. Seidman, Eds. Boston, MA: Springer, 2000, pp. 43–63. https://doi.org/10.1007/978-1-4615-4193-6_2
- [7] D. Tjosvold and H. Sun, "Effects of power concepts and employee performance on managers' empowering," *Leadersh. Organ. Dev. J.*, vol. 27, no. 3, pp. 217–234, 2006. <https://doi.org/10.1108/01437730610657730>
- [8] H. M. Harrim and S. J. Alkshali, "Employees' empowerment and its effect on team effectiveness: Field study on jordanian construction firms," *Jordan J. Bus. Adm.*, vol. 4, no. 1, pp. 107–117, 2008.
- [9] L. M. Smith, M. A. Andrusyszyn, and H. K. Spence Laschinger, "Effects of workplace incivility and empowerment on newly-graduated nurses' organizational commitment," *J. Nurs. Manag.*, vol. 18, no. 8, pp. 1004–1015, 2010. <https://doi.org/10.1111/j.1365-2834.2010.01165.x>
- [10] R. Zeffane and H. A. M. Al Zarooni, "Empowerment, trust and commitment: The moderating role of work-unit centrality," *Int. J. Manag.*, vol. 29, no. 1, pp. 332–351, 2012.
- [11] T. Nel, M. W. Stander, and J. Latif, "Investigating positive leadership, psychological empowerment, work engagement and satisfaction with life in a chemical industry," *SA J. Ind. Psychol.*, vol. 41, no. 1, pp. 1–13, 2015.
- [12] M. I. Ukil, "The impact of employee empowerment on employee satisfaction and service quality: Empirical evidence from financial enterprises in bangladesh," *Verslas Teor. ir Prakt.*, vol. 17, no. 2, pp. 178–189, 2016. <http://dx.doi.org/10.3846/btp.2016.651>
- [13] N. Nafari and S. Vatankhah, "Investigating the effect of empowerment on employees' occupational self-efficacy," *Bull. Soc. R. Sci. Liège*, vol. 85, pp. 1434–1447, 2016. <http://dx.doi.org/10.25518/0037-9565.6156>
- [14] S. Mustafa, M. Sadiq, A. Khan, and K. Jameel, "Women education in pakistan: Is the level enough for empowerment?" *Int. J. Sci. Eng. Res.*, vol. 7, no. 8, 2016.
- [15] S. Chakraborty and S. K. Chaudhuri, "Integrating diverse knowledge bases for empowering local farmers in india," *Ann. Libr. Inf. Stud. (ALIS)*, vol. 65, no. 3, pp. 147–155, 2018.
- [16] J. Kansal and N. Jain, "Development of competency model and mapping of employees competencies for organizational development: A new approach," *J. Sci. Ind. Res.*, vol. 78, no. 1, pp. 22–25, 2019.

- [17] M. Al-Bsheish, M. bin Mustafa, M. Ismail, M. Jarrar, A. Meri, and M. Dauwed, "Perceived management commitment and psychological empowerment: A study of intensive care unit nurses' safety," *Saf. Sci.*, vol. 118, pp. 632–640, 2019. <https://doi.org/10.1016/j.ssci.2019.05.055>
- [18] A. A. I. Asiri, "The impact of administrative empowerment on the performance of king abdul-aziz hospital in makkah (an applied study)," *J. Hum. Resour. Sustain. Stud.*, vol. 8, no. 2, pp. 157–184, 2020. <http://dx.doi.org/10.4236/jhrss.2020.82010>
- [19] A. Batiari, S. R. Al-Taha, and R. Alizadeh, "Investigating the relationship between ethical factors on job motivation in the employees of north khorasan power distribution company," *Int. J. Ethics Soc.*, vol. 2, no. 1, pp. 43–50, 2020.
- [20] M. H. V. Moghadam, M. Mohammadi, and G. A. Bazaey, "Investigating effect of transformational leadership on employees' and administrators' satisfaction of telecommunication general department of district 3," *J. Manag. Account. Stud.*, vol. 8, no. 2, pp. 24–30, 2020. <https://dx.doi.org/10.24200/jmas.vol8iss2pp24-30>
- [21] J. Khan, M. Malik, and S. Saleem, "The impact of psychological empowerment of project-oriented employees on project success: A moderated mediation model," *Econ. Res.-Ekon. Istraž.*, vol. 33, no. 1, pp. 1311–1329, 2020. <https://doi.org/10.1080/1331677X.2020.1756374>
- [22] A. Mazaherinezhad, A. M. Ahmed, M. Y. Ghafour, O. H. Ahmed, S. Ali, and M. Hosseinzadeh, "A new model for investigating the role of knowledge management system on the mental health of employees," *Kybernetes*, vol. 50, no. 12, pp. 3269–3285, 2020. <https://doi.org/10.1108/K-02-2020-0103>
- [23] D. Maiorano, D. Shrimankar, S. Thapar-Björkert, and H. Blomkvist, "Measuring empowerment: Choices, values and norms," *World Dev.*, vol. 138, p. 105220, 2021. <https://doi.org/10.1016/j.worlddev.2020.105220>
- [24] M. Malik, S. Sarwar, and S. Orr, "Agile practices and performance: Examining the role of psychological empowerment," *Int. J. Proj. Manag.*, vol. 39, no. 1, pp. 10–20, 2021. <https://doi.org/10.1016/j.ijproman.2020.09.002>
- [25] N. Jamali, H. Razavi, and M. Gharib, "Optimization of propofol dose estimated during anesthesia through artificial intelligence by genetic algorithm: Design and clinical assessment," *Neural Process. Lett.*, vol. 54, no. 4, pp. 3019–3043, 2022. <http://dx.doi.org/10.1007/s11063-022-10751-7>
- [26] M. R. Gharib, M. Rasti, P. Danesh, A. Daneshvar, and N. Mohammadyahya, "Analysis of stress and strain of human skull bone in physical injury," *Mech. Solids*, vol. 57, no. 5, pp. 1134–1156, 2022. <https://doi.org/10.3103/S0025654422050065>
- [27] N. Jamali, M. Gharib, and B. O. Koma, "Neuro-fuzzy decision support system for optimization of the indoor air quality in operation rooms," *Int. J. Robot. Control Syst.*, vol. 3, no. 1, pp. 98–106, 2023. <http://dx.doi.org/10.31763/ijrcs.v3i1.854>